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Commission



CEF support to

Rhine - Alpine Corridor

*Innovation
and Networks
Executive Agency*

Rhine-Alpine

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1. Introduction

This report aims at presenting the contribution of the Connecting Europe Facility (CEF) Transport Programme to the development of the Rhine-Alpine Core Network Corridor in line with the latest Work Plan of its European Coordinator Paweł Wojciechowski. More specifically, it describes the contribution to the implementation of the Work Plan of CEF funded Actions selected under the INEA Calls for Proposals carried out as from 2014 to 2017.

The Rhine-Alpine Corridor is situated in the so-called "Blue banana", i.e. the region which counts as the most densely populated and economically strongest in Europe. This region includes major EU economic centres such as Brussels and Antwerp in Belgium, the Randstad region in the Netherlands, the German Rhine-Ruhr and Rhine-Neckar regions, the Basel and Zürich regions in Switzerland and the Milan and Genova regions in Northern Italy. Annually more than one billion tonnes of freight are transported along the Corridor. This represents 19% of EU's total GDP (based on 2010 figures).

This multimodal Corridor constitutes one of the busiest freight routes in Europe, connecting the main North Sea ports of Rotterdam and Antwerp to the Mediterranean basin in Genoa, while providing connections to several east-west axes. It runs through five EU Member States (BE, NL, DE, FR, IT)¹ and Switzerland. Eleven sections and nodes of the Corridor overlap with five other corridors, more specifically with the North Sea-Baltic (7 sections), North Sea-Mediterranean (4), Rhine-Danube (1), Atlantic (1) and Mediterranean (1) Corridors.

In the Work Plan the Coordinator identifies the Rhine-Alpine Corridor as a particularly complex and mature corridor, making it a "front runner" for other corridors. It encompasses all modes of transport over a total length of about 6,200 km. With about 3,000 km rail is the backbone of the Corridor. Road accounts for about 1,500 km. Inland Waterways (IWW) accounts for about 1,700 km², including the Rhine River as an important route. The Corridor includes 8 seaports and 22 inland ports, 13 airports, 72 core intermodal terminals and 13 core urban nodes.

However, for the full compliance with the TEN-T standards and to allow for a seamless connectivity throughout Europe until 2030 the Work Plan identifies the some critical issues which have to be addressed, such as rail capacity bottlenecks, road congestion, noise and pollution in urban areas, incomplete ERTMS deployment, reliable and efficient navigability on the Rhine River, upgrades of lock capacity, cross border operations and vast maintenance issues of existing infrastructure.

¹ Luxemburg's inland port of Melttert has been included in the Corridor.

² In agreement with the Member States, the French inland ports on the Rhine have been integrated in the IWW network, while IWWs in Belgium are not included.

2. Action portfolio: State of play³

CEF Transport has so far funded grants worth €22.3 billion with a total investment in the European economy of €46 billion. The current portfolio of Actions in the Rhine-Alpine Corridor comprises 62 grant agreements⁴ allocating €702.1 million of actual CEF Transport Funding (corresponding to 10% of total number of CEF Transport Actions and 3% of total actual CEF Transport funding). So far, only one of these grant agreements has been closed and the final payment made.

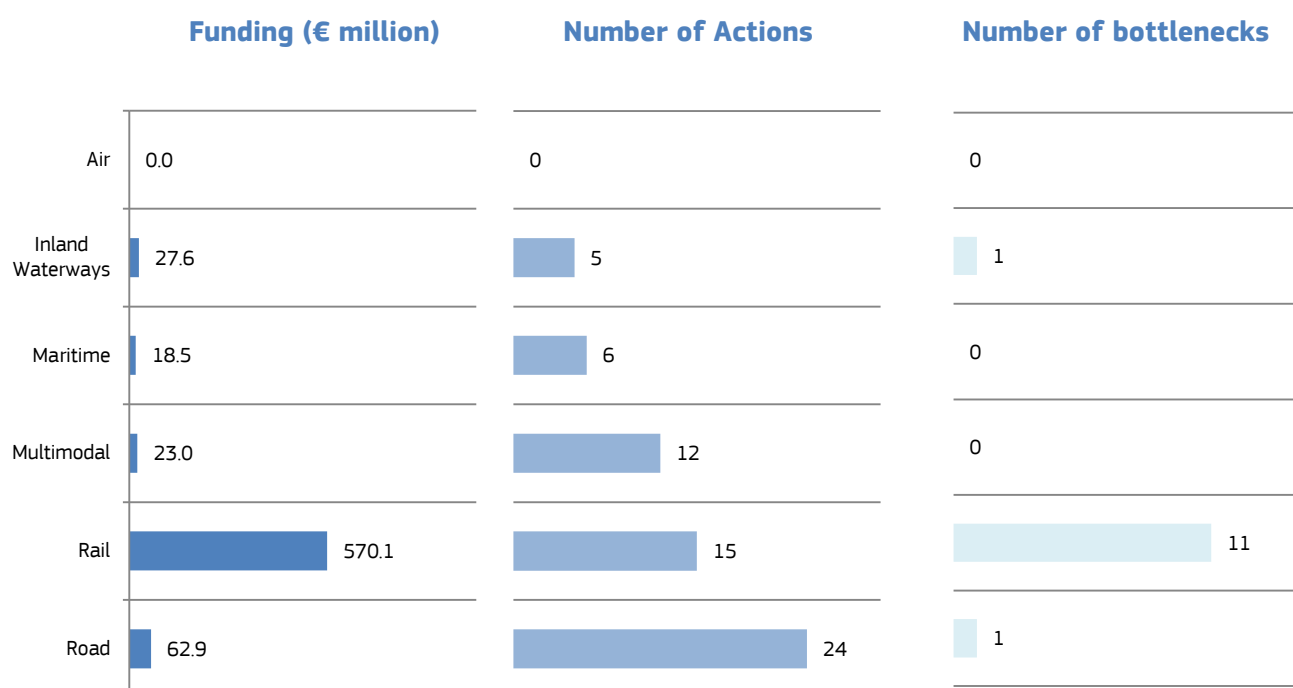
2.1. Operational Implementation

For the Rhine-Alpine Corridor, the ‘Core Network Corridor’ priority (under Funding Objective 1) represents 70% of actual CEF Transport funding. Other priorities, such as Innovation under Funding Objective 2 and ERTMS under Funding Objective 1, also significantly contribute to the development of the Corridor.

Due to its location, all of the funding for the Rhine-Alpine portfolio is from the General envelope. Around 90% of the grants allocated to this Corridor are implemented by national Actions (i.e. one or more beneficiaries of the same Member State). These Actions, however, obviously have a positive impact on all Member States along the Corridor.⁵

62% of the actual CEF funding is linked with mixed Actions. The highest number of Actions are to be found under the road transport mode (24) (mainly Actions in the area of Innovation and Intelligent Transport Systems), while rail Actions receive most of the actual funding (81%). Actions in this Corridor will address 13 bottlenecks, regarding mainly cross-border rail sections.

Figure 1: Statistics by transport mode



³ As of February 2018.

⁴ Of which 57 have been signed following the 2014-2016 Calls, and 5 are under preparation following the 2017 Blending-1 Call.

⁵ See for example the rail Action Karlsruhe-Basel

2.1.1. Inland Waterways

In total the inland waterways portfolio in the Rhine-Alpine Corridor is composed of 5 Actions, receiving €27.6 million in CEF Transport funding. Actions belonging to this transport mode will address 1 bottleneck at the most Northern point of the Corridor in Amsterdam.

The CEF funded Actions in this IWW portfolio contribute to the following issues and objectives mentioned in the Work Plan:

- increase of lock capacity and improvement of maritime access to the Corridor via the port area of Amsterdam;
- a more efficient use of the available capacity of the Rhine River;
- improvement of reliability of navigation along the Rhine River.

The Action in this portfolio receiving the largest amount of CEF funding with €11.1 million concerns the Amsterdam Sea Lock's preparatory works and project management overseeing the actual construction works. The Action shows good progress as the preparatory works (including the permitting, necessary demolition works and relocations of civil engineering structures) are already completed and the subsequent construction works (not part of the Action) are ongoing as planned. This new large and tide-independent **maritime lock** will solve the current bottleneck of the lock complex in Amsterdam and accommodate throughput growth from the current limit of 95 million tons to 125 million tons per year.

Belgium, the Netherlands, Luxemburg, France and Germany are participating in a twinned works Action concerning the River Information System Corridor Management Execution project (RIS COMEX). In this multinational initiative 13 partner countries are joining forces to improve cross-border cooperation with a view to achieving more harmonised **river information services** for several inland waterway corridors. These Actions will significantly contribute to increasing the efficiency of inland water transport, including transport on the Rhine River. This twinned Action under the General Call is receiving €9.9 million CEF funding.

Another study Action aimed at increasing the **efficiency of navigation** on the Upper Rhine (i.e. the section Ludwigshafen/Mannheim-Strasbourg-Basel) will develop an ICT traffic management platform which will integrate various stakeholders that are involved in the logistic processes, like terminal operators, barge operators, port authorities, customs, freight forwarders, trucking companies, marine ports, etc. After implementing the platform at 3 inland ports operating 7 terminals, the platform will be rolled-out to 6 other inland ports along the Upper Rhine (€1 million CEF funding).

The only Action in the portfolio that has been finalised carried out restoration and reinforcement works of the waterfront walls in the inland port of Köln in order to cope with today's larger and more powerful ships (€2 million CEF funding).

One innovative study Action is contributing to the (future) implementation of sustainability measures, as they are carrying out a study with the objective of standardising the most common components and configurations (tank, tank connection space, engines/engine rooms) resulting in an absolute reduction of the investment costs for the deployment and use of LNG for inland water transport (€3.6 million CEF funding). Pilots including 6 vessels and 4 bunkering stations are carried out to fine-tune an innovative business case which should unlock the roll-out to the potential market of 300 vessels.

The map below indicates the location of the Works Actions under the Inland Waterways and Maritime portfolios (excluding RIS and MoS Actions).



2.1.2. Maritime

In total the maritime portfolio in the Rhine-Alpine Corridor is composed of 6 Actions, receiving €18.5 million in CEF Transport funding.

There are 8 core maritime ports along the Rhine-Alpine Corridor, namely the ports of Amsterdam, Rotterdam, Moerdijk and Vlissingen in the Netherlands, the ports of Antwerp, Ghent and Zeebrugge in Belgium and the port of Genoa in Italy. Besides the port of Genoa, which is the only maritime port situated at the Mediterranean Sea in the Southern part of the Corridor, all other 7 maritime ports are accessed via the North Sea in the Northern part of the Corridor.

The maritime ports infrastructure complies with almost all technical criteria. Nevertheless, the CEF funded Actions in this maritime portfolio contribute to the following future development priorities mentioned in the Work Plan (derived from the Motorways of the Sea (MoS) Detailed Implementation Plan):

- ‘greening’ of the maritime transport by promoting the use of alternative fuels (LNG) or the upgrade/introduction of more environmental friendly vessels;
- integration of maritime transport in the logistic chain;
- safety and traffic management and human element.

The majority of CEF funding (€12 million) in this portfolio is allocated to 4 MoS Actions. The Port of Rotterdam is involved in 3 works/mixed Actions – of which 2 are already finalised – aimed at **improving the environmental performance of maritime transport** on connections towards the UK (Harwich, Teesport), Germany (Lübeck) and Finland (Helsinki). Combined, these 3 Actions receive €8 million CEF funding and will contribute to:

- the deployment and use of alternative fuels (LNG) through equipping vessels with LNG engines, and providing a LNG bunkering vessel and LNG related port infrastructure;
- the reduction of air pollution by limiting sulphur emissions in the Sulphur Emission Control Area (SECA) through the use of LNG and closed loop scrubbers;
- the improvement of efficiency of ports operations by piloting/upgrading an IT terminal management system (container tracking).

The 4th MoS Action studies a safe, sustainable and efficient fresh food transport system (cold logistics chain) using maritime connections between non-EU Mediterranean (Israel) and EU ports in Slovenia, Italy and France, and further rail connections towards Northern and Western Europe, including the Member States of the Rhine-Alpine Corridor (€4 million CEF funding).

The remaining budget in this portfolio (€6.5 million CEF funding) is awarded to 2 Actions aimed at improving the environmental performance of the port of Genoa. Being located very close to urban areas, the port of Genoa addresses waste management efficiency as well as the reduction of air pollutants and noise by constructing a new facility for port oil and waste reception, treatment and disposal, which will include a shore-side electricity component. Genoa’s port is also part of the Thyrrenian-Ligurian LNG grid being defined, prototyped and tested in order to contribute to the deployment of LNG as an alternative fuel for both maritime and road transport.

The Work Plan also mentions the importance of **establishing efficient connections from the seaports to the existing rail and IWW network** as being essential for the further development of the Corridor. Even though none of the Actions in this maritime portfolio focuses on this priority,

1 Action under the multimodal portfolio is improving the logistics platform of the port of Zeebrugge to accommodate 740 meter long freight trains. Another Action under the rail portfolio is removing a bottleneck at the Caland-bridge in the Port of Rotterdam, increasing the efficiency of the rail connection of the port of Rotterdam towards its hinterland along the Betuwe Route.

2.1.3. Multimodal

In total the multimodal portfolio in the Rhine-Alpine Corridor is composed of 12 Actions, receiving €23 million in CEF Transport funding. Actions in this portfolio focus on multimodal terminals, nodes of the core network, freight transport services and innovative actions.

The Work Plan mentions that the greatest challenges for the present **multimodal terminals** are:

- their access link with the rail network (often organised via a single and/or non-electrified line);
- upgrade of terminal capacity in order to cope with future increasing traffic volumes, including the capacity to handle 740 m train length.

There are 3 works Actions in this portfolio that will improve the capacity and accessibility of 3 different multimodal logistical platforms to the railway network: the maritime port of Zeebrugge, the inland port of Strasbourg and the rail-road terminal of Genoa. Together, these 3 Actions receive €5.4 million CEF funding.

New multimodal terminals are being constructed in Strasbourg/Lauterbourg (already finalized) and in Zeebrugge, where the Action contains the construction of 4 long tracks of minimum 740 m length. Last-mile connections and interconnection with short sea shipment services are being improved in the port of Vado Ligure (Genoa).

Urban nodes are also part of the multimodal portfolio as the TEN-T Regulation 1315/2013 specifies urban nodes as starting points (first mile), final destination (last mile) and/or points of transfer within or between different transport modes for freight and passengers on the TEN-T network. The Work Plan indicates that a seamless connection between the long-distance infrastructure and regional/local traffic and urban freight delivery on the last-mile should be achieved.

Within the Corridor, 2 study Actions (totalling €8.5 million CEF funding) focus on passenger transport in compliance with these priorities. The study Action receiving the largest amount of CEF funding (€7.7 million) in this portfolio aims at preparing all required planning documents and carrying out the public consultation process for the creation of a direct rail link connecting the area West of Frankfurt (Germany) with the airport and the city in general, enhancing the intermodality of the airport.

The second study on urban node accessibility aims at optimising access and travel times within and between nodes across the Corridor by considering infrastructure and operational aspects such as station configuration, way finding, integrated ticketing and amenities for transferring passengers.

The Work Plan specifies real-time information in the transport chain and communication to the users at the stations as part of the Corridor's **technical infrastructure** parameters to be complied with. These are crucial to ensure efficient and reliable transport chains for intermodal services throughout Europe.

In this respect, 3 Actions related to freight transport services are receiving a total of €1.5 million CEF funding. The study Action most relevant for the Rhine-Alpine Corridor (€1.4 million CEF funding) will implement a demonstration in the Corridor of a real-time Tracking Information and Estimated Time of Arrival (ETA) sharing software in a series of existing rail freight services run by intermodal operators, i.e. railway infrastructure managers, railway undertakings, intermodal operators, terminals and end-users (shippers).

The 2 remaining Actions – already finalized - with only minimal impact on the Rhine-Alpine Corridor (€0.1 million CEF funding) have invested in track and trace IT technology with GPS telematics for real-time monitoring of freight flows.

The Work Plan indicates that the dissemination of **clean fuel alternatives** has to be regarded as a critical issue along the Corridor and recommends that sustainability measures, such as the deployment of LNG, should be encouraged through regulatory coordination at all levels.

CEF funding of €7.2 million supports 3 Innovation study Actions aimed at the deployment of LNG as fuel for inland navigation in Germany, alternative fuels infrastructure (power chargers, L-CNG and hydrogen stations, shore power boxes) on cross-border sections of Belgium and the Netherlands through a co-funding framework/grant scheme for road and IWW transport, and L-CNG and Bio-LNG infrastructure for road transport in Italy.

One multimodal works Action selected in the 2017 Blending-1 Call will further contribute to the roll-out of LNG infrastructure for inland navigation and heavy road traffic in the German part of the Corridor (€0.3 million CEF funding).

The map below indicates the location of the Works Actions under the Multimodal and Rail portfolios (excluding ERTMS Actions and Actions under horizontal priorities such as Freight Transport Services and Innovation).



2.1.4. Rail

In total the rail portfolio in the Rhine-Alpine Corridor is composed of 15 Actions, receiving €570.1 million in CEF Transport funding. Representing 81% of the total CEF funding awarded to all Actions in the Corridor, this is by far the most supported transport mode.

Actions belonging to this transport mode will address 11 bottlenecks. The focus lies on the removal of bottlenecks in 4 different cross-border sections and 1 access point of the Corridor (i.e. the Port of Rotterdam), and on implementing ERTMS. All Actions are aimed at increasing capacity, efficiency, safety and/or interoperability of the rail network. The objective is to cope with existing congestion and to address expected future increase of rail traffic.

In this respect, the CEF funded works Actions in this rail portfolio are contributing to removing several of the most important **capacity bottlenecks** identified as such in the Work Plan, and recommended by the European Coordinator as sections that deserve particular attention.

One single works Action is receiving 48% of all CEF funding awarded to all Actions in the Rhine-Alpine Corridor, i.e. the upgrade and new-build rail line between Karlsruhe and Basel (€338.5 million CEF funding). Located at the central part of the Corridor, this cross-border section also known as the 'Rheintalbahn' will see its number of tracks doubled to 4 tracks. The 2 new tracks will run parallel to the existing 2 tracks and will be designed for high speed traffic (250 km/h), leading to a travel time reduction of 31 minutes for high speed passenger trains.

Another 3 works Actions in the Netherlands, Germany and Italy are receiving a total CEF funding of €133.5 million, i.e. 19% of all CEF funding awarded to all Actions in the Corridor:

- In the Netherlands the rail connection of the Port of Rotterdam with its European hinterland along the Corridor is being improved by rerouting rail freight transport via an alternative route of 4.5 km double track in order to be able to cope with the increased capacity of the port after the seaport terminals at Maasvlakte 2 became operational (€59.9 million CEF funding).
- In Italy the capacity and efficiency of the cross-border rail connection between Milan and Chiasso (Switzerland) is being improved with new signalling/distancing systems and prepared for the implementation of ERTMS (€40.9 million CEF funding).
- In Germany a mix of works and studies will increase the capacity and efficiency of the cross-border line NL/DE border – Emmerich – Oberhausen (€32.7 million CEF funding). While the works will tackle capacity at the Emmerich station and install ERTMS Level 2 equipment at the cross-border section, the studies will prepare the upgrade of this line from 2 to 3 tracks, the installation of ERTMS on the whole line and the removal of level crossings along the route.

The aforementioned efforts in preparing **ERTMS implementation** contribute to another important objective mentioned in the Work Plan: currently only 12% of the Corridor's rail network is equipped with ERTMS infrastructure. Especially Germany and Italy are identified as critical bottlenecks in the Corridor-wide ERTMS rollout, both with 0% implementation. Also Belgium currently has only 18% ERTMS implementation.

A significant cluster of Actions are aimed at improving the efficiency and interoperability of the railway system along the Corridor. One Action is supporting the Rhine-Alpine Rail Freight Corridor (RFC) in facilitating the efficient functioning and sustainable development of the RFC (€2.9 million CEF funding). Additionally, 5 Actions in Germany, Italy and Belgium receiving a total

CEF funding of €89.5 million are implementing trackside deployment of ERTMS over a length of 850 km railway tracks. This represents 26.4% of the Corridor's total railway network (3,225 km).

The most important CEF funded ERTMS works Actions are located in Germany and Italy:

- The largest Action (€53.7 million CEF funding) covers the preparatory phase and trackside deployment on about half of the German part of the Corridor of ERTMS Level 1 and 2, including GSM-R and interlocking adaptations. The second German Action (€13.5 million CEF funding) covers the trackside deployment of ERTMS Level 2 Baseline 3 on 2 cross-border sections with the Netherlands and Belgium and 1 gap along the Corridor.
- In Italy 2 Actions (together €20 million CEF funding) cover the trackside deployment of ERTMS Level 2 Baseline 3 on the majority of the Italian part of the Corridor. The Actions concern both cross-border sections from Milan to Switzerland and the section between Milan and Tortona.
- The Action in Belgium (€2.4 million CEF funding) concerns the deployment of ERTMS Level 1 Baseline 2 on 30 km of the section Ans – Angleur.

Additionally, 3 study Actions complement the rail portfolio:

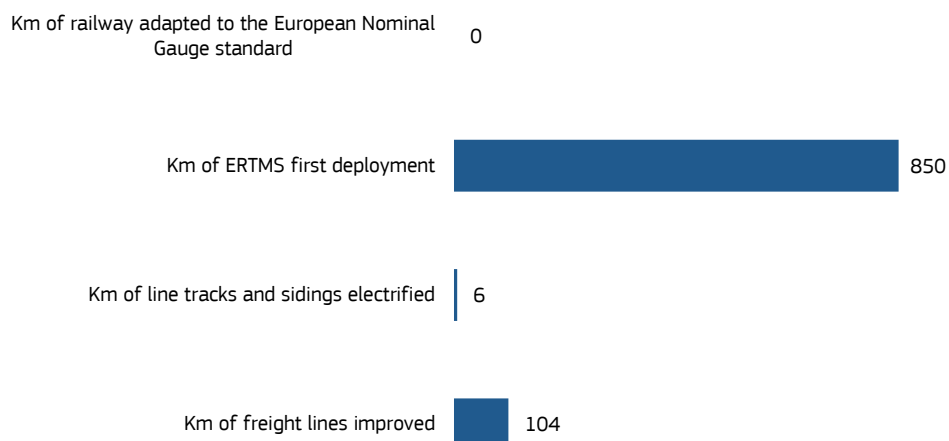
- In Italy a missing rail link is being designed between Malpensa airport and the Simplon line towards the north of the airport (€2.1 million CEF funding).
- Partners from the Netherlands, Germany and Italy are aiming to launch an innovative European Rail Freight Line System (ERFLS) which will connect the different regions along the whole Corridor with regular rail freight line services in combined traffic through a system of 'smart hubs' (€0.6 million CEF funding).
- The Dutch province of Limburg is developing a plan and tender documents (ready for construction) for infrastructure improvements on 3 cross-border Intercity rail connections towards Germany (Aachen and Düsseldorf) and Belgium (Liège). While most of the foreseen measures are part of the comprehensive network, a part in Germany (near Aachen) is located on the Corridor. Additionally, an ICT application is being developed for a joint ticketing system valid for all 3 cross-border connections (€0.7 million CEF funding).

This last study mentioned above has already produced a follow-up works Action: the Dutch province of Limburg and German partners are executing a set of infrastructural measures on the comprehensive network section between Heerlen (NL) and Aachen (DE) – representing a total investment cost of €71.7 million – in order to create an improved, reliable and direct cross-border connection. These measures include electrification of about 6.3 km and construction of an electrified double track along 3.3 km of the Dutch part of this comprehensive network cross-border connection. Despite that only some signalling works in Aachen station are located on the Corridor (€0.6 million CEF funding), this Action is worth mentioning because of its importance in providing a reliable alternative route for freight traffic between the port of Rotterdam and the German Ruhr area, which is necessary due to the ongoing and planned works on the German part of the Betuwe line between Zevenaar (NL) and Oberhausen (DE). This **important rail bypass** is mentioned in the Work Plan by the European Coordinator as a necessity, in particular during the works on the ongoing and future works on the Betuwe line.

To conclude the rail portfolio, 1 Innovation study Action including pilot has tested the adaptation for freight transport of the Rail Infrastructure Optimisation (RIO) interface system already existing for passenger transport (€1.8 million CEF funding). This interface system aims at improving energy efficiency on rail freight operations by reducing energy use between 4% and 13%.

The expected results of the Rhine-Alpine Corridor railway Actions are the following:

Figure 2: Improved railway lines (number of km)



2.1.5. Road

In total the road portfolio in the Rhine-Alpine Corridor is composed of 24 Actions, receiving €62.9 million in CEF Transport funding. Actions belonging to this transport mode will address 1 bottleneck.

All but 2 Actions concern Actions being carried out in multiple corridors. Approximately 81% of the CEF funding in this portfolio is allocated to Actions encouraging the use of alternative fuels (45%) and ITS Actions (36%).

All of the Actions receiving CEF funding are contributing to the objectives for road transport as identified in the Work Plan. They concern the reduction of congestion, interoperability on the network, road safety, availability of clean fuels and reduction of emissions.

The Work Plan mentions that the Corridor's extensive road network fulfils to a great extent the TEN-T requirements, but that the availability of clean fuels' infrastructure is still underdeveloped.

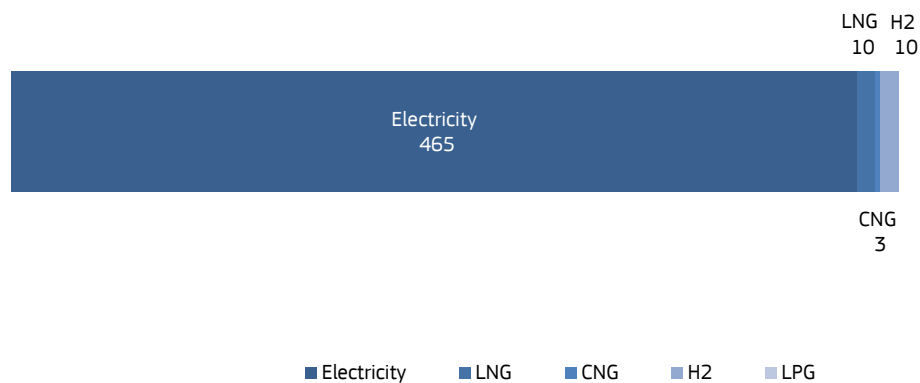
The majority of the CEF funded road Actions (16 out of 25, totalling €28.5 million CEF funding) are Innovation Actions targeting the deployment of **alternative fuels infrastructure** (gas, hydrogen and electricity) in the framework of the EU Directive 2014/94/EU:

- Eight Actions (3 study and 5 works Actions) are focused on electro-mobility for Electric Vehicles, more specifically the deployment of multi-standard fast chargers (0-50 kW) and ultra-fast chargers (150-300 kW) across the Corridor (€14.4 million CEF funding). The more recently selected Actions all focus on the ultra-fast chargers to be used for medium to long distance travel along the Corridor. There is equal involvement of all Member States along the Corridor.

- One works Action is aimed at deploying a full battery electric bus (ZEB) system within the Urban Node of Rotterdam (NL), including a zero emission bus fleet and the charging infrastructure (€3.3 million CEF funding).
- Four study Actions (including pilots) are aimed at deployment of LNG/CNG infrastructure for freight traffic (€5.4 million CEF funding). Also here there is involvement of all Member States along the Corridor.
- Three study Actions are contributing to the deployment of Hydrogen refuelling infrastructure in the Netherlands, Belgium and Germany (€5.4 million CEF funding).

Concretely, Actions in the Corridor expect to install 488 supply points for alternative fuel for road transport: 465 Electricity, 10 LNG and 3 CNG, and 10 H2.

Figure 3: Number of supply points for alternative fuel for road transport



In the Work Plan **Intelligent Transport Systems (ITS)** are mentioned as supportive and innovative services relating to transport and traffic management that are beneficial for overall efficiency and safety for road transport. ITS focuses on the implementation of the priorities of EU Directive 2010/40/EU and its delegated regulations.

ITS services provide for example real-time traffic information, information on the availability of Intelligent Truck Parkings, real-time safety related alerts on road works, road accidents, adverse weather, etc. for various road users, allowing them to make safer, more coordinated and smarter use of the road transport networks.

Four Actions in the field of ITS on roads account for a total CEF funding of €22.4 million. The ITS services are harmonised, interoperable and deployed at Corridor level. The provision of CEF funding in this field acts as catalyst for the development of the Corridor and to significantly improve the efficiency and safety of the existing road network.

The main ITS Action along the Corridor is URSA MAJOR neo (€9 million CEF funding). One of its main added values is the provision of services to international truck drivers and hauliers (better truck parking, better navigation, less delays and less uncertainties, increased safety).

Furthermore, the Work Plan mentions that the Rhine-Alpine Corridor's extensive road network fully fulfils the TEN-T regulations compliance check, except for one road section in the Netherlands which is not classified as a motorway yet: the **missing link on the A15 south of Arnhem (NL)**. This area between Nijmegen and Arnhem is also indicated in the Work Plan as an important bottleneck dealing with structural capacity issues (not just peak hour congestion).

The only 2 road construction Actions in the road portfolio are contributing to solving this bottleneck. Both Actions concern the ViA15 Global Project, which aims to remove the missing link and to ensure the continuity of cross-border flows on the Corridor between the Netherlands (Nijmegen) and Germany (Ruhr area). The earlier study Action carried out the necessary studies and public consultations in the spatial planning procedure, while the works Action is preparing the actual construction works for the new 12.5 km road in the Netherlands planned to take place in 2021-2023, by for example carrying out the necessary procurement and preparatory works. Together these Actions receive €8.7 million CEF funding.

To conclude, as a contribution to the safety priority mentioned in the Work Plan under the road (and rail) policy, the road portfolio includes 2 '**Safe and Secure Infrastructure**' Actions in the Netherlands and Belgium.

Especially the scarcity of secured parking is mentioned in the Work Plan as a critical issue: in border crossing sections and around important multimodal nodes as well as ports, there is a substantial unmet demand for **secure truck parking**. This jeopardizes compliance with the applicable driving time regulations, increases the pressure on available rest areas and forces trucks to park off-ramps and outside the designated areas, creating a safety and security hazard.

One Actions is contributing to resolving this issue, and is ensuring the construction of 2 certified parking areas for trucks in the vicinity of the Corridor in the Netherlands with around 230 secure places in Duiven and around 174 (expandable to 290) secure places in Breda/Hazeldonk (€0.5 million CEF funding).

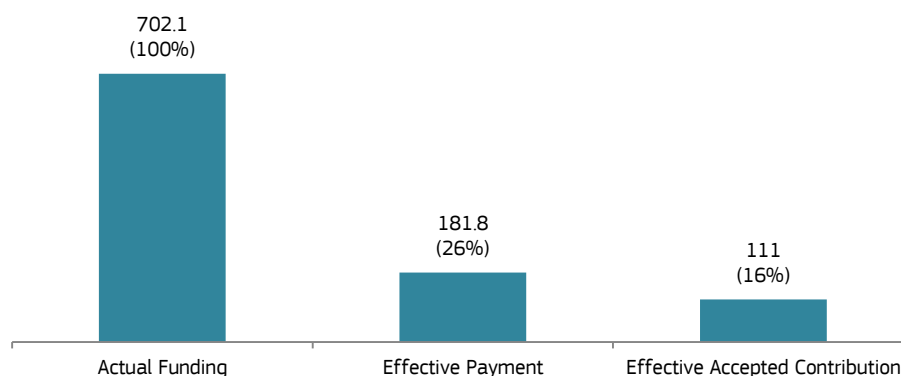
The second Action is aiming at 7 **level crossings removals** on the section Zeebrugge–Ghent–Antwerp and eliminating 2 level crossings near Liège along the road and rail Corridor in Belgium (€2.8 million CEF funding).

2.2. Financial implementation

The state-of-play of the financial implementation of the portfolio is shown in the figure below. The effective payment⁶ (including pre-financing) corresponds to €181.8 million and therefore 26% of the actual CEF Transport funding. As a consequence of the interim cost claims introduced by the beneficiaries, costs corresponding to CEF-T funding of €111 million have been accepted so far (16% of the actual CEF Transport funding).

⁶ (closed payments – recoveries)

Figure 4: Financial implementation ratios (€ million)



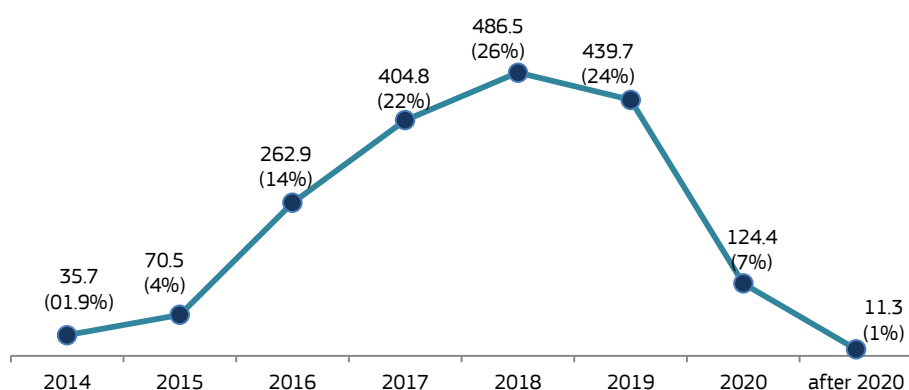
Effective payments and effective accepted contribution as shown in the figure above may appear as relatively low. This is due to a series of reasons:

- Actions are due to submit interim payment claims every two years. As a consequence, the "accepted contribution" by the end of 2017 corresponds to cost claims received in 2017 for some Actions, which includes costs incurred until 31/12/2016, and cost claims received in 2016 for other Actions, which includes costs incurred until 31/12/2015.
- The bulk of the funding goes to works (or major studies). These Actions usually start with a study and/or a tendering phase during which the costs incurred are relatively low. For this reason, the bulk of the costs are incurred in the last implementing years of these Actions (see also figure 5 below).

Moreover, it has to be noted that effective payments are higher than effective accepted contribution due to the fact that advance payment (pre-financing) are made.

Figure 5 gives an overview of the estimated financial progress, in terms of total estimated costs, of the overall portfolio.

Figure 5: Estimated budget implementation (€ million)



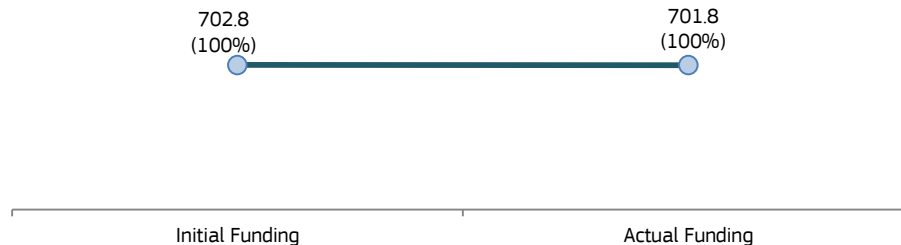
3. Evolution of the Action portfolio

3.1. Funding variations after the Grant Agreement signature

The actual CEF Transport funding allocated to Actions can differ from the initially allocated funding depending on (1) Action closures and terminations and (2) certain types of amendments. So far

one closed Action and one amendment have triggered a funding reduction of €1 million. Therefore, as shown in Figure 4, Actions in this Corridor have experienced no significant funding reductions so far.

Figure 6 : CEF Transport funding variations (€ million)



3.2. Challenges affecting the implementation of Actions

In general, the most common implementation issues faced by Actions are related to governance and the technical complexity of co-funded activities. Delays due to technical complexities are recurrent in implementing large infrastructure projects and are a common challenge for CEF Actions.

The technical complexity of Actions can have an impact on the timing and create unexpected delays in the approval of concept and design studies due to extra research needed into the layout of the infrastructure, the cost and reduction of its impact on the local population and (environmental) surroundings. Actions located in urban and industrial areas may face administrative spatial planning, permitting and authorisation procedures that take longer than expected due to public consultations unveiling issues which complicate and lengthen the approval process. In certain cases this complexity also has an impact on the planned timing required to carry-out and conclude procurement procedures, subsequently delaying the start of works. Governing these challenges becomes even more complex and cumbersome for cross-border Actions needing political decisions, permits, approvals and authorisations in more than one Member State where procedures and requirements differ.

For Innovation Actions the main challenge in most Actions addressing alternative fuels is to secure locations of charging points/refuelling stations on or as close as possible to the Corridor. Especially for LNG in a fast developing market the competition between different operators on securing locations may impact the duration of the implementation of the Actions. In addition, some Actions establishing LNG and CNG stations have faced issues related to the safety and security requirements linked to their on-site installation. Actions installing charging stations for electric vehicles have encountered delays due to the necessity to obtain approvals to connect the stations to the local electricity network.

The most challenging issue regarding ERTMS deployment along the Corridor is the implementation on cross-border sections where the difference in technical, operational and administrative requirements for each Member State makes the successful completion of the Actions rely on a constructive cooperation between the different stakeholders, notably the infrastructure managers.

For ITS one of the main challenges for public authorities and road operators in this area is to ensure the efficient and cross-border communication among the various traffic management centres. In this regard, the implementation of national access points and the use of the DATEX II communication standard have started and are funded by past and ongoing CEF Actions.

4. Conclusion and Outlook

This report highlights the contribution of CEF funded Actions – selected under the INEA Calls for Proposals carried out from 2014 to 2017 – to the development of the Rhine-Alpine Corridor in line with the objectives and priorities as defined in the latest Work Plan by its European Coordinator Paweł Wojciechowski.

To implement the Rhine-Alpine Corridor by 2030 the Work Plan identifies 318 infrastructure projects proposed by the Member States and other stakeholders, with an investment need of around €97.3 billion.

The Connecting Europe Facility (CEF) is one of the EU instruments established to provide financial support for the implementation of the corridors. Currently, for the Rhine-Alpine Corridor there are 62 Grant Agreements in place allocating €702.1 million of actual CEF Transport Funding related to a total investment of €1.93 billion.

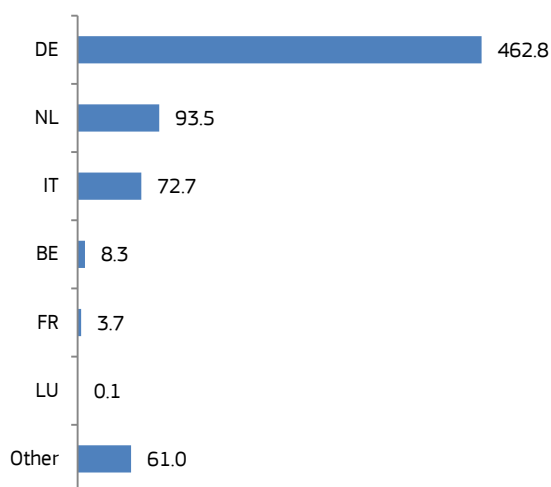
It is evident that the CEF Transport funding alone cannot cover the total investment needs of the Corridor. For this, a much more ambitious CEF budget would be needed. Nevertheless, as this report indicates, the Actions along the Corridor receiving CEF funding contribute significantly to the most important priorities and objectives mentioned in the Work Plan which are crucial for the development of the Corridor.

While some of the Actions are receiving a large portion of the EU funding for the whole Corridor, it is important to recognize that many smaller Actions are having a significant impact on (i) improving multimodal connections and information systems, (ii) providing safer and more interoperable infrastructure, and (iii) the availability of alternative fuel for road and waterborne transport.

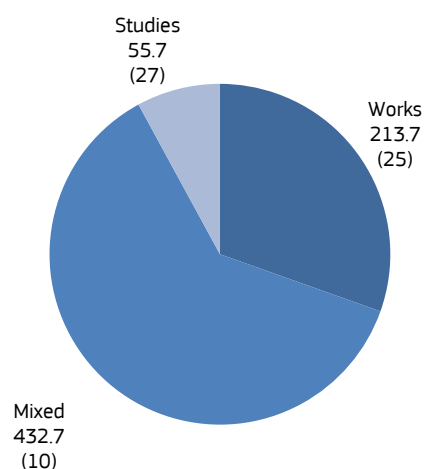
In conclusion, the past 4 years of CEF implementation has shown that CEF funded Actions have already made and will continue to make a significant contribution to the development of the Rhine-Alpine Corridor in line with the latest Work Plan. Further progress is expected through the upcoming Calls for Proposals. INEA will continue making implementation happen through regular monitoring of the progress of the Actions and close cooperation with the Rhine-Alpine Corridor European Coordinator, the Member States and other stakeholders.

5. Statistical Annex

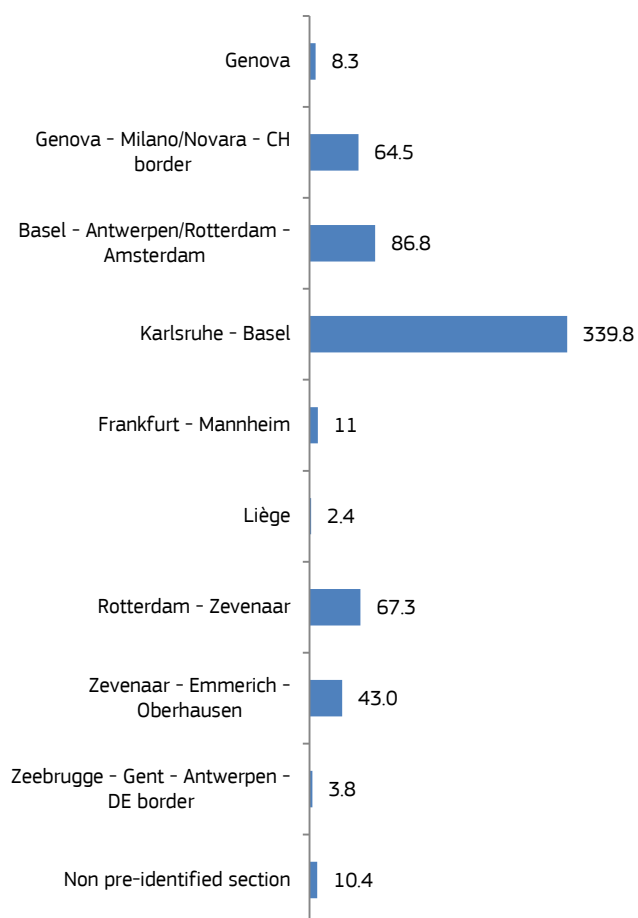
Corridor funding (€ million) per country (*)



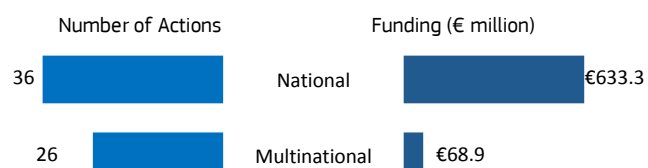
Corridor funding (€ million) per type



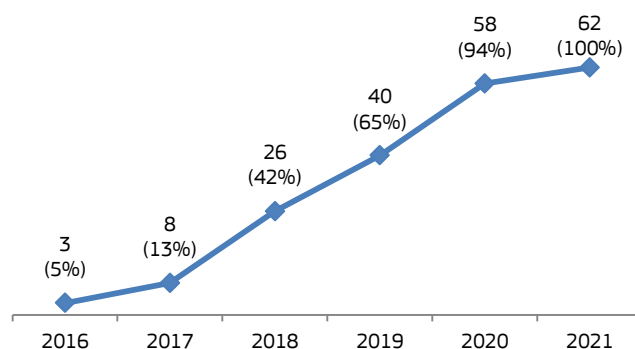
Corridor funding (€ million) per section



Number of Actions and Corridor funding (€ million) by national/multinational



Cumulative number of finalised Actions



(*) Disclaimer: The allocation of Actions and funding to the Corridor is based on the assessment done by INEA. In the chart per beneficiary country, the funding of multinational Actions which are allocated to more than one Corridor is included in the "Other" category.

6. List of Actions on the Rhine-Alpine Corridor

Transport Mode	Project Code	Title	Funding Objective	Priority	Type	Actual Corridor Share	Actual Start Date	Actual End Date	Actual Funding	Actual Costs
Inland Waterways	2014-DE-TA-0113-M	Safeguarding and adaptation of waterway access to the Rhine-Alpine and North Sea-Baltic corridors from the port of Cologne	FO 1	Projects on Core and Comprehensive	Mixed	100%	01/01/2014	31/12/2017	1,976,200	9,476,000
Inland Waterways	2014-EU-TM-0210-S	Pilot implementation of an Upper Rhine traffic management platform	FO 2	Innovation	Studies	100%	01/07/2014	30/06/2018	992,500	1,985,000
Inland Waterways	2014-NL-TM-0241-W	Preparatory activities and project management for the new large Amsterdam lock	FO 1	Core Network Corridors	Works	100%	01/01/2014	31/12/2019	11,095,628	27,739,070
Inland Waterways	2014-NL-TM-0394-S	Breakthrough LNG deployment in Inland Waterway Transport	FO 2	Innovation	Studies	33%	01/01/2016	31/12/2018	3,608,588	7,217,176
Inland Waterways	2015-EU-TM-0038-W	River Information Services Corridor Management Execution (General Call)	FO 3	RIS	Works	100%	15/02/2016	31/12/2020	9,886,679	19,773,358
Inland Waterways Total									27,559,595	66,190,604
Maritime	2014-EU-TM-0095-W	ReaLNG: Turning LNG as marine fuel into reality in the North Sea-Baltic region	FO 3	MoS	Works	20%	01/01/2014	30/09/2017	2,616,555	8,013,171
Maritime	2014-EU-TM-0451-M	Scrubbers: Closing the loop	FO 3	MoS	Mixed	50%	21/04/2014	31/12/2018	3,172,200	10,041,500
Maritime	2014-EU-TM-0531-S	FRESH FOOD CORRIDORS	FO 3	MoS	Studies	40%	01/09/2014	31/07/2018	4,022,333	8,044,666
Maritime	2014-IT-TM-0276-W	INES - Implementing New Environmental Solutions in the Port of Genoa	FO 1	Core Network Corridors	Works	100%	01/07/2015	30/06/2019	4,651,000	23,150,000
Maritime	2014-IT-TM-0450-S	GAINN4CORE	FO 1	Core Network Corridors	Mixed	15%	01/06/2015	30/09/2019	1,866,289	6,597,279
Maritime	2015-EU-TM-0098-M	DOOR2LNG -Upgrade of the maritime link integrated in the multimodal container transport routes	FO 3	MoS	Mixed	13%	16/02/2016	30/06/2019	2,204,540	7,287,800
Maritime Total									18,532,918	63,134,416

Transport Mode	Project Code	Title	Funding Objective	Priority	Type	Actual Corridor Share	Actual Start Date	Actual End Date	Actual Funding	Actual Costs
Multimodal	2014-DE-TA-0296-W	40-CONTECH - Investing in a just in time intermodal logistics concept with an innovative 40ft open top curtain side container to develop sustainable, interoperable and safe rail services through the Eurotunnel along the TEN-T core network corridors	FO 2	Freight Transport Services	Works	4%	01/07/2014	31/12/2017	57,535	287,676
Multimodal	2014-DE-TA-0326-W	MEDAS 3.0 - Greening the automotive supply chain with trusted collaborative networks to bundle cargo and operate a sustainable 'just in time' Mediterranean rail shuttle service	FO 2	Freight Transport Services	Works	3%	01/01/2014	31/12/2016	31,659	158,294
Multimodal	2014-DE-TM-0006-S	Planning of Regionaltangente-West (RTW) in Frankfurt am Main	FO 3	Nodes of the Core Network	Studies	100%	01/01/2014	30/06/2018	7,680,500	15,361,000
Multimodal	2014-FR-TM-0260-W	New Multimodal Terminal of the Port of Strasbourg / Lauterbourg site	FO 3	Multimodal	Works	100%	01/04/2015	31/07/2018	2,024,000	10,120,000
Multimodal	2015-BE-TM-0248-W	Improving of the multimodal logistic platform of the port of Zeebrugge, in order to accommodate long freight trains	FO 3	Multimodal	Works	100%	01/03/2016	31/01/2019	1,598,000	7,990,000
Multimodal	2015-DE-TM-0376-M	LNG for shipping and logistics in Europe	FO 2	Innovation	Studies	100%	01/03/2016	31/12/2018	4,056,000	8,112,000
Multimodal	2015-EU-TM-0028-S	Rhine-Alpine Integrated and Seamless Travel Chain (RAISE-IT)	FO 3	Nodes of the Core Network	Studies	100%	01/09/2016	31/12/2019	836,348	1,672,696
Multimodal	2015-IT-TM-0312-M	Vado Multimodal Platform rail/road terminal (core RRT node of the TEN-T network) intermodal connections optimization and Upgrading (VAMP UP)	FO 3	Multimodal	Mixed	100%	01/03/2016	31/07/2019	1,815,200	10,720,000

Transport Mode	Project Code	Title	Funding Objective	Priority	Type	Actual Corridor Share	Actual Start Date	Actual End Date	Actual Funding	Actual Costs
Multimodal	2016-EU-TA-0185-S	Sharing of train tracking & ETA information	FO 2	Freight Transport Services	Studies	100%	01/09/2017	31/08/2019	1,429,076	2,858,152
Multimodal	2016-EU-TM-0277-S	BENEFIC	FO 2	Innovation	Studies	33%	01/07/2017	31/12/2020	2,501,400	12,259,500
Multimodal	2016-IT-TM-0284-S	GAINN4MED	FO 2	Innovation	Studies	11%	01/03/2017	31/03/2020	668,525	1,337,050
Multimodal	2017-DE-TM-0040-W	LNG Rollout in Central Europe - for a greener transportation sector	FO 2	Innovation	Works	10%	01/01/2018	30/06/2021	327,294	1,636,470
Multimodal Total									23,025,537	72,512,838
Rail	2014-BE-TM-0660-W	Deployment of ETCS Level 1 on the rail section Ans - Angleur	FO 1	ERTMS	Works	100%	01/07/2015	01/05/2018	2,367,500	4,735,000
Rail	2014-DE-TM-0057-W	ERTMS Deployment on the German part of the Core Network Corridor Rhine - Alpine	FO 1	ERTMS	Works	100%	01/01/2014	31/12/2020	53,720,339	109,230,948
Rail	2014-DE-TM-0094-M	Upgraded line / New-build line (ABS/NBS) Karlsruhe - Basel with partial upgrade measures on the existing line	FO 1	Core Network Corridors	Mixed	100%	01/01/2014	31/12/2019	338,532,745	828,614,563
Rail	2014-DE-TM-0252-M	Upgraded line (ABS) (Amsterdam) D/NL border - Emmerich - Oberhausen	FO 1	Core Network Corridors	Mixed	100%	01/01/2014	31/12/2019	32,684,100	67,475,000
Rail	2014-DE-TM-0299-S	Support and coordination of Rail Freight Corridor Rhine-Alpine for its long term sustainable operation as required by the EU Regulations 913/2010, 1315/2013 and 1316/2013.	FO 1	Rail interoperability	Studies	100%	01/01/2015	31/12/2018	2,855,000	5,710,000

Transport Mode	Project Code	Title	Funding Objective	Priority	Type	Actual Corridor Share	Actual Start Date	Actual End Date	Actual Funding	Actual Costs
Rail	2014-DE-TM-0414-S	RIO Railway Infrastructure Optimisation - Deployment of an innovative and technological rail infrastructure-vehicle interface system to ensure a low-carbon and energy-efficient freight transport system along the TEN-T Core Network Corridors	FO 2	Innovation	Studies	100%	01/01/2014	31/12/2016	1,798,300	3,596,600
Rail	2014-EU-TA-0131-S	European Rail Freight Line System on the Rhine-Alpine Corridor	FO 1	Projects on Core and Comprehensive	Studies	100%	01/12/2015	30/11/2018	625,000	1,250,000
Rail	2014-IT-TM-0058-W	ERTMS Deployment on the Italian part of the Rhine - Alpine Core Network Corridor	FO 1	ERTMS	Works	100%	19/11/2014	31/12/2018	13,691,000	27,382,000
Rail	2014-IT-TM-0174-S	MXP-AT Railink	FO 1	Core Network Corridors	Studies	100%	01/04/2015	31/03/2018	2,066,000	4,132,000
Rail	2014-IT-TM-0176-M	Upgrading of the Chiasso - Milano railway line	FO 1	Core Network Corridors	Mixed	100%	01/01/2014	31/12/2018	40,903,600	135,786,400
Rail	2014-NL-TA-0680-S	3EUStates2cross (Study, Rail, Limburg S-E Netherlands)	FO 1	Projects on Core and Comprehensive	Studies	15%	16/11/2015	15/11/2018	713,625	1,427,250
Rail	2014-NL-TM-0233-W	Removing the bottleneck on the rail freight corridor between mainport Rotterdam and the European hinterland by realising the Theemsweg railway section.	FO 1	Core Network Corridors	Works	100%	01/10/2015	31/12/2019	59,892,117	199,640,390
Rail	2015-DE-TM-0363-W	Design and equipment of ERTMS for six border crossing corridor sections as well as two gap closings on German TEN core network corridors	FO 1	ERTMS	Works	54%	16/02/2016	31/12/2020	13,453,806	27,941,367
Rail	2016-EU-TA-0108-W	2EUStates2cross	FO 1	Projects on Core and Comprehensive	Works	2%	07/02/2017	31/12/2020	573,600	1,434,000
Rail	2016-IT-TM-0244-W	ERTMS on strategic sections of 3 CNCs	FO 1	ERTMS	Works	23%	07/02/2017	31/12/2020	6,267,500	12,535,000
Rail Total									570,144,233	1,430,890,518

Transport Mode	Project Code	Title	Funding Objective	Priority	Type	Actual Corridor Share	Actual Start Date	Actual End Date	Actual Funding	Actual Costs
Road	2014-EU-TM-0196-S	FAST-E (DE/BE)	FO 2	Innovation	Studies	19%	01/09/2014	30/09/2018	1,664,372	3,328,743
Road	2014-EU-TM-0318-S	Connecting Hydrogen Refuelling Stations (COHRS)	FO 2	Innovation	Studies	20%	01/09/2015	30/06/2019	2,595,557	5,191,115
Road	2014-EU-TM-0365-W	URSA MAJOR 2	FO 3	ITS	Works	50%	01/01/2014	31/12/2018	9,228,060	46,140,300
Road	2014-EU-TM-0579-M	UNIT-E	FO 2	Innovation	Mixed	31%	01/07/2015	31/12/2017	552,792	1,105,584
Road	2014-EU-TM-0630-S	Connect2LNG	FO 2	Innovation	Studies	40%	01/10/2015	31/12/2018	1,818,500	3,637,000
Road	2014-NL-TA-0072-S	ViA15 road project, missing link study – Rhine-Alpine Core Network Corridor	FO 1	Projects on Core and Comprehensive	Studies	100%	01/01/2014	31/12/2016	2,844,968	5,689,935
Road	2014-NL-TM-0153-W	Safe & Secure Truck Parkings on core network in the Netherlands	FO 2	Safe and secure infrastructure	Works	38%	01/01/2015	31/12/2017	491,378	2,456,890
Road	2015-BE-TM-0244-W	Elimination of level crossings on the Core Network Corridors in Belgium in order to increase safety and remove bottlenecks for both rail and road	FO 2	Safe and secure infrastructure	Works	39%	01/03/2016	31/12/2020	2,788,500	13,942,500
Road	2015-BE-TM-0391-S	C-ITS for Trucks (CITRUS)	FO 3	ITS	Studies	20%	01/10/2016	30/09/2019	182,275	364,549
Road	2015-EU-TM-0316-S	Models for Economic Hydrogen Refuelling Infrastructure	FO 2	Innovation	Studies	19%	01/07/2016	31/12/2020	1,046,805	2,093,610
Road	2015-EU-TM-0367-S	ULTRA-E	FO 2	Innovation	Studies	20%	01/03/2016	31/12/2018	1,308,530	2,617,060
Road	2015-EU-TM-0415-S	EVA+ (Electric Vehicles Arteries in Italy and Austria)	FO 2	Innovation	Studies	24%	01/07/2016	31/03/2019	1,016,795	2,033,590
Road	2015-EU-TM-0422-S	LNG motion: Fuelling trucks with LNG/CNG along the core network	FO 2	Innovation	Studies	3%	16/02/2016	31/12/2020	832,953	1,665,906
Road	2016-DE-TM-0332-S	LNG4Trucks	FO 2	Innovation	Studies	7%	07/02/2017	31/12/2020	670,960	1,341,920
Road	2016-EU-TM-0044-M	URSA MAJOR neo	FO 3	ITS	Mixed	28%	07/02/2017	31/12/2020	8,996,229	41,849,279
Road	2016-EU-TM-0121-W	High speed electric mobility across Europe	FO 2	Innovation	Works	9%	01/07/2017	31/12/2020	915,120	4,575,600
Road	2016-EU-TM-0175-S	H2Benelux	FO 2	Innovation	Studies	25%	07/02/2017	31/12/2020	1,804,719	4,371,137
Road	2016-EU-TM-0327-S	CONCORDA	FO 3	ITS	Studies	40%	01/10/2017	30/06/2020	4,000,000	8,000,000

Transport Mode	Project Code	Title	Funding Objective	Priority	Type	Actual Corridor Share	Actual Start Date	Actual End Date	Actual Funding	Actual Costs
Road	2016-NL-TA-0019-W	VIA15: solving the missing link in the cross-border road infrastructure on the Rhine-Alpine corridor	FO 1	Projects on Core and Comprehensive	Works	100%	01/03/2017	31/12/2020	5,884,616	58,846,156
Road	2016-NL-TM-0339-S	BIOLNG4EU	FO 2	Innovation	Studies	25%	07/02/2017	31/12/2020	2,050,000	4,100,000
Road	2017-DE-TM-0064-W	EUROP-E: European Ultra-Charge Roll Out Project - Electric	FO 2	Innovation	Works	12%	15/07/2017	31/12/2021	4,692,645	23,463,227
Road	2017-EU-TM-0065-W	Central European Ultra Charging	FO 2	Innovation	Works	8%	01/08/2017	31/12/2020	987,808	4,939,042
Road	2017-EU-TM-0068-W	MEGA-E: Metropolitan Greater Areas - Electric	FO 2	Innovation	Works	11%	01/08/2017	31/12/2021	3,223,036	16,115,182
Road	2017-NL-TM-0060-W	REMETBUS2 Rotterdam	FO 3	Nodes of the Core Network	Works	100%	01/07/2017	31/12/2021	3,266,579	41,825,600
Road Total									62,863,196	299,693,925

