EUROPEAN COMMISSION

DIRECTORATE-GENERAL FOR MOBILITY AND TRANSPORT

Director-General

DECISION
AUTHORISING THE USE OF UNIT CONTRIBUTIONS TO SUPPORT THE DEPLOYMENT OF ERTMS, ELECTRIC VEHICLES RECHARGING INFRASTRUCTURE AND THE RETROFITTING OF NOISY WAGONS UNDER THE CONNECTING EUROPE FACILITY (CEF) – TRANSPORT SECTOR

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Regulation (EU) 2021/1153 of the European Parliament and of the Council of 7 July 2021 establishing the Connecting Europe Facility and repealing Regulations (EU) No 1316/2013 and (EU) No 283/2014, (the CEF 21-27 Regulation)[1], and in particular Article 9(2)(b)(ii)(iii)(iv) thereof,

Having regards to Regulation (EU) No 1315/2013 of the European Parliament and of the Council of 11 December 2013 on Union guidelines for the development of the trans-European transport network (the TEN-T guidelines) and repealing Decision No 661/2010/EU[2]

Having regard to Regulation (EU, Euratom) No 1046/2018 of the European Parliament and of the Council of 18 July 2018 on the financial rules applicable to the general budget of the Union[3] (the Financial Regulation), and in particular Articles 125 and 181 thereof,

Whereas:

(1) Simpler funding rules reduce the administrative costs for both beneficiaries and the Commission and contribute to the prevention and reduction of financial errors.

(2) The use of simplified cost options for serial deployment of ERTMS, electric vehicles recharging infrastructure and retrofitting of noisy wagons is justified and should foster their widespread roll-out.

THE FOLLOWING HAS BEEN DECIDED:

Sole Article

The use of the Union contribution in the form of unit contributions is authorised for the deployment of electric vehicles recharging infrastructure, the retrofitting of noisy

[1] OJ L 249, 14.07.2021
[2] OJ L 348, 20.12.2013
[3] Regulation (EU, Euratom) 2018/1046 of the European Parliament and of the Council of 18 July 2018 on the financial rules applicable to the general budget of the Union, amending Regulations (EU) No 1296/2013, (EU) No 1301/2013, (EU) No 1303/2013, (EU) No 1304/2013, (EU) No 1309/2013, (EU) No 1316/2013, (EU) No 223/2014, (EU) No 283/2014, and Decision No 541/2014/EU and repealing Regulation (EU, Euratom) No 966/2012 (OJ L 193, 30.07.2018)

wagons, and for the deployment of European Rail Traffic Management System (ERTMS) under the Transport sector of the Connecting Europe Facility (CEF), for the reasons and under the conditions set out in the Annex.

Done at Brussels,

Henrik HOLOLEI
Director-General for Mobility and Transport

ANNEX

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1. FORM OF UNION CONTRIBUTION AND CATEGORIES OF COSTS COVERED

The Union contribution for actions supporting ERTMS, electric vehicles recharging infrastructure and retroffiting of noisy wagons deployment under the Connecting Europe Facility (CEF) – Transport sector shall exclusively take the form of unit contributions.

1.1. ERTMS

The Union contribution for actions supporting ERTMS deployment shall cover the following categories of eligible costs:

Table 1. Categories of eligible costs for ERTMS

For on-board deployment	For track-side deployment
- Engineering – system design - Material - Hardware – including European Vital Computer, Antennas, Driver-Machine Interface (DMI), cabling - Material – Software - Testing - Subsystem verification and authorisation procedure - Project management	- Engineering – system design - Material – Hardware – including balises, Class A Radio communication Antennas, Line-side Electronic Units (LEU), interlockings - Material – Software - Testing - Subsystem verification and authorisation procedure - Project management

The constituents of ERTMS on-board and trackside equipment are defined in Commission Regulation (EU) No 2016/919 on the technical specification for interoperability to the 'control-command and signalling' subsystems[4].

The amounts of the unit contribution to be used shall be calculated in accordance with point 3.

1.2. ELECTRIC VEHICLES RECHARGING INFRASTRUCTURE

The Union contribution for actions supporting electricty recharging points shall cover the following categories of eligible costs:

Table 2. Categories of eligible costs for electric vehicles recharging infrastructure

New electricity recharging point with a minimum recharging capacity of 150 kW and of minimum 350 kW	Grid connection
– Station building o Work site adaptation o Construction works (including but not limited to a minimum of one parking spot per charger) o Electrical works and equipment (including transformer)	– Detail engineering / design – Grid connection works – battery storage

[4] Section 5, Annex of the Commission Regulation (EU) No 2016/919 (OJ L 158 15.6.2016, p. 31).

– Commissioning of the installation	

The amounts of the unit contribution to be used shall be calculated in accordance with point 3.

1.3. RETROFITING OF NOISY WAGONS

The Union contribution for actions retrofitting noisy wagons shall cover the following categories of eligible costs:

Table 3. Categories of eligible costs for retrofitting of noisy wagons

For the S-type wagon	For the SS-type wagon
– Material - brake blocks – Work - installation of brake blocks – Wheels reprofiling – Brake test – New markings on wagon	– Material - brake blocks – Material - brake cylinder/ventil – Work - installation of brake blocks – Work - brake cylinder/ventil – Wheels reprofiling – Brake test – New markings on wagon

The amounts of the unit contribution to be used shall be calculated in accordance with point 3.

2. JUSTIFICATION

Recourse to unit contributions considerably simplifies, streamlines and reduces the time needed for the financial management of projects, including payment procedures, both at Commission and beneficiary level. Compared to the 'traditional' system of calculating the grant amount on a detailed budget of estimated actual eligible costs per cost category, a unit contribution shortens the time needed to calculate grant amounts and prevents amendments related to budget variations. Furthermore, it implies additional simplification at beneficiary level both in terms of application and reporting requirements.

At the same time, unit contributions strongly increase the focus on the quality of the performance and output of projects.

Actions regarding deployment of ERTMS, electric vehicles recharging infrastructure and retrofitting of noisy wagons are particularly suited to the use of unit contributions given that the operations result in uniform and repetitive outputs that can be easily monitored and reported on.

2.1. NATURE OF THE SUPPORTED ACTIONS

2.1.1. ERTMS

ERTMS is a major industrial programme to harmonise the automatic train control and communication system and underpin interoperability throughout the rail system in Europe. The differences among the large variety of national legacy train control systems constitute a significant barrier to interoperability of the European rail system. Deployment of ERTMS will overcome this barrier and will provide the backbone for a digital, connected Single European Rail Area.

ERTMS consists of:

– The ETCS (European Train Control System), the first ERTMS component
– Class A radio communication, the second ERTMS component

The ERTMS Business case analysis carried out by the Deployment Management Team[5] demonstrates that ERTMS has strong system-level benefits, as it will improve safety and punctuality of rail transport, increase the competitiveness of rail freight and increase competition between suppliers. Moreover, ERTMS is also seen by the industry as an enabler of digitalization of the railway system. But individual investment cases for operators and infrastructure managers can be challenging. This is particularly the case for international operators.

In order to accelerate ERTMS deployment, financial assistance from the Union is expected to facilitate the mobilisation of resources in a short period of time, in line with the Commission's policy.

In all cases, for the purposes of this decision, ETCS Baseline 3 (B3) means the set of specifications #2 or #3 or subsequent releases included in Annex A to the latest Commission Regulation (EU) on the technical specification for interoperability relating to the 'control-command and signalling' subsystems of the rail system in the European Union.

There are two kinds of outputs which could benefit from unit contributions:

– For on-board, an ERTMS Baseline 3 (incl. ETCS Baseline 3 and/or class A radio communication) equipped vehicle;
– For track-side, an equivalent of 1 double track km (incl. ETCS Baseline 3 and/or class A radio communication and/or interlocking deployed)

But vehicles and tracks are in different situations or starting points, which leads to different activities in order to deliver the output. Also, the complexity of stations in an urban node[6] results in higher costs. Therefore, the amounts of unit contributions should reflect these specific situations.

On-board - eligible activities

- Retrofitting: installation of the ERTMS Baseline 3 (B3)-compliant equipment (hardware, software, class A radio communication in the case of ERTMS Level 2) on an existing vehicle(s) already in operation and not equipped with ERTMS.
- Upgrade: installation of the ERTMS Baseline 3 (B3) compliant equipment (hardware, software, class A radio communication in the case of ERTMS Level 2) on an existing vehicle(s) already equipped ERTMS[7].
- Fitment: installation of the ERTMS Baseline 3 (B3) compliant equipment (hardware, software, class A radio communication in the case of ERTMS Level 2) on new vehicles at the time of their manufacturing.

A vehicle eligible for unit contribution shall be a thermal or electric traction unit (such as a locomotive or a shunter) or a self-propelling thermal or electric passenger train (such as a trainset or an EMU or a DMU). In order to be funded, the vehicle shall be equipped with at least one ERTMS/ETCS on-board equipment.

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5 Contract No MOVE/B2/2014-670, 'Note to support decision authorising the use of a unit cost approach to support ERTMS deployment'

6 Urban node as defined in article 3 (p) and article 30 of Regulation (EU) No 1315/2013

7 Software-only upgrades would not receive a prototype unit contribution

International vehicles are vehicles authorized in more than one Member State. National vehicles are vehicles authorized in only one Member State.

Track-side - eligible activities (including in urban nodes)

1. ERTMS deployment, i.e. first deployment of the system on a railway line section(s) not equipped with the system before, covering:
   - ETCS and associated infrastructure
   - Class A radio communication deployment
   - Deployment of interlocking

In case of the ERTMS deployment in urban nodes, eligible are the railway stations located in urban nodes as defined in Annex II. 1 of Regulation (EU) No 1315/2013. The full list of eligible urban nodes is listed in Annex II.1 of that Regulation.

2. ERTMS upgrades deployment of Baseline 3 (B3) compliant equipment on a section which is already equipped with ERTMS

Essential conditions triggering the payment

The essential condition triggering the payment shall be based on the outputs, namely the number of units equipped with ERTMS.
- for on-board: an ERTMS Baseline 3 equipped vehicle;
- for track-side: equivalent of 1 double track km, including in urban node.

2.1.2. ELECTRIC VEHICLES RECHARGING INFRASTRUCTURE

The European Green Deal and the Sustainable and Smart Mobility Strategy[8] call for the deployment of about 1 million publicly accessible recharging and refuelling stations by 2025, necessary for the 13 million expected zero- and low-emission vehicles on European roads. The limited CEF support shall prioritise publicly accessible infrastructure for the recharging and refuelling of zero emission vehicles.

Considering the number of electric vehicles (EVs) and corresponding recharging points already in operation on the European market, the sufficiency and reliability of available costs data allows defining a CEF unit contribution for electric vehicles recharging points. In view of the comparably low number of hydrogen fuel-cell vehicles and corresponding refuelling stations and the different concepts of electric vehicles recharging in bus depots for public transport, no CEF unit contribution was defined for these types of project.

Considering the need for fast and seamless recharging options along the core and comprehensive networks to enable cross-border EU travel with electric vehicles, CEF support will address the deployment of high power recharging points with a power capacity of minimum 150 kW for both light duty vehicles and heavy duty vehicles (HDV). In addition, in order to specifically address the recharging needs of HDV and considering the current absence of dedicated high power recharging infrastructure for this vehicle category, CEF will support recharging infrastructure of a minimum of 350 kW primarily addressing HDV.

High power recharging infrastructure requires the establishment of an adequate connection to the electricity grid that is an inevitable part of the overall installation cost of a recharging station. While the grid connection costs are site specific, investments in the grid connection for a recharging station can be considered as one-off costs as they do

[8] EC COM(2020)789: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020DC0789

not change significantly with an increase or decrease of the number of recharging points at a recharging station. Therefore, the methodology for the calculation of the unit contributions in section 3 shall dissociate the unit cost of the recharging point from the unit cost of the grid connection.

Essential conditions triggering the payment

The essential condition triggering the payment shall be based on the outputs, namely:

– the number of newly developed recharging points with a minimum power capacity ('P') of 150 kW (150kW ≤ P < 350kW). The unit contribution is valid for each recharging point that is (ii) at least equipped with one CCS 'Combo 2' connector as described in standard EN 62196-3[9], and (ii) capable of recharging only one electric vehicle at a time[10][11];

– the number of newly developed recharging points with a minimum power capacity ('P') of 350 kW (P ≥ 350 kW). The unit contribution is valid for each recharging point that is (ii) at least equipped with one CCS 'Combo 2' connector as described in standard EN 62196-3[12], and (ii) capable of recharging only one electric vehicle at a time[13];

– the number of related new grid connections;

2.1.3. RETROFITTING OF NOISY WAGONS

The root problem of rail noise is the braking technology used in older wagons (cast iron brake blocks), which affects the wheels' surface, increasing their roughness resulting in more rolling noise. Rail freight wagons equipped with cast iron brake blocks still represent about 40 % of all the European freight wagon fleet.

The installation of synthetic (composite) brake blocks reduces the roughness of the wheel, which in turn rapidly improves the noise level. However, the use of synthetic blocks and the resultant damage on the running surface of the wheels increases the amount of reprofiling required, which makes the operation of rail freight wagons more expensive. Newer, technically advanced solutions, such as disc brakes, which reduces the life cycle costs problem, have still found limited acceptance among many players in the

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9 Point 1.2 of Annex II of the Directive 2014/94/EU of 22 October 2014 on the deployment of alternative fuels infrastructure. OJ L 307, 28.10.2014.

10 Article 2(3) of the Directive 2014/94/EU of 22 October 2014 on the deployment of alternative fuels infrastructure. OJ L 307, 28.10.2014.

11 For the purposes of determining whether a specific recharging infrastructure is capable of recharging only one electric vehicle at a time at 150kW, account will be taken of the type and amount of connectors provided on that recharging infrastructure. For example if a recharging infrastructure of 300kW offers two CCS connectors, both capable of recharging an electric vehicle at 150kW power supply (or more), it is eligible for two unit contributions, as it essentially consists of two eligible recharging points. If two CHAdeMO connectors are added to each of those two eligible recharging points and those CHAdeMO connectors cannot be used simultaneously with the CCS connector of that same recharging point, the respective 300kW recharging infrastructure remains eligible for two unit contributions only. By contrast, if that same 300kW recharging infrastructure offers one CCS connector and one CHAdeMO connector, it will be eligible for one unit contribution only, as it consists of one eligible recharging point only. By way of another example: if a 150kW recharging infrastructure is equipped with two CCS connectors, or with one CCS connector and one CHAdeMO connector that can recharge two electric vehicles simultaneously, it will not be eligible for any unit contribution, as the dedicated power supply for recharging an electric vehicle at a time of 150kW cannot be guaranteed.

12 Point 1.2 of Annex II of the Directive 2014/94/EU of 22 October 2014 on the deployment of alternative fuels infrastructure. OJ L 307, 28.10.2014.

13 Article 2(3) of the Directive 2014/94/EU of 22 October 2014 on the deployment of alternative fuels infrastructure. OJ L 307, 28.10.2014.

market, as the initial additional costs of procurement prove to be an obstacle to their application.

In this context, in 2018 the European Union Agency for Railways (ERA) has prepared a recommendation for the revision of the Commission Regulation (EU) No 1304/2014 of 26 November 2014 on the technical specification for interoperability relating to the subsystem 'rolling stock — noise'[14] (hereafter NOI TSI), accompanied by the impact assessment[15].

The NOI TSI impact assessment focused in particular on the retrofitting of freight wagons brake blocks, which has been determined as the most cost efficient measure to reduce railway noise.

Essential conditions triggering the payment

The essential condition triggering the payment shall be based on the outputs, namely the number of retrofitted noisy wagons fulfilling any of the first four bullet points of clause 7.2.2.2 of TSI Noise (Commission Regulation (EU) No 1304/2014 amended by Commission Implementing Regulation (EU) 2019/774 of 16 May 2019)[16].

2.2. RISKS OF IRREGULARITIES AND FRAUD AND COSTS OF CONTROL

Reporting and control will focus on the implementation of the supported actions and the achieved outputs rather than on the eligibility of costs incurred, reducing the workload and scope for error of both participants and managing body.

In terms of costs of control, application of the unit contributions shall result in simplification of the administrative burden at all stages of the action cycle. The final payment procedure will be based on the above-mentioned outputs and related ex-ante defined unit contributions, i.e. technical deliverables, without ex-post verifications of the actual expenditures.

The risks of irregularities or fraud related to accounting the number of units are limited as they would be approximated in advance in the grant application form. The proposals will be assessed during the evaluation phase of the call, including the requested grant amount corresponding to each output, and the delivery of the output will need to be verified and can be checked ex post. Beneficiaries will furthermore need to contribute to the dissemination and communication of results.

3. METHOD TO DETERMINE THE AMOUNT OF THE UNION CONTRIBUTION IN THE FORM OF UNIT CONTRIBUTIONS

In accordance with Article 181(4)(c)(i) of the Financial Regulation, the method for determining the unit contributions is based on statistical data and on the expert judgement of DG MOVE.

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14 ERA 006REC1072 Revision of the NOI TSI Recommendations: http://www.era.europa.eu/Document-Register/Documents/006REC1072%20Recommendation.pdf

15 ERA 006REC1072 Revision of the NOI TSI Impact Assessment: http://www.era.europa.eu/Document-Register/Documents/006REC1072%20Full%20impact%20assessment.pdf

16 1 OJ L 139I , 27.5.2019, p. 89–102

3.1. ERTMS

RAO decision (2019)1025126[17] authorises the use of unit contributions for the deployment of ERTMS under the CEF - Transport sector in the 2014-2020 period. These actions will again be eligible in the 2021-2027 period and under the same conditions. Since the decision was adopted in 2019, no major changes in technology, nor entry on the market of new major suppliers, nor evidence of significant evolution in prices has been observed. Therefore, it is considered appropriate to re-apply the amounts previously authorised for the period 2021-2027.

In addition, it is necessary to establish separate unit contributions for the ERTMS trackside deployment in urban nodes. The ERTMS deployment in urban nodes is complex and costly. As a result urban nodes remain often unequipped with a detrimental impact on interoperability. Focusing on urban nodes is therefore of a paramount importance for the effective deployment of ERTMS as a system and for making the TEN-T network truly interoperable. Establishing separate unit contributions that better reflect the real costs in the urban nodes should give the right incentive to infrastructure managers and accelerate the process of closing the ERTMS gaps.

Methodology for track-side units on urban nodes is based on the review of available data provided by the Austrian, Bulgarian, Czech, Dutch, French and Italian railway infrastructure managers, totalising a sample of 22 projects[18]Out of which, a comprehensive and usable set of data available for 11 projects on ERTMS deployment allowed for defining unit costs per 1 km of a double track line of both ETCS & associated upgrade and Interlockings.

No track-side GSM-R unit contribution for urban node was defined as most of the nodes are already equipped with GSM-R, and no new robust set of data could be collected to demonstrate such a need.

To define the unit contribution deriving from the unit costs, an adjustment was performed and rounded down or up where needed, based on:

(i) the legal framework of the CEF 21-27 Regulation:

Article 15(2) of the CEF 21-27 Regulation sets the maximum co-funding rate for ERTMS deployment at 50% under the general envelop and 85% under the cohesion envelope.

(ii) the dispersion of values observed:

For ETCS and associated upgrade cost per kilometre, the adjustment was based on the dispersion observed (-25%) rounded down. For interlockings, the adjustment was based on 50% of the lowest value collected.

Lastly, the successful experience of the ERTMS unit contributions under the General envelope of the CEF 2014-2020 encourages the development of similar approach for the Cohesion envelope. To this end, the methodology concerning the application of the co-financing rate, as authorised by the RAO decision (2019)1025126, and the methodology described above for the deployment of ERTMS in urban nodes was proportionally aligned on the maximum co-funding rate defined by the CEF 21-27 Regulation for the cohesion envelope. As a result, the differentiated co-financing rate per category of cost was equally applied pro-rata for activities funded under the cohesion envelope with a higher co-financing rate, as presented in Table 4.

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17 Ref. Ares(2019)1025126

18 ERTMS Deployment Management Team - Technical support for the deployment of ERTMS along the core network corridors - Unit contributions – nodes - study: Ares(2021)2201757

Table 4. ERTMS unit contributions

Activities	Cost category		Scenario	Sub-scenario	Unit cost identified in report	Co-funding rate applied (%) General envelope	Unit contribution General Envelope	Co-funding rate applied (%) Cohesion envelope	Unit contribution Cohesion envelope
On-board ERTMS B3 equipped vehicle	Retrofitting	Prototype	International	/	2 509 000	36%	900 000	60%	1 500 000
			National	/	1 352 000	33%	450 000	55%	750 000
		Serial	International	/	255 000	43%	110 000	75%	190 000
			National	/	273 000	29%	80 000	51%	140 000
	Upgrade	Prototype	International	Software+ Hardware	1 683 000	36%	600 000	59%	1 000 000
			National	Software+ Hardware	907 000	39%	350 000	66%	600 000
		Serial	International	Software	41 000	44%	18 000	73%	30 000
			National	Software	44 000	34%	15 000	57%	25 000
			International	Software+ Hardware	130 000	42%	55 000	73%	95 000
			National	Software+ Hardware	139 000	40%	55 000	68%	95 000
	Fitment				100 000	25%	25 000	45%	45 000
Track-	Deployment		Standard ETCS & associated		200 000	45%	90 000	75%	150 000

side **1 double track km equipped**		upgrade costs					
		ETCS & associated upgrade costs in urban nodes	585 000	34%	200 000	58%	340 000
		Class A radio communication	50 000	40%	20 000	70%	35 000
		Interlocking	196 000	41%	80 000	71%	140 000
		Interlocking in urban nodes	1 360 000	22%	300 000	38%	510 000
	Upgrade	/	44 000	45%	20 000	80%	35 000

⚠ *For vehicles with several driving cabs or vehicles which require several on-board equipments, the number of unit contributions depends on the number of equipments used. For example:*

- *vehicle with two driving cabs served by one ERTMS/ETCS on-board equipment: 1 unit contribution (prototype or serial, as appropriate)*
- *vehicle with two driving cabs served by two individual ERTMS/ETCS on-board equipments: 2 unit contributions (one prototype + one serial or two serial, as appropriate)*

3.2. ELECTRIC VEHICLES RECHARGING INFRASTRUCTURE

The method for determining the electricity recharging point and grid connection unit contributions is based on an expert judgement in the form of a study for the evaluation of the Directive on the Deployment of Alternative Fuels Infrastructure[19] in combination with historical data from CEF actions.

The experience gained under the CEF 2014-2020 in supporting alternative fuels projects showed the need for higher funding rates for the Cohesion Member States. Therefore, the methodology described below consists in three steps:

Step 1. To estimate the unit costs for the 3 items covered under the electric vehicles recharging infrastructure: (1) electric vehicles recharging points of minimum 150 kW, (2) electric vehicles recharging points of minimum 350 kW for HDV and (3) the grid connection.

Step 2. To apply funding rates ensuring sound financial management under the general envelope and cross-validate the resulting unit contributions with existing national schemes supporting electric vehicles recharging points within the non-cohesion Member States.

Step 3. To apply the cohesion funding rate in line with the maximum rate defined by the CEF 21-27 Regulation for the cohesion envelope, giving differentiated amounts per category of costs with a higher co-financing rate, as presented in Table 6 and Table 7.

Steps 2 and 3 are together described under the point 3.2.2.

3.2.1. Estimation of unit costs

Unit cost for a recharging point

The baseline to establish the unit cost is the assumed cost of a recharging point with a power supply ('P') >=150 kW and of a recharging point with a power supply P >= 350 kW. Table 5[20] presents the costs assumptions for 150kW and 350kW DC recharging points covering capital expenditures (CAPEX), including installation costs (without costs related to grid reinforcements or connection costs to the grid). The cost estimates are based on a literature analysis of recharging point costs, as well as on learning effects based on production volumes literature analysis[21] allowing estimation of the evolution of costs for the period 2020-2050.

Table 5. Cost assumptions for high power recharging points

Investment costs (EUR/point)	2020	2025	2030	2040	2050
Recharging point (150KW DC)	90.000	72.510	63.757	56.016	53.114

[19] Study contract no. MOVE/B4/SER/2019-264/SI2.812549, draft final report dated 20.11.2020.

[20] Extracted from the Study contract no. MOVE/B4/SER/2019-264/SI2.812549, draft final report dated 20.11 2020. These cost assumptions were also used for the baseline/reference scenario for the Climate Target Plan. Sources used to derive the figures include: Cambridge Econometrics, "Low-carbon cars in Europe: A socio-economic assessment", 2018; Michael Nicolas, "Estimating electric vehicle charging infrastructure costs across major U.S. metropolitan areas", ICCT report, 2019; Spöttle et al., Research for TRAN Committee -Charging infrastructure for electric road vehicles, 2018; Gnann et al., "Fast charging infrastructure for electric vehicles: Today's situation and future needs", Transportation Research Part D: Transport and Environment, Vol 62, 2018; McDonald, Schrattenholzer, 2001, Learning rates for energy technologies. Energy Policy 29, 255-261.

[21] See footnote 19.

Recharging point (350KW DC)	230.000	186.164	164.836	145.532	138.282

Based on the anticipated rapid decrease of costs between 2020 and 2030, the unit costs are based on the cost assumptions for the year 2025:

- for the recharging point of minimum 150 kW: **EUR 72.510;**
- for the recharging point of minimum 350 kW: **EUR 186.164.**

Unit cost for grid connection

These costs can vary widely, depending on the distance to the existing grid.

Based on data from seven CEF actions under the 2014-2020 period (covering 878 grid connections with a wide coverage across the EU[22])[23], a cost of **EUR 92.731** is estimated by calculating the median of the grid connection costs per recharging station.

3.2.2. Amounts of the unit contributions

Unit contributions of electric vehicles recharging points

Table 6 presents the amounts of the unit contribution following application of funding rates (in accordance with the maximum funding rates allowed under the CEF 21-27 Regulation[24]).

Table 6. Unit contributions for electric vehicle recharging points of minimum 150 kW and minimum 350 kW

Recharging point of minimum		General Envelope		Cohesion Envelope	
	unit cost (EUR)	Funding Rate (%)	Unit Contribution (EUR)	Funding Rate (%)	Unit contribution (EUR)
150 kW	72.510	27.6	**20.000**	41.4	**30.000**
350 kW	186.164	21.5	**40.000**	32.2	**60.000**

The estimated figures for the general envelope were cross-referenced against existing national schemes to support electric vehicles recharging points within the non-cohesion Member States, in particular in The Netherlands, Belgium and Germany.

Electric vehicle recharging points of 350 kW financed under CEF shall primarily address high duty vehicles, such as heavy urban distribution trucks or long haul trucks, for which series production by automotive manufacturers are expected in 2021 - 2024. The deployment of this type of high power recharging points is currently very limited and not usually targeted by the national schemes described below. Consequently, no cross-referencing sources are available yet.

The unit contribution for electric vehicle recharging points of minimum 150 kW under the general envelope is lower than the amount of support provided by similar national schemes for high power recharging points of 150 kW, developed in non-cohesion countries (i.e. Germany, Belgium and the Netherlands).

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22 Croatia, Italy, Slovakia, Slovenia, Germany, Austria, Bulgaria, Czech Republic, Hungary, Romania, Belgium, Denmark, Estonia, Finland, France, Latvia, Lithuania, Luxembourg, Netherlands, Poland, Sweden, United Kingdom.

23 See annex

24 The application of the co-financing rates for the general envelope was proportionally aligned on the maximum co-funding rate defined by the CEF 21-27 Regulation for the cohesion envelope, followed by a slight adjustment allowing for a rounding-off the unit contributions.

In Germany:

The support rates are up to a maximum of 50 % and up to a maximum of EUR 30 000[25] for high power recharging points of 100 kW (or more) installed in the blue area of the S-card, i.e. areas identified as with higher needs in annex 1 of the call text.

Eligible costs described in annex 2 of the German call text are similar to the category of costs listed in section 1.2, except for the possible inclusion of upgrades of the electric vehicle recharging point.

In Belgium - Netherlands:

The Benefic project is a cross-border grant scheme, supported by the 2016 CEF call[26]. It aims at launching calls for proposal in Belgium and the Netherlands to support the deployment of alternative fuels infrastructure, in particular electric vehicles recharging stations.

The funding scheme for high power recharging points is 20% of the eligible costs with a maximum of EUR 60.000 co-financing per high power recharging point with P > 150kW. As seen below, this amount is higher than the combined CEF contribution for the recharging point and grid connection.

This maximum amount includes the costs of grid connection, which are treated separately in the context of this decision.

Unit contribution for grid connection

Table 7 presents the contribution amounts following application of funding rates (in accordance with the maximum funding rates allowed under the CEF 21-27 Regulation).

Table 7. Unit contribution of grid connection

Grid connection		**General Envelope**		**Cohesion Envelope**	
	unit cost (EUR)	Funding Rate (%)	Unit Contribution (EUR)	Funding Rate (%)	Unit Contribution (EUR)
	92.731	21.6	**20.000**	32.35	**30.000**

Additional validation of amounts through cross-referencing with other sources

The unit contribution under the general envelope is lower than the amount of support provided by the two non-cohesion national schemes presented above.

In Germany:

The German call text encourages the grid connection per site by supporting the connection to the medium-voltage grid with a maximum of EUR 50 000.

In Belgium - Netherlands:

As mentioned above, the funding scheme allow for a support of a maximum of EUR 60.000 for high power recharging points with P > 150kW including the costs of the grid connection.

[25] https://www.bav.bund.de/SharedDocs/Downloads/DE/LIS/Sechster_Aufruf_zur_Antragseinreichung.pdf?__blob=publicationFile&v=1

[26] https://ec.europa.eu/inea/en/connecting-europe-facility/cef-transport/2016-eu-tm-0277-s

3.3. RETROFITTING OF NOISY WAGON

RAO decision (2018)4510586[27] authorises the use of unit costs for the retrofitting of noisy wagons under the CEF - Transport sector under the period 2014-2020. This action will again be eligible under the 2021-2027 period and under the same conditions. Since the decision was adopted in 2018, no major changes in technology, nor entry on the market of new major suppliers, nor evidence of significant evolution in prices has been observed. Therefore, it is considered appropriate to re-use the amounts previously authorised for the period 2021-2027.

These amounts are presented in Table 8.

Table 8. Retrofitting of noisy wagons unit contribution

Type of wagon	Value per Unit (EUR)	Funding Rate (%)	Unit contribution (EUR)
S-type wagon	1.456	17.2	**250**
SS-type wagon	3.506	17.1	**600**

4. SOUND FINANCIAL MANAGEMENT AND CO-FINANCING PRINCIPLES AND ABSENCE OF DOUBLE FINANCING

4.1. ERTMS

Compliance with the principle of sound financial management was demonstrated in the 2019 RAO decision establishing the unit contributions. As the amounts will be similar and as there has been no major evolution in prices, sound financial management continues to be complied with.

The application of the funding rates (between 25 and 45% of the eligible costs under the general envelope and between 45% and 80% of the eligible costs under the cohesion envelope) in this Decision further contributes to ensuring sound financial management and also ensures that there will be other finding than then the Union contribution for the action.

Double funding is effectively prevented by controls by Commission services at the:

- evaluation stage, based on the information provided by applicants in the application forms;
- final payment stage, based on deliverables received identifying particular vehicles benefitting from the CEF support.

4.2. ELECTRIC VEHICLES RECHARGING INFRASTRUCTURE

Compliance with the principle of sound financial management is ensured by taking account of the decreasing evolution in prices and considering the cost assumptions for the year 2025 both for the electric vehicles recharging points of minimum 150 kW and 350 kW.

While the grid connection costs are site specific, the grid connection costs for a recharging station can be considered as one-off costs as they do not change significantly with an increase or decrease of the number of charging points at a recharging station. A reliable proxy was estimated on the basis of a representative sample of CEF historical data.

[27] Ref. Ares(2018)4510586

The application of lower co-funding rates[28] than the maximum co-funding rate defined by Article 15 of the CEF 21-27 Regulation[29] further contributes to ensuring sound financial management and also ensures that there will be other funding than the Union contribution for the action.

Double funding is effectively prevented by controls by Commission services at the:

- evaluation stage, based on the information provided by applicants in the application forms;
- final payment stage, based on deliverables received.

4.3. RETROFITTING OF NOISY WAGON

Compliance with the principle of sound financial management was demonstrated in the 2018 RAO decision establishing the unit contributions. As the amounts will be similar and as there has been no major evolution in prices, sound financial management continues to be complied with.

The application of a lower co-funding rate (17%) that the maximum co-funding rate defined by Article 15 of the CEF 21-27 Regulation (30%) further contributes to ensuring sound financial management and also ensures that there will be other funding than then the Union contribution for the action.

Double funding is effectively prevented by controls by Commission services (namely INEA) at the evaluation stage and final payment stage on:

- Identification of the freight wagon(s) type(s) to be retrofitted (S or SS type) and their number as registered in the corresponding National Vehicle Register;
- Identification of a workshop where the retrofitting will take place.

[28] Under the general envelope 27,6% for the electric vehicles recharging points of minimum 150 kW; 21,5% for the electric vehicles recharging points of minimum 350 kW and 21,6% for the grid connection.
Under the cohesion envelope 41,4% for the electric vehicles recharging points of minimum 150 kW; 32,2% for the electric vehicles recharging points of minimum of 350 kW and 32,35% for the grid connection.

[29] Maximum co-funding rate under the general envelope is 50% and 85% under the cohesion envelope.