- **Germany (DE)**

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

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

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 H2 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 H2 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.

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

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

Part of the Directive 2014/94/EU	Requirement	Mode of transport / Alternative Fuel (provided in the NIR)		Yes / No
ANNEX I: 1. Legal measures	Information on legal measures, which may consist of legislative, regulatory or administrative measures to support the build-up of alternative fuels infrastructure, such as building permits, parking lot permits, certification of the environmental performance of businesses and fuel stations concessions.	All / Electricity, CNG, LNG, hydrogen		Yes
ANNEX I: 2. Policy measures supporting the implementation of the national policy framework	Information on those measures shall include the following elements: • direct incentives for the purchase of means of transport using alternative fuels or for building the infrastructure, • availability of tax incentives to promote means of transport using alternative fuels and the relevant infrastructure, • use of public procurement in support of alternative fuels, including joint procurement, • demand-side non-financial incentives, for example preferential access to restricted areas, parking policy and dedicated lanes, • technical and administrative procedures and legislation with regard to the authorisation of alternative fuels supply, in order to facilitate the authorisation process.	Road, rail, water / Electricity, CNG, LNG, hydrogen, LPG		Yes
	• consideration of the need for renewable jet fuel refuelling points in airports within the TEN-T Core Network	Air	Biofuels	Yes
ANNEX I: 3. Deployment and manufacturing support	• Annual public budget allocated for alternative fuels infrastructure deployment, broken down by alternative fuel and by transport mode (road, rail, water and air).	Road, rail, water / Electricity, CNG, LNG, hydrogen		Yes
	• Annual public budget allocated to support manufacturing plants for alternative fuels technologies, broken down by alternative fuel and by transport mode.	All / Electricity, LNG, hydrogen		Yes
	• Consideration of any particular needs during the initial phase of the deployment of alternative fuels infrastructures.	All / All		Yes
ANNEX I: 4. Research, technological development and demonstration	• Annual public budget allocated to support alternative fuels RTD&D, broken down by fuel and by transport mode.	All / Electricity, LNG, hydrogen, biofuel, synthetic fuels		Yes
ANNEX I: 5. Targets and objectives	• Estimation of the number of alternative fuel vehicles expected by 2020, 2025 and 2030	Road / Electricity		Yes
	• Level of achievement of the national objectives for the deployment of alternative fuels in the different transport modes (road, rail, water and air)	All / Electricity, CNG, LNG, Hydrogen, LPG, Methanol		Yes
	• Level of achievement of the national targets, year by year, for the deployment of alternative fuels infrastructure in the different transport modes	All / Electricity, CNG, LNG, Hydrogen, LPG		Yes
	• Information on the methodology applied to take account of the charging efficiency of high power recharging points	Road	Electricity	Yes
ANNEX I:6 Alternative fuels infrastructure developments	Changes in supply (additional infrastructure capacity) and demand (capacity actually used)			No

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

Regarding the combination of AF/AFV/AFI with transport mode, electricity is covered for all modes; all the other pairs are partially covered, in particular: CNG and LPG for road transport; LNG for road and waterborne transport; hydrogen for road and rail transport; biofuels for air transport; synthetic and paraffinic fuels for road, inland waterway transport and air transport. All the other combinations are either absent or not applicable.

The German NIR reports a list of 180 measures. Under the Policy and Deployment & Manufacturing sections it was possible to identify 12 AF/transport mode clusters of measures, all assessable.

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

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

Alternative fuel / Transport mode		2018		2020		2025		2030	
		AFV	AFI public	AFV	AFI public	AFV	AFI public	AFV	AFI public
Electricity / road	NIR	164,566	17,245	1,000,000*	43,000	NA	NA	8,500,000	1,000,000
	Change NIR vs NPF [%]			0.00%*	0.00%				
	Attainment [%]			16.46%	40.10%			1.94%	1.72%
CNG / road	NIR	78,251	862	NA	NA	NA	NA	NA	NA
	Change NIR vs NPF [%]								
	Attainment [%]								
LNG / road	NIR	7	4	NA	NA	NA	≥ 9	NA	NA
	Change NIR vs NPF [%]						0.00%		
	Attainment [%]						44.44%		
LNG / water (maritime)	NIR	2	0**	NA***	NA	NA	NA	NA	NA
	Change NIR vs NPF [%]								
	Attainment [%]								
LNG / water (inland)	NIR	0	0**	NA	NA	NA	NA	NA	NA
	Change NIR vs NPF [%]								
	Attainment [%]								
H2 / road	NIR	378	66	NA	100	NA	400	NA	NA
	Change NIR vs NPF [%]				0.00%		0.00%		
	Attainment [%]				66.00%		16.50%		
LPG / road	NIR	213,718	7,128	NA	NA	NA	NA	NA	NA
	Change NIR vs NPF [%]								
	Attainment [%]								

Legend:

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

*In this particular case, the value includes L-category vehicles. **The values refer to stationary shore-to-ship facilities (i.e. bunkering stations) (see Section 5.5.3.3.2). ***The NIR states that two new LNG vessels are planned but no indicative year of deployment is provided.

- Road transport
    - Electricity

Vehicles

Germany recorded 164,566 battery-electric and plug-in hybrid electric vehicles in use in 2018 (Table Error***! No text of specified style in document.***-*2*). Of these, 148,845 were passenger cars (55% were battery-electric), 15,423 were LCVs (almost all of them battery-electric), 165 were HCVs (all battery-electric) and 133 were buses and coaches (all battery-electric). In addition, the NIR reported a stock of 62 trolleybuses (operating in the municipalities of Eberswalde, Esslingen and Solingen) and 9,684 L-category vehicles. Although not sufficiently explicitly, the NIR seems to retain the 2020 target of 1 million EVs. Both the NPF and NIR lack estimates for the EV fleet in 2025. The NIR expects that, by 2030, between 7 and 10 million electric passenger cars will be in use; electric buses will account for up to 50% of the city bus stock and around 33% of vehicle mileage in heavy road haulage will be undertaken by means of electricity.

The 2018 ***attainment*** of future EV estimates is 16.46% in 2020 and 1.94% for 2030. According to the assessment methodology described in Section 2.1, the 2018 situation corresponds to an ***adequate progress*** towards reaching the envisaged EV estimates. The calculated ***average annual growth rate*** corresponding to the period 2016-2030 for EV fleet evolution planned by Germany is equal to 39%.

Infrastructure

Germany recorded 17,245 publicly accessible recharging points in 2018 (Table Error***! No text of specified style in document.***-*2*), of which 2,562 were high power (>22kW) points (of these 40.1% were AC fast charging, 53.6% DC fast and 6.3% DC ultrafast). The NIR seems to endorse the 2020 targets reported in the NPF and indicates that one million recharging points can be expected by 2030 (without details on the share of high power recharging points). Both the NPF and NIR lacked 2025 targets. The DE NIR provides no information on private recharging points on the grounds that the available information is not robust.

The 2018 ***attainment*** of future publicly accessible recharging infrastructure targets is 40.10% for 2020 and 1.72% for 2030. According to the assessment methodology described in Section 2.1, the 2018 situation corresponds to an ***adequate progress*** towards reaching these envisaged targets. The calculated ***average annual growth rate*** corresponding to the period 2016-2020 for publicly accessible recharging infrastructure evolution planned by Germany is 42%.

Ratio

Based on the DE NIR, the following table shows the ratio between vehicles and publicly accessible recharging points (i.e. sufficiency index) for the pair electricity/road. It can be seen that the sufficiency index fluctuated around the value of 10 between 2016 and 2018 and was thus adequate to support EV uptake. The foreseen sufficiency index is 23.26 for 2020 (potentially not adequate) and 8.50 for 2030.

Sufficiency Index		2016	2017	2018	2020	2025	2030
Road	**Electricity**	9.28	10.22	9.54	23.26*		8.50

*In this particular case, the vehicle estimate includes L-category vehicles.

Information on charging efficiency

The German NIR fulfils the requirements on charging efficiency reporting by providing comprehensive information, based on representative samples, on actual capacity usage by type of recharging point. For instance, for high power recharging points (43 < P < 100 kW): a) the average number of charging processes/day/point is 0.5; b) the average energy delivered/day/point is 6.8 kWh; c) the average occupancy time/point/day is 18 minutes. Additional data related to the charging process, the sample and for other types of recharging points are reported in Table 12 of the German NIR.

- CNG

Vehicles

Germany recorded 78,251 CNG vehicles in use in 2018 (Table Error***! No text of specified style in document.***-*2*). Of these, 71,122 were passenger cars, 6,316 LCVs, 369 HCVs and 444 buses and coaches. Both the NPF and NIR lack estimates on future CNG vehicles, therefore the 2018 ***attainment*** and ***progress*** could not be computed.

Infrastructure

The German NIR indicates that 862 publicly accessible CNG refuelling points were available in 2018 (Table Error***! No text of specified style in document.***-*2*), a decline compared to the 913 points available in 2016. Both the NPF and NIR lack targets for future publicly accessible CNG refuelling points.

Because there were no future CNG road refuelling infrastructure targets provided in the German NIR, the 2018 ***attainment*** and ***progress*** could not be computed.

Ratio

Based on the DE NIR, the following table shows the ratio between vehicles and publicly accessible refuelling points (i.e. sufficiency index) for the pair CNG/road. It can be seen that the sufficiency index was well below the indicative value of 600 (see Section 2.1.5) between 2016 and 2018. However, the foreseen sufficiency index cannot be computed.

Sufficiency Index		2016	2017	2018	2020	2025	2030
Road	CNG	76.03	79.73	90.78			

- LNG

Vehicles

Germany recorded seven LNG vehicles in use in 2018: one LCV and six HCVs (Table Error***! No text of specified style in document.***-*2*)[1]. Both the NPF and NIR lacked future LNG vehicle estimates, therefore the 2018 ***attainment*** and ***progress*** could not be computed.

[1] Registrations of only vehicles with bivalent diesel-LNG propulsion are reported in the NIR, which however acknowledges that it is not possible to determine the number of past LNG vehicles and regards the reported figures as a very likely underestimation. Since 2019, vehicles with the more common monovalent LNG propulsion are being recorded under a specific category.

Infrastructure

The German NIR indicates that four publicly accessible LNG refuelling points were available in 2018 (Table Error***! No text of specified style in document.***-*2*), of which three are on the TEN-T Core Network. The NIR states that "*at least 9 LNG refuelling points for heavy goods vehicles are to be in operation on the TEN-T Core Network by 2025*", which is in line with the target provided in the NPF.

The 2018 ***attainment*** of future publicly accessible LNG refuelling infrastructure targets is 44.44% for 2025. According to the assessment methodology described in Section 2.1, the ***progress*** obtained by Germany for publicly accessible LNG refuelling infrastructure deployment from 2016 until 2018 versus the period 2016-2030 could not be computed because the 2030 target is not provided.

Ratio

Based on the DE NIR, the following table shows the ratio between vehicles and publicly accessible refuelling points (i.e. sufficiency index) for the pair LNG/road, computable only for 2018.

Sufficiency Index		2016	2017	2018	2020	2025	2030
Road	LNG			1.75			

- Hydrogen

Vehicles

The German NIR indicates that 378 hydrogen-powered vehicles[2] were in use in 2018 (Table Error***! No text of specified style in document.***-*2*), of which 367 were passenger cars and 11 were buses and coaches. In addition, the NIR reports one L-category vehicle powered by hydrogen. Both the NPF and NIR lacked future hydrogen vehicle estimates, therefore the 2018 ***attainment*** and ***progress*** could not be computed.

Infrastructure

The German NIR indicates that 66 publicly accessible hydrogen refuelling points were available in 2018 (Table Error***! No text of specified style in document.***-*2*), of which 4 were 350-bar points and the rest 700-bar. This represents a strong increase compared to the 23 points available in 2016. According to the NIR, "the Federal Government is supporting the objective of 100 public refuelling stations in 2020 which was formulated by the industry and – subject to the condition of an appropriate vehicle ramp-up – the objective of 400 public refuelling stations in 2025". No infrastructure target for 2030 is provided.

The 2018 ***attainment*** of future publicly accessible hydrogen refuelling infrastructure targets is 66.00% for 2020 and 16.50% for 2025. According to the assessment methodology described in Section 2.1, the ***progress*** obtained by Germany for publicly accessible hydrogen refuelling infrastructure deployment from 2016 until 2018 versus the period 2016-2030 could not be computed because the 2030 target is not provided.

[2] Including plug-in vehicles with hydrogen fuel cell and vehicles with hydrogen-powered internal combustion engines, as reported in the NIR.

Ratio

Based on the DE NIR, the following table shows the ratio between vehicles and infrastructure (i.e. sufficiency index) for the pair hydrogen/road (see Section 2.1.5).

Sufficiency Index		2016	2017	2018	2020	2025	2030
Road	**Hydrogen**	9.65	6.74	5.73			

- Biofuels

Information is not available in the German NIR.

- LPG

Vehicles

The German NIR indicates that 213,718 LPG vehicles were in use in 2018 (Table Error***! No text of specified style in document.***-*2*), which represents a 3% decline compared to 2016. Of these, 206,786 were passenger cars, 6,907 were LCVs, 20 were HCVs and 5 were buses and coaches. In addition, the NIR reports 34 L-category vehicles powered by LPG. Both the NPF and NIR lacked future LPG vehicle estimates, therefore the 2018 ***attainment*** and ***progress*** could not be computed.

Infrastructure

The German NIR indicates that 7,128 publicly accessible LPG refuelling points were available in 2018 (Table Error***! No text of specified style in document.***-*2*), compared to 7,061 points in 2016 (no data is provided for 2017). Both the NPF and NIR lacked future targets for publicly accessible LPG refuelling points, therefore the 2018 ***attainment*** and ***progress*** could not be computed.

Ratio

Based on the DE NIR, the following table shows the ratio between vehicles and infrastructure (i.e. sufficiency index) for the pair LPG/road (see Section 2.1.5).

Sufficiency Index		2016	2017	2018	2020	2025	2030
Road	**LPG**	31.07		29.98			

- Synthetic and paraffinic fuels

Vehicles

The NIR mentions two passenger cars powered by methanol.

Infrastructure

Information is not available in the DE NIR.

- Rail transport
    - Electricity

Vehicles

The German NIR indicates that the stock of electric railway vehicles in use was 6,173 in March 2019, compared to 5,572 in 2016 (no disaggregation between locomotives and railcars is reported). The NIR also mentions that diesel-electric hybrid locomotives have been deployed for shunting operations and have been presented for long-distance freight transport (see also Section 5.5.4).

Infrastructure

According to the DE NIR, overhead contact lines are presently not available in around 40% of the rail network, most of it affecting low traffic passenger services. Germany's ambition is to deploy alternative fuels or, when economically feasible, to pursue further electrification of those lines.

    - Hydrogen

Vehicles

The German NIR indicates that two hydrogen-powered railway vehicles were in use in March 2019. It is expected that by 2022 there will be 26 hydrogen trains in regular operation in Hessen and 14 hydrogen trains in Niedersachsen.

Infrastructure

The German NIR indicates that one hydrogen refuelling point (350-bar) was available for rail services in 2018.

- Waterborne transport (maritime)
    - Electricity

Vessels

The German NIR indicates that there were no electric maritime vessels in use in 2018 and it does not provide future estimates.

Infrastructure

The German NIR indicates that there were three maritime ports providing shore-side electricity supply in 2018. Both the NPF and NIR lack targets for future deployment of shore-side electricity supply in maritime ports, therefore the 2018 ***attainment*** and ***progress*** could not be computed.

    - LNG

Vessels

The German NIR indicates that two LNG maritime vessels were in use in 2018. Both the NPF and NIR lacked future LNG maritime vessel estimates, therefore the 2018 ***attainment*** and

progress could not be computed. The NIR, however, states that two new state-owned LNG maritime vessels are planned, though no tentative year of deployment is indicated.

Infrastructure

The German NIR reports that there were no maritime ports supplying LNG in stationary bunkering stations in 2018. Both the NPF and NIR lacked future targets for publicly accessible LNG refuelling points in maritime ports, therefore the 2018 ***attainment*** and ***progress*** could not be computed. The NIR, however, mentions that "truck-to-ship" supply is available and that "ship-to-ship" supply will be available in the future. Four ports (Brunsbüttel, Rostock, Stade and Wilhelmshaven) are being considered by private investors as suitable locations for the deployment of LNG import/distribution terminals.

- Waterborne transport (inland)

  - Electricity

Vessels

The German NIR indicates the use of 14 inland vessels powered by electricity in 2018, including two plug-in hybrid vessels. Both the NPF and NIR lacked future electric inland vessel estimates, therefore the 2018 ***attainment*** and ***progress*** could not be computed.

Infrastructure

The German NIR indicates that there were 128 inland ports providing shore-side electricity supply in 2018[3]. In addition, the NIR specifies that there were 279 facilities providing electricity along inland waterways, thus the total number of 'shore-side electricity facilities' for inland vessels amounted to 407 in 2018. Both the NPF and NIR lacked future targets for shore-side electricity supply in inland ports, therefore the 2018 ***attainment*** and ***progress*** could not be computed.

  - LNG

Vessels

The German NIR indicates that there were no LNG inland vessels in use in 2018. Both the NPF and NIR lacked future LNG inland vessel estimates, therefore the 2018 ***attainment*** and ***progress*** could not be computed.

Infrastructure

The German NIR reports that there were no inland ports supplying LNG in stationary bunkering in 2018. Both the NPF and NIR lacked future targets for publicly accessible LNG refuelling points in inland ports and the 2018 ***attainment*** and ***progress*** could not be computed. The NIR, however, indicates that "truck-to-ship" supply is available and that "ship-to-ship" supply will be available in the future. The NIR mentions plans to deploy 14 stations and the interest from the private sector to set up an LNG distribution network along the German section of the Rhine River.

[3] Data unavailable for Brandenburg, Niedersachsen, Nordrhein-Westfalen and Schleswig-Holstein.

- Synthetic and paraffinic

Vessels

The NIR indicates that one passenger vessel, powered by renewable methanol, is operating on the Baldeneysee.

Infrastructure

Information is not available in the DE NIR.

- Air transport
  - Electricity

Airplanes

The NIR indicates that all-electric and hybrid-electric engines for commercial air taxis as well as hybrid-electric propulsion for small commercial aircraft are being developed. The NIR considers that electric engines are still at an early stage of development for use in air transport.

Infrastructure (for stationary airplanes)

The German NIR provides information on two sources of electricity supply to stationary airplanes at airports (at the terminal and on the tarmac) based on the responses to a 2016 survey covering fourteen airports (all part of the *Flughafenverband ADV*). With regards to supply at the terminal, almost all of the 270 terminal positions are equipped with stationary ground power connections. In contrast, the NIR acknowledges that supply on the tarmac is less developed: around 40% of ca. 580 positions on the tarmac are equipped.

  - Hydrogen

Airplanes

The NIR indicates that hydrogen-powered fuel cell engines are being developed for commercial air taxis, but are still at an early stage.

Infrastructure

The NIR mentions an existing research project focusing on on-board power supply via hydrogen fuel cell auxiliary power units (see Section 5.5.4).

  - Biofuels

Airplanes

Information is not available in the DE NIR.

Infrastructure

The NIR considers that there is no need for renewable jet fuel refuelling points in German airports within the TEN-T Core Network.

- Synthetic and paraffinic

Airplanes

Information is not available in the DE NIR.

Infrastructure

The NIR mentions that research and demonstrations projects targeting synthetic kerosene production for use in aviation have been initiated (see Section 5.5.4) however, no further information is provided on the expected growth path.

- ***Measures assessment***

The German NIR assigns each measure to one or more of the following categories: strategies and framework programmes, legislative measures, administrative measures, R&D, procurement of vehicles, establishment of infrastructure, public transport, funding of production facilities and other policy measures. For the purpose of this assessment, the following two preliminary steps were executed: (i) each category appearing in the NIR was mapped into a category used for the assessment (refer to the Guidance document provided to the Member States); (ii) for those measures listed by the NIR as belonging to more than one category, the most appropriate category used for the assessment was chosen. Due to the limited information on budget provided and to the large number of measures listed, the clustering of the measures was performed only for the national ones. However, the most salient regional measures (typically those with a reported budget exceeding 10 million €) were taken into account in the final assessment. Finally, the NIR indicates when a given measure is reported twice (in separate sections) and when an individual measure is part of a package / programme listed separately. In these cases and for the purpose of assigning the overall cluster score and to avoid double counting, the measure in question was considered once.

The German NIR reports a long list of 180 measures. A few of the measures reported in the NIR can be considered packages or programmes consisting of individual measures that are also listed separately with specific budgets. An example of this is the "*Marktanreizpaket Elektromobilität*" (Market Incentive Programme for Electric Mobility). The German NIR reports the measures in two lists: national and regional measures[4]. Although the budget for the regional measures is incomplete, the indicated sum amounts to at least 1 billion €. The following regional measures can be highlighted (with the figure within the square brackets indicating the number of measures listed in the NIR for each region):

- Baden-Württemberg [15]: Electro-mobility federal state initiatives II and III, with a budget of 50 million € and 83.7 million € respectively;
- Bayern [4]: public transport grants;
- Berlin [6]: taxi programme;
- Brandenburg [10]: public transport grants, including for procurement and for tram and trolleybus infrastructure, with a budget of 65 million €;
- Bremen [3]: public transport electrification;

[4] For the measure denominated "ExcellentBattery", the NIR lists it as a national measure but it indicates that the measure is implemented at regional level.

- Hamburg [10]: public recharging infrastructure deployment and 'ELectrify Buildings for EVs' (ELBE) project, with respectively a budget of 27 million € and 16 million €;
- Hessen [7]: two electro-mobility support programmes, with a combined budget of 24.3 million €, and electric bus procurement with a budget of 15 million €;
- Mecklenburg-Vorpommern [2]: municipal and business climate support guidelines, including for electricity and hydrogen in road transport, with a budget of 47 million €;
- Niedersachsen [11]: 125 million € for local public transport bus procurement, ca. 278.4 million € for electric railway vehicle procurement and 89 million € for fuel cell railway vehicle procurement and the provision of related refuelling infrastructure;
- Nordrhein-Westfalen [15]: two R&D projects covering fuel cell and battery technology and synthetic and biofuels, with a combined budget of 91.1 million €, and funding in the amount of 40 million € for fuel cell vehicle and EV procurement and recharging infrastructure;
- Rheinland-Pfalz [2]: training and information measures;
- Saarland [1]: measure under preparation to convert trains to battery-electric railcars;
- Sachsen [4]: vehicle procurement and retrofitting and grants for alternative fuels infrastructure at inland ports;
- Sachsen-Anhalt [5]: financial support amounting to 35.7 million € for EV procurement and deployment of recharging infrastructure;
- Schleswig-Holstein [4]: R&D projects for sustainable logistics;
- Thüringen [6]: 14 million € for the procurement of public road transport vehicles powered by electricity and the construction of recharging infrastructure.

As in the NPF, the German NIR contains a comprehensive list of measures already existing or adopted. Information on the budget implications is limited and not available on an annual basis. The reported measures tend to target a combination of alternative fuels, or of transport modes or both. For those measures listed as targeting all the alternative fuels, the NIR points out that LPG is generally excluded. Nonetheless, it is possible to identify twelve AF/transport mode clusters for the quantitative assessment: electricity/road, electricity/rail, electricity/water (maritime), electricity/water (inland), electricity/air[5], CNG/road, LNG/road, LNG/water (maritime), LNG/water (inland), hydrogen/road, hydrogen/rail and hydrogen/water (maritime)[6] (see Table Error***! No text of specified style in document.***-*3*).

- Legal measures

The German NIR contains 15 national legal measures, which is almost twice the number of measures identified in the NPF (most of which focused on cooperation with other Member States and consideration of stakeholders' interests). Eight of the measures target electricity, six target a combination of alternative fuels and one hydrogen. All the measures were in place during the implementation period and all the transport modes are covered.

- Legislative & Regulatory

[5] In terms of the quantitative assessment, however, this cluster consists only of manufacturing measures that apply to other transport modes as well.

[6] Though none of the measures in this cluster is exclusively dedicated to the use of hydrogen in maritime vessels.

Of all the national legal measures described in the German NIR, six can be categorised as legislative and regulatory measures (most of them targeting road transport) and include among others:

- Norms & requirements: Charging Point Regulation with a focus on public recharging points; Product Safety Act, transposing technical standards for hydrogen refuelling; amendment to the 10th Federal Emissions Control Regulation, transposing labelling requirements; and Amendment to the Energy Industry Act, which also covers technical standards for shore-side electricity facilities.
- Other: Federal Rail Network Expansion Act, which may include measures for railway electrification.

- Administrative

Of all the national legal measures described in the German NIR, nine can be categorised as administrative measures (sub-type "other"). Of these, four were found in the NPF. Taken together, these measures cover road, rail, waterborne transport (particularly inland) or combinations thereof. Four of these measures target electricity and the rest a combination of alternative fuels.

- Policy measures

The German NIR contains 14 policy measures at national level, a similar number as identified in the NPF. Four measures no longer explicitly found in the NIR are: fast recharging for highway resting areas, tax incentive for company cars that excludes the battery price, minimum tax rate for shore-side electricity and tax exemption for electricity generated on board of vessels and airplanes. All of the measures reported in the NIR were in place during the implementation period. The majority of these measures have a financial nature (though information on the budget is rather limited) and focus on road transport. Half of the measures target a combination of alternative fuels.

- Measures to ensure national targets and objectives

Of all the national policy measures described in the German NIR, eleven can be categorised as measures to ensure national targets and objectives (of which five were found in the NPF). Among these, the following can be highlighted:

- Purchase incentives: environmental premium with a budget of 600 million € for the period 2016-2019 to subsidise EV sales;
- Road toll exemptions: Amendment to the Federal Trunk Road Toll Act to exempt electric, fuel cell and natural gas powered HCVs from the "*LKW-Maut*" (HCV toll) scheme.
- Retrofitting: Subsidies for the use of LNG by retrofitting and equipping new seagoing vessels.
- Preferential lanes/access to restricted areas: Electro-mobility Act establishing preferential treatment for electric vehicles, including fuel cell electric vehicles. At municipal level, the NIR reports that 110 municipalities had lowered parking charges for electric road vehicles by May 2018, 3 municipalities had allowed their partial circulation on bus lanes and 2 municipalities had lifted access restrictions.

- Measures that can promote AFI in public transport services

Of all the national policy measures described in the German NIR, three can be categorised as measures that can promote AFI in public transport services. All of them are new measures targeting electricity. The NIR lists a national measure on electric bus procurement, including public, and recharging infrastructure in the public road transport network, with a budget of 292 million €. In addition, half of the Federal States are listed to provide financial support for public transport vehicle procurement (for some examples, see the list above). The NIR also lists a national measure to support public transport by rail, to which a budget of 500 million € was allocated. At regional level, in addition to the measures listed above for several regions and information on future hydrogen train deployment in Hessen (see Section 5.5.3.2.2), the DE NIR indicates that 55 battery-powered railcars will replace diesel railcars in Schleswig-Holstein.

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

No national measure devoted to this aspect was identified in the DE NIR[7]. However, the NIR mentions in the context of the "standortTOOL" the possibility of funding in the future jointly used private and commercial recharging infrastructure. At regional level, five measures explicitly mention the deployment of private electro-mobility infrastructure in Bremen, Hamburg, Hessen and Nordrhein-Westfalen.

- Deployment and manufacturing support

- AFI deployment

The German NIR reports eight AFI deployment measures, half of which were found in the NPF. They target hydrogen, electricity for road and waterborne transport and combinations of alternative fuels and/or transport modes. All of them were in place during the implementation period. Among the measures for which budget information is provided, the following can be highlighted: 300 million € (2017-2020) to install public recharging infrastructure; 250 million € (2016-2019) to inter alia construct hydrogen refuelling infrastructure and electrolysis units (though it is unclear what fraction of the budget was devoted to AFI deployment only); and 217.5 million € (2015-2019) for investments in alternative fuels infrastructure development.

- Support of manufacturing plants for AF technologies

The German NIR lists five measures to support manufacturing plants for AF technologies, of which one focusing on waterborne transport was found in the NPF. The remaining four deal with electricity for all modes of transport. One of them, with an estimated budget of 1 billion € for the period 2019-2022, targets battery cell production and the rest are part of the "battery research factory" support scheme, which has a total budget of 500 million € for the same period. All the measures were in place during the implementation period.

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

The German NIR indicates the following: "*The initial phase of the market introduction of alternative drivetrain technologies is a special challenge because sufficiently dense supply infrastructure is a necessary condition for alternative fuels to be broadly accepted by the users.*

[7] As a result of applying the assessment methodology (Section 2.2), not the DE NIR's own categorisation indicated above.

The objective of the measures taken by the Federal Government and the federal states is to overcome this barrier while ensuring European interoperability through uniform standards".

- Quantitative assessment of Policy and Deployment & Manufacturing measures

Table Error*! **No text of specified style in document.**-3* presents an analysis of all the national Policy and Deployment & Manufacturing measures, carried out according to the assessment methodology described in Section 2.2. As it can be seen, clusters of measures could be identified in the German NIR on electricity, CNG, LNG and hydrogen for road transport, electricity and hydrogen for rail transport, electricity and LNG for inland waterborne transport, electricity, LNG and hydrogen for maritime waterborne transport and electricity for air transport.

The electricity/road and hydrogen/road clusters are the only ones with a high score; the rest of the clusters involving road and rail receive a medium score; the clusters related to waterborne and air transport have a low score. All the clusters, with the exception of electricity/air and hydrogen/water (maritime), can be considered comprehensive. In terms of expected impact of these measures to support the realisation of the AFV/AFI objectives as presented in the NPF and revised in the NIR, the lack of future targets and estimates does not facilitate the task of putting this assessment into perspective. Based on the impact seen during the implementation period, it can be said that in the future the measures for the pairs electricity/road and hydrogen/road are expected to have a high impact, those for the pairs electricity/rail, CNG/road, LNG/road and hydrogen/rail might have a medium impact while all the other measures should have a low impact. However, a caveat is due: because most of these clusters are the result of adding measures that target a combination of alternative fuels and/or transport modes and information on budget is limited, the possibility cannot be ruled out that budget competition in practice might constrain the overall impact of certain clusters.

Compared to the NPF, the level of ambition of the Policy and Deployment & Manufacturing support measures has increased for all the identified clusters.

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

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

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

- Research, Technological Development & Demonstration

The German NIR contains 67 RTD&D projects, which represents a significant increase compared to the 17 RTD&D projects identified in the NPF. Of those, 33 are national RTD&D projects and 34 regional ones. All the national RTD&D projects were in place during the implementation period, with 15% of them having expired by 2019. Over half of the national RTD&D projects described in the NIR are applicable to more than one transport mode. Almost 40% of the national RTD&D projects refer to road transport only, with the vast majority of these targeting electricity. The NIR also lists national projects dedicated to waterborne and air transport, targeting a combination of fuels. RTD&D projects are also reported for biofuels and synthetic and paraffinic fuels, including synthetic kerosene.

Among the list of national RTD&D projects, the National Hydrogen and Fuel Cell Technology Innovation Programme (NIP; phases I and II), with a budget of over 1 billion €, and funding for R&D in the field of electro-mobility, with a budget of up to 380.5 million € (2017-2020), can be singled out. For the "battery research factory", see Section 5.5.4.3.2.

The NIR acknowledges that annual budget values could not be reported on the ground that some projects go beyond alternative fuels, so total budget figures are provided in their stead, though not for all the projects listed (in fact, budget information is not available for 27% of the reported national RTD&D projects). For projects where budget is reported, the total estimated budget amounts to 2.8 billion € for the period 2006-2023 (for those projects that started in 2017 or later, the estimated value is 1 billion €). Information on the type of funding and, for some projects, the length of the project, is not provided.

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

Information is not available in the DE NIR.

- ***Summary of the assessment***

Tabular overview

*Table **Error! No text of specified style in document.**-4 Overview of the NIR assessment*

		Indicators	Alternative fuel / transport mode					
			Electricity / road	CNG / road	LNG / road	LNG / water (maritime)	LNG / water (inland)	H2 / road
AF Vehicles / Vessels		Past situation (2016)	58,477	69,266	0	2	0	222
		Situation (2018)	164,566	78,251	7	2	0	378
		Estimate (2030)	8,500,000*	NA	NA	NA	NA	NA
		Future share (2030) [%]	17.17%					
		Estimate attainment (2018 vs 2030) [%]	1.94%					
		Progress (2018)	adequate					
Publicly accessible AF Infrastructure		Past situation (2016)	6,300	911	1	0**	0**	23
		Situation (2018)	17,245	862	4	0**	0**	66
		Target (2030)	1,000,000	NA	NA	NA	NA	NA
		Target attainment (2018 vs 2030) [%]	1.72%					
		Progress (2018)	adequate					
Sufficiency Index		2016	9.28	76.03				9.65
		2018	9.54	90.78	1.75			5.73
		2020	23.26					
		2025						
		2030	8.50					
Measures	Legal measures	Ambition (NIR vs NPF)	+	+	+	=	+	+
	Policy measures + Deployment & manufacturing	Score	H	M	M	L	L	H
		Comprehensiveness	C	C	C	C	C	C
		Impact	H	M	M	L	L	H
		Ambition (NIR vs NPF)	+	+	+	+	+	+
	RTD&D	Ambition (NIR vs NPF)	+	X	X	=	X	+

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

*The NIR expects that between 7 and 10 million electric passenger cars will be in use by 2030 (see Section 5.5.3.1.1 for information on other vehicle types). **The values refer to stationary shore-to-ship facilities (i.e. bunkering stations) (see Section 5.5.3.3.2).

After the adoption of the "*Klimaschutzgesetz*" (Climate Change Act), the German government is committed to reducing 95 million tonnes of CO_2 transport emissions by 2030 and achieving GHG neutrality by 2050. The government of Germany stresses that it is pursuing a technology-neutral approach for the uptake of alternative fuel technology, while it considers that the most energy-efficient and climate-friendly option should prevail. Furthermore, the German government has introduced the following initiatives in recent years: "*Klimaschutzprogramm 2030*" (2030 Climate Change Programme), "*Mobilitäts- und Kraftstoffstrategie* (MKS)" (Mobility and Fuels Strategy), "*Marktanreizpaket Elektromobilität*" (Market Incentive Programme for Electric Mobility), "*Sofortprogramm Saubere Luft 2017-2020*" (2017-2020 Immediate Action Programme for Clean Air) and the research agenda "Sustainable urban mobility".

Compared to the German NPF that fulfilled many but not all of the requirements of Article 3 of the Directive, the NIR fully addresses the requirements of Annex I of the Directive. However, it cannot be stated that the German NIR covers the whole AFID period (2016-2030), for it lacks infrastructure targets and vehicle estimates for several alternative fuels.

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

Road transport

- **Electricity** – In 2018, Germany recorded 164,268 light-duty EVs, 298 heavy-duty vehicles and 17,245 publicly accessible recharging points. With reference to the objectives of the DE NPF as updated by the NIR, Germany is progressing adequately in both vehicles and infrastructure uptake. The NIR expects one million publicly accessible recharging points to provide electricity to 8.5 million EVs in 2030. The NIR does not provide recharging points targets / EV estimates for 2025.
- **CNG** – In 2018, Germany recorded 78,251 CNG vehicles, the majority of which were passenger cars, and 862 publicly accessible CNG refuelling points. Both the NPF and NIR lacked future targets for publicly accessible CNG refuelling points and CNG vehicle estimates. Due to this, the progress could not be computed. Notwithstanding, the DE NIR expects CNG technology to play an important role for HCVs.
- **LNG** – In 2018, Germany recorded seven LNG vehicles and four publicly accessible LNG refuelling points. Both the NPF and NIR lacked future LNG vehicle estimates. Nonetheless, the NIR expects LNG technology to play a more prominent role for HCVs. In line with the NPF, the NIR expects that a minimum of 9 LNG refuelling points will be available for HCVs by 2025.
- **Hydrogen** – In 2018, Germany recorded 378 fuel cell vehicles, of which 11 were buses and the rest passenger cars, and 66 publicly accessible hydrogen refuelling points. Both the NPF and NIR lacked future hydrogen vehicle estimates, but in terms of infrastructure the DE NIR expects that 400 publicly accessible hydrogen refuelling points will be in operation in 2025.
- **Biofuels** – There was no information on road vehicles powered by biofuels and related infrastructure in the NIR.
- **LPG** – In 2018, Germany recorded 213,718 LPG vehicles, most of which were passenger cars, and 7,128 publicly accessible LPG refuelling points. Apart from this, LPG plays a minor role in the NIR.
- **Synthetic and paraffinic** –The NIR mentions a project with two methanol-powered passenger cars.

Rail transport

- **Electricity** – In 2018, Germany recorded 6,173 electric railway locomotives. The NIR expects the deployment of alternative fuels in Germany on the non-electrified railways, or further network electrification.
- **Hydrogen** – In 2018, Germany recorded two fuel cell locomotives powered by hydrogen and one point to refuel them. The NIR expects a stock of at least 40 hydrogen trains in two Federal States in 2022.

Waterborne transport (maritime)

- **Electricity** – The NIR indicates that there were three maritime ports providing shore-side electricity supply but no German maritime vessels powered by electricity in 2018. Both the NPF and NIR lacked future targets for shore-side electricity supply in maritime ports and electric maritime vessel estimates.
- **LNG** – The NIR indicates that there were two LNG maritime vessels in operation in 2018. In the same year, LNG supply was not available in stationary bunkering stations at

maritime ports but "truck-to-ship" supply was. Both the NPF and NIR lacked future targets for publicly accessible LNG refuelling points in maritime ports and estimates of maritime vessels powered by LNG. However, the NIR expects "ship-to-ship" LNG supply to become available and new LNG maritime vessels to be deployed.

Waterborne transport (inland)

- **Electricity** – In 2018, Germany recorded 14 electric inland vessels and a total of 407 facilities supplying electricity in inland ports and along waterways. Both the NPF and NIR lacked future targets for shore-side electricity supply in inland ports and electric inland vessel estimates.
- **LNG** – In 2018, there was no use of LNG in Germany's inland waterborne transport system (i.e. no LNG supply in inland ports and no stock of LNG inland vessels). Both the NPF and NIR lacked future targets for LNG supply in inland ports and LNG inland vessel estimates. Notwithstanding, the NIR expects 14 LNG stations to become available in the future, seemingly along the German Rhine.
- **Synthetic and paraffinic** – The NIR mentions one methanol-powered passenger vessel in operation.

Air transport

- **Biofuels** – The NIR sees no need to nurture this market on the grounds that blend limits currently exist.
- **Synthetic and paraffinic** – The NIR indicates that R&D projects are targeting synthetic kerosene production and use for aviation.

As for the **measures**, the German NIR reports a long list of 75 national measures and 105 regional measures. Only two of them cover LPG. For the rest of the alternative fuels, the set of measures reported by the German government is wide-ranging, as the emergence of twelve clusters shows. Given the emphasis on electrification, the bundle of measures focusing on battery research and production can be highlighted. Considering all the legal measures, they appear, if fully implemented, to be fit to support the realisation of the AFV/AFI objectives as described in the NPF and revised in the NIR. Compared to the NPF, the level of ambition of the legal measures has increased in the NIR, except of the cluster LNG/water (maritime). No legal measures were identified for the clusters hydrogen/rail and hydrogen/water (maritime). With reference to the Policy and Deployment & Manufacturing measures, the level of ambition has increased for all the clusters, with the ones on road for electricity and hydrogen receiving the highest score. In terms of expected impact of these measures to support the realisation of the AFV/AFI objectives as presented in the NPF and revised in the NIR, the lack of future targets and estimates does not facilitate the task of putting this assessment into perspective. Based on the impact seen during the implementation period, it can be said that in the future the measures for the pairs electricity/road and hydrogen/road are expected to have a high impact, those for the pairs electricity/rail, CNG/road, LNG/road and hydrogen/rail a medium impact while all the other measures are expected to have a low impact. As for RTD&D measures, on the basis of the available information and in comparison to the NPF, the level of ambition for RTD&D projects in the NIR can be considered to have increased for the five clusters targeting electricity and the three clusters focusing on hydrogen, while it has remained similar for the pair LNG/water (maritime). No RTD&D projects were identified for the clusters CNG/road, LNG/road and LNG/water (inland).

- ***Final remarks***

The German NIR provides a comprehensive report on the efforts to implement the Directive. The NIR is largely in line with the provisions of Annex I to the Directive, with the main exception that it does not include estimates for future market uptake of natural gas vehicles and vessels and related targets for natural gas infrastructures, except for LNG vehicle refuelling points in 2025. A significant number of measures are being implemented to promote a wide range of alternative fuels, with a strong focus on electro-mobility and hydrogen for the different transport modes. A significant budget is devoted to research and innovation projects focusing mainly on the development of batteries and fuel cell technologies. Research and demonstrations projects targeting synthetic kerosene production for use in aviation are funded too.

With regard to electricity, the NIR estimates that approximately 8,500,000 vehicles could be on the roads by 2030, representing about 17% of the fleet by that time. One million charging points should serve that fleet in the same year. Taking into account the current situation and expected trend development, this level of ambition appears to be broadly consistent with the pace of deployment of electric vehicles considered necessary for a full transition to carbon neutrality by 2050. The number of shore-side electricity supply facilities for inland vessels amounted to 407 in 2018. However, only 3 out of 6 maritime ports of the TEN-T Core Network in Germany are equipped with such facilities. Germany should provide information on its plans to supply shore-side electricity supply in the remaining three maritime ports of the TEN-T Core Network. Fourteen electric inland waterways vessels are already in use in Germany. Moreover, almost all of the 270 airport terminals are equipped with stationary ground power connections. Around 60% of Germany's rail network is electrified. Information on charging efficiency is provided.

Regarding hydrogen for transport, the NIR presents the ambitious target of 400 hydrogen refuelling stations in place by 2025, but it does not provide estimates for FCHVs. The number of refuelling stations seems sufficient taking into account the length of Germany's TEN-T Core network, provided that the refuelling points are widely distributed along the network. Further, the NIR foresees the use of hydrogen in rail transport as well in aviation in the longer term.

In terms of natural gas for transport, Germany has the second largest network of CNG refuelling stations in the EU. It seems sufficient for serving a larger fleet of CNG vehicles compared to the current one. Germany does not provide any estimates for the future growth of such vehicles. The NIR does not provide estimates for LNG vehicles either. The NIR foresees at least nine LNG refuelling points by 2025 in the TEN-T Core Network. This number seems rather low compared to the overall extensiveness of the German TEN-T Core Network. Although the NIR reports that two LNG maritime vessels were in use in 2018, it does not provide any target for LNG refuelling points in maritime and inland ports. Germany should provide further detail in future reporting.

In 2018, there were 213,718 LPG vehicles (less than those registered in 2016) and 7,128 refuelling points registered. The NIR does not provide information on the estimated future number of LPG vehicles and refuelling points.

With regards to renewable fuels, Germany should provide more information in future reporting on efforts to promote the use of renewable fuels in transport, and particularly in aviation.

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

On a surface area of 357,100 km², Germany has a population of 82.792 million people in 2018, which makes up for a population density of 232 inhabitants/km².

Number of main urban agglomerations

- 126 urban agglomerations > 50,000 inhabitants

In 2018, Germany achieves a per capita gross domestic product at market prices of €40,340, which represents a per capita gross domestic product in purchasing power standards of 122 if expressed in relation to the EU-28 average set to equal 100.

Length of the road networks

The length of the road TEN-T Core Network in Germany is 6,363 km. The total road network length is 230,035 km, of which 13,141 km are motorways.

The following lengths of the TEN-T Road Corridors are present in Germany: 35% (1,393 km) of the North Sea - Baltic Corridor, 26% (1,398 km) of the Orient / East - Mediterranean Corridor, 30% (1,895 km) of the Scandinavian - Mediterranean Corridor, 50% (707 km) of Rhine - Alpine Corridor and 27% (1,191 km) of the Rhine - Danube Corridor.

Through the TEN-T Road Corridors, Germany is connected with the following Member States:
- Poland (through the North Sea - Baltic Corridor)
- the Netherlands (through the North Sea - Baltic and the Rhine - Alpine Corridor)
- Belgium (through the North Sea - Baltic and the Rhine - Alpine Corridor)
- Czechia (through the Orient/ East Mediterranean and the Rhine - Danube Corridor)
- Austria (through the Scandinavian - Mediterranean and the Rhine - Danube Corridor)
- Denmark (through the Scandinavian - Mediterranean Corridor)
- France (through the Rhine - Danube Corridor)

Number of registered road vehicles

At the end of 2018, Germany accounts for 54,915,724 registered road vehicles of which 47,095,784 are categorized as passenger cars, 2,616,118 as light goods vehicles, 750,303 as heavy goods vehicles and 80,519 as buses and coaches. The motorisation rate is 569 passenger cars per 1,000 inhabitants.

Number of ports in the TEN-T Core Network

- 6 maritime ports in the TEN-T Core Network (Bremen, Bremerhaven, Hamburg, Lübeck, Rostock, Wilhelmshaven)
- 15 maritime ports in the TEN-T Comprehensive Network
- 21 inland ports in the TEN-T Core Network (Berlin, Braunschweig, Bremen, Bremerhaven, Dortmund, Duisburg, Düsseldorf- Neuss, Frankfurt am Main, Hamburg,

Hamm, Hannover, Karlsruhe, Koblenz, Köln, Lübeck, Magdeburg, Mainz, Mannheim-Ludwigshafen, Nürnberg, Regensburg, Stuttgart)
- 68 inland ports in the TEN-T Comprehensive Network

Through the 4,248 km inland waterways TEN-T Core Network, Germany is connected with the Netherlands through the North Sea - Baltic and Rhine - Alpine Corridors, with Austria through the Rhine - Danube Corridor, with France through the Rhine-Alpine and the North Sea - Mediterranean Corridor, with Czechia through the Orient/East-Mediterranean Corridor, with Luxembourg through the Rhine-Alpine Corridor and with Poland through the core network.

Number of airports in the TEN-T Core Network

- 11 airports in the TEN-T Core Network (Berlin-Brandenburg Intl., Bremen, Düsseldorf, Frankfurt am Main, Hamburg, Hannover, Köln-Bonn, Leipzig-Halle, München, Nürnberg, Stuttgart)
- 13 airports in the TEN-T Comprehensive Network