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COMMISSION STAFF WORKING DOCUMENT

Report on the Assessment of the Member States National Policy Frameworks for the development of the market as regards alternative fuels in the transport sector and the deployment of the relevant infrastructure pursuant to Article 10 (2) of Directive 2014/94/EU

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Disclaimer

This updated version includes the evaluations of the National Policy Frameworks submitted by Greece, Malta, Romania, and Slovenia. These National Policy Frameworks could not be taken into account for the initial version of this Staff Working Document (SWD/2017/0365 final). The developments in other Member States occurred since the date of the adoption of this SWD (8 November 2017) have not been taken into account.

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Introduction

Alternative fuels are key to improving the EU's security of energy supply, reducing the impact of transport on the environment and boosting EU competitiveness. They are also an important building block for the EU's transition towards a low-carbon economy.

The Directive on the deployment of alternative fuels infrastructure (2014/94/EU), hereafter referred to as 'Directive', requires that Member States provide a minimum infrastructure for alternative fuels such as electricity, hydrogen and natural gas. Per article 3 of the Directive, the Member States had to notify the European Commission by 18 November 2016 on their National Policy Frameworks (NPF). In their NPF, the Member States should outline their national targets and objectives, and any supporting actions for the development of the market as regards alternative fuels, including the deployment of the necessary infrastructure to be put into place.

The directive sets a regulatory framework for the following fuels:

Electricity: Since about 2010, electric vehicles have become a common sight on European roads. The directive requires Member States to set targets for recharging points that would be accessible to the public, to be built by 2020, to ensure that electric vehicles can circulate freely, at least in urban and suburban agglomerations. Targets should ideally foresee a minimum of one recharging point per ten electric vehicles.

Compressed Natural Gas (CNG): For over a decade, CNG vehicles and buses have been deployed in several Member States. The directive requires that Member States ensure a sufficient number of publicly accessible refuelling points, with common standards, to be built thus allowing the circulation of CNG vehicles, both in urban and sub-urban areas (by end-2020) as well as on the TEN-T (Trans-European Transport Network) core network, ideally every 150 km (by end-2025).

Liquefied Natural Gas (LNG): Natural gas/bio-methane vehicles today offer a well-developed technology, with performances and cost equivalent to petrol or diesel units and with cleaner exhaust emissions. Natural gas used in trucks and ships can substitute diesel. For the development of LNG for road transport, Member States have to ensure a sufficient number of publicly accessible refuelling points, with common standards, on the TEN-T core network, ideally every 400 km, to be built by end-2025. The directive also requires a minimum coverage to ensure accessibility of LNG in main maritime and inland ports.

Hydrogen: The directive aims to ensure a sufficient number of publicly accessible refuelling points, with common standards, in the Member States who opt for hydrogen infrastructure, to be built by end-2025.

Besides the NPF, the Directive also regulates common EU-wide standards for equipment needed and user information. These latter two aspects are governed by the general transposition provisions of the Directive.

The Directive aims at facilitating a functional internal market for alternative fuel vehicles and technology, and infrastructure build-up. The targets and objectives of the NPF can have an impact on:

- creating a minimum level of recharging and refuelling infrastructure across the EU including cross-border continuity and enabling market uptake of alternative fuel transport systems,

- the achievement of EU climate and energy objectives,
- improvement of air quality,
- strengthening the EU's competitiveness and jobs.

The figure below schematically describes how the estimates, targets and measures for the alternative fuel vehicles and alternative fuels infrastructure described in the NPFs interact and how these combined impact EU wide goals.

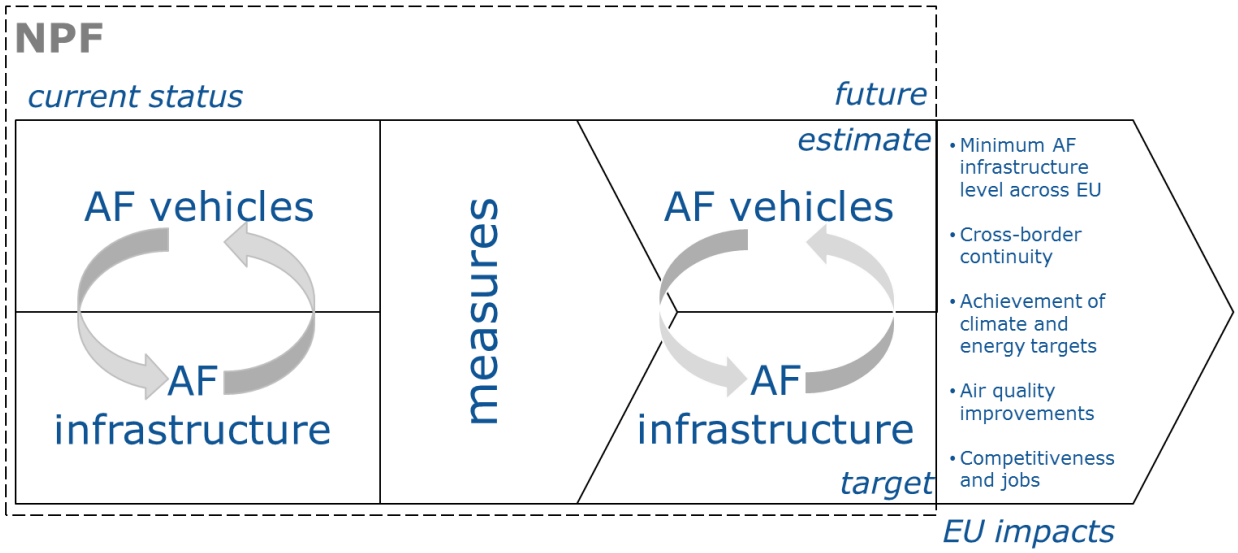

Figure 1: Interaction of various aspects covered in the NPF and resulting impacts

This document contains a one to two page summary chapter with the main results of the assessment for each NPF. The full assessment is documented in the SWD accompanying the Communication "Towards the broadest use of alternative fuels – an Action Plan on Alternative Fuels Infrastructure, including the report on the implementation of Directive 2014/94/EU". Each chapter contains a tabular overview of the current status of AF vehicles/vessels and their corresponding infrastructure, the future estimates for AF vehicles/vessels as well as the corresponding future targets for AF infrastructure. It also contains an assessment of the sufficiency of the defined targets and a qualitative assessment of the defined support measures.

Tabular overview explanations

	AF Vehicles / Vessels				Publicly accessible AF Infrastructure					Measures	
Fuel / Vehicles or Vessels / targets year	Current situation	Future Estimate	Future share (%)	Estimate reached (%)	Current situation	Target	Target attain-ment (%)	Sufficiency (Index) Current	Sufficiency (Index) Future	Score	Compre-hensive-ness
Electricity / vehicles / 2020	Number of registered AF vehicles retrieved from EAFO in March 2017 (unless otherwise stated), AF vessels always from NPF	Estimate of future AF vehicles or vessel (according to NPF)	Future share in percent: calculated by dividing the future estimate (previous column) by total number of vehicles/vessels in member state	Attainment of estimate (in percent): calculated by dividing the current situation (2016) by future estimate	Number of publicly accessible recharging/refuelling points available, retrieved from EAFO in March 2017 (unless otherwise stated), port infrastructure always from NPF	Target of publicly accessible recharging/refuelling points (according to NPF)	Attainment of target (in percent): calculated by dividing the current situation (March 2017) by future target	Number of EV per publicly accessible recharging point		H-High, M-Medium, L-Low score. X-nothing assessable defined For details see SWD	c-comprehensive, n-not-comprehensive. For details see SWD
CNG / vehicles / 2020								Number of CNG vehicles per publicly accessible CNG refuelling point			
LNG / heavy-duty vehicles / 2025								Assessment of coverage (distance for road modes) OK – sufficient (OK) – seems sufficient, not all information provided in the NPF I – insufficient X – nothing defined/considered			
LNG / seagoing ships / 2025											
LNG / inland waterway vessels / 2030											
H_2 / vehicles / 2025											
Other fuels											

Abbreviations

AF	Alternative Fuels
AFI	Alternative Fuels Infrastructure
CNG	Compressed natural gas
CO_2	Carbon dioxide
EAFO	European Alternative Fuels Observatory
EC	European Commission
EU	European Union
EV	Electric Vehicle
GHG	Greenhouse Gas
GPU	Ground Power Unit
H_2	Hydrogen
LNG	Liquefied natural gas
LPG	Liquefied petroleum gas
MGO	Marine gasoil
MS	EU Member State
NDI	Normalised Difference Index
NO_x	Nitrogen oxides
NPF	National Policy Framework
PM	Particulate matter
SSE	Shore-side electricity
SWD	Staff Working Document
TEN-T	Trans-European Transport Network

1 AUSTRIA

Tabular overview

	AF Vehicles / Vessels				Publicly accessible AF Infrastructure					Measures	
Fuel / transport mode / targets year	Current situation (from EAFO March 2017)	Future Estimate	Future share (%)	Estimate reached (%)	Current situation (from EAFO March 2017)	Target	Target attain-ment (%)	Sufficiency (Index / Assessment)		Score	Compre-hensive-ness
								Current	Future		
Electricity / vehicles / 2020	13,338	64,000-175,000	1.25-3.42	20.8-7.6	2,486	3,500-4,700	71-52.9	5.37	18.3-37.3	M	c
CNG / vehicles / 2020	6,165				173	171	100.0	35.64		M	n
LNG / heavy duty vehicles / 2025					0	1-2	0.0		(OK)	X	-
LNG / seagoing ships / 2025	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LNG / inland waterway vessels / 2030						1-2			(OK)	X	-
H2 / vehicles / 2025	20				3	5	60.0		(OK)	L	n
LPG / vehicles	8,000				50					X	-

The Austrian NPF fully addresses the requirements of Article 3. 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.

The Austrian NPF puts a lot of emphasis on electric vehicles and contains, with more than 1.3% share by 2020, high estimates for the future deployment of EV, when compared with its current EV shares (0.3%). Austria has already today a relatively dense network of public recharging points. Eligibility for several support measures for EV is contingent on 100% renewable electricity contracts. This ensures zero emission electro-mobility also under a well-to-wheel perspective. Austria, already today, has a significant number of electric buses, some powered via overhead lines. Bicycles and electric bikes as well as their infrastructure also receive support. Regarding electricity supply for stationary airplanes, the Austrian NPF commits to maintaining the current infrastructure. For shore-side electricity, the NPF mentions ongoing studies to investigate the possible extension of the basic existing network.

Today, the spatial distribution of recharging points and especially high power recharging infrastructure seems to appropriately cover the needs of electric vehicles in terms of distance requirements in Austria. For the future, the targeted ratio of only one public recharging point per 18-37 electric vehicles estimated for 2020 could evolve to become a barrier for the further market deployment of electric vehicles. This could also lead to market fragmentation within the EU. It will be important to closely monitor this development and correct infrastructure targets in line with the market developments.

Austria currently has a sufficient network of CNG refuelling points. However, the Austrian NPF displays a sceptical view on the future prospects of CNG vehicles and does not foresee additional investments in CNG refuelling infrastructure.

Depending on market demand, 1-2 dual use LNG refuelling points for vessels and heavy-duty trucks are proposed in the NPF. If both LNG refuelling points were realised, this would guarantee that the

maximum distance requirement for LNG refuelling points along the TEN-T Core Network would be fulfilled on Austrian territory.

The Austrian NPF considers hydrogen for transport and targets a slight increase of hydrogen refuelling points.

The Austrian NPF contains a very comprehensive list of measures, most already in place and their prolongation foreseen. Most of them can be considered having a medium impact on market actor's decisions. Longer periods for their validity could provide certainty for market actors and hence increase the likelihood that the national targets and objectives of the NPF can be reached. The NPF contains a comprehensive list of support measures that can promote the deployment of alternative fuels infrastructure in public transport services.

The consideration of the interests of regional and local authorities, as well as stakeholders during the drafting of the Austrian NPF can be considered exemplary. Further coordination is planned in order to ensure follow-up of the implementation actions, collaboration among authorities and advice from stakeholders.

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

2 BELGIUM

Tabular overview

	AF Vehicles / Vessels				Publicly accessible AF Infrastructure					Measures	
Fuel / transport mode / targets year	Current situation (from EAFO March 2017)	Future Estimate	Future share (%)	Estimate reached (%)	Current situation (from EAFO March 2017)	Target	Target attain-ment (%)	Sufficiency (Index / Assessment)		Score	Compre-hensive-ness
								Current	Future		
Electricity / vehicles / 2020	21,102	86,641	1.30	24.4	1,715	8,324	20.6	12.30	10.40	M	c
CNG / vehicles / 2020	4,285	42,581	0.62	10.1	58	333	17.4	61.40	127.90	M	n
LNG / heavy duty vehicles / 2025	40				2	2-14*	14		(OK)	L	n
LNG / seagoing ships / 2025					3	>=4	~50		OK	M	n
LNG / inland waterway vessels / 2030					0	2	0.0		(OK)	L	n
H2 / vehicles / 2025	21				3	22*	13.6		OK	L	c
LPG / vehicles	42,000				509					X	-

* - 2020

The Belgian NPF fully addresses the requirements of Article 3. It contains tables of the current state and future estimates for alternative fuels vehicles in the transport sector. For all fuels and modes, it establishes targets as required by Article 3 of the Directive.

The Belgian NPF puts a lot of emphasis on electric cars. It contains high estimates for the future deployment of EV with an estimated roughly 1.3% electric vehicles on the road in 2020. Today, the spatial distribution of recharging points seems to appropriately cover the needs of electric vehicles in terms of distance requirements in Belgium. For the future, the targeted ratio of less than one public recharging point per 10 electric vehicles estimated for 2020 could evolve to become a barrier for the further market deployment of electric vehicles, especially in the Walloon and Brussels-Capital Region. This could also lead to market fragmentation within the EU. It will be important to closely monitor this development and correct infrastructure targets in line with the market developments. Belgium has also defined ambitious targets for electric buses, especially in the Brussels-Capital Region. Other initiatives for electrifying public transport, such as taxi fleets and carpooling are presented in the Belgian NPF. Electric bikes as well as their infrastructure also receive support. The Belgian NPF contains targets for further increasing shore-side electricity in its ports but no plans to increase the electricity supply for stationary airplanes.

The Belgian NPF sees a growing role for CNG cars. It contains modest estimates for the further evolution of CNG cars, with an estimated share of 0.6% on the road in 2020. Belgium has today a sufficient network of public recharging and CNG refuelling points.

LNG refuelling is planned for all maritime ports in the TEN-T Core Network and several inland ports. Furthermore, at least 2 LNG refuelling points for heavy-duty vehicles are targeted in the ports of Antwerp and Oostende. According to the results of a sector survey, that is mentioned in the NPF, these targets could be significantly exceeded. Altogether, the planned LNG refuelling points could

guarantee that the maximum distance requirement for LNG refuelling points along the TEN-T Core Network would be fulfilled on Belgian territory.

The Belgian NPF displays a strong commitment towards hydrogen. The deployment of 19 publicly accessible hydrogen refuelling points in addition to the three existing is planned.

The Belgian NPF contains a comprehensive list of measures, most already in place and foreseen to stay. Most of them can be considered having a medium impact on market actor's decisions, especially for electric and CNG cars as well as electrification of public transport. The measures listed in the Belgian NPF differ for the three different regions (Flemish Region, Walloon Region, and Brussels Capital Region). A number of measures are defined at the federal level and apply for all three regions. The level of support varies greatly across the three regions. This could lead to a certain market fragmentation within the country.

The consideration of the interests of regional and local authorities, as well as stakeholders during the drafting of the Belgian NPF is evident throughout the text of the NPF.

Belgium is actively involved in coordinating its plans on alternative fuels infrastructure with the Benelux countries and is collaborating with them in this field. It may be advisable to extend this cooperation effort also towards other neighbouring countries such as France and Germany.

3 BULGARIA

Tabular overview

	AF Vehicles / Vessels				Publicly accessible AF Infrastructure					Measures	
Fuel / transport mode / targets year	Current situation (from EAFO March 2017)	Future Estimate	Future share (%)	Estimate reached (%)	Current situation (from EAFO March 2017)	Target	Target attain-ment (%)	Sufficiency (Index / Assessment)		Score	Compre-hensive-ness
								Current	Future		
Electricity / vehicles / 2020	58 (EAFO) 2,337 (NPF)	35,000	1.08	0.2	22 (EAFO) 43 (NPF)	2,500	0.9	2.64	14.00	L	c
CNG / vehicles / 2020	80,875 (NPF)				105			770.24		M	n
LNG / heavy duty vehicles / 2025	3				1 (NPF) 0 (EAFO)	4	25.0		i	M	n
LNG / seagoing ships / 2025					0	1	0.0		(OK)	X	-
LNG / inland waterway vessels / 2030					1	2	25.0		(OK)	X	-
H2 / vehicles / 2025	0	400	0.01	0	0	10	0.0		(OK)	X	-
Other fuels (LPG / vehicles)	140,409 (NPF)				2,900					X	-

The Bulgarian NPF addresses only part of the requirements of Article 3 of the Directive. It contains an extensive discussion of the current state and future scenarios for alternative fuels in the transport sector. However, the NPF does not contain any designation of urban/suburban agglomerations to be equipped with recharging points and with CNG refuelling points. In the Bulgarian NPF, the number of refuelling points for CNG and for LNG to be put in place along the TEN-T Core Network is not defined. Bulgaria intends to develop an alternative fuels infrastructure network that it is considerate of the Bulgarian economic conditions with lower initial investments and minimised risks in the first years.

The Bulgarian NPF recognises that electrification of the propulsion of vehicles could contribute to the development of environmentally friendly road transport in Bulgaria however in a long term perspective. Bulgaria expects a rather rapid deployment of electric vehicles, mainly PHEV. It estimates the share of EV in Bulgaria to be roughly 1% by 2020. For electric recharging infrastructure, the current situation, with 22 publicly accessible recharging points, is sufficient. The Bulgarian targets for the recharging network in 2020, 2025 and 2030 might not be enough if the estimates for electric vehicles in Bulgaria are met. It may be important to closely monitor this development and correct infrastructure targets in line with the market developments. The NPF does not contain concrete targets to increase the availability of electricity supply for stationary airplanes. For shore-side electricity it focuses on plans for modernising the existing infrastructure.

Bulgaria has already today a relatively dense network of CNG refuelling points in parts of the country and the NPF foresees that this will further grow to cover the complete Bulgarian territory and the Bulgarian part of the TEN-T Corridors. The Bulgarian NPF does not contain future estimates for the number of CNG vehicles.

It has a target of 4 LNG refuelling points for heavy-duty vehicles, which is insufficient to ensure appropriate coverage of the TEN-T Core Network on Bulgarian territory.

The Bulgarian NPF contains some targets for LNG bunkering infrastructure for inland and seagoing vessels. Building of the bunkering infrastructure is to a certain extent dependent on the availability of EU funds.

Bulgaria considers hydrogen technologies as a way of integrating renewable energy sources in transport and has included hydrogen in its NPF. The NPF estimates the share of hydrogen vehicles to be around 0.01% by 2025 in Bulgaria.

The Bulgarian NPF is based on a well-defined legislative framework and on investment support that to some extent relies on European Union co-funding instruments and Cohesion Funds. The NPF contains large number of possible initiatives with support measures to enhance the deployment of electro-mobility, hydrogen and natural gas vehicles and alternative fuels infrastructure, also for public transport. All these measures, if implemented, could help overcome deployment barriers. Since most of these measures are still only under consideration, there is a certain risk that the national targets and objectives of the NPF may not be reached.

The Republic of Bulgaria, in its NPF, declares interest to cooperate with the neighbouring countries to ensure EU-wide circulation of vehicles and vessels, especially for natural gas. It may be advisable to extend this cooperation also for the other fuels and modes.

4 CYPRUS

Tabular overview

	AF Vehicles / Vessels				Public AF Infrastructure					Measures	
Fuel / transport mode / targets year	Current situation (from EAFO March 2017)	Future Estimate	Future share (%)	Estimate reached (%)	Current situation (from EAFO March 2017)	Target	Target attain-ment (%)	Sufficiency (Index / Assessment)		Score	Compre-hensive-ness
								Current	Future		
Electricity / vehicles / 2020	75	100 - 2000	0.02 – 0.32	75 – 3.75	36	100	36	2.08	1 - 20	M	c
CNG / vehicles / 2020									X	X	-
LNG / heavy duty vehicles / 2025									X	X	-
LNG / seagoing ships / 2025									X	X	-
LNG / inland waterway vessels / 2030	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
H2 / vehicles / 2025									X	X	-
LPG /vehicles / 2025	64 (NPF)					20			(OK)	X	-

From the Cyprus NPF, it is transparent that alternative fuels are at an early deployment stage in Cyprus. The Cyprus NPF addresses only a small part of the requirements of Article 3 of the Directive, mainly electro-mobility. For the future development and further penetration of alternative fuels in transport, a study entitled 'Technical Assistance in order to assess and formulate recommendations for the promotion and penetration of alternative fuels in the transport sector' has been commissioned. The purpose of the ongoing study is to present a comprehensive proposal regarding future penetration scenarios for various alternative fuels in the transport sector in Cyprus, as well as promotion policies and measures, taking account of the specific characteristics of Cyprus, to achieve the climate and energy targets related to the transport sector.

In the case of electricity for road transport, which constitutes the focus of the Cyprus NPF, the requirements of the Directive were fulfilled and details were given about the targeted recharging infrastructure for 2020 in terms of number and placement. Even though the future estimates of electric vehicle stock are rather modest, being situated in the range of 0.02% to 0.32% of the future vehicle stock, the proposed set of measures can support reaching the declared objectives since it was evaluated as being comprehensive and having a medium assessment score. In the case of electricity supply at airports and shore-side supply in its maritime ports, the Cypriot authorities are currently examining the situation and studies are carried out. The decision of setting targets and support measures is foreseen for the future.

Besides electro-mobility, the national strategy for the other alternative fuels is briefly or inadequately treated in the Cyprus NPF, being dependent on the results of currently ongoing studies. For CNG and LNG fuels, the NPF contains neither future estimates for vehicles nor targets for refuelling infrastructure. The lack of ambition for natural gas can be partially explained by the small market size in Cyprus and the lack of interconnections with other natural gas networks. However, the Cypriot NPF declares intentions to foster LNG use in maritime transport, also in cooperation with Greece and Italy

The Cyprus NPF does not contain any targets for hydrogen in transport.

The Cyprus NPF contains a medium size portfolio of support measures, many being currently discussed and planned and receiving in consequence the status ‘under consideration’. The majority of the proposed measures necessary to ensure national targets concern electricity for road transport, this cluster that contains 7 assessable measures received a medium overall assessment score. The use of alternative fuels for public transport activity is too vaguely addressed and additional concrete details would have been desirable.

Regarding the cooperation with other Member States, the NPF states that Cyprus cooperates with Greece and Italy in the frame of the EU funded POSEIDON-MED II LNG project. A study regarding the future deployment and placement of LNG refuelling infrastructure at Cypriot ports will be carried out within this project.

5 CZECH REPUBLIC

Tabular overview

	AF Vehicles / Vessels				Publicly accessible AF Infrastructure					Measures	
Fuel / transport mode / targets year	Current situation (from EAFO March 2017)	Future Estimate	Future share (%)	Estimate reached (%)	Current situation (from EAFO March 2017)	Target	Target attain-ment (%)	Sufficiency (Index / Assessment)		Score	Compre-hensive-ness
								Current	Future		
Electricity / vehicles / 2020	1,386	17,000	0.35	8.2	451 (EAFO) 164 (NPF)	1,300	34.7	3.07	13.08	L	c
CNG / vehicles / 2020	10,227	50,000	1.03	20.5	108	200	54.0	94.69	250	M	n
LNG / heavy duty vehicles / 2025		500	0.23		0	5	0.0		OK	M	n
LNG / seagoing ships / 2025	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LNG / inland waterway vessels / 2030									X	X	-
H2 / vehicles / 2025					1	3 - 5	33.3-20.0		OK	L	n
Other fuels (LPG / vehicles)	179,000				1,100				X	L	n

The Czech NPF broadly addresses the requirements of Article 3. It contains an extensive discussion of the current state and future scenarios for alternative fuels in the transport sector. For most fuels and modes, it establishes sufficient targets as required by Article 3 of the Directive. It does not contain a target for LNG refuelling points at inland ports.

The Czech NPF puts a comparably low emphasis on electric vehicles and estimates only 0.35% electric vehicles on the road in 2020. Today, the spatial distribution of recharging points and specifically high power recharging infrastructure seems to appropriately cover the needs of electric vehicles in terms of distance requirements in the Czech Republic. For the future, the targeted ratio of only one public recharging point per 13 electric vehicles estimated for 2020 could evolve to become a barrier for the further market deployment of electric vehicles. This could also lead to market fragmentation within the EU, especially in the context of the rather low estimated EV shares in the Czech NPF. It will be important to closely monitor this development and correct infrastructure targets in line with the market developments. Regarding electricity supply for stationary airplanes, the NPF only mentions that further installations for the Prague airport are under consideration. The NPF does not provide any targets for shore-side electricity.

The Czech Republic already today has a relatively dense network of CNG refuelling points and the NPF foresees that this will further grow in line with the expected market needs, which are comparably high in the NPF, with estimates of 1% CNG cars on the road in 2020.

The NPF has established targets for LNG refuelling points for heavy-duty vehicles that will likely ensure appropriate coverage of the road TEN-T Core Network on Czech territory.

The Czech NPF does not contain targets for LNG refuelling at inland ports. This omission could have a negative impact on the circulation of LNG inland waterway vessels throughout the TEN-T Core Network. The decision not to include LNG refuelling at inland ports in the Czech NPF would have merited a more detailed discussion of market needs. This may need to be revisited also in light of estimated market needs from other Member States.

The NPF establishes targets for hydrogen refuelling points.

The Czech NPF contains a very comprehensive list of measures, which, if implemented, could help overcome deployment barriers. Since the adoption status of most of these measures is low, there is a certain risk that the national targets and objectives of the NPF may not be reached. The NPF also contains a list of considered support measures to promote the deployment of alternative fuels infrastructure in public transport services.

The Czech Republic, in its NPF, declares interest to cooperate with the neighbouring countries to ensure EU-wide circulation, especially for LNG and hydrogen for road transport. It may be advisable to extend this cooperation also for the other fuels and modes.

6 GERMANY

Tabular overview

	AF Vehicles / Vessels				Publicly accessible AF Infrastructure					Measures	
Fuel / transport mode / targets year	Current situation (from EAFO March 2017)	Future Estimate	Future share (%)	Estimate reached (%)	Current situation (from EAFO March 2017)	Target	Target attain-ment (%)	Sufficiency (Index / Assessment)		Score	Compre-hensive-ness
								Current	Future		
Electricity / vehicles / 2020	87,914	1,000,000	2.14	8.8	18,078	43,000	42.0	4.86	23.26	M	c
CNG / vehicles / 2020	116,970				913	913	100.0	128.12		L	c
LNG / heavy duty vehicles / 2025					0	9	0.0		OK	M	c
LNG / seagoing ships / 2025					4 (3***)				(OK)	L	n
LNG / inland waterway vessels / 2030	5/2*				4 (3***)				(OK)	L	n
H2 / vehicles / 2025	215 (NPF) 109 (EAFO)				50 (NPF) 18 (EAFO)	400**	12.5		OK	H	c
Other fuels (LPG / vehicles)	476,000				7,000				X	L	n

*5 operating in Germany, 2 under German flag, ** maximum numbers, depending on the deployment of AFV, *** on TEN-T Core Network

The German NPF addresses most of the requirements of Article 3. It presents the current state of alternative vehicle uptake and infrastructure and derives targets for future recharging points, LNG refuelling points (road), and H_2 refuelling points (road). It does not establish targets for LNG refuelling points in ports beyond the already existing facilities.

A main focus of the German NPF is on electric vehicles. It estimates a share of roughly 2% electric vehicles on the road in 2020. This is a comparably high estimate and will require a rapid growth of EV deployment in Germany in the coming years. While the targeted number of recharging points seems adequate to cover the needs of electric vehicles in terms of distance requirements in Germany, the ratio of only one public recharging point per 23 electric vehicles estimated for 2020 could evolve to become a barrier for the further market deployment of electric vehicles. This could also lead to market fragmentation within the EU. It will be important to closely monitor this development and correct infrastructure targets in line with the market developments. The NPF does not provide any targets for further deployment of electricity supply for stationary airplanes. For shore-side electricity, it does not contain targets. Instead, it refers to pilot projects with a focus on inland ports.

The NPF enables for potentially significant further market uptake of CNG vehicles. Germany has already today a relatively dense network of CNG refuelling points, offering a good coverage in most regions and in all urban agglomerations. Available infrastructure could probably support more than five times the CNG vehicles on the road in Germany today. No CNG infrastructure build-up beyond present levels is intended.

The German NPF defines a network of nine road LNG refuelling points that could guarantee fulfilment of the maximum distance requirement for LNG refuelling points for heavy-duty vehicles along the TEN-T Core Network on German territory. However, LNG propelled heavy-duty vehicles may have to deviate from the shortest route in order to refuel when travelling on the TEN-T Core Network.

The NPF does not establish target numbers for LNG refuelling points for ports, nor does it define an LNG distribution system as required by the Directive. According to the NPF, LNG infrastructure build-up will be pursued depending on market needs.

The German plan allows for potentially ambitious market uptake of H_2 vehicles, where infrastructure sufficiency is planned to be achieved in the near future.

The German NPF contains a comprehensive list of measures which are already existing or adopted. Measures are focussed on electric vehicles and infrastructure for road, but measures are proposed also for other road AFI/AFV types as well as for waterborne transport. Most of them can be considered having a medium or low impact on market actor's decisions. Some measures attain a low overall measure score due to scarce information on planned budget and boundaries which allows for qualitative evaluation only. Measures presented seem sufficient to contribute to the achievement of the targets set in the NPF. The NPF also contains several support measures to promote the deployment of alternative fuels infrastructure in public transport services.

Interests of regional and local authorities as well as stakeholders have been considered during the drafting of the German NPF. Germany is actively involved in coordinating its plans on alternative fuels infrastructure with other Member States as well as collaborating with them in this field.

7 DENMARK

Tabular overview

	AF Vehicles / Vessels				Publicly accessible AF Infrastructure					Measures	
Fuel / transport mode / targets year	Current situation (from EAFO March 2017)	Future Estimate	Future share (%)	Estimate reached (%)	Current situation (from EAFO March 2017)	Target	Target attain-ment (%)	Sufficiency (Index / Assessment)		Score	Compre-hensive-ness
								Current	Future		
Electricity / vehicles / 2020	10,228	30,621*	0.94	33.4	2,540	3,000	84.7	4.03	10.21	M	c
CNG / vehicles / 2020	226				13	20**	65.0	17.38		M	n
LNG / heavy duty vehicles / 2025					0				X	X	-
LNG / seagoing ships / 2025	1				2				(OK)	X	-
LNG / inland waterway vessels / 2030	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
H2 / vehicles / 2025	82				10				X	X	-
Other fuels (LPG / vehicles)	20				4				X	M	n

*the number of electric buses, LDVs and HDVs are assumed to remain the constant from 2016, due to undefined targets for these vehicle categories in the NPF. **for road CNG infrastructure, no 2020 targets are defined. Since there are 13 points and 7 planned, the assumption of 20 is adopted.

The Danish NPF addresses most of the requirements of Article 3. It presents the current state of alternative vehicle uptake and infrastructure and derives targets for future recharging points and CNG refuelling points (road). It discusses LNG refuelling in maritime ports and H_2 refuelling points (road). It does not establish targets for LNG refuelling points for heavy-duty vehicles. The government in Denmark is committed to achieve the goal of becoming a low-emission society, independent of fossil fuels by 2050. The Danish government seeks to promote a market-driven (i.e. determined by market players) development of infrastructure deployment and to limit public financial aid, so that greater pressure on public finances can be avoided. Technology neutrality is emphasised in the NPF.

For electricity, the Danish NPF is relatively well-balanced in terms of future targets and description of policy measures. Notwithstanding, the latter is fundamentally based on current, rather than planned measures. The NPF estimates that the EV share (of all vehicles on the road) will remain below 1% until 2020. The prospects of shore-side electricity supply in Danish maritime ports are not good. The only policy measure mentioned in the NPF is a tax relief for electricity. However, this incentive was not sufficient to make the investment in shore-side electricity supply attractive in the context of the Nordhavn expansion of the Port of Copenhagen. At the opposite extreme lies the status of electricity supply for stationary airplanes. Denmark considers itself a leader in this matter. Notwithstanding, communication of the number of ground power units installed in the three largest airports would facilitate the assessment.

For other alternative fuels, the NPF is not comprehensive.

The NPF highlights the lack of market momentum for private ownership of CNG cars. The NPF does not contain any future estimates for CNG vehicles. Although the sufficiency index for CNG refuelling points is adequate, it seems that Aarhus in particular could benefit from CNG infrastructure

deployment for two reasons: it is the second-largest city in the country and it is located along the TEN-T Network between Aalborg and Vejle.

In terms of LNG for road transport, no infrastructure targets are given.

There appears to be a lack of policy measures targeting LNG in the Danish maritime ports.

At present, Denmark foresees insignificant market uptake for hydrogen vehicles before 2025.

The support measures defined in the Danish NPF are unlikely to have a high impact on removing market barriers.

The NPF does not provide any information on stakeholder engagement and cooperation with other Member States.

8 ESTONIA

Tabular overview

	AF Vehicles / Vessels				Publicly accessible AF Infrastructure					Measures	
Fuel / transport mode / targets year	Current situation (from EAFO March 2017)	Future Estimate	Future share (%)	Estimate reached (%)	Current situation (from EAFO March 2017)	Target	Target attain-ment (%)	Sufficiency (Index / Assessment)		Score	Compre-hensive-ness
								Current	Future		
Electricity / vehicles / 2020	1,257				384	384	100.0	3.28		X	-
CNG / vehicles / 2020	2,000 (NPF)				6 (NPF)	16	37.5	333.33		M	C
LNG / heavy duty vehicles / 2025					0	1	0.0		(OK)	X	-
LNG / seagoing ships / 2025	1				0	1	0.0		(OK)	X	-
LNG / inland waterway vessels / 2030	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
H2 / vehicles / 2025					0	1	0.0		(OK)	L	N
Other fuels - LPG / vehicles / 2025	3,000 (NPF)				200				(OK)	X	-

The Estonian NPF addresses partially the requirements of Directive's Article 3. For many aspects more details would have been needed for an accurate assessment. The NPF does not contain any future estimates for alternative fuels vehicles. Vague targets are provided concerning AFI for 2020 (>100 for high power recharging points and >10 for biomethane refuelling points). Spatial distribution details or references to urban areas and the TEN-T network are not presented. Estonia is focusing on increasing the proportion of alternative fuels use in road transport and is seeking to increase the use of renewable energy sources in road transport to 10% of the amount of fuel consumed. The objective is to be achieved through three types of fuel – liquid biofuels, biomethane and electricity.

The Estonian NPF lacks concrete targets for EV infrastructure and information about the future EV vehicle market development. It neither contains targets for further deployment of electricity supply for stationary airplanes nor shore-side electricity.

One of the Estonian NPF's main objectives is the introduction of methane-based fuels in transport. Longer term preference is biomethane because of its environmental and energy security benefits. Promoting the creation of a comprehensive network of natural gas refuelling points is considered to be the main challenge in the period leading up to 2020.

Regarding LNG, the NPF mentions that an LNG terminal including an LNG bunkering terminal is due to be completed in 2017, at the Harbour of Muuga (part of the Tallinn port) where a distribution system will also be developed, including loading facilities for LNG tank vehicles.

For hydrogen, a first pilot project is pointed out, in which the University of Tartu and the private sector plan to jointly create a hydrogen refuelling point, a production facility in Pärnu.

The Estonian NPF contains a reduced and vaguely described portfolio of existing and proposed measures covering road transport and shore-side electricity supply. All the measures concerning the use of electricity for road transport (private or public infrastructure) have expired and no future ones

are proposed. Support measures for natural gas infrastructure and the promotion of biomethane are vaguely mentioned and lack concrete information (e.g. start year, budget). Biofuels are promoted in the short term and Estonia's energy policy regulates the blending shares of biofuels in petrol and diesel (gradually increasing up to at least 10% as of 2020). For LNG, no measures are proposed at this moment but the degree of interest and need will be further investigated after the completion of the first terminal in 2017. The NPF presents two measures regarding public transport that relate to public procurement of CNG and hydrogen public buses.

The NPF mentions cross-border cooperation focussing on shore-side electricity supply.

9 GREECE

Tabular overview

	AF Vehicles / Vessels				Public AF Infrastructure					Measures	
Fuel / transport mode / targets year	Current situation (from EAFO March 2017)	Future Estimate	Future share (%)	Estimate reached (%)	Current situation (from EAFO March 2017)	Target	Target attainment (%)	Sufficiency (Index / Assessment)		Score	Compre-hensive-ness
								Current	Future		
Electricity / vehicles / 2020	187 (EAFO) 160 (NPF)	3,500	0.06	5.34	33 (EAFO) 3 (NPF)	700	4.71	5.67	5.00	M	c
CNG / vehicles / 2020	1,939 (EAFO) 1,407 (NPF)	13,500	0.23	14.36	11	22	50.00	176.27	613.64	M	c
LNG / heavy duty vehicles / 2025	0	250	0.06	0.00	0	2	0.00		i	M	n
LNG / seagoing ships / 2025					0	2	0.00		(OK)	M	c
LNG / inland waterway vessels / 2030	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
H2 / vehicles / 2025	0				0				X	X	-
LPG / vehicles / 2020	264,053 (NPF) 275,000 (EAFO)	265,450	4.52	99.47	811	1,100	73.73		OK	L	n

The Greek NPF addresses many of the requirements of Article 3. It contains a detailed description of the current state and some future estimates for alternative fuels vehicles in the transport sector and establishes targets required by Article 3 of the Directive. However, the NPF does not contain any designation of urban/suburban agglomerations to be equipped with recharging points and the number and location of recharging points and LNG refuelling points to be put in place along the TEN-T Core Network is not defined.

The Greek NPF estimates a very modest share of below 0.1% electric vehicles on the road in 2020. The proposed set of measures based mainly on tax reliefs could support reaching the declared objectives since it was evaluated as being comprehensive and having a medium assessment score. The ratio of one public recharging point per 5 electric vehicles estimated for 2020 indicates that Greece has defined appropriate targets for recharging infrastructure in line with the requirements of the Directive. The spatial distribution of the future recharging points is not provided in the NPF.

The Athens central airport in the TEN-T Core Network has currently fixed electricity supply points and mobile ground power units for use by stationary airplanes. Other airports are using mobile ground power units. However, the Greek NPF does not include targets for electricity supply for stationary airplanes and it only mentions the possibility of pilot deployment for evaluating the feasibility and viability of such electricity supply points at specific airports.

In Greece, existing shore-side infrastructure for supplying electricity to ships primarily relates to tourist ports whereas at major maritime ports infrastructure is limited and mainly relates to pilot applications (such as the ELEMED project). The Greek NPF contains targets for further increasing shore-side electricity in its ports, concrete values being provided for different categories of ports (tourist ports, maritime ports of the TEN-T Core Network and outside of it). The NPF mentions that adopting a maritime electricity tariff category will be examined coupled with tax breaks for ships that use shore-side electricity supply.

For CNG vehicles, the estimated shares are slightly higher than for EVs (0.23% in 2020 and 0.5% in 2025). Due to high estimates for CNG vehicles and non-proportional expansion of refuelling points, the number of publicly accessible CNG refuelling points in the future will likely be insufficient. The NPF shows the ambition of increasing the number of CNG refuelling points with 13 new ones by 2020 on selected urban agglomerations along the TEN-T Core Network in the framework of a project partially funded by the Connecting Europe Facility. The NPF also presents different projects to significantly extend the existing natural gas distribution network.

The NPF has established a target of 2 LNG refuelling points for heavy-duty vehicles in 2025, which is insufficient to ensure appropriate coverage of the TEN-T Core Network on Greek territory. The NPF mentions also a project entailing the design and development of LNG tanker truck transhipment facilities at the Revythousa LNG terminal.

Currently, only the Port of Piraeus has the potential to provide ships berthed with LNG by transporting it from Revythousa facilities, using specially fitted ships. The Public Gas Corporation of Greece is currently examining the potential for developing LNG facilities at the other 4 maritime ports of the TEN-T Core Network.

The Greek NPF presents the situation of LPG for which the current number of vehicles, corresponding to a share of 3.04% from all the vehicles in circulation, is expected to grow to shares higher than 4.5% in 2020, than 5.5% in 2025 and than 7.5% in 2030. It also establishes appropriate refuelling infrastructure targets consistent with the vehicle projections.

The Greek NPF does not examine the potential for using hydrogen in the transport sector.

The Greek NPF, intending to accelerate the AF deployment in transport, contains a relatively wide portfolio of measures. More than half of the presented measures are of administrative, legislative and regulatory type targeting transposition provisions of the Directive and laying down terms and conditions for the installation and operation of the AFI. A high amount of the measures is under consideration whilst only a reduced amount is already in place. Some of the mentioned measures seem to have the potential to contribute towards reaching the national targets and objectives. In many cases, the lack of concrete information (for example budget ceiling or quantification of future incentives) for the measures makes it difficult to evaluate the scope according to our methodology. Electro-mobility is promoted mostly with financial measures in the form of taxation exemptions while direct incentives for purchase of vehicles are lacking. For natural gas, the Greek NPF focuses in a first stage to extend and improve the existing natural gas distribution network. The NPF also contains several support measures to promote the deployment of alternative fuels infrastructure in public transport services and of private electro-mobility infrastructure.

Greece is interested to cooperate with the neighbouring countries in the context of the deployment of alternative fuels infrastructure on the TEN-T Core Network to ensure EU-wide circulation. The NPF states that Greece cooperates with Cyprus and Italy in the frame of the EU funded POSEIDON-MED II project that aims to have LNG adopted as a marine fuel in the Eastern Mediterranean. Greece also cooperates with Cyprus and Slovenia in the frame of the ELEMED project regarding the introduction of shore-side electricity supply to the East Mediterranean Corridor (Adriatic and Ionian seas).

10 SPAIN

Tabular overview

	AF Vehicles / Vessels				Publicly accessible AF Infrastructure					Measures	
Fuel / transport mode / targets year	Current situation (from EAFO March 2017)	Future Estimate	Future share (%)	Estimate reached (%)	Current situation (from EAFO March 2017)	Target	Target attainment (%)	Sufficiency (Index / Assessment)		Score	Compre-hensive-ness
								Current	Future		
Electricity / vehicles / 2020	12,883	38,000-150,000	0.14-0.54	33.9-8.6	1,754 (EAFO)			7.34		M	c
CNG / vehicles / 2020	2,929 (EAFO) 4,366 (NPF)	17,200	0.06	17.0	45	76	59.2	65.09	226.32	M	c
LNG / heavy duty vehicles / 2025	306 (EAFO) 250 (NPF)	800*	0.09	38.3	19 (EAFO) 15 (NPF)	44	43.2		OK	M	c
LNG / seagoing ships / 2025		3				13			OK	M	c
LNG / inland waterway vessels / 2030						1			(OK)	X	-
H2 / vehicles / 2025	11	500*	<0.01	2.2	4	20	20.0		OK	M	c
LPG / vehicles	50,000 (NPF) 58,038 (EAFO)	200,000-250,000*	0.72-0.90	25-20	468	800	58.5		OK	M	c

*2020 estimate

The Spanish NPF addresses most of the requirements of Article 3. It contains an extensive discussion of the current state and future scenarios for alternative fuels in the transport sector. For most fuels and modes, it establishes targets as required by Article 3 of the Directive. The Spanish NPF does not contain a 2020 target for recharging points. This violates a basic requirement of the Directive. It can pose a serious risk to cross-border continuity and a functioning internal market for electric vehicles.

The Spanish NPF estimates a comparably low share of roughly 0.5% electric vehicles on the road in 2020. While the spatial distribution of recharging points seems to cover the needs of electric vehicles in terms of distance requirements in Spain, the absence of targets for publicly accessible recharging points for 2020 is a risk to the further market deployment of electric vehicles. This could also lead to market fragmentation within the EU, especially in the context of the rather low estimated EV shares in the Spanish NPF. It will be important to establish appropriate infrastructure targets in line with the market developments. Coverage of electricity supply for stationary airplanes at the major airports is already good and no increase is foreseen. The Spanish NPF contains modest targets and measures for increasing shore-side electricity in its ports.

The Spanish NPF focusses on LPG and natural gas, for which substantial infrastructure is already in place. It considers strong growth of CNG and LPG vehicles and establishes appropriate refuelling infrastructure targets consistent with the vehicle projections.

The Spanish NPF strongly emphasizes LNG. There are already 15 publicly accessible LNG refuelling points for heavy-duty vehicles present in the Spanish territory and it is foreseen to have 44 by 2020. Altogether, the planned LNG refuelling points could guarantee that the maximum distance requirement for LNG refuelling points along the road TEN-T Core Network would be fulfilled on the Spanish territory.

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.

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 NPF also contains several support measures to promote the deployment of alternative fuels infrastructure in public transport services.

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 cooperation 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 fuels infrastructure for electricity, natural gas and LPG. Spain and France collaborate for the establishment of a hydrogen refuelling point corridor connecting the two countries.

11 FINLAND

Tabular overview

	AF Vehicles / Vessels				Publicly accessible AF Infrastructure					Measures	
Fuel / transport mode / targets year	Current situation (from EAFO March 2017)	Future Estimate	Future share (%)	Estimate reached (%)	Current situation (from EAFO March 2017)	Target	Target attain-ment (%)	Sufficiency (Index / Assessment)		Score	Compre-hensive-ness
								Current	Future		
Electricity / vehicles / 2020	3,436	22,000	0.63	15.6	971	2,000	48.6	3.54	11.00	M	c
CNG / vehicles / 2020	1,344	5,800	0.17	23.2	24	55	43.6	56.00	105.45	M	c
LNG / heavy duty vehicles / 2025	8 (NPF) 1 (EAFO)				2 (NPF) 0 (EAFO)	11	18.2		OK	M	n
LNG / seagoing ships / 2025	12				2	6	33.3		OK	H	n
LNG / inland waterway vessels / 2030						1			(OK)	L	c
H2 / vehicles / 2025	1				2	21*	9.5		(OK)	X	-
Ethanol (E85)/2030	36,000				100	250	40.0		X	X	-

*2030

The Finnish NPF fully addresses the requirements of Article 3. 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. The Finnish NPF focuses on biofuels to meet the near-zero emission transport target by 2050, and states ambitious measures to achieve them. Low and high blends are planned to be used in different modes of transports, ensuring less fossil oil dependency and less GHG emissions.

The NPF states high recharging point targets and vehicle estimates, and contains some measures to deploy electricity in transport, such as tax reductions and direct investments for private and public electro-mobility. The given recharging points target and its spatial distribution seems to cover the needs of electric vehicles in terms of number of publicly accessible recharging points as well as distance requirements in Finland. The ratio of recharging points per estimated number of electric vehicles is on the borderline to sufficiency until 2030, and close monitoring may be needed to ensure sufficiency. In Finland, 22 electric buses have been procured for public transport for demonstration projects in 4 cities. The Finnish NPF contains targets to further promote and increase shore-side electricity in ports and ground power for stationary airplanes is already offered in the major airports.

Finland currently has a sufficient CNG infrastructure in terms of vehicles per refuelling point and will continue to have in 2025. The NPF provides a map of spatial CNG distribution where minimum coverage criteria does not hold on the TEN-T Core Network in 2020, and no information about CNG infrastructure until 2025 is provided. Thus, additional revision could be necessary to secure the minimum coverage criteria until 2025.

LNG with gradual increase of renewable share is foreseen as the main shipping and long-haul transport fuel. Six LNG refuelling points in maritime ports and one mobile inland waterway bunker are planned until 2030. Nine road LNG refuelling points on the TEN-T Core Network will ensure the

minimum coverage criteria of one LNG refuelling point at least every 400 km for heavy-duty motor vehicles, already by 2020.

Furthermore, the Finnish NPF displays a strong commitment towards hydrogen. The deployment of 19 publicly accessible hydrogen refuelling points in addition to two existing is planned, ensuring the distance of 300 km between two points.

The Finnish NPF contains a comprehensive list of measures, with most already in place and foreseen to stay. Most of them could have a medium impact on electricity, CNG and LNG in the road transport, and high impact on LNG in shipping. However, some measures could not be assessed due to the limited information contained in the NPF. The NPF contains a comprehensive list of support measures that can promote the deployment of alternative fuels infrastructure in public transport services.

Finland considered regional and local authorities, stakeholders' interests and cooperation with other Member States in some instances.

12 FRANCE

Tabular overview

	AF Vehicles / Vessels				Publicly accessible AF Infrastructure					Measures	
Fuel / transport mode / targets year	Current situation (from EAFO March 2017)	Future Estimate	Future share (%)	Estimate reached (%)	Current situation (from EAFO March 2017)	Target	Target attain-ment (%)	Sufficiency (Index / Assessment)		Score	Compre-hensive-ness
								Current	Future		
Electricity / vehicles / 2020	118,663	960,000	2.19	12.4	16,081	35,000	45.9	7.38	27.43	H	c
CNG / vehicles / 2020	7,606				43	79/210*	29.8	176.88		M	c
LNG / heavy duty vehicles / 2025	40				4 (EAFO) 1 (NPF)	25/40*	12.3		OK	M	c
LNG / seagoing ships / 2025					1	7	14.3		OK	L	n
LNG / inland waterway vessels / 2030					0	3	0.0		OK	L	n
H2 / vehicles / 2025	30 (NPF) 16 (EAFO)				11 (NPF) 9 (EAFO)	30	36.7		OK	M	c
Other fuels (LPG / vehicles)	206,846				1,750				(OK)	M	c

* sector actors estimation

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

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

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

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

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

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

The French NPF has a big portfolio of measures, the great majority already in effect. These measures are structured in: legislative and regulatory (20), informative (11), incentive (15), call for projects (6), RTD&D (3) and measures for cross-border coordinated actions and projects funded by EU programmes (11). The measures defined in the French NPF are comprehensive for the following fuels in road transport: electricity, CNG, LNG, and hydrogen. They can be considered exemplary for electric vehicles and the associated infrastructure.

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

13 CROATIA

Tabular overview

	AF Vehicles / Vessels				Publicly accessible AF Infrastructure					Measures	
Fuel / transport mode / targets year	Current situation (from EAFO March 2017)	Future Estimate	Future share (%)	Estimate reached (%)	Current situation (from EAFO March 2017)	Target	Target attainment (%)	Sufficiency (Index / Assessment)		Score	Compre-hensive-ness
								Current	Future		
Electricity / vehicles / 2020	496 (EAFO) 856 (NPF)				226	296	76.4	2.19		M	c
CNG / vehicles / 2020	211 (EAFO) 427 (NPF)				2	13	15.4	105.50		L	n
LNG / heavy duty vehicles / 2025					0	2	0.0		i	L	n
LNG / seagoing ships / 2025					0	1	0.0		(OK)	X	-
LNG / inland waterway vessels / 2030					0	2(+2)	0.0		OK	X	-
H2 / vehicles / 2025					0				i	X	-
LPG / vehicles	57,911 (NPF) 87,000 (EAFO)				334				OK	X	-

The Croatian NPF addresses most of the requirements of Article 3. It contains a comprehensive discussion of the current state, but a somewhat limited discussion of future scenarios for most alternative fuels in the transport sector. For all fuels and some modes, it establishes targets as required by Article 3 of the Directive. The NPF does not contain concrete measures to encourage and facilitate the deployment of recharging points not accessible to the public.

The NPF does not contain vehicle estimates for the future deployment of EVs. The given recharging points target and especially high power recharging infrastructure seems to cover the needs of electric vehicles in terms of number of publicly accessible recharging points as well as minimum coverage requirements in Croatia in 2020. The NPF does neither consider electricity supply for stationary airplanes nor shore-side electricity.

The NPF does not contain vehicle estimates for the future deployment of CNG vehicles. Croatia currently has a sufficient network of CNG refuelling points when compared to CNG vehicles, but it does not meet the minimum coverage requirements. Regarding the 2025 minimum coverage target in terms of distance requirements, the existing measure for the deployment of CNG refuelling points seems sufficient. Croatia already counts a high number of CNG buses and future promotion of CNG vehicles for public transport is foreseen.

The Croatian NPF plans two LNG refuelling points for heavy-duty vehicles in road transport until 2025 and seven until 2030. Moreover, the NPF plans one LNG refuelling point in maritime transport in 2025 and seven until 2030. Furthermore, two LNG refuelling points for inland waterways are planned until 2030. It is not specifically stated in the NPF whether the inland waterways and maritime LNG refuelling points will be accessible for LNG heavy-duty vehicles. In case they are accessible, Croatia would meet the minimum distance requirement of one LNG refuelling point every 400 km on the road TEN-T Core Network in 2025.

The NPF does not consider hydrogen for transport.

The Croatian NPF contains a list of measures with a low impact score on overcoming deployment barriers in electro-mobility, CNG and LNG vehicles and infrastructure deployment. Only measures concerning electro-mobility are considered comprehensive. Most of the existing or planned measures end in 2018 or earlier, with no prolongation explicitly stated. The majority of measures stated in the NPF could not be assessed due to the limited information provided.

Croatia considered local authorities and stakeholders' interest, and coordinated the NPF with the local authorities. Moreover, Croatia cooperated with many Member States in projects concerning electro-mobility and LNG infrastructure deployment.

14 HUNGARY

Tabular overview

	AF Vehicles / Vessels				Publicly accessible AF Infrastructure					Measures	
Fuel / transport mode / targets year	Current situation (from EAFO March 2017)	Future Estimate	Future share (%)	Estimate reached (%)	Current situation (from EAFO March 2017)	Target	Target attain-ment (%)	Sufficiency (Index / Assessment)		Score	Compre-hensive-ness
								Current	Future		
Electricity / vehicles / 2020	790 (EAFO) 395 (NPF)	21,200	0.56	3.7	205	2,250	9.1	3.85	9.42	M	c
CNG / vehicles / 2020	5512 (EAFO) 2385 (NPF)	40,000	1.06	13.8	8	62	12.9	689.00	645.16	H	n
LNG / heavy duty vehicles / 2025	0	6300	4.38	0	0	83	0.0		OK	M	n
LNG / seagoing ships / 2025	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LNG / inland waterway vessels / 2030					0	8	0.0		OK	M	c
H2 / vehicles / 2025	0	75	<0.01	0	0	5	0		(OK)	X	-
LPG / vehicles / 2020	24,872 (NPF) 85,000 (EAFO)	22,000	0.58	113.1	611	630	97.0		(OK)	X	-

- all estimates and targets correspond to the realistic scenario

The Hungarian NPF addresses most of the requirements of Article 3. It contains a comprehensive discussion of the current state and future scenarios for most alternative fuels in the transport sector. For all fuels and some modes, it establishes targets as required by Article 3 of the Directive.

It contains a large bandwidth of estimates for the future deployment of EV ranging for the 2 extreme EV penetration scenarios from 0.3% to 1.4% electric vehicles on the road in 2020. The given recharging points target and especially high power recharging infrastructure seems to cover the needs of electric vehicles in terms of number of publicly accessible recharging points as well as distance requirements in Hungary. The NPF mentions that new gates at the Liszt Ferenc International Airport will feature ground power units, but no quantitative targets are provided. For shore-side electricity it targets a modest growth at its ports.

For CNG cars, the estimated shares are slightly higher than for EV. Hungary currently does not meet the threshold of at least one CNG refuelling point per 600 CNG vehicles on the road. The NPF states very high estimates for CNG vehicles that would also for the future lead to a sufficiency index of less than one refuelling point per 600 CNG vehicles. Regarding the 2025 minimum coverage target in terms of distance requirements, the existing measure for the deployment of CNG refuelling points seems sufficient. Hungary already counts a high number of CNG trucks and buses and the NPF contains very ambitious estimates for 2020.

The Hungarian NPF has firm plans for building 5 LNG road refuelling points for 2020. Beyond, for 2025 it targets, between 36 and 182 LNG refuelling points for heavy-duty vehicles in road transport and plans a pilot liquefaction plant for vessels and heavy-duty trucks. It also describes a project for an LNG ship-to-ship bunkering vessel. Moreover, the NPF states that Hungary should already in 2020 appropriately cover with LNG infrastructure, both the TEN-T Corridors and the Comprehensive Network, for road and inland waterways.

Hungary, in its NPF, has established targets for the deployment of a hydrogen refuelling infrastructure, accessible to the public.

The Hungarian NPF contains a comprehensive list of measures that could have a medium impact on overcoming deployment barriers, especially in electro-mobility. Most of the existing or planned measures end in 2018 or earlier, with no prolongation foreseen. It may be challenging to achieve NPF targets and corresponding vehicle deployment estimates for electricity until 2020 even in the low penetration scenario. For CNG, the described measures may create a too low impact vis-à-vis the high estimates. The NPF does not list any measures in support of LNG refuelling point deployment.

Cooperation with neighbouring Member States is not mentioned in the NPF. It may be advisable for Hungary to coordinate its NPF with neighbouring Member States.

15 IRELAND

Tabular overview

	AF Vehicles / Vessels				Public AF Infrastructure					Measures	
Fuel / transport mode / targets year	Current situation (from EAFO March 2017)	Future Estimate	Future share (%)	Estimate reached (%)	Current situation (from EAFO March 2017)	Target	Target attain-ment (%)	Sufficiency (Index / Assessment)		Score	Compre-hensive-ness
								Current	Future		
Electricity / vehicles / 2020	2,176	25,005	1.00	8.7	832	950	87.6	2.80	26.32	M	c
CNG / vehicles / 2020	10	4,200	0.17	0.2	1	13	7.7	10.00	323.00	M	c
LNG / heavy duty vehicles / 2025									X	L	n
LNG / seagoing ships / 2025									X	L	n
LNG / inland waterway vessels / 2030	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
H2 / vehicles / 2025									X	L	c
Other fuels (LPG)	3,000	3,600	0.14	83.3	78				X	L	n

The Irish NPF addresses partly the requirements of Article 3. It contains a discussion of the current state and future scenarios for alternative fuels in the transport sector. For all the mandatory fuels and modes except for LNG it establishes targets as required by Article 3 of the Directive.

The spatial distribution of the available recharging points fulfils the requirement of having chargers available every 60 km on Ireland's main intercity roads, including the TEN-T Core Network. The actual number of public recharging points is also sufficient to cover the requirement of one recharging point every 10 electric vehicles. However, the numbers of electric recharging points foreseen for 2020, 2025 and 2030 seem to be insufficient for the foreseen number of electric vehicles in Ireland if only the public recharging points are taken into account. Ireland supports the deployment of private electro-mobility infrastructure. To increase the number of electric vehicles in Ireland, vehicle purchase and registration tax incentives exist since 2011. Company tax incentives exist since 2008. The registration tax relief for battery electric vehicles will be extended until 2021 and for plug in hybrid vehicles until 2018.

The Dublin Airport in the TEN-T Core Network is currently using mobile ground power units for use by stationary airplanes. However, the Irish NPF does not include targets for electricity supply for stationary airplanes only a life-cycle cost analysis of rolling out Fixed Electrical Grown Power units at airports is considered for 2018.

The Irish NPF does not include concrete plans for shore-side electricity supply for maritime ports. The development of a feasibility study of shore-side electricity supply for seagoing ships in TEN-T ports (Dublin, Cork and Shannon Foynes) is considered for 2018. Based on the results of the study, targets for shore-side electricity supply should be established.

Regarding CNG, the current number of vehicles in Ireland is insignificant. The current number of refuelling points is also insufficient to cover the Irish territory, not fulfilling the requirement of refuelling points every 150 km. In order to improve this situation, the Ireland has established direct incentives for the installation of 5 public CNG points in 2017. For 2020, the targeted number of public

refuelling points would be sufficient to have one for every 600 vehicles. For 2025 and 2030, the number of public points seems to be insufficient to cover all the foreseen CNG vehicles in Ireland. The inclusion of biomethane as transport fuel in the biofuel obligation scheme since 2010 assists the promotion of the vehicles running with natural gas.

The Irish NPF does not consider any LNG refuelling points in Ireland (neither for road nor for maritime ports). Ireland has committed to setting targets for the LNG facilities at the three TEN-T Core Network maritime ports in 2019.

The Irish NPF does not include hydrogen. It has already identified measures to be considered by 2020 and plans to analyse opportunities to further the advancement of hydrogen infrastructure.

In Ireland, since 2013 tax incentives like lower fuel excise duty for LPG vehicles exist. They are foreseen to be active at least until 2023. These measures together with the already existing infrastructure for LPG have led to substantial LPG vehicle shares in Ireland.

The Irish NPF contains a comprehensive list of financial support measures already in place for the support of electricity, CNG (biofuels included) and LPG vehicles and infrastructure. They can be considered having a medium impact on market actor's decisions. Longer periods for their validity could provide certainty for market actors and hence increase the likelihood that the national targets and objectives of the NPF can be reached. For other modes and fuels the measures in the Irish NPF seem to have a rather low impact because they are only in planning phase. The Irish NPF has included a group of measures to be implemented in the coming years 2017 and 2018 (e.g. establishment of the green bus fund and scrappage scheme for taxis) which have been considered to have a medium impact on the promotion of alternative fuels in public services. Finally, the tax incentives for the installation of free home recharging points have had an important impact on the deployment of private electro-mobility infrastructure in Ireland.

The NPF states that the development of alternative fuels use has benefitted from close cooperation between the Republic of Ireland and Northern Ireland.

16 ITALY

Tabular overview

	AF Vehicles / Vessels				Publicly accessible AF Infrastructure					Measures	
Fuel / transport mode / targets year	Current situation (from EAFO March 2017)	Future Estimate	Future share (%)	Estimate reached (%)	Current situation (from EAFO March 2017)	Target	Target attain-ment (%)	Sufficiency (Index / Assessment)		Score	Compre-hensive-ness
								Current	Future		
Electricity / vehicles / 2020	11,663	45,000-130,000	0.11-0.32	9.0 -25.9	2,205	6,500-19,000	11.6-33.9	5.29	6.92-6.84	M	c
CNG / vehicles / 2020	1,057,461	1,350,000	3.27	78.3	1,101	1,350	81.6	960.46	1,000.00	M	c
LNG / heavy duty vehicles / 2025	56				8 L-CNG & 3 LNG (NPF) 2 (EAFO)	80	13.8		i	M	c
LNG / seagoing ships / 2025					0	12 (2025) 20 (2030)	0.0		OK	X	-
LNG / inland waterway vessels / 2030									OK	X	-
H2 / vehicles / 2025	11	27,000	0.06	<0.1	4	140	7.9		OK	M	c
LPG / vehicles	2,137,078	2,400,000	5.82	89.0	3,767				OK	M	n

The Italian NPF fully addresses the requirements of Article 3. It contains an extensive discussion of the current state and future scenarios for alternative fuels in the transport sector. However, not for all fuels and modes it establishes hard targets, because the NPF uses scenario dependent projections relying on 'expected trends' or 'evolution' rather than real quantitative targets.

For electric vehicles, the Italian NPF adopts a very conservative approach. For 2020, low shares of new sales (1% - 3%) and of electric vehicles on the road (0.1% - 0.3%) are estimated, and the NPF does not contain any estimates beyond 2020. The Italian NPF has established sufficient 2020 targets for recharging points accessible to the public consistent with the rather low estimates for EV for the same year. The NPF ensures appropriate coverage of the TEN-T Core Network with high power recharging points. Regarding electricity supply for stationary airplanes the Italian NPF refers to ongoing cost-benefit analyses. No concrete targets are established. For shore-side electricity the situation is similar, although there seems to be a general consensus on its decisive role to reduce air pollution.

The Italian NPF puts a lot of emphasis on CNG, for which Italy has already today a dense network of public refuelling points, especially in the northern regions. Nevertheless, on a country level, Italy does not currently nor will in the future meet a level of at least one CNG refuelling point per 600 CNG vehicles on the road. According to the Italian NPF, CNG vehicles can contribute a lot to reduce CO_2 emissions in transport. The aim is to increase the share of the CNG vehicle park on the road from 2% to 3.3% in 2020 and 6% in 2025. Considering the leading position of Italy in relation to CNG vehicles, it could be explored if more ambitious targets could be set for its development beyond 2025.

A number of 5 dual-use LNG refuelling points for heavy-duty trucks are proposed in the NPF along the TEN-T Core Network by 2025. This would not guarantee that the maximum distance requirement for LNG refuelling points along the road TEN-T Core Network would be fulfilled on Italian territory.

The Italian NPF considers the development of a LNG infrastructure for maritime applications as strategic and critical in the context of the implementation of the Directive. Plan for its development,

including designing of storage quantities in all 14 maritime TEN-T Core Network ports and beyond is part of the NPF and can be considered exemplary.

A very comprehensive plan has been developed for the deployment of hydrogen technologies (hydrogen production, distribution and fuel cell vehicles). Targets have been set up to 2050 and the amount of public funding needed to achieve the targets has been calculated. However, the Italian NPF states that the financial coverage for this hydrogen roll-out could not be provided, so that the plan has to be considered a 'potential scenario'. In essence, the targets for hydrogen technologies appear too ambitious vis-à-vis the lack of financial coverage considered essential for their achievement. It is therefore expected that the only evolution, which will take place in the near term, will be local, and related to the inter-MS corridor linking Italy with Austria.

The Italian NPF contains a comprehensive list of measures, partially already in place in the case of CNG. Most of them can be considered as having a medium impact on market actor's decisions. Since the Italian NPF is a law, it guarantees long periods of validity which could provide certainty for market actors and hence increase the likelihood that the national targets and objectives of the NPF can be reached. The NPF report identifies additional technical and administrative bottlenecks which need to be eliminated to enable the expected developments. However, in some cases, it is not clear if and which practical measures have been / will be taken to achieve the goal (for example, the facilitations of the present requirement for CNG refuelling point to be at not more than 1,000 meters from the CNG distribution grid, or the mentioned still existing difficulties related to the permitting procedures for LNG in ports).

Regional and local interests have been considered in the evaluation of the measures, as well as industrial and public R&D stakeholders. In fact, regional authorities and municipalities play a critical role in ensuring the implementation of the actions, having jurisdiction on infrastructure for highways, respectively for local infrastructure. A particular attention in the Italian NPF has been dedicated to the island Sardinia, which at the moment is the only region of Italy deprived of a NG distribution infrastructure.

Evidence of collaboration of Italy with other Member States has been found mainly in the frame of EU projects, especially of the TEN-T family.

17 LITHUANIA

Tabular overview

	AF Vehicles / Vessels				Publicly available AF Infrastructure					Measures	
Fuel / transport mode / targets year	Current situation (from EAFO March 2017)	Future Estimate	Future share (%)	Estimate reached (%)	Current situation (from EAFO March 2017)	Target	Target attain-ment (%)	Sufficiency (Index / Assessment)		Score	Compre-hensive-ness
								Current	Future		
Electricity / vehicles / 2020	155	1,200	0.07	12.9	26	100	26.0	5.96	12.00	L	n
CNG / vehicles / 2020	80				3	10	30.0	26.67		L	n
LNG / heavy duty vehicles / 2025					0	1	0.0		(OK)	X	-
LNG / seagoing ships / 2025					1	1	100.0		(OK)	X	-
LNG / inland waterway vessels / 2030					0	1*	0.0		(OK)	X	-
H2 / vehicles / 2025					0				X	X	-
Other fuels (LPG / vehicles)	112,000				690				(OK)	X	-

* = target for 2025

The Lithuanian NPF does not fully address the requirements of Article 3. A short discussion on the current state and future scenarios for alternative fuels in the transport sector in Lithuania is presented in the NPF. Targets as required by Article 3 of the Directive were established for CNG, LNG, and electricity for vehicles.

The Lithuanian NPF places attention on electric vehicles without possessing currently a dense network of publicly accessible recharging points. The spatial distribution of recharging points does not currently cover the needs of vehicles in terms of distance requirements; the ratio of only one public recharging point per 12 electric vehicles estimated for 2020 may be seen as a risk to the further market deployment of electric vehicles. It may be important to closely monitor this development and correct infrastructure targets in line with the market developments. Lithuania, today, has 10 hybrid buses (electricity + CNG). Bicycles as well as their infrastructure also receive support. The NPF neither contains any targets for increasing the availability of electricity supply for stationary airplanes nor for shore-side electricity.

Lithuania currently has a sufficient network of CNG refuelling points. Targets for an increase of the number of CNG refuelling points by 2020 and 2025 are foreseen. However, as the NPF does not provide estimates for the future deployment of CNG vehicles, their CNG infrastructure sufficiency for 2020 cannot be assessed.

Despite an existing fleet of 161 public transport buses with engines fuelled by LNG, no publicly accessible road LNG refuelling points are mentioned in the Lithuanian NPF. One LNG refuelling point for heavy-duty vehicles is targeted for 2025.

According to the Lithuanian NPF, there are no further plans for an extension of LNG refuelling points in ports, besides the already existing LNG refuelling point in Klaipėda, Lithuania's only maritime port in the TEN-T Core Network.

The NPF does not cover hydrogen for transport.

The Lithuanian NPF contains a list of measures, most of them, however, still under consideration with little details revealed in the NPF. Most of them can be considered having a low or medium impact on market actor's decisions. Their low implementation status could create uncertainty for market actors and hence decrease the likelihood that the national targets and objectives of the NPF could be reached.

The interests of regional and local authorities, as well as stakeholders have been considered during the drafting of the Lithuanian NPF. Further coordination is planned in order to ensure follow-up of the implementation actions, collaboration among authorities and advice from stakeholders.

Lithuania is actively involved in coordinating its plans on rail infrastructure with other Member States as well as collaborating with them in this field. Beyond that, the NPF does not mention any cooperation or coordination in the field of alternative fuels.

18 LUXEMBOURG

Tabular overview

	AF Vehicles / Vessels				Publicly accessible AF Infrastructure					Measures	
Fuel / transport mode / targets year	Current situation (from EAFO March 2017)	Future Estimate	Future share (%)	Estimate reached (%)	Current situation (from EAFO March 2017)	Target	Target attain-ment (%)	Sufficiency (Index / Assessment)		Score	Compre-hensive-ness
								Current	Future		
Electricity / vehicles / 2020	1,535	40,000	9.22	3.8	155	1,758	8.8	9.90	22.75	H	c
CNG / vehicles / 2020	234	200	0.05	117.0	7	2	350.0	33.43	100	L	n
LNG / heavy duty vehicles / 2025		30 / 150*	0.14 / 0.71		0	1	0.0		OK	X	-
LNG / seagoing ships / 2025	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LNG / inland waterway vessels / 2030									X	X	-
H2 / vehicles / 2025	2				0				X	M	n
LPG / vehicles	151								X	X	-

*2020 estimate

The Luxembourgish NPF broadly addresses the requirements of Article 3. It contains tables of the current state and future estimates for alternative fuels vehicles in the transport sector. For most fuels and modes, it establishes targets as required by Article 3 of the Directive. It does not provide a target for its inland port in the TEN-T Core Network.

The Luxembourgish NPF puts the accent on electric vehicles deployment with ambitious plans in terms of recharging infrastructure and share of electric vehicles on the road in 2020 (more than 9% from the total vehicle fleet). Bicycles and electric bikes also receive support. To be highlighted is the fact that Luxembourg has legislated a very detailed action plan for the implementation of the public recharging infrastructure for electric vehicles (including the exact number of recharging points per commune and TEN-T Core Network segments). The NPF foresees a small increase of available ground power units for stationary airplanes. The Mertert inland port does not have shore-side electricity and no targets are foreseen in the NPF.

While the spatial distribution of recharging points seems to cover appropriately the needs of electric vehicles in terms of distance requirements in Luxembourg, the ratio of more than 22 electric vehicles per one recharging point for 2020 could evolve to become a barrier for the further market deployment of electric vehicles. This could also lead to market fragmentation within the EU. It will be important to closely monitor this development and correct the infrastructure targets in line with the market developments.

In the case of CNG, the Luxembourgish government is pessimistic regarding the economic viability for this fuel. Therefore, it plans the decrease of the number of refuelling points to two CNG refuelling points considering this quantity to be sufficient in the medium term, estimating also a reduction of the CNG fleet.

Concerning LNG, the installation of a refuelling infrastructure for road transport is envisaged for 2020. Such an infrastructure will be intended to refuel apart from the LNG vehicles registered in

Luxembourg the heavy-duty vehicles transiting the country. LNG-powered vessels having a high autonomy, an LNG refuelling infrastructure in the port of Mertert is not deemed as viable.

For the moment, the Luxembourgish government decided not to include in the current stage refuelling points for hydrogen accessible to the public in its NPF.

The Luxembourgish NPF contains a comprehensive list of measures, most already in place. According to the assessment methodology, a High overall assessment score is derived for electricity for vehicles, a Medium overall score for hydrogen for vehicles and a Low overall score for CNG for vehicles. This is a consequence of the government estimation that CNG will only play a marginal part in the future, the focus being placed on the promotion of electric mobility which is considered to be the most suited for the decarbonisation of the transport sector in the NPF.

Two regulations (one Grand Ducal and another Ministerial) provide evidence that the interests of local authorities and stakeholders have been considered.

Luxembourg is actively involved in coordinating its plans on alternative fuels infrastructure with the Benelux countries and has signed a collaboration agreement with them in this field. It may be advisable to extend this cooperation effort also towards other neighbouring countries such as France and Germany.

19 LATVIA

Tabular overview

	AF Vehicles / Vessels				Publicly accessible AF Infrastructure					Measures	
Fuel / transport mode / targets year	Current situation (from EAFO March 2017)	Future Estimate	Future share (%)	Estimate reached (%)	Current situation (from EAFO March 2017)	Target	Target attain-ment (%)	Sufficiency (Index)		Score	Compre-hensive-ness
								Current	Future		
Electricity / vehicles / 2020	303	747*	0.10	40.6	72	150	48.0	4.21	4.98	M	c
CNG / vehicles / 2020	29				2	5	40.0	14.50		M	n
LNG / heavy duty vehicles / 2025					0				X	L	n
LNG / seagoing ships / 2025	0				0				X	X	-
LNG / inland waterway vessels / 2030	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
H2 / vehicles / 2025	0				0				X	X	-
LPG / vehicles	54,197				210 [EAFO] >30 [NPF]				X	X	-

*By 31 December 2023.

The Latvian NPF addresses only part of the requirements of Article 3 of the Directive. It does not contain any target for LNG refuelling points to be put in place along the TEN-T Core Network, neither for heavy-duty vehicles nor for its two maritime ports in the core network.

The Latvian NPF considers that the deployment of an appropriate EV recharging infrastructure has a high priority for fostering electro-mobility. Latvia centres on deploying a comprehensive publicly accessible high power recharging infrastructure. The NPF lacks sufficient information on electricity supply for stationary airplanes. For vessels, two studies were carried out, concluding that the costs for the deployment of shore-side electricity supply for the ports of Riga and Ventspils outweigh the benefits.

The Latvian NPF admits that the absence of a national policy plan has jeopardised the use of natural gas and hydrogen in transport. The NPF does not provide future estimates thereof. The Latvian NPF indicates that a revision of the excise duty would be a candidate measure to promote natural gas use. It has established targets for the deployment of CNG refuelling points accessible to the public. The targeted number of CNG refuelling points could support a significant increase of CNG vehicles. The coverage of the TEN-T network with CNG refuelling points is unclear.

As indicated in the NPF, Latvia has no plans for the deployment of LNG refuelling points in its ports.

The NPF does not consider hydrogen for transport.

The Latvian NPF expects that the purchase price of 'green' vehicles will remain in the near-term higher than that of conventional vehicles. However, the government of Latvia considers it has "few instruments available to influence this". Notwithstanding, the NPF mentions the possibility of financial support between 2018 and 2020 to reduce the current 7,000 EUR financial differential

between internal combustion engine vehicles and EVs on sale in Latvia. Three levels of support are under discussion: 7,000 EUR for 2018, 5,000 EUR for 2019 and 3,000 EUR for 2020.

20 MALTA

Tabular overview

	AF Vehicles / Vessels				Public AF Infrastructure					Measures	
Fuel / transport mode / targets year	Current situation (from EAFO March 2017)	Future Estimate	Future share (%)	Estimate reached (%)	Current situation (from EAFO March 2017)	Target	Target attainment (%)	Sufficiency (Index / Assessment)		Score	Compre-hensive-ness
								Current	Future		
Electricity / vehicles / 2020	116 (EAFO) 248 (NPF)	5,000	1.69	2.32	97 (EAFO) 102 (NPF)	590	16.44	1.20	8.47	M	c
CNG / vehicles / 2020										X	-
LNG / heavy duty vehicles / 2025									X	X	-
LNG / seagoing ships / 2025									X	X	-
LNG / inland waterway vessels / 2030	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
H2 / vehicles / 2025									X	X	-
LPG / vehicles / 2020	1,038 (NPF) 2,000 (EAFO)				6				X	L	n

The Maltese NPF addresses only partly the requirements of Article 3 of the Directive, focussing on electric vehicles and infrastructure for road. For determining the fuel or fuels (other than electricity) that are the most feasible for use in road transport in Malta, the Maltese government will be commissioning in 2018 the 'Alternative Fuels in Road Transport Study'. Another study aiming at providing recommendations regarding the development of LNG as a marine fuel is currently underway.

In the case of electricity for road transport, which constitutes the focus of the Maltese NPF, the requirements of the Directive were fulfilled. The NPF contains, with around 1.7% share by 2020, high estimates for the future deployment of EVs, when compared with its current EV share of less than 0.1%. Already today, the spatial distribution of recharging points appropriately covers the needs of electric vehicles in terms of distance requirements in Malta. The given publicly accessible recharging points target is in line with the requirements of the Directive for 2020 and the assessment threshold of less than 10 EVs per recharging point is fulfilled. The proposed set of measures for electro-mobility could support reaching the declared objectives since it was evaluated as being comprehensive and having a medium overall assessment score.

The NPF does not contain concrete targets to increase the availability of electricity supply at airports for stationary airplanes. In the case of shore-side supply in its maritime ports no targets are provided, but an action plan for its implementation at the TEN-T Core Network ports of Valetta and Marsaxlokk is expected to be finalised by the end of 2018.

Besides electro-mobility, the national strategy for the other alternative fuels is briefly or inadequately treated in the Maltese NPF, being dependent on the results of currently ongoing studies. For CNG and LNG fuels, the NPF contains neither future estimates for vehicles and vessels nor targets for refuelling infrastructure. The lack of ambition for natural gas can be partially explained by the small market size in Malta and the lack of current interconnections with other natural gas networks. The best option known for Malta to be supplied with natural gas is the 159 km gas pipeline connecting Malta to Sicily but the earliest commercial operation of this pipeline is targeted for 2024.

The Maltese NPF does not contain any targets for hydrogen in transport.

The Maltese NPF contains a quite large portfolio of measures and most of them are already existing or adopted. The vast majority of the measures targets electricity for road and includes substantial direct incentives for purchase and tax incentives. 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 NPF also contains several support measures to promote the use of electricity in public transport which address mainly public procurement. Bicycles and electric bikes as well as their infrastructure also receive support. No future measures are discussed to promote the deployment of private electro-mobility infrastructure.

The Maltese NPF does not specify to which extent interests of regional and local authorities, as well as those of the stakeholders concerned have been considered in its drafting. However, it mentions plans to establish a stakeholder group (e.g. including representative of the private sector, NGOs, ministries and public entities) which will be involved in the drafting of the updated NPF.

Several European projects are mentioned in the Maltese NPF, mainly regarding cooperation with Italy. Two of them concern the promotion of electro-mobility while one is related to the connection of Malta to the European Gas Network.

Evidence of Romania's collaboration with other MSs has been found mainly in the frame of EU projects regarding the inland navigation sector (INNOVATIVE DANUBE VESSEL, PROMINENT, the LNG Master Plan for Rhine-Main-Danube). Beyond these projects, the NPF does not mention any cooperation or coordination with the neighbour MSs in the field of alternative fuels. It is advised to provide evidence of existing collaborations and planning or to engage in such cooperation to ensure AFI cross-border continuity.

21 NETHERLANDS

Tabular overview

	AF Vehicles / Vessels				Publicly accessible AF Infrastructure					Measures	
Fuel / transport mode / targets year	Current situation (from EAFO March 2017)	Future Estimate	Future share (%)	Estimate reached (%)	Current situation (from EAFO March 2017)	Target	Target attainment (%)	Sufficiency (Index / Assessment)		Score	Compre-hensive-ness
								Current	Future		
Electricity / vehicles / 2020	90,000 (NPF) 115,502 (EAFO)	140,000	1.47	82.5	10,400* (NPF) 29,094** (EAFO)	17,844*	58.3	8.65	7.85	H	c
CNG / vehicles / 2020	11,269				147	145	100.0	76.66		X	-
LNG / heavy duty vehicles / 2025	350 (NPF) 387 (EAFO)				19 (NPF) 14 (EAFO)	28	67.9		OK	M	n
LNG / seagoing ships / 2025					3	6	50.0		(OK)	M	c
LNG / inland waterway vessels / 2030	5	40***		12.5	5	13	38.5		(OK)	M	c
H2 / vehicles / 2025	31	2,120***	0.02	1.5	3	20***	15.0		(OK)	M	c
LPG / vehicles	180,000				1,750				X	X	-

*Only public, no semi-public; ** public + semi-public; *** 2020 estimate

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.

22 POLAND

Tabular overview

	AF Vehicles / Vessels				Publicly accessible AF Infrastructure					Measures	
Fuel / transport mode / targets year	Current situation (from EAFO March 2017)	Future Estimate	Future share (%)	Estimate reached (%)	Current situation (from EAFO March 2017)	Target	Target attainment (%)	Sufficiency (Index / Assessment)		Score	Compre-hensive-ness
								Current	Future		
Electricity / vehicles / 2020	1,010	76,898 (53,829*)	0.32	1.3	325	6,859	4.7	3.11	11.21 (7.85*)	L	c
CNG / vehicles / 2020	1,722	9,592 (2,296*)	0.04	18.0	27	72	37.5	63.78	133.22 (31.88*)	L	c
LNG / heavy duty vehicles / 2025	57	3,000	0.20	1.9	3 (NPF) 0 (EAFO)	14	21.4		OK	L	n
LNG / seagoing ships / 2025					1	4	25.0		OK	L	c
LNG / inland waterway vessels / 2030					0	2	0.0		(OK)	X	-
H2 / vehicles / 2025	0				0				X	X	-
LPG / vehicles	2,914,000				5,420				OK	X	-

*= data available for agglomerations/densely populated areas

The Polish NPF addresses most of the requirements of Article 3. It contains a description of the current state and future estimates for alternative fuels vehicles in the transport sector and establishes targets as required by Article 3 of the Directive. The analysis of agglomerations/densely populated areas and TEN-T network needs regarding AFI, including the calculation of market needs can be considered exemplary. The Polish NPF does not contain any measures that could encourage and facilitate the deployment of recharging points not accessible to the public.

The Polish NPF puts a lot of emphasis on the development of the market for electric and CNG cars; however, it is currently at a very early stage of its development. In view of the low numbers of EV and CNG cars on the road today, Poland has at the moment a sufficient network of public recharging and CNG refuelling points and this situation is going to be maintained in the time frame mentioned in the NPF. Beyond 2020, Poland, in its NPF, defined a very ambitious target of reaching more than 1 million of EVs on the road by 2025. The support measures defined in the NPF may not be sufficient to ensure target achievement, considering that the EV share in Poland is very low today. The spatial distribution of recharging points seems to appropriately cover the needs of electric vehicles in terms of distance requirements. No targets are foreseen for increasing the availability of electricity supply for stationary airplanes. Also for shore-side electricity the Polish NPF does not contain concrete targets. However, it envisages a pilot project to better assess the cost and benefits.

The planned LNG refuelling points for heavy-duty vehicles could guarantee that the maximum distance requirement for LNG refuelling points along the road TEN-T Core Network would be fulfilled on Polish territory.

LNG refuelling is planned for all maritime and inland ports in the TEN-T Core Network.

The Polish NPF displays no commitment towards hydrogen in the next future.

The Polish NPF contains a comprehensive list of measures; however, most of them are still only under consideration or in an early stage of the adoption process. Very few are already in place. Some of the

measures, especially the ones targeting to improve the economics of AF, can be considered having a medium impact on market actor's decisions. Poland has also defined ambitious targets for low emitting vehicles in fleets of companies performing public services and fleets of public institutions. Direct incentives are foreseen aiming in increasing the AFV market share. The Polish NPF also contains targets for increasing shore-side electricity supply in its maritime ports.

The consideration of the interests of regional and local authorities, as well as stakeholders during the drafting of the Polish NPF is not evident throughout the text of the NPF. This issue should be strengthened.

Poland did not present any evidence of coordinating its plans on alternative fuels infrastructure with other countries, especially neighbouring. It is advised to provide evidence of existing collaborations and planning or to engage in such cooperation.

23 PORTUGAL

Tabular overview

	AF Vehicles / Vessels				Public AF Infrastructure					Measures	
Fuel / transport mode / targets year	Current situation (from EAFO March 2017)	Future Estimate	Future share (%)	Estimate reached (%)	Current situation	Target	Target attain-ment (%)	Sufficiency (Index / Assessment)		Score	Compre-hensive-ness
								Current	Future		
Electricity / vehicles / 2020	2,258	14,000**	0.23	16.1	1,126*	2,394*	47	2.01	5.85	M	c
CNG / vehicles / 2020	618	858***	****	****	6	8	75	103.00		M	n
LNG / heavy duty vehicles / 2025	0	200	0.11	0	4	11	36		i	L	n
LNG / seagoing ships / 2025					1	5	20		(OK)	M	n
LNG / inland waterway vessels / 2030									X	X	-
H2 / vehicles / 2025									X	X	-
LPG / vehicles / 2020	50,000				347	393	88		OK	X	-

*Public. **Based on a visual assessment of the chart found in the NPF. ***Buses only ****Not calculated because the information available relates only to buses.

The Portuguese NPF addresses most of the requirements of Article 3. It contains a description of the current state and future estimates for alternative fuels vehicles in the transport sector and establishes targets as required by Article 3 of the Directive, except LNG refuelling in its TEN-T Core Network inland port.

Thanks to its strategy to develop electric recharging infrastructure, Portugal was an early mover. However, the stock of EV has grown slowly, as corroborated by the sufficiency index. The ratio of EV per recharging point is low, suggesting that Portugal may consider implementing further support measures, specifically designed to stimulate the market uptake of EVs, in order to align the deployment of EV infrastructure with EVs on the road. The recent introduction of EV purchase subsidies (2,250 EUR for BEVs and 1,125 EUR for PHEVs) is likely to have a slightly favourable impact in this regard. The future estimate of EVs in Portugal is modest with a share of about 0.23% in 2020. The role of two-wheelers in Portugal can also be highlighted. The NPF estimates ca. 20,000 electric two-wheelers in 2020. The Portuguese NPF does not discuss electricity supply for stationary airplanes. Furthermore, the provision of shore-side electricity supply for vessels and seagoing ships is minimally addressed, but not articulated.

There appears to be a need to fulfil the distance requirements for CNG along several routes of the TEN-T Core Network. In terms of LNG, the NPF defines 2025 targets, both for road and maritime transport. It also proposes supporting policy measures which, in principle, may lead to achieving these targets. However, appropriate coverage of LNG refuelling seems not to be ensured for the complete road TEN-T Core Network crossing Portuguese territory. Given the weight of LPG in the Portuguese alternative fuels vehicle stock, the NPF offers a target for LPG refuelling points in 2020.

The Portuguese NPF, at the moment, does not foresee any targets for hydrogen for transport.

The NPF is detailed in describing past legislation and contains a relatively abundant list of policy measures, structured by type of alternative fuel. Positively, the Portuguese NPF tackles infrastructure deployment in the realms of public transport and private electro-mobility. However, there is no indication of the tentative size of funding to be earmarked for the implementation of these measures. The rate of tax exemptions is not communicated either. This is an important issue because, as could be seen from past plans (e.g. EV purchase subsidy), translating these into action is far from a simple process.

Finally, the NPF highlights at several instances the importance of MS cooperation, particularly with Spain.

24 ROMANIA

Tabular overview

	AF Vehicles / Vessels				Public AF Infrastructure					Measures	
Fuel / transport mode / targets year	Current situation (from EAFO March 2017)	Future Estimate	Future share (%)	Estimate reached (%)	Current situation (from EAFO March 2017)	Target	Target attainment (%)	Sufficiency (Index / Assessment)		Score	Compre-hensive-ness
								Current	Future		
Electricity / vehicles / 2020	337 (EAFO) 251* (NPF)				63	>292**	<21.6	5.35		M	c
CNG / vehicles / 2020	400 (EAFO) 155 (NPF)				2 (NPF) 1 (EAFO)	55	3.6	200		L	c
LNG / heavy duty vehicles / 2025	1 (NPF)				0				X	L	c
LNG / seagoing ships / 2025					0	1			(OK)	X	-
LNG / inland waterway vessels / 2030					0	2			(OK)	X	-
H2 / vehicles / 2025									X	L	c
LPG / vehicles / 2020	190,000 (EAFO) 4,349 (NPF)				1,200 (EAFO) >1,800 (NPF)				X	L	c

The Romanian NPF addresses partly the requirements of Article 3 of the Directive. For most mandatory fuels and modes, it establishes targets but it does not contain a target for LNG refuelling points to be put in place along the road TEN-T Core Network for heavy-duty vehicles. It contains a discussion of the current state and future scenarios for alternative fuels in the transport sector. The Romanian NPF indicates global AF targets for infrastructure in 2020 and vague targets for electricity and CNG in road transport related only to urban agglomerations and the TEN-T Core Network. The NPF contains only general estimates of percentage increase for AFV in the future.

The Romanian NPF lacks concrete targets for EV infrastructure and information about the future EV vehicle market development. It only mentions a target for urban agglomerations in 2020 and one for the TEN-T Core Network in 2030. According to the Romanian NPF, the distance between two directly neighbouring high power recharging points along the TEN-T Core Network will be approximately 70 km in 2030 which seems insufficient. If implemented, the proposed set of measures could support electro-mobility since it was evaluated as being comprehensive and having a medium assessment score. There are plans for the public procurement of 107 electric buses for public transport in three main urban agglomerations.

For shore-side electricity, the NPF does not contain concrete targets but mentions ongoing studies for Bucharest Airport "Henri Coandă" to investigate the possible extension of the existing network. The Romanian NPF provides targets for supplying shore-side electricity in its TEN-T Core Network ports.

The NPF shows the ambition of increasing the number of CNG refuelling stations with 23 new ones in selected urban agglomerations and 30 new ones along the TEN-T Core Network before the end of 2020. The targeted number of CNG refuelling stations can be considered sufficient, although the NPF does not provide future estimates for CNG vehicles. Since the average distance between them is foreseen to be 150 km along the TEN-T Core Network, it seems that the 2025 minimum coverage

requirements will be fulfilled even though their precise spatial distribution information is not provided.

No infrastructure targets are given in terms of LNG for road transport, for 2025 the NPF is only mentioning as objective the assessment of the feasibility of deploying such an infrastructure.

The Romanian NPF does not provide targets for hydrogen refuelling infrastructure but mentions that research and development in this field will be encouraged since Romania is part of the group of countries who traditionally produce hydrogen.

The Romanian NPF, intending to accelerate the AF deployment in transport, contains a large portfolio of measures with more than half of the presented measures being of administrative, legislative and regulatory type. In the case of the assessed measures, most of them are under consideration and only few are already in place while the lack of concrete information makes it difficult to evaluate the scope according to our methodology. A medium overall assessment score is derived for electric vehicles as well as for alternative fuels in public transport services. Electro-mobility is promoted through substantial direct incentives for purchase of vehicles that are in place since 2016. However, these incentives are only approved for one year at a time and this could be perceived by market actors as a lack of predictability in terms of stability of support measures.

The NPF provides a detailed current situation and assessment of the need for investment in public transport services. Measures and plans to increase to more than 30 % the share of electricity powered vehicles (including tramways, trolleybuses, buses and micro-buses) in the urban public transport fleet in 2020 are presented.

Five ministries and a series of relevant central public institutions were involved in the drafting of the Romanian NPF. It has been established respecting the interests of regional and local authorities. An inter-ministerial coordination council has been set up in order to ensure the monitoring of the implementation actions and cooperation between the relevant authorities.

Evidence of Romania's collaboration with other MSs has been found mainly in the frame of EU projects regarding the inland navigation sector (INNOVATIVE DANUBE VESSEL, PROMINENT, the LNG Master Plan for Rhine-Main-Danube). Beyond these projects, the NPF does not mention any cooperation or coordination with the neighbour MSs in the field of alternative fuels. It is advised to provide evidence of existing collaborations and planning or to engage in such cooperation to ensure AFI cross-border continuity.

25 SWEDEN

Tabular overview

	AF Vehicles / Vessels				Publicly accessible AF Infrastructure					Measures	
Fuel / transport mode / targets year	Current situation (from EAFO March 2017)	Future Estimate	Future share (%)	Estimate reached (%)	Current situation (from EAFO March 2017)	Target	Target attain-ment (%)	Sufficiency (Index / Assessment)		Score	Compre-hensive-ness
								Current	Future		
Electricity / vehicles / 2020	34,633				2,854			12.13		M	c
CNG / vehicles / 2020	30,354 (EAFO) 44,109 (NPF)				163			186.22		M	c
LNG / heavy duty vehicles / 2025	69				6				X	X	-
LNG / seagoing ships / 2025									X	X	-
LNG / inland waterway vessels / 2030									X	X	-
H2 / vehicles / 2025	10 (NPF) 28 (EAFO)				3	5	60.0		X	L	n
Biofuels / vehicles	235,000*				1,828**				X	M	c
LPG / vehicles	491				39				X	M	c

*Cars, **E85

The Swedish NPF addresses only very few of the requirements of Article 3. According to the Swedish NPF, climate change is 'one of the top priority issues for the government'. The expression 'fossil-free' is emphasised throughout the NPF. Sweden clusters national policy objectives of interest to the Directive into 6 groups: climate, energy, transport, regional, industry and consumer. Numerical targets are shown only for the first two. The Swedish NPF does neither contain any future estimates for alternative fuels vehicles nor any targets for alternative fuels recharging or refuelling infrastructure. This violates a basic requirement of the Directive. It can pose a serious risk to cross-border continuity and a functioning internal market for alternative fuels vehicles.

Concerning future estimates of electric vehicle stock, the Swedish NPF is rather vague. The lack of clear targets for future electric vehicle market deployment jeopardises the assessment and may represent an obstacle to policy efforts towards electro-mobility. It will be important to establish appropriate infrastructure targets in line with the market developments.

The Swedish NPF indicates regional discrepancies with regards to the share of natural gas use. No natural gas refuelling points can be found in large inland areas in Northern Sweden (see Figures 7-8 of the NPF). CNG refuelling infrastructure halfway the Skellefteå - Härnösand route (around southern Umeå) as well as halfway the Sundsvall - Gävle route (around Hudiksvall) would appear sufficient to meet the requirement of one refuelling point at least every 150 km.

The use of alternative fuels for public transport activity is concisely addressed. Rail is briefly mentioned. Additional details would be desirable.

The Swedish NPF highlights the role of biofuels in the country's transport sector and the fact that Sweden has already met the sectoral 2020 target set by the Renewable Energy Directive. The Swedish NPF stresses that no special infrastructure is required for biofuels and regards this as a cost-effective

solution for road vehicles. At the same time, the NPF indicates that new flex-fuel car registrations have decreased dramatically in recent years (0.4% share in 2015).

The Swedish NPF contains a relatively comprehensive portfolio of measures. Overall, Sweden appears to be implementing a solid policy package, beneficial to the deployment of alternative fuels vehicles, also visible in the current high shares of newly registered EV; but, as the Swedish NPF does not contain future quantitative targets for AFI, it is difficult to judge how the support measures can support reaching the objectives.

Further elaboration on the possibility of Member State cooperation to establish a harmonised fairway and port recharging system in the Baltic Sea Area would be advantageous.

Information on AFI targets related to inland waterways, airports and private electro-mobility is inadequate. Information on these is essential in view of the requirements stipulated in the Directive.

26 SLOVENIA

Tabular overview

	AF Vehicles / Vessels				Public AF Infrastructure					Measures	
Fuel / transport mode / targets year	Current situation (from EAFO March 2017)	Future Estimate	Future share (%)	Estimate reached (%)	Current situation (from EAFO March 2017)	Target	Target attain-ment (%)	Sufficiency (Index / Assessment)		Score	Compre-hensive-ness
								Current	Future		
Electricity / vehicles / 2020	790 (EAFO) 624 (NPF)	11,750	0.95	6.7	483	1,200	40.3	1.64	9.79	M	c
CNG / vehicles / 2020	173 (EAFO) 272 (NPF)	2,928	0.24	5.9	4	14	28.6	43.25	209.14	L	c
LNG / heavy duty vehicles / 2025	8 (NPF)	1,906	4.14	0.4	0	3	0.0		(OK)	L	n
LNG / seagoing ships / 2025					0	1	0.0		(OK)	X	-
LNG / inland waterway vessels / 2030	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
H2 / vehicles / 2025	6 (NPF)	1,240	0.10	0.5	1	5-9	14.3		OK	L	c
LPG / vehicles /2020	8,762 (NPF)	33,099	2.66	26.5	100 (EAFO) 115 (NPF)				X	L	n

The Slovenian NPF addresses most of the requirements of Article 3. For most fuels and modes, it establishes infrastructure targets and vehicle estimates for 2020, 2025 and 2030.

The Slovenian NPF puts emphasis on the development of the market for electric vehicles. It estimates a share of roughly 1% electric passenger cars on the road in 2020 and 16.9% in 2030. The 2030 estimations are also optimistic for electric light commercial vehicles (12.4%) and electric buses (6.3%). Measures are already in place or planned to reach these estimated shares (several tax exemptions and benefits, attractive incentives for purchase and for use of electric vehicles). Slovenia already today has a well-developed recharging infrastructure, with a ratio of one public recharging point per only 1.64 electric vehicles. It plans to further increase the number of recharging points, its targets being in line with the requirements of the Directive and they seem sufficient to cover appropriately the needs of electric vehicles in terms of distance requirements. The Slovenian NPF mentions that electricity supply will be in place in all 3 airports of the TEN-T network by the end of 2025. Regarding shore-side electricity, studies are ongoing and measures are planned to build new power lines for the needs of the Port of Koper.

CNG is considered to be the key alternative fuel for buses in the future with estimated shares of CNG buses in the total buses fleet of around 9.3% (2020), 19.7% (2025) and 33.9% (2030) and measures are planned to ensure that these objectives are realised. The NPF mentions that CNG recharging infrastructure will be deployed in all municipalities and their targets for 2020 and 2025 are considered appropriate since they pass the sufficiency threshold.

A target of 3 LNG refuelling points for heavy-duty vehicles is foreseen for 2020 that will also ensure the fulfilment of the distance requirement on the TEN-T Core Network in Slovenia. The LNG road infrastructure will be built in the framework of two European projects, namely SiLNGT (2015-EU-TM-0104-S Mediterranean Corridor) and cHAMeleon.

LNG refuelling is planned for the only maritime port in the TEN-T Core Network, the port of Koper. Two studies were performed within the projects POSEIDON MED II and GAINN4MOS to find appropriate solutions for supplying ships with LNG in the port of Koper.

A target of 5 to 9 hydrogen refuelling points is established for 2025 for which full subsidies for installation are considered necessary by the NPF (in particular, grants from EU funds are mentioned).

The Slovenian NPF contains a wide range of measures, but the majority of the measures are under consideration whilst a reduced amount is already in place. The presented measures cover a wide variety of types, addressing many deployment barriers. However, information concerning their implementation status, validity periods, or appropriated budget is often lacking.

A medium overall assessment score is derived for electric road transport where the mentioned existing and planned measures seem to have the potential to contribute towards reaching the committed targets and objectives.

The NPF mentions that incentives will be available to replace public transport vehicles of EURO IV or lower standards with less polluting vehicles powered by alternative fuels, in particular in areas with poor air quality. With regard to buses, CNG is stated to be the key alternative and subsidies are being considered for the purchase of CNG buses for a period of two to five years.

The Slovenian government established an inter-ministerial working group for drafting the NPF. The Slovenian NPF considers that the local communities and other stakeholders will have an important role in implementing the planned measures.

Slovenia shows intentions to cooperate with the neighbouring countries to ensure EU-wide circulation of AF vehicles and vessels. For setting up infrastructure for the supply of ships with LNG, Slovenia cooperates with neighbouring Member States within the European projects POSEIDON MED II and GAINN4MOS.

27 SLOVAK REPUBLIC

Tabular overview

	AF Vehicles / Vessels				Publicly accessible AF Infrastructure					Measures	
Fuel / transport mode / targets year	Current situation (from EAFO March 2017)	Future Estimate	Future share (%)	Estimate reached (%)	Current situation (from EAFO March 2017)	Target	Target attain-ment (%)	Sufficiency (Index / Assessment)		Score	Compre-hensive-ness
								Current	Future		
Electricity / vehicles / 2020	586	10,000	0.49	5.9	440	750	58.7	1.33	13.33	M	c
CNG / vehicles / 2020	822	5,000	0.24	16.4	10	41	24.4	82.20	121.95	L	n
LNG / heavy duty vehicles / 2025					0	2	0.0		OK	L	n
LNG / seagoing ships / 2025	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LNG / inland waterway vessels / 2030						2			OK	L	n
H2 / vehicles / 2025					0				X	L	n
LPG / vehicles	42,982 (NPF) 15,500 (EAFO)				380 (NPF) 210 (EAFO)				X	X	-

The Slovak NPF addresses partly the requirements of Article 3. It contains a discussion of the current state and future scenarios for alternative fuels in the transport sector. For all the mandatory fuels and modes (electricity and natural gas), it establishes targets as required by Article 3 of the Directive. No measures have been taken or proposed to promote alternative fuels infrastructure in public transport services or to facilitate the deployment of recharging points not accessible to the public.

The Slovak NPF puts a comparably low emphasis on electric vehicles and estimates only 0.5% electric vehicles on the road in 2020. The number of electric recharging points foreseen for 2020 and 2025 seems not sufficient to cover the needs of Slovakia in terms of number of the estimated number of vehicles and distance requirements. This could evolve to become a barrier for the further deployment of electric vehicles in Slovakia and could also lead to market fragmentation within the EU. The spatial distribution of the recharging points is not given. According to the Slovak NPF, the greatest distance between any two directly neighbouring high power recharging points is at the moment approximately 80 km which seems insufficient. Also according to the Slovak NPF, South Slovakia is at the moment poorly – perhaps even inadequately – covered in terms of all types of recharging. It will be important to closely monitor this development and correct the infrastructure targets in line with the market developments. Purchase incentives have been defined to increase the number of electric vehicles in Slovakia. The Slovak NPF discusses electricity for stationary airplanes at the Bratislava TEN-T Core Network airport. It does not specify any quantitative targets for this. The Slovakian NPF does not include concrete plans for shore-side electricity supply for inland ports. However, it mentions that this will be further investigated in the future.

Regarding CNG, the NPF shows that the available number of CNG refuelling points and the ones planned for 2020 and 2025 are sufficient to pass the threshold value of one CNG refuelling point per 600 vehicles today and in the future. The distance requirement of at least one refuelling point every 150 km is met already today. The NPF shows also the ambition of increasing the number of CNG refuelling points with a specific plan on selected urban/suburban agglomerations. Some lower impact financial measures have been defined to promote the use of CNG vehicles on the roads.

The Slovak NPF considers that at least two LNG refuelling points for heavy-duty vehicles will be required and mentions that the ideal situation appears to be 3-5 public LNG refuelling points for road transport by 2025. If at least two LNG refuelling points were realised (one on each TEN-T Corridor; Bratislava area, Žilina area and/or Košice/Prešov area) this could guarantee that the maximum distance requirement for LNG refuelling points along the TEN-T Core Network would be fulfilled on Slovak territory.

The construction of LNG bunkering facilities in the two TEN-T Core Network inland ports (Bratislava and Komárno) is planned and measures are proposed to support the construction of these LNG facilities on the Slovak section of the River Danube.

The Slovak NPF does not include hydrogen but will analyse opportunities to further the advancement of hydrogen infrastructure.

According to the Slovak NPF, LPG is actually covered by a relatively large nationwide network of refuelling points (fulfilling the needs of vehicle operators) and the infrastructure of LPG refuelling points is constantly expanding. However, one of the main barriers preventing the development of LPG vehicles seems to be the restriction on parking in underground parking facilities.

The Slovak NPF contains a comprehensive list of support measures for electricity for vehicles, most already in place and for some a prolongation is foreseen. They can be considered having a low to medium impact on market actor's decisions. Longer periods for their validity could provide certainty for market actors and hence increase the likelihood that the national targets and objectives of the NPF can be reached. For other modes and fuels, the measures in the Slovak NPF seem to have a rather low impact and are not comprehensive. No measures are discussed to promote AFI in public transport services or to promote the deployment of private electro-mobility infrastructure.

The Slovak NPF has taken into consideration the interests of regional and local authorities, as well as other stakeholders during its drafting.

Slovakia has not listed specific cooperation programmes; however, some collaboration examples are given. Slovakia has cooperated with the Czech Republic within the Connecting Europe Facility programme and, since 2013, has also assisted in the implementation of the TEN-T project LNG Masterplan for the Rhine - Main - Danube Corridor.

28 UNITED KINGDOM

Tabular overview

	AF Vehicles / Vessels				Public AF Infrastructure					Measures	
Fuel / transport mode / targets year	Current situation (from EAFO March 2017)	Future Estimate	Future share (%)	Estimate reached (%)	Current situation (from EAFO March 2017)	Target	Target attain-ment (%)	Sufficiency (Index / Assessment)		Score	Compre-hensive-ness
								Current	Future		
Electricity / vehicles / 2020	89,977 (NPF) 104,751 (EAFO)	396,000 - 431,000	1.02 - 1.11	22.7 - 20.9	9,345 (NPF) 12,957 (EAFO)	12,000 - 13,500	77.9 - 69.2	9.63	33.00 - 31.93	H	c
CNG / vehicles / 2020	57				7 (NPF) 8 (EAFO)	8 - 13	63.6	8.14		L	n
LNG / heavy duty vehicles / 2025	621				11 (NPF) 20 (EAFO)	20 - 48	55.0		(OK)	L	n
LNG / seagoing ships / 2025					2	4 - 5	50.0 - 40.0		(OK)	X	-
LNG / inland waterway vessels / 2030	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
H2 / vehicles / 2025	38 (NPF) 79 (EAFO)				15 (NPF) 12 (EAFO)	65	23.1		OK	M	c
LPG / vehicles	135,000				1,300 (NPF) 1,400 (EAFO)				X	L	n

The UK NPF addresses all of the requirements of Article 3. It is well structured, contains a description of the current state and some future estimates for alternative fuels vehicles in the transport sector and establishes targets required by Article 3 of the Directive.

The UK NPF puts a lot of emphasis on the development of a market for electric vehicles. It contains relatively high estimates for the future deployment of EV with an estimated roughly 1.1% electric vehicles on the road in 2020. Today, the spatial distribution of recharging points seems to appropriately cover the needs of electric vehicles in terms of distance requirements in the UK. For the future, the targeted ratio of less than one public recharging point per 30 electric vehicles estimated for 2020 could evolve to become a barrier for the further market deployment of electric vehicles. It will be important to carefully monitor this development and correct infrastructure targets in line with the market developments. Regarding electricity supply for stationary airplanes, the UK government considers that the airport owners and operators are the best placed to assess the needs and cost/benefits, including environmental, for electricity supply for stationary airplanes. The NPF mentions shore-side electricity is not considered to be currently a commercially attractive proposition. Consequently, it does not provide any target for shore-side electricity and leaves it to the port operators and their customers to implement it on a purely commercial basis.

The UK currently features seven publicly accessible CNG refuelling points and plans to increase this number by 2020 to 8-13. The current number of publicly accessible LNG refuelling points is 11 and the 2025 target is set to 20-48, suggesting that the maximum distance requirement of at least one refuelling point every 400 km for LNG refuelling points along the TEN-T Core Network could be fulfilled on the UK territory by that year.

In view of the lack of distinction in the NPF between LPG, CNG and LNG vehicles, it is difficult to understand the current market status for those fuels. Future CNG or LNG vehicle estimates are missing in the NPF. This makes an assessment of the future situation impossible.

There is a lack of information on the future targeted spatial distribution for recharging points and CNG and LNG refuelling points in the UK NPF, along the TEN-T Core Network as well as within agglomerations/densely populated areas (urban nodes).

The UK currently offers LNG refuelling in 2 (out of 15) maritime ports in the TEN-T Core Network and 2-3 additional facilities are considered before 2025 allowing for the circulation of LNG vessels as required in the Directive.

The UK NPF displays a commitment towards developing an early market for hydrogen in 2025 timeframe, targeting the availability of 65 publicly accessible refuelling points.

The UK NPF contains a quite comprehensive list of measures; the great majority of them are in force and foreseen to stay, only few being obsolete. Some of them, especially the ones targeting to improve the economics of alternative fuels, can be considered having a medium or high impact on market actor's decisions, especially for electricity for road transport as well as private recharging infrastructure and public transport. Most of the measures are addressing financing and early market barriers, being essential in the market development. Even though the budget is provided for the majority of the measures, in some cases it is not clearly defined which part of this is still available for future years, which makes their assessment difficult. The UK also supports research, development, and demonstration activities in the field of alternative fuels and propulsion systems.

The UK supports companies realizing public transport services and public institutions in acquiring low emitting vehicles for their fleets. The measures cover direct incentives for purchasing new electric buses (covering for zero-emission vehicles from 75% to 90% of the additional costs compared to conventional vehicles) and taxis, but also grant schemes for retrofitting old vehicles (mainly buses).

The consideration of the interests of regional and local authorities and stakeholders engaged in alternative fuels is evident throughout the text of the NPF.

The UK did not present any evidence of coordinating its plans on alternative fuels infrastructure with other countries, especially neighbouring member states.