



Brussels, 6.6.2018
SWD(2018) 312 final

COMMISSION STAFF WORKING DOCUMENT

IMPACT ASSESSMENT

Accompanying the document

**Proposal for a Regulation of the European Parliament and the Council
establishing the Connecting Europe Facility and repealing Regulations (EU)
No 1316/2013 and (EU) No 283/2014**

{COM(2018) 438 final} - {SEC(2018) 292 final} - {SWD(2018) 313 final}

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Glossary

<i>Term or acronym</i>	<i>Meaning or definition</i>
CEF	Connecting Europe Facility
EEPR	European Energy Programme for Recovery (EEPR)
EFSI	European Fund for Strategic Investments
EIB	European Investment Bank
ERDF	European Bank for Reconstruction and Development
ERTMS	European Rail Traffic Management System
ESIF	European Structural and Investment Funds
eTEN	Trans-European Telecommunications Networks
INEA	Innovation and Networks Executive Agency
MFF	Multiannual Financial Framework
PCIs	Projects of Common Interest
RES	Renewables
SESAR	Single European Sky ATM Research
TEN	Trans-European Networks
TEN-E	Trans-European Energy Networks
TEN-T	Trans-European Transport Network

1 INTRODUCTION: POLITICAL AND LEGAL CONTEXT

"State-of-the-art connectivity of digital, energy and transport infrastructure is key to Europe's territorial, social, and economic cohesion."¹

1.1 Scope and context

The Connecting Europe Facility² (CEF) is a common, centrally-managed funding programme for transport, energy and telecommunications infrastructures, with an available budget of EUR 30.4 billion for the years 2014 to 2020. It was established as part of the Europe 2020 strategy for smart, sustainable and inclusive growth and the EU's '20-20-20' objectives in the area of energy and climate policy.

On 2 May 2018, the European Commission adopted its proposals for a new Multiannual Financial Framework (MFF) for 2021-2027. Under these proposals, the Connecting Europe Facility programme will have a budget of EUR 42,265,000,000 over this period. This impact assessment report reflects the decisions of the MFF proposals and focuses on the changes and policy choices which are specific to this instrument.

Based on the respective sectoral guidelines³, CEF supports the development of trans-European networks (TEN)⁴, with the objective of improving cohesion in the internal market and the EU's competitiveness in the global market. The general objective of CEF is to foster implementation of projects contributing to the completion of the TEN. This is reflected in the priorities laid down in the guidelines for the sectors of transport and energy. CEF addresses market failures, focuses on projects of high European added value and helps leverage further investment from the private sector.

As the scope of intervention in the digital component of CEF has changed significantly, it is necessary to repeal the sectoral guidelines for telecommunications and incorporate the provisions defining and prioritising projects of common interest in the area of digital connectivity - which would have been the substance of the revised digital guidelines - into the CEF Regulation. This was done in order to ensure a coherent and comprehensive view of its scope, of the funding instruments and priorities proposed for the next multi-annual financial framework, and, conversely, to avoid overlaps and contradictory legislation.

As outlined in the Communication on the budget for Europe 2020⁵, the Commission considered that *"while the market can and should deliver the bulk of the necessary investments, there is a need to address market failure – to fill persistent gaps, remove bottlenecks and ensure adequate cross-border connections. However, experience shows that national budgets will never give sufficiently high priority to multi-country, cross-*

¹ Communication from the Commission "A new, modern Multiannual Financial Framework for a European Union that delivers efficiently on its priorities post-2020" COM(2018)98 – 14.2.2018

² Regulation (EU) No 1316/2013 of the European Parliament and of the Council of 11 December 2013.

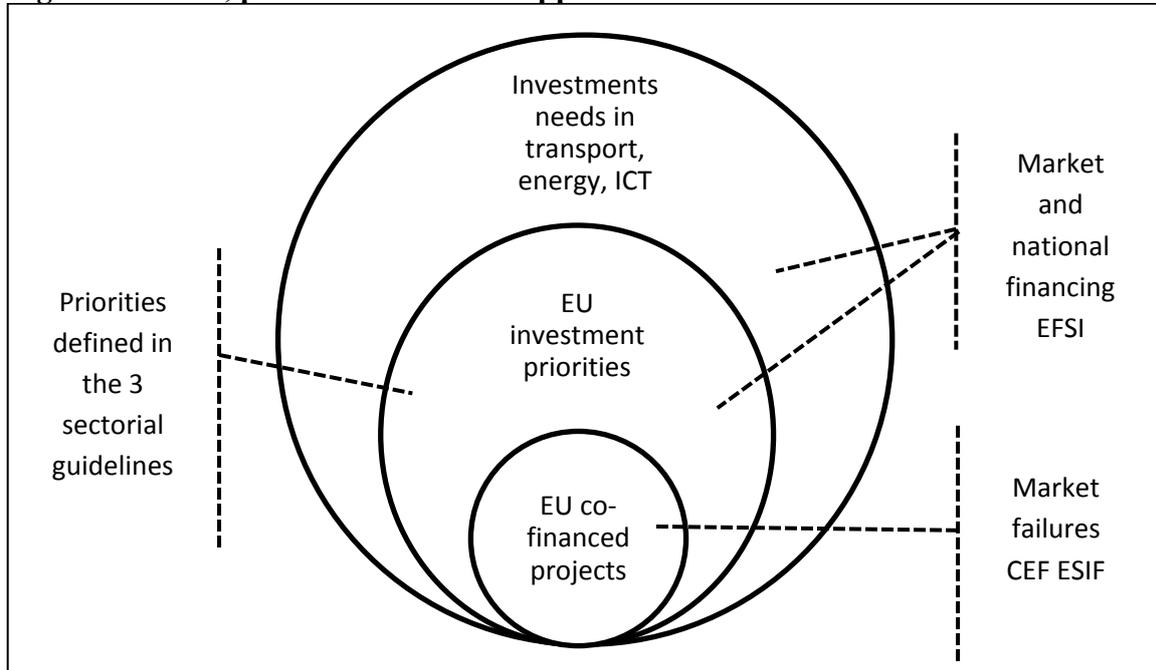
³ Regulation (EU) No 1315/2013 of the European Parliament and of the Council of 11 December 2013 on Union guidelines for the development of the trans-European transport network, Regulation (EU) No 347/2013 of the European Parliament and of the Council of 17 April 2013 on guidelines for trans-European energy infrastructure, and Regulation (EU) No 283/2014 of the European Parliament and of the Council on guidelines for trans-European networks in the area of telecommunications, to be repealed by the new CEF Regulation.

⁴ Articles 170-174 of the Treaty on the Functioning of the European Union (TFEU).

⁵ Communication from the Commission to the European Parliament, the Council, the European economic and social Committee and the Committee of the regions: A Budget for Europe 2020, European Commission, 29 June 2011.

border investments to equip the Single Market with the infrastructure it needs. This is one more example of the added value of the EU budget. It can secure funding for the pan-European projects that connect the centre and the periphery to the benefit of all. Therefore, the Commission has decided to propose the creation of a Connecting Europe Facility to accelerate the infrastructure development that the EU needs.”

Figure 1: Needs, priorities and CEF support



A mid-term evaluation⁶ of the current programme was carried out in 2017. It indicated that CEF is overall on track in its contribution to meeting the policy objectives of the TENs and is effective in supporting projects with high EU added value. CEF triggered the development of projects that Member States had failed to enable with their own financial means. In some areas however, the effectiveness could still be improved. This would require a number of improvements in the financing of the TENs and, where appropriate the European Structural and Investment Funds⁷ (ESIF), with a view to preparing a successor investment instrument post-2020. The financing framework of the TENs must take into account the impact of new initiatives such as the European Fund for Strategic Investments (EFSI) as well as the creation of the single guarantee fund “Invest EU”. The framework must also fully align with the current policy priorities of the Juncker Commission as well as long-term objectives such as the Paris Agreement⁸ commitments with more emphasis on digitalization, decarbonisation, (cyber)security and green industrial leadership. In this context, an extension of scope to integrate renewables into cross-border cooperation involving at least two Member States is considered as an additional element in the CEF-energy window. This extension is designed to make use of the cost-effective renewable energy potential across the EU by stimulating regional/cross-border cooperation, sector integration and enabling the EU to meet its

⁶ COM(2018)66

⁷ Including European Regional and Development Fund (ERDF) and the Cohesion Fund (CF)

⁸ In 2015, the adoption of the Paris Agreement by the 21st session of the Conference of the Parties (COP21) to the UN Framework Convention on Climate Change committed the EU and its Member States to a reduction in domestic greenhouse gas (GHG) emissions of at least 40 % by 2030 and by 80 to 95 % by 2050 compared with 1990 levels.

collective 2030 target. The scope of intervention of CEF Digital is changed in the same context, in order to ensure a closer alignment with the Union's strategic connectivity objectives, and a stronger focus on the core overall objective of the programme, allowing it to deliver on the infrastructure necessary for the digital transformation of the economy⁹.

Moreover, in alignment with the cross cutting objectives of the new MFF, there is a need to explore ways to incorporate in the future programme simplification, flexibility, synergies and coherence with other EU programmes. Of paramount importance is the need to reflect upon the considerations put forward in the Commission's reflection paper on the EU's finances¹⁰ which highlights CEF as a directly-managed EU programme supporting major EU infrastructures with high EU added value, contributing in making the EU visible and recognisable in the daily lives of its citizens. The paper also invites reflection on improvements to strengthen the performance and impact of the programme, in particular by avoiding overlaps, combining instruments and ensuring complementarity and simplification. In this spirit, the design of the successor CEF programme has to well address any potential overlaps and maximise synergies with the different EU instruments and programmes such as EFSI/InvestEU, the European Structural and Investment Funds (ESIF), Horizon Europe and the envisaged Digital Europe Programme.

The European Commission jointly with the Estonian Presidency contributed to this reflection process by holding in the margins of the Informal Council in Tallinn in November 2017 a joint session of transport and energy ministers, looking into the achievements and the future of CEF as well as its priorities post-2020. The session highlighted the need to build in the next MFF on the success of CEF as the key tool for promoting infrastructure development and a deeper integration of the EU. The outcome of discussions were reflected in formal Council Conclusions on TEN-T and CEF¹¹ adopted by unanimity in December 2017, which emphasised the efficient management of the CEF budget and called for the reinforcement of CEF as the strategic EU investment instrument for the realisation of the TENs.

While completion of electricity network infrastructure remains the priority to achieve the development of renewables, integrating cross-border cooperation on renewables reflects the more Europeanized approach adopted as part of the Clean Energy for all Europeans Package with a collective responsibility to reach at least 27 % renewables in 2030, the changed policy context and the amendments from both legislators calling on the Commission to enable and support regional cooperation in the currently negotiated review of the Renewables Directive (for more details cf. chapter 3.3. Annex 3). It will also contribute to making better use of synergies, align with the development of the meshed grid under current energy priority corridors and facilitate sector coupling e.g. between power and mobility.

A first class digital infrastructure is also a clear political priority, not only for the Commission but also for many Member States. In the wake of the Tallinn Digital Summit of 29 September 2017, the European Council has, in its conclusions of the October 2017 meeting, formally declared that “to successfully build a Digital Europe, the

⁹ These changes, as well as the ones resulting from the realignment of the instruments in the context of the coherence of the overall MFF package, are discussed in detail below as well as in Annex 4.

¹⁰ COM(2017) 358 of 28 June 2017

¹¹ <http://data.consilium.europa.eu/doc/document/ST-15053-2017-INIT/en/pdf>

EU needs in particular [...] a first rate infrastructure and communications network: this requires cooperation at the EU level, inter alia with the aim of achieving world-class very high-speed fixed and mobile networks (5G) all across the EU [...]" (EUCO 14/17).

In its report on the next MFF: "Preparing the Parliament's position on the MFF post-2020"¹², the European Parliament:

"supports reinforcing the Connecting Europe Facility [...];

[...] Stresses that an updated and more effective CEF programme should cover all modes of transport, including road and rail infrastructure, as well as inland waterways; considers that it should prioritise greater links between comprehensive networks and modes of transport that contribute to reducing CO2 emissions, and focus on interconnections and the completion of the network in peripheral areas; reiterates the importance of enhancing interoperability through the European Railway Traffic Management System and enabling the full use of the Single European Sky initiative; calls for the completion of the European digital air traffic management system;

[...] stresses that CEF Telecom should continue to support Digital Service Infrastructures and high-speed broadband networks by enabling their accessibility, including in remote regions and rural areas, and by improving digital literacy, interconnectivity and interoperability;

[...] calls [...] for continuous support for investments ensuring the diversification of energy sources and routes, increasing energy security and energy independence, and enhancing energy efficiency and the use of renewable energy, including by CEF Energy;"

With regards to complementarity with related programmes to CEF, the Parliament called for the Commission to implement and further facilitate greater synergies and complementarities between the different EU funds, including cohesion policy, FP9 and EFSI. The Parliament also asked for a thorough climate mainstreaming and underlined that the EU should not finance projects and investments that are contrary to the achievement of EU climate goals.

On the basis of the CEF mid-term evaluation and stakeholder consultation including the Open Public Consultation on EU funds in the area of strategic infrastructure, the envisaged scope of this impact assessment relates to identifying the main challenges to be addressed by the future CEF programme 2021-2027 with a focus on the key issue-areas requiring improvement compared to the current CEF programme. Stemming from this impact assessment will be the overall general and specific objectives of the future programme and a programme structure and associated delivery mechanisms that reinforce CEF for the purpose of the achievement of the EU policy objectives in the sectors concerned.

This impact assessment satisfies the requirements of the Financial Regulation in respect of preparing an ex-ante evaluation.

¹²European Parliament resolution of 14 March 2018 on the next MFF: Preparing the Parliament's position on the MFF post-2020 (2017/2052(INI))

1.2 Lessons learned from previous programmes

Mid-Term Evaluation of CEF

In accordance with the CEF Regulation¹³, the Commission, in cooperation with the Member States and the beneficiaries concerned, was required to present a report on the mid-term evaluation of the CEF to the European Parliament and the Council. This report¹⁴ and its accompanying Commission staff working document (SWD) was adopted by the Commission on 13 February 2018. The evaluation assessed the programme's overall performance in light of its general and sectoral objectives, as well as compared to what has been achieved as a result of national or EU action. In line with the Commission's Better Regulation Guidelines, the evaluation was carried out according to five criteria: effectiveness, efficiency, relevance, coherence and EU added value.

Table 1: Summary financial information as of March 2018 (EUR million)¹⁵

Sector	CEF Budget		CEF Funding (Grants) ¹⁶			
	Total CEF Budget (Financial programming Draft Budget 2019)	out of which total CEF Budget allocated to grants	Total reserved by an annual work programme or an amended multi-annual work programme (% of CEF budget allocated to grant)	out of which total Actual CEF Funding for the awarded grants (% of CEF budget allocated to grant) ¹⁷	Total effective budgetary commitment for grants (% Actual CEF funding)	Total effective payment for grants (% Actual CEF funding)
Transport	24.138	23.549	23,540 (100%)	22,293 (95%)	8,877 (40%)	3,608 (16%)
Energy	4.752	4.574	3,406 (74%)	2,461 (58%)	1,201 (49%)	259 (11%)
Telecom	1.043	579	325 (56%)	176 (30%)	155 (88%)	71 (40%)
Synergy			40 ¹⁸	22 (55%)	22 (100%)	8 (40%)
Total	29.933	28.724	27,311 (95%)	24,952 (87%)	10,255 (41%)	3,946 (16%)

The grants selected under the Multi-annual Work Programmes for CEF Transport and CEF Energy are managed through annual instalments over the period 2014-2020. The legal commitment is broken down into one or several budgetary commitments depending on the progress of the action. The total budgetary commitment is therefore lower than the

¹³ Article 27 of Regulation (EU) No 1316/2013 of the European Parliament and of the Council of 11 December 2013.

¹⁴ COM(2018)65

¹⁵ The synergy call funding came from both the Transport and Energy budgets.

¹⁶ Not taking into account the credits allocated to PSAs, Financial Instruments and procurements (including IT costs for TENtec). In addition, the total CEF Budget for grant has been supplemented with internal assigned revenues for EUR 255 million (mostly allocated to the CEF Transport).

¹⁷ Taking into account funding reductions due to amendments, closures and terminations

¹⁸ The indicative amount for the multi-sectorial call for proposal (energy and transport) was EUR 40 million but the effective demand was limited and only EUR 22 million was awarded in grants

total amount allocated via grant agreements (i.e. the total of the budgetary commitment represents 41% of the total amount of the grants allocated). So far, 16% of the total amount allocated to the selected grants has been paid through pre-financings and interim payment accounts. This information is broken down per sector in the above table.

Overall, the conclusions of the Mid-Term Evaluation of CEF were as follows:

"The evaluation illustrated that after the first three and a half years of CEF implementation, the programme is on track, although it is much too early to measure results given that the programme implementation is still at an early stage. Moreover, the performance framework provided in the Regulation has proven lacking well defined or robust indicators. With this reservation in mind, the evaluation showed that:

- *CEF is an effective and targeted instrument for investment in trans-European infrastructure (TEN) in transport, energy and the digital sector. Since 2014, it has invested EUR 25 billion, which has resulted in approximately EUR 50 billion of overall infrastructure investment in the EU. CEF contributes to the Commission's priorities on jobs, growth and investment, the internal market, Energy Union and climate, and the Digital Single Market. In so doing, it is strengthening the competitiveness of the EU economy.*
- *CEF brings high European added value for all Member States by supporting connectivity projects with a cross-border dimension. Most funding is awarded to projects bridging missing links and removing bottlenecks, with the aim of ensuring the proper functioning of the EU internal market and territorial cohesion among Member States in the transport, energy and digital sectors. Projects in energy also provide security of supply and are key for the cost-effective decarbonisation of the economy. CEF is also instrumental in the deployment of EU-wide new systems in traffic management and safety (e.g. SESAR for aviation, ERTMS for railways), high-performance electricity lines and smart grids essential for the rapid intake of renewable non-carbon energy sources, and in the roll-out of broadband and interconnected Digital Services (such as Open Data, e-Health, e-Procurement, eIdentification and eSignature).*
- *The direct management of CEF grants has proved very efficient, with a strong project pipeline and a competitive selection process, a focus on EU policy objectives, coordinated implementation and the full involvement of Member States. The INEA executive agency has a very good track record on the financial management of CEF and on optimising the budget, particularly thanks to its flexibility in quickly re-directing money unspent by certain actions to financing new ones.*
- *For the first time, a share of the cohesion budget (EUR 11.3 billion for transport) was executed under direct management within the CEF framework. 100 % of the envelope was allocated during the first half of the programme period, almost exclusively on sustainable transport modes. Targeted technical assistance, lower administrative costs for Member States, clear funding priorities and a solid project pipeline stemming from the continuity of projects and studies formerly supported by the TEN-T Programme or by the Cohesion Policy instruments contributed to the fast allocation of funds.*

- *CEF has continued to use and develop innovative financial instruments. However, their deployment has been limited due to the new possibilities offered by EFSI¹⁹. The use of the CEF financial instruments is expected to take up during the second half of the programme when complementarity between the CEF specific financial instruments and EFSI will have been ensured. The Connecting Europe Broadband Fund, building on contributions from CEF and EFSI, is expected to become operational in 2018 and fund the rollout of very high capacity networks in underserved areas, with an important leverage effect.*
- *Moreover, a very positive first experience of blending²⁰ grants with financial instruments was carried out in 2017 in transport, with EUR 2.2 billion funding requested for a call with an indicative budget of EUR 1 billion, enabling the use of grants to maximise the leverage of private or public funds.*
- *CEF spending in transport and energy is a major contributor to the EU's target of at least 20 % of the total EU budget to be dedicated to climate action-related spending. In the area of energy more than 50% of the CEF energy budget²¹ was allocated to electricity transmission and smart grids therefore contributing to the energy transition.*
- *In the Telecom sector, the dual focus of CEF on digital cross border services of public interest and communication and computing infrastructure has shown that the programme has an important impact on achieving the EU digital single market goals, enabling citizens and businesses to access high quality digital services across Europe. It has helped develop and implement common policies to address societal challenges including the digital transformation of healthcare, cybersecurity and digitisation of governments. However, due to the limited resources CEF Telecom could only support the very first steps towards a full cross border digital infrastructure in areas of public interest. Given the limited envelope allocated for broadband under CEF vis-à-vis the size of the investment gap, it was necessary to implement it in an innovative way and to aim at maximising leverage in order to ensure effectiveness. However, due to the complex set up of the dedicated financial instruments, the investments on the ground will only materialise at a late stage in the implementation of the programme.*
- *CEF has also tested cross-sectoral synergies, but has been limited by constraints in the current legal/budgetary framework. The sectoral policy guidelines and the CEF instrument would need to be made more flexible to facilitate synergies and be more responsive to new technological developments and priorities such as digitalisation, while accelerating decarbonisation and addressing common societal challenges such as cybersecurity.*
- *The completion of the TENs defined in the EU policy priorities will still require massive investments, part of which will depend on continued EU support. The size of CEF currently makes it possible to address only some of the identified market*

¹⁹ In particular projects initially in the pipeline for CEF Debt Instrument got ultimately financed under EFSI guarantee

²⁰ Commission Implementing Decision C(2017) 164 'EU grants from the Connecting Europe Facility – Transport Sector (General envelope) combined with financing from the European Fund for Strategic Investments, or the European Investment Bank, or National Promotional Banks, or private sector investors'

²¹ EUR 1.25bn out of the EUR 2.46bn awarded in grants in the CEF energy calls between 2014 and 2017

failures in all three sectors. Therefore, potential exists for unlocking further public and private investment if additional EU budget was made available to address market failures."

In addition, concerning the delivery, some additional points of improvement were identified regarding the reduction of administrative requirements for small grants, and a certain lack of flexibility over time as regards the priorities and scope of intervention, for instance to accommodate new policy priorities or to reflect technological evolutions.

Furthermore, various lessons learnt, which - due to the timing of the operational launch of the instruments - could not be incorporated in the Mid-Term Evaluation. They have nevertheless been reflected in the proposals for the new CEF Digital, in particular in the change of scope and in the implementation mechanisms. The lack of adequate funding, as well as the limitation to financial instruments at the onset of the implementation of the current CEF, where clear impediments to CEF having a strong impact in the area of broadband. Most importantly, the experience of setting up the financial instrument in the field of broadband, as well as the monitoring of the broadband investments supported by other EU programmes, clearly underlined that there are gaps and missing links in the types of projects supported, which constitute barriers to the completion of the Digital Single Market. These gaps and missing links, as well as the proposed refocus, are further described in section 2.1 below. Finally, new strategic objectives in the digital area have been defined in the Gigabit Society Strategy Communication, which have to be reflected in the new scope of CEF Digital, now focusing only on infrastructure.

1.3 Results from the consultation activities

OPC for the CEF Mid Term Evaluation and OPC on strategic infrastructure in the next MFF

Overall, stakeholders reiterated their support for the CEF programme and highlighted the key role it plays in contributing to the EU's objectives in areas such as the completion of the TENs, promoting economic growth and jobs across the EU. The transition to a low carbon system was named as the most important challenge for the future CEF in both the energy and transport areas by respectively 94 and 98 % of respondents. Stakeholders encouraged additional flexibilities in the new programme to encourage further synergies across the three sectors.

Respondents in the transport sector stressed the importance of CEF in facilitating cross-border projects as well as removing bottlenecks and missing links. Stakeholders called for an increased budget in order to accelerate the decarbonisation and digitalisation of the transport sector while increasing connectivity across the EU.

The energy-related responses to a very large extent reaffirmed the important contribution of CEF towards the completion of the trans-European energy infrastructure network and by extension towards the fulfilment of the Energy Union targets.

The digital respondents highlight the central role of broadband connectivity as a catalyst for the economic and social development across society and sectors. In order to increase competitiveness of the EU, they call for increased investments into connectivity and 5G, which would help improve economic performance, generate jobs in the EU and promote a qualitative leap in the transition to a Digital Society.

Stakeholders at the same time provided useful feedback on the areas that require further improvement or development and this is detailed in the consultation report in Annex 2.

Specific consultations concerning renewable energy

The extension of scope towards cross-border projects in the field of renewable energy is supported and justified by relevant findings of the REFIT-evaluation of the RES Directive of 2016²², and the outcome of the specific expert stakeholder workshop on the extension to cross-border renewables cooperation which took place on 5th March 2018 in Brussels where stakeholders present (including 12 Member State governments) overwhelmingly felt that EU action (including financial support) was necessary in order to overcome the Member State's hesitance to engage in cross-border cooperation and/or overcoming associated barriers (*for more details see annex 3*)

Specific consultations concerning synergies between sectors

To reinforce synergies between the three sectors specific expert workshops were organised. A workshop on the Internet of Energy was held on 26 February 2018 and on 30 January 2018 a workshop on Green-ICT.

2 THE OBJECTIVES

2.1 Challenges for the programmes of the next MFF

Key features of the ongoing programme and the Baseline

CEF is the main funding tool contributing to the objectives set by the Treaty²³ as regards the establishment of the TENs and which have been identified in the respective sectorial guidelines. ESIF, the EIB, including through EFSI, and the Member States alone, or in combination, make considerable contributions to the achievement of the objectives of the TENs; however, they tend to focus on national and regional areas as opposed to the European dimension. One additional challenge is that TENs are complex structures developed in a cross-border context with associated regulatory hurdles to be addressed.

There are many EU actions that support the achievement of the TENs objectives. The unique features of CEF however, such as direct management (including of the CEF Cohesion envelope for transport); the "use it or lose it" principle; clear prioritisation and deadlines; focus on cross-border and low-carbon infrastructures; flexibility to re-orientate unused funds; capacity to develop synergies; capacity to blend with private finance; targeted technical assistance and the full involvement of the Member States through the respective Committees allow CEF to address these particularly complex challenges. CEF is the only instrument of this scale at the EU level designed to specifically tackle the market failures due to the cross-border nature.

As highlighted in the Reflection Paper on the Future of EU Finances,²⁴ CEF is steering investments where the EU added-value is highest: on projects with a cross-border impact and European-wide interoperable systems and services. Given the persistence of market

²² SWD(2016) 416 final

²³ Article 170 TFEU

²⁴ COM(2017) 358 of 28 June 2017

failures for these types of projects as well as the significant investment needs that remain, the continuity of the instrument is very relevant and indispensable after 2020 for the achievement of the TENs. In addition, thanks to its efficient *modus operandi* and its capacity to attract private finance, CEF is also a major contributor to the Investment Plan for Europe and EU policy objectives of the Juncker Commission.

An unchanged policy (the Baseline²⁵), would see the continuation of the current CEF approach in the next financial perspective, carrying on in the post-2020 period with the same scope, delivery methods and budget (EUR 30.4 billion²⁶). Investments in the TEN-T core transport network, the integration of the internal energy market, security of energy supply, the transition to low-carbon and climate resilient economy and the digital single market as currently possible would continue. However, without further refinement of CEF, the main challenges identified in this impact assessment could not be addressed. For example, the possibility to address the increased investment challenge of the existing²⁷ and new emerging priorities, innovative projects and exploiting synergies and sector coupling would be very limited, while overlaps with other EU funds/programmes would persist.

The baseline scenario for CEF Digital would amount to quantitative and qualitative shortcomings, both risking to jeopardise the completion of the Digital Single Market. In terms of budget vis-à-vis the estimated investment gap, assuming that the same level of public funding is dedicated to broadband investment through all the EU programs, including CEF, ESIF, and InvestEU, and taking into account private investment predictions, it is estimated that between 50 and 70 million households across the EU would remain unconnected to high-capacity networks. More importantly, in the absence of a change of scope of CEF Digital, digital projects of strategic importance for EU's competitiveness would risk remaining unrealised, translating into significant untapped potential in the Digital Single Market. Finally, in terms of the overall structure of the CEF programme, failure to bring CEF digital budget to a more comparable level than that of the two other sectors would mean failure to reflect the importance of digitalising the European economy and, in particular, the other two sectors of CEF.

With respect to the qualitative shortcomings of CEF Telecom, and to the proposed change of scope of CEF Digital, a review of the support for broadband by instruments in the current programming period revealed that several types of digital projects of strategic importance are underfunded or overlooked. Seamless connectivity networks, including cross-border links and international connectivity networks have clearly been absent under the existing EU schemes, including ESIF investments, since it was decided that INTERREG 2014-2020 would not invest in digital networks and most other Operational Programmes are based on (Member States') national core-to-periphery models. The deployment of 5G corridors, by definition cross-border, would be clearly hampered if

²⁵ This Impact Assessment uses as basis Baseline EU28 including the UK, because due to the nature of the CEF Calls procedure there is no possibility to single out particular MS or attribute the average annual envelope between the individual MS.

²⁶ CEF support is attributed through competitive calls. It is therefore not possible to single out an envelope for the UK and to define an EU 27 baseline. To date, grants awarded to beneficiaries established in the UK amount to EUR 430.8 million. Moreover, specifically for CEF-energy, the track record shows that UK related projects tend to be commercially viable and therefore do not require subsidies for construction. They benefit from grants for preparatory studies which are normally much less budget intensive than construction subsidies

²⁷ E.g. there will be a step-change in the need for the reinforcement of the electricity transmission grid to be able to support the decarbonisation processes

broadband support would continue under the same conditions as the current ones. Moreover, various areas throughout the EU would remain uncovered, unless grant support is extended. The experience of setting up the financial instrument dedicated to broadband confirmed the importance of financial instruments in generating leverage for broadband investments and dealing with problems of access to finance; however, it also underlines the difficulty of steering private investments into market failure areas, due to a mismatch between risks and expected returns. While in such cases, a low intensity grant, possibly blended with a financial instrument, is sufficient to render a deployment commercially viable, it is necessary to be able to provide such grant in order to ensure that the project is implemented and that it generates a comprehensive coverage of the area in question. In other words, a grant component is needed to ensure a stronger policy steer of the intervention.

The main challenges and problems to be addressed by the future programme

The findings of the open public consultation on the future CEF programme and the CEF mid-term evaluation show that there is scope to build on the momentum created with the positive implementation of CEF in the period 2014-20. Further aligning CEF with the current political priorities of the Commission, in particular digitalisation and decarbonisation, can actually contribute to a strengthening of CEF delivery as more areas for synergy may emerge. The incorporation of support for cross-border renewables planning and deployment can be complementary to the development of the meshed grid (=integrated development of electricity transmission and offshore sources infrastructure (in the North Seas and the Baltic Sea) which is a complex endeavour. As with all programmes of the MFF, the challenge to increase flexibility, coherence and synergies, simplification and focus on performance needs to be addressed. In considering how CEF could be improved, the following main challenges have been identified:

First challenge: completion of Trans-European Networks in transport, energy and digital area

Europe's sustainable growth and competitiveness depend on efficient connectivity both within and to the rest of the world. CEF is a key EU funding tool contributing to the achievement of the objectives set by the Treaty as regards the establishment and development of the Trans-European Networks. Other EU instruments complement this, as the investment needs go far beyond interconnectors with the transition to a decarbonised system having in particular a very strong decentralised dimension (see also second challenge²⁸). Achieving well-interconnected, interoperable and efficiently managed transport, energy and digital infrastructures in Europe requires the ability to plan and invest in a coordinated long-term approach at EU level.

In the post-2020 financial period, the continued development of high-performance infrastructure connecting and integrating the Union and all its regions, in the transport, energy and digital sectors will be crucial for strengthening the social, economic and territorial cohesion of the Union and contributing to the creation of a single European transport area, an EU Energy Union, and the Digital Single Market (DSM).

²⁸For example, only the investment needs for renewables over 2021-2030 to meet the at least 27 % target for 2030 in Europe were estimated to be 240,000-400,000 million Euros and hence already higher than the TEN-E investment needs indicated above. Estimates go even up to 600,000 million Euros in a study of 2017 for the ITRE Committee that provided estimates for investments that ensure alignment with 2050 decarbonisation.

As illustrated in the table below, recent studies have estimated significant investment needs required in order to fulfil the objectives of the TENs.

Table 2: Estimated investment needs related to the Trans-European Networks - 2021-2030 (EUR million)

	<i>Investment needs</i>
<i>TEN - Transport</i>	550,000 ²⁹ - 1,500,000
<i>TEN - Energy</i>	178,670 ³⁰
<i>TEN - Digital</i>	500,000 ³¹

For transport, the figures cover cross-border sections, bottlenecks and missing links on the TEN-T core network, the large scale deployment of traffic management systems such as SESAR and ERTMS and major new priorities such as alternative fuels, digitalisation, and overall safety and security. Taking into account the TEN-T Comprehensive Network and urban transport investment needs, this figure would amount to EUR 1.5 trillion. Over the period 2021-2027, it is estimated that the total investments in the area covered by the new programme (core network, parts of the comprehensive networks and additional investments in decarbonisation and digitalisation of transport) would be close to EUR 1 trillion, while the new instrument would only target approx. 10% of the total, in order to focus the intervention on where it brings clear EU added-value. In addition, important support would also be needed through ESIF in order to match the investment needs, notably as regards urban and territorial mobility³².

For energy, the figures cover infrastructure projects with cross-border relevance in electricity, gas³³ and smart grids at transmission level. The detailed assessment of the investment needs in each of the TEN-E priority corridors and areas (factoring in the historical data on the average co-funding rate required within corridor) indicates that out of EUR 11 billion EU support needed for TEN-E (2021-2027), more than 85% would be required for electricity PCIs. It is expected that smart grid PCI projects alone will require EUR 2bn in EU support in the next decade. This indeed confirms that a step change in investments will be required in reinforcing the electricity grid (for higher absorption of renewable generation), in electricity storages and grid smartening and therefore it is expected that projects' technological innovation will become even more important driver

²⁹ Based on a consultation of Member States carried out in June-July 2017 and relating to the Core Network and Horizontal Priorities only. EU support to the Comprehensive Network (notably in Cohesion Member States) and urban mobility is not included in the EUR 95 billion amount indicated in the table.

³⁰ Based on the study "Investment needs in trans-European energy infrastructure up to 2030 and beyond", Ecofys, July 2017.

²⁹ Connectivity for a Competitive Digital Single Market - Towards a European Gigabit Society - COM(2016)587 and other studies. The figure includes both private and public investment needs to reach the targets set.

³² Specific attention will be given to the outermost regions connectivity needs and participation to the Trans-European Transport Network as indicated in the Commission Communication of 24 October 2017 "The outermost regions of the European Union: towards a new approach" (COM (2017) 623 final)

³³ The recent Communication on strengthening Europe's energy networks (COM(2017) 718 of 23 November 2017) recognises that the gas grid has become more resilient and nearly all Member States comply with the N-1 criterion and already have access to two sources of gas. If the necessary commitment is ensured from Member States, promoters, regulators and stakeholders, the remaining bottlenecks can be largely addressed by 2022/25 and Europe should achieve a well interconnected and shock resilient gas grid.

behind the grant decisions³⁴. It should be noted that the investment needs in the overall energy sector associated with the transition to a low carbon system are much higher than those reflected under the scope of TEN-energy which focuses on transmission infrastructure with cross-border relevance. Significant investments will be required at decentralised and local level (including for smart grids), in energy efficiency, renewables etc.

For the digital sector, the figure illustrates investment needs to reach EU's connectivity targets, i.e. gigabit connectivity for all main socio-economic drivers, high performance 5G connectivity –in particular uninterrupted 5G coverage of all major terrestrial paths – and access to at least 100Mbps for all European households. The combined investment needed to meet the Gigabit Society connectivity objectives by 2025 has been estimated at EUR 500 billion, for which an additional EUR 155 billion is required over and above a simple continuation of the trend of current network investment and modernisation efforts. An improved regulatory environment, as well as an increased exploitation of synergies, are expected to reduce this investment gap. It should be noted indeed that important synergies can be achieved between the deployment of 5G and of other (mostly fixed) connectivity networks. A dense 5G network reaching all urban areas and major transport paths – based on backhaul fibre to the 5G cells - will also benefit the deployment of wider networks for connectivity of both households and socio-economic drivers located in less densely populated area, e.g. by bringing the fibre network closer to homes as domestic and enterprises' needs and demand evolve. Nevertheless, a significant infrastructure investment gap to reach the EU's objectives is expected to persist after 2020, spread throughout the entire territory of the EU. Given the size of the challenge, EU support must be complementary, targeted and efficient, making the most of limited public resources.

It is important to note that with regard to digital infrastructure, all projects supported have cross-border characteristics and cross-border effects. Notably, the current legal base for CEF Telecom does not distinguish between cross-border projects and projects implemented entirely within one Member State. Due to the architecture and way of functioning of Internet connectivity, any local deployment is part of a trans-European digital network and has cross-border impact. Moreover, by addressing local connectivity problems at the EU level, in a coordinated and timely manner, the scale and network effects are maximised. Nevertheless, in view of the limited resources available and in order to maintain the key features of the CEF programme, it is important to prioritise digital investments on the projects that are considered to have most impact on the Digital Single Market and the highest EU benefit. "Local is global": the current experience of the Wifi4EU, of an otherwise purely local character as regards physical location, should demonstrate, thanks to its foreseen roaming functionality, the mechanism to build a network effect at EU level, underpinning the digital economy. Similar initiatives can be replicated for socio-economic drivers, which are local but underpin e-health, e-government, and enhanced digital skills. By their location and function, they should be at the forefront of digital connectivity, driving the digitalisation of public services and producing important socio-economic spillovers. Acting at EU level, due to scale and timing produces an effect which could not be achieved at national or regional level and,

³⁴ Only PCIs providing significant externalities such as innovation, security of supply or solidarity are eligible for grants for works under CEF-energy. To date the innovativeness was the key driver behind grants amounting to at least 25% of the overall granted amount.

moreover, avoids increasing territorial, social and economic discrepancies associated with digital divides.

The revised scope CEF Digital programme is then aimed at ensuring a more effective intervention in the sense of a stronger alignment with EU's strategic connectivity objectives, including by selecting priority areas of intervention that are currently not covered by public funding programs or that are best suited to be covered under CEF. CEF has indeed a proven track record concerning the timely delivery of cross-border deployments or of projects with strong cross-border effects, as well as the support to projects that can be delivered with only small grant components, which also maximise private participation to projects. This prioritisation, along with further eligibility criteria making sure that the risk of market distortion is minimised, further described in Annex 4, are reflected in the new CEF Regulation. Finally, it is of utmost importance that the reinforced intervention in the area of digital connectivity is reflected also in the allocated budget, in order to enable its effectiveness.

Compared to the overall investment needs, CEF will focus on a limited part relating to public goods of European dimension that would not be realised at national, regional or local level without EU support. More specifically, the programme will steer public and private finance towards EU policy objectives, enabling action where the costs are borne at national/local level and the benefits are tangible at European scale, and will accelerate the shift to a low-carbon and digital economy, while contributing to economic, social and territorial cohesion.

Without this targeted support, the possibility to achieve the EU policy objectives to complete Trans-European Networks in transport³⁵, energy and digital area would be limited. Significant delays would occur and the completion of strategic projects would be at risk. Projects already started would slow down or stall, leading to a partial loss of benefits from previous investment and EU support.

This would notably be the case for the deployment of smart systems such as SESAR and ERTMS and for major transport projects as illustrated in the recent Communication "A new, modern Multiannual Financial Framework for a European Union that delivers efficiently on its priorities post-2020"³⁶:

*"Other examples of the negative effects of delays in agreeing a new financial framework include **Rail Baltica**. The project will build a **crucial railway link into the Baltic States** and should be completed by 2025/2027. The project must be able to launch the major procurements it needs for construction in 2021. This is crucial for the completion of a project that will help connect five million people in the Baltic States to the rest of Europe. The high-speed rail link will cater at the same time for freight flows all the way from Finland to Germany, the Benelux and the Adriatic.*

*The **Brenner base tunnel** is planned to be completed by 2027, with the rail engineering works due to start under the next MFF. It is a crucial project to shift half of the 2.2 million trucks of the Brenner motorway to rail. This will cut down on pollution in the precious valleys between Munich-Innsbruck and Verona.*

³⁵The achievement of the TEN-T core network and its corridors is expected to generate additional EUR 4,500bn or 1.8% of GDP and 13 million additional job-years by 2030 (Delivering TEN-T, Facts & Figures, https://ec.europa.eu/transport/sites/transport/files/delivering_ten_t.pdf, September 2017)

³⁶COM(2018)98, 14.2.2018

The Fehmarn Belt between Denmark and Germany, the Evora-Merida railway link that will finally connect Lisbon and Madrid, the Lyon-Torino base tunnel that will connect the high-speed railway networks of France and Italy are also all due to be completed by the end of the next Multiannual Financial Framework. "

A lack of EU support would also put at risk major energy cross-border interconnections, including those necessary to reach the electricity interconnection targets, deployment of electricity interconnectors which are crucial for integrating markets, enabling more renewables in the system and benefiting from their different demand and renewable supply portfolio, off-shore wind networks and smart grids, de-synchronisation of the Baltic electricity grid, integrating all countries into a liquid and competitive energy markets.

The connectivity targets as set in the Gigabit society, which are a pre-condition for a functional Digital Single Market, would also not be reached without further targeted support. In particular those projects with the strongest cross-border characteristics and with the highest expected impact on the Digital Single Market, such as the deployment of 5G corridors and the digitalisation of energy and transport networks, would be impacted. The viability of the anticipated next generation digital services, such as Internet of Things services and applications that are expected to bring significant benefits across various sectors and for society as a whole, will require uninterrupted cross-border coverage with 5G networks, in particular in view of allowing users and objects to remain connected while on the move. However, the cost sharing scenarios for 5G deployment across these sectors remain unclear, and the perceived risks of commercial deployment in some key areas are very high. Road corridors and train connections are expected to be key areas for the first phase of new applications in the field of connected mobility and therefore constitute vital cross-border projects for funding under this Programme. The aim is to deliver "5G corridors", meaning full coverage with 5G systems of transport path, road or railway, particular 5G systems, enabling the uninterrupted provision of synergy digital services such as connected and automated mobility or similar smart mobility services for railways. At a more general level, the absence of a realignment of interventions for all programmes supporting broadband deployment, including ESIF and InvestEU, would lead to a situation where many areas throughout the EU would remain unconnected, with untapped potential for the digital economy but also for smart public services.

Overall, a reduced CEF budget would require policy choices between the completion of the TEN networks, the possibility to better address their evolution in relation with the energy and digital transition, and to build –up significant synergies on emerging topics as illustrated in the following second and third challenges.

Second challenge: the energy transition and technological developments in the transport, energy and digital sectors

While CEF makes a strong contribution to climate change actions and decarbonisation of infrastructures³⁷, this is insufficient in view of a growing need to invest directly into

³⁷ 90% of CEF funding dedicated to transport supported green modes of transport, while approximately 48% of the CEF electricity budget allocated so far has contributed to projects contributing directly to reduction of CO2 emissions (electricity projects; gas projects not taken into account)

rolling out of innovative technologies, notably in mobile equipment, for the decarbonisation of the land and maritime transport in line with Europe's transition to low-emission³⁸ and climate resilient mobility and EU commitments entered in the scope of the Paris Agreement.³⁹ This requires the roll-out of infrastructure for alternative fuels, as well as enhancing climate resilience during planning, design, construction and operation of infrastructures. The challenge of transitioning to a low carbon and climate resilient economy was the highest ranked issue in the public consultation for both the transport and the energy part (with 98% and 94 % of respondents respectively).

The Alternative Fuels Infrastructure Directive⁴⁰ addresses the provision of common standards on the internal market, the appropriate availability of infrastructure and consumer information on the compatibility of fuels and vehicles. Based on this Directive, Member States were requested to design policy frameworks for rolling-out publicly available electric recharging points and natural gas filling stations, and optionally hydrogen filling stations. In order to achieve mass acceptance and deployment of electric vehicles, charging and maintenance infrastructure needs to become widely available throughout Europe. While in the current CEF framework, a target of 5% of the CEF Transport budget is dedicated to innovation in low carbon transport, and proved successful in starting to deploy such infrastructures this will have to be scaled up substantially in order to meet future needs. For instance, the Commission's proposal for post-2020 CO2 targets for cars and vans⁴¹ implies that a substantial share of the vehicle fleet in 2030 will be electric (plugin hybrid or full electric). Similarly, in light of technological advancements, digitalisation and innovation requires intensifying support.

In the energy sector, the recent Communication⁴² on strengthening Europe's energy network recognises that electricity, *where renewables will constitute half of the electricity generation by 2030, will increasingly be driving the decarbonisation of sectors so far dominated by fossil fuels, such as transport, industry and heating and cooling. Therefore the focus will need to be on the reinforcement of the electricity transmission and distribution grids, digitalisation and smartening of the grids and deployment of new infrastructure solutions, particularly in the electricity storage area, and the impact of self-consumption.*" It is important to recognise that innovation is already one of the three main drivers (externalities) which can justify CEF energy grants for works (within the framework of the TEN-E guidelines). To date the energy envelope of CEF enabled several important highly innovative projects such as SincroGrid, Biscay Bay HVDC connection, gas deodorisation technology (these three totalling to EUR 0.629 billion, i.e. more than 25% of the overall budget allocated to date). It is, however, clear that in view of the investment challenge and the transformational (hence increasingly innovative, first-of-the-kind⁴³) character of the planned projects there is insufficient funding in the market alone. Public budget support will be indispensable to facilitate and de-risk the

³⁸ Communication from the Commission "A European Strategy for Low-Emission Mobility" COM(2016)501

³⁹ In the case of transport for example, this is reflected in the 2011 White Paper. In addition, commitments of the United Nations Climate Change Conference (COP 21) calls upon the achievement of 60% greenhouse emission reduction target in the area of transport

⁴⁰ Directive 2014/94/EU.

⁴¹ https://ec.europa.eu/clima/policies/transport/vehicles/proposal_en

⁴² Communication from the Commission COM(2017) 718 of 23 November 2017

<http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1511977964680&uri=CELEX:52017DC0718>

⁴³ E.g. transformer station solutions required off-shore, which have unprecedented design

take-up of such innovation in the networks sector⁴⁴ and to enable system operators to invest substantially higher volumes than they (both through their balance sheets and their regulated asset bases) are used to, including on sector integration beyond energy. As innovation will be necessary along the full value chain, the complementing enabling instrument for cross-border projects in the field of renewable energy will promote innovation aspects beyond the transmission network.

The extension to cover cross-border projects in the field of renewable energy happens against a new political context of more Europeanisation of efforts in this area and the increasing focus on renewables within existing intergovernmental groupings on energy matters. In addition to benefits stemming from a more coordinated approach⁴⁵, there are potential cost savings to be reaped from coordinated grid and RES deployment, reduced overall investment and back up needs as documented in various studies⁴⁶. The EU is entering a new scale in terms of RES electricity deployment (almost 50 % of EU electricity in 2030 will be from RES) and complementing regional transmission network planning with a more regional approach to planning of renewables can further help optimising the energy systems. While renewable electricity costs (particular for wind and photovoltaics) have significantly decreased in the last years and these technologies start becoming competitive, there is a need of tapping the potential of cross-border projects to further decrease production costs (= total generation and grid development costs) and incentivise sector coupling (where the electricity producing sector is developed in an integrated manner with the energy end use sectors such as transport).

In the digital sector, the demand for network data will increase exponentially with the advance of the Internet of Things, bringing at the same time major benefits across sectors and across borders. For example, the benefits of the deployment of 5G networks have been estimated at EUR 113 billion per year across for industrial sectors (automotive, health, transport and energy), while the cost sharing scenarios across these sectors remain unclear and the perceived risks of commercial deployments, very high. Other examples of exponential need for data concern the smart home market, which is expected to grow at a compound annual rate of 57% in the next five years, or the healthcare sector, where major savings can be realised - but only to the extent that high capacity connectivity covers not only major hospitals, but also smaller medical centres and homes of patients living with chronic conditions. Beyond this, measures need to be employed to control both the amount and the type of energy required to fuel that demand. In particular, it will be necessary to support appropriate solutions for the growing number of data centres migrating from single enterprise/institution to co-location and cloud data centres, which will operate through a steadily increasing number of sites across different countries. In addition, future trends, including the advance of the Internet of Things (IoT) may support the development of small and distributed data centres with many of the features of Cloud data centres.

⁴⁴ Considering the cross-border/EU relevance of PCIs in these sectors, EU level instrument, i.e. CEF, is best placed to provide such support

⁴⁵ SWD (2016)0418 final.

⁴⁶ See Annex 3 for more details

Third challenge: Better coordination with other EU programmes and better exploitation of synergies within CEF

Transport, energy and telecommunications infrastructure is supported to various degrees by a number of EU financial programmes and instruments, including CEF, ESIF, Horizon 2020 and EFSI. CEF is for the most part complementary with these other EU financial interventions; however, this complementarity bears the risk of overlap with implications to TENs policy and overall EU budget. Consequently, for the new CEF programme, the distinction from other EU financing programmes is a key requirement in order to maintain and promote clear objectives of the programme, avoid overlaps and optimise budgetary resources.

Complementarity with ESIF

The European structural and investment funds comprise the European regional development fund (ERDF), the European social fund (ESF), the Cohesion fund, the European agricultural fund for rural development (EAFRD) and the European maritime and fisheries fund (EMFF). The current ESIF mainly focus on five areas: research and innovation, digital technologies, supporting the low-carbon economy, sustainable management of natural resources and small businesses. Both the Cohesion fund and the ERDF fund actions in the transport, energy and digital sectors with the ERDF aiming to promote balanced development in the different regions of the EU and the Cohesion Fund funding transport and environment projects in countries where the gross national income (GNI) per inhabitant is less than 90% of the EU average. All of these funds are managed by the EU countries themselves, by means of partnership agreements.

Building on the first experience of directly managing a EUR 11.3 billion CEF envelope from the Cohesion fund for transport, the challenge is to better delineate the scope of both instruments in order to render them more complementary. Investments on the TEN-T Network are currently supported by CEF, the Cohesion Fund and ERDF.

The overlap between these instruments in the field of transport is limited by the narrower eligibility perimeter of CEF, in particular by its focus on railways and inland waterways while ESIF also covers important investments in the road sector. In addition, CEF resources are concentrated on the core network, while ESIF covers both the core and the comprehensive networks amongst other transport infrastructure.

Complementarity is pursued through:

- the national programming of regional instrument at the beginning of the period;
- the transfer to CEF of a EUR 11 billion share of the Cohesion Fund (entirely allocated, positive feedback from stakeholders and concerned Member States);
- the participation of DG REGIO in the CEF selection panels and in project specific task forces.

However, as evidenced in the CEF mid-term evaluation, there is significant overlap between CEF and ESIF for railway projects on the core network. In the period 2014-2020, CEF financing for railway projects on the core network is expected to reach approx. 16 billion, while Cohesion Fund and ERDF financing to railway projects on the core network are respectively expected to reach EUR 5.3 billion and EUR 2.5 billion. In certain cases, different sections of the same railway line are financed by different instruments as a result of optimising strategies of Member States and promoters.

In addition to the lack of clarity concerning the scope and results of each programme, this situation means that project promoters have to adapt to different administrative frameworks, rules and reporting schemes with all additional costs associated.

For example, CEF and ESIF large infrastructure projects have different rules as regards the maturity of projects and application requirements. As regards maturity, major projects under ESIF need as a minimum to have a binding environmental permit to be eligible for support, whereas this is not a requirement for the CEF projects, as maturity is assessed by the Commission during the evaluation process. Furthermore, the application requirements slightly differ, for example, ESIF major projects have to take additionally into account climate change adaptation and mitigation needs. The results of the public consultation show that the stakeholders expect fewer rules and more aligned rules. Hence, the above differences should be reduced where possible and only be maintained where justified by the different management mode.

In the case of energy transmission, the areas of intervention for CEF and ESIF have been designed with a view to avoiding overlaps. CEF which stems from the Trans-European Network article of the Treaty concentrates on cross-border relevant transmission assets and energy storages, CO₂ transportation as well as transmission grid smartening and pioneering smart grids in interface between transmission and distribution networks⁴⁷. ESIF, in turn, covers gas and electricity transmission which is not identified as PCI (i.e. of national and regional relevance only⁴⁸), investments in distribution networks and in particular in increasing these networks' intelligence. The objective is to continue with this clear delineation of responsibilities between CEF and ESIF also recognising that the latter would increasingly focus on accompanying the CEF enabled investments in transmission assets, the backbone and integrating element for the transformation of energy systems, with the decarbonisation-enabling investments in regions and municipalities (such as local RES storages, reinforcement of distribution and distributed renewable generation). For the extension of scope towards cross-border cooperation in renewable energy, the demarcation line will be similar: ESIF will continue to fund RES at urban and regional level, including through bordering regions assistance via INTERREG, whilst the new programme specifically supports two Member States getting together in planning and roll-out.

There are currently very limited overlaps in the digital field due to a different scope of intervention and current limitations for broadband under the current CEF, i.e. the low budget and the exclusive use of financial instruments. For the upcoming period, it is foreseen that CEF and ESIF will provide complementary and coherent support to reaching EU's strategic connectivity objectives, while having different focuses, reflected in the eligibility criteria set out in the CEF Regulation. CEF will focus on projects with cross-border and cross-sector dimensions, which would benefit from a coordinated approach at EU level (such as CAD/5G corridors, submarine cables, the Internet of Energy, green-ICT, connectivity for health etc.); on covering socio-economic drivers across the EU with Gigabit connectivity as well as local communities with very high quality wireless connectivity for citizens and visitors; and on supporting broadband

⁴⁷ The identification of Projects of Common Interest that are subsequently eligible for CEF is done under the strict criteria set out in TEN-E guidelines regulation (347/2013) which guarantees that the programme focused on projects with the highest EU added value.

⁴⁸ Even though during the negotiations of the legal bases for ERDF for 2014-2020 the explicit ban on financing of TEN-E assets was abandoned, in practice only two countries programmed investments in TEN-E gas and electricity and only for very few specific projects

rollout in areas where a market failure is observed, but where a limited public intervention can ensure commercial viability. On the other hand, it is expected that ESIF will focus on connecting areas with more severe market failure, where high intensity grants and public promoters remain necessary.

In terms of EU's connectivity targets as set out in the Gigabit Society Strategy, CEF will mostly support objectives regarding the main 5G corridors and the connectivity of socio-economic drivers and local communities, while both CEF and ESIF will contribute in a complementary manner - depending on the characteristics of each individual project to be funded in different areas - to reach the objective regarding ubiquitous coverage of households with high capacity broadband networks. CEF is indeed specifically appropriate for pan European/cross-border projects, but also for targeted and efficient interventions, pushing the footprint of private investments to cover as much geography as possible. CEF has indeed a proven record of use of financial instruments and blending, and this experience is useful in ensuring coverage of areas where only a low intensity grant can render a project viable. Ensuring that such resource-efficient interventions are done via CEF also allows ESIF to reach further territories with deeper market failures, such as peripheral or sparsely populated areas. At the same time, the eligibility criteria for CEF interventions will ensure that the supported projects do not lead to market distortion or crowding out private investments, inter alia by taking into account investments by private operators. Such delineation remains therefore, ensuring consistency with state aid principles. Further mechanisms to ensure complementarity will be put in place, at the level of national programming of ESIF and at the selection level.

Complementarity with Horizon2020

Horizon 2020 is the EU Research and Innovation programme for 2014 to 2020, implementing the Innovation Union, a Europe 2020 flagship initiative aimed at securing Europe's global competitiveness. The goal is to ensure Europe produces world-class science, removes barriers to innovation and makes it easier for the public and private sectors to work together in delivering innovation. The successor programme (Framework Programme 9) will be known as Horizon Europe.

Systemic yet underexploited synergies exist in the area of research and innovation. For example, while the scope of Framework Programmes is focused on supporting research and innovation, including technology development and prototype demonstration, the CEF scales it up to the level of development of new business cases and results in a broader and faster market⁴⁹ deployment of innovative technologies, covering market risks, in the three sectors of transport, energy and telecommunications.

Options in harnessing complementarity at the level of projects or financing solutions should take into account the market maturity, alignment of timeline and scope of the researched product and the readiness to deploy that product, in order to cover the full life

⁴⁹ It is important to note that CEF support allows promoters of energy transmission projects opt for innovative solutions (to system problems) which might not be otherwise approved by the (conservative and cost conscious) national regulators. This makes CEF supported grids more suitable test-beds for the outcome of EU research than average transmission assets.

cycle. It is furthermore important to ensure a cross-dissemination of the know-how accumulated on the supported projects⁵⁰ and of the results of the overall programmes.

Complementarity with Digital Europe Programme

The new CEF programme will provide the physical infrastructure for digital services supported by the Digital Europe Programme that is, the infrastructure necessary to support the digital transformation of industry, economy, public administration and society at large. On the other hand, Digital Europe, in general, will provide the service ecosystem that will make the infrastructure rentable and used. For example, Digital Europe will ensure and build the Cybersecurity capacity required for the deployment and functioning of trusted and secure infrastructure, and it will deploy the Services of Public Interests that need a connected society to be used at their full potential. Clear synergies exist and will need to be exploited, by taking into account specific area's needs and timeline alignment.

Therefore, it is clear that, contrary to what has been done in the current MFF, the new CEF will not provide support to the deployment of digital services in areas of public interest, as this will be done within the scope of the new Digital Europe Programme. The envisaged extension of scope is to widen connectivity coverage to reach new stakeholders thus making (cross-border) digital services accessible to an enlarged users' community.

Complementarity with EFSI/"InvestEU"

The European Fund for Strategic Investments (EFSI) is an initiative launched jointly by the European Commission and the EIB Group – the European Investment Bank and European Investment Fund –to help overcome the current investment gap in the EU. In order to enhance complementarity with EFSI, the Commission took action to reorient⁵¹ the CEF Debt Instrument to innovative EU pilot programmes, which has yielded some significant⁵² room for complementarity, and further work is planned to re-orient the CEF Debt Instrument to support the deployment of alternative fuels and PCIs in third countries.

It is expected that financial instruments will play an important role in delivering investments in the transport, energy and digital sectors and that for the next programming period they will be available under the InvestEU programme. Financial instruments are considered particularly relevant to support broadband deployment, complementary with the interventions via grants and blending. Concretely, it is proposed that InvestEU would provide: (i) guarantees for more mainstream broadband investments, with the aim to steer, de-risk, and accelerate investments in the newest technologies; while (ii) special purpose vehicles/thematic instruments, with the aim to overcome persistent issues of access to finance. Contrary to CEF, whose intervention is clearly steered towards market failure areas, InvestEU support is not expected to reach on its own commercially

⁵⁰ There were several research projects under H2020 which resulted in improved processes and technologies actively used by electricity and gas transmission system operators (e.g. iTESLA)

⁵¹ Following an agreement by the Commission and the EIB in the scope of the CEF Steering Committee in September 2015

⁵² The Green Shipping Guarantee Programme benefits from dual support of both the EFSI and the CEF Debt Instrument, with potential to mobilise up to EUR 3 billion of investment.

unattractive areas, being rather focused on maximising the commercially viable deployments.

As these types of intervention are, however, likely to be covered by the “InvestEU”, this would then eliminate the issue of complementarity between different financial instruments in different programmes.

Consequently, the complementarity between the CEF grants and the InvestEU will relate to:

- the intervention logic (CEF grants only where support through financial instruments is not sufficient/possible);
- the possibility to use CEF grants blended with InvestEU (or other private financing).

Synergies within CEF

The mid-term evaluation of CEF illustrated that the potential of CEF as a joint instrument for three sectors has not been fully exploited. Infrastructures such as EV charging stations, energy storage and smart grids often combine and operate at the intersection of transport, energy storage and digital infrastructures, but so far, CEF has not been able to sufficiently address this in an integrated way. The EU's commitments on decarbonisation will imply a growing role for sector coupling, i.e. infrastructure where power generation and storage and end-use sectors are interlinked.

One CEF Synergy Call has been launched covering the sectors of transport and energy, yielding limited results.⁵³ The CEF Transport Call 2018 will focus on horizontal priorities under an overall "digitalisation" umbrella coordinated in close proximity with CEF Digital calls. For 2018, CEF-telecom plans to explore cross-sector activities with CEF-energy and CEF-transport under Cybersecurity applied to the area of cooperative, connected and automated mobility and well as to the Internet of Energy. However, at the time of publication of this Impact Assessment, results were still unknown. Meanwhile, a substantial number of indirect synergies have been identified indicating that they are happening by default, but go uncaptured.⁵⁴

- Energy Union and its priorities identified in the recent Communication "Accelerating Clean Energy Innovation"⁵⁵: such as alternative fuels, low-carbon solutions and innovative systems (energy-transport-digital-climate-maritime);
- Alternative fuels charging infrastructure can involve transport infrastructure, power network, and digital investments aspects. Currently, restrictive selection criteria constitute barriers to invest in such technologies;
- Digital Single Market, such as data, infrastructures/processing capabilities, automated driving vehicles, e-mobility, ERTMS (transport-digital-energy);
- Regional, such as enhanced interconnectivity at urban nodes (transport-regional)

⁵³ 7 out of 9 innovative studies were recommended for funding for about EUR 24 million, falling short of the available EUR 40 million. As the first step it is encouraging since this call involved rather complex synergy between transport and energy, providing lessons for the future

⁵⁴ 36 CEF transport actions with a total value of EUR 220 million in funding awarded as enabling synergies with energy. Additional data show that 10 actions in CEF Energy for a total value of EUR 45 million are contributing to the enablement of synergies with transport.

⁵⁵ COM(2016)763 final

- Research and Innovation, as well as Energy Union, such as urban energy efficiency (transport-digital-energy-research);

The challenge for this programme is how best to support projects including through the proposed scope extensions delivering benefits which are in line with policy objectives of more than one CEF sector.

2.2 Objectives of the programmes for the next MFF

General objective of the programme

The overarching objective of the future CEF is to support the achievement of the EU policy objectives in the transport, energy and digital sector, as regards the trans-European networks, by enabling or accelerating investments into projects of common interest, and to support transnational cooperation on renewables planning and deployment in line with EU long-term climate and sustainable development goals. It will aim at maximising synergies among the sectors covered by the CEF and with the other EU programmes.

The future CEF should thus contribute to the EU policy objectives detailed in the table below.

Supporting the EU policy objectives beyond 2020

- ▶ Completion of the TEN-T Core Network by 2030⁵⁶, including the deployment of SESAR and ERTMS, and transition towards clean, competitive and connected mobility⁵⁷, the low-carbon transition through innovative infrastructure including an EU backbone of charging infrastructure by 2025; progress towards the completion of the TEN-T comprehensive network by 2050.
- ▶ Completion of the TEN-E priority corridors and thematic areas⁵⁸, in alignment with “Clean Energy for all Europeans⁵⁹” objectives, to ensure the functioning of the Union internal energy market, provide security of supply (inter alia through smartening and digitalisation of the infrastructure) and contribute to sustainable development and climate objectives by integrating renewable energy sources and enabling a cost-effective collective target achievement by 2030
- ▶ Achieving the digital connectivity infrastructure of a Gigabit society⁶⁰, as a underlying condition for a functional digital single market⁶¹, as well as providing the necessary infrastructure to properly support the EU-wide digital transformation of economy and society.

⁵⁶ Regulation No 1315/2013 on Union guidelines for the development of the trans-European transport network, Art 38

⁵⁷ COM(2017)283 Communication from the Commission "Europe on the move - An agenda for a socially fair transition towards clean, competitive and connected mobility for all"

⁵⁸ Regulation (EU) 347/2013 on guidelines for trans-European energy infrastructure

⁵⁹ COM(2016) 860 final

⁶⁰ i.e. Gigabit connectivity for all main socio-economic drivers, High performance 5G connectivity, access to Internet connectivity offering download speed of at least 100 Mbps, upgradable to Gigabit speeds for all European households, including rural ones, cf Connectivity for a Competitive Digital Single Market - Towards a European Gigabit Society - COM(2016)587

⁶¹ A Connected Digital Single Market for All: COM(2017) 228 final

Specific objectives of the programme

CEF aims to ensure the development of high-performance infrastructure connecting and integrating the Union and all its regions, in the transport, energy and digital sectors while contributing to the energy transition and technological advancement in these sectors. In light of this and on the basis of the challenges previously defined, the general objective of CEF can be translated into specific objectives for each of the three sectors. These specific objectives will be addressed at the level of programme structure and priorities and/or delivery mechanism.

Cross-cutting specific objectives

- The programme should also address the cross-cutting objectives of the MFF for all funding programmes in terms of **simplification, flexibility, coherence and focus on performance**. These objectives will be taken into account in section 4 (delivery mechanism) and 5 (performance measurement).
- For **synergies** between the three sectors, the programme should be sufficiently flexible to support actions at the crossroad of several sectorial objectives and adapt the form and scope of synergies to technological development and market needs. The synergies should in particular result in a more efficient and cost effective implementation of specific projects. Initial synergy areas could include Cooperative, Connected and Automated Mobility (CCAM) along major European Transport paths, smart grids, the use of alternative fuels and a better support for sector coupling in sectors that are end users of energy (such as electrification of transport), as well as an optimised grid for renewables, Internet of Energy and Green-ICT. Actions in one sector which also contribute to policy goals of another sector should also be encouraged and supported⁶².
- As regards climate mainstreaming, CEF should, in line with the overall approach taken in the next MFF, ensure that it fulfils its potential to accelerate the low carbon and climate resilient transition, and that it does not invest in activities that are incompatible with the related EU policy.

Sectorial specific objectives of the programme

- **Trans European Networks - Transport**
In the transport sector, the specific objectives of the programme are twofold. First, the programme will aim at the development of projects of common interest relating to efficient and interconnected transport networks. This includes the completion of major cross-border projects and the removal of bottlenecks and missing links. Priority will be given to the core network corridors, with the possibility to also support sections of the comprehensive network where justified (cross-border projects). Second, the programme will aim at modernising or upgrading the transport infrastructure in order to allow for smart, sustainable and safe mobility. This includes the deployment of alternative fuel supply facilities, a

⁶² For example, a lock co-funded under CEF transport that contains a small turbine that improves its socio economic case, could also receive co-funding for the turbine element. This element of the action would be ineligible under the current CEF (see section on synergies page 31).

next phase in the deployment of the digital systems like ERTMS and SESAR, further initiatives relating to cooperative, connected and automated mobility, and actions aiming at improving safety (notably road safety) and security of the transport infrastructure, as well as its resilience to climate change.

➤ **Trans European Networks - Energy**

Completion of the internal energy market through interconnections
Sustainable development through network infrastructure enabling integrating renewable energy sources⁶³ including through facilitating cross-border planning and deployment of renewables.

Security of supply inter alia through smartening and digitalisation of the grids

➤ **Trans European Networks - Digital**

To contribute in an efficient and targeted way to reach the broadband connectivity targets set in the Gigabit Society Strategy [*i.e. Gigabit connectivity for all main socio-economic drivers, High performance 5G connectivity, access to Internet connectivity offering download speed of at least 100 Mbps, upgradable to Gigabit speeds for all European households, including rural ones.*].

To contribute to the digitalisation of energy and mobility networks to enable cross-border services in these two areas.

To contribute to the resilience and capacity of EU digital networks by addressing international connectivity.

3 PROGRAMME STRUCTURE AND PRIORITIES

The table below summarises the main changes in scope for the new CEF programme.

<u>Main changes concerning the scope of the programme</u>		
	In	Out
All sectors		Financial instruments transferred to InvestEU
Transport (TEN-T)	Scope unchanged – but more weight given to decarbonisation and digitalisation	
Energy	Scope unchanged for TEN-E	
	Support to cross-border projects in the field of renewable energy	
Digital		Digital Service Infrastructure (transferred to the Digital Europe programme)
	Grant support to strategic connectivity infrastructure/redefined projects of common interest	

It is estimated that these changes of scope will not affect more than 10-15% of the programme budgetary allocations.

⁶³ And therefore contributing to decarbonisation of the energy systems and overall energy transition

3.1 The core priorities remain focused on the trans-European networks

Necessity for EU action

On the basis of Article 171 of the TFEU, the Union is empowered to define projects of common interest in TENs infrastructure while leaving the Member States to choose the methods of implementation. The same Article empowers the Union to support such projects of common interest.

A legal basis for the extension to renewables is provided by Article 194 TFEU that explicitly lists the promotion of renewables as one of the objectives of EU energy policies. In addition, Article 3(4) of the recast Renewables Directive stipulates "the Commission shall support the high ambition of Member States through an enabling framework comprising the enhanced use of Union funds, in particular financial instruments".

EU action is necessary for the following reasons:

- The scale of the problems being tackled specifically require EU action since they are by nature EU-dimensional, and can be more efficiently resolved at Union level, leading to overall greater benefits, accelerated implementation and reduction of costs if Member States act together.
- CEF was developed taking into consideration the impact of the decline in investment during the financial crisis and thereafter, when long-term bank lending was scarce. Although market conditions have evolved, the investment needs in TENs beyond 2020 exceed the resources at the disposal of several Member States.
- Transport: public budgets are still under considerable fiscal consolidation, while the implementation of the CEF for TEN-T in 2014-2016 shows that financing support from Member States and private sector continues to be crucial but insufficient for projects with European dimension.
- Energy: while the majority of projects of common interest can be financed in principle by the market within the regulatory framework, EU support is indispensable for a number of projects because of their externalities (including innovation) and the investment volume exceeding capacity of the system to socialise the cost.
- Renewables projects are also expected to be increasingly financed by the market in the future. Potential support in this area would only compensate the cost for overcoming barriers associated with cooperation beyond borders amongst Member States and/or the barriers preventing sector integration.
- Digital: a future-proofed EU economy and society depends heavily on the deployment of data infrastructure capable of supporting the development of new technologies, services and applications. Insufficient funding as well as missing links in current programmes lead to persistent gaps in broadband connectivity infrastructure, which are a barrier to the achievement of the full potential of the EU's digital economy. Digital innovations and services – including all Internet of Things services, all the applications and implications for the other economic sectors and public services - can only emerge and flourish if Europe becomes a truly connected continent. Public support, and in particular EU action is required to ensure seamless connectivity across the EU, which will in turn lead to massive benefits across various economic sectors, as well as to increased cohesion across the continent.

Added value of EU action

CEF provides EU added value⁶⁴ through the development of connectivity in transport, energy and telecommunications, not only because of the type of public goods with a European dimension that it covers, but also because of its focus on projects that would not be realised without EU support.

More specifically, the EU added value of CEF resides in its capacity to:

- steer public and private finance towards EU policy objectives;
- enable key investments where the costs are borne at national/local level whereas the benefits are tangible on a European scale;
- accelerate the shift to a low-emission and digital society.

In comparison with the total investment needs, EU CEF support focuses on actions that carry the highest EU added value. It should drive the alignment of major new infrastructure investment in the EU to our long-term climate objectives, thereby reducing the risk of stranded assets.

For transport, it covers cross-border sections and bottlenecks on the core networks, the large scale deployment of traffic management systems and major new priorities such as alternative fuels, digitalisation, and overall safety and security.

For energy, it covers infrastructure projects with cross-border relevance in electricity transmission and storage, gas, CO₂ transportation and smart grids at the interface between transmission and distribution networks (enabling integration of data flow between the various grid layers and reaching the energy consumers/prosumers) as well as increasing the intelligence of the transmission networks. It also covers targeted cross-border projects in the field of renewable energy deployment and planning involving (funding) of at least two Member States⁶⁵, possibly with accompanying storage facilities and connections to the transmission grid.

For the digital sector, it covers the deployment of digital connectivity projects expected to have a high impact on the Digital Single Market, inter alia through their alignment with the objectives of the Gigabit Society Strategy Communication, through strong cross-border effects, and through synergies across sectors and with the digital services enabled. Projects are furthermore prioritised taking into account the advantages of realising them at EU scale, noting that on the one hand, some projects would not be realised at all if left to Member States, while for other projects a series of granular, un-coordinated interventions would not achieve the same impact on the Digital Single Market.

Critical mass of funding/projects

In the case of transport, TEN-T core network corridors and horizontal priorities are listed in Annex I of the CEF Regulation. Each of the corridors is underpinned by a well-known project pipeline, with identifiable financial maturity and readiness for implementation,

⁶⁴ Criteria for assessing the value-added of European Finance were set out in the Reflection Paper on the Future of EU Finances (COM(2017) 358 of 28 June 2017).

⁶⁵ RES technology such as wind, CSP, sustainable biomass or even more innovative ones such as ocean technology

drawn together with the Member States and all relevant stakeholders in the scope of the Corridor Work Plans (cf. 2.1 above).

New emerging priorities needed to improve the future programme in the area of transport decarbonisation, digitalisation and cross-sectorial synergies constitute another cluster of projects that require EU's intervention. A significant scale-up of support to the deployment of alternative fuels infrastructure, major initiatives in the field of cooperative, connected and automated mobility or cybersecurity is expected to necessitate very considerable resource.

In the case of energy, the programme addresses very specific needs and objectives across various energy transmission sub-sectors in order to ensure that an increasingly integrated energy system of the EU functions well. It is clear, as evidenced with the investment needs analysis, that CEF must provide a comprehensive answer to specific problems across the entire system since an inability to address deficiencies in one area would immediately undermine the achievements/interventions in other parts of the interconnected grid⁶⁶.

In addition, a limited number of targeted cross border projects in the field of renewables can bring economies of scale, avoid duplication of infrastructures, increase deployment across Europe to better reflect the available potential, policy convergence, knowledge transfer, uptake and replication of innovative technologies in the European home market. It was precisely such EU added value that provided also the justification for granting support for selected offshore projects under the European Economic Recovery Programme.⁶⁷

In the case of the digital sector, considering the size of the investment gap (cf. 2.1 above), increasing the support to connectivity is indispensable for the success of all digital policies and for a competitive European economy. In case such additional funding will not be granted via CEF, significant potential for efficient support of network rollout and for socio-economic impacts would be lost. This relates to the focus of CEF on strategic connectivity projects, on cross-border and cross-sector projects, currently not supported adequately by any other EU programme. CEF also has a proven record of resource efficient support for deployments.

3.2 The scope of intervention in the digital sector is redefined in complementarity with the new Digital Europe Programme and with the centralisation of all financial instruments under InvestEU

The scope of the CEF programme for the digital sector has been changed with respect to the current financial framework and will not address the part called Digital Services Infrastructure, which will be included in the new Digital Europe Programme. A further change relates to the centralisation of all financial instruments under InvestEU, with the consequence that CEF support will be provided via grants and blending.

This changed scope of intervention amounts to a re-focus of CEF Digital on CEF core business of supporting connectivity infrastructure, taking advantage of the benefits of

⁶⁶ E.g. even most sophisticated off-shore grid may still require some reinforcements on-shore to deliver its benefits in full

⁶⁷ Regulation (EC) No 663/2009

aligning with the new EU's strategic connectivity objectives defined in 2016 and thereby also leading to a re-definition of projects of common interest. The funding projects envisaged in the CEF programme for the digital sector will focus on covering the needs of the physical layer infrastructure of very high capacity broadband networks, from backbone to access networks, in view of ensuring coverage to specific communities/areas and socio-economic drivers, as well as coverage along major terrestrial transport paths. International and cross-border connectivity, as well as connectivity in support of cross-sector projects (in particular but not exclusively connectivity infrastructure requirements and operational digital platforms supporting the digitalisation of transport and energy sectors, such as for Cooperative, Connected and Automated Mobility, the Internet of Energy and Green ICT) will also be focused. Contrary to what is done in the current MFF, the new CEF will not provide support to the deployment of digital services in areas of public interest, as this will be done under the scope of the new Digital Europe Programme. The rationale behind the new projects of common interest is further described in Annex 4.

CEF will therefore become a major tool to support the delivery of EU's strategic connectivity objectives. It will thus provide the first-class infrastructure necessary to support the digital transformation of industry, economy, public administration and society at large.

3.3 The scope of intervention in the energy sector is extended to targeted cross-border cooperation in the field of renewable energy under specific circumstances

Renewables deployment is currently mostly driven by Member States through national support schemes and planning with mainly national resources in mind. Support schemes that include cross-border elements, for instance when competitive bidding processes allowed the participation of producers from other Member States, had lower auctioning prices⁶⁸. Over the past ten years, Member States have not engaged significantly in transnational co-operation on Renewables deployment - despite the obvious socio-economic benefits of a more regional approach⁶⁹. This approach is promoted in several Articles of the 2009 RES Directive, a guidance document on cross-border cooperation from 2013, the revision of the renewables Directive and relevant wording in the current energy and environment state aid guidelines. In the few cases where cooperation took place in the past, projects either did not materialise, were (partly) too complex even with a grant from the EU budget (Krieger's Flak reduced from a 3 MS project to a 2 MS one) or took a substantial time to take off.

⁶⁸The results of the first cross-border tender for renewable electricity in Europe is an illustration of how a Member State can limit the costs of financing renewables through allowing foreign electricity generators to bid in the auction. The 50 MW photovoltaic tender organised by Germany and open to Danish generators achieved an awarded price (5,38 cents/kWh) that were more than 25% lower the last German tender for only-German individual installations (7,25 cents/kWh). The good response obtained by the tender, with bids totalling almost fivefold the amount procured and half of it represented by foreign installations shows also the willingness of generators to participate in a broader market.

⁶⁹ Cf. modelling underpinning the Clean Energy Package; "Cooperation mechanisms to achieve renewables target, Jacobson/Pade/Schroeder/Kitzing, in Renewable Energy 63 (2014); "Promotion of electricity from renewable energy in Europe post 2020- the economic benefits of cooperation. Fuersch/Lindenberger, EWI working papers. 2013;. http://www3.imperial.ac.uk/newsandeventspggrp/imperialcollege/newssummary/news_17-7-2017-14-13-34.

The reasons for Member States' reluctance to engage in cross-border projects include: regulatory complexities and administrative burden; first mover risk; difficulty in quantifying the costs and benefits of cooperation; preference for reaping the benefits of renewables' deployment nationally (jobs); political acceptance of using national taxpayers/consumers' money to fund projects abroad; uncertainty on cooperation design options and the difficulty in assessing the impacts on grid and integration costs.

Regulatory issues play a role and the Clean Energy for all Europeans Package of November 2016 already foresees certain alignments and improvements on permit granting (for all renewable projects, not only cross-border projects), market principles for support schemes, rules on renewable market integration, rules on grid costs and grid connection. Further harmonisation in those areas would be disproportionate from a subsidiarity point of view and will in any event never be able to cover all national specificities, which also extend in into other areas of strict national competence such as spatial planning and taxation. Even more importantly, and confirmed both by research and statements from Member States and other stakeholders the by far biggest obstacle is indeed the lacking incentive for either Member States or project promoters to engage or invest in such cooperation ⁷⁰

While the integration of renewables to the grid and achievement of EU level target for renewables will be primarily achieved through the completion of electricity network infrastructure, reaching this target can become more costly than necessary when areas with good conditions are not exploited because a Member State lacks the financial means or energy needs to do so on its own. Also, the additional component on renewables cross-border cooperation can complement the priority projects on the offshore meshed grid. In the North Sea and in the Baltic Sea the current transmission projects are point-to-point interconnectors that do not yet integrate an offshore renewables source. Projects such as Krieger's Flak supported in 2009 by the EEPR and the world's first infrastructure projects linking an offshore renewables source to two national grids could thus far not be replicated.

Similarly, a project might not happen when it requires coordination with other Member States to take place (e.g., investment in interconnections is needed to reap full benefits, even though this could bring benefits across several Member States). There are positive externalities from integrated projects when a production site is planned jointly (economies of scale) or connected cross-border allowing power to be transmitted to the country with higher demand and price hence improving the profitability of the site. Finally, with an EU-level binding target, renewables deployment and target achievement becomes a collective responsibility with the Commission's role becoming a facilitator. This calls for an adjustment also of available EU instruments to align them with this new reality.

Current EU support for renewables does not aim to facilitate their joint deployment. Lessons can be drawn from the TEN-E Regulation and the CEF also for the future development of renewables, in particular when it comes to incentives to promote cross-border cooperation. A similar EU-wide coordination for renewables deployment in the EU is still at its initial phase, but developing it could facilitate sector integration e.g. with

⁷⁰ Cf. finding in: Cooperation between EU Member States under the RES Directive, Ecofys 2014 based on interviews with representatives from 11 EU Member States and feedback from stakeholders received at the expert workshop on 5th March 2018 in Brussels (see Annex for more details)

transport as well as the development of the meshed grids.. Finally, in outermost regions, solutions only based on interconnectors might not be the most effective ones so that CEF can become more relevant for those regions if a combination with renewables were possible.

That is where the new enabling instrument for renewables under the CEF would come in. It would also underpin the provisions on partial opening of support schemes proposed by the Commission under the recast of the Renewables Directive.

The present IA considers the following actions:

- grants for studies and technical assistance to support Member States in:
 - assessing the benefits and costs of cross border cooperation
 - selecting the most adequate cooperation format
 - implementing cooperation agreements

- grants for studies (pre-feasibility and feasibility and development studies) for the implementation of projects
- grants for works for a limited number of projects with high EU added value based on a preselected Projects of European Interest, when the EU intervention is justified by the need to overcome:
 - the additional risks of complex multi country projects
 - significant positive externalities such as increased grid stability or due to a particular innovative solution and/or
 - MS' preference for investing only at home.

The intervention would be geared towards overcoming the identified market/coordination failures/incentive structure and therefore cover the additional costs arising from cross-border and multi-purpose infrastructure planning and development, as well as providing an incentive for Member States to explore such cooperation instead of only planning and deploying renewable resources nationally. The EU funding, by helping limit the additional costs linked to cross-border complexities would incentivise Member States to develop regional planning and deployment.

The total amount of support would be limited to 10% of the total energy window of the Connecting Europe Facility, whilst it would be ensured that unspent money could be transferred within the CEF energy window to TEN-E projects, and vice versa.

4 DELIVERY MECHANISMS OF THE INTENDED FUNDING

4.1 Changes in the programme delivery according to the Commission's global simplification measures

In the framework of the Commission's global simplification measures under the post-2020 Multiannual Financial Framework (MFF), overall simplification efforts will impact the CEF programme delivery. The preparation of the next MFF was launched by the Commission with the publication of the White Paper on the Future of Europe in March 2017. The next steps were the publication of the Reflection Paper on the Future of EU Finances in June 2017 and the circulation of the draft template basic act by DG BUDG in November/December 2017. The results of this political process provide the top-down

guidance for the next MFF and will affect the form of the post-2020 CEF programming period.

The template for the basic act has provided for an overall simplification basis for the new CEF regulation. This is in line with all other funding programmes and will consequently affect the new CEF in particular in the simplification of cost options, co-funding rates, Member States involvement and the development of programme objectives and indicators. It will also provide for a further simplified legal framework of CEF through a streamlined basic act and the possibility to delegate provisions and conditions to work programmes, which will facilitate further synergies between the three sectors and enable CEF to adapt to future needs.

4.2 Direct management of CEF and its benefits

The targeted delivery of CEF under direct management by the parent DGs and their executive agency INEA has proved efficient for the implementation of the current CEF programme. For the delivery and implementation of CEF funding, direct management has shown several practical advantages.

- Direct management allows for a stronger policy steering as regards the priorities, the selection of projects and their implementation;
- Direct management allows for exerting an independent coordination at EU level. Such coordination is exerted by the Commission (CEF parent DGs and INEA interacting directly with the project promoters);
- For the three CEF sectors, direct management allows for a fast delivery of EU support. As an example, in transport, the EUR 11 billion Cohesion envelope under direct management through CEF was entirely allocated by mid-2017 and all corresponding grant agreements were signed before end 2017.
- Direct management has allowed for project management expertise at INEA to be built up allowing for the monitoring of projects and the handling of these matters in an efficient and consistent manner while ensuring close control as regards compliance with EU standards. Direct management also allows for coordinated and consistent technical validation procedures.
- The "use it or lose it" principle, a key feature of direct management, helps Member States to prioritise as well as to adhere to commitments. Nevertheless, the possibility to recycle the commitments in cases where projects are not performing as foreseen increases the efficiency of CEF.

There are many benefits to using an Executive Agency for the implementation of CEF. Gains in efficiency have been introduced through the externalised management of the grant cycle via a unified system. In addition, annual Action Status Reports from beneficiaries allow for closer monitoring of grants. Furthermore, there is increased cost effectiveness given the ratio between human resources employed and the amounts granted.

The direct management of CEF will be supported especially by the "ex-ante assessment mechanism for large infrastructure projects"⁷¹. The mechanism is aimed at providing targeted support to ensure that the public procurement processes of CEF financed projects are implemented efficiently and effectively by the beneficiaries. It will thereby further facilitate the deployment of critical infrastructure.

Based on this positive experience, which has also been supported by the CEF mid-term evaluation results, the aim for the period beyond 2020 is thus to continue the current direct management for the new CEF with identified simplification and efficiency adaptations.

4.3 Proposed changes in the programme management by the parent DGs and the Agency

While the general principles applied for the programme management of the current CEF programme have demonstrated their efficiency and should be maintained, this section identifies improvements in specific areas, mainly related to simplification, innovative forms of support, technical assistance to project preparation, sustainability/climate proofing of certain types of projects and synergies.

Table: Challenges, objectives and delivery

Challenges	Objectives	Delivery mechanism
<i>First challenge: completion of Trans-European Networks in transport, energy and digital area</i>	<u>General objective</u>	For transport and energy, the current delivery mechanism proved efficient, it will be continued (grants managed by INEA). The same delivery mechanism will be used for connectivity projects in the digital sector.
	to support the achievement of the EU policy objectives in the transport, energy and digital sector, as regards the trans-European networks, by enabling or accelerating investments into projects of common interest	
	<u>Specific objectives</u>	
	Transport: development of efficient and interconnected transport networks, including the completion of major cross-border projects and the removal of bottlenecks and missing links.	
	Energy: completion of the internal energy market through interconnections	
	Digital: deployment of very high capacity digital networks and 5G systems in line with the Gigabit	

⁷¹Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions "Helping investment through a voluntary ex-ante assessment mechanism of the procurement aspects for large infrastructure projects", COM (2017) 573 of 3.10.2017.

	Society Strategy Communication, increased resilience and capacity of digital networks.	
<i>Second challenge: the energy transition and technological developments in the transport, energy and digital sectors</i>	<p><u>General objective</u></p> <p>to support the achievement of the EU policy objectives in the transport, energy and digital sector, as regards the trans-European networks, by enabling or accelerating investments into projects of common interest</p> <p><u>Specific objectives</u></p> <p>Transport: modernising or upgrading the transport infrastructure in order to allow for smart, sustainable and safe mobility</p> <p>Energy: Sustainable development through network infrastructure enabling integrating renewable energy sources including through facilitating cross-border planning and deployment of renewables. Security of supply inter alia through smartening and digitalisation of the grids</p> <p>Digital: Contribute to the digitalisation of energy and mobility networks to enable cross-border services in these two areas.</p>	<p>A reinforced priority will be given as regards the decarbonisation and digitalisation components of the programme.</p> <p>For transport, a significantly higher share of the budget will be earmarked.</p> <p>While the key features of the current delivery mechanism will be maintained, some adaptation are necessary to take into account a greater diversity of beneficiaries and type of actions supported as regards:</p> <ul style="list-style-type: none"> - simplified forms of grants (notably for lower amounts and/or standardised actions); - a more proportionate degree of oversight exerted by MS (application process, monitoring, certification of reports and cost statement).
<i>Third challenge: Better coordination with other EU programmes and better exploitation of synergies within CEF</i>	<p><u>General objective</u></p> <p>maximising synergies among the sectors covered by the CEF and with the other EU programmes</p> <p><u>Cross-cutting specific objectives</u></p> <p><u>Synergies within CEF</u></p> <p><u>Changed scope of CEF Digital, with a refocus on core business and a</u></p>	<p>Coordination with other programmes:</p> <p>Synergies: The delivery will be improved as regards:</p> <ul style="list-style-type: none"> - convergence and simplification of rules (less sector-specific) in order to

	<u>realignment with other EU programmes supporting connectivity deployments.</u>	facilitate synergies; - adoption of joint work programmes; - more flexible definition of eligible actions.
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Simplification

The aim for the post-2020 MFF period is to continue regular administrative simplification measures of the programme management based on INEA's experiences during the 2014-2020 programming period. As an example, INEA has implemented various administrative simplification measures largely based on the TEN-T Executive Agency's experiences during the 2007-2013 programming period. These measures include the introduction of electronic communication tools for beneficiaries as well as the replacement of grant decisions by grant agreements which require less involvement from the Commission and the Member States. The following measures are envisaged for the new CEF at the level of the basic act⁷²:

- Simplification of the **programme structure**

Following the general approach defined for all programmes in the next MFF, the basic act will be simplified compared to the current CEF regulation (see section 4.1). This includes the removal of all provisions already covered by the Financial Regulation, references to the TEN guidelines instead of repeating their provisions wherever possible, and use of standard provisions identical for all programmes. In addition, the number of specific objectives will be reduced and put in correspondence with the list of eligible actions.

- Simplification of **co-funding rates** in transport⁷³

While the current CEF Regulation specifies in detail the co-funding rate applicable per type of action (different categories at 20, 30, 40 and 50% and the cohesion envelope at 85%), the new Regulation would only refer to a generally applicable maximum co-funding rate (for instance 30%) with two exceptions:

- a maximum co-funding rate at 50% in duly justified cases to be specified in the Regulation;
- an exception concerning actions funded under the cohesion envelope (the maximum co-funding rates of the future Cohesion Fund would apply).

In addition, the Regulation should clearly specify that, within these limits, the work programme may provide for more differentiated co-funding rates depending on the type of action.

⁷² It is noted that the most important simplification measures for beneficiaries relate to the implementation phase, notably as regards the programming and design of the calls, the evaluation process, the grant agreement preparation and the monitoring arrangements. These elements are not regulated at the level of the basic act.

⁷³ Co-funding rates in case of CEF-energy and CEF-ICT under the current CEF regulation have already been simple and will remain such in the next generation of CEF.

Finally, the Regulation should allow for the derogation to these limits in the case of joint work programmes covering several sectors in order to avoid that different co-funding rates per sector constitute an obstacle to synergies.

- Streamlining the **Member States** involvement through the **CEF Committee**

While the implementation of the programme lies within the responsibility of the Commission, the involvement of Member States is considered important, especially when it comes to large infrastructure projects on their territories or to regulated public goods. In addition, the simplification of the programme implies that important implementation modalities would be set in the work programmes and no longer in the basic act.

For these reasons, it is considered proportionate and justified to maintain the CEF Committee and to focus its role on the work programmes. While the Committee would continue to be informed in detail on the selection of projects and on the monitoring of the programme, it should be assessed if a formal opinion of the Committee on the award decisions taken by the Commission is necessary. Such simplification would allow to further reduce the time to grant by almost a month.

As regards individual projects, currently Member States are requested to approve applications and to certify incurred expenses and final reports. The approval of applications by Member States was questioned in a certain number of cases, notably when promoters are private entities and/or the project does not concern common goods or interest. It would be preferable to remove this general obligation but to keep the possibility to impose it in the work programmes when duly justified (large infrastructure projects, use of the national envelope under the transport cohesion envelope, projects including certain aspects related to security or public authority, etc.).

On the contrary, the certification of expenditure and final report by Member States could be removed entirely and replaced by a more systematic obligation to provide an audit certificate.

Complementarity/Coherence with other funds

The challenges identified in section 2.1 concerning the complementarity/coherence with other EU programmes are presented in the table below:

ESIF	<ul style="list-style-type: none"> • Better delineation of scope between ESIF and CEF concerning transport⁷⁴: CEF focusing on the TEN-T infrastructure of cross-border relevance (including through the implementation of a Transport Cohesion Fund envelope) while ESIF focuses on the urban, local and regional mobility needs through ERDF. • Better coordination and streamlining of policy objectives and interventions through the ex-ante conditions applicable to transport investment under shared-management (to ensure full consistency with the TEN-T). • In case of energy, clear delineation ensured with CEF focusing
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⁷⁴ Subject to final decisions concerning the scope and budget of each programme.

	<p>on TEN-E (including smart grids on transmission and transmission/distribution interface) while ESIF on national/regional transmission, distribution and distribution level smart grids and storages. Increasing importance of investments at local and regional level in a decentralised energy system points to a continued or even increased relevance of EFSI funding for energy therefore</p> <ul style="list-style-type: none"> • Both ESIF and CEF are aligned in providing coherent and complementary support to EU's strategic connectivity objectives. As regards one target to which both ESIF and CEF are expected to contribute to, CEF is expected to cover market failures areas where projects can be deployed with low intensity grants, allowing ESIF to address further and more severe market failure areas which require higher grant amounts and intensity. • Better alignment of rules concerning applications, implementation and monitoring.
InvestEU	<ul style="list-style-type: none"> • No competing financial instruments in CEF. • Focus grant support on projects that cannot be supported through financial instrument, or • Use grants for blending with InvestEU (or other private financing) if needed for bankability.
Digital Europe Programme	<ul style="list-style-type: none"> • According to its current definition, Digital Europe will include future activities concerning the Digital Services Infrastructures part of the current CEF. • Services developed in Digital Europe will run over the connectivity infrastructure provided by CEF2. • Cybersecurity developed in Digital Europe will be used also to protect critical infrastructures supported by CEF2
FP9	<ul style="list-style-type: none"> • As in the current period, while the development of innovative solutions will be supported by the EU research programme FP9, the deployment of innovative solutions will be supported by the new CEF when in relation with its scope (for instance as regards alternative fuels or digital traffic management systems). No risk of overlaps as inherently different stages of market maturity of FP9 and CEF actions

Innovative forms of support

For infrastructure projects that have positive expected environmental and socio-economic values in support of EU policy objectives, there exists a full spectrum of financing needs (in terms of the financial viability of the investment). From financially viable projects based on the income stream generated by users and concession fees in regulated sectors, to projects of high policy, environmental and economic value, but not generating sufficient revenues to cover investment and therefore being highly dependent on public sector/government support.

Therefore a full range of support mechanisms continue to be appropriate for infrastructure including a continuation of EU-backed budgetary guarantees and financial instruments under “Invest EU”, to complement the bulk of EU support to the sector

which will continue to be delivered through grants by EU programmes such as CEF (whether conventionally or through blending) and by the EIB and other financing public and private institutions and investors.

- Expanding the use of **blending**.

The provision of grants in combination of EIB, whenever appropriate through EU-backed financial instruments, National Promotional Banks or private finance to projects aligned with EU high value objectives is an appropriate support mechanism because many infrastructure projects are on the margins of financial viability, and support solely through EU-backed financial instruments, including "InvestEU" backed financial products, would not be sufficient to deliver financial viability.

The blending approach allows the bulk of the finance to be provided privately, minimising the overall public sector contribution in line with the goals of the Investment Plan for Europe, improves the quality of the projects and their efficient delivery. Furthermore, an emphasis on private finance and blending can catalyse changes in investment strategies by Member States.

There is a strong case for the administration and allocation of grants (whether conventionally or through blending) to be towards projects with high EU added value. The proven way to deliver this is through centralised sector specific instruments such as the CEF, through either blending calls or blending facilities, where the use of the CEF budget ensures the fulfilment of the TEN priorities.

The update of the EU Financial Regulation includes legal text regarding blending and blending facilities⁷⁵. In addition, as part of the so called 'Omnibus', an amendment to the current CEF Regulation to establish the possibility of a blending facility for one or more of the CEF sectors, has been agreed. This approach can be tested in the current financial period and then scaled up in the next period.

Blending seems also well suited for the integration of renewables into cross-border action. Blending also seems particularly suitable for supporting broadband rollouts, where only a small grant component could ensure full coverage of territories where private investors alone would otherwise not go, or would favour locations within that specific area.

- Making use of **simplified forms of grants**

The new Financial Regulation no longer requires grants to be expressed as a percentage of eligible costs and grants may also be expressed as an absolute value, i.e. in a so called notional approach.⁷⁶ The possibility to use simplified forms of grants will be ensured in the new Regulation according to the provisions set out in the template basic act circulated by DG BUDG. This includes notably provisions under Article 11 of the new Regulation

⁷⁵ A cooperation framework established between the Commission and development or other public finance institutions with a view to combining non-repayable forms of support and/or financial instruments from the Union budget and financial support from development or other public finance institutions as well as from commercial finance institutions and investors and be managed either by the Commission or by persons or entities implementing Union funds pursuant to point (c) of the first subparagraph of Article 62(1)".

⁷⁶ As further specified in Article 11 of the template basic act circulated by DG BUDG and in Article 180(1) of the new Financial Regulation.

specifying that co-financing rates will only apply where the work programmes foresee grants calculated as a percentage of eligible cost.

Simplified forms of grants, for example in the form of voucher schemes, will continue to be used to fund very high quality wireless local connectivity to local communities and could be used for socio-economic divers in the future: connectivity vouchers are envisaged to be used to provide Gigabit connectivity to specific entities with a public mission, e.g. eHealth centres and practitioners, schools, local administrations. This will directly and indirectly support important digitisation efforts, i.e. driving demand by illustrating the benefits of advanced digital services, and potentially improving the business case for wider network deployments in the respective areas.

Synergies

The design of the programme will allow synergies between sectors in a flexible manner notably through the following changes.

- The alignment of key provisions for the three sectors and the possibility to adopt **thematic work programmes** covering specific priorities of several sectors. The possibility to adopt thematic work programmes between the three sectors will also further facilitate coordinated synergy calls for proposals between the sectors, which will enable CEF to specifically direct Union funding to shared areas of interests and inter-sectoral horizontal priorities. The first thematic work programme could focus on Connected and Automated Mobility for instance.
- The **removal of the obstacles** that have hampered synergies in the current programme. Under the current programme specific obstacles were identified, which have hindered the exploitation of synergies in practice:
 - Actions with synergies can be financed only if the components and costs of such an action can be clearly separated per sector;
 - Each component must be eligible under the specific sectoral guidelines which each, independently, sets strict criteria;
 - No dedicated budget line for synergies exists which would support actions whose components cannot be separated per sector;
 - Difference in programming timing (e.g. multiannual vs annual work programmes).

Under the new programme, the Commission's global simplification measures will notably facilitate the removal of the identified obstacles for synergies of the current programme period. In particular, the above-mentioned possibility for dedicated synergy work programmes as well as simplified provisions in the basic act will enable synergies among the three sectors. As the new Regulation would only refer to generally applicable maximum co-funding rates in all three sectors and gives the possibility to specify additional eligibility criteria in the calls for proposals, the new Regulation offers more flexibility through the delegation of provisions to the work programme level.

- A **more flexible definition of eligible actions** in the new Regulation allowing to take into account some elements in synergy with other elements eligible under CEF or contributing to the policy goals on in the transport, energy or digital sectors.

Sustainability/climate proofing of projects

The climate proofing (both mitigation and adaptation aspects) of ESIF major projects has been successfully implemented within the 2014-2020 period. Furthermore, individual MS/regions devised their national/regional approaches to strengthen the sustainable dimension of EU co-funded infrastructure projects⁷⁷. In view of this experience and the sustainable development requirements of the TFEU (Art. 11), the CEF funding should better integrate the sustainability/climate proofing into its operation, irrespectively of the sustainable nature of its project portfolio.

Any system to be designed should be relatively simple and should not entail excessive costs and be made-to-measure for specific types of projects.

Climate proofing of investments made under the CEF will aim at ensuring continuity of services in case of extreme weather events (minimisation of disruption of transport services, security of energy supply and security of network stability). The increase in weather related risks caused by climate change should also be taken into account, using sector specific and the best available information. For investments made under the CEF, negative externalities related to climate and other environmental risks can be taken into account in the overall project risk assessments and mitigation strategies during planning and development phases. For larger infrastructural systems such as energy network systems, transport systems or broadband infrastructure, a climate proofing exercise would include both damages to the infrastructure itself and losses due to projected operational down-time.

5 HOW WILL PERFORMANCE BE MONITORED AND EVALUATED?

Compared to CEF 2014-2020, a simpler but more robust performance framework will be put in place to monitor the achievement of the Programme's objectives and its contribution to the EU policy objectives. Performance monitoring will continue to be carried out both at actions level and at programme level.

At actions level, the necessary data will be collected by INEA during the implementation and evaluation of supported actions. The collected data will relate to the technical and financial progress of the actions. To this end, the conditions for applying for a grant and the model grant agreement will contain proportionate requirements on applicants and beneficiaries to provide the necessary data.

At programme level, in line with guidance from DG BUDG under the EU Budget Focused on Results initiative and building on the work INEA has already undertaken on improving output indicators during the current CEF programme (in accordance with the findings of the mid-term evaluation), the new CEF Regulation will contain several high level indicators based on each of the specific objectives with the measurement mechanisms for these indicators being developed in advance of the implementation of the new regulation.

As far as possible, the relevant criteria and approaches will be harmonised across all MFF programmes. As far as possible, the mainstreaming methods of ESIF and CEF

⁷⁷ Some examples can be found in the Report of the European Network of Environmental Authorities – Managing Authorities (ENEA-MA) working group on [Mainstreaming the environment in cohesion policy in 2014-2020](#), 2016

should be harmonised⁷⁸. The table below sets out the high level indicators and provides illustrative examples of possible measurement mechanisms.

Sectors	Specific Objectives	Indicators
Transport	Efficient and interconnected networks and infrastructure for smart, sustainable and safe mobility	Number of cross-border and missing links addressed with the support of CEF (including actions relating to urban nodes, maritime ports, inland ports and rail-road terminals of the TEN-T core network)
		Number of CEF supported actions contributing to the digitalisation of transport
		Number of alternative fuel supply points built or upgraded with the support of CEF
		Number of blackspots addressed with the support of CEF
	Contribution to military mobility requirements	Number of transport infrastructure components adapted to meet military mobility requirements
Energy	Contribution to interconnectivity and integration of markets	Number of CEF actions contributing to projects interconnecting MS networks and removing internal constraints
	Security of energy supply	
		Number of CEF actions contributing to projects ensuring resilient gas network
		Number of CEF actions contributing to the smartening and digitalisation of grids and increasing energy storage capacity
	Sustainable development through enabling decarbonisation	Number of CEF actions contributing to projects enabling increased penetration of renewable energy in the energy systems
		Number of CEF actions contributing to transnational cooperation in the area of renewables
Digital	Contribution to the deployment of digital connectivity infrastructure throughout the European Union	New connections to very high capacity networks for socio-economic drivers and very high quality wireless connections for local communities
		Number of CEF actions enabling 5G connectivity along transport paths
		Number of CEF actions enabling new connections to very high capacity networks for households
		Number of CEF actions contributing to the digitalisation of energy and transport sectors

Regarding the climate and air quality related indicators, common headline indicators would improve coherence and communicability of the CEF and should be developed in the context of a Commission-wide coordinated approach in order to harmonise the provisions with other programmes, including with regard to the climate mainstreaming methods (on project/programme screening criteria/CBA, on tracking, on KPIs, on reporting). As regards indicators for air quality and emission reduction⁷⁹, they should include emissions of PM 2.5 in kg/year and emissions of NO₂ (or NO₂ equivalent in the case of NO_x) in kg/year, before and after the project.

⁷⁸ For example on delivery mechanisms, project/programme screening criteria/CBA, on tracking, on KPIs, and on reporting.

⁷⁹ There is the European Court of Auditors' recommendation for quantification of environmental benefits (notably in transport projects co-funded by the EU, even if these are only secondary objectives of projects).

These indicators will allow monitoring and evaluating implementation and progress of the Programme towards the achievement of its objectives. A mid-term and an ex-post evaluation of the programme will be carried out in conformity with Article 34 paragraph 3 of the Financial Regulation and, based on the implementation and output indicators, assess the efficiency, effectiveness, relevance, coherence and value added of the programme. Where available, results and impacts indicators will be taken into account⁸⁰. The Commission will communicate the conclusions of the evaluations accompanied by its observations, to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions.

⁸⁰For investment in large infrastructures, results and impacts can only be measured after several years of operation.

ANNEX 1: PROCEDURAL INFORMATION

Lead DG(s)

Directorate-General for Mobility and Transport (DG MOVE), Directorate-General for Energy (DG ENER) and Directorate-General for Communications networks, Content and Technology (DG CNECT).

Organisation and timing

The preparations for the CEF programme in the 2021-2027 period were undertaken in accordance with the guidance received from central services as part of the overall preparations for the Multiannual Financial Framework for 2021 – 2027. A drafting working group was established by the three parent DGs to prepare the CEF proposal, comprising the legislative proposal and the accompanying impact assessment. The Secretariat General set up an Inter-Service Steering Group (ISSG) for the CEF proposal for the 2021-2027 period, gathering representatives of different Directorates-General of the Commission. Two meetings (26 February and 16 March) were held prior to submission of the Staff Working Document containing the impact assessment to the Regulatory Scrutiny Board in March 2018.

Consultation of the RSB

An informal upstream meeting was held on 9 January 2018 with RSB representatives. During this discussion Board members provided early feedback and advice on the basis. Board members' feedback did not prejudice in any way the subsequent formal deliberations of the RSB. The initial draft of the impact assessment was submitted to the Regulatory Scrutiny Board on 21 March 2018. Scrutiny took place at the Board meeting of 18 April 2018 and a positive opinion with reservations was issued on 21 April 2018. The table below demonstrates how each of the Board's recommendations were taken into account.

Main considerations of RSB	Revisions
The report is too vague regarding the changes and extensions to the programme's scope of intervention, in particular in the digital pillar. It does not demonstrate that extensions clearly target cross-border solutions.	A table summarising the changes of scope has been added at the beginning of section 3. In addition, a table illustrating the linkage between the challenges, objectives and delivery of the programme has been added to section 4.3. The drafting throughout the text on the extension of scope to renewables and digital has been further elaborated and a standalone annex on the digital sector is now included.
It is not always clear how the fund will ensure that its interventions are coherent with those of other programmes, such as the structural funds or InvestEU	Additional drafting has been provided in section 2.1 on the third challenge regarding complementarity. Furthermore, a table has been inserted in section 4.3 summarising the key aspects concerning complementarity/coherence with other funds.
The report does not sufficiently develop arrangements for monitoring and evaluation.	Section 5 has been redrafted to better reflect the monitoring and evaluation arrangements for the new programme with the proposed new indicators detailed.

Evidence, sources and quality

In addition to the evaluation of the public consultation, data collection and evidence stems from:

- The mid-term evaluation of the CEF Programme 2014-2020
- Progress report on implementation of the TEN-T network in 2014-2015
- The impact of non-completion of the TEN-T network in terms of growth and jobs
- The independent full-scale evaluation of the pilot phase of the Europe 2020 Project Bond Initiative
- Communication on 'Building the transport core network: core network corridors and CEF'
- Study on the impact on growth and jobs realised through the realisation of the TEN-T core network
- Communication on the mid-term review of the MFF 2014-2020
- Study on the long term sustainability of Digital Service Infrastructures
- Study on the maturity of the Digital Service Infrastructures supported by the CEF
- Assessment of the alternatives for, market sentiment towards, and recommendation of the most effective financial instrument(s) for the CEF broadband activity
- Ex-post evaluation of the TEN-T 2007-2013 programme carried out in 2017
- Preliminary results of Study on permitting & facilitating the preparation of TEN-T core network projects
- Investment needs in trans-European energy infrastructure to 2030 and beyond
- Cost-Effective financing structures for mature projects of common interest (PCIs) in Energy
- TEN-E evaluation - Annex to the Staff Working Document accompanying the Commission Delegated Regulation (C(2017) 7834)
- Evaluation of the impact of PCI implementation
- ENER A4 study for next MFF: Evaluating the structure of EU Financing of Energy under the current MFF and assessment of options for structuring EU financing of energy under the next MFF, Final Report prepared for DG ENER, January 2018, Vivideconomics, Ramboll
- Expert stakeholder meeting on cross-border renewables cooperation on 5th March 2018 in Brussels (cf. annex).
- ECA special report 31/2016 on climate mainstreaming and the COM replies: <https://www.eca.europa.eu/en/Pages/DocItem.aspx?did=39853>
- CLIMA consultants' report on climate mainstreaming in the next MFF: <https://publications.europa.eu/en/publication-detail/-/publication/1df19257-aef9-11e7-837e-01aa75ed71a1>
- Expert stakeholder Consultation workshop on Green-ICT on 30th January 2018 in Brussels
- Expert stakeholder Consultation workshop on the Internet of Energy held on 26th February 2018 in Brussels
- - Expert stakeholder consultation workshop on integration of cross-border renewables held on 5th March 2018 in Brussels

ANNEX 2: STAKEHOLDER CONSULTATION

1. OPEN PUBLIC CONSULTATION

This report presents the results of the online public consultation, organised as part of a series of public consultations covering the entire spectrum of EU future funding. While the public consultation covered the topic of strategic infrastructure funding (comprising CEF, Galileo and ITER), this report will analysis the CEF focused results. The consultation was launched on 10 January 2018 and remained opened for a period of 8 weeks, until 9 March 2018.

1.1 Respondents

The questionnaire's initial section collected background and contact information on the respondents. A total of 441 responses were received, which led to a total of 424 when the Galileo related responses were removed. There was at least one response from every Member States as well as 8 responses from outside of the EU (Switzerland, FYROM, Bosnia and Herzegovina and the USA). Respondents were asked to which topic their questionnaire referred and Table 1 illustrates the breakdown of responses per CEF sector.

Table 1: Breakdown of responses by CEF sector

Relevant CEF sector	Number of respondents	%
Digital	69	16%
Energy	107	25%
Transport	248	58%
Total	424	100%

Of the total number of responses, 63 respondents identified themselves as individuals responding in a personal capacity while 361 identified themselves as responding in a professional capacity or on behalf of an organisation. Table 2 provides a breakdown of responses by Member State and respondent type. The large number of responses from Belgium can be explained by the fact that many EU representative associations are based there. A significant number of responses from logistic companies based in France accounts for the high number of responses received from France. The geographical breakdown was quite evenly spread across each sector with 21 Member States represented in digital responses, 22 Member States in energy responses and 25 Member States in transport responses.

Table 2: Breakdown of responses by Member States

	Country	Individuals	Professional Capacity/Organisations	Number of Respondents
EU-Members States	Austria	1	9	10
	Belgium	7	65	72
	Bulgaria	1		1

	Croatia	4	3	7
	Cyprus		1	1
	Czech Republic	1	8	9
	Denmark		6	6
	Estonia		3	3
	Finland	2	6	8
	France	7	64	71
	Germany	4	32	36
	Greece	2	6	8
	Hungary	4	7	11
	Ireland	2	10	12
	Italy	3	22	25
	Latvia		5	5
	Lithuania	1	3	4
	Luxembourg	2		2
	Malta	1		1
	Netherlands	3	16	19
	Poland	2	10	12
	Portugal	4	10	14
	Romania	1	3	4
	Slovakia		6	6
	Slovenia		2	2
	Spain	6	30	36
	Sweden		16	16
	United Kingdom	3	12	15
Non EU-MS	Bosnia and Herzegovina	1	2	3
	FY Republic of Macedonia	1		1
	Switzerland		3	3
	USA		1	1
Total		63	361	424

Responses were received for a wide variety of entities as detailed in Table 3. Responses to “Other” included state owned companies such as railway undertakings and energy operators as well as region groups and financial organisations.

Table 3: Breakdown of responses by type of organization

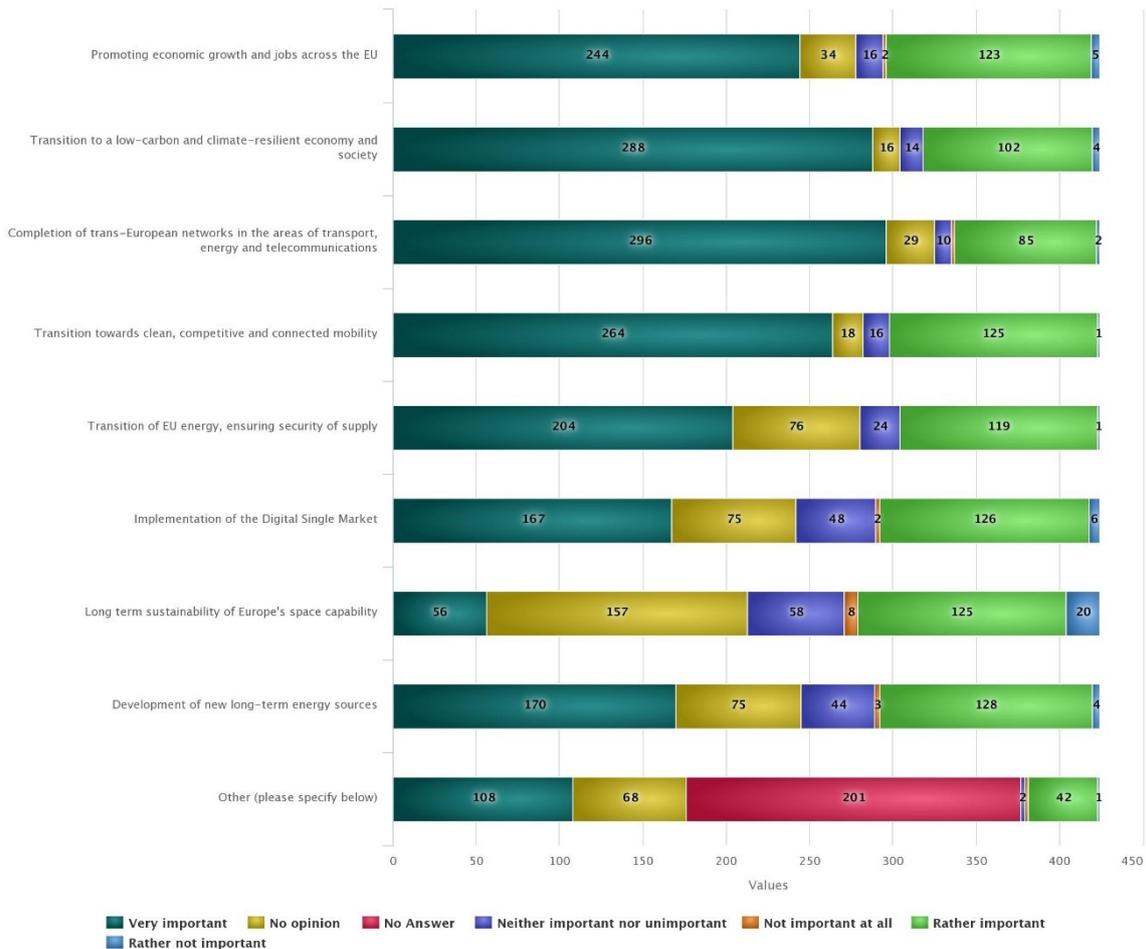
Type of organizations represented	Number of respondents	%
International or national public authority	35	8%
Non-governmental organisation, platform network	59	14%
Private enterprise	117	28%

Professional consultancy, law firm, self-employed consultant	19	4%
Regional or local authority (public or mixed)	61	14%
Research and academia	15	4%
Trade, business or professional association	56	13%
Other	62	15%
Total	424	100%

1.2 OVERVIEW OF RESULTS

1.2.1 Policy challenges

1. The Commission has preliminarily identified a number of policy challenges which programmes/funds in this area – strategic infrastructure – could address. How important are these policy challenges in your view?



When asked to rate the importance of the policy objectives, respondents considered the transition to a low carbon and climate resilient economy and society, the transition towards clean, competitive and connected mobility, completion of the TENs and promoting economic growth and jobs across the EU as the most important challenges.

Respondents for the transport sector were more inclined to indicate the specific transport related challenges as very important or rather important (the transition to a low carbon and climate resilient economy and society (98%), completion of the TENs (91%) and the

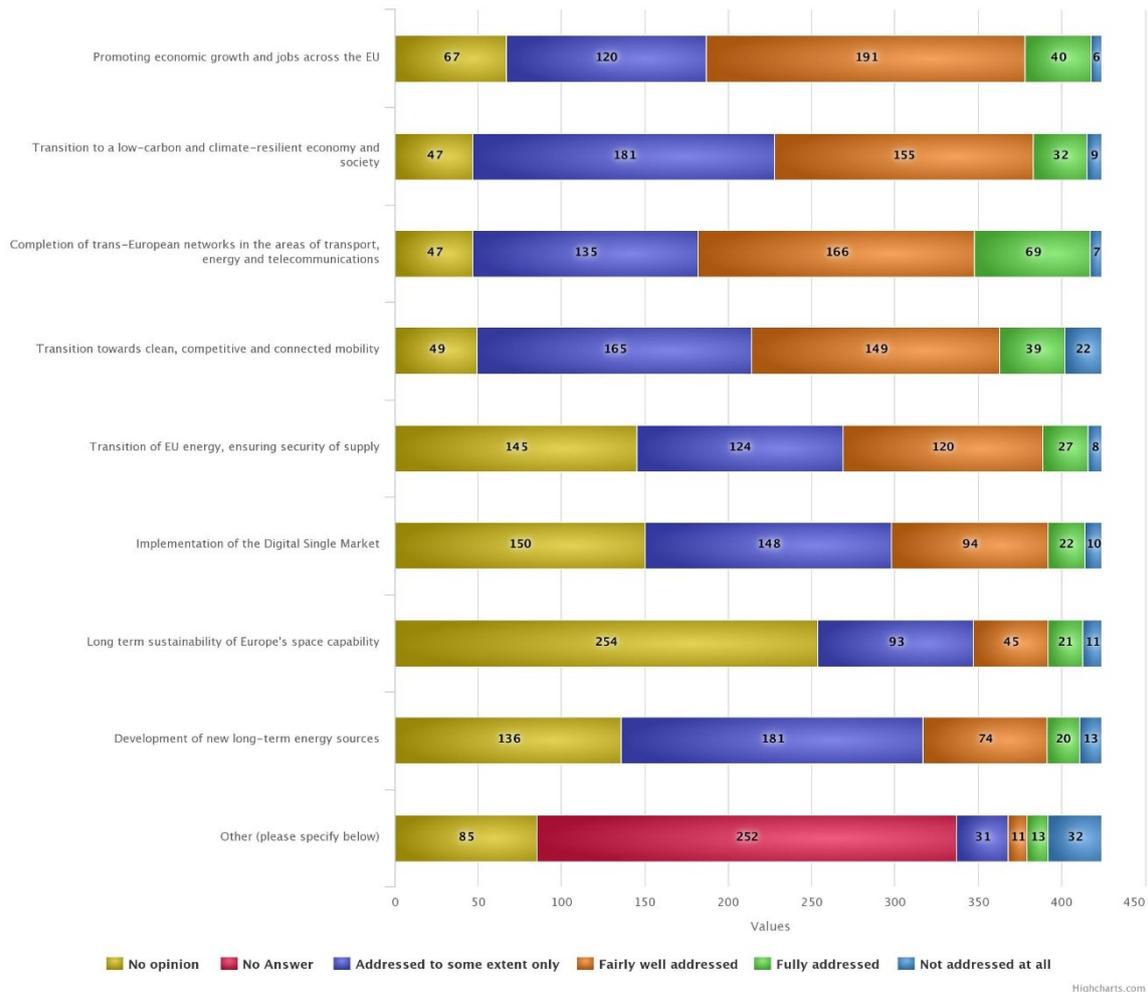
transition towards clean, competitive and connected mobility (98%). Energy respondents confirmed the importance of completion of the TENs (84%), the transition of EU energy and need for ensuring security of supply (92%) and developing new energy sources for the EU (86%) while also recognising the challenge of transitioning to a low carbon and climate resilient economy and society (94%). Digital sector respondents identified the Transition to Digital Single Market (96%) and promoting economic growth and jobs across the EU (94%) as the two most important challenges, closely followed by Completion of the trans-European networks in the third place (93%).

When asked to address other policy challenges, just over 64% gave no answer or no opinion. Of those who did believe other challenges existed, transport respondents identified urbanisation, territorial accessibility and cohesion (in particular for peripheral regions), removal of bottlenecks and barriers, and funding (i.e. lack of funding, and insufficient access to funding for local and regional authorities). A large number of French logistics companies listed Logistics & Infrastructures as the main policy challenge. Other issues raised include climate change and clean transport, transition towards a circular economy, development of interoperable digital traffic management systems, waterborne transport and digitalisation of maritime transport, integration of transport modes, and funding of transport projects outside the EU.

When naming additional policy challenges that such programmes/funds could address, several energy stakeholders stressed the value in promoting energy efficiency and energy savings including in the context of cohesion programmes. Some suggested the need for a better integration of power and gas sectors and the possible role for biogases/ hydrogen and the need for suitable infrastructure. Specifically for gas infrastructure, some stakeholders considered it as essential for helping the EU in achieving its energy targets while some stressed that the EU should not invest in fossil fuel infrastructure. Some stakeholders highlighted the importance of investing in renewable energy sources and in this context of making full use of existing cooperation possibilities in the area of investments in renewable and electricity trade between countries. The integration of decentralised energy sources and the support for the deployment of smart grid solutions was highlighted by some stakeholders, as was the emphasis on the support of research and innovation to further optimise the grids. The commitments under Paris Agreement were raised by some of the respondents, a couple of whom underlined the role of nuclear power.

Answers from the digital sector respondents highlighted the need to support high speed connection and development of digital networks, especially in economically weaker areas where connectivity greatly improves employment opportunities. The responses call for intervention to speed up the transition to Digital society, to build up digital capabilities and make them available to users in all areas, including the poorer and less populated regions.

2. To what extent do the current programmes/funds successfully address these challenges?



When asked to what extent CEF successfully addresses the challenges listed⁸¹ and when respondents were most positive towards the following challenges: promoting economic growth and jobs across the EU (either fully addressed or fairly well addressed - 65%) and completion of the TENs (62%). Respondents were fairly neutral towards the transition to a low carbon and climate resilient economy and society (51% either fully addressed or fairly well addressed); the transition towards clean, competitive and connected mobility (50%); the transition of EU energy and need for ensuring security of supply (52%). Respondents were less positive towards the extent to which the following challenges are being addressed; Implementation of the Digital Single Market (42% to 58%) and development of new long-term energy sources (34% to 66%).

The majority of transport respondents considered the transport-focused challenges as being fully addressed or fairly well addressed; completion of the TENs (67%), the transition to a low carbon and climate resilient economy and society (54%) and the transition towards clean, competitive and connected mobility (58%).

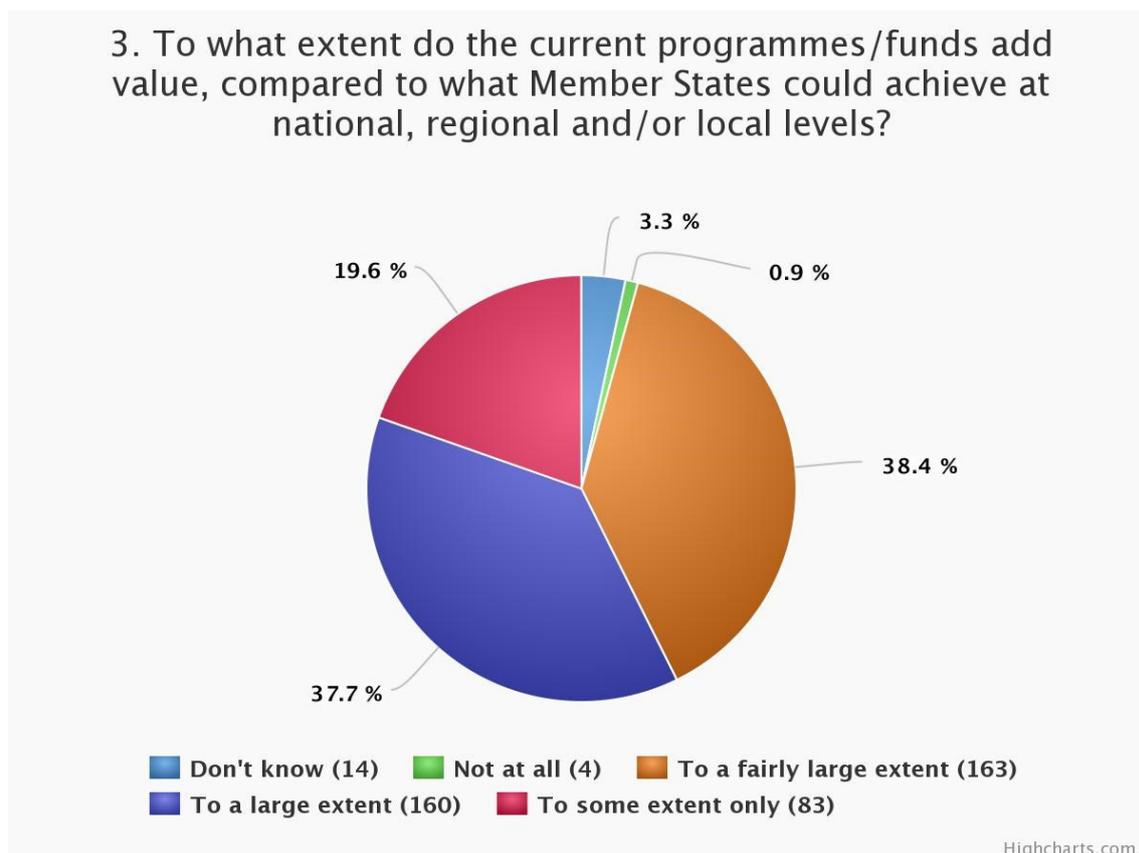
Energy respondents believed completion of the TENs to be the challenge mostly addressed by the current programmes/funds (65% of the respondents said that it was fully or fairly well addressed) with promoting economic growth and jobs across the EU (58%)

⁸¹ No opinions were removed for the analysis of this question.

and the transition of EU energy and need for ensuring security of supply (55%) following behind. Only 35% of energy respondents considered CEF to be addressing the challenge of development of new long-term energy sources.

Digital sector respondents identified the Implementation of the Digital Single Market as the challenge mostly addressed by the current programmes/funds (54% of the respondents said that it was fully or fairly well addressed). Promoting economic growth and jobs across the EU was voted in second place (47%), while completion of the TENs stands as the third mostly addressed challenge by current programmes/funds (43%).

1.2.2 Added value



The figure above illustrates that a majority of respondents (76%) believe that CEF adds value compared to what could be achieved at national, regional or local level. The figure rises to 80% when looking at transport respondents only, decreases slightly to 74% for energy respondents and further to 65% for digital respondents.

When asked to explain how the current programmes/funds add value compared to what Member States could achieve at national, regional and/or local levels, a large number of transport respondents listed green and sustainable transport and transnational and cross-border transport infrastructure, in particular rail, as the two areas where CEF funds added most value. Territorial cohesion and access to isolated regions were also seen as areas where EU funds played an important role. One respondent pointed out that the importance of local and regional authorities in the establishment of the trans-European transport network had been "legitimised" via the corridor fora. The CEF was also seen as playing an important role in contributing to the development of inland waterways, the implementation of common standards and technologies in Europe (e.g. rail interoperability, intelligent transport, ERTMS), fostering innovation and new

technologies, and promoting road safety. A few respondents highlighted the importance of cities, noting that CEF funding for urban nodes was largely insufficient.

The vast majority of the energy sector respondents confirmed the added value of the program stating that EU funds play a crucial role in enabling the implementation of EU policies by financing actions that the Member States would not have been otherwise able to fund on their own. Moreover, most of the respondents highlighted the fact that the program finances cross-border projects that in many cases are of lower priority for the Member States as well as of much higher risk, but which at the same time yield significant welfare benefits for the European citizens.

Digital respondents mentioned the unification of infrastructure, which results in the cross border interoperability and contributes to the sustainable, inclusive economic growth and cohesion within the European Union. Some more specific achievements of the CEF programme, which would not have been at place with only national funding at disposal, were mentioned.

1.2.3 Objectives

When asked is there a need to modify or add to the objectives of the programmes/funds in this policy area and if yes, which changes would be necessary or desirable, a large number of transport respondents called for increased funding for low-emission mobility, promoting a modal shift from road to sustainable modes of transport, including waterborne. Respondents suggested that sustainability should be better integrated as a selection criterion, and that the term "EU added value" should be more clearly defined.

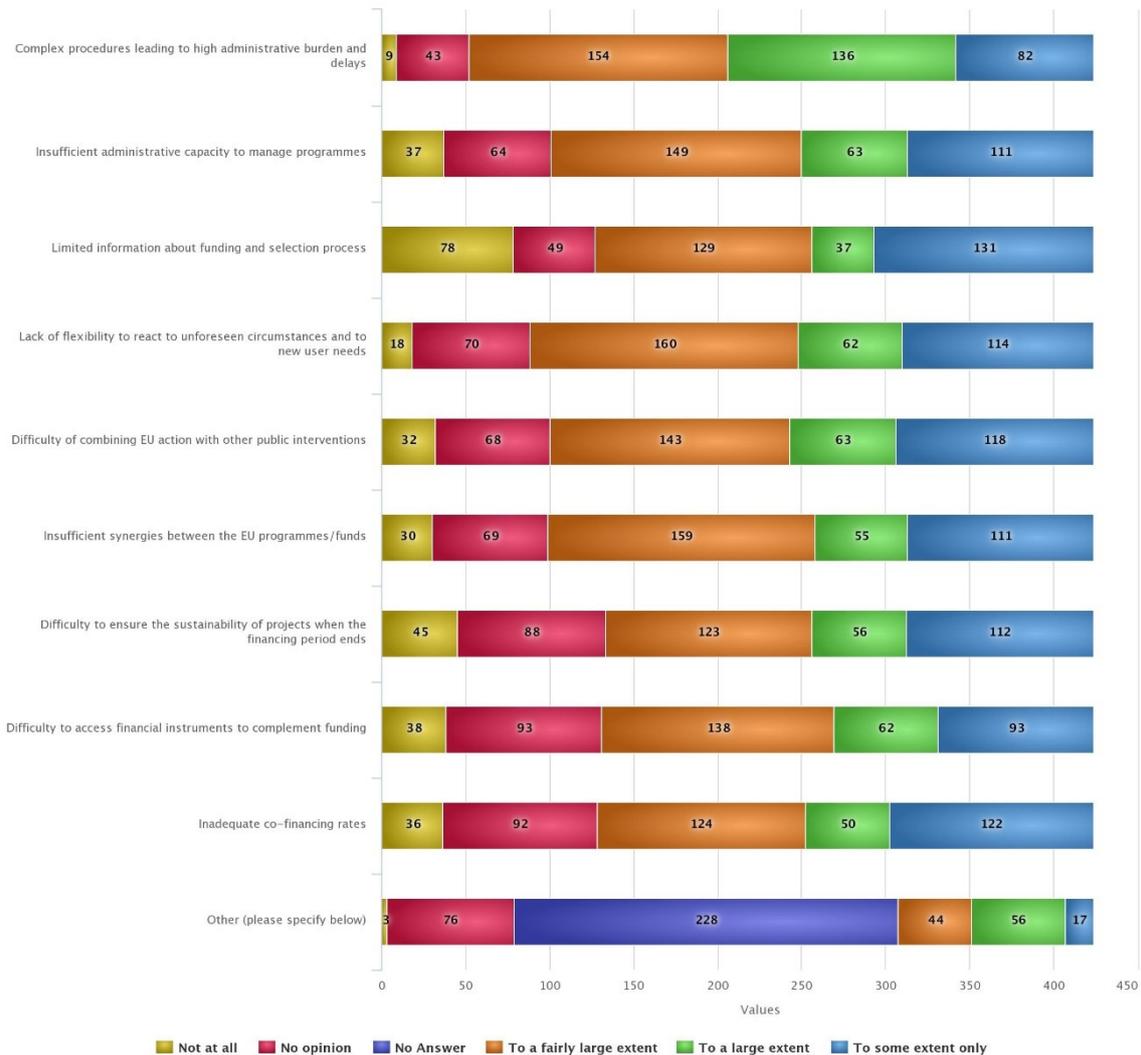
Some respondents also called for EU funds to be made available to fund local public transport and to promote regional projects, in particular in peripheral regions. They argued that EU funding for transport infrastructure at the heart of urban nodes is too limited. A number of respondents also argued that, as ports are transnational in nature; their co-financing rate should be raised from 20% to 40%.

The majority of energy respondents were of the view that the concept of synergies between the three sectors should be reinforced with particular emphasis on the combination of energy and digital infrastructure elements. In the same vein, some of the participants raised the issue of sector coupling and how the programme could extend in a way to address this emerging need. Moreover, some of the respondents highlighted the role that green gas could play in the energy transition and suggested that CEF's objectives could extend to the deployment of new carbon-neutral technologies, while others proposed exploring opportunities for a Trans-European Network for Green Infrastructure ("TEN-G").

Digital respondents highlighted the necessity to commit more funds to increase connectivity (including creation of a dedicated fund for Broadband), and reduce the digital gap between rural and urban areas. Highly specific technical suggestions on changes in procedures or regulations were also submitted.

1.2.4 Obstacles

6. To what extent do you consider the following as obstacles which prevent the current programmes/funds from successfully achieving their objectives?



The most prominent obstacle identified by respondents by quite some margin was complex procedures leading to high administrative burden and delays (65% chose to a large extent or to a fairly large extent). The second most important challenge was the lack of flexibility to react to unforeseen circumstances and new user needs (53%) while the third was insufficient synergies between EU programmes/funds (51%). The lowest scoring obstacles were limited information on the selection process (39%) inadequate co-financing rates (41%) and difficulty to ensure the sustainability of projects when the financing period ends (43%).

When looking at transport respondents only, the figure for each obstacle was higher and in particular for complex procedures leading to high administrative burden and delays (70%), lack of flexibility to react to unforeseen circumstances and new user needs (59% as opposed to 53% overall) and insufficient administrative capacity to manage programmes (56% compared with 50% overall). On the other hand, for energy respondents the figure was lower for each obstacle with only complex procedures leading to high administrative burden rated as an obstacle by over half of energy respondents (61%). The next most important obstacle for energy respondents was and insufficient

administrative capacity to manage programmes with 41% of respondents rating it at to a large extent or to a fairly large extent. The most important obstacles for digital respondents were complex procedures leading to high administrative burden and delays (72%), the difficulty of combining EU actions with other public interventions (61%) and insufficient synergies between EU programmes/funds (54%).

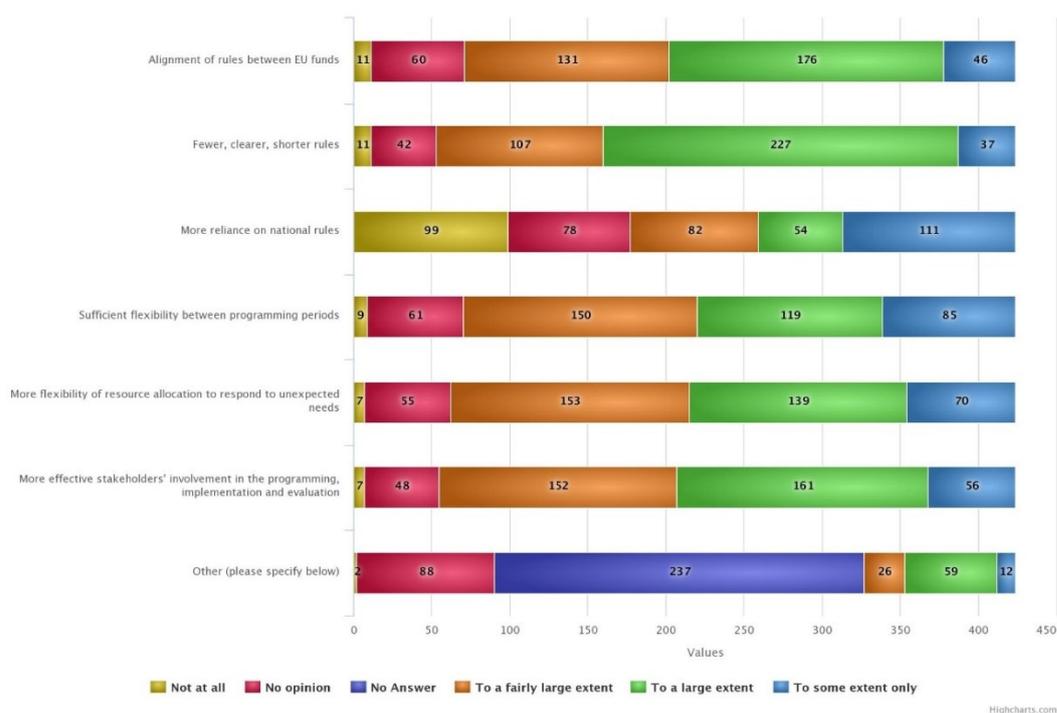
Only 26% of respondents identified other obstacles. For transport respondents, further flexibility in the eligibility criteria of CEF calls was requested by several stakeholders as well as more flexibility to the programme generally such as with regards to the requirement for Member State approval of applications and the facilitation of synergies with other sectors. Some stakeholders raised the administrative burden at Member State level in the implementation of the CEF programme as well as requesting further clarity regarding the timing of calls. The importance of grants was highlighted as well as the need for an increased budget given the large oversubscription in the current programme. A few stakeholders requested exemption for the national co-financing element from the Stability and Growth Pact rules.

A commonly identified obstacle for energy respondents was the timing of the calls. More specifically, the respondents stated that they should be given more time to prepare their application and asked for more flexibility with the deadlines. Some of the participants in the survey mentioned that more clarity regarding the eligibility criteria is required, while very often it is difficult for them to identify the right person that could provide them with all necessary information.

When stating other obstacles, digital respondents referred to general issues such as the complex procedures, the lack of flexibility or the lack of knowledge of the local authorities as well as the insufficient funding for CEF and Broadband and the low priority of the disadvantaged areas.

1.2.5 Simplification and reduction of administrative burden

7. How could current programmes/funds be further simplified and administrative burdens for beneficiaries be reduced?



The majority of respondents believed that simplification and reduction in administrative burden could be reduced with fewer, clearer, shorter rules (79% to a large or fairly large extent), the alignment of rules between EU funds (73%), more effective stakeholders' involvement in the programming, implementation and evaluation (72%), more flexibility of resource allocations to respond to unexpected needs (69%) and sufficient flexibility between programming periods (63%). The results were fairly similar across all sectors.

Over 77% respondents gave no opinion or no answer to specifying another possible method. Of those who did provide suggestions, a number of transport respondents called for more foreseeable timetables for CEF calls, more even distribution of funds over a funding period, and more direct involvement of regional authorities in the programming and implementation of the CEF. They suggested that feedback be given directly to applicants rather than via the Member States. They asked for pre-financing opportunities or more financial support dedicated to the development phase of projects. One respondent suggested that allowing more lead time for applying for funding would be a way to reduce administrative burden, as it would allow the work to be spread over a longer time period.

Respondents also pointed out that a two-stage application process (like in H2020 or Interreg) could significantly reduce the burden on applicants. They suggested that a simplified proposal could be submitted during the first phase, with more detailed proposals only required during later phases. Respondents called for simpler procedures, uniform rules across the various EU funds, and greater flexibility at project level.

Other proposals included broader stakeholder involvement, a one-stop-shop for infrastructure projects, and translation of documents in all EU languages. A couple of respondents asked for the publication of a Eurostat Guidance on the statistical treatment of concession contracts. It was also recalled that the SGP rules represented a heavy constraint on Member States' co-financing capacity.

Referring specifically to ERTMS, a large French company pointed out that the duration of the GA is not enough to cover the cycles related to public procurement procedures. They also called for CEF grants to be paid on the basis of an interoperability demonstration rather than submission of the file to the National Safety Authority.

Most of the energy respondents suggested that more effective stakeholders' involvement in the programming, implementation and evaluation process could lead to further simplification of the current program and reduction of the administrative burdens for beneficiaries. They also proposed that fewer, clearer and shorter rules as well as more flexibility of resource allocation to respond to unexpected needs could be a solution to the various procedural complexities. One of the additional suggestions submitted by the energy sector respondents is the division of the grant application process into two steps: the first for the identification of the eligible projects and the maximum amount of fund likely to be granted and the second for the actual award of the grant. A few respondents proposed the simplification of the (regulatory Cross Border Cost Allocation – CBCA) process as well as the acceleration of the applications' evaluation phase.

Both segments agree that fewer, clearer and shorter rules would simplify to a large or fairly large extent current programmes and funds, reducing administrative burdens for beneficiaries. In second place, both elected more effective stakeholder's involvement in the programming, implementation and evaluation. In third place, again the segments agree on the alignment of rules between EU funds as an initiative that would simplify the

current programmes and funds. Respondents are divided on question whether more reliance on national rules would simplify the administrative burdens. Not at all or to some extent only, was the opinion of 49% of both segments, as opposed to 37% of digital and 32% of overall respondents meaning that more reliance on national rules would lead to simplification at a large or fairly large extent.

Digital respondents mostly referred to simplification of procedures on the EU side and to greater involvement of the local actors on the MS level in early phases of drafting, as well as later in the implementation phase. A call for a dedicated fund for Broadband was made, as well as the necessity to introduce more flexibility of expenditure eligibility.

1.2.6 Synergies

When asked how could synergies among programmes/funds in this area be further strengthened to avoid possible overlaps/duplication and whether for example, grouping/merging some programmes should be considered, to a large extent the respondents concurred that keeping the transport, telecom and energy sector together seems appropriate in light of their common goals and challenges but that a separate pillar per sector seemed appropriate given particular circumstances.

Respondents requested that greater coherence be provided between CEF and complementarity funds such as Horizon 2020 and ESIF through clarifying the perimeter of the various funds. Some of the respondents suggested the establishment of a "one-stop-shop" approach by which a project developer could enter data once on a single portal and apply for funds from various programs, while others stressed the importance of just better coordination and alignment between the various EU and national funding programs. On the other hand some respondents were sceptical about the grouping/merging of programs stating that this might create ambiguity.

Several respondents mentioned the limited success of harnessing synergies in the current CEF programme and stressed the importance of emerging needs such as decarbonisation and digitalisation. Thematic cooperation and building on the lessons learned from the CEF Synergy Call 2016 was encouraged by several respondents in order to make the most efficient and effective use of the CEF instrument. Joint work programmes on common themes across sectors was suggested for instance. Several respondents also suggested that greater flexibility and simplification of rules could help to foster further synergies.

1.3. POSITION PAPERS

84 respondents of the OPC offered additional contributions in the form of a position paper. Position papers were submitted by '*non-governmental organisation*' (28), '*trade, business or professional association*' (18), '*private enterprise*' (15); '*regional or local authority (public or mixed)*' (12), and '*international or national public authority*' (5), '*research and academia*' (1), and '*professional consultancy, law firm, self-employed consultant*' (1).

Among all received position papers, 23 focused particularly on the transport pillar of CEF and commented on this matter. Furthermore, 15 respondents used the opportunity to provide more targeted input regarding the role of CEF to the energy systems, while five other position papers were strictly dedicated to issues concerning the digital sector. All the remaining documents took a more general approach, either targeting multiple sectors

of CEF activity at once, or highlighting the importance of other topics. Below follows an overview of the key remarks made by respondents, divided by the sector of activity.

1.3.1 Transport

In addition to highlighting the importance of investment in specific (missing) links, cross border sections and bottlenecks of particular interest to certain stakeholders, increasing co-financing rates, and calling for an increase in the overall CEF budget compared to the current programming period, several other issues were raised by stakeholders issued. These were as follows:

- Increasing the availability of DG MOVE and INEA to provide advice as part of the development and at different stages of CEF implementation
- Allowing access to CEF grants for initiatives such as cross border metro / light rail and short sea shipping vessels (where waterborne transport is the only connection within the TEN-T) as well as increasing funding opportunities for ports, in particular, LNG bunkering facilities;
- Making calls for proposals more predictable, simplifying application procedures, and increasing the transparency regarding the final selection of projects;
- Incentivizing 'green and clean' projects (e.g. by increasing co-financing rates, adopting a climate rating methodology);
- Recognizing cycling as a major mode of transport in the new financial frameworks and support the implementation of those measures included in the EU's new Road Safety Programme 2020-2030 which have the highest lifesaving potential;
- Further improving and facilitating cities' involvement in TEN-T governance, and stimulating cooperation between all relevant public and private sectors.

1.3.2 Energy

In the position papers received for the energy programs, stakeholders recognised the importance of the CEF for the development of transmission projects with high net benefits at EU level but also with high investment costs due to the technology required to minimize environmental and social impact. On the other hand, there was criticism about the eligibility criteria for not being clear enough in the case of grants for works and in terms of the CBCA decision for being rather restrictive. Stakeholders from the Baltic region stressed the role of CEF in strengthening security of supply, highlighting the significance of the projects contributing to the Baltic synchronisation and the diversification of the region's natural gas sources.

Other energy stakeholders stressed the potential of biomethane in countries like France and its contribution to sustainable development objectives as well as the benefits of offshore wind power. Furthermore, there was a paper suggesting the introduction of a Full Lifecycle Cost Management (FLCM) method that could master and estimate the cost of the plant operation and electricity cost, while an energy stakeholder provided insight into the macro-trends of the changing energy system – including decarbonisation, digitalisation, decentralisation, sector coupling and uncertainty – and how the next generation of EU energy infrastructure policies can successfully adapt concluding that financing flows should be channelled towards the low carbon infrastructure of the future.

Finally, there have been submitted a number of position papers arguing in favour of investing in energy renovation of buildings in the post-2020 EU Multiannual Financial

Framework, highlighting the benefits to the local economies and the environment and suggesting among other things that the new CEF should enable investments in efficiency in demand- and supply-side infrastructures, in particular where they have the potential to avoid unnecessary network investment.

1.3.3 Digital

The position of the stakeholders from the digital sector were aligned on the requirement for an increased EU investment in the state-of-the-art digital infrastructure, as it is a catalyst to all other economic sectors' growth. Connectivity was regarded as central to participation in the economy and society, and they pinpointed that a proper infrastructure including broadband and 5G will set up Europe as a serious player in the global digital economy.

1.3.4 General

Most notably, many of the received position papers elaborated on the importance of environmental protection and the need to incorporate it into CEF's objectives. Other stakeholders highlighted aspects related to multiple CEF pillars including:

- Existing railway infrastructure should be given priority in EU programmes, and most of all in CEF. There was a call for the establishment of a Shift2Rail 2.
- Spending on energy and transport infrastructure should prioritize projects of cross-border nature that deliver EU added value and which explicitly support the EU's climate and energy policies
- Investment in vehicle charging infrastructure should be increased, along with ensuring that electrification projects of public transport systems are eligible for support.
- Green hydrogen economy, sustainable mobility, and autonomous mobility are emerging markets and need (experiment) space in the existing EU legislation to make public-private partnerships possible without tendering and state aid issues.
- The Digital sector was highlighted as was the need to increase competitiveness of the EU through connectivity across EU with strong focus on rural
- Also, connectivity, 5G and interventions in these fields are seen as the key factor improving economic performance, promoting qualitative leaps and generating jobs in the EU
- Furthermore, the stakeholders stress the contribution of digitalization, as well as the importance of the synergies between the TENs. Consequently, digitalization is considered one of the key elements to be supported by EU investments

4. SPECIFIC CONSULTATIONS TO REINFORCE SYNERGIES BETWEEN THE THREE SECTORS

In addition to the online public consultation - organised as part of a series of public consultations covering the entire spectrum of EU future funding - specific expert and stakeholders consultation workshops where organised to reinforce synergies between sectors.

4.1 Expert stakeholder Consultation workshop on Green-ICT on 30th January 2018 in Brussels

The take-up of emerging ICT technologies and paradigms (e.g. IoT, Cloud Computing, Big Data, Data Analytics, etc.) has contributed to the modernisation of our economy, from transport to manufacturing. However, this also meant that the energy consumption of the ICT sector itself (in particular data centres and networks) is drastically increasing.

To reduce the carbon footprint of the ICT sector is a necessary condition in order to achieve the EU climate and energy goals. The experts considered action on both infrastructure and cross-border services. On infrastructure they recommended:

Support the creation of an EU wide cross-border govCloud based on Open technologies to pool together resources contributed by various MS public sector including both sharing and hosting infrastructure. Support the deployment of cross border broadband high capacity low latency connectivity infrastructure as a necessary condition for the deployment of the EU-wide govCloud.

Create an EU network of data centres (the govCloud) connected cross border to the smart grids of the neighbouring countries. Provide cross-border connectivity in areas that are ideal locations for data centres (e.g. regions rich in renewable energy sources and/or possibilities for heat reuse but no connectivity), while analysing and identifying other areas in the European network requiring more bandwidth and access points. This would give data centres the option to locate in optimal areas helping them reduce their environmental footprint.

On the cross border services, they proposed the deployment of EU wide data platforms. Examples are a platform to collect energy consumption reports and a cross-border platform to exchange cybersecurity information and best practices.

4.2 Expert stakeholder Consultation workshop on the Internet of Energy held on 26th February 2018 in Brussels

Expert's recommendations can be classified in two groups. Firstly to support digital e-platforms providing energy related information services. These would facilitate the development of the EU energy market in general and more optimal use of renewable energy production across Europe. Secondly, they stressed there is a need to deploy digital infrastructures to optimise the energy interconnections amongst the EU member states.

On Digital energy-services e-platforms, there was general agreement that creating a new renewable energy availability e-platform, forecasting generation across the EU, providing predictive information on renewable energy availability across the EU to generators, TSOs, DSOs, aggregators, and other energy market players, would open new opportunities for interaction and service sharing. It would increase market transparency and asset optimisation across the energy value chain and facilitate more optimal use of renewable energy generation capacity throughout the EU. It would enable better information flows about energy resource availability and would result in more efficient use of energy resources and interconnection capacity across borders.

Other platforms were also proposed e.g. on cybersecurity and on simulation to monitor and predict the evolution of all aspects the EU energy market.

On Digital infrastructures, the interconnection of Smart Grids operating in different MS is already happening at TSO level and they recommended more coordination between the TSOs and DSOs and also amongst DSOs. There is a need for more integration of the distribution grid and the transmission systems and more interconnections at lower

voltage levels to enable digital and physical interconnections at the distribution level and across international borders in the future.

Also, there are synergies to be exploited amongst the telecoms, energy and transport sectors in terms of digitalisation and infrastructures. Close collaboration amongst these sectors is needed in order to use resources efficiently and effectively to build a framework that will support the development of new value added services connecting the three pillars of IoT, 5G networks and the Internet of energy (IoE). This needs to be done in a way that is open and compatible at the EU level.

4.3 Consultation to MS on Connected and Automated Mobility (CAM)

In **April 2016** the Dutch Presidency organised an informal transport council during which the Amsterdam Declaration was presented and endorsed by all Member States. It focuses on cooperative driving and automated vehicles.

The Dutch ministry organised two High Level Dialogues to follow-up on the goals set out in the Amsterdam Declaration. As a result, 27 Member States plus Norway and Switzerland signed on **23 March 2017** in Rome the Letter of Intent on cross-border demonstration and testing of CCAM.

Extensive consultations with Member States took place to identify possible cross-border corridors and during the High Level meeting in Frankfurt and the Round table on CAD (**14-15 September 2017**), six cross-border initiatives were announced by Member States:

- FR – DE – LU: Metz-Merzig-Luxembourg
- NL – BE: Rotterdam-Antwerp-Eindhoven;
- ES – PT: Porto-Vigo and Merida-Evora (corridor Lisbon – Madrid);
- FI – NO: The E8 "Aurora Borealis" corridor between Tromsø (Norway) and Oulu (Finland);
- The "Nordic Way" between Sweden, Finland and Norway.

The Commission is aiming at having more concrete progress on these corridors and having some additional corridors announced in the frame of the Digital Day 2 high level event on 10 April 2018 in Brussels.

The policy context

- This is in line with other Commission initiatives including GEAR2030 (managed by DG GROW, having provided stakeholder recommendations to the Commission in October 2017), the work of DG MOVE on C-ITS (Cooperative Intelligent Transport Systems, aiming at a Delegated Act scheduled for the end of 2018 providing technical and organisational specifications for deployment) and the Communication on CCAM scheduled for 2 May 2018 as part of the third Mobility Package.
- CCAM has been identified as a promising (flagship) application enabled by the future deployment of 5G networks, e.g. in the 5G Action Plan. The Commission has further proposed that all main EU transport paths be covered by 5G services by 2025 (Communication on connectivity for the gigabit society). Where 5G infrastructure is deployed, it will provide uninterrupted coverage for relevant CCAM services across the full corridor.

- CCAM will figure prominently in the 3rd mobility package that the Commission intends to adopt on 16 May this year. This package will come two weeks after the adoption of the data package and the Communication on Artificial Intelligence, both extremely relevant for the automotive sector. By the end of the year, we will also adopt the cyber security package. It will complement the related C-ITS legislative approaches by giving guidance how to provide overall security, concerning different strands of possible attacks to the moving vehicle.

4.4. Expert workshop on the extension of scope towards cross border cooperation on Renewables on 5th March 2018 in Brussels

A stakeholder workshop *"Towards a more Europeanised approach to Renewables' policy – a possible instrument to support cross-border cooperation on renewables in the MFF post-2020"* took place in Brussels, 5 March 2018 in order to support the analysis of this part of the impact assessment. The expert stakeholder event gathered around 60 participants, including representatives from 12 EU Member States and the Energy Community, TSOs, utilities, industry umbrella organisations NGOs, think tanks and consultancies. The purpose was to allow stakeholders to express their views on the merits and design of an enabling instrument for renewables regional cooperation. Questions for discussions focussed on persistent barriers, main criteria to assess the EU added value, delivery mechanisms and innovation.

Main outcome of the discussion:

- The benefits of having a more coordinated approach to renewables planning and deployment are uncontested, but at the same time barriers are preventing cooperation to happen.
- Member States face a basic conflict between achieving greater cost efficiency through cross-border cooperation (but potentially having to trade-off with RES investments and benefits occurring in another country) and public acceptance and preference for investments at home (but then losing out on potential gains from cooperation),
- Setting up cross-border cooperation on renewables is complex, lengthy and might benefit from facilitating action by EU. Ambition in first cooperation projects was even too high (Kriegers Flak planned to involve 3 MS, meshed DC grid still as long-term ambition).
- Financial support (comprising financial instruments and grants) for renewables projects of European interest is very important as to provide an incentive to overcome Member States preference for national planning and national deployment of RES capacity. It fosters the Europeanisation of RES policies and support.
- Support in the form of grants for technical assistance and studies is a useful EU intervention to help lower the high upfront costs related to setting up the coordinated action. There is also a need for EU first loss instruments, equity and guarantees to lower the high risk of cross border RES projects.
- With regard to flagship projects under such an instrument, there is a need of learning from experiences acquired with the EEPR and TEN-E interventions with regard to innovation, consistency with the environmental acquis and the need to facilitate also

combinations of technologies, bearing in mind its potential contribution to keep and expand EU RES industrial leadership.

- A possible link to the National Energy and Climate Plans and the Financial Platform (Art 27) under the Governance Regulation should be explored
- There was large consensus on the need for more alignment between grid and RES planning to which this potential new instrument could effectively contribute. On the other hand, the importance to continue electricity grid development as a pre-requisite was also raised.
- Integration of cross-border renewables adds value to the relevant provisions of the legal framework (provisions in the Clean Energy Package on simplified administrative procedures, cooperation projects, and in particular grid integration as supported through TEN-E and CEF). Some interventions calls for more regulatory alignment. The Commission was also invited to update the 2013 guidance on cross border cooperation including templates.
- Participants also called upon the Commission to come up with a more supportive framework for PPAs, for the creation of renewables free trade zones as in the UK, as well as new measures to address the large differences in cost of capital as to ensure that renewables can be deployed equally throughout Europe.

ANNEX 3: COMPREHENSIVE ASSESSMENT OF THE EXTENSION OF SCOPE OF THE ENERGY WINDOW TOWARDS TARGETED CROSS-BORDER COOPERATION IN RENEWABLES

1. INTRODUCTION

1.1. Context

The EU has the **political ambition to "to become the world leader in renewables"**⁸². This is not only contributing to the EU's commitments under the Paris agreement, but important also for industrial leadership and associated jobs and growth. Renewable energies should furthermore increasingly penetrate sectors so far predominantly dependent on fossil fuels, such as mobility which will require appropriate infrastructure development (e.g. e-mobility).

To achieve these goals, the Commission has tabled the most performant **legislative framework: Clean Energy for All Europeans package**, which is currently under negotiations in the ordinary legislative process. Some key new elements of this proposed new regulatory framework relevant for renewables development are the following:

- Firstly, **Member States will no longer be bound by a national target for renewables post 2020**. With the change to an EU-level binding target, renewables deployment and target achievement becomes a collective responsibility with the Commission's role moving to a facilitator. This calls for an adjustment also of available EU instruments to align them with this new reality. The recast Renewables Directive includes furthermore measures to Europeanise renewables support, such as cross-border opening of support schemes.
- The **market design** proposals aim at making the market more flexible and thus fit for the integration of increasing amounts of variable renewable energies.
- The **Governance** proposal will further reinforce cooperation among Member States, including on their national and energy climate action plans (NECPS). In particular, the Commission's proposal on Governance of the Energy Union and the recast of the Renewable Directive put forward that *"Member States shall identify opportunities for regional cooperation"*.
- Art. 3(4) of the **recast Renewables Directive**⁸³ stipulates that *"the Commission shall support the high ambition of Member States through an enabling framework comprising the enhanced use of Union funds, in particular financial instruments"*. The co-legislators strengthened the text referring to an enabling framework in the currently negotiated review of the Renewables Directive to explicitly call for enabling action to support renewables cooperation across borders.⁸⁴

As **President Juncker** recently said: *"We need a budget that matches our ambitions. For instance, we want to be world leaders in renewable energy and get ahead of the curve on new technologies. If we want our Union to have a role in that, we must give ourselves the tools we need to make it happen."*

Also, Member States and industry repeatedly called for looking into options for EU funding for joint projects and encourage their uptake, in particular with a focus on

⁸² Cf. Clean Energy for all Europeans package[COM(2016) 860 final]

⁸³ COM/2016/0767 final

⁸⁴ Cf Art 3.4 of the General Approach of the Council on the revised Renewables Directive as adopted on 18th of December and EP Amendment 113 to the same text.

offshore wind.⁸⁵ The European Parliament in its resolution of 14th March 2018 on the post 2020 MFF⁸⁶ called for continuous EU support for investments to enable the use of renewable energy, including by CEF.

It is in this context that the Commission is assessing the inclusion of financial support to specific aspects of renewables development under the Connecting Europe facility. It is to be noted that 94 % of respondents in the public consultation on the future strategic infrastructure funding considered the low carbon transition as important challenge, and pointed to the increasingly important role of sector integration (e.g. between the power sector, grid development and the transport sector).

In this context, **regional cooperation** is essential to ensure an effective and affordable energy transition in the EU taking advantage of trade, evening out variability, safeguarding security of energy supply, coordinating climate adaptation measures and optimising the cost-effectiveness of actions.

Voluntary regional cooperation on energy matters such as in the **Central and South-Eastern European Energy Connectivity (CESEC)** and **Baltic energy market interconnection plan (BEMIP)**, which were initially aimed at improving physical infrastructure, is expanding its scope and has recently started covering aspects such as renewables development and energy efficiency.

1.2. Concept

Enabling action to promote **optional cross-border cooperation of EU Member States (EU MS)** was already included in the Renewables Directive (2009/28/EC in 2009 (and strengthened in the revision of 2016). The rationale was to give Member States flexibility to jointly exploit cheaper renewable energy sources. The ones with less resource potential to cost-effectively achieve their binding national target could use renewables across the border to fulfil their target. Those Member States that had a relatively lower national target to fulfil (mostly the countries with lower GDP) were in return given the possibility to benefit from their renewables (RES) potential by allowing a Member State to explore it in return for a financial reward. The four variants of cooperation mechanisms listed are:

Article 6⁸⁷

Statistical transfers between Member States.

Member States agree on a statistical transfer of a specified amount of energy from renewable sources from one Member State to another Member State.

Article 7

Joint projects between Member States.

Member States may cooperate on all types of joint projects relating to the production of electricity, heating or cooling from renewable energy sources. That cooperation may involve private operators.

Article 9

Joint projects between Member States and third countries.

One or more Member States cooperate with one or more third countries on all types of joint projects regarding the production of electricity from renewable energy sources. Such cooperation may involve private operators.

⁸⁵Cf. with a view to the North Seas <https://windeurope.org/wp-content/uploads/files/policy/topics/offshore/Offshore-Wind-Statement-of-Intent-signed.pdf> and with a view to the Baltic Sea <http://www.tuuleenergia.ee/wp-content/uploads/Baltic-Sea-Declaration.pdf>.

⁸⁶<http://www.europarl.europa.eu/sides/getDoc.do?type=TA&reference=P8-TA-2018-0075&language=EN>

⁸⁷The numbering in the revised directive is altered for all Articles listed.

Article 11

Joint support schemes.

Member States partly or fully coordinate their national support schemes so that production in the territory of one participating Member State may count towards the national overall target of another participating Member State.

The proposal to extend the scope of CEF to support cross-border projects in the field of renewables as part of the present Impact Assessment focusses on those mechanisms – including their fully voluntary nature-, but complements it with action targeting the very early stages of cooperation between Member States: planning and mapping of sites, feasibility studies, assessment of the regulatory framework, assessment of benefits and costs of cross border cooperation and their allocation, comparative assessments of the total costs of deployment (including generation infrastructure and grid development). Support will be reserved to projects resulting from a cooperation agreement or any other kind of arrangement between Member States and or member States and third countries as set out in above listed Articles of the 2009 Renewables Directive. In addition, the projects need to provide cost savings in the deployment and/or benefits for system integration, security of supply or innovation compared to similar projects implemented at national level and also a cost benefit analysis.

The amount dedicated to such projects will not exceed 10% of the total energy window under the Connecting Europe Facility of which a vast part and the first phase will be support provided for grants for studies and technical assistance to Member States and action aimed at identifying and assessing the expected impact and costs and benefits of cross-border cooperation in the field of renewables. In a second phase, grants for studies for the implementation of project and grants for works for a limited number of projects would be made available – only for those projects that can demonstrate significant positive externalities of regional significance (such as security of supply, solidarity or innovation) and in the case of evidence that the project would not materialise or not be commercially viable in the absence of a grant. Examples for innovative technologies that are at this point in a phase where market upscaling is needed are:

- Multiterminal substations (HVDC or AC) allowing a modular build out of the RES capacity
- Floating substations instead of fixed structures
- Solution with HVDC cables to enable exploitation of RES further away from consumption centres
- On site storage facilities (batteries, pumped hydro) to enable higher capacity use of the cables and provide SOS
- Energy conversion facilities (e.g. electrolyzers) to enable higher capacity use of the cables and provide SOS

Insofar they are not already covered under the TEN-E Regulation, projects consisting of such technologies may now become candidates for cross-border project in the field of renewable energy status and for a possible support under the CEF.

The **cooperation on renewables by at least two Member States** can either result in:

- (i) RES projects physically connected to several Member States and or between a Member State and a third country;

- (ii) RES projects located in a single Member State, but demonstrating significant cross-border benefits and financially supported by two or more Member States or financed by one Member State but located on the territory of a different Member State (with or without physical connection).

This means that the new instrument would not only be about connecting infrastructure, but also cooperation with cross-border relevance. The cross-border dimension is assured by the involvement of two or more Member States. In addition to the **obligatory cross-border dimension**, the projects should furthermore display a **positive cost-benefit analysis** taking into account all "integration costs".

Examples of project resulting from enabled cross-border cooperation could include:

- Large North Sea/Baltic Sea offshore wind developments where planned RES generation sites in the waters of several adjacent Member States are developed and deployed jointly and possibly connected to several Member States instead of each developing it on its own and linking it only to its national shore.
- Other RES technologies such as onshore wind, concentrated solar power, sustainable biomass⁸⁸ or more innovative ones such as floating windmills, ocean technology or innovative combinations of different renewables technologies (e.g. solar PV plus offshore wind) could become eligible under the proposed new instrument.
- RES projects including integrated storage or energy conversion facilities (e.g. windfarms with combined electrolysers or methanisation facilities for gas grid injections) that are currently not eligible under TEN-E.

With the emergence of e-mobility, cross-border e-mobility projects will be considered in synergies with the transport and digital parts of CEF.

1.3. Lessons learnt from the past and past programmes

The European Energy Plan for Recovery has demonstrated how financial support to specific cross-border renewables projects (Krieger's Flak) could enable the world's first project linking two national grids with an offshore energy source. What however did not happen in the case of Krieger's Flak was a joint planning of RES deployment which would have resulted in economies of scale compared to each MS deploying a smaller capacity on its own.

Furthermore, the European Fund for Strategic Investments has significantly contributed to renewables development, with EUR 3.2 billion funding by February 2018, triggering a total investment value of more than EUR 24 billion⁸⁹ (contributing to the de-risking of projects).

Accordingly to the 2014 study on the meshed grid⁹⁰, a more integrated approach to grid and RES planning/deployment could be beneficial also for the meshed North Sea grid

⁸⁸ Biomass combustion should be only eligible if certain sustainability conditions are met and the effects on air pollution are integrated into the cost-benefit-assessment.

⁸⁹ Includes funding for EFSI projects in other energy sub-sectors, beyond renewables.

⁹⁰https://ec.europa.eu/energy/sites/ener/files/documents/2014_nsog_report.pdf

which is currently part of a priority corridor under TEN-E. This was also the main outcome of a recent joint event by the Renewables Grid Initiative and WindEurope: "(...) renewable energy producers – including wind – and grid operators need to work together more closely. Defining the future energy landscape requires joint planning on the development of new transmission lines. This should take into consideration the expansion of renewables and the electrification of other sectors, as well as environmental and social impacts (...)"⁹¹. Renewables development is currently mostly driven by Member States through national support schemes and national plans that remain largely un-coordinated. Support schemes that include cross-border elements, for instance when competitive bidding processes allowed the participation of producers from other Member States, auctioning prices tend to be lower, enhancing the competitiveness of renewable energies⁹². A similar EU-wide coordination for renewables deployment in the EU is still at its initial phase

Over the past 10 years, Member States did not engage significantly in transnational co-operation on RES deployment and the role that the cooperation mechanisms were expected to have for the growth of renewables in Europe up to 2020 did not materialise - despite the socio-economic benefits of a more regional approach (see below) and despite the fact that those have been and are promoted in several Articles of the 2009 RES Directive (as quoted above), a guidance document on cross-border cooperation from 2013⁹³ and relevant wording in the current energy and environment state aid guidelines.

With 2020 approaching and Member States having more clarity on whether they will be able to meet the target on their own, the last two years saw the emergence of two more cases of cross-border cooperation - the statistical agreements between Luxemburg and Lithuania⁹⁴, as well as Estonia⁹⁵.

Table 1: List of implemented cooperation mechanisms

Cooperation type and countries involved	Year	Status/comments
Joint certificate scheme Norway - Sweden	2012	Since January 2012, Sweden and Norway operate a joint certificate scheme for supporting renewable energy. The target is to increase electricity production based on RES in Sweden and Norway by 28.4 TWh until 2020.

⁹¹<https://renewables-grid.eu/publications/press-releases/detail/news/smarter-roll-out-of-electricity-grids-makes-integrating-35-renewables-easier-and-cheaper.html>

⁹² The results of the first cross-border tender for renewable electricity in Europe is an illustration of how a Member State can limit the costs of financing renewables through allowing foreign electricity generators to bid in the auction. The 50 MW photovoltaic tender organised by Germany and open to Danish generators achieved an awarded price (5,38 cents/kWh) that were more than 25% lower the last German tender for only-German individual installations (7,25 cents/kWh). The good response obtained by the tender, with bids totalling almost fivefold the amount procured and half of it represented by foreign installations shows also the willingness of generators to participate in a broader market.

⁹³SWD(2013) 440 final

⁹⁴ https://ec.europa.eu/info/news/agreement-statistical-transfers-renewable-energy-amounts-between-lithuania-and-luxembourg-2017-oct-26_en

⁹⁵<http://www.tuuleenergia.ee/en/2017/11/estonia-luxembourg-sign-eur-10-5-mln-renewable-energy-agreement/>

Cross-border PV auctions Denmark - Germany	2016	In July 2016, Denmark and Germany signed a cooperation agreement allowing for a mutual cross-border participation in auctions for PV installations. The agreement sets the framework for two pilot auction rounds in Denmark (20 MW auction, 2.4 MW opened for installations in DE) and Germany (50 MW, fully opened for installations in DK). Both auctions were run in 2016. The cooperation links to the state aid decisions on the support schemes for renewable energy in both countries. Both decisions include the partial opening of auctions for electricity for renewable energy (to comply with Art. 30/110 TFEU).
Statistical transfers Luxembourg - Lithuania and Luxembourg - Estonia	2017	In October 2017, the first statistical transfer agreement was signed between Luxembourg and Lithuania, in November 2017 the agreement between Luxembourg and Estonia followed. The transfers will cover the period from 2018-2020 and will to help Luxembourg fulfil its 2020 national renewable energy target.
Krieger's Flak	2009 for grant	Krieger's Flak CGS (Combined Grid Solution) is a transmission project with an offshore-wind park-system in the Baltic Sea in the waters of the exclusive economic zone of Denmark, Germany and Sweden. The project was initially set up as a tripartite one between (Denmark-Sweden-Germany), but reduced to only linking the Danish and German grids and technology-wise the transmission system which was planned to be based on high voltage direct current (HVDC) is now built with a more common Alternate Current (AC) system. An additional driver for the project was the associated reduced integration costs, although the grant only covered the grid aspects. The project has been supported by a 150 million euro grant through the European Energy Programme for Recovery (EEPR) in 2009, construction work is ongoing.

Table 2: List of so far not implemented cooperations

Project	Status/comments	
Intended cooperation on a wind project Ireland - United	Not implemented	The two countries signed a memorandum of understanding in January 2013. The aim was to establish

Kingdom		an intergovernmental agreement on energy trading, to be signed in 2014. However, a respective agreement was not signed and discussion on the cooperation came to a halt.
DESERTEC	Not implemented	The DESERTEC project relates to the concept of producing electricity from renewable energy in North Africa and exporting it to EU Member States under Art. 9 of the Renewable energy Directive 2009/28/EC. Following the creation of the Desertec industrial initiative (Dii) in 2009, North African countries, in particular Morocco, and EU Member States, including France, Germany, Italy and Spain, discussed the implementation of a possible first pilot project. In 2012, the discussion came to a halt.
HELIOS	Not implemented	The HELIOS project relates to concept of producing solar electricity in Greece and exporting to other EU Member States. The project was proposed by the Greek government in 2011. An agreement with a possible off-taker country was not concluded.

As can be seen from the above listing, where intergovernmental cooperation took place in the past, in several cases projects did not materialise, or at least not as planned, even with a grant from the EU budget. The underlying complexity and the substantial time and resources that would have been required explain why such envisaged cooperations did not move forward.

With regard to offshore projects, the European vision for a North Sea offshore meshed grid was launched back in 2010, planning for future large volumes of offshore wind linked with maritime interconnectors for cross-border electricity transmission. However, progress is thus far rather slow, as was also observed at the specific stakeholder event to inform the present Impact Assessment that took place on 5th March 2018 in Brussels (*see preceding Annex for more details*). What one can observe at this stage is that currently several interconnectors are planned in the North Sea, but all are point-to-point transmission links. Merely the 1400MW "FAB Link" UK-France project may eventually be connected to an offshore tidal energy project⁹⁶.

II. THE PROBLEM AND ITS DRIVERS

2. 1. Problem: Foregone gains from uncoordinated RES deployment in the EU

⁹⁶ The project was originally conceived as an interconnector via the island Alderney where 3 GW tidal power capacity was to be developed. At this stage the interconnector goes ahead for 1.4 GW (less than the planned capacity of the offshore source, with the construction of the tidal plant being delayed).

The national approach to renewables implies that deployment is not necessarily prioritising the best spots: Where resources are more abundant; where overall system costs would be minimised (e.g. reduced need for back-up, avoided grid investments); where overall social benefits would be maximised (e.g. increased security of supply, avoided local air pollution, employment effects, innovation transfer effects). **From an EU perspective, renewable energy tends to be exploited not necessarily where it is most efficient to do so** from a natural resources/geographical conditions/grid/alternative fuel infrastructure perspective.

The **economic benefits** that could arise from using better Europe's resource potentials have been confirmed by a number of studies and modelling efforts. Most recently, the modelling underpinning the Clean Energy package of November 2016 revealed that cross-border opening of national support schemes would result in reduced energy system costs ranging from **EUR 1.0 billion (partial opening) to EUR 1.3 billion** (mandatory regional schemes) annually for the period 2021-2030, while at the same time reducing renewable energy support costs paid by the consumer by 3% and 5% respectively.⁹⁷

A study carried out for the European Commission on the benefits of a meshed offshore grid in the Northern Seas of 2014⁹⁸ estimated the **annual savings** including costs of losses, CO2 emissions and generation savings to be **EUR 1.5 to 5.1 billion** higher per year for the coordinated grid. These monetized benefits make the meshed grid profitable in all studied scenarios and for a wide range of fuel and CO2 costs. When states also coordinate their reserve capacity, an additional **EUR3.4 to 7.8 billion** generation investment cost reduction is obtained. On top of the monetized benefits, there are **less CO2 emissions and less cables making landfall** in the meshed configuration. The same study also concluded that in order to realise this benefits of coordinated grid development, coordination between all stakeholders has to be enabled.

A 2014 study by the Imperial College London on the North Seas Grid infrastructure⁹⁹ concluded that an integrated approach to offshore electricity grid development in the North Seas can lead to **EUR25-EUR75 billion savings** in operation and network investment costs as well as **EUR3.4-EUR7.8 billion** in generation investment costs, lowering average cost of electricity production by 0.8-2.2 €/MWh. However, if each country were to develop its own renewable power supply and network infrastructure independently from their neighbours, there will be no possibility for offshore wind generators to directly dispatch electricity to different markets other than that of the connected country. Further studies came to similar results for cost savings in cross border renewables cooperation in general (not only in offshore wind deployment).¹⁰⁰

The reasons preventing (sufficient) cooperation are well known and documented for years. The Commission's 2013 guidance document on cross-border cooperation already provides a comprehensive list of barriers. This diagnosis was since confirmed in several studies with most details possibly contained in a 2014 study carried out for the European

⁹⁷SWD (2016) 418 final

⁹⁸https://ec.europa.eu/energy/sites/ener/files/documents/2014_nsog_report.pdf

⁹⁹<https://www.e3g.org/news/media-room/how-to-build-a-north-seas-grid-without-regretting-it>

¹⁰⁰<https://link.springer.com/content/pdf/10.1007%2Fs12398-014-0125-0.pdf>;
http://orbit.dtu.dk/files/59386176/Renewable_energy_63_p_345_352_postprint.pdf;
<http://www.nature.com/articles/nclimate3338>

Commission that based its findings on interviews with representatives from 11 EU Member States in different stages of renewables deployment.¹⁰¹

The identified main barriers to more cross-border cooperation in renewables are:

1. (Perceived) technical complexity of designing the most appropriate cooperation model and reluctance to take associated "first mover risk". Perceived uncertainty and complexity of cost and benefit sharing arrangements between Member States.

Almost all Member States that were interviewed as part of the 2014 Ecofys study, referred to above, mentioned uncertainty on the design options of cooperation mechanisms as a barrier. Among other aspects, the compensation of consumers, monitoring and operation, accounting of RES amounts for target fulfilment and risk allocation were cited as components that would need either more specific guidance or knowledge sharing. A proof that complexity is not only a perceived, but actually a real issue could be that the statistical transfers by Luxemburg – the presumably least complex form of cooperation - took the governments several years to settle¹⁰². ENTSO-E confirmed at the expert workshop that cost-benefit assessment of integrated projects with a generation component are more demanding and therefore the meshed grid in the North Sea is still a medium to long-term vision. The technical complexity was emphasised again by stakeholders present at the expert stakeholder workshop including the Spanish and Austrian government representatives, complemented by the German representative who described the EU as still being in a "*learning phase on cooperation*". WindEurope and MOT¹⁰³ thus called on the Commission to provide an update of the 2013 guidance document among other action.

In a similar vein, Member State sometimes name the reluctance of countries to assume the first-mover risks, i.e. engaging in cooperation mechanisms without building on the experience and best-practices of other countries that have done so previously, as a barrier: "*Without first projects that could be used as a reference for price setting, the Member State was hesitant to use cooperation mechanisms himself.*"¹⁰⁴

In the 2016 online public consultation supporting the REFIT evaluation, 90 % of respondents considered uncertain benefits for individual Member States as a very important or important obstacle. As demonstrated in a study of the Institute of Energy Economics, University of Cologne¹⁰⁵ that analysed the national renewables action plans of Member States until 2014, administrative issues and questions concerning the fair sharing of costs and benefits between the Member States represent major obstacles that need to be tackled in order to reach renewable energy targets at the lowest costs possible. EU MS declared that there is no clear common understanding of how cooperation mechanisms could work in practice or a lack of information concerning the potential for joint projects in other MS or third countries. The Ecofys 2014 study concludes on this

¹⁰¹ <https://www.ecofys.com/files/files/ec-ecofys-tuvienna-2014-cooperation-member-states-res-directive.pdf>

¹⁰² MEP Claude TURMES from Luxemburg at the 5th March 2018 expert workshop in Brussels and REFIT evaluation supporting the review of the RES Directive SWD (2016) 0416 final.

¹⁰³ La Mission Opérationnelle Transfrontalière (MOT), French government.

¹⁰⁴ <https://www.ecofys.com/files/files/ec-ecofys-tuvienna-2014-cooperation-member-states-res-directive.pdf>, page 12.

¹⁰⁵ <https://link.springer.com/content/pdf/10.1007%2Fs12398-014-0125-0.pdf>

issue that "*further insights to governments on quantifiable costs and benefits of specific projects would help to inform the discussion*".¹⁰⁶

2. Domestic policy considerations – in particular communicating to the national electorate the benefits of cooperation over reliance on domestic resources (with their various perceived economic benefits)

The political willingness of Member States to engage in cooperation is a prerequisite, but Member States highlight public acceptance as a barrier preventing them from pursuing cooperation mechanisms more actively. Governments face difficulties to communicate the costs and benefits of cooperation mechanisms to their national electorate.¹⁰⁷ Interestingly this problem does not only occur with the buying country that needs to explain to its tax payers that it is partly sponsoring investment abroad, but also for the receiving country that could find itself in a situation to explain to its citizens why it is beneficial to exploit domestic resources beyond the own energy needs. The public consultation underpinning the REFIT evaluation on the RES Directive in 2016 revealed again a reluctance to see taxpayers or consumers' money used for investments abroad¹⁰⁸ as main reasons for the limited use of cooperation mechanisms. Indeed, the majority of respondents support such view, arguing that benefits in the form of employment, economic and industry growth, tax income and security of supply are thus not created within the own country. This observation was confirmed again by a representative from the renewables industry at the expert workshop in 2018 stating that the main barrier is "*the not unreasonable view by Member States that RES should first and foremost be deployed at home*". The lack of incentive with every Member State to start including cross-border elements results in a first mover disadvantage where the one that moves first and without prior agreement by the other actors stands to lose. Besides public acceptance issues, concerns about giving up national sovereignty through the engagement in cooperation mechanisms were mentioned. Cooperation mechanisms could interfere with domestic support schemes or domestic policy preferences such as the security of supply.¹⁰⁹

3. Investments in cross-border RES projects can be hindered by conflicting national interests and/or insufficient coordination between grid operators and RES generation project promoters.

RES potential e.g. in South East Europe may not be exploited because a Member State lacks the financial means or energy needs to do so on its own or because the project requires coordination with other Member States to take place (e.g. investment in interconnections is needed to reap full benefits, even though this could bring benefits across several Member States). In 2017, IRENA estimated Southern and Eastern Europe to hold a potential of renewable resources of 740GW¹¹⁰. This represents twice the economically attractive potential by 2030 in the North Seas¹¹¹. Also the Baltic Sea has

¹⁰⁶ <https://www.ecofys.com/files/files/ec-ecofys-tuvienna-2014-cooperation-member-states-res-directive.pdf>

¹⁰⁷ <https://www.ecofys.com/files/files/ec-ecofys-tuvienna-2014-cooperation-member-states-res-directive.pdf>

¹⁰⁸ 94% of public consultation respondents cite this factor as important or very important

¹⁰⁹ <https://www.ecofys.com/files/files/ec-ecofys-tuvienna-2014-cooperation-member-states-res-directive.pdf>

¹¹⁰ http://www.irena.org/-/media/Files/IRENA/Agency/Publication/2017/IRENA_Cost-competitive_power_potential_SEE_2017.pdf?la=en&hash=DE44F51BDDFB43D4CB8D880B5AB71713447BA04

¹¹¹ <https://windeurope.org/wp-content/uploads/files/about-wind/reports/Unleashing-Europes-offshore-wind-potential.pdf>

significant unexploited potential and could according to the wind industry be as big as 9 GW by 2030.

National decisions on RES infrastructure (in particular of large projects) can carry cross-border impacts in terms of intangible benefits, but also on the use of networks and flexibility needs.

The importance of coordination between grid developers and RES generation promoters was already highlighted as one contributing factor to the delays with the meshed North Sea Grid. Participation of all relevant stakeholders, particularly market participants, to ensure pragmatic and practical solutions was also given as one of the most important success factors for renewables cooperation in a 2015 study.¹¹² It could be seen in the past (with cases of RES capacity additions that were not fully matched with timely grid developments resulting in curtailment and re-dispatching needs due to congested grids), that having more comprehensive information on what is planned on renewables development at the moment when transmission operators plan the grid extensions can be useful. Secondly, coordination can lead to lower needs for transmission, generation and back up infrastructure.

2.2. The scope of the problem

The consequence of the above is that achievement of the EU renewables target and the energy transition can become more costly than necessary for EU's Member States, project promoters, taxpayers and consumers, especially when looking at the "full costs" of RES (including in particular grid development and integration costs), when underexploited areas with good conditions are not used, because a Member State lacks the financial means or energy needs to do so on its own, when Member States interests are not aligned, or when the complexities in setting out such cooperation regimes are (perceived) higher than the benefits.

The relevance of gains from cooperation is expected to increase in the future with renewables estimated to have around 50 % share in EU electricity production in 2030. Renewables will continue to play a major role in the decarbonisation of the European economy and in meeting Europe's commitments under the Paris process. Higher share of variable renewables also means that grid and integration costs will become an increasingly acute issue that requires optimisation of renewables planning and deployment, including across Member States.

IV. NECESSITY AND EU ADDED VALUE

Necessity

A legal basis for the extension of the new CEF to renewables is provided by Article 194 TFEU that explicitly lists the promotion of renewables as one of the objectives of EU energy policies. In addition Art. 3(4) of the recast Renewables Directive¹¹³ stipulates that *"the Commission shall support the high ambition of Member States through an enabling*

¹¹²<https://www.ecofys.com/files/files/hbf-ecofys-2015-regional-cooperation-res.pdf>

¹¹³COM/2016/0767 final.

framework comprising the enhanced use of Union funds, in particular financial instruments".

The necessity of the EU to intervene is evident from the above description of the underlying problem drivers, which also are due to diverging interests of EU Member States (distribution of benefits and costs from cooperation fall uneven among Member States and/or few incentives for a country with high RES potential to allow another country to explore it) that prevent cooperation from happening and leave European public goods delivered at sub-optimal levels (e.g.: an optimised deployment of RES). At the same time national energy policies increasingly affect each other, impacting the energy mix of neighbouring countries through cross-border trade and electricity flows, especially in the context of improved cross-border electricity trade.

The crucial role of the national targets until 2020 for successful cooperation in the past is evidenced in research, with Ecofys 2014 stating that "*without strong incentives to cooperate beyond 2020 such long-term joint endeavours and investments are unlikely*". The new collective and binding target for renewables for 2030 could also be described as a European public good: The European Commission and the Member States are jointly bound by this target, but there is the possibility of single Member States to not contribute to it and free-ride. Vice versa, the currently more advanced Member States might feel that they have already delivered their share and that others will need to step up.

EU added value

Such coordination between Member States can be done only at macro regional level. Experience shows that the Commission's facilitating role has been decisive in such contexts. Reinforced cooperation can bring economies of scale, avoid duplication of infrastructures, increase deployment across Europe to better reflect the available potential, contribute to policy convergence and thus to further market integration (with an example often referred to being the different requirements for signalling red stripes on windmill blades in different national legislation), knowledge transfer and uptake and replication of innovative technologies in the European home market. It was precisely such EU added value that provided also the justification for granting support for selected offshore projects under the European Energy Economic Recovery Programme (Regulation (EC) No 663/2009).

III. COMPLEMENTARITY WITH OTHER PROGRAMMES

The TEN-E Regulation and the existing strand of CEF-Energy and its priority corridors on electricity transmission grids, and efforts for EU grid integration in a wider sense have and will need to continue playing a key role in supporting the transformation of the energy sector as this brings flexibility that is the key to managing intermittent renewable sources. **The new supporting framework for renewables cross-border cooperation shall thus not crowd out electricity transmission investment**, but rather complement and facilitate them further.

Strengthened regional cooperation including the articulation from all stakeholders in the energy sector can provide a solid base for more efficient integration of renewables. Better knowledge on the costs and benefits for renewables projects could help informing also the assessment of grid projects in the future, as put forward by a Member State's representative and E3G.

As could be demonstrated above and also accordingly to what was stated in the 2014 study on the meshed grid for the Commission¹¹⁴, a more integrated approach to grid and RES planning/deployment could be beneficial also for the meshed North Sea grid which is currently part of a priority corridor under TEN-E. This was also the main outcome of a recent joint event by the Renewables Grid Initiative and WindEurope: "(...) *renewable energy producers – including wind – and grid operators need to work together more closely. Defining the future energy landscape requires joint planning on the development of new transmission lines. This should take into consideration the expansion of renewables and the electrification of other sectors, as well as environmental and social impacts (...)*".¹¹⁵

The **North Seas energy cooperation**¹¹⁶ indeed has this more integrated approach also as one of its objectives. However, it does not have any budget with which to overcome the cross-border related barriers. Also the new cooperation instrument would aim to replicate cooperation in other parts of Europe and on other technologies besides offshore wind. For example, it might be an important venue for the EU industry in the view of global competitiveness to develop hybrid wind and solar photovoltaic projects or advance in floating or ocean technologies - all of which can for legal base reasons not be done under TEN-E and is at least for the moment also not discussed in the North Sea Offshore cooperation.

The European Structural and Investment Fund has resulted in ca 4.8 billion Euros allocated by Member States for renewables under the low carbon earmarking obligation in 2014-2020. It did not obligate Member States to invest in renewables (and in fact not all of them allocated ESIF to renewables), but those that wished to do so, could support local and regional renewables deployment, implement renewables investments e.g. as part of refurbishment of buildings and/or integrate a renewables dimension into the so-called smart specialisation strategies. The EU support via ESIF does not have as an aim to facilitate Member States' joint planning or deployment, but rather supports regional and urban action and knowledge sharing. Transnational cooperation under ESIF (INTERREG B and C) is supporting bordering regions from several countries facing similar challenges and can occasionally include the territory of a full Member State, but is not meant to facilitate whole Member States cooperating. The scope of INTERREG B and C is wider than renewables, but did in the past support coordination and exchange of best practice of bordering regions also for renewables.

Financing through **EFSI** has become a major source of funding for renewables, successfully contributing to de-risking of RES investment in particular for large infrastructure projects. EFSI has already provided EUR 3.2 billion of EFSI financing to renewables resulting in more than 24 billion total investment. The relevance is expected to continue in the future with the 40 % earmarking foreseen for energy and climate in the new EFSI. EFSI is, as well as the new InvestEU programme will be, a bottom-up programme that relies on project proposals to be driven by the market. It will greatly contribute to renewables development in a national context, it can however not overcome coordination failures and complexities of cross-border projects as set out

¹¹⁴ https://ec.europa.eu/energy/sites/ener/files/documents/2014_nsog_report.pdf

¹¹⁵ <https://renewables-grid.eu/publications/press-releases/detail/news/smarter-roll-out-of-electricity-grids-makes-integrating-35-renewables-easier-and-cheaper.html>

¹¹⁶ <https://ec.europa.eu/energy/en/topics/infrastructure/north-seas-energy-cooperation>

above. Furthermore, the new to be set up Invest EU Fund will cover, as is the case for CEF energy in general, also the RES related financial instruments part.

The **Innovation Fund** (successor of NER 300) will provide support for innovative low carbon technologies including for renewables projects. Innovfin – Energy Demo – Complementing Horizon 2020 and NER 300, provides financial instruments that target the demonstration of innovative RES technologies.

The intended opening for cross-border cooperation in renewables under CEF would complement the aforementioned instruments as it would also provide support for non-technological innovations such as action combining already established RES technologies and/or targeting market uptake. Finally, the new instrument would become an effective and complementary tool to help Member States in the reporting and planning of the national energy and climate plans established in the proposed Governance Regulation, in particular with respect to its regional dimension. A possible future link to the financial platform to be set up by the Commission under Art 27 of the proposed Governance Regulation could be explored. The new instrument would also underpin the provisions on mandatory partial opening of support schemes proposed by the Commission under the recast of the Renewables Directive.

V. POLICY OBJECTIVES

In line with the problem statement above and also reflecting the changed policy context with a Europeanisation of renewables target achievement after 2020 and innovation and leadership ambitions, the objectives of the new enabling action for cross border cooperation would be the following:

General objective: enabling a cost-effective EU target achievement by 2030 and cost effective energy transition, reflecting also the Juncker Commission ambition of the EU as the world leader in renewables

Specific objectives:

- Facilitate cooperation in cross-border planning and deployment of renewables by overcoming the persisting barriers and disincentives
- Facilitate that the collective EU-level renewables target for 2030 and renewable energy integration is met cost-effectively and that CEF further contributes to the energy transition and 2030 and 2050 decarbonisation commitments.
- Contribute to improving the EU's competitive position in renewables and the EU leadership ambition for all renewables technologies

VI. POLICY OPTIONS AND BRIEF OUTLINE OF IMPACTS

The following options have been identified:

- Option 1: Business as usual (baseline)
- Option 2: Reinforced voluntary cooperation and/or revised non-legal guidance
- Option 3: Establishing an enabling framework for cross-border cooperation on renewables

Variant 1: additional legal provisions to be included in the CEF Regulation, but with no financial support

Variant 2: same as above but with access to additional finance in CEF

1. Business as usual (baseline)

Under the baseline scenario we assume that the **Clean Energy Package** will be adopted in its integrity and that CEF is implemented as described above- but not including the extension of scope towards renewables. Also other currently existing financial programmes are assumed to continue with their current scope.

The Clean Energy package will already include the following provisions that are expected to contribute to a more regional approach towards renewables deployment and planning: An obligation for Member States "*to cooperate at regional level to effectively meet the targets, objectives and contributions set out in the integrated national energy and climate plans.*" (Article 11 of the Governance Regulation). The same article then continues to request from Member States to identify opportunities for cooperation, to consult with neighbouring countries and to consider any comments from those countries. Again in the same article the Commission is called upon to "*facilitate cooperation and consultation among the Member States on the draft plans*".

As mentioned above, with regard to the binding EU target for renewables, the approach followed in the Clean Energy Package is to give Member States the final say in their national contribution towards the target, but also to incentivise high pledges through the iterative process established in the Governance regulation, where the Commission may issue recommendations to draft integrated energy and climate plans (Art 9.2 Governance Regulation) taking into account the level of ambition of objectives, targets and contributions in view of collectively achieving the Union's 2030 target. Additionally, the finally adopted version of the revised Renewables Directive will in all likelihood contain an Article on partial opening of renewables support schemes (Article 5). The voluntary cooperation fora for energy matters (North Seas Offshore Cooperation, BEMIP, CESEC, Pentilateral Forum) would continue to operate and the development of the meshed North Sea Grid would continue at its current pace delivering in the medium or long term as explained above.

Under this option, it can be expected that over the next few years some more progress will be made with regard to regional cooperation for renewables with Member States - who are under the new 2030 Governance obligated to reflect on the cooperation opportunities. The existing fora for intergovernmental cooperation will continue their work - and in the case of CESEC and BEMIP start - on renewables cooperation. However, there would still not be targeted action or a budget for the costs associated with overcoming the barriers identified above that currently prevent cross-border action from happening and Member States from investing into the additional cost of coordination.

The Commission would under this option also not respond to the call from the co-legislators to enable cross-border action in the area of renewables, including through finance. This might then again make it more difficult for the Commission to request additional action by Member States and in particular on renewables as part of the recommendations under the Governance Regulation. The finally agreed text on the revised Renewables Directive will most probably contain some provisions for Member

States to partially open the RES support schemes, although it is at this point in time not clear whether this would become a mandatory or voluntary clause. Whilst a partial opening of national support schemes is one element in order to reap the benefits of a more coordinated approach, this provision does not apply to the other forms of cooperation and more importantly does not overcome the national perspective in planning and deployment in the first place.

It is however to be expected that not all the benefits described in Section II.2.1 of this Annex 3 will be realized. It should be noted that in the expert workshop held to gather stakeholders view on the extension of scope of CEF, none of the around 60 stakeholder present intervened or submitted input describing the baseline as sufficient.

2. Reinforced voluntary cooperation and/or revised non-legal guidance

Under this option, the context would evolve as described for the baseline, but in addition, the Commission would **issue an update of the guidance document on cross-border cooperation from 2013 and/or reinforce its input to the voluntary cooperation fora that exist**. This would take up on a proposal that was also put forward by several stakeholders at the expert meeting, in particular if it were to include detailed lessons learnt from cooperation that have occurred between 2013 and today. However it should be noted that most of those who intervened with suggestions for improved or updated guidance did not feel that this was the only additional element that would be needed, but rather suggested it as part of a package complemented e.g. by additional legislative provisions to improve coordination. With a revised non-legal guidance document, details could be made available on how concretely a bilateral agreement (until now there was no trilateral cooperation) needs to be drafted and topics to be taken into account. Alternatively or additionally, the Commission could re-enforce the support it currently provides to the intergovernmental fora on energy matters, however this will be within the limitations of not having additional resources for that. This option would most certainly accelerate renewables cooperation in those geographical areas and/or sectors that are currently covered by such a forum, even though it was noted in a report from 2015¹¹⁷ that the progress occurred on existing renewables capacity rather than on future RES deployment thus far. This progress might not go as far as to address the important issues that will condition renewables deployment over the next decade e.g. the most efficient use of RES potential across Europe.

3. Establishing an enabling framework for cross-border cooperation on renewables

Variant 1: additional legal provisions to be included in the CEF Regulation, but with no financial support

Variant 2: same as above but with access to additional finance in CEF

Both variants can be combined with the content of **option 2**.

Replicating the logic established with the TEN-E framework, two variants will be considered for the extension of scope: One in which only a regulatory enabling framework for cross border cooperation will be set up (**variant 1**) vs. one in which such a

¹¹⁷ <https://www.ecofys.com/files/files/hbf-ecofys-2015-regional-cooperation-res.pdf>

framework will also be complemented by financial support through the EU budget (CEF) (**variant 2**). The cross-border component on renewables will not be underpinned by separate sectoral guidelines as is the case for the current energy part under CEF. However, the Clean Energy Package already contains a number of provisions that actually address regulatory issues for cross border cooperation:

- The proposed revised Directive for Renewables foresees an Article on limits for duration for authorisation procedures (for all RES projects, not only cross-border ones), basic principles for support schemes including partial opening,

The proposed Electricity Regulation contains rules on RES market integration, including principles on rules on grid costs and grid connection rules.

The subsidiarity assessment underpinning the Clean Energy Package of 2016 has not changed and further regulatory alignment seems to be disproportionate and will in any event never be able to cover all national specificities, which also extend in into other areas of strict national competence such as spatial planning and taxation. Even more importantly, and confirmed both by research and statements from Member States and other stakeholders the by far biggest obstacle is indeed the lacking incentive to engage or invest in such cooperation.

However the CEF Regulation will contain for both variants a definition of cross-border cooperation on renewables, the definition of the criteria that need to be met in order for a cooperation to be selected for the status of a cross-border project in the field of renewable energy , the process with which this selection is being made and the information and methodology that is being used in order to select projects. Under variant two, it would also contain provisions on how to provide financial support for cross-border project in the field of renewable energy. The cross-border project in the field of renewable energy status would not result in any fast track procedure or priority treatment.

To address the issue of uncertainty around the allocation of benefits and costs among various Member States, it could be envisaged to include provisions similar to those in the TEN-E (Article 12) guidelines specifying rules on the allocation of costs (**variant 1**) or under **variant 2** financial support for studies could be offered to Member States that could be used for exactly such purpose. Variant 2 seems more appropriate to underline in the light of the responses received from Member States and other stakeholders.

With regard to maximum permit granting period, Art 16 of the proposal for a revised Renewables Directive already introduces new rule for permitting procedures (for all RES projects, not only cross-border ones). There is no need for amending those rules as the proposed 3 years maximum permitting period seems to be already sufficiently fat for the generally more complex cross border projects.

Both variants would contribute to a more integrated approach between renewables and grid development, with variant 1 expected to provide input for anticipatory grid planning by making visible the planned cross-border cooperation in the area of renewables.

The new enabling framework would also be complementary and in line with what was announced recently with regard to outermost regions¹¹⁸ and deliver on the EU's territorial

¹¹⁸ SWD (2017) 349 final.

cohesion objectives and "*take account in particular of the need to link island, landlocked and peripheral regions with the central regions of the Union*". A pure energy transmission connection to the mainland is for some of those regions not the most attractive and effective solution, hence integrating renewables into cross border action can make the new CEF more relevant for those regions that tend to have a significant RES potential.

However, it will be only under variant 2 that the biggest impediments (such as the Member States reluctance to be the first mover, to invest abroad or to invest in such cooperation without knowing to what extent benefits and costs will fall between Member States) will be addressed

The enabling framework could put the Commission into a better position in order to facilitate target achievement under the 2030 Governance and contribute to all innovation efforts under the new MFF with an emphasis on innovative combinations of existing technologies and technologies in the stage of market uptake needing upscaling. Variant 1 without financial support will however be significantly less powerful in overcoming the domestic policy concerns that prevent Member States in cooperating more. Only setting up new rules and not offering also a component of financial support (as requested by the co-legislators) would add to the costs of cooperation that are already present today and the EU would also not directly contributing to the collective target.

Thanks to these enabling measures by the EU, it is expected that cross-border cooperation will be put into action leading to a more cost-effective deployment of renewables in across the EU. Under variant 1, certain hurdles e.g. the cross border cost allocation would be addressed with provisions, its effectiveness can be expected to be limited (as the estimation of potential gains and attribution to specific Member States may be costly or impossible and the benefits may go wider than what can be allocated among the directly involved Member States). The financial component under Variant 2 could therefore finance programme support actions, technical assistance facilitating the coordination among Member States, studies notably to facilitate the cost-benefit analysis of rational projects and grants to compensate for the positive externalities, such as wider economic benefits to the society which however represent additional costs to the promoters.

An EU financial contribution could finally be justified based on the delivery of EU wide benefits such as collective target achievement, an optimised grid or the innovative dividend that can help towards the global leader ambition.

Based on the above it seems that regulatory issues are addressed sufficiently in the proposed Clean Energy Package so that additional provisions are only need in order to define cross border cooperation on renewables, renewables projects of European Interest and their eligibility criteria and selection processes. Given that the biggest persisting barriers cannot be solved without addressing the costs of the increased coordination, variant 2 is chosen.

Delivery mechanisms:

Cross-border project in the field of renewable energy will be eligible for

- grants for studies and technical assistance aimed at identifying and assessing the expected impact and costs and benefits of cross-border cooperation in the field of renewables
- grants for studies for the implementation of projects
- grants for works for a limited number of projects – only for those projects that can demonstrate significant positive externalities of regional significance (such as security of supply, solidarity or innovation) and that the project would not materialise or not be commercially viable in the absence of a grant.

The intervention would be geared towards overcoming the identified market/coordination failures/incentive structure and therefore cover the additional costs arising from cross-border and multi-purpose infrastructure planning/ development; providing an incentive for Member States to explore such cooperation instead of only planning and deploying nationally and/or compensate for positive externalities occurring elsewhere e.g. for grid stability and security of supply.

In the case of grants, it shall be provided in the form of upfront investment aid. The resulting lower cost of the project to the Member State would be the incentive for them to engage in such mutual beneficial cooperation. In particular, it could help overcome political acceptance issues (i.e. preference for deploying RES in the domestic market), by making very visible the support cost reduction achieved thanks to the participation of EU funds. The EU financial contribution would represent the EU's contribution to an EU-level target, complementing thus Member States contributions.– based on which then companies in competitive tenders could develop projects.

The expert workshop also revealed that financial instruments could be particularly useful to ensure funding at attractive rates (e.g. loans, equity, junior debt or first loss guarantees, EU budget guarantee). In line with Art. 3(4) of the recast Renewables Directive¹¹⁹ that stipulates that "*the Commission shall support the high ambition of Member States through an enabling framework comprising the enhanced use of Union funds, in particular financial instruments*", blending will be a significant component of the future instrument and will be fully embedded in the future InvestEU Single Investment Fund.

VIII MONITORING AND EVALUATION

The main output indicator would be the number of cooperation mechanisms and Cross-border projects in the field of renewable energy that emerges once the enabling framework is in place. This main indicator could be complemented by the number of intended cooperation (that do not materialize) and the number of preparatory studies by Member States that were initiated.

A relevant source of information for the progress on cross-border cooperation on renewables will be the reporting under the new Governance Regulation where if adopted as proposed the annexed template to be used includes information on the role that regional cooperation plays for all headings (one of which is renewables) and a section in which Member States describe the impact of their plan on other Member States.

119COM/2016/0767 final

ANNEX 4: FURTHER BACKGROUND REGARDING THE SCOPE OF CEF DIGITAL

1. CONTEXT

Delivering a digital single market is the first priority set for the second half of the Juncker Commission's mandate. The benefits of a functioning digital single market (€ 415 billion per year to the EU's economy, hundreds of thousands of new jobs) can only be realised if the underlying broadband connectivity is in place. Flagship projects like 5G, the digitisation of European industry, or the modernisation of sectors like healthcare or public administration depend on universal access to reliable, affordable and high-quality digital networks. Tomorrow's innovations and their wide take-up can only emerge if Europe becomes a truly connected continent.

Ubiquitous connectivity has become one of the decisive factors to close economic, social and territorial divides, making sure that every EU region, including rural and peripheral ones, contributes to growth. In education and life-long learning, all EU citizens should have access to basic (e-)services. Connectivity increases the capacity of labour market to adapt to new challenges even in the most disadvantaged areas, and allows for a better link between demand and offer, regardless of geographic location. It creates new markets and growth environment for SMEs. It also supports the modernisation of local economies and sectors underpinning the diversification of economic activities. Telemedicine technologies and electronic health records not only help reducing the costs of health care, especially of elderly care, but also pave the way to a new generation of personalised care, patient-centric and preventive. Connectivity improves mobility from an efficiency, safety, and comfort perspective; it supports an efficient energy grid management and consumption.

On October 2017, the European Council has called for a first rate infrastructure and communications network in Europe, in order to successfully build a Digital Europe, which requires cooperation at the EU level, inter alia with the aim of achieving world-class very high-speed fixed and mobile networks (5G) all across the EU.

In its report on the next MFF: "Preparing the Parliament's position on the MFF post-2020", the Parliament underlined the importance of ensuring financing for completing the digital single market by making full use of the spectrum, 5G deployment and gigabit connectivity

In the Opinion on "Boosting broadband connectivity in Europe"¹²⁰, the European Committee of the Regions "supports efforts to promote broadband expansion by strengthening cohesion policy, inter alia to ensure it can address the most severe market failures in the rural, sparsely populated areas of the EU" and "supports an enhanced role for the Connecting Europe Facility (CEF) and EFSI in funding financial instruments and blending facilities (combining grants with financial instruments) to address more moderate types of market failures [...]. Such complementary interventions would ensure a high quality broadband connectivity across all regions of the EU".

The Proposal for a European Electronic Communications Code, revising the regulatory framework for electronic communications networks and services providers, aims inter

¹²⁰ SEDEC-VI/034

alia at promoting access to and take up of very high capacity connectivity, both fixed and mobile by all Union citizens and businesses, by means of creating a regulatory environment which incentivises private investments in digital connectivity networks. It is nevertheless clear that network deployments will remain commercially unviable in many areas throughout the European Union, due to various factors such as remoteness, low population density, and various other socio-economic factors.

The Communication on "Connectivity for a Competitive Digital Single Market - Towards a European Gigabit Society"¹²¹ (the Gigabit Society Strategy) sets out strategic objectives for 2025, in view of optimising investment in new very-high capacity networks:

1. Gigabit connectivity for all main socio-economic drivers such as schools, transport hubs and main providers of public services as well as digitally intensive enterprises. Supporting connectivity for such anchor customers/engines of digital growth will significantly improve the business case for operators to serve entire areas where they are located, by stimulating demand and lowering deployment costs at the same time. In 2013 for example less than 10% of all schools¹²² and only 16% of the European hospitals¹²³ were connected to speeds of 100Mbps or above. Nowadays Gigabit speeds are still largely confined to some universities, university hospitals and some enterprises.

2. High performance 5G connectivity: by 2020 a fully-fledged commercial service in at least one major city in each of the 28 Member States and by 2025 uninterrupted 5G coverage of all urban areas and major terrestrial transport paths. The deployment of 5G is expected to generate € 213 billion revenues worldwide in 2025 and could lead to € 113 billion in benefits per year across four industrial sectors (automotive, health, transport and energy). The success of the commercial deployment of 5G will depend critically on the timeliness and intensity of investments in two key areas: (1) investments in infrastructure, mainly to lay out a dense fibre network infrastructure to ensure the backhauling of 5G cells, as well as to finance the installation of the actual 5G cell equipment and (2) investments in service innovation to stimulate the emergence of the new 5G-enabled services.

3. All European households, rural or urban, to have access to Internet connectivity offering download speed of at least 100 Mbps, upgradable to Gigabit speeds. The ultimate success of innovative digital services depends on the access of all Europeans to high speed connectivity. In January 2017, less than 76 % of European households had access to connections above 30 Mbps; in rural areas, that percentage goes down to less than 40 %. Domestic demand is expected to grow exponentially with the launch of digital services. For instance, while North America is the world's most advanced smart home market, with almost 22 million smart homes, the European market only counted 8.5 million homes at the end of 2016 and is expected to grow at a compound annual rate of 57 % in the next five years, reaching 80.6 million smart homes by 2021.

¹²¹ COM(2016) 587 final

¹²² Survey of schools: ICT in Education - see http://ec.europa.eu/information_society/newsroom/cf/dae/document.cfm?doc_id=1800

¹²³ European Hospital Survey – Benchmarking Deployment of eHealth Services – see <https://ec.europa.eu/digital-single-market/en/news/european-hospital-survey-benchmarking-deployment-ehealth-services-2012-2013>

Important synergies can be achieved between the deployment of 5G and of other (mostly fixed) connectivity networks. A dense 5G network reaching all urban areas and major transport paths - based on backhaul fibre to the 5G cells - will also benefit the deployment of wider networks for connectivity of both households and socio-economic drivers located in the area, e.g. by bringing the fibre network closer to homes as domestic needs and demand evolve. Connecting anchor customers lowers the costs of covering households in the respective areas.

II. ASSESSMENT OF THE INVESTMENT NEEDS

The combined investment needed to meet the three connectivity objectives by 2025 and to bring major benefits across sectors and across borders has been estimated at € 500 billion. To meet this, an additional € 155 billion is required over and above a simple continuation of the trend of current network investment and modernisation efforts of the connectivity providers¹²⁴. The improved regulatory environment that inter alia the future Electronic Communications Code will bring about and the savings from increased synergies across sectors will reduce this amount. However,, a significant infrastructure investment gap to reach the EU's objectives is expected to persist after 2020, spread throughout the entire territory of the EU and mostly affecting its rural areas. The EU budget should support Member States' own efforts, to unlock, maximise and complement private investments in digital networks in order to reach EU's connectivity objectives.

Based on the current trends, taking into account the existing public support for network investment (national broadband plans) as well as the expected positive effects of the regulatory changes, we estimate that 50-70 million households in various areas – both sub-urban and rural areas across the EU – will have no access to very high capacity connectivity in 2020. Unless the EU supports Member States and acts as a catalyst for more commercial deployments and connects areas showing lower population density, remoteness, or less developed demand, the broadband targets will not be met. Many areas will not see the deployment of 5G or other Gigabit-ready networks in the next decade and will miss out on economic growth and jobs. While 5G networks are believed to bring significant growth and gains across sectors and services, their deployment is currently associated with many risks and the scenarios regarding the participation of / agreement among the various industries remain highly uncertain. It is important to note that gaps in coverage – be them gaps in coverage of communities, of business/industrial areas, or o transport paths – represent missed opportunities, unexploited potential and bottlenecks in the completion of the Digital Single Market, as discussed further below under sections IV and V.

The next map below shows the estimated investment gap, limited to household coverage, account taken of already planned national and EFSI funding (up to 2020) and after expected market investments projected until 2025. The map differentiates areas where:

- in yellow, the market is expected to cover **most** of the identified investment gap until 2025 and/or sufficient public funding is currently available to address the remaining (rural) market failure; and

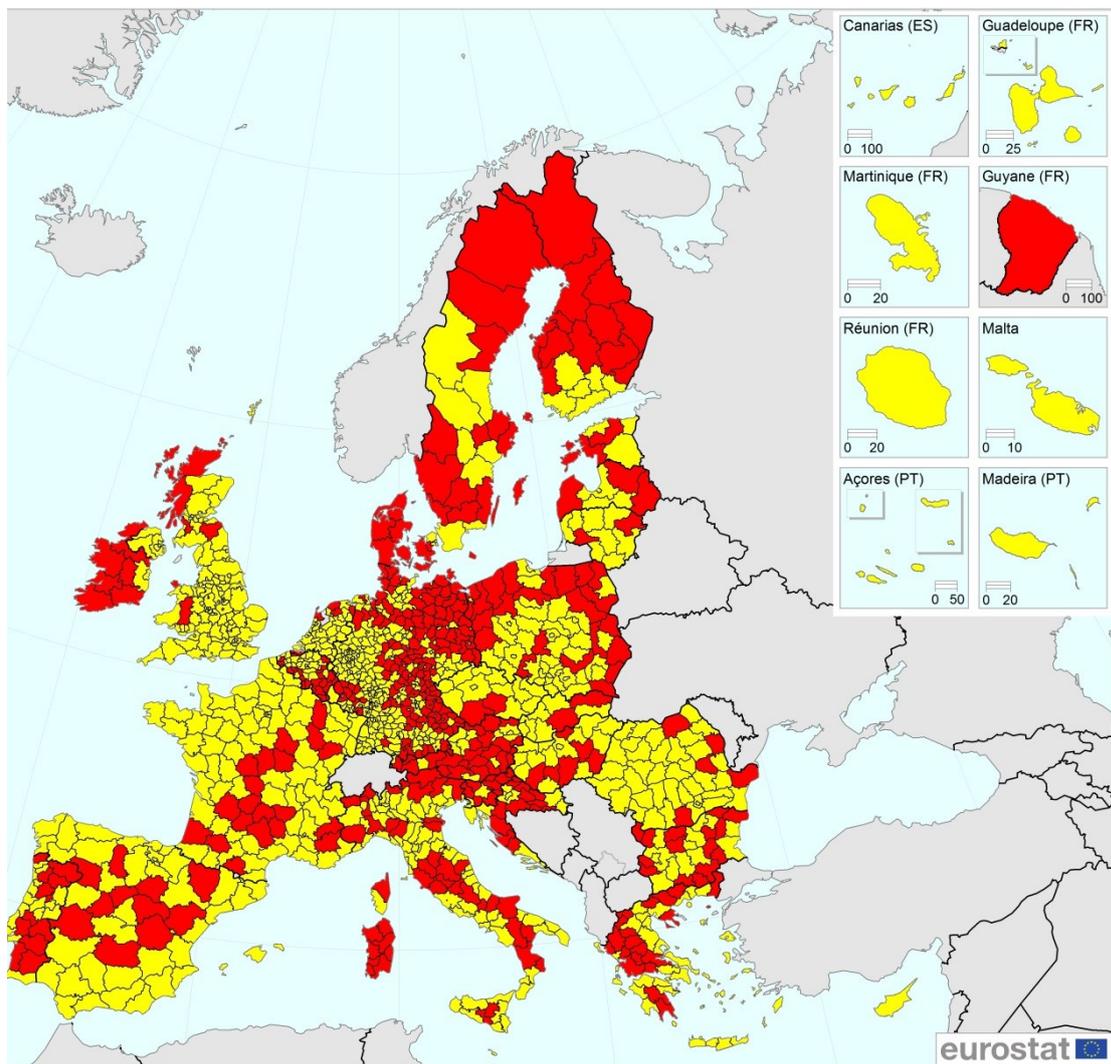
¹²⁴ Commission Communication "Connectivity for a Competitive Digital Single Market - Towards a European Gigabit Society" (COM(2016) 587; 14.09.2016).

- in red, areas where continued public intervention will be required in order to meet the Gigabit Society strategic objectives.

Note that the map is based on NUT3 level statistics and that many smaller size areas of market failure can be encountered within the regions identified in yellow.

The overall investment gap across the red areas is about EUR 70 billion. Within these areas, it is estimated that the majority of households that will remain uncovered will be rural households, representing an estimated investment gap for rural households of about EUR 52,5 billion. To meet the Gigabit Society targets, it is evident that public intervention is required to, on the one hand maximise the footprint of market investment in areas bordering commercial viability and on the other hand ensure the availability of funds for publicly driven deployments.

Map 1: Estimated NUTS3 regions needing public support post 2020

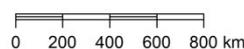


efault subtitle2

Administrative Boundaries: © EuroGeographics © UN-FAO © Turkstat
Cartography: Eurostat — IMAGE, 02-05-18

egend:

- No need for public support expected post-2020
- Continued market failures post-2020
- Data not available



III. ANALYSIS OF PREDECESSOR PROGRAMMES

The current public interventions in support of broadband networks include: (i) national Broadband Plans amounting currently to € 13.5 billion¹²⁵, (ii) a € 6 billion envelope dedicated to broadband under ESIF (reaching an estimated € 10 billion together with national co-funding), (iii) EFSI support (€ 2.3 billion until now) and (iv) smaller but innovative interventions under CEF (WiFi4EU, CEBF) for around € 240 million.

European Structural and Investment Funds (ESIF) on broadband have been concentrated in a few countries (Poland, Italy, France, the Czech Republic and Spain account for over half of the planned ERDF/EARDF investments)¹²⁶, supporting mainly public driven deployments through grants in market failure areas. Where there is no business case for private operators ("white areas" according to state aid rules), so far progress has been slow in closing digital and territorial divides as the areas addressed are not always the ones most in need and the focus has often been on less performant technologies. In many Member States, the ERDF investments focused primarily on productive sites in urban/semi-urban areas while EARDF managing authorities also prefer to invest on other rural development projects than broadband rollout¹²⁷, so the most peripheral and rural areas will therefore likely not even meet the current Digital Agenda for Europe (DAE) targets by the end of the current programming period.

At the other end of the spectrum, European Fund for Strategic Investments (EFSI) interventions along with European Investment Bank lending operations are improving credit conditions and providing support to commercially driven, larger scale deployments for which there is a medium-term business case. Up to now, projects for above € 2.3 billion have been approved by the EIB, mostly undertaken by well-established operators.

With the very small envelope dedicated to broadband, the current Connecting Europe Facility (CEF) is putting in place two innovative interventions, complemented by technical assistance actions. Firstly, the CEF- and EFSI-funded Connecting Europe Broadband Fund (CEBF) seeks to address a demand for equity/long-term finance for smaller-scale and riskier commercially driven projects. This type of demand is currently unmet by either the market or existing EC instruments. The CEBF will allow funding to reach projects that would otherwise not meet current investment criteria and to address a clearly identified gap in the finance market, an opportunity estimated by the EIB's consultants at €33 billion¹²⁸. The set-up of the fund has confirmed that, while there is a persistent need for supporting the provision of equity (in particular for smaller operators and smaller projects), it remains difficult to impose coverage obligations with this type of instrument (for instance, to impose that project promoters include non-profitable locations within the project deployment area).

¹²⁵ Based on a study of the National Broadband Programmes, we estimate that currently €13.5 billion is dedicated to broadband rollout via purely national schemes – see <https://ec.europa.eu/digital-single-market/en/news/study-national-broadband-plans-eu-28-connectivity-targets-and-measures>

¹²⁶ Source: ICT Monitoring Tool: <http://s3platform.jrc.ec.europa.eu/ict-monitoring/-/tool/search?code=7a3841fa59e74e34a67be9189f4f874b>

¹²⁷ As illustrated in the 2010 European Economic Recovery Package (EERP), only about a third of the resources available were eventually programmed on broadband (Ares(2013)107783 - 29/01/2013).

¹²⁸ Market study conducted for the EIB to assess the market potential for the CEBF: Assessment of potential for a broadband infrastructure fund, May 2016.

Secondly, the WiFi4EU initiative is a demand-stimulating measure that aims to provide free access to high-speed wireless connectivity in public spaces, thus promoting the take-up of broadband by local authorities and facilitating the access of citizens to digital services. This initiative is based on an innovative approach to direct management through simple online tools of small-value grants, providing standardised support in the form of a voucher scheme. The experience of launching the program has shown the great interest generated at local level by the initiative, and the roaming functionality that will be available in the future will further enhance the EU level effect anticipated.

The overview above illustrates that certain type of projects and interventions have been clearly absent in the current multi-annual financial programme. For example, cross-border links have clearly been totally absent under the existing intra-EU schemes, including ESIF investments since it was decided that INTERREG 2014-2020 would not invest in digital networks and since most other Operational Programmes are based on (Member States') national core-to-periphery models. However, cross-border infrastructure projects are important in the context of the Digital Single Market, e.g. providing seamless connectivity along transport routes that cross national territories. Cross-border international connectivity networks (e.g. submarine cables, interconnectors) and associated servers form a key backbone for today's connectivity. These core digital networks increase capacity and ensure vital redundancy, and thus improve investment prospects for entire sub-regions of the European continent and islands to be more attractive for the world's data centres.

Border areas and international connectivity are however not the only areas/types of intervention which remain uncovered by the current programmes: several gaps in connectivity – "pockets" of small but not insignificant size - persist in otherwise well-developed regions throughout the EU. Covering relatively small areas in an otherwise covered territory is extremely uneconomic and therefore not done by private investors. Covering such areas is also not among the objectives of any of the current programmes. On the other hand, such gaps represent significant unexploited potential on the Digital Single Market, and handicaps for socio-economic drivers in these areas.

IV. POLICY OPTIONS

Continuing the status quo would amount to seeing the EU efforts for the deployment of broadband continue, yet far below what is required to meet the EU Gigabit Society strategic objectives. De facto, this scenario entails broadening the digital divide and leaving a majority of rural households uncovered, as well as putting at risk the achievement of the second Gigabit Society target concerning the deployment of 5G. While a broader geographic deployment of broadband networks may contribute to some extent to the availability of high capacity networks that form the underlying prerequisite (fixed backhaul) for 5G deployment, it would not permit the deployment of 5G along major EU transport corridors, nor the deployment of a dense network of 5G cells to cover all urban areas. In addition, international connectivity and other cross-border deployment would not be addressed.

Should these investments not be prioritised within the envelope foreseen in this scenario, the investment gap in rural areas would be significantly higher. This would also imply that socio-economic drivers would not be sufficiently supported in particular, making the investment in disadvantaged areas, of which many are rural areas, more difficult. The

challenge of reaching the Gigabit Society strategic objectives and of delivering the underlying connectivity for a functional Digital Single Market is therefore not only quantitative: the nature of the current public interventions supporting broadband rollout leave several areas and types of projects uncovered, across the whole EU territory.

Given the importance of investments in very high capacity networks, size of the investment gap and based on the profiles and strengths of the current programmes, it is necessary for rollouts to be supported via a set of well-targeted, efficient and complementary interventions beyond 2020. Based on the experience gained in the current MFF, a mix of instruments using grants, financial instruments (including budgetary guarantees and thematic instruments) and blending between these various forms of assistance will maximise the impact of EU support in the next Multi-annual Financial Framework.

In this context, the intervention via the Connecting Europe Facility must be complementary to other sources of funding for the deployment of very high capacity networks, in particular ESIF and InvestEU. It is also necessary to address the scope of CEF Digital in view of the new Digital Europe Programme. The resulting scope of CEF Digital has been a re-focus on the core business of CEF, namely support of digital connectivity infrastructure, whereas digital services will be supported through the Digital Europe Programme. Moreover, CEF Digital will now strongly focus on strategic projects aligned with the EU strategic connectivity objectives, considered essential to the success of the Digital Single Market.

As regards the cross-border focus, the particularity of Internet networks is that, even when deployed locally, they have global effects, due to the structure of the network and scale effects of the applications and services running over the Internet. In that sense, all digital connectivity networks, which are connected to the Internet, are intrinsically cross-border. For this reason, all deployments into very high capacity networks in the digital area, which are able to support EU's digital transformation, are considered projects of common interest in the sense of trans-European digital networks. In view of the limited resources available, priority for support via the Connecting Europe Facility should be given to projects with the highest expected impact on the Digital Single Market, inter alia through their alignment with the objectives of the Gigabit Society Strategy Communication or through their strong cross-sector and/or cross-border characteristics, and for which market failures have been observed. The proposed areas of intervention for CEF Digital are presented in detail below.

V. NEW SCOPE OF INTERVENTION UNDER CEF DIGITAL

In view of the above, the scope of CEF Digital has been adjusted with a view to:

- continue supporting measures which enhance connectivity for citizens, such as the WiFi4EU initiative, a voucher scheme for providing local wireless connectivity to citizens and visitors;
- focus its new scope on digital connectivity infrastructure projects contributing to the achievement of the strategic objectives set out in the 2016 Communication for a Gigabit Society, by scaling up support for coverage of territories and households with very high capacity networks, by providing support to Gigabit connectivity to socio-economic drivers as well as grant-based schemes to deploy 5G corridors and backbone networks; and to

- enhance synergies within the programme and by contributing to the digitisation of transport and energy networks.

In particular, CEF should provide support for the following actions:

1. Gigabit connectivity for socio-economic drivers

Schools, universities, libraries, local, regional or national administrations, main providers of public services, hospitals and medical centres, transport hubs and digitally intensive enterprises, etc. are entities and places that can drive important socio-economic developments in the area where they are located. Such socio-economic drivers need to be at the cutting edge of Gigabit connectivity and to provide access to the best services and applications for European citizens, business and local communities in order to maximise the positive spill-over effects on the wider economy and society, including by generating wider demand for such connectivity and services.

This type of intervention will directly support important digitisation efforts and also (through the infrastructures funded) improve the business case for wider network deployments in the respective areas. It will also stimulate future demand for Gigabit connectivity by exposing whole communities to the benefits of advanced digital services. This grant-based scheme, taking the form of simplified forms of grants (i.e. vouchers) would complement ESIF intervention and a few existing national schemes.

As an example, Europe has achieved important progress as regards eHealth services and their interoperability. These eHealth services are expected to improve quality of services and realise important savings. For instance, large net savings in elderly/home care have been estimated in Sweden resulting from a more extensive introduction of digital health services (e.g. net savings of about EUR 60 million per large city with 500.000 residents by 2020). The successful deployment of many new digital applications and services will however depend on the availability of 5G/Gigabit connectivity for hospitals and smaller medical centres, as well as the connectivity of patients (i.e. households).

2. Wireless connectivity for local communities

Building on the experience and significant success of the WiFi4EU initiative so far, very high quality local wireless connectivity should be provided free of charge in the centres of local public life, including entities with a public mission such as public authorities and providers of public services as well as outdoor spaces accessible to the general public, in order to support EU's digital vision. As in the current period, the scheme should be implemented without interfering with the commercial deployments and offers and by using simplified forms of grants (i.e. vouchers).

3. Support for the deployment of 5G corridors

In the context of the 5G Action Plan¹²⁹, the Commission is working on the definition of a network of 5G corridors together with the Member States, to ensure uninterrupted 5G coverage for Connected and Automated Driving / Mobility. The investment in such major terrestrial transport paths is a prerequisite to achieve the key benefits of 5G

¹²⁹ Communication of the Commission : "5G for Europe: an Action Plan"; COM(2016) 588 of 14.09.2016.

technologies and ensure a scalable rollout across sectors and across borders. Once such a major enabling infrastructure is deployed, for which market investment is not foreseeable on an optimal timeline or scale because of the many beneficial externalities, major impacts are expected in several areas including mobility, health and public connectivity. This grant-based scheme would help funding deployments complementing any private initiative.

4. Backbone and international connectivity projects

Today only 4% of the world's data is stored in the EU and the EU has only 14% of revenues in the cloud service providers market.¹³⁰ To make the EU more attractive for the world's data centres, the underlying connectivity needs to be ensured. Several Member States have recognised the importance of connectivity as a 'digital harbour' for 'digital goods' as a key enabler for the digital economy. For example in France Marseille is a key hub for international connectivity; after the completion of the new submarine cable between Germany and Finland (providing more bandwidth and improved latency) the Finnish government is now actively pursuing an extension to Japan and China via the Arctic route; similarly Malta is today only linked to Sicily and is concerned about the reliability and resilience of this link and prices that are significantly higher compared to others. In addition, to further international bandwidth for research¹³¹ the EU has supported the establishment of Ella Link, linking Brazil with the EU and offering a competitive alternative to the US submarine cables that currently channel most traffic between the continents.

The deployment of backbone electronic communications networks, including with submarine cables connecting European territories to third countries on other continents or connecting European islands or overseas territories to the mainland, are needed in order to build redundancy, and increase the capacity and resilience of EU's digital networks. However, such projects are often commercially non-viable.

5. Targeted support for household and territories coverage

All European households, rural or urban, should have access to adequate fixed or wireless connectivity. In view of ensuring coherence with other funding programmes and taking into account the new forms of interventions foreseen (grants instead of financial instruments), CEF should focus on those local deployments which contribute to this objective, for which market failures are observed, but which can be deployed using low intensity grants, alone or in combination with financial instruments.

As explained above, financial instruments only work within certain territories, in particular in urban and sub-urban territories, or in wealthier areas where there is a commercial case for deployment, even if the investment is riskier than market standard

¹³⁰ Commission staff working document on the free flow of data and emerging issues of the European data economy, January 2017, see: http://ec.europa.eu/newsroom/dae/document.cfm?doc_id=41247

¹³¹ International connectivity investments allow the scientific community to fully exploit research data produced by big-data factories and HPCs. Existing communication networks will have to be upgraded (e.g. the link Bologna – Trento – Innsbruck to enable for transfer of Copernicus data, or the Nordic network to exploit new Arctic links) and new networks will have to be laid down (e.g. between Italy and the Balkans, to improve connectivity with that region). If properly funded, the pull effect created by the scientific demand for increased network capacity will improve the bankability of international connectivity projects.

ones. Financial instruments can improve the business case, but cannot create one. On the other hand, ESIF often focuses on deployments which are purely public driven, and where high-intensity grants are necessary, typically covering more rural and poorer semi-urban territories. In between these extremes, there are several areas throughout the EU which, as discussed above, risk to remain uncovered in the absence of public intervention, and which represent significant unexploited potential and bottlenecks for the Digital Single Market.

In view of an efficient and effective intervention, CEF seek to focus on these "middle" areas, and to cover them comprehensively via low intensity grants, including via blending. Such intervention would bring the principles and efficiency of financial instruments to poorer and more rural areas, including in poorer Member States, where risk capital alone would typically not go. Moreover, providing a grant allows also imposing conditionalities, in terms of which households and which socio-economic drivers are to be covered in a certain area. The intervention will be done in full respect of state aid principles, in particular by taking into account existing and planned private investments.

6. Contributing to the digitisation of transport and energy networks

Significant positive impacts, for the sectors, and for the economy and society as a whole, are expected from the digitalisation of energy and transport networks. The funding of 5G corridors are one example of synergy action, expected to be followed by many others. One of the objectives of CEF Digital is to contribute indeed the digitalisation of transport and energy networks.

VII. COMPLEMENTARITY WITH OTHER PROGRAMMES

In the new MFF, the intervention under CEF described above will be complementary in particular with:

- InvestEU will intervene to support economically viable projects, which present a potential capacity to generate revenues, via budgetary guarantees, in order to overcome issues of access to finance, to support an increased risk taken by private investors and to support the rapid deployment of the newest technologies throughout Europe;
- ESIF is expected to ensure the rollout of digital networks in view of covering all territories throughout the EU, including rural, isolated, and sparsely populated areas, focusing on areas where more severe market failures are observed and where higher intensity grants are required to render the network deployment viable. ESIF intervention can be complemented by high speed connectivity vouchers to specific demand drivers and anchor customers, e.g. eHealth practitioners, schools, local administrations, etc. located in these areas, which can be implemented through a simplified direct management approach;
- Digital Europe Programme will fund digital services, while CEF refocuses on the underlying digital infrastructure.