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COMMISSION STAFF WORKING DOCUMENT

Monitoring and Evaluation Framework for the Connecting Europe Facility 2021-2027

Monitoring and evaluation framework for the Connecting Europe Facility 2021-2027

1. Introduction

This performance and evaluation framework presents the monitoring and evaluation strategy for the mandatory evaluation of the Connecting Europe Facility (CEF) covering the 2021-2027 period. It is based in particular on key indicators listed in Part 1 of the Annex to the CEF Regulation (EU) 2021/1153¹.

2. Background

The CEF is managed jointly by DG MOVE, DG ENER and DG CNECT, with support from the executive agencies CINEA and HaDEA. All strands are implemented through direct management, mostly by delegating its implementation to CINEA (transport and energy sectors) and HaDEA (digital). In very specific circumstances, indirect management can be used to implement the programme (e.g. for the technical assistance).

The intervention logic presented further below (Annex IV) describes how this programme is expected to work and it is used to understand how the programme can be monitored and evaluated during the 2021-2027 period. In particular, the intervention logic synthesises the relations between needs, inputs, outputs, results and possible impacts linked with each of the specific objectives for the transport, energy and digital sectors, supported under the CEF Regulation.

Overall, the evaluation takes stock of how the CEF programme has been implemented and assesses, at a minimum, whether the programme has been effective, efficient, coherent and relevant and whether it has provided EU added value. Evaluations will be carried out in line with the article 23 of the CEF regulation.

3. Objectives and policy context

Seamless cross-border connectivity is necessary for the European Union internal market to function properly. The trans-European networks (TEN) in the digital, energy and transport sectors should facilitate cross-border connections, encourage greater economic, social and territorial cohesion, and help combat climate change. The CEF constitutes the financing arm of the three TEN sectors.

The primary objective of the trans-European transport network (TEN-T) Regulation² is to build an EU-wide transport network to increase connectivity in Europe. The trans-European transport network should be gradually developed in three steps with the overall aim to realise a multimodal and interoperable European wide network of high-quality standards, while respecting the overall Union climate neutrality and environmental objectives: the completion of a core network by 2030 of an extended core network by 2040 and of a comprehensive network by 2050. The Annex to the CEF Regulation stipulates the indicative budgetary proportions to be dedicated to the TEN-T core and comprehensive network.

¹ 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 (Text with EEA relevance), OJ L 249, 14.7.2021, p. 38–8.

² Regulation (EU) 2024/1679 of the European Parliament and of the Council of 13 June 2024 on Union guidelines for the development of the trans-European transport network, amending Regulations (EU) 2021/1153 and (EU) No 913/2010 and repealing Regulation (EU) No 1315/2013, *OJ L*, 2024/1679, 28.6.2024

For its part, the trans-European energy networks (TEN-E) Regulation (the 2013 Regulation³ and the revised 2022 Regulation⁴) is a central instrument in the development of an internal energy market and helps fulfil the objectives of the European Green Deal. To achieve higher levels of greenhouse gas emission reductions by 2030 and climate neutrality by 2050 at the latest, the EU will need a more integrated energy system. This system will rely on higher levels of electrification based on additional renewable and low-carbon sources and the decarbonisation of the gas sector (Recital 7 of the TEN-E Regulation). The TEN-E policy also contributes to energy security, market and system integration, and competition that benefits all Member States. It also helps to provide energy at an affordable price for households and businesses.

The TEN-E Regulation creates a process to identify the projects of common interest (PCIs) and projects of mutual interest (PMIs) belonging to energy infrastructure categories (electricity, natural gas, smart grids, hydrogen and CO₂ transport) that are needed to implement energy policy priorities. PCIs and PMIs benefit from advantages in terms of procedure (a one-stop shop and a maximum duration for permitting), regulatory treatment (the faculty to apply for cross-border cost allocation and regulatory incentives) and EU funding (CEF). With the revision in 2022 of the initial TEN-E Regulation of 2013, fossil energy infrastructure projects (particularly for natural gas) are now ineligible for PCI status, whereas new infrastructure categories (including hydrogen projects, smart gas grids and electrolysers) have become eligible.

The part of the CEF dealing with digital matters – CEF digital – helps achieve the Digital Decade policy programme (DDPP)⁵ objectives for connectivity, i.e. to have every household connected to gigabit networks and 5G coverage in all populated areas. This is estimated to require more than EUR 200 billion in investments from the private and public sectors⁶. Due to its proportionally small budget, the CEF contribution has been designed to address:

- 1. cross-border connectivity infrastructures that Member States would not likely be interested in supporting;
- 2. best practice 5G infrastructures, requiring massive densification of base stations backhauled with fibre.

Both types of investments are meant to help improve the coverage of 5G and fibre (therefore gigabit) connectivity.

No private investment is expected in remote regions (e.g. outermost regions) and challenging geographical areas (e.g. mountainous areas), and national funds are unlikely to be used with an overall European interest as the main driver. Therefore, CEF digital is an indispensable source to help ensure a harmonized European approach and adequate connectivity for all Europeans.

³ Regulation (EU) No 347/2013 of the European Parliament and of the Council of 17 April 2013 on guidelines for trans-European energy infrastructure and repealing Decision No 1364/2006/EC and amending Regulations (EC) No 713/2009, (EC) No 714/2009 and (EC) No 715/2009 (Text with EEA relevance), OJ L 115, 25.4.2013, p. 39–75.

⁴ Regulation (EU) 2022/869 of the European Parliament and of the Council of 30 May 2022 on guidelines for trans-European energy infrastructure, amending Regulations (EC) No 715/2009, (EU) 2019/942 and (EU) 2019/943 and Directives 2009/73/EC and (EU) 2019/944, and repealing Regulation (EU) No 347/2013, OJ L 152, 3.6.2022, p. 45–102.

⁵ https://eur-lex.europa.eu/eli/dec/2022/2481

⁶ https://digital-strategy.ec.europa.eu/en/library/investment-and-funding-needs-digital-decade-connectivity-targets

CEF 2021-2027 is the successor of the CEF 2014-2020⁷ programme. Its general objective is to build, develop, modernise and complete the trans-European transport, energy and digital networks and to facilitate cross-border cooperation in the field of renewable energy, taking into account the EU's long-term decarbonisation commitments. It is helping fulfil the goals of increasing: i) European competitiveness; ii) smart, sustainable and inclusive growth; iii) territorial, social and economic cohesion; and iv) the access to and integration of the internal market, with an emphasis on facilitating the synergies among the transport, energy and digital sectors. The digital sectors indirectly contribute to areas such as health, education, mobility, energy and security.

The part of the CEF dealing with transport – CEF transport – helps fulfil the objectives of the European Green Deal and the Sustainable and Smart Mobility Strategy⁸. It takes into account the changed geopolitical situation created by Russia's war of aggression against Ukraine and helps put in place the Solidarity Lanes⁹. CEF transport also aims to improving connectivity of remote, insular or outermost regions or of Member States with no land border with another Member State.

The specific objective of CEF transport sector is to help develop PCIs to complete the TEN- T^{10} in line with the TEN-T Regulation. The programme also helps adapt parts of the TEN-T for dual use of the infrastructure to improve both civilian and military mobility. It is expected to help make the transport system's modes more sustainable, to meet EU climate neutrality and zero pollution ambitions by 2050. The TEN-T regulation requires, with regard to new technologies and innovation, that the TEN-T enables the decarbonisation of all modes of transport by stimulating energy efficiency and the use of alternative fuels while respecting the principle of technological neutrality. Regulation 2023/1084 of the European Parliament and of the Council¹¹ establishes a common framework of measures for the deployment of alternative fuels infrastructure for all modes of transport in the Union in order to reduce as far as possible the dependence on fossil fuels and to mitigate the environmental and climate impact of transport.

CEF transport complements investments made into developing the transport infrastructure under other EU programmes (such as Cohesion Fund and European Regional Development Fund, Recovery and Resilience Facility etc.) and InvestEU. However, the main focus of the CEF transport is developing od cross-border sections and the national sections significant for the cross-border mobility whereas other EU programmes focus merely on developing national sections. In the CEF I and CEF II, Member States have agreed to transfer certain share of their Cohesion Fund to the CEF. Although CEF and Cohesion policy funds are financing the similar type of projects, the CEF focus is on financing the cross-border sections on the TEN-T network. These projects are the highest EU added value connecting the networks in Cohesion countries

⁷ Regulation (EU) No 1316/2013 of the European Parliament and of the Council of 11 December 2013 establishing the Connecting Europe Facility, amending Regulation (EU) No 913/2010 and repealing Regulations (EC) No 680/2007 and (EC) No 67/2010 Text with EEA relevance.

⁸ COM(2020) 789 final of 9.12.2020: Sustainable and Smart Mobility Strategy – putting European transport on track for the future.

⁹ COM(2022) 217 final of 12.05.2022: An action plan for EU-Ukraine Solidarity Lanes to facilitate Ukraine's agricultural export and bilateral trade with the EU.

¹⁰ 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 and repealing Decision No 661/2010/EU Text with EEA relevance OJ L 348, 20.12.2013, p. 1–128.

¹¹ Regulation (EU) 2023/1804 of the European Parliament and of the Council of 13 September 2023 on the deployment of alternative fuels infrastructure, and repealing Directive 2014/94/EU *OJ L 234, 22.9.2023, p. 1–47*

with the TEN-T. The Cohesion Fund is focusing more on developing of national TEN-T sections. The mid-term evaluation of the Recovery and Resilience Facility (RRF) published on 22 February 2024 shows a certain level of complementarity between CEF and RRF. However, shortcomings are present in prioritising cross-border projects under RRF, as there is no mandatory or specific share to be allocated to such projects, and as the plans are developed nationally. In the transport sector, there is a clear complementarity between e.g. CEF Alternative Fuels Infrastructure Facility (AFIF) and call from Clean Hydrogen JU where the latter provides grant support to renewable hydrogen production, hydrogen storage and distribution, hydrogen end users for transport applications, whereas the AFIF provides grant support to hydrogen refuelling stations for all transport modes. Furthermore, synergetic effects of the programmes are also ensured through evaluators from the JU for the evaluation of the AFIF projects. In the air traffic management sector, some of the SESAR research and technological solutions developed under Horizon Europe (e.g. green taxi, environmental performance management, dynamic airspace configuration, collaborative framework managing delay constraints on arrivals, delegation of ATM services provision amongst Air Traffic Service Units) are coming for deployment when the solutions have reached a mature technical readiness level and are deployed in projects implemented under CEF Transport.

The part of the CEF dealing with energy – CEF energy – will help develop energy infrastructure PCIs and, by extension, PMIs between Member States and non-EU countries, in line with the TEN-E Regulation. By providing for cross-border projects in renewable energy to be selected and funded, it will also facilitate cross-border cooperation in energy, including renewable energy. This will enable renewable energy to be deployed cost-effectively in the EU through cooperation mechanisms and achieve the EU's binding target of at least 42.5% renewable energy in 2030, with the aspiration of reaching 45%. CEF energy is fully aligned with the objectives of both the European Green Deal and the REPowerEU plan to rapidly reduce the EU's dependence on Russian fossil fuels by accelerating the clean transition¹².

The CEF's specific objectives in the digital sector are to help develop PCIs related to:

- the deployment of and access to safe and secure very high-capacity networks, including 5G systems;
- the increased resilience and capacity of digital backbone networks on EU territories by linking them to neighbouring territories; and
- the digitalisation of transport and energy networks.

The CEF is expected to target a contribution of 60% of its overall financial budget to cofinancing actions that support climate objectives and move fast towards zero-emission mobility and a decarbonised energy system. The Commission has developed a methodology¹³ to track climate expenditures against the targets set, and it will be applied to all CEF actions.

While the market and the national budgets are expected to primarily help complete the TEN-T, several actions and investments, especially those actions to develop cross-border sections and complete missing links, would not be carried out or would be delayed without EU support.

¹² COM(2022) 230 final of 18.5.2022: REPowerEU.

¹³ Annex I to Regulation (EU) 2021/1060 of the European Parliament and of the Council of 24 June 2021 laying down common provisions on the European Regional Development Fund, the European Social Fund Plus, the Cohesion Fund, the Just Transition Fund and the European Maritime, Fisheries and Aquaculture Fund and financial rules for those and for the Asylum, Migration and Integration Fund, the Internal Security Fund and the Instrument for Financial Support for Border Management and Visa Policy (*OJ L 231, 30.6.2021, p. 159*).

Similarly, CEF energy supports investments in PCIs and PMIs that are not viable under the existing regulatory framework and market conditions.

4. Evaluation cycle

This monitoring and evaluation framework will feed into both evaluation exercises, the ex-post evaluation of CEF regarding the period 2014 to 2020 and the interim evaluation of CEF regarding the period 2021-2027.

Under Article 23 of the CEF Regulation, the Commission must carry out an interim evaluation of the programme once there is sufficient information available about its implementation but no later than 4 years after the implementation has begun. The same article specifies that the Commission must carry out a final evaluation no later than 4 years after the MFF period.

Under Article 27 of Regulation (EU) No 1316/2013, the Commission must also carry out an ex-post evaluation of CEF regarding the period 2014 to 2020. This evaluation examines the effectiveness and efficiency of the CEF and its impact on economic, social and territorial cohesion, as well as its contribution to the Union priorities of smart, sustainable and inclusive growth and the scale and results of support used with a view to reach the climate-change objectives.

5. Problems and needs

To achieve smart, sustainable and inclusive growth, stimulate job creation and fulfil long-term decarbonisation commitments, the EU needs up-to-date, multimodal, high-performance infrastructure in its transport, energy and digital sectors. This is of particular importance to help connecting and integrating the Union and all its islands and regions, including its remote, outermost, peripheral, mountainous and sparsely populated ones.

Completing the transport, energy and digital networks is essential to achieve a seamlessly functioning internal market and boost the EU's competitiveness. Without these cross-border networks, there is a risk that the internal market remains fragmented and that its full benefits conducive to growth and competitiveness cannot be reaped. For energy specifically, a well-interconnected internal market is expected to provide a more secure and more affordable energy supply for all sectors of the economy. Additionally, TEN-T needs to be modernised: for instance, alternative fuels infrastructure across transport modes needs to be deployed, safety of transport (safe and secure parking areas) and access to transport infrastructure improved.

The European Green Deal aims to tackle the interdependent environmental crises (climate change, biodiversity loss and pollution) in a systemic and coherent manner, without leaving anyone behind. To this end, the respective legislation sets targets for the decarbonisation of the transport and energy sectors. Energy networks will need to cater for increased electrification, to integrate a large share of renewable energy power and to serve growing demand linked to low-carbon hydrogen production¹⁴. To accelerate and incentivise the achievement of these objectives, EU-level financial support is needed for greening and digitalising the transport and energy sectors.

¹⁴ To this end, CEF funding for energy infrastructure is restricted to projects on the EU's list of PCIs and PMIs, which are selected based on Regulation (EU) 2022/869 (TEN-E Regulation), which includes sustainability in terms of integrating renewable energy sources into the grid or reducing greenhouse gas emissions as an important new criterion applying to all infrastructure categories. Also, as indicated by Recital 5 of the revised CEF Regulation, there are overlaps between climate and biodiversity objectives..

The changed geopolitical situation and Russia's war of aggression against Ukraine has underpinned the need to:

- step up the development of the civilian-defence dual-use transport infrastructure;
- facilitate the transport flows at the border crossing points with Ukraine and Moldova through Solidarity Lanes;
- accelerate the phase-out of Russian fossil fuels and the clean energy transition.

However, the TEN projects needed to complete the internal market and decarbonise the EU's transport, energy and digital sectors face several challenges: they are often large-scale and entail high costs. Their cross-border nature means that rules and procedures of more than one jurisdiction will apply. Their costs and benefits may not necessarily occur in the same place (with some Member States being net beneficiaries and others being net cost bearers). They often will not be viable in market terms. For these reasons, they may not be the first priority of the Member States concerned, or they may be too costly for Member States to finance the projects alone.

EU action is needed in particular to develop the cross-border connections and eliminate the bottlenecks on the TEN-T and TEN-E. Such actions are by nature EU-dimensional and can be more effectively tackled at EU level as at that level the benefits are tangible.

The European Data Gateways Ministerial Declaration¹⁵ insists on the importance of connecting the EU with its international partners. The Communication '2030 Digital Compass: the European way for the Digital Decade'¹⁶ and the proposal for the 2030 policy programme 'Path to the Digital Decade'¹⁷ reaffirm the crucial role played by digital connectivity and set levels of ambitions for 2030, namely as gigabit network for all European households and 5G in all populated areas. The policy documents also highlight the demand for an even greater quality of connectivity, for instance in terms of bandwidth, low latency, security and resilience¹⁸.

To achieve the Digital Decade goals, it is crucial to leverage public and private investments. However, the telecom sector is currently facing a challenging financial situation¹⁹ due to low revenues and slow take up of gigabit and 5G infrastructures, compared to other regions in the world.

The impact assessment of the CEF 2021-2027 identified the following needs:

- 1. completing trans-European networks in transport, energy and digital area by providing financial support to PCIs selected under TEN policy;
- 2. facilitating the energy transition and technological developments in the transport, energy and digital sectors, by providing funding to greening and digitalisation of networks, particularly through PCIs and cross-border projects in renewable energy;
- 3. better coordination with other EU programmes and better exploitation of synergies within the CEF.

In addition, the transport and energy sectors are undergoing transformation to become cleaner and more sustainable, in line with the European Green Deal objectives. Russia's war of

¹⁵ <u>https://ec.europa.eu/info/sites/default/files/joint_communication_global_gateway.pdf</u>

¹⁶ https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021DC0118&from=en

¹⁷ https://digital-strategy.ec.europa.eu/en/library/proposal-decision-establishing-2030-policy-programme-pathdigital-decade

¹⁸ COM (2021) 574 final - Staff Working Document Accompanying the Commission's Proposal for the Digital Decade Policy Programme, Section 3.3.1.1.

¹⁹ See Section 2.3.2 of the Commission's White Paper 'Building Europe's Digital Infrastructure of Tomorrow'.

aggression against Ukraine has prompted new needs, such as supporting the alternative transport routes (Solidarity Lanes) between Ukraine and the EU Member States and accelerating the phase-out of Russian fossil fuels. Significant investment needs have arisen in this regard.

Several other EU programmes such as RRF, cohesion policy funds, InvestEU, Digital Europe Programme provide synergies and complement the actions supported under the CEF (see chapter 11).

6. Inputs

Inputs consist of the CEF budget, and human and institutional resources. The total budget of the CEF for the 2021-2027 period is EUR 33 710 000 000 across the three strands.

6.1 CEF transport

CEF transport has a total budget of EUR 25 807 000 000, which is divided as follows:

- EUR 12 830 000 000 from the MFF 2021-2027, Heading 1(2), European Strategic Investment (general envelope);
- EUR 11 286 000 000 transferred from the Cohesion Fund to be spent in line with this Regulation exclusively in Member States eligible for funding from the Cohesion Fund (cohesion envelope);
- EUR 1 691 000 000 from the MFF 2021-2027, Heading 5(13) (military mobility envelope).

The budget proposed for development of the civilian-defence dual-use transport infrastructure has been reduced significantly in the inter-institutional agreement on the CEF regulation, allowing less investment into dual-use infrastructure. In addition, the CEF transport sector has contributed EUR 250 million to the Chips Act.

Part II of the Annex to the CEF2 Regulation stipulates the indicative share to be spent to develop the TEN-T core and comprehensive network. The respective indicative budget is set in the CEF transport multiannual programme.

The calls for proposals are carried out in an annual basis in 2021-2024 and under the military mobility envelope in 2021-2023. The budget has been frontloaded due to the high oversubscription of the calls.

DG MOVE and CINEA share the implementation and monitoring of the CEF transport programme, while technical assistance actions are carried out by DG MOVE or other DGs, and by CINEA.

In this MFF, for the grant management process, eGrants system is used. The common tool is expected to streamline the grant application and management process.

6.2 CEF energy

CEF energy has a total budget of EUR 5 838 000 000, of which 15%, depending on market uptake, is intended for cross-border projects in renewable energy. If the 15% threshold is reached, the Commission must increase that threshold up to 20%, subject to market uptake.

DG ENER and CINEA share the implementation and monitoring of the CEF energy programme, while technical assistance actions are carried out by DG ENER or other DGs, and by CINEA.

6.3 CEF digital

The current CEF digital work programme budget amounts to around EUR 1.6 billion for the current MFF for 2021-2027, following the transfer (out of the initial allocation of over EUR 2 billion for CEF digital) of EUR 200 million to the EuroHPC Joint Undertaking, EUR 150 million to the Chips Act and EUR 110 million to the secure connectivity programme IRIS2.

Under Articles 8(4) and Article 9(4) of the CEF Regulation, CEF digital supports, amongst others, the following key topics that target specific types of deployment projects.

a) The deployment of and access to very high-capacity networks, including 5G systems and other state-of-the-art connectivity, in line with EU strategic connectivity targets, in areas where socio-economic drivers are located.

Corresponding work programme topic: 5G for smart communities.

Resources allocated (2021-2023): EUR 111.7 million.

b) The deployment of 5G corridors along major transport paths, enabling the uninterrupted provision of synergy digital services, considering its socio-economic relevance relative to any currently installed technological solutions in a forward-looking approach.

Work programme topic: 5G corridors along transport paths.

Resources allocated (2021-2023): EUR 229.6 million.

c) Deployment or significant upgrade of cross-border backbone networks linking the EU to non-EU countries and strengthening links between electronic communications networks within the EU's territory, including submarine cables.

Work programme topics:

Global gateways (submarine cables)

Resources allocated (2021-2023): EUR 295 million.

d) The deployment of operational digital platforms must prioritise actions based on stateof-the-art technologies, taking into account aspects such as interoperability, cybersecurity, data protection and privacy and data re-use.

Work programme topic: Operational digital platforms.

Resources allocated under CEF (2021-2023) EUR 0 million (there is however \notin 4 million that were allocated to a support action for preparing the work projects for the second work programme project deployment).

7. Activities

The activities supported by the CEF, referred to as 'actions' in the CEF Regulation, generally consist of preparatory studies and construction works related to implementing PCIs or cross-border projects in renewable energy, as well as to providing technical assistance.

The CEF transport sector supports actions, including studies and works (in line with Article 9 of the CEF Regulation) which help:

- complete the TEN-T network: actions related to efficient, interconnected, interoperable and multimodal networks for the development of railway, road, inland waterway and maritime infrastructure;
- modernise the TEN-T network: actions related to smart, interoperable, sustainable, multimodal, inclusive, accessible, safe and secure transport;
- adapt parts of the TEN-T for the dual use of the transport infrastructure to improve both civilian and military transport.

The Commission has established the CEF transport work programme for 2021-2027²⁰, which stipulates the funding priorities, eligible actions and the budget for the calls. The work programme is the basis for the periodical calls for proposals that are launched by CINEA. In 2023, the work programme was amended to address the high oversubscription of the calls for proposals carried out so far and frontload the remaining budget²¹.

For CEF energy, only the following actions (preparatory studies and construction works) will be eligible to receive EU financial support under Article 9(3) of the CEF Regulation:

- actions relating to PCIs and, by extension, PMIs, as set out in Article 14 of the 2013 TEN-E Regulation and Article 18 of the 2022 TEN-E Regulation;
- actions supporting cross-border projects in the field of renewable energy, including innovative solutions, as well as in storage of renewable energy, and their conception, as defined in Part IV of the Annex, subject to the conditions laid down in Article 7 of the CEF Regulation being fulfilled.

The Commission has adopted a multiannual work programme for CEF energy that provides indicative information on the planning of calls and the respective call budgets²².

Regarding CEF digital, the following activities are being carried out:

- providing financial support to fill the investment gap to achieve the gigabit and 5G targets set for 2030, and incentivising public and private instruments to develop high-performance, secure, trans-European communication infrastructures as the 'nervous system' of an increasingly interconnected European society;
- providing targeted CEF digital co-financing to address the market failures by supporting the deployment of gigabit infrastructures, including 5G, and backbone networks;

²⁰ Commission Implementing Decision C(2021) 5763 final on the financing of the Connecting Europe Facility – Transport sector and the adoption of the work programme for 2021-2027 <u>https://transport.ec.europa.eu/system/files/2023-09/c20215763-cef-financing.pdf</u> <u>https://transport.ec.europa.eu/system/files/2023-07/c2023_4886.pdf</u>

²¹ Commission Implementing Decision (2023) 4886 final of 25.7.2023 amending Implementing Decision C(2021) 5763 final on the financing of the Connecting Europe Facility – Transport sector and the adoption of the work programme for 2021- 2027 <u>https://transport.ec.europa.eu/system/files/2023-07/c2023_4886.pdf</u>

 $^{^{22}}$ Commission Implementing Decision C(2022) 7393 final of 13.10.2022 amending the Commission Implementing Decision C(2021) 5791 on the financing of the energy sector under the Connecting Europe Facility and the adoption of the multiannual work programme for the period 2021-2027,

https://energy.ec.europa.eu/system/files/2022-10/C_2022_7393_1_EN_ACT_part1_v2.pdf

https://energy.ec.europa.eu/system/files/2022-10/C_2022_7393_1_EN_annexe_acte_autonome_part1_v4.pdf

- creating new opportunities in the telecom sector to thrive in an increasingly challenging market, where over-the-top (OTT) services and hyperscalers²³ may represent a threat;
- supporting the development of innovation and new use cases, in particular through 5G connectivity investments;
- communicating about the achievements of the implemented projects (stakeholders events and workshops, conferences, online media);
- boosting the capacity, resilience, redundancy and security of EU's internal and international backbone connectivity, in particular with submarine cables and the quantum communication infrastructure.

The CEF transport and energy sectors support studies and works related to projects eligible for CEF support under the TEN-E and TEN-T Regulation. Developing and constructing large-scale infrastructure projects take a significant amount of time. Therefore, the results and impacts are not immediate or visible in the respective MFF period in such cases. In addition, the large-scale transport infrastructure projects are co-funded via several subsequent grants. Currently For instance, for CEF energy, the most recently commissioned PCIs (in 2023) have been supported from CEF1 (2014-2020), while the first CEF2 (2021-2027) supported projects have not yet been commissioned. Therefore, the mid-term evaluation of the CEF2 Regulation could also consider projects that were supported under the CEF1 programme.

The CEF calls for proposals are launched on a competitive basis. The project proposals are evaluated based on five evaluation criteria: priority and urgency, maturity, quality, impact and catalytic effect. The projects which receive the highest scores are expected to have the most significant impact on the network and energy system, and therefore are selected for co-financing. In line with Article 11.4 of the CEF Regulation, the assessment of the proposals in the transport sector must: i) ensure that the proposed actions are consistent with the corridor work plans and implementing acts of the responsible European coordinator, and ii) take into account the consultative opinion of the responsible coordinator.

CEF provides funding in the form of grants and procurement (the latter primarily concerns the technical assistance). For most of the transport projects, EU financial support does not exceed 30% of the total eligible cost. This is increased up to 50% for studies, for priority actions such as cross-border connections, and the civilian-defence dual-use actions: up to 70% for the actions in the outermost regions; and up to 85% for projects where funds are transferred from the Cohesion Fund. For CEF energy, the amount of EU financial support for studies and for works must not exceed 50% of the total eligible cost. The co-funding rate may be increased to a maximum of 75% of the total eligible cost for actions that help develop PCIs that provide a high degree of regional or EU-wide security of supply, strengthen EU solidarity or offer highly innovative solutions. For CEF digital, the EU financial support for the backbone connectivity is 30% for works and 50% for studies. The co-funding rate for works may be increased to 50% if there is a strong cross-border dimension and to 70% for the outermost regions. For the 5G corridors, the EU financial support is 50%, while for the 5G and edge cloud for smart communities, the reimbursement is up to 75% of the infrastructure costs.

²³ A hyperscaler is a large technology company that drives significant industry growth and operates massive, global networks of data centres, providing cloud computing services such as infrastructure as a service (IaaS), platform as a service (PaaS), and software as a service (SaaS) to customers on a pay-as-you-go basis. Examples of hyperscalers include Amazon Web Services (AWS), Microsoft Azure, and Google Cloud Platform (GCP).

8. Outputs

The outputs of CEF consist of the PCIs in all three sectors and the cross-border projects in the field of renewable energy that are making progress thanks to the financing of preparatory studies or construction works. The outputs will be measured, for example, in the number of projects commissioned, which can be translated into metrics such as kilometres of lines added, alternative fuel supply points built or upgraded, and capacity increases (in megawatt or million cubic metres per year). In addition, considering that it takes several years to implement these projects and in some cases implementation is extended beyond the end of the current MFF, it could also be measured in the number of projects for which construction works have started. In line with Part I of the Annex of the CEF Regulation, these outputs can be grouped into different categories.

By collecting data on the projects commissioned or in construction, their total investment costs and the amounts of CEF funding granted (which in line with the co-funding logic set out above in Section 7 is less than 100% of the eligible cost), the evaluation will measure the CEF's efficiency in terms of delivering outputs with a limited volume of input (CEF budget).

8.1 CEF Transport

The CEF-supported projects are expected to help complete and modernise the TEN-T, and help adapt parts of the TEN-T to the civilian-military dual use. CINEA collects quantifiable data for the deliverables shown below and these data are indicated in the schematic intervention logic annexed to this document.

The following are the specific deliverables of the interventions.

- The CEF-supported projects are expected to address the cross-border and missing links on the TEN-T, leading to the newly built or upgraded railway lanes, inland waterway sections, and roads, railroad terminals and other multimodal logistic platforms, and improve the maritime and inland ports.
- The CEF-supported projects are expected to help digitalise transport, in particular through the deployment of the onboard and trackside European Rail Traffic Management System (ERTMS), the River Information System (RIS), Intelligent Transport Systems (ITS), the Vessel Traffic Management System (VTMIS), e-Maritime services, and the Single European Sky ATM Research project (SESAR).
- The CEF-supported projects are expected to help develop the newly built or upgraded alternative fuel supply points along the TEN-T for all modes of transport.
- The CEF-supported projects are expected to help improve transport safety, in particular by developing the safe and secure parking areas for trucks and removing level crossings on roads.
- The CEF-supported projects are expected to help improve accessibility infrastructure so people with reduced mobility can access transport.
- The CEF-supported projects are expected to help reduce the rail freight noise.
- The CEF-supported projects are expected to help adapt parts of the TEN-T to the civilian-defence dual-use requirements.
- The CEF transport supported actions have synergies with other CEF areas, for example grid connections to the charging stations.

8.2 CEF Energy

In line with the key indicators in Part I of the Annex to the CEF Regulation, the following are the specific outputs of the CEF actions.

- Regarding interconnectivity and integration of markets (a), the CEF-supported actions are expected to contribute to projects that interconnect Member States' networks and remove internal constraints (**first key indicator**).
- Regarding security of supply (b), the CEF-supported actions are expected to contribute to projects that ensure a resilient gas network (second key indicator).
- Regarding security of supply (b), the CEF-supported actions are expected to contribute to the smartening and digitalisation of grids and the increasing of energy storage capacity (third key indicator).
- Regarding sustainable development through enabling decarbonisation (c), the CEFsupported actions are expected to contribute to projects that enable increased penetration of renewable energy in energy systems (**fourth key indicator**).
- Regarding sustainable development through enabling decarbonisation (c), the CEFsupported actions are expected to contribute to cross-border cooperation in the field of renewable energy (**fifth key indicator**).

8.3 CEF digital

Following the objectives set out in the DDPP, the following are the expected outputs of CEF digital actions:

- deployed or upgraded submarine/terrestrial cables with an increased number of fibre pairs which translates into additional capacity;
- Deployed 5G infrastructures along transport corridor(s) in each Member State and at EU level (for roads, rail, inland waterways and multimodal transportation);
- increased number of connected operators and other energy/mobility stakeholders supporting cross-border exchange of data and services;
- deployed 5G networks, enabled 5G-based use cases for socio-economic drivers and created new edge nodes.

9. Results

The results of the CEF comprise the effects that the PCIs and cross-border renewable energy projects implemented thanks to CEF supported actions are expected to have. In other words, the CEF results consists of the effects of the outputs identified above towards the relevant objectives.

9.1 CEF Transport

The results of the small-scale and short-timeline projects, for example the deployment of charging stations, is visible already during the MFF. On the other hand, for example the results of the complex and large-scale cross-border railway projects, which may stretch over several MFFs, may not be available within the same MFF. Measuring the results of the programme requires to go beyond the usual time span of the CEF projects. Moreover, to measure achievements in terms of transport policy, the output of the infrastructure has to be considered together with other aspects, such as the transport service provided by the same infrastructure,

the charging policy applied, soft regulatory measures applied, etc. Still, many smaller scale projects such as deployment of EV infrastructure under the CEF II are already showing results.

Based on the outputs of the actions, the results of CEF are expected to be the following:

New or upgraded railway infrastructure supported by the CEF is expected to help: i) improve cross-border connectivity across the TEN-T railway network (including ERTMS); ii) increase the capacity for freight and passenger traffic; iii) increase the possibilities for freight modal shift; and iv) reduce the travel time for passengers.

New or upgraded inland waterways and newly-built or upgraded inland and maritime port infrastructure are expected to help improve connectivity across the TEN-T waterborne network, boost capacity, and increase the possibilities for freight modal shift in inland and maritime ports.

The new or upgraded railroad terminals and multimodal logistic platforms are expected to contribute to the modal shift and more effective transportation.

The new or upgraded road infrastructure is expected to improve cross-border connectivity across the TEN-T road network (including ITS), increasing safety and security for users.

The deployment of alternative fuels infrastructure along the TEN-T network (and the support to mobile assets in certain limited cases) aims to help decarbonise the transport sector. In particular, it is expected to support the uptake of alternative fuels infrastructure for all transport modes.

By reducing rail freight noise, the quality of life of people living close to the railways will improve. By improving accessibility for persons with reduced mobility makes the transport infrastructure more accessible.

The construction or upgrade of parts of the TEN-T network to adapt to the dual-use requirements (civil-military) is expected to help prepare the transport infrastructure for the civilian-military dual use for all transport modes.

CEF is also expected to contribute to territorial cohesion by improving maritime port, airport and road infrastructure as well as urban nodes in rural and remote regions such as the outermost regions²⁴, as they have specific challenges such as extreme remoteness, insularity and small size, recognised by Article 349 TFEU.

9.2 CEF Energy

CEF energy funded actions have led to the commissioning of PCIs, PMIs and cross-border projects in the field of renewable energy. However, investment in large infrastructure and generation projects have long lead times and implementation periods. Therefore, the evaluation should take into account: (a) commissioned projects funded from the previous MFF, i.e. the CEF1 programme (2014-2020); and (b) projects funded from CEF1 or CEF2 that are not yet commissioned, but for which construction works have started.

• CEF-supported actions are expected to lead to better interconnection of national electricity grids and of national gas grids (in terms of the number of Member States connected, the reduction of Member States' isolation and access to new gas sources).

²⁴ French Guiana, Guadeloupe, Martinique, Mayotte, Reunion Island, Saint-Martin (France), the Azores, Madeira (Portugal) and the Canary Islands (Spain).

They are also expected to lead to development of offshore electricity grids (both radial and hybrid), cross-border hydrogen networks and CO₂ networks. This in turn will help create EU-wide electricity, gas and hydrogen markets and CO₂ transport and storage markets.

- CEF-supported actions expected to lead to a better interconnected gas and hydrogen system that ensures a secure and diversified gas and hydrogen supply.
- CEF-supported actions expected to lead to: i) a more efficient and intelligent electricity transmission and distribution network; ii) increased capacity to integrate new forms of generation, energy storage and consumption and facilitate new business models and market structures; iii) several low-carbon and renewable gases, including biomethane or hydrogen, being integrated into the gas network; and iv) an energy system that can integrate more renewable energy thanks to sufficient storage capacity.
- CEF-supported actions expected to lead to a more meshed energy system that: i) links Member States with offshore generation centres; ii) provides for energy system integration across energy vectors; and iii) allows for increased integration of renewable energy sources.
- CEF-supported actions expected to lead to: i) a cost-effective deployment of renewables and a higher share of renewable energy in generation and consumption at EU level: and ii) renewable energy sources being better integrated into electricity, gas and hydrogen grids, including through novel technologies, project set-ups and value-chain approaches.

9.3. CEF digital

1. Improved access to very high-capacity networks, including 5G systems, capable of providing gigabit connectivity in areas where socio-economic drivers are located;

2. uninterrupted coverage of 5G systems on all major transport paths, including the trans-European transport networks;

3. deployment of new or significant upgrade of existing backbone networks including submarine cables, within and between Member States and between the EU and non-EU countries, to the extent to which they significantly help increase performance, resilience and the very high capacity of the electronic communications networks;

4. deployment of a European quantum communication infrastructure (EuroQCI) to provide EU actors with a worldwide quantum key distribution service, with this infrastructure possibly being upgraded to a fully-fledged quantum information network, including a terrestrial QCI and a space QCI;

5. implementation of digital connectivity infrastructures related to cross-border projects in the areas of transport or energy and/or supporting operational digital platforms directly associated to transport or energy infrastructures.

10. Impacts

The actions supported by the CEF transport aim to help improve the cross-border connectivity, make transport more environmentally friendly, reduce emissions, and promote modal shifts by encouraging greater use of railways, maritime, and inland waterway transport. In addition, they support the widespread implementation of alternative fuel infrastructure across all modes of transport. They contribute to the goals of economic, territorial and social cohesion and the access to and integration of the internal market. Better connectivity is expected to lead to the economic growth and creation of jobs.

Digitalisation in transportation is expected to improve traffic management, reducing congestion and improving overall efficiency. Investments in dual-use civilian-military transport infrastructure are expected to step up the preparedness of the transport infrastructure for civilian-military dual-use and response capabilities within the EU territory, consequently improving the security in the EU Member States.

Acknowledging the long implementation timeline of large-scale infrastructure projects, often the CEF only contributes to specific sections of comprehensive projects. Therefore, the immediate impact of the intervention might not be apparent during or after the respective MFF. However, once the infrastructure becomes operational, its influence on the performance of the transport network is likely to extend over decades.

The output and results of the activities identified above as supported by CEF energy are expected to contribute to: i) more integrated, liquid and competitive markets for electricity, gas, hydrogen and CO_2 transport and storage; ii) secure access to affordable and decarbonised energy for all sectors of the economy; and iii) an energy system that is smart and increasingly decarbonised, thanks to increasing volumes of renewable energy sources being integrated into the electricity system.

This impact will be measured by assessing and quantifying the contribution of the actions supported under CEF energy to points identified in the previous paragraph, namely: how and how much they:

- i) Increased integration and competitiveness in the electricity, gas, hydrogen and CO₂ transport and storage markets; As a basis to this assessment we will rely on the results identified for CEF-supported actions linked to the **first specific objective** ("Fostering market integration and interconnectivity of networks and sectors") and linked to **the first and third key indicator** (see section on Outputs).
- ii) Increased secure access to affordable and decarbonised energy; As a basis to this assessment we will rely on the results identified for CEF-supported actions linked to the **second and third specific objective** ("Promoting security of supply, including through the smartening and digitalisation of grids and the increasing of energy storage" and "Sustainable development through enabling decarbonisation, including increased penetration of renewable energy in energy systems") and linked to the **second, third and fifth key indicator** (see section on Outputs).
- iii) Increased smartness of the energy system and integrating renewable energy into the EU energy mix. As a basis to this assessment we will rely on the results identified for CEF-supported actions linked to the **second and third specific objective**, and therefore linked to the **third fourth and fifth key indicator** (see section on Outputs).

CEF digital:

Tackling market failure and its negative effects on socio-economic indicators

While there is strong competition in many areas of the electronic communications sector, there are still situations of severe market failure which undermine digital inclusion and competitiveness. One of these is the lack of availability of strong and resilient backbone connectivity in certain areas, particularly for remote territories (such as the outermost regions)

or less densely populated territories and areas with socio-economic characteristics disincentivising commercial deployment. Such backbones are needed to support the deployment of very high-capacity networks, both fixed and mobile, in those areas. Their deployment will help prevent digital divides, isolation and depopulation, reducing the costs of delivery of both goods and services and partially compensating for remoteness.

Recent studies confirm that access to very high-capacity networks is a driver of inclusion: in areas characterised by a digital divide, the risk of unemployment for long periods is 45%, compared to 6% in adequately connected areas. Moreover, territories with access to gigabit networks have a high birth rate for businesses compared to poorly connected territories.

Deploying 5G to improve the efficiency of socio-economic drivers

5G connectivity coupled with edge computing and other technologies can help socio-economic drivers (such as schools, universities, libraries, local, regional or national administrations, main providers of public services, hospitals and medical centres, as well as certain transport hubs) to carry out their missions more efficiently. CEF digital helps finance such projects in areas where commercial deployment of 5G connectivity has neither taken place nor is expected in the near future. In addition, these 5G projects can serve as a model and contribute to a wider adoption of advanced solutions by other socio-economic drivers in the neighbouring areas and across the EU. By connecting them to very high-capacity networks, we can maximise their positive impact on the wider economy and society.

Gigabit and 5G connectivity as driver for competitiveness

CEF digital helps achieve the connectivity targets set in the DDPP, namely connecting all European households to a gigabit network and ensuring 5G coverage in all populated areas. Achieving the connectivity targets is paramount to all the other objectives set in the DDPP along the 'cardinal points', namely people, public services and businesses. This would highlight the foundational role of connectivity for the whole digital sector and the economy and society at large.

Internet of Things (IoT) and edge-cloud services alongside AI and Web 4.0, will enable myriads of data-intensive applications, for consumers, businesses and public services, requiring unprecedented quality of connectivity, in terms of low latency, high bandwidth, symmetry and robustness, including in large geographical areas and with cross-border continuity. However, the costs and funding models for 5G and fibre deployment of such future-proof infrastructures remain unclear and the perceived risks of 'first mover' commercial deployment are very high for investors.

According to the 2023's State of the Digital Decade Report, 5G has reached 81% penetration in populated areas. However, the coverage is limited to only 42% if the 5G service is provided on the 3.4-3.8 GHz bands. This means that considerable effort is required to ensure that the most advanced version of 5G, the 'standalone' version that can ensure an appropriate level of quality of service and high generation of value, particularly for businesses and industry, is deployed throughout the EU. The CEF provides unique opportunities to stakeholders to develop such advanced 5G infrastructures and related business models in real-life situations, mitigating the 'first mover' risks and providing opportunities to build EU strengths in the sector.

Furthermore, 50% of telcos' revenues will have to be spent on aligning network infrastructures with major technology changes (e.g. network virtualisation, IoT and edge-cloud integration, security compliance, etc.). This requires EU-level intervention in particular via the CEF, in

order to mitigate the impact of this transformation on critical EU assets such as telecommunications infrastructures. Without the CEF, there would be a risk that technological approaches would be fragmented with EU's telecom critical infrastructure assets becoming increasingly vulnerable with respect to possible acquisitions by non-EU controlled investors.

There is a strong correlation between investing in connectivity infrastructures and spillovers along the whole digital value chain, namely in terms of enabling greater digital capacities (possibility to interconnect pan-European resources such as cloud, data or high-performance computing) as well as vertical application domains (e.g. health or education). CEF digital projects will generate synergetic effects between different segments and will support a coherent European approach to deploying digital capacities and solutions across the value chain.

In this context, CEF digital will also be used to reduce fragmentation within the EU telecommunications sector and enable strong EU players capable of competing worldwide to emerge. Public and private investments catalysed through CEF digital should enable operators to rapidly renew their business model, embracing a wider offer than bare broadband services for consumers, gaining new ground in innovative connectivity services for businesses, public services and consumers.

Strengthening EU digital sovereignty

Lastly, CEF digital is a fundamental tool to strengthen the EU's international connectivity and digital sovereignty, in line with the Global Gateway strategy. The deployment of backbone networks, including submarine cables connecting EU territories to non-EU countries on other continents or connecting European islands, outermost regions or overseas countries and territories, is needed to: i) provide necessary redundancy for such vital infrastructure; ii) increase the capacity, resilience and security of the EU's digital networks; and iii) contribute to territorial cohesion. However, such projects are often commercially non-viable without public support. In addition, support should be available to connect digital capacities with adequate terabit-capacity connections across the EU, such as high-performance computing resources, cloud federations, and to ensure ultra-secure connectivity between Member States, including through deploying a QCI.

Leveraging public and private funds

The funding gap to achieve the DDPP connectivity targets is so wide that the CEF and other EU funding should be used to leverage private investment, when possible. CEF will help bringing together public support and private investment in the most efficient manner possible, for instance, by stimulating private operators' investments to deploy networks as comprehensively as possible in terms of geographical reach, diversity of targeted entities, quality of connectivity, etc.

One way to leverage private investments is through financial instruments. For instance, drawing on the lessons learnt from the Connecting Europe Broadband Fund (CEBF) launched under CEF Telecom, a CEF investment into an equity instrument could lead to a leverage effect of between 5 and 6 times the capital invested.

Digital connectivity infrastructures are supported at European, national, regional and local levels. CEF digital helps cross-fertilise these investments and acts as a catalyst for the EU-wide digital connectivity ecosystem. By encouraging the combination of different funding sources and taking into account the existence of complementary projects (e.g. national segments of broadband infrastructures in market failure areas complementing cross-border projects or complementary backhaul and access networks), the aim is to reduce the fragmentation of

investments while ensuring the coherence, interoperability and harmonisation of digital connectivity infrastructures and their efficient integration into other strategic infrastructures, particularly in the sectors of transport and energy.

11. Coherence with other EU policies and instruments

The CEF is one of the programmes that has helped complete the TEN-T and the TEN-E. It also helps fulfil decarbonisation objectives in the transport and energy sectors. It represents only a small share of the investments needed to meet the objectives of the TEN-T and TEN-E Regulations and complete the TEN-T and TEN-E. In addition to the national and market-based funding and financing coming from the regulatory framework (i.e. tariffs paid by network users), several other funding programmes and instruments support investments into the TEN-T and TEN-E: for the transport sector, these are cohesion policy funds (European Regional Development Fund, Cohesion Fund), the Recovery and Resilience Facility (RRF) and InvestEU. For the energy sector, funding can come mainly from the RRF and InvestEU. To avoid overlaps in the financing of the same activity as well as double-funding of the same cost, there are coordination processes in place.

Synergies and complementarities with other EU funds for developing the TEN-T and TEN-E networks are coordinated with responsible national authorities and relevant Commission DGs and services. as an example, the highest priority of CEF transport is to support the projects that develop the cross-border connections and eliminate bottlenecks on the TEN-T. The other EU programmes will complement this support, for instance, dealing with national sections on the TEN-T.

Although other programmes also support connectivity, including the RRF, the European Regional Development Fund, the European Agricultural Fund for Rural Development, InvestEU and national programmes, CEF digital is focused on addressing cross-border needs in which individual Member States would not invest, such as 5G corridors or backbones, as well as supporting strategic connectivity between the EU and non-EU countries.

12. External factors

The global pandemic and the outbreak of Russia's war of aggression against Ukraine have a direct impact on the implementation of CEF projects. These events have led to delays in implementing projects, high inflation and increased costs of construction material and components, lack of workers and disruption to the supply chains. Therefore, the projects need more time and more financing so the actions can be carried out.

In addition, due to Russia's war of aggression, the transport connectivity with Ukraine and Moldova had to be improved, in order to continue exporting agriculture products from Ukraine. The Commission established the Solidarity Lanes and CEF transport has provided financial support to facilitate the transport flows at the border crossing points between EU Member States and Ukraine and Moldova.

The COVID-19 pandemic and the Russian war of aggression against Ukraine highlighted the importance of high-quality secure connectivity within the EU and between the EU and its international partners. The submarine cables serving more than 97% of the international internet traffic are therefore playing a crucial geopolitical role as critical infrastructures that support the economy and the functioning of our society.

CEF energy has been affected by changes in the policy framework: first by the 2022 revision of the TEN-E Regulation, which amended the PCI infrastructure categories that are eligible for CEF; and second by the policy response to Russia's war of aggression in Ukraine, particularly

the REPowerEU plan, with is focus on reducing dependency on Russian fossil fuels, diversifying supply sources of gas, and accelerating the clean energy transition, and the different pieces of legislation it has entailed.

Other EU programmes, such as regional policy funds and the RRF support the development of the transport and digital infrastructures. CEF support can create synergies with other funding programmes to achieve the TEN-T and the DDPP objectives.

13. Indicators for monitoring and evaluation

The **programme's effectiveness** will be measured, in particular, by the number of PCIs and cross-border projects in the field of renewable energy that reach construction stage or are commissioned thanks to CEF support for studies and/or works and how their impact contributed towards the CEF objective. Additional project-related indicators could include: (a) the number of projects commissioned thanks to support from CEF-1 (2014-2020), given that projects generally take a long time to materialise; and (b) the number of projects for which the completion is scheduled by the end of the MFF.

The **programme's efficiency** will be assessed, in particular, by considering the CEF's outputs and results in relation to its inputs such as budget and resources, taking into account whether the CEF objectives are being met in an efficient manner and whether the CEF's management processes are efficient. One particular metric will be the ratio between the CEF grants awarded for studies and/or works and the total investment costs of the projects that reach construction stage or commissioning.

The **programme's relevance** will be assessed qualitatively by considering the events and policy developments that have occurred since the start of CEF2 and their effect on the problems and needs. As a preliminary consideration, the Russian war of aggression against Ukraine and the need to develop Solidarity Lanes and phase out Russian fossil fuels appear to have strengthened the case for integrating and decarbonising transport, energy and digital networks. The evaluation should also consider, for CEF Energy, that the revised TEN-E Regulation has introduced new infrastructure PCI categories (particularly offshore grids, hydrogen and electrolysers), which has expanded the scope of the trans-European networks for energy and therefore the scope of the needs in terms of decarbonisation and market integration.

The **programme's coherence** will be assessed qualitatively by considering the objectives and effects of other programmes at EU and national level, as well as international obligations such as the Paris Agreement and the UN Sustainable Development Goals. Under coherence, the evaluation should also explore the synergies between the three strands, in particular by measuring the share of the CEF budget that went to projects or project components that belong to more than one strand. Further, this assessment will look into the coordination with other EU funded programmes by ascertaining potential overlaps and complementarity with them.

The **EU added value** will be assessed qualitatively by examining if the same results could have been achieved by action at Member State level. This could, for instance, be done by establishing counterfactual scenarios for CEF-funded PCIs to determine whether they would have been implemented at all, at the same scale and/or within the same timeframe.

The CEF Regulation includes seven indicators for the transport sector, five indicators for the energy sector and two for CEF digital (Annex, Part I, of the CEF Regulation). In addition, CINEA collects information and data on the indicators which are not included in the legal basis but are valuable for monitoring and evaluating the performance of the programme.

Furthermore, the schematic intervention logics annexed to this document present the links between objectives, needs, outputs, results and impact of the CEF-supported actions.

The following indicators address the specific objectives of the CEF2 Regulation.

CEF transport

Specific objectives	#	Indicator framework
of the CEF		of the CEF2 Regulation
Regulation		
Efficient,	1	Number of cross-border and missing links addressed with the
interconnected and		support of CEF (including actions relating to urban nodes, regional
multimodal networks		cross-border rail connections, multimodal platforms, maritime
and infrastructure		ports, inland ports, connections to airports and railroad terminals of
for smart,		the TEN-T core and comprehensive network)
interoperable,	2	Number of CEF-supported actions helping digitalise transport, in
sustainable,		particular through the deployment of the ERTMS, RIS, ITS,
inclusive, accessible,		VTMIS/e-Maritime services and SESAR
safe and secure	3	Number of alternative fuel supply points built or upgraded with
mobility		CEF support
	4	Number of CEF-supported actions helping to make transport safer
	5	Number of CEF actions helping to make transport more accessible
		to people with reduced mobility
	6	Number of CEF-supported actions helping reduce rail freight noise
Adaptation to	7	Number of transport infrastructure components adapted to civilian-
civilian-military		military dual-use requirements
dual- use transport		
infrastructure		

CEF energy

Specific objectives of the CEF	#	Indicator framework of the CEF2 Regulation
Regulation		
Contribution to	1	Number of actions supported by the CEF contributing to projects
interconnectivity and		interconnecting Member States' networks and removing internal
integration of		constraints
markets		
Security of supply	2	Number of actions supported by the CEF contributing to projects
		ensuring resilient gas networks
	3	Number of actions supported by the CEF contributing to the
		smartening and digitalisation of grids and increasing energy
		storage capacity
Sustainable	4	Number of actions supported by the CEF contributing to projects
development through		enabling increased penetration of renewable energy in energy
enabling		systems
decarbonisation	5	Number of actions supported by the CEF contributing to cross-
		border cooperation in the field of renewable energy

CEF digital

Specific objectives of the CEF	#	Indicator framework of the CEF2 Regulation
Regulation	-	
Development of	1	Number of actions supported by the CEF contributing to
PCIs for the		projects enabling increased capacity of networks (including 5G
deployment of and		systems) and safe/secure access
access to safe and		
secure very high-		
capacity networks		
Contribution to	2	Number of actions supported by the CEF contributing to
increased resilience		projects ensuring resilience of digital backbone networks and
and capacity of		increased capacity of digital backbone infrastructure
digital backbone	3	Number of actions supported by the CEF contributing to
networks in the EU		international connectivity by connecting the EU to third
		countries.

14. Data collection

For CEF transport, the data on the indicators is collected through an IT tool – MApping Performance Indicators for Transport (-MAP-IT) – developed by CINEA. MAP-IT is an internal data collection tool that combines the features of project map creation, TEN-T network allocation and indicator encoding. The grant agreements concluded with the beneficiaries are the main sources of information and data. These are encoded in MAP-IT by CINEA project managers (basic checks of the data are in place). CEF beneficiaries do not currently have direct access to the tool.

For CEF energy, CINEA will use the data available from the PCI Transparency Platform and the grant management system E-Grants.

For CEF digital, the data will be collected mostly through the KPI tool via eGrants (projects' continuous reporting) but also through specific deliverables (e.g. analysis reports) provided by the different support actions for the different topics.

Annex I (CEF transport)

Data collection for the indicators included in the CEF Regulation and additional data available for monitoring and evaluation purposes

The following section explains how the data addressing the indicators will be collected. Apart from the data collected to measure the indicators laid down in the CEF legal basis, CINEA collects additional data for monitoring and evaluation purposes.

- 1. Data collection for the indicators included in the CEF regulation
 - 1. Number of cross-border and missing links addressed with CEF support (including actions related to urban nodes, regional cross-border rail connections, multimodal platforms, maritime ports, inland ports, connections to airports and railroad terminals of the TEN-T core and comprehensive network).

This indicator counts the number of cross-border and missing links addressed by CEF grant agreements. The cross-border and missing links are defined in the CEF Regulation.

Туре	Output
Frequency of update	At grant agreement signature, afterwards at least once per year or if there are amendments. Final update is requested when the project has finished.
Baseline	Zero – without CEF intervention it is assumed that the project would not happen.
Source	MAP-IT, based on data provided by the project beneficiaries and encoded by CINEA (basic checks in place).
Unit of measurement	Number of cross-border and missing links.

2. Number of CEF-supported actions that help digitalise transport, in particular through deploying ERTMS, RIS, ITS, VTMIS/e-Maritime services and SESAR.

This indicator counts the number of CEF grant agreements on topics under the SIMOB calls that help digitalise transport, including: ERTMS, RIS, ITS, VTMIS, e-Maritime, SESAR and other smart applications.

Туре	Output

Frequency of update	At grant agreement signature, afterwards at least once per year or if there are amendments. Final update is requested when the project has finished.
Baseline	Zero – without CEF intervention it is assumed that the project would not happen.
Source	MAP-IT, based on data provided by the project beneficiaries and encoded by CINEA (basic checks in place).
Unit of measurement	Number of grant agreements.

3. Number of alternative fuel supply points built or upgraded with CEF support.

This indicator counts the number of alternative fuel supply points built or upgraded by CEF Transport.

Туре	Output
Frequency of update	At grant agreement signature, afterwards at least once per year or if there are amendments. Final update is requested when the project has finished.
Baseline	Zero – without CEF intervention it is assumed that the project would not happen.
Source	MAP-IT, based on data provided by the project beneficiaries and encoded by CINEA (basic checks in place).
Unit of measurement	Number of alternative fuel supply points.

4. Number of CEF-supported actions contributing to the safety of transport.

This indicator counts the number of CEF grant agreements dealing with road safety: safe and secure parking, removal of level crossings, improving the road alignment for safety reasons, and ITS.

Туре	Output
Frequency of update	At grant agreement signature, afterwards at least once per year or if there are amendments. Final update is requested when the project has finished.

Baseline	Zero – without CEF intervention it is assumed that the project would not happen.
Source	MAP-IT, based on data provided by the project beneficiaries and encoded by CINEA (basic checks in place).
Unit of measurement	Number of grant agreements.

5. Number of CEF actions helping to make transport more accessible to people with reduced mobility.

This indicator counts the number of CEF grant agreements that help increase access for passengers with reduced mobility. Only projects addressing accessibility improvements in railway stations will be included.

Туре	Output
Frequency of update	At grant agreement signature, afterwards at least once per year or if there are amendments. Final update is requested when the project has finished.
Baseline	Zero – without CEF intervention it is assumed that the project would not happen.
Source	MAP-IT, based on data provided by the project beneficiaries and encoded by CINEA (basic checks in place).
Unit of measurement	Number of grant agreements.

6. Number of CEF-supported actions contributing to reduce rail freight noise.

This indicator counts the number of CEF grant agreements addressing rail freight noise reduction through the retrofitting of wagons.

Туре	Output
Frequency of update	At grant agreement signature, afterwards at least once per year or if there are amendments. Final update is requested when the project has finished.
Baseline	Zero – without CEF intervention it is assumed that the project would not happen.
Source	MAP-IT, based on data provided by the project beneficiaries and encoded by CINEA (basic checks in place).

7. Number of transport infrastructure components adapted to civilian-military dualuse requirements.

For each relevant grant agreement, CINEA collects the dual-use requirements addressed, in accordance with the annex to the Commission Implementing Regulation 2021/1328.

Once the dual-use requirements have been selected, one or more of the following 14 transport infrastructure components are linked via a reference table: i) airport capacity and air traffic management; ii) airport capacity; iii) seaport capacity; iv) connectivity to rail; v) rail capacity; vi) motorway capacity; vii) inland waterways capacity; viii) airport connectivity to rail; ix) airport connectivity to motorways; x) seaport connectivity to motorways; xi) inland port connectivity to rail; xii) inland port connectivity to motorways; xiii) multimodal handling capacity; and xiv) cybersecurity.

Туре	Output
Frequency of update	At grant agreement signature, afterwards at least once per year or if there are amendments. Final update is requested when the project has finished.
Baseline	Zero – without CEF intervention it is assumed that the project would not happen.
Source	MAP-IT, based on data provided by the project beneficiaries and encoded by CINEA (basic checks in place).
Unit of measurement	Number of transport infrastructure components (based on a reference list provided by DG MOVE).

2. Programme specific indicators

The Commission and CINEA use 18 detailed indicators to monitor the performance of CEF transport:

#	Indicator
1	The number of cross-border and missing links addressed through CEF support
2	The number of alternative fuel supply points installed with CEF support
3	The number of mobile assets built or upgraded with CEF support
4	The number of energy infrastructures supported by CEF
5	The number of inland ports improved with CEF support
6	Investment in inland waterways infrastructure supported by CEF

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7 The number of maritime ports improved with CEF support

8 CEF support to other maritime interventions (not inside ports)

9 Investment in railway infrastructure supported by CEF

10 The number of vehicles equipped with onboard ERTMS with CEF support

The number of rail freight wagons equipped with composite brake blocks with 11 CEF support

12 The number of km of road newly constructed or upgraded with CEF support

13 The number of secure parking places built or upgraded with CEF support

14 The number of airports improved with CEF support

15 CEF support to air traffic management

16 The number of rail-road terminals improved with CEF support

Investment in freight and/or passenger handling infrastructure and equipment supported by CEF

18 CEF support to ITS

2.1. Detailed description of programme specific indicators and the data collection

1. The number of cross-border and missing links addressed through CEF support The CEF Regulation includes an indicative list of cross-border and missing links which need to be addressed to ensure a seamless transport network. CEF transport projects are linked to the indicative list of cross-border and missing links through their location, in MAP-IT. Whenever an action addresses at least one missing link, the full funding of the action identified will be counted.

Туре	Output
Frequency of update	At grant agreement signature, afterwards at least once per year or if there are amendments. Final update is requested when the project has finished .
Baseline	Zero – without CEF intervention it is assumed that the project would not happen.
Source	MAP-IT, based on data provided by the project beneficiaries and encoded by CINEA (basic checks in place).
Unit of measurement	Number of cross-border and missing links.

2. The number of alternative fuel supply points installed with CEF support

For alternative fuel supply, CINEA collects different indicators depending on the final user (road, inland waterway, maritime, stationary aircrafts).

Туре	Output
Frequency of update	At grant agreement signature, afterwards at least once per year or if there are amendments. Final update is requested when the project has finished.
Baseline	Zero – without CEF intervention it is assumed that the project would not happen.
Source	MAP-IT, based on data provided by the project beneficiaries and encoded by CINEA (basic checks in place).
Unit of measurement	Number of alternative fuel supply points.

2.1 Alternative fuel supply for road users

The indicator on alternative fuel supply points for road users covers supply points for electricity, hydrogen, compressed natural gas (CNG) and liquefied natural gas (LNG) to road users, including those in freight or passenger handling areas (e.g. airport ground handling vehicles and freight handling vehicles). The scope includes the related grid connections.

Alternative fuel supply points for road users are represented as points on a map, depicting the real location of the infrastructure.

The output indicator for alternative fuel supply for road users is different depending on whether the project is selected under the unit contribution topics or not. Funding shares are collected at the level of the alternative fuel supply station. The data are available for the number of supply stations and points for road users, their location and the part of the TEN-T network to which they contribute. Data are also available on the status, power capacity, connectors and final user type. See the table below for more details.

Section	Question	Reply
Common	Works or study	Works
Common	Status	Not started yet/ongoing/completed/terminated/partially completed
Common	In operation date	Date

Table 1: Alternative fuel supply for road users indicator

Section	Question	Reply
Common	Green/bioenergy source	Yes/no/partially
Common	Comments	Free text
Common	Fuel type	EV/H2/CNGLNG
Common	Intended usage (mobile asset)	Light-duty vehicles (LDVs)/heavy-duty vehicles (HDVs)/ handling equipment & vehicles
Common	Intended usage (subtype HDV)	Bus/truck
Common	captive fleet	Yes/no
EV	Grid connection	Yes/no
EV	Type of connectors	Options available
EV	Number of recharging points with output power up to 50 kW	Number
EV	Number of recharging points with output power in the range of 50 and 150 kW	Number
EV	Number of recharging points with output power in the range of 150 and 350 kW	Number
EV	Number of recharging points >350 kW	Number
H2	Number of dispensers at 350 bars	Number
H2	Number of dispensers at 700 bars	Number

Section	Question	Reply
H2	Capacity (t/day) per location/station	Number
LNG/CN G	Number of LNG refuelling points	Number
LNG/CN G	Number of CNG refuelling points	Number
LNG/CN G	LNG tanks capacity (m3)	Number

2.2 Alternative fuel supply for stationary aircraft

The indicator on alternative fuel supply for stationary aircraft covers supply points of electricity to stationary aircraft (incl. grid connection).

Alternative fuel supply points for stationary aircraft are represented as points on a map, depicting the real location of the infrastructure.

In this output indicator, funding shares are collected at the level of the alternative fuel supply station. Data are available on the number of supply stations and points for stationary aircraft through the CEF, their location and the part of the TEN-T network to which they contribute. Data are also available on the status and type.

Section	Question	Reply
Common	Works or study	Works
Common	In operation date	Date
Common	Green/bioenergy source?	Yes/no/partially
Common	Comments	Free text
Common	Grid connection	Yes/no
Common	Туре	Options available
Electricity	Number of electricity supply to stationary aircraft	Number

Table 2: Alternative fuel supply for stationary aircrafts indicator

2.3 Alternative fuel supply for inland waterway and maritime users

The indicator on alternative fuel supply points for maritime/inland waterway users covers supply of electricity (shore-side electricity (SSE) or onshore power supply (OPS)), LNG

(including small-scale, bunkering station, jetties, bunkering terminal, etc.) or hydrogen to maritime and/or inland waterway vessels (i.e. cruise vessel, freight vessel, passenger vessel, freight and passenger vessel, ice-breaking vessel or any other vessel). It also includes auxiliary investments like grid connection.

Alternative fuel supply points for maritime/inland waterway users are represented as points on a map, depicting the real location of the infrastructure.

In this output indicator funding shares are collected at the level of the alternative fuel supply station. Data are available on the number of the supply stations and points for inland waterway (IWW) and maritime users, their location and the part of the TEN-T network to which they contribute. Data are also available on the status and type.

Section	Question	Reply	
Common	Work or study	Works/studies	
Common	Status	Not started yet/ongoing/completed/terminated/partially completed	
Common	Intended usage (mobile asset)	Maritime vessel/IWW vessel	
Common	Intended usage (type of vessel)	Cruise vessel/freight vessel/passenger vessel/freight and passenger vessel/ice-breaking vessel/other vessels	
Common	Intended usage (details)	Free text	
Common	Freight vs passenger	Freight/passenger	
Common	Comments	Free text	
Common	In operation date	Date	
Common	Green/bioenergy source?	Yes/no/partially	
Common	Comments	Free text	
Electricity	Number of SSE/OPS connections	Number	
LNG	Type of facility	Small-scale/bunkering station/jetties/bunkering terminal	

Table 3: Alternative fuel supply for IWW and maritime users indicator

Section	Question	Reply
LNG	Type of facility details	Free text field
LNG	Nb of refuelling points	Number
LNG	Capacity LNG facility (m3)	Number
Н2	Nb refuelling points at 350 bars	Number
Н2	Nb of refuelling point at 700 bars	Number
H2	Capacity (kg H2/day)	Number
OTHER	Other type	Free text

2.4 Alternative fuel supply for locomotives

Alternative fuel supply for locomotives covers fuel supply points for rail users (i.e. locomotives). They are represented as points on a map, depicting the real location of the infrastructure.

	3.	The number	of mobile	assets built o	r upgraded v	with CEF support	rt
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Туре	Output
Frequency of update	At grant agreement signature, afterwards at least once per year or if there are amendments. Final update is requested when the project has finished.
Baseline	Zero – without CEF intervention it is assumed that the project would not happen.
Source	MAP-IT, based on data provided by the project beneficiaries and encoded by CINEA (basic checks in place).
Unit of measurement	Number of mobile assets.

For this indicator, mobile assets are locomotives, heavy duty vehicles (HDVs), maritime vessels and inland waterway vessels. Subtypes are available for HDVs and for vessels.

Given their mobile nature, a precise location is not available, so the map will consist of a deployment area. However, it is also possible to encode mobile assets for particular locations (for example, if a vessel operates exclusively inside a specific port).

In this output indicator, funding shares are collected at the level of the project or of the location.

For all mobile assets, information is available on energy efficiency. This means that we know the number of mobile assets retrofitted or the number of new assets equipped with alternative fuels. For vessels, we also collect information on other interventions, such as digitalisation (IT systems and related equipment), scrubbers, navigational upgrades, ballast water treatment systems, vessel extension, vessel ramp and surveying.

Section	Question	Reply
Common	Works or studies	Works/studies
Common	Status	Not started yet/ongoing/completed/terminated/partially completed
Common	Comment	Free text
Mobile asset	Number of mobile assets	Number
Mobile asset	Type of investment	Retrofit/new asset
Mobile asset	Type of mobile asset	Locomotive/HDV/maritime vessel/IWW vessel
Mobile asset	Subtype (HDV)	Bus/truck/trolleybus
Mobile asset	Public transport	Yes/no
Mobile asset	Subtype (vessel)	Cruise vessel/freight vessel/passenger vessel/freight and passenger vessel/ice-breaking vessel/other vessels
Mobile asset	Subtype (vessel) Comment if other	Free text
Mobile asset	Freight or passenger	Freight/passenger
Intervention	Type of intervention	Energy efficiency/digitalisation (IT systems and related equipment)/scrubbers/navigational upgrades/ballast water treatment systems/vessel extension/vessel ramp Surveying/other
Intervention	Type of intervention - comment if Other	Free text
Intervention	Energy efficiency type	Propulsion system upgrade/reception installations for OPS/other

Table 4: Mobile assets indicator

Section	Question	Reply
Intervention	Energy efficiency - comment if Other	Free text
Intervention	Fuel type	Electricity/H2/CNG/LNG
Intervention	Batteries	Yes/no
Intervention	Digitalisation type	Ice-breaking IT system/other

4. The number of energy infrastructures supported by the CEF

Туре	Output
Frequency of update	At grant agreement signature, afterwards at least once per year or if there are amendments. Final update is requested when the project has finished.
Baseline	Zero – without CEF intervention it is assumed that the project would not happen.
Source	MAP-IT, based on data provided by the project beneficiaries and encoded by CINEA (basic checks in place).
Unit of measurement	Number of energy infrastructures.

5. The number of inland ports improved with CEF support

Туре	Output
Frequency of update	At grant agreement signature, afterwards at least once per year or if there are amendments. Final update is requested when the project has finished.
Baseline	Zero – without CEF intervention it is assumed that the project would not happen.
Source	MAP-IT, based on data provided by the project beneficiaries and encoded by CINEA (basic checks in place).
Unit of measurement	Number of inland ports.

The inland ports indicator will cover output related to the port area. Besides the specific investment in inland port infrastructure, we also collect information on other types of investment in the port area, such as: i) investment in freight and passenger handling operations in the port area; ii) investment in vessels localised in the port area; iii) investment in rail connections to the port and within the port; iv) investment in road connections to the port and

within the port; v) <u>investment in IWW</u> connections to the port; vi) <u>investment in alternative</u> <u>fuel supply</u> in the port area; and vii) <u>investment in parking facilities</u> in the port area.

6. Investment in inland waterways infrastructure supported by the CEF

Investment in inland waterway infrastructure can be classified either as linear or as a point intervention. Information is available on two indicators: one focusing on line interventions and the other focusing on point interventions. Both indicators aim to measure CEF support provided towards developing the TEN-T IWW network.

Туре	Output
Frequency of update	At grant agreement signature, afterwards at least once per year or if there are amendments. Final update is requested when the project has finished.
Baseline	Zero – without CEF intervention it is assumed that the project would not happen.
Source	MAP-IT, based on data provided by the project beneficiaries and encoded by CINEA (basic checks in place).
Unit of measurement	Number of km.

6.1 The number of km in the inland waterways network improved with CEF support

This indicator covers any linear intervention on the TEN-T inland waterway network (either construction of new canals or upgrade of existing waterways), including infrastructure interventions such as: dredging, curves/basins, canal embankments and riverbanks, dykes, utilities, riverbed protection and barge crossing points.

Linear interventions on the inland waterway network are represented as lines depicting the real location of the infrastructure. The intervention line should generally follow the TEN-T IWW network alignment.

For inland waterway lines, data are available on the length of the inland waterway, the types of interventions taking place and whether they are connected to an existing port (and if yes, what type and name). Information is collected on whether there has been an increase in capacity. The funding share is collected at the level of the line (split at country borders and per corridor).

Section	Question	Reply
Common	Connection to port	Yes/no
Common	Type of port	Maritime/inland
Common	Name of port	From TEN-T port list or to be typed if not TEN-T port
Section	Question	Reply
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Common	Type of access	Inland vessels/maritime vessels
Common	Works or studies	Works/studies
Common	Status	Not started yet/ongoing/completed/terminated/partially completed
Common	Impact	Works – leading directly to commissioning/works – followed by more works/studies leading to works/studies not leading to works
Common	Partial completion %	percentage
Common	Upgrade or New	Upgrade/new
Common	Comments	Free text
Common	Number of km	Number
Common	Increased capacity	Yes/no
Common	Class before intervention	Class I to VII
Common	Tonnes before intervention	Number
Common	Type of intervention	Dredging/curves/basins/canal embankments and riverbanks/dykes/utilities/river bed protection/barge crossing points/other
Common	Target capacity - class	Class IV to VII
Common	Target capacity - tonnes	Number

6.2 The number of punctual inland waterway interventions supported by the CEF

Туре	Output
Frequency of update	At grant agreement signature, afterwards at least once per year or if there are amendments. Final update is requested when the project has finished .
Baseline	Zero – without CEF intervention it is assumed that the project would not happen.

Source	MAP-IT, based on data provided by the project beneficiaries and encoded by CINEA (basic checks in place).
Unit of	Number of interventions.
measurement	

This indicator covers any timely infrastructure intervention on TEN-T inland waterways. Such interventions include those carried out on locks, bridges, weirs/dams, remote control centres, quays and mooring systems.

Inland waterway interventions are represented as points on a map, depicting the real location of the infrastructure.

Thanks to the encoding of this indicator, data are available on the number of locks, bridges, weirs/dams, remote control centres, quays and mooring systems and the amount of support provided by the CEF.

Table 6: In	nland waterwa	y intervention	point indicator
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Section	Question	Reply
Common	Connection to port	Yes/no
Common	Type of port	Maritime/inland
Common	Name of port	From TEN-T port list or to be typed if not TEN-T port
Common	Type of access	Inland vessels/maritime vessels
Common	Works or studies	Works/studies
Common	Status	Not started yet/ongoing/completed/terminated/partially completed
Common	Impact	Works – leading directly to commissioning/works – followed by more works/studies leading to works/studies not leading to works
Common	Partial completion %	percentage
Common	Upgrade or new	New/upgrade
Common	Comments	Free text
Lock	Remote control	Yes/No
Lock	Increased capacity	Yes/No
Lock	Class before intervention	Class I to VII

Section	Question	Reply
Lock	Tonnes before intervention	Number
Lock	Target capacity - class	Class IV to VII
Lock	Target capacity – tonnes	Number
Lock	Fish pass	Number
Weir/dam	Remote control	Yes/No
Weir/dam	Fish pass	Number
Bridge	Bridge type	Railway/road/cycling/pedestrian/road and other/other
Bridge	Increased capacity	Yes/no
Bridge	Layers before intervention	Positive integer >=0
Bridge	Target capacity – Layers	2/3/4
Quay	Increased capacity	Yes/No
Quay	Class before intervention	Class I to VII
Quay	Tonnes before intervention	Number
Quay	Target capacity – Class	Class IV to VII
Quay	Target capacity – Tonnes	Number

Aside from the specific investment in inland waterway infrastructure, information is available on other types of investment in inland waterways, such as investment in vessels localised on a specific inland waterway and investment in alternative fuel supply on inland waterways.

7. The number of manufile ports improved with elle support			
Туре	Output		
Frequency of update	At grant agreement signature, afterwards at least once per year or if there are amendments. Final update is requested when the project has finished.		

7. The number of maritime ports improved with CEF support

Baseline	Zero – without CEF intervention it is assumed that the project would not happen.
Source	MAP-IT, based on data provided by the project beneficiaries and encoded by CINEA (basic checks in place).
Unit of measurement	Number of ports.

The maritime port indicator covers output related to basic port infrastructure, port access and other interventions.

Maritime ports are represented as points on a map, depicting the location of the TEN-T maritime port in the TEN-T network.

In the indicator for maritime ports, we collect information on investment in: i) basic port infrastructure (berths, quays, jetties, docks, dykes, turning basins, backfills, land reclamation, mooring systems, fixed ramps, etc.); ii) port access (dredging, breakwaters, access channels, fairways, locks, navigational aids, etc.); and iii) other investments (digitalisation and related equipment, port reception facilities, superstructure, port vehicles and equipment – not linked to freight/passenger handling). The funding share is collected at the level described in the table. See the table below for more details.

Section	Question	Reply	Funding share
Common	Works or studies	Works/studies	
Common	Status	Not started yet/ongoing/completed/terminated/ partially completed	
Common	Partial completion %	Percentage	
Common	Maritime link	Yes/no	
Common	Maritime link type	New/upgraded	
Common	Zero/low emission multimodal solution	Yes/no	
Common	Facilities for offshore wind farms	Yes/no	
Common	Remote/insular/outer most region	Yes/no	
Basic port infrastructure	Basic port infrastructure	Yes/no	YES

Table 7: Maritime ports indicator

Section	Question	Reply	Funding share
Basic port infrastructure	Type of vessel	Inland vessels/maritime vessels	
Basic port infrastructure	Berths	Number	
Basic port infrastructure	Quays	Number	
Basic port infrastructure	Jetties	Number	
Basic port infrastructure	Docks	Number	
Basic port infrastructure	Dykes	Number	
Basic port infrastructure	Turning basins	Number	
Basic port infrastructure	Backfills	Yes/no	
Basic port infrastructure	Land reclamation	Yes/no	
Basic port infrastructure	Mooring systems	Yes/no	
Basic port infrastructure	Fixed ramps	Yes/no	
Basic port infrastructure	Other	Yes/no	
Basic port infrastructure	Other details	Free text	
Basic port infrastructure	Comments	Free text	
Port access	Port access	Yes/no	YES
Port access	Type of vessel	Inland vessels/maritime vessels	
Port access	Dredging	Yes/no	
Port access	Dredging max depth	Number	
Port access	Breakwaters	Yes/no	

Section	Question	Reply	Funding share
Port access	Access channels	Yes/no	
Port access	Fairways	Yes/no	
Port access	Locks	Yes/no	
Port access	Navigational aids	Yes/no	
Port access	Other	Yes/no	
Port access	Other details	Free text	
Port access	Comments	Free text	
Other investments	Digitalisation and related equipment	Yes/no	YES
Other investments	Digitalisation and related equipment sub-category	VTMIS/customs information systems/maritime port community systems/other IT systems	
Other investments	Port reception facilities	Yes/no	YES
Other investments	Superstructure	Yes/no	YES
Other investments	Port vehicles and equipment	Yes/no	YES
Other investments	Comments	Free text	

Aside from the specific investment in maritime port infrastructure, information is available on other types of investment in the port area, such as: i) investment in freight and passenger handling operations in the port area; ii) investment in vessels localised in the port area; iii) investment in rail connections to the port and within the port; iv) investment in road connections to the port and within the port; v) investment in IWW connections to the port; vi) investment in alternative fuel supply in the port area; and vii) investment in parking facilities in the port area.

8. CEF support to other maritime interventions (not inside ports)

Frequency of update	At grant agreement signature, afterwards at least once per year or whenever there are amendments. One final update is requested when the project has finished.
Baseline	Zero – without CEF intervention it is assumed that the project would not happen.
Source	MAP-IT, based on data provided by the project beneficiaries and encoded by CINEA (basic checks in place).
Unit of measurement	Number of projects/funding amount.

Information is available on an indicator on CEF support to other maritime interventions. In this indicator, collected at project level, information is available on the CEF funding for this topic and it details whether the interventions are related to digitalisation (e.g. EMSWe), related equipment, ice-breaking interventions or other interventions.

9. Investment in railway infrastructure supported by CEF

There are two indicators covering trackside interventions on a rail section: the railway trackside indicator and the ERTMS trackside indicator.

Linear interventions on the rail network are represented as lines depicting the real location of the infrastructure. The intervention line should generally follow the TEN-T rail network alignment, but may be inside ports, airports or railroad terminals.

Туре	Output
Frequency of update	At grant agreement signature, afterwards at least once per year or whenever there are amendments. One final update is requested when the project has finished.
Baseline	Zero – without CEF intervention it is assumed that the project would not happen.
Source	MAP-IT, based on data provided by the project beneficiaries and encoded by CINEA (basic checks in place).
Unit of measurement	Number of km.

9.1 The number of km of railway lines built or upgraded with CEF support

The railway trackside indicator covers interventions on a rail section (e.g. electrification, gauge, speed, axle load and number of tracks), including inside ports, airport and railroad terminals. This indicator form is also used to locate short trackside interventions (i.e. for construction/upgrade of individual bridges, etc.). The funding share is collected at the level of the line (split at country borders and per corridor).

Table 8: Railway trackside indicator

Section	Question	Reply
Common	Works or studies	Works/studies
Common	Status	Not started yet/ongoing/completed/terminated/partially completed
Common	Impact	Works - leading directly to commissioning/works – followed by more works/studies leading to works/studies not leading to works
Common	Partial completion %	Percentage
Common	Construction type	New/upgrade
Common	Multimodal connection	Yes/no
Common	Type of connected node	Port/airport/RRT
Common	Name of connected node	List of TEN-T nodes
Common	If name of connected node=other	Free text
Common	Trackside improvements	Yes/no
Trackside – target line	Km of rail section addressed	Number
Trackside – target line	Track type	Single/double /triple/quadruple
Trackside – target line	Line type	Freight/mixed/passenger
Trackside – target line	General comment	Free text
Trackside – target line	Line gauge type	1 435 mm/1 676 mm/1 520 mm
Trackside – target line	Line electrification type	Electrified/Not electrified
Trackside – target line	Line speed type	Options available
Trackside – target line	Axle load compliance (freight)	22.5t axle load/below 22.5t axle load/above 22.5t axle load

Section	Question	Reply
	Lina speed	Compliant with minimum speed of 100 km/h
Trackside – target line	compliance (freight)	Not compliant with minimum speed of 100 km/h
Tracksida target line	Train length	Compliant with 740m trains
Trackside – target fille	compliance (freight)	Not compliant with 740m trains
Trackside – type of upgrade	Track type upgrade supported	Yes/no
Trackside – type of upgrade	Track type before intervention	Single/double /triple/quadruple
Trackside – type of upgrade		
Trackside – type of upgrade	Gauge upgrade supported	Yes/no
Trackside – type of upgrade	Gauge type before intervention	1 676 mm/1 520 mm
Trackside – type of upgrade		
Trackside – type of upgrade	Electrification supported	Yes/no
Trackside – type of	Type of	First electrification
upgrade	upgrade	Upgrade of existing electrified line
Trackside – type of upgrade		
Trackside – type of upgrade	Line speed upgrade supported	Yes/no
Trackside – type of upgrade	Type of speed upgrade	Options available
Trackside – type of upgrade		
Trackside – type of upgrade	Axle load compliance upgrade supported	Yes/no

Section	Question	Reply
Trackside – type of upgrade	Type of axle load compliance upgrade	Some upgrades but still not fully compliant Upgrade of line to reach compliance
Trackside – type of upgrade		
Trackside – type of upgrade	Freight line speed compliance upgrade supported	Yes/no
Trackside – type of upgrade	Type of freight line speed compliance upgrade	Some upgrades but still not fully compliant Upgrade of line to reach compliance
Trackside – type of upgrade		
Trackside – type of upgrade	Train length compliance upgrade supported	Yes/no
Trackside – type of upgrade	Type of train length compliance upgrade	Some upgrades but still not fully compliant Upgrade of line to reach compliance

9.2 The number of km of railway lines equipped with ERTMS with CEF support

Туре	Output
Frequency of update	At grant agreement signature, afterwards at least once per year or whenever there are amendments. One final update is requested when the project has finished.
Baseline	Zero – without CEF intervention it is assumed that the project would not happen.
Source	MAP-IT, based on data provided by the project beneficiaries and encoded by CINEA (basic checks in place).
Unit of measurement	Number of km.

The ERTMS trackside indicator covers ERTMS interventions on a rail section. It also collects details on the type of installation, baseline and level. The ERTMS indicator is slightly different for projects selected under the unit contribution calls. The funding share is collected at the level of the line (split at country borders and per corridor).

Table 9: ERTMS trackside indicator

Group	Question name	Reply type
Common	Works or studies	Works/studies
Common	Status	Not started yet/ongoing/completed/terminated/partially completed
Common	Partial completion %	%
Common	Km of double track equivalent	Number
Common	Type of installation	Deployment/upgrade
Common	ERTMS baseline	Pre-baseline 2/baseline 3
Common	ERTMS level	Level 1/level 2/level 3/level 1-2
Common	ERTMS supplier	Options available
Common	Comments	Free text

9.3 The number of railroad level crossings removed with CEF support

Туре	Output
Frequency of update	At grant agreement signature, afterwards at least once per year or whenever there are amendments. One final update is requested when the project has finished.
Baseline	Zero – without CEF intervention it is assumed that the project would not happen.
Source	MAP-IT, based on data provided by the project beneficiaries and encoded by CINEA (basic checks in place).
Unit of measurement	Number of level crossings.

As part of the railway indicator, information is collected on short trackside interventions that involve removing level crossings. Through this indicator it is possible identify the location, funding and number of level crossings.

Table 10: Removal of level crossings indicator

Section	Question	Reply
Common	Works or studies	Works/studies

Section	Question	Reply
Common	Status	Not started yet/ongoing/completed/terminated/partially completed
Common	Impact	Works – leading directly to commissioning/works – followed by more works/studies leading to works/studies not leading to works
Common	Partial completion %	Percentage
Common	Construction type	New/upgrade
Common	Multimodal connection	Yes/no
Common	Type of connected node	Port/airport/RRT
Common	Name of connected node	List of TEN-T nodes
Common	If name of connected node=other	Free text
Common	Trackside improvements	Yes/no
Removal of level crossings	Removal of existing level crossings	Yes/no
Removal of level crossings	Nr of level crossings being removed	Number

9.4 The number of railway stations supported by the CEF

Туре	Output
Frequency of update	At grant agreement signature, afterwards at least once per year or whenever there are amendments. One final update is requested when the project has finished.
Baseline	Zero – without CEF intervention it is assumed that the project would not happen.

Source	MAP-IT, based on data provided by the project beneficiaries and encoded by CINEA (basic checks in place).
Unit of measurement	Number of railway stations.

As part of the railway indicator, information is collected on the upgrade of platforms in railway stations (including upgrades that involve improving accessibility). Through this indicator it is possible to identify the location, funding and number of railway stations.

Section	Question	Reply
Common	Works or studies	Works/studies
Common	Status	Not started yet/ongoing/completed/terminated/partially completed
Common	Impact	Works – leading directly to commissioning/works – followed by more works/studies leading to works/studies not leading to works
Common	Partial completion %	Percentage
Common	Construction type	New/upgrade
Common	Multimodal Connection	Yes/no
Common	Type of connected node	Port/airport/RRT
Common	Name of connected node	List of TEN-T nodes
Common	If name of connected node=other	Free text
Common	Trackside improvements	Yes/no
Improvement of railway stations	Railway stations	Yes/no
Improvement of railway stations	Number of railway Stations	Number

Table 11: Railways stations indicator

Section	Question	Reply
Improvement of railway stations	of which with improvements of accessibility for people with reduced mobility	Number

10. The number of vehicles equipped with onboard ERTMS with CEF support

Туре	Output
Frequency of update	At grant agreement signature, afterwards at least once per year or whenever there are amendments. One final update is requested when the project has finished.
Baseline	Zero – without CEF intervention it is assumed that the project would not happen.
Source	MAP-IT, based on data provided by the project beneficiaries and encoded by CINEA (basic checks in place).
Unit of measurement	Number of vehicles.

In the ERTMS onboard indicator, we collect the number of vehicles (trainsets or locomotives), equipped with ERTMS onboard.

Given their mobile nature, we generally do not have a precise location available, and the map will consist of a deployment area. In this output indicator, funding shares are collected per beneficiary. The indicator form is slightly different for projects selected under the unit contribution topics. See the table below for more details.

Table 12: ERTMS onboard indicator

Section	Question	Reply
Common	Works or studies	Works/studies
Common	Status	Not started yet/ongoing/completed/terminated/partially completed
Common	Type of mobile asset	Locomotive/trainset
Common	Passenger or freight	Passenger/freight

Section	Question	Reply
~	Number of	
Common	vehicles	Number
	Type of	
Common	installation	Retrofit/upgrade/fitment/prototype retrofit/prototype upgrade
Common	Baseline	Pre-baseline 2/baseline 3
Common	Level	Level 1/level 2/level 3/level 1-2
Common	Supplier	Options available
Common	Vehicle type	Text
Common	Comments	Text

11. The number of rail freight wagons equipped with composite brake blocks with CEF support

Туре	Output
Frequency of update	At grant agreement signature, afterwards at least once per year or whenever there are amendments. One final update is requested when the project has finished.
Baseline	Zero – without CEF intervention it is assumed that the project would not happen.
Source	MAP-IT, based on data provided by the project beneficiaries and encoded by CINEA (basic checks in place).
Unit of measurement	Number of wagons.

In the rail freight noise indicator, information is collected on the number of S or SS rail freight wagons equipped with composite brake blocks.

Given their mobile nature, the map will consist of a deployment area. In this output indicator funding shares are collected per beneficiary.

Table 13: Rail freight noise indicator

Section	Question	Reply
Common	Works or studies	Works

Section	Question	Reply
Common	Status	Not started yet/ongoing/completed/terminated/partially completed
Common	Type of mobile asset	Wagon
Common	NUMBER OF S- TYPE WAGONS	NUMBER
Common	NUMBER OF SS- TYPE WAGONS	NUMBER
Common	COMMENTS	Free text

12. The number of km of road newly constructed or upgraded with CEF support

Туре	Output
Frequency of update	At grant agreement signature, afterwards at least once per year or whenever there are amendments. One final update is requested when the project has finished.
Baseline	Zero – without CEF intervention it is assumed that the project would not happen.
Source	MAP-IT, based on data provided by the project beneficiaries and encoded by CINEA (basic checks in place).
Unit of measurement	Number of km.

The road indicator covers all cases where there is an intervention on a road section (new road construction or upgrade of existing roads), including tunnels and bridges under any topic (including road safety). This also includes road sections connecting to or within ports, airports etc.

Linear interventions on the road network are represented as lines depicting the real location of the infrastructure. The intervention line should generally follow the TEN-T road network alignment but may be inside ports, airports and railroad terminals.

The road indicator collects information on the number of km, whether they are new or upgraded, whether they connect to a node or whether they include tunnels.

Table 14: Road indicator

Group	Question name	Reply type
Common	Km of road section addressed	Number
Common	Construction type	New/upgrade
Common	Multimodal connection	Yes/no
Common	Type of connected node	Port/airport/RRT
Common	Name of connected node	List of TEN-T nodes
Common	If name of connected node=other	Free text
Common	Works or studies	Works/studies
Common	Status	Not started yet/ongoing/completed/terminated/partially completed
Common	Impact	Works – leading directly to commissioning/works – followed by more works/studies leading to works/studies not leading to works
Common	Partial completion %	Percentage
Common	Comment	Free text
Common	Upgrade of tunnels	Yes/no
Common	Nr of upgraded tunnels	Number

13. The number of secure parking places built or upgraded with CEF support

Туре	Output
Frequency of update	At grant agreement signature, afterwards at least once per year or whenever there are amendments. One final update is requested when the project has finished.
Baseline	Zero – without CEF intervention it is assumed that the project would not happen.
Source	MAP-IT, based on data provided by the project beneficiaries and encoded by CINEA (basic checks in place).
Unit of measurement	Number of parking places.

The safe and secure parking indicator covers new/upgraded safe and secure parking areas. Safe and secure parking points are represented as points on a map, depicting the real location of the infrastructure.

The safe and secure parking indicator form collects information about the number of safe and secure parking spots, whether they are new or upgraded, and their standard and digital information.

Section	Question	Reply
Common	Parking area construction Type	New/upgraded
Common	Number of parking spots	Number
Common	Works or studies	Works/studies
Common	Status	Not started yet/ongoing/completed/terminated/partially completed
Common	Partial completion %	Percentage
Common	Digital information on availability of parking spaces (yes/no)	Yes/no
Common	Standard of parking area	Gold/silver/bronze/platinum
Common	Comments	Free text

Table 15: Safe and secure parking indicator

14. The number of airports improved with CEF support

Туре	Output
Frequency of update	At grant agreement signature, afterwards at least once per year or whenever there are amendments. One final update is requested when the project has finished.
Baseline	Zero – without CEF intervention it is assumed that the project would not happen.
Source	MAP-IT, based on data provided by the project beneficiaries and encoded by CINEA (basic checks in place).
Unit of measurement	Number of airports.

The airport indicator is a simple indicator covering investments in airport infrastructure. Airports are represented as points on a map, depicting the location of the TEN-T airport in the TEN-T network.

Aside from the specific investment in airport infrastructure, information is collected on other types of investment in the airport area, such as: i) investment in freight and passenger handling operations in the airport area; ii) investment in rail connections to the airport; iii) <u>investment</u> in road connections to the airport; iv) <u>investment in alternative fuel supply</u> in the airport area; v) <u>investment in parking facilities</u> in the airport area; and vi) investment in <u>air traffic management</u>.

15. CEF support to air traffic management

Information is collected on the indicator on the CEF support to air traffic management. In this indicator, which is collected at project level, information is collected on the CEF funding going to this topic.

Туре	Output
Frequency of update	At grant agreement signature, afterwards at least once per year or whenever there are amendments. One final update is requested when the project has finished.
Baseline	Zero – without CEF intervention it is assumed that the project would not happen.
Source	MAP-IT, based on data provided by the project beneficiaries and encoded by CINEA (basic checks in place).
Unit of measurement	Number of projects/funding amount.

16. The number of railroad terminals improved with CEF support

Туре	Output
Frequency of update	At grant agreement signature, afterwards at least once per year or whenever there are amendments. One final update is requested when the project has finished.
Baseline	Zero – without CEF intervention it is assumed that the project would not happen.
Source	MAP-IT, based on data provided by the project beneficiaries and encoded by CINEA (basic checks in place).

Unit of	Number of railroad terminals.
measurement	

Information is available on the number of RRTs financed through the CEF, the location and the part of the TEN-T network to which they contribute. RRTs are represented as points on a map, depicting the location of the TEN-T RRT in the TEN-T network.

In most cases, investment in railroad terminals and/or the logistic area serving the terminal will be covered by the indicator on freight and passenger handling operations.

Furthermore, information is collected on other types of investment into RRTs, such as: i) investment in rail connections to the RRT and within the RRT; ii) investment in road connections to the RRT and within the RRT; iii) investment in alternative fuel supply in the RRT area; and iv) investment in parking facilities in the RRT area.

17. Investment in freight and/or passenger handling infrastructure and equipment supported by the CEF

Туре	Output
Frequency of update	At grant agreement signature, afterwards at least once per year or whenever there are amendments. One final update is requested when the project has finished.
Baseline	Zero – without CEF intervention it is assumed that the project would not happen.
Source	MAP-IT, based on data provided by the project beneficiaries and encoded by CINEA (basic checks in place).
Unit of measurement	Number of projects/funding amount.

Investment in freight and passenger handling represents the core of multimodality. It covers any investment in infrastructure, superstructure, equipment and digitalisation that are used for freight and/or passenger handling operations, meaning any operations where freight and passengers are transitioning from one mode of transport to another one (or between two different rail systems for freight).

Such operations typically take place in terminals at airports, inland ports, maritime ports, railroad terminals (including their logistic area) and multimodal passenger hubs (e.g. in rail stations that ensures direct connection with the airport and are integrated with public transport such as metros and buses). Therefore, the indicator can be encoded for airports, inland ports, maritime ports, railroad terminals and multimodal passenger hubs. The funding share is collected at the level described in the table below.

Group	Question name	Reply type	Funding shares
Common	Works or studies	Works/studies	
Common	Status	Not started yet/ongoing/completed/terminated/partially completed	
Common	Partial completion %	Percentage	
Common	Type of handling operations	Freight/passenger	
Common	Multimodal freight terminal and/or logistic platform	Yes/no	
Common	Number of multimodal freight terminals and/or logistic platforms	Number	
Common	Construction type	New/upgrade	
Common	Handling infrastructure and superstructure (freight/passenger)	Yes/no	YES
Common	Handling equipment & vehicles (freight/passenger)	Yes/no	YES
Common	Clean handling equipment	Yes/no	
Common	Digitalisation and related equipment	Yes/no	YES
Common	Type of digitalisation	ROS/TOS/other	
Common	Comment	Free text	

Table 16: Freight and passenger handling infrastructure indicator

Group	Question name	Reply type	Funding shares
Common	Other	Yes/no	YES
Common	Other comment	Free text	
Common	General comment	Free text	

Annex I-1: Link between CEF objectives and indicator framework

The link between the performance framework and the CEF objectives is described in the table below.

Specific objectives of the CEF2 Regulation	Indicator framework of the CEF2 Regulation (Level 2)	Detailed indicator framework (Level 3)
	(1) Number of cross-border and missing links addressed with CEF support (including actions related to urban nodes, regional cross-border rail connections, multimodal platforms, maritime ports, inland ports, connections to airports and railroad terminals of the TEN-T core and comprehensive network)	Primarily indicator 1 (cross- border and missing links). Also indicators 5 (inland ports), 6 (inland waterway interventions), 7 (maritime ports), 9 (railway trackside), 12 (road sections), 16 (rail- road terminals) and 17 (for multimodality)
Efficient, interconnected and multimodal networks and infrastructure for smart,	(2) Number of CEF-supported actions helping digitalise transport, in particular through the deployment of the ERTMS, RIS, ITS, VTMIS/e- Maritime services and SESAR	Indicator 7 (for the VTMIS), Indicator 10 (for the ERTMS onboard), Indicator 15 (for SESAR). There is currently no plan to have a level 3 indicator on the RIS.
interoperable, sustainable, inclusive,	(3) Number of alternative fuel supply points built or upgraded with CEF support	Indicator 2 (and sub- indicators)
accessible, safe and secure mobility	(4) Number of CEF-supported actions helping to make transport safer	Indicator 9 (for level crossings) Indicator 12 (for road sections) Indicator 13 (for safe and secure parking)
	(5) Number of CEF actions contributing to make transport more accessible to people with reduced mobility	Indicator 9 (accessibility in railway stations)
	(6) Number of CEF-supported actions helping reduce rail freight noise	Indicator 11 (rail freight noise)

Adaptation to civilian-military dual- use transport infrastructure	(7) Number of transport infrastructure components adapted to civilian- military dual-use requirements	Not applicable. Only level 2 indicator collected.
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Annex II (CEF energy)

The following section demonstrates how the data addressing the indicators will be collected. Apart from the data which is collected for measuring the indicators laid down in the CEF legal basis, CINEA collects additional data for monitoring and evaluation purposes.

1. Number of actions supported by the CEF contributing to projects interconnecting Member States' networks and removing internal constraints

For the purposes of this indicator, the following PCIs are considered to address the 'interconnection of MS networks and/or removal of internal constraints':

- electricity PCIs and PMIs except electricity storage;
- gas PCIs and PMIs except gas storage;
- hydrogen PCIs and PMIs except hydrogen storage;
- CO₂ PCIs and PMIs.

Storage projects are counted under another indicator below.

Туре	Output
Frequency of update	At grant agreement signature, afterwards at least once per year or if there are amendments. Final update is requested when the project has finished.
Baseline	Zero – without CEF intervention it is assumed that the project would not happen.
Source	The PCI Transparency Platform managed by CINEA and E-Grants.
Unit of measurement	Number of CEF actions

2. Number of actions supported by the CEF contributing to projects ensuring a resilient gas network

For the purposes of this indicator, the following PCIs are considered to help in 'ensuring a resilient gas network':

- gas PCIs and PMIs, including gas storage;
- hydrogen PCIs and PMIs, including hydrogen storage;
- smart gas grids;
- electrolysers.

Туре	Output

Frequency of update	At grant agreement signature, afterwards at least once per year or if there are amendments. Final update is requested when the project has finished.
Baseline	Zero – without CEF intervention it is assumed that the project would not happen.
Source	The PCI Transparency Platform managed by CINEA and E-Grants.
Unit of measurement	Number of CEF actions

3. Number of actions supported by the CEF contributing to the smartening and digitalisation of grids and increasing energy storage capacity

For the purposes of this indicator, the following PCIs are considered to help achieve the 'smartening and digitalisation of grids and increasing energy storage':

- smart electricity grids;
- smart gas grids;
- storage PCIs and PMIs (electricity, gas, hydrogen);
- electrolysers.

Туре	Output
Frequency of update	At grant agreement signature, afterwards at least once per year or if there are amendments. Final update is requested when the project has finished.
Baseline	Zero – without CEF intervention it is assumed that the project would not happen.
Source	The PCI Transparency Platform managed by CINEA and E-Grants.
Unit of measurement	Number of CEF actions

4. Number of actions supported by the CEF contributing to projects enabling increased penetration of renewable energy in the energy systems

For the purposes of this indicator, the following PCIs are considered to help in 'enabling increased penetration of renewable energy in the energy system':

- electricity PCIs and PMIs, including storage;
- smart electricity grids;
- hydrogen PCIs and PMIs, including storage;

- smart gas grids;
- electrolysers.

Туре	Output
Frequency of update	At grant agreement signature, afterwards at least once per year or if there are amendments. Final update is requested when the project has finished.
Baseline	Zero – without CEF intervention it is assumed that the project would not happen.
Source	The PCI Transparency Platform managed by CINEA and E-Grants.
Unit of measurement	Number of CEF actions

5. Number of actions supported by the CEF contributing to cross-border cooperation in the field of renewable energy

For the purposes of this indicator, all cross-border projects in the field of renewable energy will be considered as helping to achieve the objective of 'contributing to cross-border cooperation in the field of renewable energy'.

Туре	Output
Frequency of update	At grant agreement signature, afterwards at least once per year or if there are amendments. Final update is requested when the project has finished.
Baseline	Zero – without CEF intervention it is assumed that the project would not happen.
Source	The TENtec Transparency Platform managed by CINEA and E-Grants.
Unit of measurement	Number of CEF actions

Annex III (CEF digital)

Key indicators

a) New connections to very high-capacity networks for socio-economic drivers and very high-quality connections for local communities.

Programme statement indicator: number of socio-economic drivers provided with 5G connectivity under topic 5G for Smart Communities.

b) Number of actions supported by the CEF enabling 5G coverage along major transport paths.

Programme statement indicator: the number of projects funded under topic 5G coverage along transport corridors.

c) Number of actions supported by the CEF enabling new connections to very high-capacity networks.

Programme statement indicator: number of projects dealing with backbone networks.

d) Number of actions supported by the CEF helping digitalise energy and transport sectors.

Programme statement indicator: number of projects funded under the Operational digital platforms' topic.

Cross-sectoral indicators valid for all infrastructure related topics:

- greenhouse gas emissions (i.e. carbon dioxide, methane);
- number of data centres connected to the cross-border energy system.

Output indicators:

a) 5G for Smart Communities

i. Numbers of 5G networks deployed

Туре	Output
Frequency of update	Annual (project continuous reporting)
Baseline	0 – without the CEF intervention it is assumed that the project would not happen
Target	30 networks by 2030
Source	KPI tool via eGrants
Unit of measurement	Number of completed networks
Responsible for reporting	HaDEA B1

ii. Number of enabled 5G-based use cases for socio-economic drivers

Туре	Output
Frequency of update	Annual (project continuous reporting)
Baseline	0 – without CEF intervention it is assumed that the project would not happen
Target	60 by 2030 (the Call text promotes more than one 5G-based use case per deployed network)
Source	KPI tool via eGrants
Unit of measurement	Number of enabled use cases
Responsible for reporting	HaDEA B1

iii. Number of new edge nodes created

Туре	Output
Frequency of update	Annual (project continuous reporting)
Baseline	0 – without CEF intervention it is assumed that the project would not happen
Target	10 by 2030 (new KPI - only as from Call 3 onward)
Source	KPI tool via eGrants
Unit of measurement	Number of edge nodes
Responsible for reporting	HaDEA B1

b) 5G Corridors along transport paths

i. Total length of CEF-funded transport corridor(s) covered by 5G connectivity infrastructure (passive and/or active network elements) in each Member State and at EU level (for roads, rail, inland waterways and multimodal transportation)

Туре	Output
Frequency of update	Annual (project continuous reporting)

Baseline	0 – without CEF intervention it is assumed that the project would not happen
Target	26 000 km by 2030
Source	KPI tool via eGrants
Unit of measurement	Number of covered km by 5G connectivity
Responsible for reporting	HaDEA B1

c) Global gateways (submarine cables)

i. Total length of (newly) deployed submarine/terrestrial cables

Туре	Output
Frequency of update	Annual (project continuous reporting)
Baseline	0 – without CEF intervention it is assumed that the project would not happen
Target	60 000 km by 2030
Source	KPI tool via eGrants
Unit of measurement	Km
Responsible for reporting	HaDEA B1

ii. Total length of upgraded submarine/terrestrial cables

Туре	Output
Frequency of update	Annual (project continuous reporting)
Baseline	0 – without CEF intervention it is assumed that the project would not happen
Target	3 200 km by 2030
Source	KPI tool via eGrants
Unit of measurement	Km

Responsible for	HaDEA B1
reporting	

iii. Total additional capacity created (in number of fibre pairs)

Туре	Output
Frequency of update	Annual (project continuous reporting)
Baseline	0 – without CEF intervention it is assumed that the project would not happen
Target	320 by 2030
Source	KPI tool via eGrants
Unit of measurement	Number of fibre pairs
Responsible for reporting	HaDEA B1

iv. Total additional capacity created (in Tbps)

Туре	Output
Frequency of update	Annual (project continuous reporting)
Baseline	0 – without CEF intervention it is assumed that the project would not happen
Target	2 800 Tbps by 2030
Source	KPI tool via eGrants
Unit of measurement	Tbps
Responsible for reporting	HaDEA B1

d) Operational digital platforms

i. Number of connected operators supporting cross-border exchange of data and services

Туре	Output

Frequency of update	Once
Baseline	0 – without CEF intervention it is assumed that the project would not happen
Target	6 by 2030
Source	KPI tool via eGrants
Unit of measurement	Number of connected operators
Responsible for reporting	HaDEA B1

ii. Number of interconnected cross-border energy and/or transport systems

Туре	Output
Frequency of update	Once
Baseline	0 – without CEF intervention it is assumed that the project would not happen
Target	3 by 2030
Source	KPI tool via eGrants
Unit of measurement	Number of connected systems
Responsible for reporting	HaDEA B1

- a. Quantum communication infrastructure
 - i. Number of cross-border quantum interconnections
 - ii. Number of optical ground stations deployed

Results:

- a) 5G for Smart Communities
 - i. Number of 5G best practices to serve as templates for possible replication

Туре	Result
Frequency of update	Annual (project continuous reporting)
Baseline	0 – without CEF intervention it is assumed that the project would not happen
Target	20 by 2030
Source	Project Directory – a knowledge base of use cases to facilitate the replicability of good practices (deliverable by the 5G for Smart Communities Support Platform published on the Digital Strategy website)
Unit of	Number of 5G best practices to serve as templates
measurement	
Responsible for reporting	CNECT B5

ii. Number of user connections to 5G networks

Туре	Result
Frequency of update	Annual (project continuous reporting)
Baseline	0 – without CEF intervention it is assumed that the project would not happen
Target	450 000 by 2030
Source	KPI tool via eGrants
Unit of measurement	Number of user connections to 5G networks
Responsible for reporting	HaDEA B1

b) 5G Corridors along transport paths

i. Number of MEC/edge nodes created under CEF-funded 5G corridors and integrated to the European federated cloud infrastructure.

Туре	Result

Frequency of update	Annual (project continuous reporting)
Baseline	0 – without CEF intervention it is assumed that the project would not happen
Target	100 by 2030
Source	Analysis reports from the 5GMEC4EU and GUIDE support actions
Unit of measurement	Number of MEC/edge nodes (depending on the network architecture)
Responsible for reporting	HaDEA B1

 Number of EU cross-border areas (rail, road and waterways) covered by seamless 5G connectivity meeting quality of service requirements for connected and automated mobility and/or automated rail operation

Туре	Result
Frequency of update	Annual (project continuous reporting)
Baseline	0 – without CEF intervention it is assumed that the project would not happen
Target	49 by 2030
Source	KPI tool via eGrants
Unit of measurement	Number of cross-border areas covered by 5G seamless connectivity
Responsible for reporting	HaDEA B1

c) Digital global gateways

i. Number of alternative (new and/or upgraded) CEF-funded routes and created capacity

Туре	Result
Frequency of update	Annual (project continuous reporting)

Baseline	0 – without CEF intervention it is assumed that the project would
	not happen
Target	12 routes with 240 Tbps capacity by 2030
Source	KPI tool via eGrants
Unit of	Number of routes and capacity in Tbps
measurement	
Responsible for	HaDEA B1
reporting	

ii. Number of CEF-funded routes and created capacity in the outermost regions and overseas countries and territories

Туре	Result
Frequency of update	Annual (project continuous reporting)
Baseline	0 – without CEF intervention it is assumed that the project would not happen
Target	6 routes with 120 Tbps capacity by 2030
Source	KPI tool via eGrants
Unit of measurement	Number of routes and capacity in Tbps
Responsible for reporting	HaDEA B1

iii. Number of CEF-funded routes and created capacity in areas not previously connected and not in remote regions

Туре	Result
Frequency of update	Annual (project continuous reporting)
Baseline	0 – without CEF intervention it is assumed that the project would not happen
Target	2 routes with 40 Tbps
Source	KPI tool via eGrants

Unit of measurement	Number of routes and capacity in Tbps
Responsible for reporting	HaDEA B1

d) Operational digital platforms

i. Energy saved from curtailing due to cross-border interconnected energy and/or transport systems.

Туре	Result
Frequency of update	Once
Baseline	Tbd by the BEGONIA CSA
Target	10 by 2030
Source	KPI tool via eGrants
Unit of measurement	GWh
Responsible for reporting	HaDEA B1

ii. GHG emissions' decrease due to cross-border energy and/or transport exchange.

Туре	Result
Frequency of update	By the end of programming period (project continuous reporting)
Baseline	Tbd by the BEGONIA CSA
Target	10% by 2030 (and onwards)
Source	KPI tool via eGrants
Unit of measurement	Percentage of the decrease of the carbon dioxide and methane (in tonnes of carbon dioxide equivalent)
Responsible for reporting	HaDEA B1

Impact:

a) 5G for Smart Communities

i. Impacted sectors by the 5G enabled use cases, e.g. healthcare, education, agriculture

Туре	Impact
Frequency of update	Once
Baseline	0 – without CEF intervention it is assumed that the project would not happen
Target	6 by 2030
Source	Project Directory – a knowledge base of high impact use cases per sector (deliverable by the 5G for Smart Communities Support Platform published on the Digital Strategy website)
Unit of	Number of the sectors impacted
measurement	
Responsible for reporting	CNECT B5

ii. Uptake of the CEF-funded reference architecture in the global MEC/edge cloud for 5G-based technology

Туре	Impact
Frequency of update	Once
Baseline	0 – without CEF intervention it is assumed that the project would not happen
Target	Not possible to set
Source	Reference architecture (deliverable of the 5GMEC4EU action for the global MEC and network architecture)
Unit of	Percentage of 5G use cases (integrating the reference architecture
measurement	in the edge-cloud nodes/5G technology)
Responsible for reporting	DG CNECT B.5
b) 5G Corridors along transport paths

Туре	Impact
Frequency of update	Once
Baseline	Not possible to set
Target	EU Blueprint for 5G handover of solutions
Source	Recommendations for an EU Blueprint 5G handover (deliverable of the 5G Corridors actions)
Unit of measurement	Percentage of standardisation initiatives enabling/addressing cross- border connectivity stemming from CEF digital projects
Responsible for reporting	DG CNECT E1

i. Seamless 5G handover of cross-border service between operators.

ii. Delivery of high-quality services e.g. C-V2X, infotainment and other (non) safety services on the infrastructure

Туре	Impact
Frequency of update	Once
Baseline	0 – without CEF intervention it is assumed that the project would not happen
Target	10 by 2030
Source	CSA GUIDE (Report on CEF-funded best practices (uses cases) 2023/2024 and 2024/2025), 5GAA (Reports on C-V2X uses cases)
Unit of	Number of defined use cases/best practices defined and/or project
measurement	trials reported
Responsible for reporting	DG CNECT E1

c) Digital global gateways

i. Number of additional operators using the CEF-funded projects

Туре	Impact
Frequency of update	Once
Baseline	0 – without CEF intervention it is assumed that the project would not happen
Target	1 per funded action
Source	Periodic reporting and/or questionnaires to the coordinators
Unit of measurement	Number
Responsible for reporting	HaDEA B1

ii. Availability/improved connectivity in remote areas

Туре	Impact
Frequency of update	Once
Baseline	Current situation per area covered by CEF projects
Target	10% increase by 2030
Source	DoA and project continuous reporting
Unit of measurement	Users or population in islands/remote areas digitally connected with CEF funded projects
Responsible for reporting	HaDEA B1

iii. EU Digital sovereignty

Туре	Impact
Frequency of update	Once
Baseline	0 – without CEF intervention it is assumed that the project would not happen
Target	30 by 2030
Source	DoA and report on final actions

Unit of measurement	Number of new or upgraded routes owned and controlled by EU entities
Responsible for reporting	HaDEA B1

d) Operational digital platforms

i. Uptake of smart energy/transport systems and services

Туре	Impact
Frequency of update	By the end of the programming period (project continuous reporting)
Baseline	0 – without CEF intervention it is assumed that the project would not happen
Target	1 by 2030 (and onwards)
Source	Deliverable of the BEGONIA CSA action on the shortlisted use cases
Unit of measurement	Number of use cases
Responsible for reporting	DG CNECT E.4

Annex IV CEF intervention logic



Impacts

Improved connectivity in cross-border and remote areas Increased territorial cohesio Economic growth (GDP) Reduction of environmental impact of energy and transport Reinforce EU Digital sovereignty Improved provisioning of services through 5G infrastructure

TRANSPORT - Result

Improved cross-border connectivity across the TEN-T railway network (including ERTMS), increased capacity of freight and passenger traffic, enhanced possibilities for freight modal shift, reduced travel time for passengers

mproved connectivity across the TEN-T waterborne network, increasing capacity, enhancing the possibilities for freight modal shift in inland and maritime port

Increased volumes of transport through rail-road terminals and multimodal logistic

Improved cross-border connectivity across the TEN-T road network (including ITS), enhanced safety and security of users

Improved uptake of alternative fuels

Improved infrastructure for civilian-military dual-use on the TEN-T network

ENERGY - Results

Better interconnection of national electricity and of national gas grids (in terms of the number of Member States connected, the reduction of Member States' isolation and access to new gas sources)

A gas and hydrogen system that is better interconnected and that ensures a secure and diversified gas and hydrogen

A more efficient and intelligent electricity transmission and distribution network, increased capacity to integrate new forms of generation, energy storage and consumption and facilitating new business models and market structures The integration of a plurality of low-carbon and particularly renewable gases, including biomethane or hydrogen, into

nergy system that can integrate more renewable energy thanks to sufficient storage capacity

A more meshed energy system, linking Member States with offshore generation centres, providing for energy system Integration across energy vectors and allowing for increased integration of renewable energy sources. A cost-effective deployment of renewables and higher share of renewable energy in generation and consumption at EU level, as well as better integration of renewable energy sources in electricity, gas and hydrogen grids.

DIGITAL - Results

- Increase in the number of alternative (new and/or upgraded) CEE funded routes and created capacity for better

connectivity - Increase in the Number of CEF funded routes and created capacity in Outermost Regions and Overseas Countries and

Better connectivity with areas not previously connected and remote regions by CEF funded routes and created

- Increase in number of MEC/edge nodes created under CEF funded 5G corridors and integrated to the European

- Increase in number of EU cross-border areas (rail, road and waterways) covered by seamless 5G connectivity meeting

Delivery of high-quality services e.g., C-V2X, infotainment and other (non) safety services on the infrastructure

Increase in the number of 5G best practices to serve as templates for possible replication Increase in the number of sectors with 5G enabled use cases, e.g., healthcare, education, agriculture Uptake of the CEF funded Reference Architecture in the global MEC/edge cloud for 5G-based technology

Increase in energy saved from curtailing due to cross-border interconnected energy and/or transport systems.
Decrease in GHG emissions' due to cross-border energy and/or transport exchange

Increase in the number of national QCI networks connected by cross-border terrestrial or satellite links and capable of