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CORRIGENDUM
This document corrects SWD(2019) 330 final of 11.7.2019.
This version corrects the omission of the annexes to the Impact Assessment.
The text shall read as follows:

COMMISSION STAFF WORKING DOCUMENT

IMPACT ASSESSMENT

Accompanying the document

Proposal for a Regulation of the European Parliament and of the Council on the European Institute of Innovation and Technology (recast)

and

Proposal for a Decision of the European Parliament and of the Council on the Strategic Innovation Agenda of the European Institute of Innovation and Technology (EIT) 2021-2027: Boosting the Innovation Talent and Capacity of Europe

{COM(2019) 330 final} - {COM(2019) 331 final} - {SEC(2019) 275 final} - {SWD(2019) 331 final}

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Glossary

Term or acronym	*Meaning or definition*
CLC	Co-Location Centre, a geographical hub for the practical integration of the knowledge triangle
DG EAC	Directorate-General Education, Youth, Sport and Culture, a Directorate General of the European Commission
DG GROW	Directorate-General Internal Market, Industry, Entrepreneurship and SMEs
DG RTD	Directorate-General Research and Innovation
ECA	European Court of Auditors
EFSI	European Fund for Strategic Investments
EIC	European Innovation Council
RIS	EIT Regional Innovation Scheme
EIT	European Institute of Innovation and Technology
ERASMUS+	The EU programme supporting education, training, youth and sport in Europe during the 2014-2020 period
ERDF	European Regional Development Fund
ESIF	European Structural and Investment Fund
EU	European Union
ExCo	Executive Committee of the EIT Governing Board
GB	Governing Board of the EIT
Horizon 2020	Horizon 2020 – the EU's framework programme for research and innovation 2014-2020
HEI	Higher Education Institution

HEInnovate	Joint initiative of the European Commission and the OECD supporting HEIs wishing to increase their innovative and entrepreneurial potential
HLG	High Level Group
JRC	Joint Research Centre, a Directorate General of the European Commission
KAVA	KIC Added Value Activities
KCA	KIC Complementary Activities
KIC	Knowledge and Innovation Community
KPI	Key Performance Indicator
KTI	Knowledge Triangle Integration - close, effective links between education, research, and innovation
MFF	Multiannual Financial Framework
OECD	Organisation for Economic Co-operation and Development
OPC	Open Public Consultation
R&I	Research and Innovation
R&D	Research and Development
SIA	Strategic Innovation Agenda
SME	Small and Medium-sized Enterprise
SPD	Single Programming Document
SWD	Staff Working Document
TFEU	Treaty on the Functioning of the European Union
TRL	Technology Readiness Level - a method of estimating the maturity of technology

1. INTRODUCTION: POLICY AND LEGAL CONTEXT

1.1. Scope of the impact assessment

This impact assessment accompanies the Commission proposals for an amendment of the European Institute of Innovation and Technology (EIT) Regulation[1] through a recast[2] and for a new Strategic Innovation Agenda (SIA) for the EIT for the period 2021-2027. These initiatives aim to align the EIT legislative framework with the Commission proposal establishing the Horizon Europe Programme[3], the next Union framework programme supporting research and innovation, to define the new priority fields of the EIT as well as its financial needs, and to improve the functioning of the EIT taking into account the lessons learned from the past years.

The Impact Assessment accompanying the proposal for Horizon Europe[4] provided a clear, evidence-based blueprint for how the programme will help to consolidate European leadership in research and innovation to deliver scientific, economic and societal impact. It described the key objectives and rationale of the programme including a stronger focus on the added value of its parts.

The Horizon Europe proposal confirmed the importance and contribution of the EIT and its Knowledge and Innovation Communities (KICs) in delivering the EU's strategic priorities in the area of innovation. It proposes the EIT budget for 2021-2027, its scope, added-value and main areas of activity, while pointing to a revised role of the EIT in order to reinforce its contribution to Horizon Europe's objectives. However, the Horizon Europe proposal itself does not provide the legal basis for continuing EIT operations beyond 2020, which would continue to be laid down in the EIT Regulation.

This impact assessment does not cover the decisions already taken concerning the EIT in the Horizon Europe proposal (see section 1.3 and 1.4), since these were assessed as part of the Horizon Europe impact assessment. Instead, this impact assessment focusses on key problems and issues that have been identified as hampering the effectiveness of the EIT based on lessons learned from the EIT interim evaluation and other key sources of evidence.

1.2. Legal and operational context of the EIT and the KICs

The European Institute of Innovation and Technology

The EIT's overall mission is to boost sustainable European economic growth and competitiveness by reinforcing the innovation capacity of the Member States and the Union. Set up in 2008, and part of Horizon 2020 since 2014, the EIT seeks to integrate the knowledge triangle of higher education, research and innovation, reinforce the Union's innovation capacity, and address societal challenges. The EIT achieves these goals primarily through its Knowledge and Innovation Communities (KICs): large-scale European partnerships (with ~50-400 partners) focussing on global societal challenges.

1 Regulation (EC) No 294/2008 of the European Parliament and of the Council of 11 March 2008 establishing the European Institute of Innovation and Technology (OJ L 97, 9.4.2008, p. 1). Amended by Regulation (EU) No 1292/2013 of the European Parliament and of the Council of 11 December 2013 (OJ L 347, 11.12.2013, p. 174).
2 Interinstitutional Agreement of 28 November 2001 on a more structured use of the recasting technique for legal acts. OJ C 77, 28.3.2002, p. 1.
3 Proposal for a Regulation of the European Parliament and of the Council establishing Horizon Europe – the Framework Programme for Research and Innovation, laying down its rules for participation and dissemination. COM(2018) 435 final.
4 SWD(2018) 307 final.

The EIT provides grants to the KICs, monitors their activities, supports cross-KIC collaboration and disseminates results and good practice. The EIT's Governing Board is responsible for the strategic orientation of the EIT and of the KICs and takes the decisions on the designation of the KICs and their funding.

The Horizon Europe Impact Assessment highlighted the role of the EIT in addressing specific structural weaknesses in the EU's innovation capacity which are common to EU Member States. They include: the under-utilisation of existing research strengths to create economic or social value; the lack of research results brought to the market; low levels of entrepreneurial activity and mind-set; low leverage of private investment in research and development; and an excessive number of barriers to collaboration within the knowledge triangle of higher education, research, business and entrepreneurship on a European level. The EIT addresses these challenges through the KICs.

The EIT's objectives, rationale, EU added value, budget, broad lines of activity and performance indicators are currently defined in the Horizon 2020 Regulation[5]. The EIT Regulation sets out, in parallel, the mission and tasks for the EIT along with the framework for its functioning. The strategic, long-term priority fields and financial needs of the EIT for each seven-year period are laid down in the Strategic Innovation Agenda (SIA) of the EIT[6]. The SIA includes the detailed operating modalities of the EIT such as the selection and designation of the KICs and their performance monitoring, based on the framework set out in the EIT Regulation. The graph below illustrates the key aspects of the current regulatory environment.

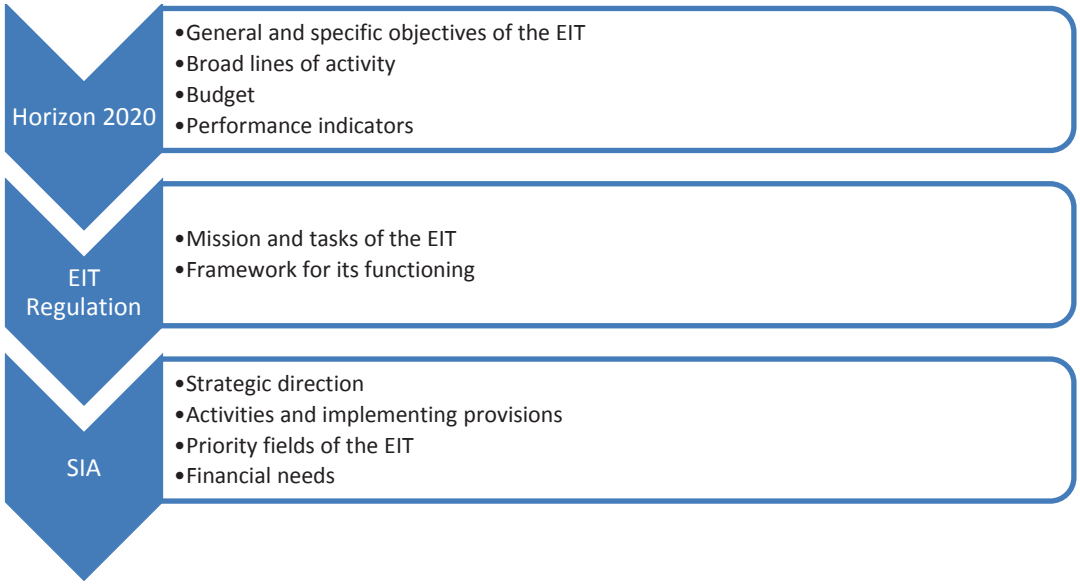


Figure 1: Current regulatory context of EIT, own illustration

5 Regulation (EU) No 1291/2013 of the European Parliament and of the Council of 11 December 2013 establishing Horizon 2020 - the Framework Programme for Research and Innovation (2014-2020). OJ L 347, 20.12.2013, p. 104.
6 Decision No 1312/2013/EU of the European Parliament and of the Council of 11 December 2013 on the Strategic Innovation Agenda of the European Institute of Innovation and Technology (EIT): the contribution of the EIT to a more innovative Europe. OJ L 347, 20.12.2013, p. 892.

Knowledge and Innovation Communities

The KICs are autonomous partnerships of businesses, research institutes and higher education institutions (HEIs). The KICs are set up as legal entities under respective Member States' laws, appoint a Chief Executive Officer to run their operations and have their own governance systems. The relations between the EIT and KICs are laid down in contractual agreements, which set out their respective rights and obligations, ensure an adequate level of coordination and outline the mechanism for monitoring and evaluating KIC activities and outcomes. The KICs report on their activities on a yearly basis to the EIT. Specifically, the KICs submit their annual Business Plans to the EIT as the basis for the award of the EIT grant.

Since 2010, eight KICs have been set up or designated to address specific societal challenges. According to the EIT Regulation (Article 7b) and the financial sustainability principles adopted by the EIT Governing Board[7], the duration of EIT grant for each KIC is expected to last a maximum of 15 years after which the KIC should be able to pursue its activities without EIT funding. The areas of intervention of the current KICs are indicated below, together with their missions.

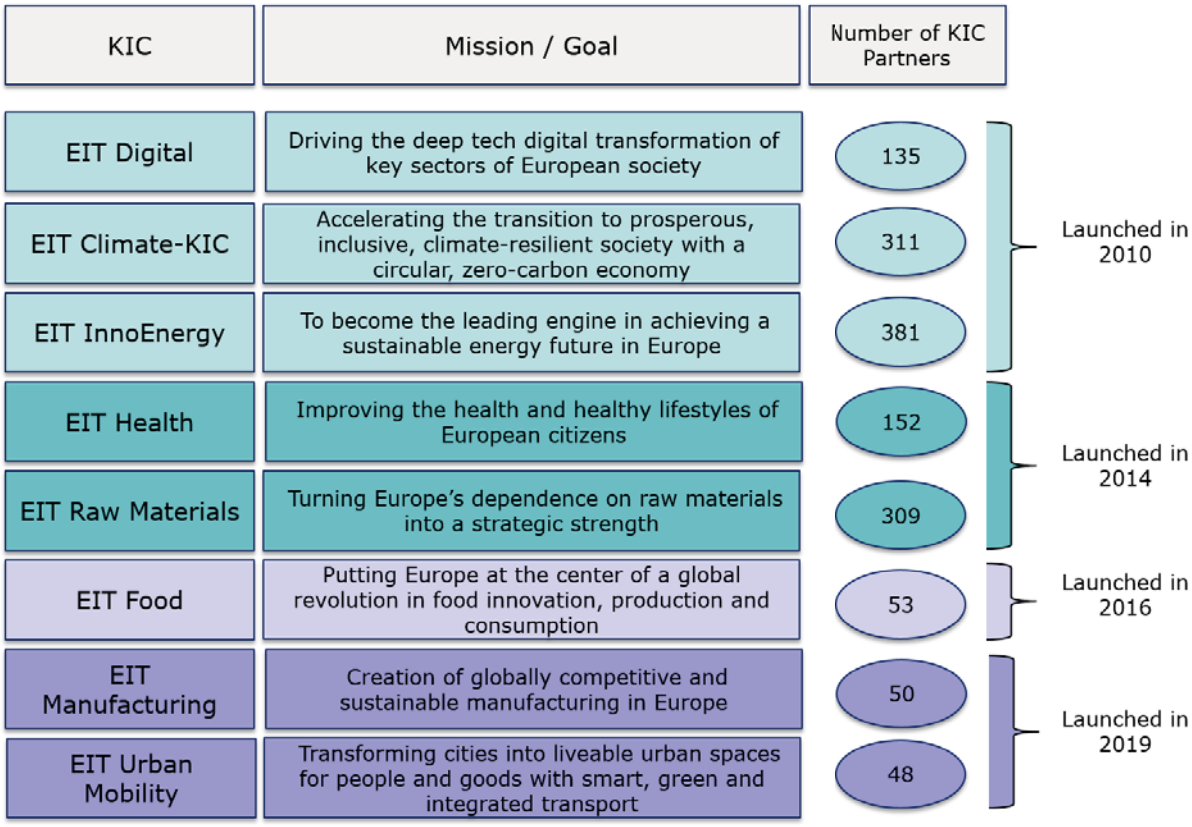


Figure 2: Overview of current KICs, their missions and number of partners; own illustration

7https://eit.europa.eu/sites/default/files/EIT%20GB%20Decision%20on%20principles%20on%20KIC%20Financial%20Substainability.pdf

Each KIC aims at reinforcing innovation capacities by running a balanced portfolio of activities in three areas:

1. **Innovation support projects**: aimed at supporting and developing new innovative products, services and solutions that address societal challenges in the KICs areas of activity. They may include the support to demonstrators, pilots or proofs of concept.
2. **Education**: these include innovative educational and training programmes offered by each KIC in the form of post-graduate (MSc/PhD) programmes, executive/ professional development courses, lifelong learning modules, summer schools, etc. The EIT Label ensures quality of the KIC education programmes and recognition within and beyond the EIT Community.
3. **Business creation and support activities**: these include start-up and accelerator schemes to help entrepreneurs and potential entrepreneurs translate their ideas into successful business. The focus is primarily on access to market, access to finance, and access to networks, mentoring & coaching.

KICs also engage in a range of outreach, communication, dissemination and horizontal cross-sectoral activities. Since 2014, the EIT has developed the EIT Regional Innovation Scheme (RIS) as part of its outreach strategy in regions in Europe that are modest or moderate innovators according to the European Innovation Scoreboard[8].

1.3. The EIT as part of the Horizon Europe Programme

The Horizon Europe impact assessment emphasises that the EIT should be more strongly integrated within Horizon Europe than is currently the case in Horizon 2020 and greater synergies with other components of the programme should be created. Within the Commission's proposal for Horizon Europe the EIT activities thus become part of the Pillar III "Open Innovation", which focuses primarily on supporting breakthrough and market-creating innovation. The EIT and the KICs are also expected to play a key role in addressing global challenges and European industrial competitiveness - and achieving the objectives of future R&I missions - (Pillar II "Global Challenges and Industrial Competitiveness") while also contributing to excellent science (Pillar I).[9]

A novelty of the Horizon Europe proposal is the introduction of multiannual Strategic Planning[10] for ensuring the implementation of the programme-level objectives in an integrated manner based on wide consultations about priorities and the suitable types of action and forms of implementation, in particular European research and innovation partnerships. These European Partnerships are initiatives where the Union, together with private and/or public partners (such as industry, public bodies or foundations) commit to support jointly the development and implementation of a programme of research and innovation activities. Horizon Europe promotes a more strategic, ambitious and impact-oriented approach to these partnerships, ensuring that they can effectively contribute to the Union's policies and priorities[11].

8 http://ec.europa.eu/growth/industry/innovation/facts-figures/scoreboards_en

9 e.g. it is expected that the EIT will contribute to the climate-related expenditure target which should exceed 35 % of the overall Horizon 2020 budget

10 Annex I, COM(2018) 436 final, pp. 1-2.

11 European Partnerships will be designed on the basis of key principles of Union added value, transparency, openness, impact, leverage effect, long-term commitment of involved parties, flexibility, coherence and complementarity with Union, national and international initiatives. The criteria for the selection, implementation, monitoring, evaluation and phasing out of Union funding for European partnerships are set out in Annex III of the proposed Regulation for Horizon Europe.

Under the Horizon Europe proposal, the EIT KICs are considered as institutionalised European Partnerships. The alignment with the Horizon Europe framework will be supported through the multiannual Strategic Planning, which will in particular incorporate inter-disciplinary and cross-sectoral perspectives and ensure that all activities under Horizon Europe are coordinated in an effective manner. In particular, the Horizon Europe proposal emphasises that "proposals for future EIT KICs in compliance with the EIT Regulation will be indicated in the EIT Strategic Innovation Agenda (SIA) and will take into account the outcome of the Strategic Planning process and the priorities of the Global Challenges and Industrial Competitiveness pillar"[12].

To deliver on Horizon Europe objectives close cooperation with, in particular the European Innovation Council (EIC), will also be important to ensure synergies and impact. The EIT and the EIC are complementary. The EIC will identify, develop and deploy breakthrough innovations, and support the rapid scale-up of innovative firms carrying out market-creating innovations at the European and international levels. On the other hand, the EIT will develop innovation capacity through knowledge triangle integration and support to innovation ecosystems. It will contribute to Horizon Europe with its distinctive focus on human capital, entrepreneurial education and support to business creation and development in specific thematic areas.

1.4. What decisions on the future of the EIT have already been taken in the Horizon Europe proposal and what are their implications?

A number of policy choices relating to the future of the EIT have already been made by the Commission through the adoption of the Horizon Europe proposal. Specifically, the Horizon Europe proposal sets out the budget for the EIT (EUR 3 billion for the period 2021-202713), its rationale, the areas of intervention which are the basis of EIT's general objectives, and its broad lines of activity14. In particular, the general objectives of the EIT are reflected in its areas of intervention defined by the Horizon Europe proposal:

(1) Strengthening sustainable innovation ecosystems across Europe;
(2) Fostering the development of entrepreneurial and innovation skills in a lifelong learning perspective and support the entrepreneurial transformation of EU universities;
(3) Bring new solutions to global societal challenges to the market;

The Horizon Europe proposal also defines the criteria for selection, implementation, monitoring, evaluation and phasing-out of European Partnerships (including EIT KICs). It sets out the programme's rules for participation and dissemination, as well as monitoring and evaluation requirements, which will apply to the EIT, in addition to relevant provisions of the EIT Regulation [15].

The Horizon Europe programme, however, does not specify the concrete actions nor the means and instruments to achieve the EIT's objectives. In addition, it does not specify the expected results and resources that are needed to implement the EIT key actions to

12 Explanatory memorandum, COM(2018) 435 final, p. 15.
13 Article 9, COM(2018) 435 final, p. 32.
14 Annex I, COM(2018) 435 final, p. 3 and Annex I, COM(2018)436 final, pp. 70-72.
15 In particular, with regard to entities eligible for participation, entities eligible for funding, award criteria, funding rates, indirect costs, eligible costs.

deliver on Horizon Europe objectives and expected scientific, economic and societal impacts.

Indeed, the Horizon Europe proposal and its impact assessment recognise the role of the EIT Regulation in setting out the scope of the EIT's functioning and in governing the selection and priority-setting process of the KICs taking into account the outcome of the Strategic Planning process and Horizon Europe criteria for partnerships. They also recognise the role of the Strategic Innovation Agenda in setting the priority fields of the EIT and KICs for the 7-year programming period.

1.5. The need to act

1.5.1. The need to amend the EIT Regulation

The EIT Regulation, adopted in 2008, establishes the EIT. It sets out the mission and tasks of the EIT and the framework for its functioning. The Regulation was amended in 2013 in order, *inter alia*, to align it with Horizon 2020.[16]

The EIT Regulation is not in principle time bound, contrary to the SIA. However, given that a number of provisions in the EIT Regulation make a direct reference to the current Horizon 2020 programme established for the period 2014-2020, these provisions need to be amended, to make them compatible with the next Union framework programmes supporting research and innovation.

1.5.2. The need for a new Strategic Innovation Agenda of the EIT

In line with Article 17 of the EIT Regulation a new **Strategic Innovation Agenda** (SIA) is to be adopted for each 7-year programming period (MFF).

The SIA lays down the strategic, long-term priority fields and financial needs for the EIT for the period covered by the MFF. It also includes an overview of the planned higher education, research and innovation activities and the respective budget breakdown. The current SIA is limited in time and covers only the period 2014-2020.

The new SIA will put forward the strategic orientations, financial needs and sources of funding of the EIT for the next MFF. Furthermore, the SIA will define the priority fields and time schedule for the selection and designation of KICs for the next programming period. It will include an overview of the planned higher education, research and innovation activities and the budget breakdown over the period. The SIA is also a legislative tool to align the priority setting of the EIT with the Horizon Europe strategic programming.

16 Regulation (EC) No 294/2008 of the European Parliament and of the Council of 11 March 2008 establishing the European Institute of Innovation and Technology (OJ L 97, 9.4.2008, p. 1). Amended by Regulation (EU) No 1292/2013 of the European Parliament and of the Council of 11 December 2013 (OJ L 347, 11.12.2013, p. 174).

Timing and coherence of the Strategic Innovation Agenda and Strategic Planning Process

The new Strategic Innovation Agenda of the EIT for the period 2021-2027 needs to be in place before 1 January 2021[17]. The SIA will be adopted by the European Parliament and the Council, in accordance with the ordinary legislative procedure. [18]

While the scope of the Strategic Planning process under Horizon Europe, its legal form and overall timing are to be decided by the co-legislators, the preparatory process supporting the strategic planning has already started. The Commission is discussing currently possible partnerships in order to ensure the highest coherence and complementarity at service, cabinet and political level in the form of the Project Team Meeting on Competitiveness and Innovation. In this context, it clearly emerged that the best option would be to include initially one priority area/KIC theme in the new SIA proposal for the programming period 2021-2027. Other priority areas/theme(s) for future KIC(s) within the said period would be proposed subsequently by the Commission taking into account the outcome of the multiannual Strategic Planning process, new emerging priorities, and any other relevant developments. The SIA will outline the selection of the KICs taking into account the Strategic Planning process and the criteria for partnerships in line with Horizon Europe. The total number of future KICs for the programming period will depend on the adopted EIT budget.

This approach would be in line with the EIT Regulation and would avoid any delay in the preparation and launching the call of the first new KIC in 2021. This would enable the EIT to continue developing innovative solutions addressing societal challenges through new KICs and contributing to the attainment of the objectives of Horizon Europe through a new KIC starting from 2021.

The proposed approach for the adoption of the SIA would therefore ensure (i) the continued functioning of the EIT as from 1st January 2021, (ii) avoidance of unnecessary delay of the launch of any new KIC and (iii) addressing the need for the planning of new KICs to take account of the strategic planning process under Horizon Europe.

1.5.3. Lessons learned

Given that the EIT Regulation needs to be revised to align it with the applicable Union framework programme supporting research and innovation and that a new SIA needs to be proposed, it is appropriate to consider what other changes would be needed in order to improve the functioning of the EIT and enable it to fulfil its mission and objectives. These considerations should take account of a number of evaluations, audits reviews and reports on the EIT that have been carried out over the past few years.

The following sections describe the key issues and technical problems that have been identified in these reports and assess the options for addressing these issues through the amendment of the EIT Regulation and the proposal for a new SIA.

17 According to Art. 1 of the current SIA, it will expire at the end of 2020.
18 Based on Art. 17(4) of the EIT Regulation, which provides that acting on a proposal from the Commission, the European Parliament and the Council shall adopt the SIA in accordance with Art. 173(3) of the TFEU.

The table below indicates the most important sources of evidence for this impact assessment.

Lessons learned

The **Court of Auditors report of 2016**[19] acknowledged the raison-d'être of the EIT but recommended a number of changes to the implementation model such as a revision of its funding model and changes to the EIT staff provisions in order to increase the overall effectiveness and achieve the expected impact of the EIT.

The **EIT interim evaluation of 2017** and the related Commission Staff Working Document[20] concluded that the EIT model remains valid. They highlighted the need for the EIT to improve in a number of operational areas and develop further synergies with other EU initiatives.

The **High Level Group on the EIT of 2017**[21] identified a clear need to strengthen the role of the EIT as a provider of shared services and expertise to the KICs. It recognised the distinctive role education plays in knowledge triangle integration and called for the EIT to strengthen it.

Table 1: Key sources of evidence on EIT; own illustration

19 European Court of Auditors (2016), Special Report on performance of the EIT (subsequently mentioned as ECA (2016), Special Report)

20 C. Wilkinson and al./ICF (2017), Evaluation of the European Institute of Innovation and Technology (EIT) (subsequently mentioned as ICF (2017), Evaluation), and European Commission, Staff Working Document on the Interim Evaluation of the EIT, SWD (2017) 351 final (subsequently mentioned as SWD (2017) 351 final).

21 The High Level Group was established by Commissioner Tibor Navracsics in 2016 to review the EIT's workings and make recommendations that can help guide the European Commission and the EIT Governing Board. High Level Group on the EIT (2016), The Future of the European Institute of Innovation and Technology (EIT). Strategic Issues and Perspectives (subsequently mentioned as High Level Group (2016), Future of the EIT).

2. PROBLEM DEFINITION

This chapter presents the main problems and further technical issues driving EIT intervention within the Horizon Europe framework. It presents only those problems and technical issues that need to be addressed in the next programming period (2021-2027) through legislative changes and decisions. These adjustments will increase the EIT's efficiency, effectiveness and overall internal and external coherence, in combination with operational and managerial measures. The problems and issues identified below stem primarily from the EIT evaluation, the Court of Auditors report, and the High-Level Group report, and include references to the findings of those documents.

2.1. Suboptimal funding model

The EIT provides annual grants to KICs for a maximum of 15 years. The KICs implement their knowledge triangle integration activities based on annual Business Plans which are implemented by the KIC partners. The KIC activities are divided into two categories:

a) activities funded up to 100 % by the EIT; and
b) complementary activities which are not funded by the EIT.

The distinction between these two types of activities determines the ceiling of the EIT's contribution. According to the EIT Regulation, EIT funding may only cover a maximum of 25 % of a KIC's overall costs (i.e. the sum of the costs of EIT-funded activities and non-EIT-funded activities - this complex model is set out in the Figure 3 below).

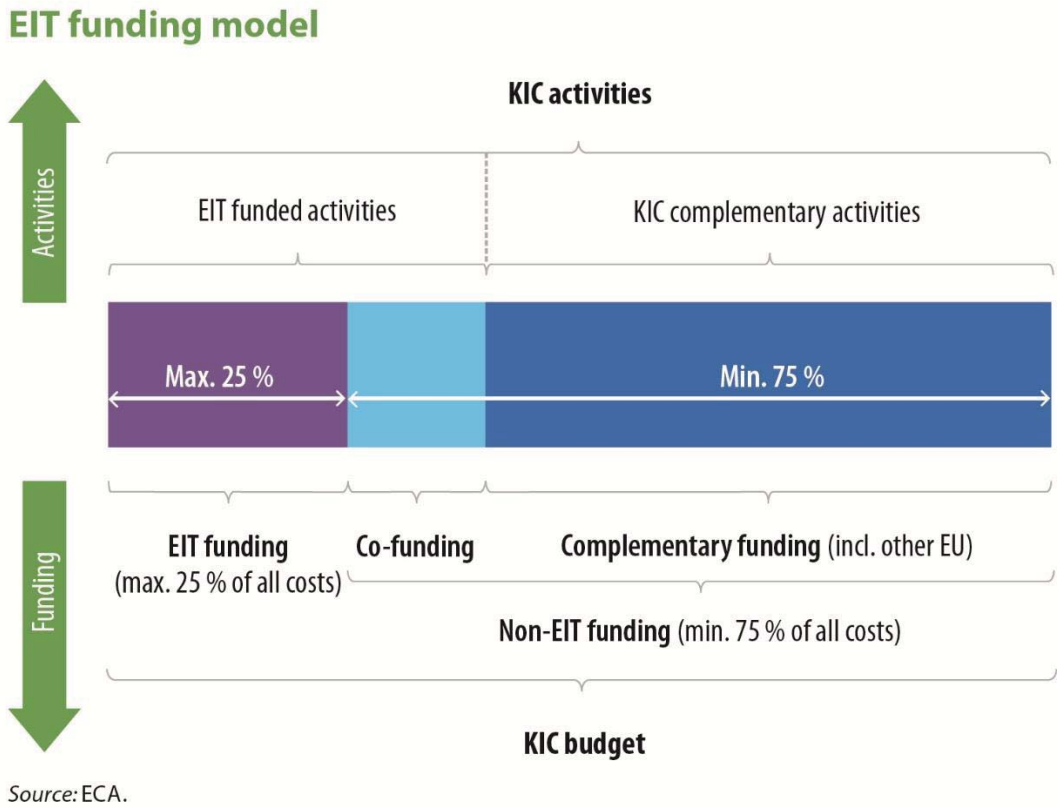


Figure 3: EIT funding model, European Court of Auditors illustration

According to the Court of Auditors 2016 report, the inclusion of "complementary activities" in the funding model is suboptimal given that both their definition and their interpretation are rather general and vague.[22] This creates problems in applying the eligibility rules among partners and KICs. The criteria for the designation of complementary activities, i.e. their links to key activities and their proportionality, are unclear, and thus, of little added value.[23]

As the Court of Auditors observed, "the measuring and reporting of KIC complementary activities are not essential to the achievements of the EIT's objectives" as many complementary activities are not additional in practical terms,[24] i.e. they are not directly triggered by the EIT intervention, already exist or will happen anyway. Therefore, the intended EIT financial leverage effect, i.e. ensuring that a substantial part of the overall KIC budget comes from non-EIT funding (such as membership fees, national or regional funding), is not applied in practice.[25] In addition, the current funding modalities create a disproportionate administrative burden in terms of financial reporting for the KICs. The Court of Auditors implied in its report clearly the need to focus on EIT-funded activities and concluded that the EIT funding model was not effective and requested its change in order to improve it.[26]

An additional important aspect of the EIT funding model is the financial sustainability objective: KICs should gradually reduce their dependency from EIT funding for their further consolidation and further expansion. In accordance with the EIT Regulation the EIT grants provided to KICs should normally cease after a maximum of 15 years. In order to support this objective, the EIT has adopted principles[27] obliging each KIC to develop and implement a financial sustainability strategy and submit an annual progress report. However, the current funding model does not provide any specific incentives to KICs to gradually increase their levels of private funding. As a result, progress towards financial sustainability remains uneven amongst KICs (see Figure 4).

22 ECA (2016), Special Report, pp. 15-20.
23 An example used also by the European Court of Auditors is that KIC partners have reported as a KIC complementary activity the cost of non-EIT students attending courses in which EIT students also participate. However, these costs are not additional as the courses were part of the standard educational programme of the university.
24 Ibid., p. 24
25 The overall level of co-funding of KAVA activities by KICs was 23% in 2016 and 20% in 2017.
26 Ibid., pp. 15-20.
27 Decision 4/2015 of the Governing Board on Principles of KICs financial sustainability.

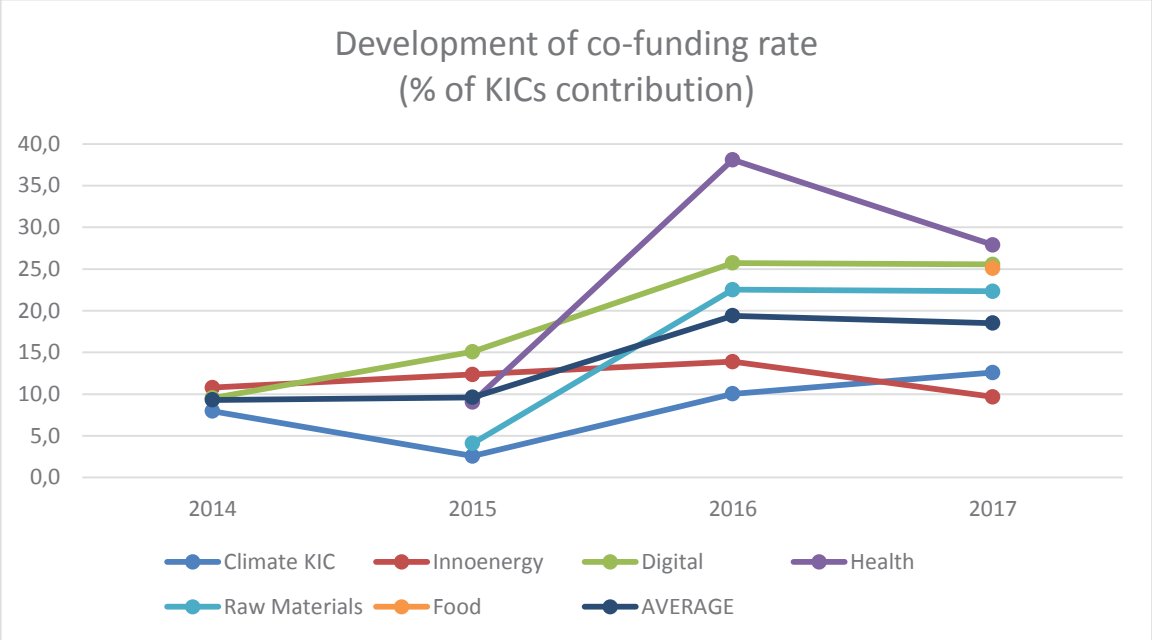


Figure 4: Co-funding attracted by KICs, 2017; own chart based on EIT data

An additional challenge of the current funding model is the annual nature of the planning and preparation cycle of the KIC Business Plans.[28] As the Court of Auditors observed, the current annual grant process is at odds with the need to reflect the longer-term perspective of innovation activities.[29] The annual grant process is also a major obstacle to planning and coordinating multiannual innovation projects. This limits the potential of the KICs and leads to a suboptimal selection of innovation activities, low engagement of some KIC partners and limited networking and interaction.[30]

Questions related to the EIT funding were also part of an Open Public Consultation (OPC) which was launched in the context of the impact assessment. The majority of respondents[31] supported the notion that KICs need a robust financial sustainability strategy from the outset (64% of respondents) and that securing other public funding for the operations of KICs is necessary (60% of respondents). Furthermore, securing funding from other sources, including those from private actors was the most popular solution cited by respondents in an open-ended question regarding financial sustainability.

2.2. Limited impact of EIT's education activities

Since its set-up, the EIT has supported innovative education and training programmes by linking education, research and business; learning-by-doing curricula; entrepreneurship education; and international and cross-sectorial mobility. EIT students have strong entrepreneurial competences and high employability rates, suggesting that their skills and education are both recognised and useful.[32] In the last four years, 43 ventures and persons

28 The KICs' Business Plan contains the detailed description of the activities that the KIC and its partners will run in the course of the year and forms the basis on which the grant allocations are decided by the EIT Governing Board; (see details in Annex 5).
29 ECA (2016), Special Report, pp. 26-30.
30 Based on the network analysis of partnering within KICs in the Study to support the Impact Assessment (SQW, November 2018), Annex 7.
31 See Annex 2B
32 There were close to entrepreneurial 1200 EIT Label graduates as of 2017, in addition to EIT students engaged in other programmes. See EIT (2017), Our Impact, from 2010 to 2016, pp. 33-34 (eit.europa.eu/interact/bookshelf/eit-our-impact-2010-2016), and SWD (2017) 351 final, p.28.

from the EIT Community have been featured in Forbes Europe 30 under 30 lists.[33] As highlighted by the EIT evaluation[34], there are benefits to EIT-supported education activities resulting from: knowledge triangle integration and the integration of research results and innovative practices into the education offer; involvement of industry in the design and delivery of the programmes; and access to accelerator programmes.

However, the EIT evaluation and the High Level Group report to the Commissioner also highlighted that the impact of the education activities of the EIT remains limited. The evaluation referred to the low awareness of the EIT education brand[35]. The EIT labelled programmes do not appear to have sufficient traction to create market demand. Moreover, the evaluation found that links "between education and innovation-support activities [are underexploited], and will require further efforts in the coming future."[36] More generally, in terms of overall impact, the Commission concluded in its Staff Working Document on the EIT evaluation that "stronger impact is expected from [EIT] education activities".[37]

A recent report[38] of the Joint Research Centre argues that "together with research centres, HEIs are co-innovators of 70% of the innovations derived from H2020 projects. However, further changes in strategic orientation and university governance are required for universities to realise their potential contribution as enablers of innovation. Excellence in research, high-quality education, entrepreneurship and contributions to innovation all need to be strengthened, while at the same time ensuring synergies between them."[39]

The Horizon Europe proposal has outlined a stronger role for the EIT in education. This relates to the need for stronger entrepreneurial and innovation capabilities and skills in HEIs.[40] Against this backdrop, the Horizon Europe impact assessment called for "an enhanced role for the EIT in embedding innovation and entrepreneurial capabilities, prospective skills identification and talent development in HEIs".[41]

The challenge to increase the innovation capacity of HEIs is set to grow as they become more integrated in local, national and global innovation chains.[42] In this context, the proposal for the Specific Programme under Horizon Europe identifies "entrepreneurial and innovation skills in a lifelong learning perspective and the entrepreneurial transformation of EU universities"[43] as one of the intervention areas for the EIT.

The stakeholders responding to the Open Public Consultation called for a stronger role of the EIT in education. A total of 65% of all OPC respondents[44] agree or strongly agree that training opportunities to become more entrepreneurial and innovation minded are insufficient in Europe. The most popular suggestions from the respondents for achieving

33 See EIT (2017), Our Impact, p. 37 and EIT Press release: EIT entrepreneurs in the spotlight in Forbes 30 under 30 (eit.europa.eu/newsroom/eit-community-entrepreneurs-spotlight-forbes-30-under-30).
34 SWD (2017) 351 final, , pp. 40-44.
35 SWD (2017) 351 final, p.31.
36 Ibid., p.28.
37 Ibid., p.44.
38 C. Benedetti Fasil et al. (2017), Current challenges in fostering the European innovation ecosystem, EUR 28796 EN, Publications Office of the European Union, Luxembourg, 2017, ISBN 978-92-79-73862-3, doi:10.2760/768124, JRC108368.
39 Ibid., p. 10.
40 See OECD (2009), Universities, innovation and entrepreneurship: criteria and examples of good practices. (http://www.oecd.org/cfe/leed/43201452.pdf) as well as OECD country reviews on https://heinnovate.eu
41 SWD (2018) 307 final, p. 256
42 See Renewed EU Agenda for Higher Education (COM(2017) 247) and the ones set in the Renewed EU Agenda for Research and Innovation (COM(2018) 306) as well as High Level Group on maximizing the impact of EU Research & Innovation Programmes (2017) LAB – FAB – APP. Investing the European future we want, p.13.
43 COM(2018) 436 final, p. 71
44 Cf. Annex 2B

the educational policy objective are for the EIT to provide funding for innovation capacity development and rewarding/recognising HEIs to become more innovative and entrepreneurial (71% of respondents) and to launch new actions supporting education and human capital development through the identification of future skills needs (69% of respondents). In the same consultation however, only 23% of respondents support the strengthening of the EIT label. Furthermore, the representatives of business and regional associations interviewed by the Commission[45] expressed the view that HEIs should play a key role for a more entrepreneurial environment in Europe.

2.3. Limited impact of EIT's regional outreach

The KICs consist of geographical hubs or co-location centres (CLCs) that bring together, at a local or regional level, education, research and industry partners of the KIC. As the EIT evaluation confirmed, CLCs broaden the EIT innovation support to some of EU's moderate innovation performers; nevertheless, the CLCs' support to the group of "moderate and modest innovator" countries[46] remains limited to a small number of Member States (Portugal, Poland, Estonia, Greece, Slovenia)[47].

Both the evaluation of the EIT and the High-Level Group report highlighted that efforts are still needed for the KICs to be fully integrated into the local innovation ecosystems. 60% of respondents to the consultation on the mid-term evaluation of the EIT reported that "the KIC had had little or no systemic impact on local, regional or national innovation ecosystems".[48]

The majority (77%) of all respondents to the OPC agree or strongly agree that the joint activities between HEIs, businesses and research organisations are not sufficiently integrated within their regional and local ecosystems. This perception is even stronger (89% of respondents) in "moderate and modest innovators" countries. Similarly, the main issue raised by the representatives of the business and regional associations during the consultation organised by the Commission in November 2018 related to the necessity of linking the EIT and KIC activities to the regional and local Smart Specialisation Strategies.

The problems of insufficient engagement of KICs in developing strong local innovation communities are further amplified by the fact that 73% of the EIT financial contribution is concentrated in five countries.[49] This results in a lack of integration and promotion of KIC activities within the regions and local innovation ecosystems across Europe and limits their overall impact on regional innovation ecosystems.

Through its Regional Innovation Scheme (EIT RIS) which was launched in 2014, the EIT developed an outreach strategy, which is carried out through the activities of the KICs. Its main objective is to support countries and regions that lag behind in innovation

45 Views expressed in the stakeholder workshops organised by the Commission in November and December 2018.
46 This report adopts the categorisation of the European Innovation Scoreboard. The Scoreboard identifies countries as: Innovation Leaders; Strong Innovators; Moderate Innovators; and Modest Innovators. ec.europa.eu/growth/industry/innovation/facts-figures/scoreboards_en
47 ICF (2017), Evaluation, p. 36, i.e. Portugal, Poland, Estonia, Greece, Slovenia
48 Ibid., p. 84. and High Level Group (2016), Future of the EIT, p. 13.
49 ECA (2016), Special Report, pp. 42-43. Funds are concentrated in partners from: Netherlands (24%), Germany (15%), France (13%), Sweden (12%) and United Kingdom (9%)

performance[50] by strengthening their capacity for innovation and by bringing the EIT model to these regions. EIT RIS is a voluntary scheme and KIC do not have an obligation to implement it unless they decide to include it their Business Plans.

Incentives for KICs to operate in EIT RIS territories are still limited, in comparison to the total budget available. The EIT RIS guidelines foresee that each KIC can apply for EUR 1.5 to EUR 4 million annually. This is between 1.7% to 5% of the total annual grant for a first generation KIC in 2018. Such incentives appear insufficient to fully exploit the potential of the regional outreach of the KICs activities and do not adequately mitigate existing regional disparities.

Given the novelty of the RIS any conclusions regarding its impact would be premature at this stage. However, there are indications that its effect is likely to be limited, partly due to low budgets as well as differing strategies between the horizontal EIT RIS strategy and the individual strategies of the KICs that ultimately implement it on a voluntary basis.

2.4. Technical issues

In addition to the three key problem areas described above, the interim evaluation, the Court of Auditors Report, the High-Level Group Report, the Commission's observations on the EIT functioning also point to a number of technical issues that the EIT needs to address in order to increase the effectiveness, efficiency and coherence of its operations, in line with its objectives and mission.

KICs: openness, transparency and collaboration

Limited transparency and openness of the KICs affect their partners and stakeholders. As the Court of Auditors observed in relation to KIC internal processes, the major challenges relate to the limited number of partners involved in the strategic and operational decision-making of the KIC[51]; the selection of activities financed by the EIT[52]; and the lack of transparency and communication[53], hindering wide participation, roll-out and replication.[54] The high concentration of EIT financial support in a small number of partners negatively impacts the attractiveness of the KICs for potential new partners.

The High-Level Group report found that the limited openness of KICs, and their innovation ecosystems as a whole, to new partners, as well as the lack of clear guidelines associated with becoming a partner can reduce the effectiveness of the EIT model. The Group report referred to the perception of the KIC as "closed clubs" and called for principles that can better engage external partners including SMEs.[55] A similar view was

50 Modest and moderate innovators in 2018, based on the European Innovation Scoreboard: Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Greece, Hungary, Latvia, Lithuania, Malta, Poland, Portugal, Romania, (South) Italy, Slovakia, Slovenia, Serbia and Turkey.

51 ECA (2016), Special Report, p. 42.

52 Ibid. p. 44; 50% of the respondents to the survey do not believe that the selection of the activities within the KIC is fair and transparent.

53 Ibid. p. 44; some KIC partners have expressed their concerns by stating that "there are a couple of influential partners and they distribute the funds among themselves".

54 E.g. the websites of some KICs still lack basic information on the supported projects such as contact details of project coordinators, project duration, amount of EU-funding, and key deliverables. The EU as funding source is not properly indicated throughout the co-funded projects.

55 High Level Group (2016), Future of the EIT, pp. 17-18.

reiterated by some participants in the consultations on Horizon Europe.[56] Some stakeholders highlighted that "it is essential that the EIT and the KICs improve their openness and responsiveness to include new relevant actors and keeping a continuous outreach effort to renew and reinforce the member base".[57] Stakeholders also highlighted the potential synergies from more active collaboration between and across the KICs.[58]

More than 50% of OPC respondents indicated that the EIT brand is not well recognised.[59] The current EIT mechanisms to ensure systematic and wide dissemination of results to better inform European, national and regional policy makers of the achievements of KICs/EIT are not effective.[60]

The integration of the activities of HEIs, research organisations, and businesses is a cornerstone of the EIT innovation model and requires efficient collaboration among these actors. As confirmed by participants in the consultation activities run by the Commission, the level of cooperation between education and training institutions and businesses is insufficient. Business actors were not always willing to partner with academia thus confirming a broader problem in university-business collaboration.[61]

Furthermore, the social network analysis in Annex 7 suggests that in selected KICs up to 83% of KIC beneficiaries participated in only one or two projects meaning that some organisations have weak ties with the system and that activities are concentrated around a small number of organisations.

EIT Governance

Good governance of the EIT is essential for achieving its objectives and ensuring long-term success. Structures, processes, roles and responsibilities as established in the EIT Regulation are interrelated. Several bodies play an important role and these are (1) a *Governing Board*[62] (high-level members experienced in higher education, research, innovation and business) assisted by an *Executive Committee*, (2) a *Director*, appointed by the *Governing Board* and (3) an *Internal Auditing Function* advising the *Governing Board* and the *Director*. The Commission has an observer role in the *Governing Board*. It also appoints the members of the *Board* but the latter is not obliged to report to the Commission. Therefore, the Commission's contribution to the effective and efficient functioning of the EIT and KICs is limited.

56 E. Griniece and M. Muizarajs (2018), Synthesis of stakeholders input for Horizon Europe, p. 64.
57 Ibid.
58 See Annex 2A
59 ICF (2017), Evaluation, pp. 51-52
60 Ibid.
61 European Commission (2018), The state of university-business cooperation in Europe. Publication available at.europa.eu/en/publication-detail/-/publication/1b03ee59-67a4-11e8-ab9c-01aa75ed71a1/language-en
62 It adopts, for example, the draft EIT's SIA, the SPD, the EIT's budget, appropriate measures if the evaluation of a KIC shows inadequate results, appoints and dismisses the *Director* and exercises disciplinary authority over him/her, promotes the EIT globally, etc.

The external evidence on governance is not as extensive as in other areas; however, in the Commission's experience it is clear that the current form of governance has an impact on the efficiency of the EIT's functioning. As an example, the current EIT Regulation does not rigorously distinguish between the supervisory powers of the Governing Board and the executive powers of the Director, e.g. with regard to the continued monitoring and evaluation of the activities of the KICs. The governance structures should also better ensure that KICs operate in synergy with each other and with relevant EU policy objectives

According to the EIT Regulation, the *Stakeholder Forum* is intended to be a platform open to national, regional and local authorities, organised interests and individual entities from business, higher education, research, associations, civil society and cluster organisations, as well as other interested parties from across the knowledge triangle. However, its implementation is through one annual event[63], which suggests that it is not effectively fulfilling its function due to its limited scope.

The governance of the EIT has also been the subject of recommendations from the High Level Group on the EIT (HLG)[64]. Consequently, there is a need to clarify and adjust roles, responsibilities and the division of tasks between the *Governing Board*, the *Executive Committee* and the *Director* with a view to increase clarity, avoid duplication and the need to simplify the EIT's decision-making process[65]. In addition, a clarification of the role of the Stakeholder Forum is necessary in order to maximise its impact.

Other issues

As highlighted by the Court of Auditors' 2016 report, there is a high staff turnover at the EIT linked to the fact that EIT staff contracts have limited duration compared to other similar EU bodies. This is an issue that needs to be addressed as it has impact on the continuity of EIT's operations and its functioning.

63 The EIT is organising every year an event gathering EIT stakeholders. See for more information https://eit.europa.eu/innoveit
64 High Level Group (2016), Future of the EIT, pp. 22-24.
65 Supported by evidence from decentralised EU agencies concluding that a clear separation of roles and functions between the *Management Board* and the *Director*, as foreseen in the founding regulations, is meant to avoid overlap between the two, and allow the *Management Board* to focus on strategic priorities and key management decisions.

2.5. Summary of problems and technical issues to be addressed:

The following problem tree exemplifies the drivers of the problems and technical issues:

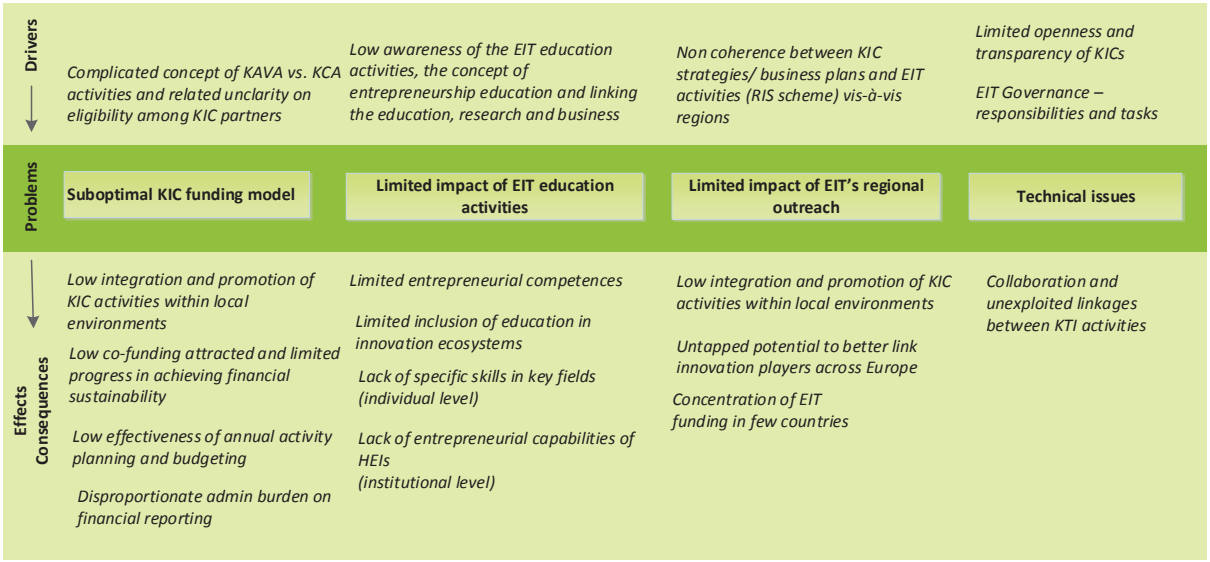


Figure 5: Problem tree; own illustration

The following table shows the sources of problems and technical issues:

Problem/technical issue	Regulation	SIA	Operational/managerial measures
Suboptimal funding model	X	X	
EIT governance	X		X
Future themes for new KICs		X	
Limited impact of education activities	X	X	
Limited impact of regional outreach	X	X	
Openness, transparency and collaboration of KICs	X	X	X
Horizontal: ensuring alignment within Horizon Europe and synergies		X	X

Table 2: Sources of problems and technical issues; own illustration

3. WHY SHOULD THE EU ACT?

3.1. Legal basis

The EU has a shared competence in industry policy based on Article 173 TFEU (Title XVII). According to Article 173(1), the Union and the Member States shall ensure that conditions necessary for the competitiveness of the Union's industry exist. For that purpose, in accordance with a system of open and competitive markets, their action shall be aimed also at fostering better exploitation of the industrial potential of policies of innovation, research and technological development. Article 173(3) foresees that the European Parliament and the Council, acting in accordance with the ordinary legislative procedure referred to in Article 294, may decide on specific measures in support of action taken in the Member States to achieve the mentioned objective, excluding any harmonisation of the laws and regulations of the Member States. This provision is the legal basis of the EIT Regulation and of the EIT's Strategic Innovation Agenda 2014-2020.

The proposed reinforcement of the activities of the EIT, including in the area of education and the regional dimension, are innovation-driven and aim at the fulfilment of the objective set out in Article 173 TFEU. Therefore, the industry legal base provided in Article 173 TFEU constitutes the legal base of both proposals assessed in this impact assessment.

3.2. Subsidiarity and proportionality: need for, and added value of EU action

The Commission proposals for amending the EIT Regulation through a recast and for a new SIA respect the principles **of subsidiarity** and **proportionality**. They do not go beyond what is required for achieving the Union's objectives and provide a clear EU added-value in terms of economies of scale, scope and speed of investments in research and innovation areas, compared to national and regional initiatives and solutions. Moreover, EU action would not interfere with purely domestic scenarios or require harmonisation of the laws and regulations of the Member States.

The EIT has a unique way of building EU-wide innovation ecosystems of education, research, business and other stakeholders.[66] Its activities have a cumulative effect, which support and stimulate Europe's expertise, notably, in key strategic fields. This strengthens the Union's competitiveness and innovation capacity for the benefits of society as a whole. Furthermore, cooperation activities supported by the EIT lead to an increased quality of action, innovation and internationalisation of KIC partners and organisations, the creation of cross-border, multidisciplinary networks, more cross-sectoral cooperation and geographical outreach.

The EIT is also the sole instrument within Horizon 2020 and the future Horizon Europe with a distinct focus on education as a key driver of innovation, growth and competitiveness. The EIT and the KICs develop innovative education and training programmes by linking education, research and business; learning-by-doing curricula and robust entrepreneurship education. The EIT contributes to increasing the number of entrepreneurs and skilled professionals thus contributing to the overall development of human capital in Europe.

66 ICF (2017), Evaluation, p. 36.

4. OBJECTIVES: WHAT IS TO BE ACHIEVED?

The general objectives are reflected in the Horizon Europe programme proposal and presented below, along with the specific objectives that address the problems and technical issues facing the EIT.

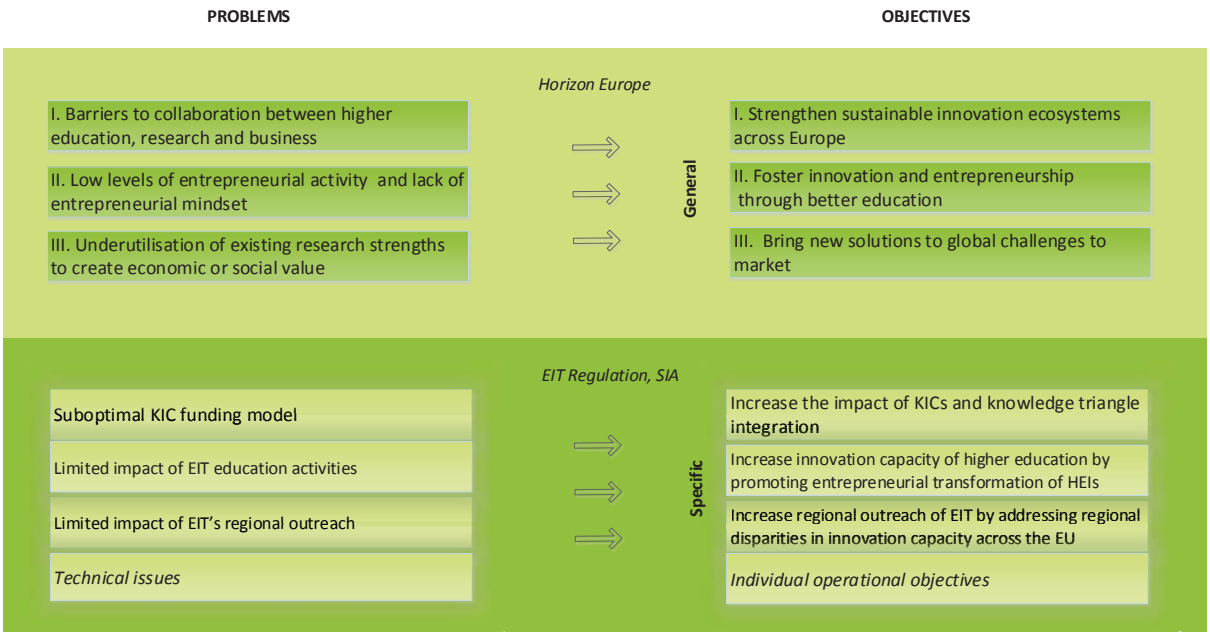


Figure 6: General and specific problems and objectives of the EIT; own illustration

In line with the identified problems, the specific objectives, to be defined in the SIA are:

a. To increase the impact of KICs and knowledge triangle integration through an effective and efficient EIT funding model;

b. To increase the innovation and entrepreneurial capacity of the higher education sector by promoting institutional change in HEIs in Europe;

c. To increase the regional outreach of the EIT in order to address regional disparities in innovation capacity across the EU;

5. HOW OPTIONS ADDRESS PROBLEMS AND TECHNICAL ISSUES

A number of options regarding the EIT's future direction were considered and discarded in the Horizon Europe impact assessment[67]: namely, the Reduction/Discontinuation of EIT KICs interventions; the Continuation of the approach to EIT/KICs as implemented under Horizon 2020[68]; the Direct integration of KICs into the Framework Programme (without the EIT). Annex 5 provides details on policy options which were not considered viable and the reasons for this.

Before proceeding to the discussion of the three policy options, sections 5.1.-5.3. discuss measures to be taken in response to problems and technical issues described in section 2 for which only one alternative is viable. The policy options are presented in the backdrop of a targeted EU level intervention on the basis of the Horizon Europe proposal for an EIT budget of EUR 3 billion (allowing the launch of one or two new KICs during 2021-2027 according to the option chosen). The options offer different strategic choices and are not cumulative even though a wide range of similarities exists across all of them.

5.1. Discussion of technical issues

Openness, transparency and collaboration

Limited transparency and openness affect negatively the collaboration of EIT stakeholders. Technical amendments in the EIT Regulation would be necessary to reinforce the principles of openness and transparency, particularly: the provision on transparency of both the EIT and KIC and access to documents and extending the selection criteria for KICs to incentivise the addition of new members and including references to Horizon Europe principles of transparency and openness for European Partnerships.

A number of technical measures can be introduced by the EIT which do not require additional amendments to the EIT Regulation. Such measures include the creation of guidelines by the EIT to be followed by KICs as regards transparency and openness aspects, in particular the selection of new partners, the preparation of the Business Plan[69] and the openness of activities to third parties. The Governing Board (GB) would monitor how KICs apply the guidelines and take them into account in the assessment of KICs' performance for the funding allocation. This includes the possibility to explore how strategic priorities that are not foreseen to be addressed by new KICs can eventually be efficiently supported through collaborative action among several KICs (cross-KIC actions). This applies even more so if more than one KIC already foresee activities common for a policy objective.

In addition, the KICs' multi-annual strategies need to describe how the KICs will ensure openness to relevant partners and stakeholders and how it intends to reach new potential partners across Europe. Other measures include ensuring that KICs transparently share the conditions and the criteria to become partners as well as improving the procedure for the preparation of a KIC multi-annual strategy and Business Plan (including the identification of priorities, synergies with other KICs and other EU-activities, the selection of activities and the allocation of funds). Finally, the Governing Board could

67 SWD(2018) 307 final, p. 129
68 This approach was discarded due to its perceived lack of integration of EIT in the overall R&I framework
69 Including guidance on streamlining the policy goals/targets and its monitoring.

incentivise KICs that demonstrably increase the share of calls, in particular for innovation projects that are open to third parties.

In its monitoring, the EIT should signal over-concentration of EIT financial support to the Governing Board which should be able to request operational measures from the KIC that mitigate such over-concentration. More generally, transparency guidelines should ensure that KIC Business Plans contain the information on the level and intensity of cooperation between KIC partners (i.e. overview/ratio of KIC partners/beneficiaries within individual KIC activities, innovation projects or education programmes; and breakdown of funding distribution among individual partners). Such measures should be monitored by the EIT via relevant indicators and trigger action at the level of the Governing Board if related objectives are not met.

Governance

There is a need for clarification of the roles for the EIT Governing Board, Executive Committee and Director. The Governing Board needs to strike the right balance between strategic leadership of the EIT and KICs and responsibility for operational aspects of the EIT and KICs.[70] In addition, the Governing Board has to give overall guidance to the EIT while respecting the autonomy of the KICs.[71] While the EIT Regulation qualifies all decisions of the Governing Board as 'strategic', it is clear that some decisions are operational in nature such as the establishment of advisory groups or the implementation arrangements for the operation of an Internal Auditing Function.

The EIT would benefit from a more guidance from the Governing Board on key strategic issues. The Governing Board currently does not play a sufficiently strong role in the monitoring, supervision and steering of KICs, which could be strengthened by supervising more closely the ongoing evaluation and monitoring of KICs. A clearer division of tasks could help the Governing Board to achieve balance between strategic leadership and operational aspects.

The assistance by the Executive Committee to the Governing Board should be clarified in order to provide more effective support (eg. preparation by Executive Committee of the meeting of the Governing Board in cooperation with the Director; consultation of the Exectutive Committee by the Director on key documents such as the draft Single Programming Document and draft consolidated annual activity report). The Commission's role should also be clarified to reflect its legal obligations in terms of monitoring and sound financial management. A requirement for agreement by the Commission on a limited number of strategic issues (e.g. monitoring and financial allocation principles) should be introduced.

The EIT Stakeholder Forum should take into consideration the activities of the Forum of Member States and Associated Countries' public authorities and bodies to be established under the Horizon Europe programme. This forum will promote coordination and dialogue on the development of the EU's innovation ecosystems and between EU and national innovation policies and programmes.

70 Under the current EIT Regulation, the GB has to i) take the necessary strategic decisions on the EIT and KICs by, for example, adopting the Strategic Programming Document (SPD) and EIT's budget, the draft SIA, selecting a partnership as a KIC; ii) exercise responsibility for operational aspects of the EIT and KICs, e.g. by adopting procedures for financing, monitoring and evaluating the activities of the KICs; and iii) respect the substantial autonomy of the KICs by not influencing their internal organisation and composition , precise agenda or working methods.

71 As a result of the broad scope of the KICs autonomy in the EIT Regulation, the KICs have tended to grow large, strong and independent, while the GB has built up the corresponding capacity to successfully oversee their strategic development and performance. The result is a lack of operational transparency of the KICs, a problem identified in ECA (2016), Special Report, and High Level Group (2016), Future of the EIT.

Moreover, several amendments to the EIT Statutes annexed to the EIT Regulation would be necessary to reinforce the EIT governance provisions. In particular, this would include changes to clarify the role of the Governing Board, the Executive Committee, the Director and the Commission in the governance of the EIT with a view to increase its effectiveness; and to clarify the role of the Stakeholder Forum. In addition, provisions as regards staff contracts should be amended to allow for contracts of an indefinite duration in line with other comparable bodies, in order to ensure the continuity of EIT operations.

5.2. Discussion of priority fields

According to the EIT Regulation, the SIA should define the priority fields for the future KICs. The Governing Board of the EIT proposed four possible priority themes for future KICs in its Strategic Outline on the Future of the EIT[72] and the draft Strategic Innovation Agenda of the EIT that was submitted to the European Commission in accordance with the EIT Regulation. The priority fields proposed by the Governing Board have been subject to a further thorough assessment by the Commission (see Annex 9 for more details). It should be noted that this assessment did not include a detailed specific assessment of the potential economic, social and environmental impacts of possible KICs launched under each of the proposed priority fields since this is not explicitly required by the EIT Regulation.[73]

The final Commission assessment, summarised in the table below, 1) builds on several reports and assessments conducted by the EIT and the Commission against various sets of criteria and 2) is based on the evaluation of 9 key aspects that condition the selection of the priority fields. Annex 9 summarizes the assessment process and its different steps and outcomes. Annex 6 outlines the European partnerships criteria that will be reflected in the call for selection of future KICs and in their multiannual strategies.

72 See for more details the strategic outline published by the EIT GB: https://eit.europa.eu/sites/default/files/eit_strategic_outline_0.pdf

73 The same approach was followed by the Commission and co-legislators for the preparation and adoption of the current Strategic Innovation Agenda 2014-2020.

Key aspects	Cultural and Creative Industries	Security and Resilience	Water, Marine and Maritime	Inclusion, Integration and Migration
Coherence and synergies with EU R&I and Education landscape	++	++	++	+
Not covered by planned similar EU initiatives (i.e. partnerships)	++	+	+	++
Fragmentation of the innovation value-chain	++	+	+	++
Suitability of the EIT model to address innovation bottlenecks	++	++	++	0
Ability to mobilize investment and sufficient market for innovation	+	+	+	0
Modernisation/transformation potential of the Education system and skills gap	++	+	+	++
Regional dimension	++	+	++	+
Citizen-focus approach	++	++	+	++
Synergies with and complementarity to existing KICs	++	+	+	0
TOTAL	**17**	**12**	**12**	**10**

Table 3: Selection of future priority fields, Commission assessment

As a result of this assessment process, the field of Cultural and Creative Industries (CCI) has been identified as the most adequate thematic priority for the first KIC to be launched under Horizon Europe as it obtained the best results in the overall assessment against the proposed criteria. CCI are a sector with a high growth potential, many grass-roots initiatives and strong citizen appeal. They are strongly embedded in their local and regional ecosystems. However, the innovators and business creators in this sector lack the needed entrepreneurial and innovation skills. For these reasons, the KIC model seems particularly well adapted.

Cultural and Creative Industries also complement very well the themes of the 8 already existing KICs in the EIT portfolio. Last but not least, they cover an area for which no other potential partnership is foreseen and where there is a strong political support from the European Parliament and from Member States. Therefore, this theme has proven to be the most suitable to the KIC model and complements well the activities of the existing ones. These conclusions would be reflected in the SIA, along with an indication for the launch of such a KIC. A call would be launched in 2021 that would lead to the designation of a KIC in the year after, i.e. 2022.

5.3. Discussion of funding model

In line with the EIT Regulation provision that requires funding for KICs to cease normally after a maximum of 15 years, the EIT Governing Board adopted principles for the financial sustainability of the KICs in 2015, based on its initial experience with the first generation KICs launched in 2010. In the principles, the Board outlined that that the maximum EIT contribution to a KIC for eligible costs should start to decrease from 100% to 80% in year 11 of the EIT grant agreement with the KIC[74], implying there is no co-funding obligation for the KIC in the years one to ten. While this decision was the first to explicitly introduce co-funding from the KIC partners, given that no KIC has entered its eleventh year by 2019, its effectiveness cannot currently be assessed.

KIC partners already attract co-funding, albeit to a very different extent. The figure below provides an overview of the co-funding attracted by KICs so far – ranging from 9.7% in EIT InnoEnergy (launched in 2009) to 27% in EIT Health (launched in 2014). The figure shows the average co-funding increasing from 9% to 19% between 2014 and 2017 (see Annex 11 for more details). However, as shown in the Figure 7, it is evident there are significant performance differences between the KICs. In particular, two out of three first generation KICs have significant difficulties in attracting co-funding.

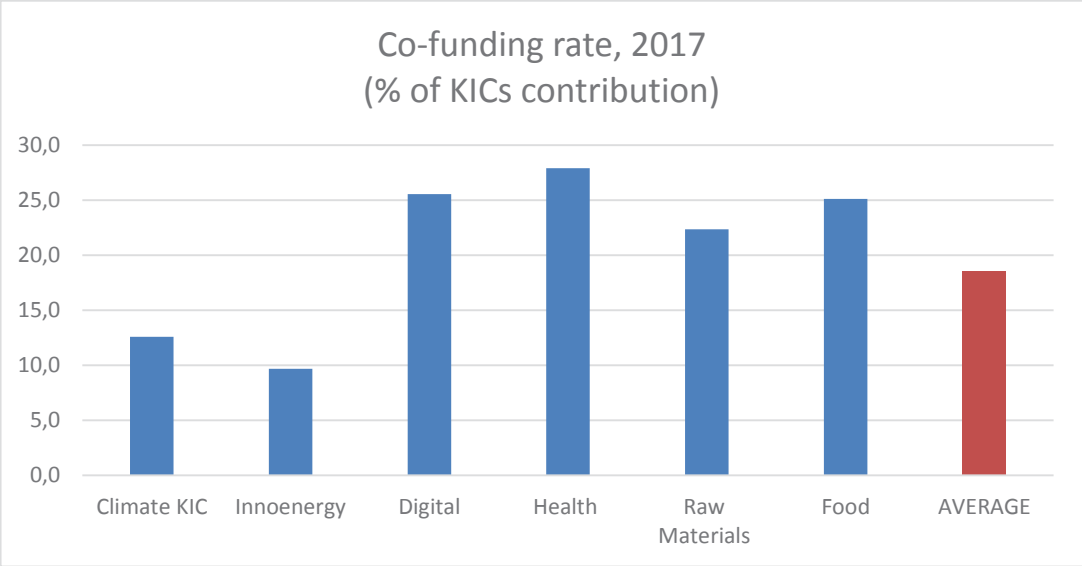


Figure 7: Co-funding rate (% of KICs contribution) in different KICs in 2017; EIT data

74 The decision applies to the so-called KAVA activities (KIC-value added activities), ie. the activities that can be funded with up to 100% (see chapter 2.1. for an explanation). The Governing Board decided in 2015 that the maximum EIT contribution to a KIC will be reduced from up to 100% funding to KAVA after 10 years of a KIC's designation to 80%, on average, in year 11 and thereafter progressive annual reductions: 60% in year 12, 40% in year 13, 20% in year 14 and 10% in year 15. This decision has not been revoked since then as it is expected that the Commission will revise the funding model, in accordance with the Court of Auditors recommendation.

In this context and in view of the recommendation of the Court of Auditors, different solutions have been analysed in order to address the suboptimal funding model of the EIT: a continuation of the current practice; an introduction of a co-funding rate in line with the Horizon Europe provisions for partnerships; and a decreasing EIT co-funding rate. Annex 10 provides a financial modelling analysis of the implications of co-funding.

5.3.1. Continuation of current funding model (discarded)

Not changing the current funding model would mean that there would continue to be a funding model that does not distinguish clearly between the EIT grant and real external investment. The KIC activities not funded by the EIT would continue to be included in the calculation basis when determining the EIT'S financial contribution to the KIC. The yearly reporting of the KIC complementary activities, both in the Business Plans and in the financial reports submitted by the KICs, would continue to add considerable burden with limited added value.

As a result, the funding allocation would continue to be ineffective and disincentivise KICs from implementing sound financial sustainability strategies. The expected leverage effect will continue to be undemonstrated. Finally, not responding to the recommendation of the Court of Auditors[75] is not a justified option, so this solution is discarded.

5.3.2. Introduction of a 50/50 co-funding rate (discarded)

In light of the 2015 decision of the Board, the subsequent recommendations of the High Level Group and the Court of Auditors, the data available, and the need to strengthen KIC partners contributions or other revenue sources, an alternative to the continuation of the current model is to consider the introduction of an explicit co-funding model to replace current practice.

One possibility would be to adopt the guidance provided for institutionalised European Partnerships based on Articles 185 and 187 of the TFEU. The provisions in Annex III on Partnerships of the Horizon Europe proposal stipulate, "the financial and/or in-kind, contributions from partners other than the Union, will at least be equal to 50%".[76] The shift to such a funding model would however raise a number of serious concerns in terms of feasibility and the overall impact on the KIC.[77]

While it can be assumed that co-funding of KICs would gradually increase, it seems implausible that KICs would be able to adapt to a co-funding rate of 50% in the transition to the Horizon Europe framework as of 2021 onwards. Such a change in the funding model of all existing KICs would imply a far-reaching revision of all existing financial management and planning practices. Such an abrupt change would need to be agreed by all KIC partners putting the KIC partnership at risk. It is not excluded that it can seriously destabilise the current structure which is based on existing guidance.

In addition, the application of a harmonised co-funding rate of 50% across all eight KICs - that are in very different stages of development - would disrupt all KICs and the entire

75 ECA (2016), Performance report, p. 51

76 See COM(2018) 435 final, Annex III, p.7.

77 It is expected that the final HE Regulation will require the limit of 50% of EU financial contribution will apply only to institutionalised partnerships under Article 185 and 187 of the TFEU.

KIC operation model. It would be contradictory to the guidance provided by the EIT GB which aimed to allow for some flexibility in preparing KICs better for financially sustainability with a decreasing rate of co-funding by the EIT.

Moreover, such a rate would not provide sufficient incentives to any new KICs to apply to upcoming calls or to the achievement of the financial sustainability goals by the current ones. In the case of new KICs, the obligation to co-fund 50% of the budget from the very beginning entails a clear risk of non-implementation, as partners would be more reluctant to engage in long-term partnerships that requires them to commit significant resources over up to 15 years. It is very likely that calls for proposals for future KICs would not attract interest under this co-funding rate.

Apart from the significant operational implications of a shift to a 50% co-funding model, the financial modelling in Annex 10 shows that even though attractive in theory in the short term, a co-funding rate of 50% would be a suboptimal solution in the long-term. Moreover, there are significant enforcement issues with such a rate that may prevent partners from participating in the activities, both for existing and new KICs.

In addition, a co-funding of 50% appears more suitable for research-industry partnerships where industrial partners have a core interest in shaping and controlling the research and development agenda. It seems however less suitable for a KIC that includes at its core also education and entrepreneurship activities that aim at developing skills and a more entrepreneurial culture. Such activities are traditionally addressed by and in close collaboration with the education sector and are more difficult to fund from private sources.

In conclusion, there is a considerable risk that a co-funding rate of 50% applied across all KICs may lead to premature termination of the activities of at least some KICs, while causing severe disruption in all of them and preventing new ones from starting. For this reason this option is discarded as well.

5.3.3. Introduction of a gradually decreasing EIT co-funding rate (retained)

A number of reasons suggest a gradually decreasing EIT co-funding rate would be an appropriate solution to the problem at hand.

First, the establishment of EIT co-funding rates that would reflect the decision adopted by the Governing Board in 2015 and the needs of KICs across their different phases (start-up phase, ramp-up phase, maturity phase, exit from the EIT grant). It would support them more effectively towards achieving financial sustainability and result in additional economic benefits due to the significant investment made already.[78] It would provide clarity on specific co-funding conditions for the different phases. This would result in higher planning security and private investment in KIC-supported projects/sectors, enabling KICs to gradually focus more on higher added-value activities and services they provide.

Secondly, the introduction of a gradually decreasing rate of EIT co-funding would stimulate and reward performance and best practice. While most of the KICs already have adequate non-EIT co-funding rates, some of them do not. This is the case of two out

78 See Annex 10 for details

of the three first generation KICs (EIT InnoEnergy at 9.7% and EIT Climate-KIC at 12.6% in 2017) despite them being fully mature and receiving a grant of around EUR 85 million and EUR 80 million, respectively for 2017. However, given the clear guidance of the Governing Board from 2015 it is expected that their performance will improve between 2018 and 2020 (latest data available is 2017) as the EIT Governing Board has raised this issue with the KICs in its monitoring and supervision.

A co-funding rate applicable to the KICs should reflect best performance and aim to increase the performance of KICs that under-perform. Based on the KIC development model, a decreasing funding rate would involve four phases. A start-up phase (years one to four) will involve the set-up of the organisational structure of the KIC, establishing its management and operational structures and defining the short-term business strategy. This phase will be supported with up to 100% of the eligible cost within the available grant. This is necessary as the KICs build up their operations in the first years and the absolute size of the grant is growing only over time (for example, EIT Health, launched in 2014, received the followings amounts: EUR 3.2 million (2015); EUR 20.7 million (2016), EUR 34.2 million (2017) and EUR 57.7 million (2018)).[79]

In the ramp-up phase (years five to seven) the KIC will consolidate its partnership structure and deliver on its mid-term business strategy. The EIT will support the KIC with up to 80% of the eligible costs, requiring the KIC to match at least 20% of the cost. In the maturity phase (years eight to eleven), the KIC will grow, expand and the EIT will support it with up to 70% of the budget. Finally, in line with the Governing Board principles for financial sustainability, during the exit phase (years twelve to fifteen), the EIT will request the KIC to gradually increase its co-funding rate on an annual basis. The "exit from EIT grant" phase is in line with the guidance of the Governing Board that stipulated a decrease starting with 80% in year 11 and thereafter progressive annual reductions: 60% in year 12, 40% in year 13, 20% in year 14 and 10% in year 15".[80] The EIT will discontinue its annual grant to the KIC after year fifteen.

The table below provides an overview of the proposed decreasing co-funding rate that adapts and formalizes the decision taken by the Governing Board.

	Start-up	**Ramp-up**	**Maturity**	**Exit from EIT grant**
Years	1 – 4	5 – 7	8 – 11	12 – 15
EIT Co-funding rate	Up to 100%	Up to 80%	Up to 70%	50% at year 12, decreasing by 10% per annum

Table 4: Overview of the proposed decreasing co-funding rate for the EIT grant; own illustration

79 Internal data and reporting provided by the EIT to the European Commission.
80 The same document stipulates "in year 11 and thereafter progressive annual reductions: 60% in year 12, 40% in year 13, 20% in year 14 and 10% in year 15".

Unlike the Governing Board proposal of 2015, the proposed decreasing co-funding rate would ensure that co-funding is applied early on in the KIC operations (starting at year 5 instead of 11), thereby significantly increasing the commitment of the partners and their long-term planning security. The proposed EIT co-funding rate would gradually decrease over the years 5 to 15 and facilitate the KICs transition to financial sustainability, rather than start to fall steeply after 10 years. All other things being equal, the proposed decreasing rate would also trigger higher private investment than the current GB proposal (see also Annex 10). Finally, such a co-funding rate reflects well the best performing KICs today that should gradually become the benchmark.

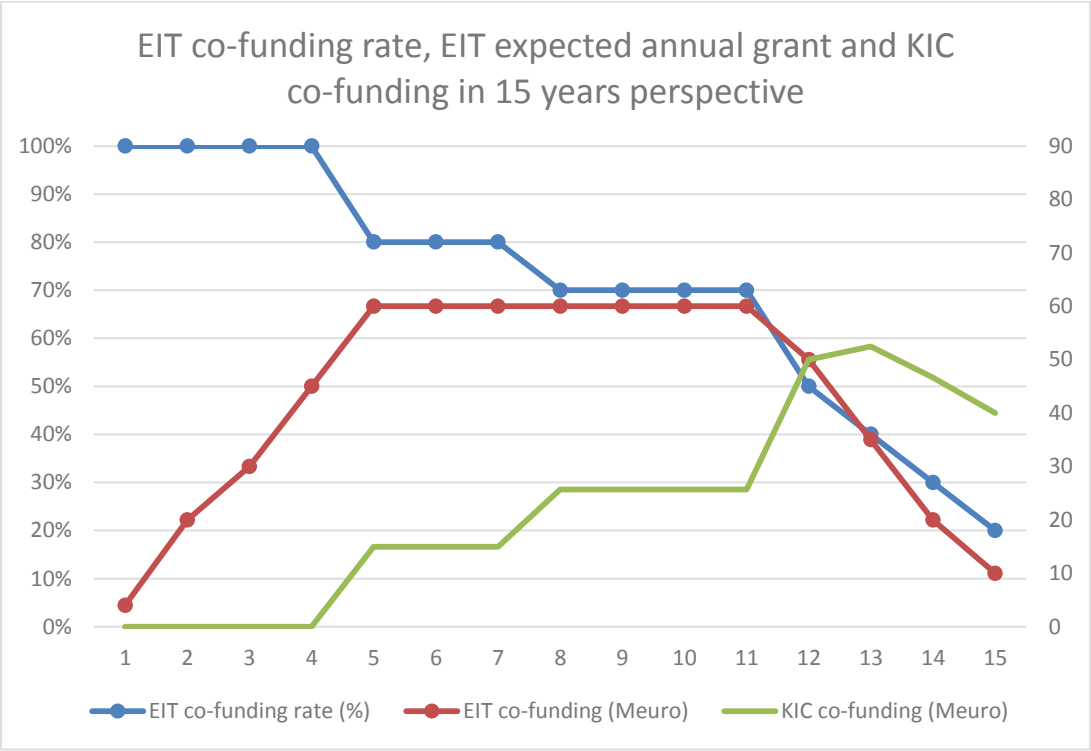


Figure 7: EIT co-funding rate, EIT expected grant and KIC co-funding in perspective; own projection

The adaptation of the funding model would increase the non-EIT co-funding share. As a result, higher private investments from both existing KIC beneficiaries as well as new partners investing in KIC-supported projects would be likely in the medium to the long term as the simulations in Annex 10 demonstrate.[81] Furthermore, the adaptation of the funding model is in line with the views of the majority of stakeholders expressed in the Open Public Consultation. Securing other public or private funding for the operation of KICs from the outset was the most popular solution cited and supported by 64% of the respondents.

81 The simulation results in Helsinki-Uusima and Noord-Brabant regions suggest that the accelerating of the private investment in the medium- to long-run is the most effective when the increasing co-funding rate over time is applied (policy option 2) attracting annually EUR 96.62 million and EUR 324 million respectively in 2035.

The implications of changes to the funding model would be different for different waves of KICs:

- **First wave** (three KICs launched in 2010): somewhat affected as the funding by the EIT will be discontinued after 2024 and Governing Board guidance from 2015 is broadly in line with current proposal.
- **Second and third wave** (three KICs launched in 2014 and 2016): moderately affected since the change in the funding model would happen in the middle of their programming period. However, the KICs of 2014 and 2016 already now have a non-EIT co-funding rate of between 20 to 25 % which is in full compliance with the proposal.
- **Fourth wave** (two KICs launched in 2018): no significant implications as they would start up their activities in 2019 and 2020 which would allow for smooth integration into any new funding model.
- For any **future KICs**: no particular implications as they would be launched in the next programming period.

Table 5: Implications of new co-funding model on KICs; own analysis

The theoretical and empirical simulation analyses in Annex 10, point to the overall large potential of the EIT investment support to leverage additional private investment into KIC projects through gradually decreasing EIT co-funding rates. However this may also have an effect on the number of KIC partners and the membership. Higher KIC co-funding rates could imply fewer partners willing to participate and contribute to the operation of the KICs. Such a scenario could however be counterbalanced with appropriate EIT incentives that reduce the financial, technology or market uptake risks of the potential KIC investors.

A number of additional measures aimed at improving the efficiency of the funding allocation will support the application of the new funding model. First, a comprehensive and in-depth review after seven years of KIC operations would be the opportunity for the EIT Governing Board to decide if a KIC has demonstrated adequate and expected results with the option to discontinue funding[82]. This review would guarantee transparency and would be in line with the guiding principles and criteria for European Partnerships in Horizon Europe and best practice in the EU.[83]

A possible challenge may emerge if there is non-compliance by the KIC with the non-EIT co-funding rule. For this there are effective mitigation measures. Firstly, a KIC must respect the financial principle of the EIT when preparing their Business Plans (prepared and submitted in year n-1), necessitating that the KIC will have to make the relevant calculations before proposing its Business Plan and requesting a budget to implement it. Secondly, should a KIC still have difficulties to match the EIT grant, then the Governing Board could reduce the absolute EU contribution to a level that the KIC can match, according to the rules. Such flexibility is currently possible and can be implemented through managerial measures.

82 The possibility that the EIT Governing Board has of terminating a KIC should its results be inadequate is foreseen in the current EIT Regulation. The new EIT Regulation should include a clear reference to the 7-year review and the possible termination or suspension of funding.

83 Cf. the review process of the Exzellenzinitiative in Germany which can extend the status of an "excellent university". Deutsche Forschungsgemeinschaft, http://www.dfg.de/foerderung/programme/exzellenzinitiative/

5.4. Description of policy options

Three policy options are presented below: a baseline reflecting the continuation of business as usual; and two different options addressing the problems and technical issues identified in the impact assessment.

The following graph presents comprehensively the intervention logic of all the Options 1, 2 and 3. It is to be noted that the options are expected to achieve the outputs, results and impacts to a different extent (further developed in section 6).

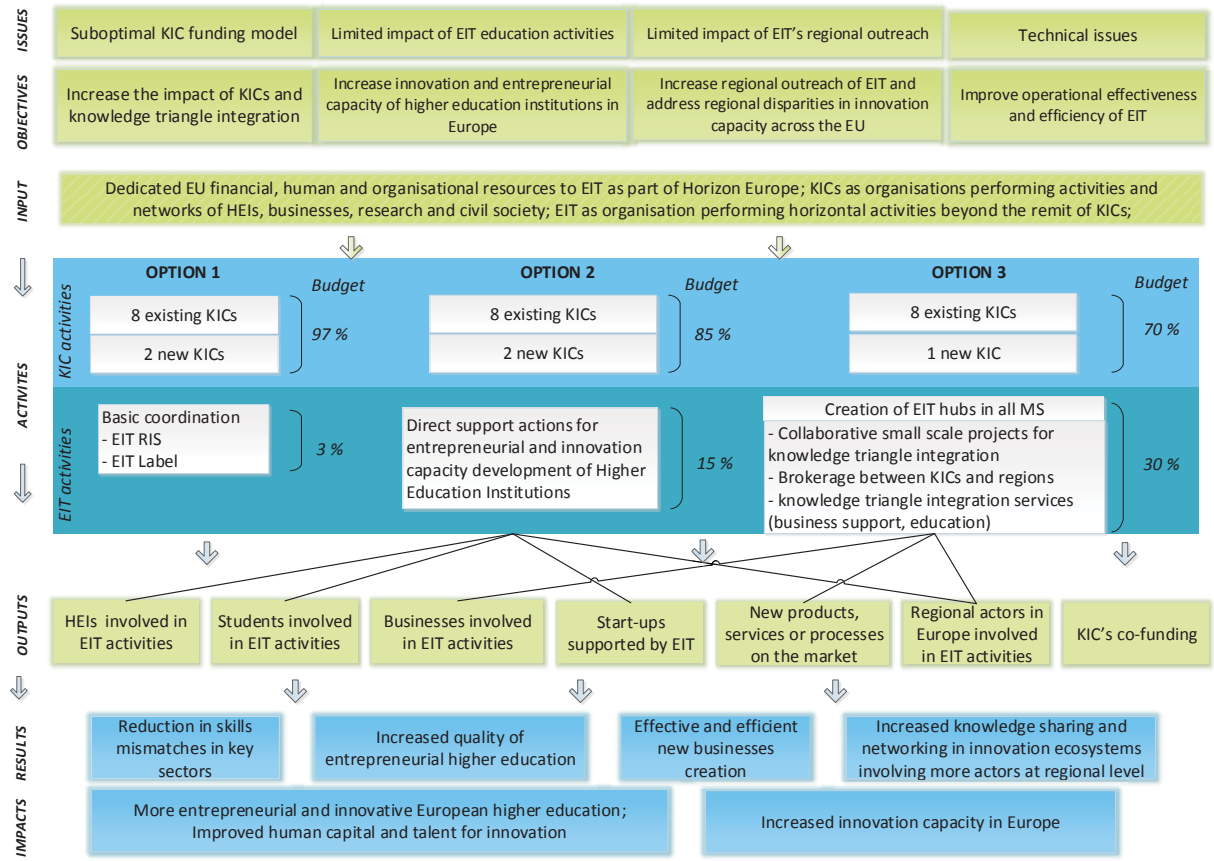


Figure 8: Intervention logic; own illustration

5.4.1. Option 1: Baseline

The baseline option represents the continuation of EIT's activities as they are today with essential adjustments necessary to align it with the proposal for Horizon Europe. The EIT's activities would be planned and implemented to maximise synergies and complementarities with the actions (clusters and missions) under the *Global Challenges and Industrial Competitiveness* Pillar. EIT would comply with implementation, monitoring and evaluation criteria for European Partnerships.
In addition, the EIT will develop synergies with the European Innovation Council in offering support to highly innovative ventures in both start-up and scale-up stages, in particular through KICs. In order to ensure alignment with the overall Horizon Europe proposal in terms of administrative rules, a simplification of rules would be pursued.

The EIT and the KICs would keep their **current model** and continue business as usual. The EIT would continue to operate only through KICs. The role of KICs as drivers of innovation ecosystems in specific fields and the EIT as primarily a grant management agency would not change. The funding model of KICs would stay unchanged. Horizontal activities, such as the EIT Label or the EIT Alumni would continue operating on their current basis. The Regional Innovation Scheme (EIT RIS), would continue to be performed on a voluntary basis and its activities would not be part of a KIC' overall strategy.

No new actions would be launched by the EIT to further address education and regional aspects as part of the baseline.

In line with the EIT Regulation, the first three KICs[84] **would cease** to receive EIT financial support after 2024. The five KICs[85] that started operations between 2015 and 2019 would reach maturity in the new programming period.

Within the proposed budget of EUR 3 billion and based on the current funding model, **two new KICs would be launched** within the timeframe of 2021 – 2027, the first in the field of Culture and Creative Industries (CCI), the second on a theme to be defined taking into account the Horizon Europe Strategic Planning exercise.

In terms of **budget**, Option 1 would represent a continuation of the current distribution of budget between KIC activities, the EIT-driven activities and the EIT administrative budget, i.e. 97% of the budget for the grants to KICs and the rest divided between the EIT-driven activities and its administrative budget. No changes would be made to the EIT staff provisions and duration of staff contracts.

	2021	2022	2023	2024	2025	2026	2027	Total
Admin budget	6	7	7	7	7	7	7	**48**
KIC-related expenditure	401	388	424	427	424	435	431	**2930**
EIT-driven activities	2	2	3	3	4	4	4	**22**
Total EIT Budget	**409**	**399**	**437**	**441**	**439**	**446**	**444**	**3000**

Table 6: Indicative budget under option 1 (MEUR); own illustration

5.4.2. Option 2

Option 2 builds on the baseline. In addition to the essential adjustments necessary to align with the proposal for Horizon Europe, (=baseline), it adopts a number of technical measures to enhance the functioning of the EIT. **Synergies** with the proposal for Horizon Europe will be similar to those under the baseline.

Option 2 introduces **a new EIT action** in order to address its specific objectives in the fields of education and regional outreach. The main defining feature of this action would be the direct support action for entrepreneurial and innovation capacity development of

84 EIT InnoEnergy, EIT Digital, EIT Climate-KIC
85 EIT Food, EIT Health, EIT Raw Materials, EIT Manufacturing, EIT Urban Mobility

Higher Education Institutions (HEIs). In addition, complementarities with other EU level programmes (e.g. ERDF, Erasmus+) or national programmes and funding instruments would increase.

The EIT would adapt its **funding model** and implement a gradually decreasing EIT co-funding rate, as described in section 5.2. Another important aspect of this Option would be the introduction of a long-term planning perspective of innovation activities (multiannuality). In order to address **technical issues** hampering its functioning, the EIT would also adapt its governance model and improve openness, transparency and collaboration.

The **Regional Innovation Scheme** will be further strengthened by integrating it fully in the KIC Business Plans and making it a core activity of the KIC with an increased budget.

A substantial number of stakeholders in the Horizon Europe consultations referred to the role of the EIT in Horizon Europe in bridging R&I instruments with support to higher **education**.[86] The EIT will simplify the EIT labelling process, extending it to a wider lifelong learning perspective and to external quality assurance.[87] In order to address its specific objectives, the EIT would launch **a new support and coordination action** aimed at supporting the **development of entrepreneurial and innovation capacity of HEIs**. This action will build on HEInnovate, a proven concept developed by the Commission and OECD.

HEInnovate is a policy framework of the Commission and the OECD launched in 2013, that offers (1) a methodology for HEIs to develop their innovation and entrepreneurial capacities and (2) a methodology to Member States to review their higher education systems. To date more than 1000 HEIs have used HEInnovate and a number of Member States have hosted HEInnovate policy reviews by OECD.[88] This demand suggests that there is a strong need in HEIs to develop their innovation and entrepreneurial capacity in a structured and systematic way. However, tn the current programming period (2014-2020) the use of HEInnovate is not linked to any funding support.

Given its experience in the knowledge triangle integration that directly supports innovation capacity development the EIT is uniquely positioned to implement an action aimed at supporting the development of entrepreneurial and innovation capacity of HEIs. The action would integrate the HEInnovate methodology of the Commission and the OECD and would fund entrepreneurial and innovation capacity development in HEIs. The new support and coordination action would include the following elements:

86 E. Griniece and M. Muizarajs (2018), Synthesis of stakeholders input for Horizon Europe, p. 62.
87 Such an approach could build on e.g. the 'European Innovation Associate' pilot (DG GROW) –a test to establish a SME-driven scheme to attract foreign recent PhD graduates (or PhD graduate returnees to their countries of origin) to R&I posts in small innovative enterprises, or the toolbox initially developed for the EC and now operated by the 'European Innovation Management Academy' in Düsseldorf, Germany (www.improve-innovation.eu)
88 Five Member States (NL, IE, HU, PL, BG) completed an OECD review and four (IT, AT, CR, RO) are currently undergoing one.

- Support the entrepreneurial and innovation capacity development in HEI in the following HEInnovate dimensions: Leadership and Governance; Digital Transformation; Organisational Capacity; Entrepreneurial Teaching and Learning; Preparing and Supporting Entrepreneurs; Knowledge Exchange; Internationalisation; and Measuring Impact.
- Transferring innovation and entrepreneurial know-how between HEIs, by networking partners established in one region with HEIs established in other regions;
- Bringing innovative HEIs from across the EU closer to KICs stakeholders communities and the EIT RIS stakeholder communities and connect local HEIs to European value chains in which KICs are involved;
- Entrepreneurial and innovation capacity building services - including business support services, entrepreneurial education;
- Support synergies and alignment between different EU programmes contributing to innovation capacity;

Table 7: Overview of new action supporting the entrepreneurial and innovation capacity of HEIs; own illustration

The EIT would implement the aforementioned action through annual calls and a dedicated budget. The calls would support collaborative projects comprising consortia of a minimum of three HEIs.[89] The EIT would provide specific guidance, expertise and coaching to participating HEIs and develop evidence on best practices and share it with the wider innovation community.

Bridging **regional disparities** will be a significant part of the new action as the EIT would particularly target HEIs from modest and moderate innovator countries to help them strengthen the regional innovation footprint and smart specialisation strategies of their HEIs. The EIT would allocate at least 25% of the overall budget of the action (around EUR 420 million) to projects led by a partner from a modest or moderate innovator country. The open nature of the calls (open to all HEIs) and the widening dimension will reach out to as many institutions from modest and moderate innovator countries as possible.

Within the proposed budget of Euro 3 billion and based on the introduction of a co-funding model that aims to increase private investment from KIC, Option 2 would see **two new KICs** launched within the timeframe of 2021-2027, the first on Cultural and Creative Industries and a second on a theme to be decided by taking into account the future Strategic Planning Process. In line with the EIT Regulation, the first three KICs (launched in 2010) would cease to receive EIT financial support after 2024.

89 The specific rules for setting up consortia will be in compliance with the relevant rules of Horizon Europe programme.

The more efficient funding of KIC through the decrease of EIT co-funding will result in the EIT being able to launch EIT-driven activities within its proposed **budget**. The distribution of budget between KIC activities, EIT-driven activities and EIT administrative budget would be as follows: 83% of the budget for the grants to KICs and the rest split between EIT-driven activities (15%) and administrative budget (1.8%).

	2021	2022	2023	2024	2025	2026	2027	Total
Admin budget	10	10	10	10	10	10	10	**70**
KIC-related expenditure	342	335	367	370	366	374	360	**2513**
EIT-driven activities	19	36	56	66	79	76	85	**417**
Total EIT Budget	**371**	**381**	**432**	**445**	**454**	**464**	**454**	**3000**

Table 8: Indicative budget under option 2 (MEUR); own illustration

5.4.3. Option 3

Similar to option 2, option 3 builds on the baseline, adopts essential adjustments necessary to align with the Horizon Europe proposal and develop **synergies** with it, and includes the same co-funding model and technical measures to enhance the functioning of EIT as option 2.

Option 3 differs from option 2 in that it would introduce **a new activity** of setting up a EIT Hub in each Member States in order to address the limited impact of the EIT's regional outreach activities, instead of the support and coordination action aimed at supporting the development of entrepreneurial and innovation capacity of HEIs proposed in option 2.

The EIT Hubs in the Member States would build on and gradually absorb the current **Regional Innovation Scheme** of the EIT. The EIT would directly implement the EIT Hubs to foster knowledge triangle integration, for example, via support for collaborative projects on a smaller scale than KICs. The projects would include partners from **higher education**, research and business. The EIT Hubs would also serve as a broker between the existing KICs and the needs of the local innovation community of the Member States and regions.

The EIT Hubs would ensure pro-active engagement with beneficiaries, development of local ecosystems as well as provision of services and small-scale grants to the beneficiaries, based on transparent criteria. They would also facilitate the management of knowledge triangle projects targeting regions where they operate. The EIT Hubs would serve the following functions:

- Brokerage between KIC activities and local partners and support cross-KIC collaboration in connecting to local partners
- Bringing the KICs stakeholders communities and the RIS stakeholder communities closer together, as well as support collaboration between European Structural and Investment Funds (ESIF) managing authorities and KICs and connect stakeholders to European value chains in which KICs are involved
- Managing annual grants in support of knowledge triangle integration for collaborative projects, including business support services, entrepreneurial education;
- Transferring expertise and know-how between KIC and regions, by networking partners established in one region with EIT Hubs established in other Member States;
- Establishing links between local actors including innovation agencies, KICs and related R&I Initiatives, notably Strategic Value Chains, European partnerships, other EU-funded initiatives like Digital Innovation Hubs;

Table 9: Overview of EIT Hubs activities; own illustration

The EIT would manage the Hubs in all Member States[90]. The Hubs would support small-scale knowledge triangle integration projects between at least one HEI, one business and one research organisation from at least 3 countries8989. A particular emphasis will be put on developing effective collaboration between HEIs and businesses as this is usually the weakest link in innovation projects. The EIT would provide specific guidance, expertise and coaching to participating organisations and develop evidence on best practice and share it with the wider innovation community. The EIT would allocate around EUR 800 million of the total budget to this action.

In terms of budget implications, Option 3 would foresee 70% of the budget for the grants to KICs and the rest would be split between EIT-driven activities (27%) and administrative budget (3%). Only one new KIC would be launched during the next programming period, on the theme of Cultural and Creative Industries. In line with the EIT Regulation, the first three KICs launched in 2010 would cease to receive EIT financial support after 2024.

	2021	2022	2023	2024	2025	2026	2027	Total
Admin budget	8	12	12	13	14	15	16	**90**
KIC-related expenditure	290	281	307	308	307	311	298	**2100**
EIT-driven activities	37	76	111	129	139	158	160	**810**
Total EIT Budget	**334**	**361**	**426**	**447**	**464**	**489**	**477**	**3000**

Table 10: Indicative budget under option 3 (MEUR); own illustration

90 In Hungary as the EIT wwouldassume this role through its headquarters based in Budapest

5.4.4. *Inputs of options*

The following table summarises the inputs to the presented options:

	Option 1 (baseline)	Option 2	Option 3
EIT administrative budget (mio EUR)	48	60	90
EIT funding to KICs (mio EUR)	2930	2500	2100
Maximum number of KICs active during SIA	10	10	9
Budget for EIT-driven activities (mio EUR)	22	440	810
EIT Hubs in EU Member States[91]	0	0	26

Table 11: Inputs of discussed options; own illustration

5.4.5. *Key features of options*

The following table summarises the key features of the presented options:

Issue	Option 1 (baseline)	Option 2	Option 3
Number of KICs	• 8 existing KICs • 2 new KICs	• 8 existing KICs • 2 new KICs	• 8 existing KICs • 1 new KIC
Alignment with Horizon Europe	• synergies with partnerships, missions, EIC	• Same as option 1	• Same as option 1
Technical issues (openness and transparency; governance)	• No changes	• adaptation of governance • measures to increase openness and transparency	• Same as option 2
Funding model	• No changes	• New funding model based on gradually decreasing co-funding rate	• Same as option 2
New actions addressing problems on limited impact of education and regional outreach	• None	• New action to support actions for entrepreneurial and innovation capacity development of HEIs • Strengthening of Regional Innovation Scheme • Strengthening of EIT Label	• New action to create EIT Hubs in Member States to support collaborative small scale projects for knowledge triangle integration • Strengthening of EIT Label

Table 12: Key features of options, own illustration

91 Hubs would operate in all Member States except Hungary and the United Kingdom following its expected withdrawal in 2019.

6. IMPACT OF POLICY OPTIONS

The following section contains a qualitative and quantitative assessment of the main economic, societal and innovation impacts identified in areas where the options are likely to have effects. The projections of future performance are based on past data reported by the EIT using existing performance indicators. The accuracy of forecasts based on historical data is limited but considered the best method to assess the results of the KICs. While undertaking such an assessment ex-ante, it is important to remember that the EIT operates in the dynamic and evolving innovation landscape. The novel character of the EIT and the knowledge triangle integration model suggest that its impacts are gradually evolving and can only be demonstrated in the long-term.

6.1. Option 1: Baseline

The EIT **would continue to support KICs** and build innovation ecosystems across the EU. The first three KICs, launched in 2010, will cease to receive an EIT grant after 2024 (in line with the maximum duration for support provided by the EIT to KIC) while one new KIC would be set up in 2022 and a second in 2025.

Synergies and complementarities with other EU programmes and funding instruments would increase due to the closer alignment with Horizon Europe, and in particular Pillars II and III. Consequently, the overall effectiveness in spending public money on innovation would improve although its quantification is not available. The presence of the EIT will remain **concentrated** in a limited number of Member States (see below). More than half of the EIT co-location centres (CLC) are placed in 6 countries, while only six CLCs out of 51 in total are located in moderate and modest innovator countries.

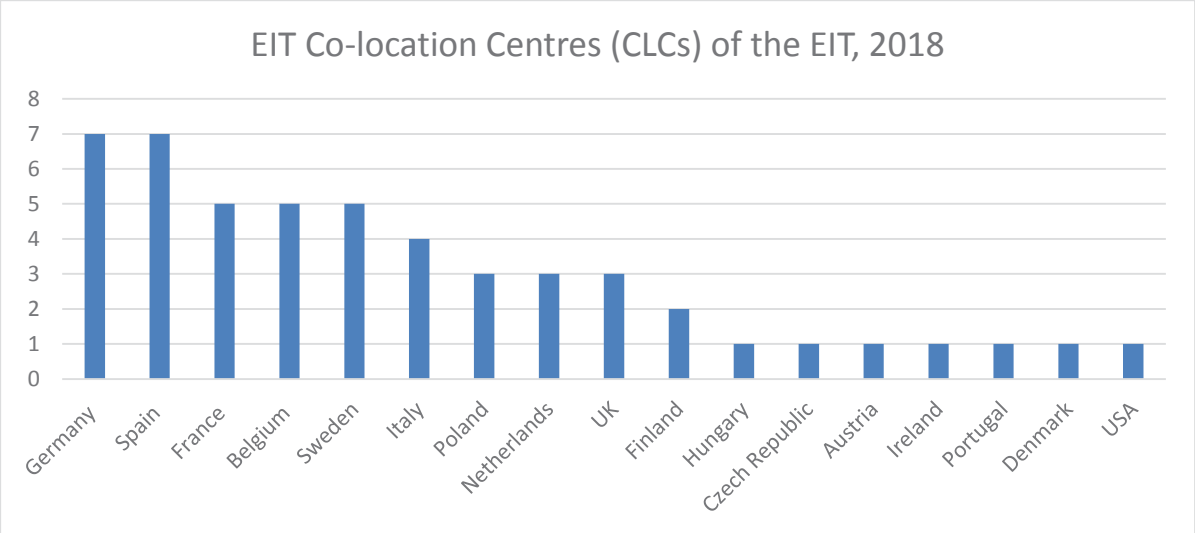


Figure 9: Co-location centres of the EIT as of 2018; EIT data

In the absence of effective transparency, openness and collaboration measures, activities of the EIT would remain limited to the KICs' partners. No significant diversification of the partnership is expected in the absence of a change in the approach towards openness and transparency.

No enhancement of SME participation is expected in this option as there would be no particular incentives for SMEs in place.

Concentration of funds would be unlikely to change, in line with the current trends, with around 73 % of the total budget concentrated in partners from five countries (see problem definition, page 16).

The establishment of the EIT with the KICs and their co-location centres were directly responsible for approximately 430 FTE direct jobs in 2016 (with a portfolio of 5 KICs, two of which only starting) across the EU.[92] Based on this data, and a portfolio of 10 mostly mature KICs between 2021-2027, it is estimated that the number of equivalent FTE in the EIT and KICs would reach 1000.

Data reported from the three first-wave KICs, suggests that they have supported start-ups, scale-ups and business ventures that have created around 6,100 jobs[93] by 2016. Building on a portfolio of up to 10 KICs between 2021 and 2027, it is assumed that the number of indirectly created jobs will more than double, i.e. around 12,000 jobs will be indirectly created.

The structure of the KIC with regard to the type of partners and their overall weight would not be expected to change.

Around 300 HEIs would continue to be part of the EIT Community as KIC partners, with some fluctuations over the years due to the cessation of the EIT grant to the first generation of KICs after 2024 and the set-up of two new KICs during the Horizon Europe programming period.

With additional and more mature KICs, opportunities for knowledge transfer would increase proportionately. Based on past performance, it is estimated that between 2021-2027 around 3500 new products, services or processes would reach the market.[94]

It is estimated that over 2021-2027 around 10,000 students would participate in EIT **education** activities through the EIT label and adjacent activities, which would equip them with solid entrepreneurial and innovation skills. It is likely that a part of them would become entrepreneurs and attract economic activity to regions where they are based, meaning agglomeration effects would continue. Currently, the ratio of student-to-entrepreneur in the EIT is around 1.8%, meaning some 200 start-ups could be created by students (8 start-ups created by EIT students in 2017). Together with the start-ups created as a result of KIC innovation projects, the number of start-ups supported by the EIT would reach almost 400.

The impacts described above would be visible across all the sectors in which KICs operate, though to different extents: the most significant impacts would be observed in the areas of health, raw materials, food, urban mobility, and added-value manufacturing as the KICs addressing these priority fields would all reach maturity during 2021-2027. The impacts of the first generation of KICs (EIT Climate-KIC, EIT InnoEnergy and EIT Digital) would be expected to remain. The impacts of new KICs would be visible mainly in the field of Cultural and Creative Industries – to be launched in 2022. The impact of the second KIC, if launched as expected around 2025, would be marginal during the Horizon Europe programming period.

92 EIT (2017) Our Impact, p. 4, available at https://eit.europa.eu/sites/default/files/11983-eit-2017_our_impact_from_2010_to_2016.pdf
93 Ibid.
94 See output table at the end of this section

Students participating in EIT education activities would continue to acquire entrepreneurial competences, and have high employability rates [95]. However, the systemic impact of EIT educational activities, i.e. beyond the direct KIC partners and beneficiaries, would remain restricted due to the lack of external quality assurance and limited visibility of the EIT Label.

There would be no changes in the funding model. The yearly reporting of the KIC complementary activities, both in the Business Plans and in the financial reports submitted by the KICs would continue to add significant administrative burden with no added value. The absence of clear rules for external co-funding will result in missed efficiencies and lost opportunities to establish stronger incentives for financial sustainability.

Option 1 would mean a continuation of EIT administrative expenditure at current levels (EUR 48 million over 7 years) in line with the overall budget increase of the EIT over the programming period of seven years arising from staffing. Within this option, the staff provisions of the EIT and duration of staff contracts would not be amended.

6.2. Option 2

The EIT would continue to support KICs and build innovation ecosystems across Europe. The key results of KIC activities (EIT Label graduates; start-ups created by EIT; new products and services on the market) would be broadly similar to the baseline given that the number of new KICs will be the same. However, there would be a number of efficiency gains resulting from the improvements related to the technical issues and the introduction of a co-funding model.

Establishing clearer implementation measures and tools regarding openness, transparency and collaboration would facilitate access to KIC and CLCs[96] and improve the interaction with partners. This would be particularly the case for partners from modest and moderate innovator countries or SMEs. This would increase the likelihood of new CLCs in modest and moderate innovator countries for both existing and new KICs. While difficult to estimate an absolute result, it is likely that the number of the CLC in modest and moderate innovator countries will at least double.

The integration of the Regional Innovation Scheme in the KICs multi-annual strategies and Business Plans would increase the effectiveness of EIT's regional outreach. Assigning a higher budget to the RIS activities from the current average of 4.3% to at least 10% will also increase their impact. Stronger impact would be expected to materialise in those countries and regions that are moderate and modest innovators as the number of organisations engaged with KICs would grow and their activities would increase due to increased knowledge and technology transfers linked to a stronger EIT regional focus.[97]

Improving the functioning of the EIT governance would have a generally positive effect for the function of the EIT and the KIC in terms of effectiveness and efficiency.

95 See Annex 4

96 EIT RIS innovation hubs could be seen as embryonic CLCs in RIS-eligible countries, directly sharing and disseminating KIC knowledge and know-how to local knowledge triangle stakeholders.

97 Liang J. and Goetz, S. (2018), "Technology intensity and agglomeration economies", *Research Policy* 47, pp. 1990–1995; see also: Apa, Noni, Orsi and Sedita (2018), "Knowledge space oddity: How to increase the intensity and relevance of the technological progress of European regions", in *Research Policy* 47, pp. 1700–1712

The change in the funding model would mean annual reporting of the KIC complementary activities would no longer be necessary, resulting in significant reduction of administrative burden. The information obligations arising from the KIC grant agreements (i.e. declaration of costs of associated activities) with its intention to show the financial commitment of KIC partners and its leverage effect will become redundant with the introduction of the new co-funding model for KICs. The alleviation of such a requirement on the side of the EIT as well as KICs and their partners will ease their resources for other tasks and improve the efficiency of the KICs operations.

The introduction of explicit conditions for co-funding will lead to stronger private investment and external involvement. Specifically, between EUR 1500 and 1800 million in co-funding is expected to be generated. This would reflect the preferences of the majority of stakeholders in the OPC who expressed their support to co-funding. Commitment from partners would further increase the likelihood of KICs to achieve financial sustainability in the long-run as the number of their stakeholders will grow. KICs are expected to adjust to the new funding model as most of them already have significant co-funding. Greater openness and stronger performance monitoring by the governing board would contribute to raising the overall efficiency of the KIC model. In the case of difficulties for some KICs (for example the first generation that will stop to receive an EIT grant after 2024), the EIT Governing Board could introduce transitory measures.

The introduction of a long-term planning perspective of innovation activities and the move away from the current annual granting scheme (annuality) would imply that KICs would offer greater legal and financial security for KIC partners. It would also consolidate the innovation activities in line with the multiannual strategies adopted by the KIC. It would ease the administrative burden by reducing the annual reporting and would facilitate the assessment of the KIC performance over the long term. Generally, it would help to ensure business continuity.

The number of start-ups generated would not necessarily increase in linear terms in 2021-2027, compared to the baseline. However, the higher private investment and external participation would improve the general quality of new business creation. While difficult to quantify, some efficiency gains are expected in terms of survival rates of start-ups and higher commercialisation of ideas and technological maturity (TRL[98]).

Compliance and implementation costs arising from the adaptation of the funding model would be expected to be higher for those KICs and their partners that would have to adjust their established processes and operation systems, and relatively low for those that are at the starting phase and establishing their operation modes. However, given that most KICs already attract co-funding, the measure would likely increase on average the performance across KICs, as those lagging behind would need to accelerate their efforts in attracting co-funding and catch up with best practice or risk correction measures requested by the EIT Governing Board.

The impacts described above will be visible across all the sectors that KIC operate in with the most significant impacts in the areas of health, raw materials, food, urban mobility, and added-value manufacturing as the KICs addressing these priority fields will all reach maturity during 2021-2027.

98 Technology Readiness Level (TRL) – a method of estimating technological maturity and capability.

Impact of the new Action on supporting the entrepreneurial and innovative capacity of HEIs

On top of the KIC results, the impact of the EIT would be distinctive as a result of the new actions that the EIT would launch to support the innovative capacity of HEIs. The new EIT actions would spread best practice and help create a community of entrepreneurial HEIs across institutions, disciplines, countries and regions[99]. The social impact of the entrepreneurial transformation of higher education through this measure would be reflected by the involvement of staff, students and institutions. Providing funding for innovation capacity development of HEIs is the most popular suggestion among the OPC respondents in order to achieve the educational policy objective for the EIT.

As a result of the action, around 450 HEIs and more than 20,000 students would be expected to participate in HEInnovate-driven in capacity development actions. Entrepreneurial and intrapreneurial[100] activities in the participating HEIs would lead to higher levels of economic activity, particularly in modest and moderate innovator countries, given the open nature of the annual calls and the earmarked budget (25% of the action budget would be allocated to projects led by partners from modest and moderate innovator countries). The illustration below provides an overview of the key assumptions behind this actions.

- Total budget of this action is around 420 Million, or 60 Million per year
- Annual calls for projects including at least 3 HEIs and an average budget of max EUR 3 million per project
- Each HEI will involve at least 50 students in the capacity building action
- 23 projects per year leading to ~150 projects in total (2021-2027)
- 150 projects with at least HEIs each means 450 HEIs (involving at least 50 students each) means at least 22500 students (2021-2027)
- At least 25% of projects would directly involve partners from moderate and modest innovator countries, i.e. 25% of 450 HEIs, or ~110 HEIs
- Overall participants from moderate and modest innovation countries, i.e. 200 (current RIS) and 200 (future RIS) and at least 110 (HEIs projects)

Table 13: Assumptions behind new action supporting the innovative capacity of HEI; own illustration

It is realistic to assume that at least 15% of all EU HEIs would be reached through the HEInnovate capacity development actions (450 in total over 7 years from around 3300 HEIs in the EU) over the 7 years. The impacts would be visible in both economic and social terms through teaching, research, and entrepreneurial activities.[101] More

99 E.g. HEinnovate country reviews which demonstrate the importance and the challenge for HEIs to develop their entrepreneurial and innovation capacity. The reports show that pioneering initiatives emerge in a number of HEIs, but need to be broader, more systematic and taken forward by HEI leaders in collaboration with key stakeholders. The reviews are available at www.HEInnovate.eu.

100 Intrapreneurship is the act of behaving like an entrepreneur while working within a large organisation.

101 Jacob, M et al. (2003) : "Entrepreneurial transformations in the Swedish University system: the case of Chalmers University of Technology", in: *Research Policy* 32, pp. 1555–1568. Also Guerrero, M., Cunningham, J. and Urbano, D., (2015), "Economic

specifically, there is evidence that scientific productivity is positively associated with entrepreneurial effectiveness so participating HEIs could be expected to increase their scientific production levels.[102] Finally, raising awareness about the entrepreneurial capacity of an HEI is crucial because perceiving an HEI as having a low or high entrepreneurial capacity has an important effect on whether an academic engages in entrepreneurial activities, thus influencing the overall entrepreneurial aptitude of academics.[103]

Together with the new action, the impact of the existing EIT Label, which is awarded to the KIC education programmes, would increase via stronger quality assurance mechanisms including external reviews. This would positively influence the recognition of the label outside the EIT community.

Synergies and complementarities with other EU programmes and funding instruments would increase due to closer alignment with the proposal for Horizon Europe, and in particular Pillars II and III[104]. In addition, strong cross-over synergies and complementarities would be expected to emerge between the Horizon Europe and the Erasmus+ programme as a result of the scaling up of the action supporting the innovation capacity of HEIs by the EIT. In budgetary terms, Option 2 would mean a re-balancing of the expenditure of the EIT back to around one-third of the total budget allocated to education (currently, only 17% of the KIC-related expenditure are spent on education, this would increase to around 31% with the proposed action under Option 2).

Compared to the baseline scenario, Option 2 would mean an increase in EIT administrative costs (EUR 70 million compared to the EUR 48 million baseline) in line with the overall budget increase of the EIT over the programming period of seven years arising from staffing and setting up a stronger capacity and expertise in the EIT. This increase appears commensurate with the overall growth of activities and responsibilities of the EIT. Within this option, the staff provisions and duration of staff contracts of the EIT would be aligned with those of other agencies in order to ensure the continuity of the EIT operation.

6.3. Option 3

The EIT would continue to support KICs and build innovation ecosystems across Europe. Within the given budget distribution of this option only one KIC could be launched (in 2022). The key results of KIC activities (EIT Label graduates; start-ups created by EIT; new products and services on the market) would be broadly similar to Options 1 and 2.

Impacts resulting from the introduction of clearer rules for transparency, openness and collaboration would be similar to those under Option 2. The effect from the adjustments in the governance of the EIT would be similar to those under Option 2 with the exception of introducing relevant governance provisions for the implementation of the new Action

impact of entrepreneurial universities' activities: An exploratory study of the United Kingdom", in *Research Policy*, Volume 44, Issue 3, April 2015, pp. 748-764

102 Van Looy, B., (2011), "Entrepreneurial effectiveness of European universities: An empirical assessment of antecedents and trade-offs", in *Research Policy* 40, pp. 553–564.

103 Kalar, B. and Antoncic, B., (2015) "The entrepreneurial university, academic activities and technology and knowledge transfer in four European countries", in *Technovation* 36-37, pp. 1–11.

104 E.g. it is expected that EIT actions will better contribute to 35% of the overall financial envelopes to climate objectives within the Horizon Europe.

described below. Compliance and implementation costs arising from the adaptation of the funding model would be similar to those under Option 2.

Impact of new EIT Hubs-related action

The most significant differences in terms of impact under Option 3 would be linked to the creation of the EIT Hubs.

This option would have a high impact on the management and governing bodies of the EIT. It would have significant implications in terms of human resources, budget and task allocations. High administrative overhead costs for the EIT would arise from setting-up, staffing and developing EIT Hubs, ensuring quality of services provided, allocation of funds to these hubs as well as reporting to the EIT. The establishment of the EIT Hubs would mean that staff would need to be appointed on a permanent basis to maintain them. Assuming that each Hub would be staffed by a minimum of five persons (a head of the hub; three account managers for education, innovation, and entrepreneurship; and a communication officer), around 130 positions would have to be managed by the EIT structure, in addition to the resources needed at the EIT itself. This means that the EIT staff needs over the period of 2021-2027 would be expected to more than double compared to Option 2.

- Total budget of EIT Hubs action over 7 years = around 810 Mio
- Set up and maintenance of 26 EIT Hubs with average administrative cost of EUR 600 000 per year x 7 years = around EUR 110 million;
- Operational budget over 7 years = EUR 700 million (annual budget = EUR 100 million);
- Each Hub to run annual projects promoting knowledge triangle activities with at least 1 HEIs, 1 Research and Technology Organisation and 1 business and an average volume of max EUR 3 million per project; at least 20 students to be involved per project;
- Total number of projects over 7 years: ~ 230;
- Total number of organisations participating in EIT Hubs activities: ~ 700
- 60% of results should be traced directly to moderate and modest innovator countries
- 700 x 60% = c. 450 institutions involved in moderate and modest innovator countries
- Overall participants from moderate and modest innovation countries, i.e. 200 (current RIS) + 200 (future RIS) + 450 (HEI projects)

Table 14: Assumptions behind new action on EIT Hubs; own illustration

The implementation of the EIT Hubs would need to take place gradually and would require strong efforts at the beginning for their establishment and continuous efforts for their coordination The substantial time lag between putting operational structures in place, implementing tasks in regions and seeing the overall effects would significantly

influence the perceived success of Option 3, particularly concerning the timeliness of impact.

Knowledge triangle integration in regions would increase as a result of operations of the EIT Hubs though the annual calls. In particular, the cooperation with education and training in the regional innovation ecosystems would improve, reflecting the positive operational experiences with the KICs. The EIT hubs would primarily serve as technology transfer hubs connecting businesses and knowledge providers and ensuring regional outreach of successful KIC activities and experiences already existing in agglomeration economies.

A moderate reduction in the skills gaps and skills shortages would be expected in the areas of active operation of EIT Hubs. The relative number of partners from modest and moderate innovator countries as compared to leading innovators in the regional ecosystem would increase. Job creation and revenue growth in local innovation ecosystem would increase marginally as a result of the activities of the EIT Hubs.

Interaction between agglomeration economies and the proposed new EIT Hubs[105]

Agglomeration economies, in a general sense, refer to productivity improvements accruing to the co-location of economic activity, typically within, and near cities. Economically useful innovation is centred on corporate functions such as R&D which are typically co-located with other high-value adding activities such as marketing, design, or IT services. Economic analysis, most recently on global value chains (OECD 2013; Belderbos et al., 2016), confirms that these corporate activities thrive in cities, where they benefit from large, dynamic pools of highly qualified professionals and a dense network of complementary services, including public research. Such effects are clearly visible in the KICs.

However, excellent research and innovation do not take place only in cities. Converging evidence (Varga et al., 2013; De Backer et al., 2017) suggest that the geographical distribution of business-driven research differs considerably to that of public research-driven science and innovation. There is evidence to suggest that agglomeration is not particularly relevant for the creation of this latter type of knowledge (Bonaccorsi and Daraio, 2005; Varga et al., 2013). Therefore it can be assumed that regional outreach activities of the EIT such as those proposed by EIT Hubs can help connect businesses and public knowledge providers irrespective of location.

Table 15: Agglomeration economies and EIT Hubs, an overview of arguments

As in option 2, synergies and complementarities with other EU programmes and funding instruments would increase due to closer alignment with the proposal for Horizon

105 Based on literature review of: OECD (2013), Supporting Investment in Knowledge Capital, Growth and Innovation, OECD Publishing, Paris; De Backer, K., Destefano, T. and Moussiegt, L. (2017), "The links between Global Value Chains and Global Innovation Networks: An Exploration", OECD Science, Technology and Innovation Policy Papers, No. 37, April; Belderbos, R., Sleuwaegen, L., Somers, D. and De Backer, K. (2016), "Where to Locate Innovative Activities in Global Value Chains: Does Co-location Matter?", OECD Science, Technology and Industry Policy Papers, No. 30, OECD Publishing, Paris.; Bonaccorsi, A. and Daraio, C. (2005), "Exploring size and agglomeration effects on public research productivity", Scientometrics, Vol. 63, pp. 87-120; Varga, A., Pontikakis, D. and Chorafakis, G. (2014), "Metropolitan Edison and cosmopolitan Pasteur? Agglomeration and interregional research network effects on European R&D productivity", Journal of Economic Geography, Volume 14(2), pp. 229–263.

Europe, and in particular Pillars II and III. In addition, specific synergies would be expected to emerge with relevant regional innovation policies such as smart specialisation strategies or the European Regional Development Fund (ERDF).

Option 3 would mean an increase in EIT administrative costs (EUR 90 million compared to EUR 70 million in Option 2 and the baseline value of EUR 48 million), primarily in order to manage the significant coordination and transaction costs incurred by the launch of a new Action, the EIT Hubs. Within this option, the staff provisions and duration of staff contracts of the EIT would be aligned with those of other agencies in order to ensure the continuity of the EIT operation.

6.4. Outputs of options

The following tables present a summary of the outputs of the presented options:

	Option 1 (baseline)[106]	Option 2[107]	Option 3[108]
# of HEI involved in EIT activities[109]	300	750[110]	530[111]
# of students involved in EIT activities[112]	10000	30000[113]	14600[114]
# of businesses involved in EIT activities[115]	800	950	1030
# of start-ups supported by EIT[116]	400	680	490
# of products, services or processes on the market[117]	3500	4300	4100
KIC partners' co-funding in EUR million (2021-2027)[118]	500	1800	1520
# of participating organisations from moderate or modest innovator countries[119]	200	500	850

Table 16: Outputs of options; own projections based on past EIT performance

106 All figures in baseline refer to projections based on past performance and derive from the performance achieved by the KICs in 2013-2017.
107 See Table 12 on the new action under option 2 for detailed assumptions.
108 See Table 13 on the new action under option 3 for detailed assumptions.
109 HEIs refer to Higher Education Institutions involved the EIT educational activities. Baseline figure includes KIC partners.
110 Figure includes baseline + all HEIs to participate in the new action launched under option 2.
111 Figure includes baseline + all HEIs to participate in the new action launched under option 3.
112 Baseline includes students participating in EIT Label and related activities.
113 Figure includes students participating in the new action launched under option 2. It is assumed that 150 students are involved in each project.
114 Figure includes students participating in the new action launched under option 3. It is assumed that 20 students are involved in each project.
115 Baseline includes business partners in KICs. Option 2 and 3 figures include, respectively business partners in actions under Options 2 and 3.
116 Baseline includes start-ups supported by EIT through KICs. Option 2 and 3 figures include, respectively start-ups emerging from actions under Options 2 and 3. Under Option 2 at least 2 Start-ups are expected to emerge from each supported project, i.e. 280 start-ups over 7 years. Under Option 3 it is assumed that 1 start-up is created per 3 projects as the focus is on knowledge triangle integration more generally.
117 Baseline includes new products, services or processes brought to the market through KICs. Option 2 and 3 figures include, respectively business partners in actions under Options 2 and 3. It is assumed that at least 3 new products/services/processes/ideas are brought to the market as a result of each start-up, i.e. 840 new solutions over 7 years
118 Baseline includes co-funding attracted at a rate of 20% (slightly higher than today).
119 Baseline includes the number of EIT RIS partners. Option 2 and 3 include the expected number of additional partners participating in the actions supported by those options.

7. HOW DO THE OPTIONS COMPARE?

The following chapter summarises the evidence and arguments outlined above and presents the effectiveness, efficiency and coherence of the Options. It presents the risks associated to the Options.

	Option 1	Option 2	Option 3
Effectiveness	**0**	++	++
Objective 1: KIC funding	No particular effect as business as usual will continue.	Introduction of co-funding rates will increase long-term impact of investment and support the financial sustainability strategies.	Identical to Option 2
	0	++	++
Objective 2: Regional outreach	No particular effect as business as usual will continue.	New action supporting HEIs will positively impact institutions from countries so far not reached by the EIT. Widening dimension of the action will further support regional outreach.	Actions addressing the regional disparities in innovation capacity would be implemented through the EIT hubs. The impact is expected to be highest in regions from countries that are moderate and modest innovators.
	0	+	++
Objective 3: HEIs innovation capacity	No particular effect as business as usual will continue.	New EIT actions would create a structuring effect supporting the transformation of the HEI. Increased impacts through engagement of a high number of organisations and students.	Spill-over effects expected from Knowledge Triangle Integration projects supported by the Hubs due to the participation of at least one HEI per project.
	0	++	+
Objective 4: Other technical issues	No particular effect as business as usual will continue.	Significant improvements and adjustments resulting from adapting the technical issues.	Identical to Option 2.
	0	++	++

Efficiency	0	++	+
Cost-benefit of managing KICs	No particular effect as business as usual will continue.	Higher cost-effectiveness due to the establishment of co-funding rates, clearer measures for openness and collaboration. Reduction of administrative burden for KICs.	Identical to Option 2
	0	++	++
Cost of new actions	Not applicable	Low additional administrative costs due to use of established shared services (procurement, project management, IT, legal).	Increase in the capacities of the EIT, its staffing levels as well as the overhaul of its operational systems to manage EIT Hubs will incur significant costs. Administrative burden on the EIT and its regional operational hubs will increase. Given the ratio of spending moving towards the EIT hubs operation and their relatively marginal role in contributing to the objectives, the overall efficiency of spending will decrease.
	0	-	--
Administrative burden	Significant as no mitigations measures are taken	Decrease in the administrative burden due to introduction of co-funding model and clearer measures on openness, transparency With regard to new action supporting HEIs, no significant burden as shared services of the EIT will be used.	Identical to Option 2. With regard to EIT Hubs, administrative burden is likely given the need to establish new structures.
	0	++	+

Coherence	0	++	+
Horizon Europe coherence	Alignment with European Partnerships; EIC; Strategic Planning Process.	Similar to baseline. High coherence with Horizon Europe mandate for the EIT in terms of education.	Similar to baseline. Role of EIT in tackling regional disparities. However, possible ambiguities between excellence and cohesion principles.
	0	++	+
Synergies with other EU programmes or policies	No particular effect as business as usual will continue.	Strong synergies with other Commission initiatives (e.g. HEInnovate, smart specialisation strategy).	Strong synergies through alignment with smart specialisation strategies via EIT Hubs.
	0	++	++

Table 17: Comparison of options. Key: The Options are rated according to their impact. Policy Option 1 (baseline scenario) is set to zero and the impacts of the rest of the policy Options on the stated/foreseen KPIs are expressed as net changes compared to it, i.e. + positive effect, ++ significantly positive effect, - negative effect and – significantly negative effect.
Source: own analysis

7.1. Risks associated with policy options

There are risks associated with all options that are set out in Table 17 below. The analysis is conceptual and based on qualitative assessment. It covers economic, consumer welfare, environmental quality and health risks. Due to the nature of the policy there will not be any particular health or environmental risks. Risks to consumer welfare are also considered to be low as it is deemed unlikely that the options will reduce the availability of goods or services, or make those available significantly more expensive. There are three principal economic risks:

Risk of closed ecosystems – i.e. the establishment of KICs as integrated legal entities leads to collusive behaviour between partners involved in the KIC. Such risk has a low probability with a potential moderate impact on economic welfare. A related risk is that EU actions in this area could distort markets if EU funds simply subsidise activities which would have occurred anyway and thus 'crowd out' private sector investment. This risk is estimated as high with a moderate impact on net economic welfare. Due to these dead-weight risks the overall risk of market distortion is moderate with a potential moderate impact on economic welfare. The risk can be mitigated with increased openness and transparency of KICs.

Risk of disparities in economic growth due to EU support for KICs – i.e. supporting the development of a limited number of centres of excellence would enhance their economies and create positive externalities leading to the increased growth of these centres compared to other parts of the EU. The probability of this occurring is high whilst the magnitude of the effect on disparities in economic growth is likely to be moderate, all other things being equal. The establishment of integrated entities of firms and institutions of higher education and research could also create barriers to new market entrants in locations outside the centres of operation. This would be due to a more difficult access of external institutions and actors to knowledge, talent and finance. The probability of this occurring is high with effects of moderate magnitude if realised.

This risk can be mitigated through measures under Option 2 and 3 (deepening the Regional Innovation Scheme, the set up of new actions to support the entrepreneurial capacity of HEIs across the EU and the establishment of EIT Hubs) and boosting the dissemination of best practices beyond the EIT and KIC Communities.

Risk of KICs not reaching financial sustainability. The probability of this occurring is high whilst the magnitude of the economic effect on existing innovation ecosystems will be considerable. A continued low level of private funding may provide disincentives to KICs pursuing financial sustainability. Unclear guidance on the future relationship between EIT and KICs that stop receiving EIT grants after 15 years may further increase the risk. Potential future benefits and gains from long-term investments made by the KIC over their programming period may be forfeit. The risk can be mitigated with the introduction of specific co-funding rates that will increase private investment and with a clearer model for the future relationship between EIT and KICs that cease to receive funding from the EIT. Guidance from the EIT is also important - evidence suggests that the second and third generation of KICs incorporate financial sustainability objectives more effectively than the first generate of KICs.

Risk	Probability	Magnitude
Consumer welfare	Low	Slight
Negative health impacts	Low	Slight
Environmental degradation	Low	Slight
Economic well-being	Moderate	Moderate
Collusive behaviour	Moderate	Moderate
Deadweight	High	Moderate
Disparities in economic growth	High	Moderate
Agglomeration economies	High	Moderate
Barriers to market entry	High	Moderate

A potential risk is one of incomplete, or no policy implementation. It is possible that calls for proposals for future KICs would not attract interest. However, based on current experience this is unlikely. Currently, there seems to be sufficient demand in consortia to apply for new KICs.[120]

120 In the 2018 call for new KICs there were 6 and 4 proposals for Urban Mobility and Added-Value Manufacturing, respectively.

8. PREFERRED OPTION

The baseline would see a business as usual with essential but limited adjustments of the EIT into the Horizon Europe framework but without addressing the problems the EIT faces. Options 2 and 3 would address the identified problems, respond to the Horizon Europe ambitions in terms of education and regional outreach and include adaptations and improvements to address the technical issues identified.

Option 2 would see a concerted action by the EIT aimed at supporting the development of innovative capacity of HEIs that would lead to economic and social spill-overs and higher competitiveness. This would come at a relatively low cost and by using the existing administrative capacity of the EIT and economies of scale to a considerable extent. Involving HEIs from across the EU through the new Action would contribute to mitigate the unbalanced strengthening of existing centres of excellence at the expense of regions from countries with modest or moderate innovation performance.

Stronger openness and transparency measures would help to unlock the innovative potential in a wide range of organisations. Sharing knowledge and expertise in a targeted way beyond KICs would further add EU value. The introduction of co-funding would lead to greater levels of private investment in KICs and enhance the promotion of new business development and creation. This would increase the potential of reaching the EIT financial sustainability objectives in the medium- to long-term. There would be improvements in the regional outreach due to the integration of RIS in the KIC strategies and an increased RIS budget.

Option 3 in comparison would see the EIT increasing its regional outreach to local innovation ecosystems via a distributed network of EIT Hubs that support small-scale knowledge triangle integration projects. This would gradually lead to knowledge spill-over effects resulting in increased innovative behaviour of participating institutions. However, the relative cost of achieving this would be significantly higher than in Option 2. The impact of the regional outreach would be likely to occur only in the long-term due to the time lag between set up of EIT Hubs and any activities they would support. The financial and administrative resources required for setting up the structures to implement Option 3 would be high. Finally, the administrative burden created from the implementation of this Option in multiple locations and the need to coordinate at a centralised EIT level would not be commensurate to the potential benefits within the proposed budget.

Based on the assessment of impacts presented above, Option 2 represents the most suitable way to implement the objectives of the initiative while offering the highest impacts. It would allow for a targeted and proportionate action, amounting to an incremental strengthening of the intervention alongside reinforced legal certainty. Option 2 would be a significant improvement over the baseline Option, it would reflect well the stakeholders views and could be implemented within the suggested timeframe. Particular attention has been paid to the contribution of each Option to the attainment of the overall delivery of EU priorities as set in the Horizon Europe proposal and the role of the EIT in that programme, while also comparing their effectiveness, efficiency and coherence.

8.1. Implications of the preferred Option for the EIT Regulation and the SIA

EIT Regulation

A clear objective of the amendment to the EIT Regulation through the recast legislative technique would be to ensure greater legal certainty and stability of the Regulation in accordance with the Commission's better regulation and law-making principles[121] in terms of structure and legal drafting. This would enable the EIT Regulation to focus on the main principles of the functioning of the EIT/KICs and, at the same time, facilitate the application of its provisions.

In light of the above, the recast EIT Regulation would be time-neutral and principle-based. This would be achieved by putting greater emphasis on the principle-based approach in the EIT Regulation, avoiding maximum harmonization and focusing on necessary provisions enabling the functioning of EIT and KIC, and at the same time, by developing and detailing these principles in the proposed new SIA. In addition, the new EIT Regulation would be time-neutral in the sense that the need for its amendments at the end of each MFF would in principle not be necessary or only minimal. It would be for the SIA to ensure the necessary alignments with the objectives of the European Framework programme for research and innovation funding the EIT, with the monitoring and obligations of that programme, and also to foster synergies with the other relevant programmes of the respective MFF.

Moreover, the EIT Regulation would be amended in order to reinforce the role of the EIT in developing innovation capabilities through addressing global challenges and to strengthen the legal clarity of its provisions. Additional adjustments would be needed to ensure compliance of the EIT Regulation with the new Commission's Framework Financial Regulation.

Strategic Innovation Agenda 2021-2027

The SIA will set the priorities of the EIT for 2021-2027. It will align the EIT future development with the Horizon Europe general framework and ensure synergies and complementarities with the latter. The SIA will include the specific objectives of the EIT. It will propose concrete measures to enhance the transparency and openness of the KIC model in line with Horizon Europe criteria for European partnerships and define guiding principles for the role of KIC co-location centres. The SIA will set clear co-funding modalities for implementation by the KICs. It will provide guidance to the KICs when they reach the maximum 15 year limit after which the EIT grant support to the KIC will stop. It will include the main principles of the post-15 year relationship between the EIT and KICs.

The SIA will include clear objectives for and in particular define the new action in support of increasing the innovation capacity of HEIs to be launched by the EIT in the next programming period. It will strengthen the regional impact of the EIT through the new actions and through strengthening of the RIS. The SIA will include an overview of the financial and human resources needed for the implementation of the EIT objectives. Clear monitoring and evaluation provisions will be defined taking into account the Horizon Europe framework and the EIT's specificities.

121 Commission's Better Regulation Guidelines; SWD(2017) 350 final. Interinstitutional Agreement on Better Law-Making; OJ L 123, 12.5.2016, p. 1. Interinstitutional Agreement on a more structured use of the recasting technique for legal acts. OJ C 77, 28.3.2002, p. 1

9. HOW WILL IMPACT BE MONITORED AND EVALUATED?

Monitoring and evaluation are fundamental tools in measuring the impact of the EIT and will be further strengthened and continuously improved over the next programming period. Given the nature of the knowledge triangle integration model, it will be important to apply a monitoring framework that allows flexibility at all relevant levels (EU, EIT, KIC) and ensures coherence with the general objectives of Horizon Europe and impacts sought.

Monitoring

The EIT has developed metrics to measure the progress of the KICs. Several Key Performance Indicators (KPIs) are applied to all KICs.[122] However, the KPIs could be further fine-tuned in terms of the relevance of KICs' performance. There is a need for a balance between a clear set of EIT key performance indicators (horizontal) to measure the KICs overall performance on the one hand and the KICs sector specific indicators (vertical) on the other. Moreover, the monitoring model and the KPIs of the EIT are perceived by stakeholders as too focused on input and output (short-term measures) with limited attention to results and impacts[123] and are not aligned with the proposed indicators and monitoring system of the Horizon Europe Programme, including monitoring aspects of the partnerships.[124]

All inputs, outputs, results and impacts identified in this impact assessment will be monitored through indicators. Such indicators already exist for the majority of the examples. Whenever they do not exist, new indicators will be developed in order to enable the EIT to monitor the achievement of its objectives. The chart below provides an overview of how operational objectives and related indicators link to the specific objectives and related indicators.

122 Full list of core KPIs: ec.europa.eu/research/participants/data/ref/h2020/other/guides_for_applicants/h2020-core-kpis-kic-eit-2018_en.pdf

123 E.g. ICF (2017), Evaluation of the EIT, pp. 35-36, High Level Group on the EIT (2016), The Future of the EIT, p. 24, European Court of Auditors (2016), Special Report on performance of the EIT, pp. 30 and 49 and SWD on the Interim evaluation of the EIT, SWD (2017) 351 final, p. 44.

124 Cf. Horizon Europe impact assessment, SWD (2018) 307; Regulation Horizon Europe, COM(2018) 435 final. Annex III.

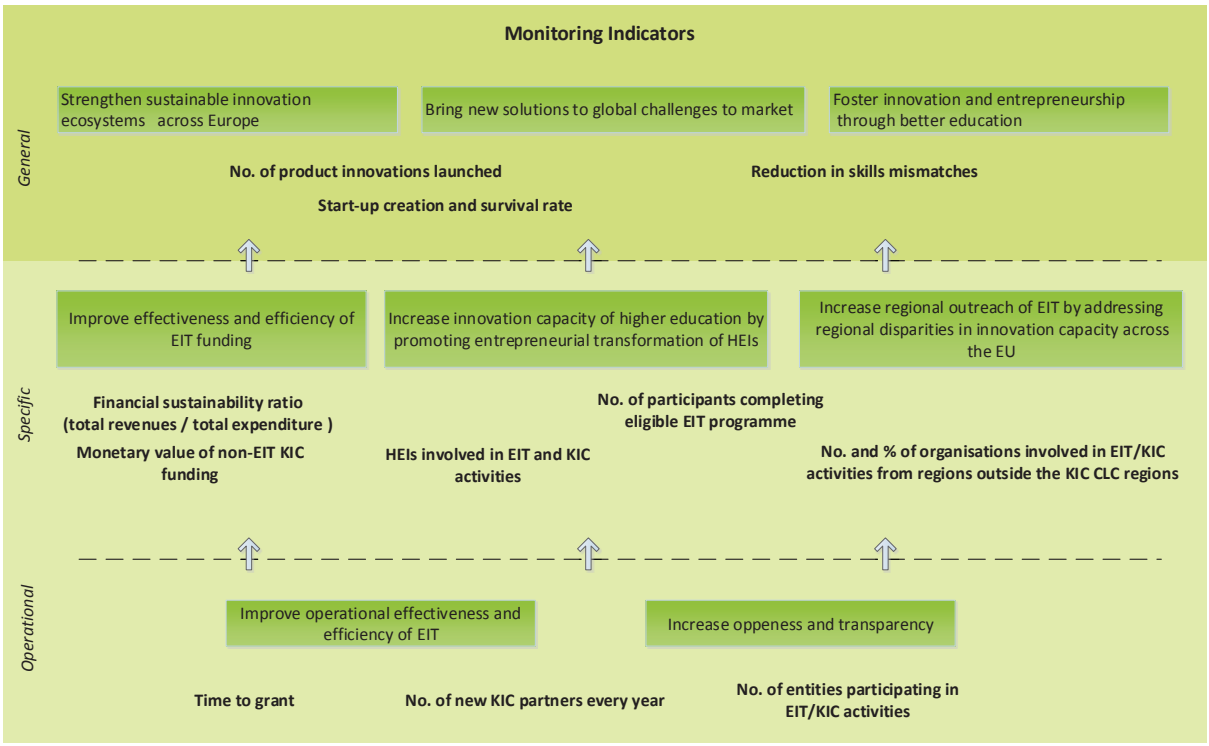


Figure 10: Link between operational objectives and indicators to specific objectives and indicators; own illustration

The table below provides an overview of key indicators that will be collected.

General objective	Monitoring Indicator	Targets[125] 2023 2027	Sources of data / collection methods	Data availability	Responsible body	Link to Horizon Europe impact pathway
Strengthen sustainable innovation ecosystems and bring new solutions on the market	No. of product innovations (goods or services) launched on the market	1.500 4.000	Annual programme / monitoring data Rolling survey of organisations in receipt of KIC support at set time intervals (i.e. 1, 3, years post support)	Yes No	EIT	Innovation-based growth
	Start-ups supported and survival rate	300 700	Annual programme / monitoring data Rolling survey of start-ups created as a result of EIT activity	Yes No	EIT	Innovation-based growth
Foster innovation and entrepreneurship through education	Reduction in skills mismatches No. of direct and indirect jobs created by organisations benefiting from KIC support	40% increase 100% increase	Rolling survey of organisations/employers in receipt of KIC support at set time intervals (i.e. 1, 3 and 5 years post support)	No	EIT, European Commission	Strengthening the uptake of innovation in society

125 Baseline for comparison is 2020

Specific objective	Monitoring Indicator	Targets 2023 2027	Sources of data / collection methods	Data availability	Responsible body	Link to Horizon Europe impact pathway
Increase impact of KIC through more effective EIT funding	Monetary value of non-EIT KIC funding	700 MEUR 1500 MEUR	Annual programme / monitoring data	Yes	EIT	n.a.
	Financial sustainability ratio (total revenues / total expenditure)	n.a.	Annual programme / monitoring data	Yes	EIT	n.a.
Increase innovation capacity of higher education	HEIs involved in EIT and KIC activities	300 750	Annual programme / monitoring data	Yes	EIT	Strengthening human capital in R&I
	No. of participants completing eligible EIT/KIC education programme	10.000 30.000	Annual programme/ monitoring data	Yes	EIT	Strengthening human capital in R&I
Increase regional outreach	No. of entities/organisations participating in EIT/KIC activities from regions outside the KICs' CLC regions	50% increase 100% increase	Annual programme / monitoring data	Yes	EIT	Strengthening the uptake of innovation in society
Operational objectives	**Monitoring Indicator**		**Sources of data / collection methods**	**Data availability**	**Responsible body**	**Link to Horizon Europe impact pathway**
Improve operational effectiveness and efficiency of EIT	Time to grant	n.a.	Annual programme / monitoring data	Yes	EIT	n.a.
Increase openness and transparency	No. of entities/organisations participating in EIT/KIC activities	20% increase 50% increase	Annual programme / monitoring data	Yes	EIT	Innovation-based growth

Table 19: Specific and operational objectives to be monitored by indicators; own illustration

In parallel and in full compatibility with existing monitoring tools, a close alignment will be sought between the EIT monitoring provisions and those that are put in place for Horizon Europe. For example, the EIT will align its monitoring tools with the Impact Pathways of Horizon Europe that seek to address the need for scientific, economic and

societal impacts indicators more comprehensively. It will be a responsibility of the EIT to regularly monitor the operational performance of the KICs and to adapt its monitoring and reporting systems continuously. The results of such monitoring will feed into the business planning processes of the KICs and into the EIT decision-making on the allocation of the budget and preparation of the framework partnership agreements with the KICs as beneficiaries. The monitoring results should feed continuously into the policy-making process.

Evaluation

The evaluation of the performance of the EIT will be carried out by the Commission in line with the requirements of the EIT Regulation and will feed into the overall Horizon Europe programme evaluation that will be carried mid-term and ex-post. This will include an assessment of the synergies of the EIT with the other instruments of the programme.

With regard to the KICs, a specific indicator framework will be used to assess the performance of the KICs during the next Strategic Innovation Agenda (2021-2027). The framework draws from current and previous indicators, fills gaps and deficiencies identified in the existing performance measurement system and is aligned to the Horizon Europe indicator framework. While this is still in development, some key parts are outlined in more detail in Annex 8. Further work on evaluation will be pursued with the JRC's Competence Centre on Microeconomic Evaluation.

10. ANNEXES

10.1. Annex 1: Procedural information

Lead DG, DECIDE Planning/CWP references

The work on the impact assessment was led by the Directorate-General for Education, Youth, Sport and Culture (DG EAC) which is responsible for the coordination of the activities related to the functioning of the EIT.

The Impact assessment supports two Decide Planning initiatives as follows:

- EAC - PLAN/2017/987 - Amendment of the Regulation on the European Institute of Innovation and Technology (EIT)

- EAC - PLAN/2017/1516 - Strategic Innovation Agenda for the period 2021-2027 of the European Institute of Innovation and Technology (EIT)

Organisation and timing

The impact assessment covers all the elements needed for (1) the EIT Regulation revision and (2) the SIA 2021-2027, i.e. the EIT vision, mission, objectives, governance and operation model as well as funding model.

Both the revisions of the EIT Regulation and the SIA are part of the wider Horizon Europe process and hence the timely adoption of both initiatives is of utmost importance.

The Impact assessment steering group (IASG) was established in January 2018 and held five meetings to steer the various phases of the process including the preparation of the Open Public Consultation (OPC).

The Commission's adoption of the proposal for a new Strategic Innovation Agenda (SIA) for the EIT for the period 2021 – 2027 as well as the amendment of the Regulation on the EIT are expected in May 2019.

Consultation of the RSB

The Impact Assessment Report was submitted to the Regulatory Scrutiny Board on xx 22 January 2019 and discussed at the meeting of the Board on 13 February 2019. The Board issued a negative opinion on 15th February. The impact assessment report was revised taking into account the Board's comments and recommendations.

The following table explains how the Board's recommendations have been addressed in the revision of the report.

Main RSB considerations	Measures taken and the changes introduced in the revised IA report	Where
1. The report does not explain what still needs to be decided and what is covered under Horizon Europe. It is also unclear which elements pertain to the new SIA and the amended EIT Regulation, respectively.	The report has been revised to explicitly state what decisions on the future of the EIT have already been made in the Horizon Europe proposal and what issues are left for the EIT Regulation and SIA. The report now contains clarifications as regards the scope of the impact assessment, the legal and operational context of the EIT and KICs and how the EIT Regulation and the SIA link to the Horizon Europe programme.	Chapter 1.3. and 1.4 Chapter 1.4. and 1.5
2. The report does not provide evidence that demonstrates the need to act on alleged problems.	The problem definition has been restructured and additional evidence on problems, drivers and effects has been added. The core problems have been identified as (i) suboptimal funding model (ii) limited impact of EIT's educational activities (iii) limited impact of EIT's regional outreach To better illustrate the linkages and relations, a problem tree (Figure 4) with drivers and consequences has been added.	Chapter 2 Chapter 2.1.-2.3 Chapter 2.5.
3. It is also not clear how the options respond comprehensively to the reported problems.	An intervention logic (Figure 7) has been added to explain how problems are addressed. The three options address all identified problems, but to a different extent.	Chapter 5.4.
4. The report does not explain why the reallocation of funds works in opposite directions for different options, nor does it explain what the regional hubs achieve.	The chapter on impacts provides additional argumentation on the effects of the reallocation of funds proposed under option 3. The same section incudes a brief discussion on agglomeration economies in the context of option 3. Additional details have been added on the functions of the EIT Hubs.	Chapter 6.3 Chapter 5.3

RSB further considerations and adjustments required	Measures taken and the changes introduced in the revised IA report	Where
1. The report should better explain what the Commission needs to decide at this stage. It should clarify the urgency to act and coherence with other initiatives. The elements already covered under the Horizon Europe proposal should come out more clearly. Also, the policy context should explain the alignment with the priorities and strategic planning of the programme. In particular, the report should clarify the timing and coherence between the choice of additional KICs in the SIA and the ongoing strategic planning process of Horizon Europe. It should acknowledge any possible risks in this respect. It should better delineate between the content of the SIA and the EIT Regulation.	Decisions made and to be made with regard to the EIT have been explicitly outlined. An explanation of the need to act has been added. The introduction has been restructured to include the policy context and the strategic planning process (SPP) of the Horizon Europe programme, its scope, timing as well as the approach of aligning the EIT/KIC priority areas in the new SIA proposal with the SPP of the Horizon Europe. Risks were clearly identified. A clearer delineation between SIA and Regulation was added.	Chapters 1.4 and 1.5 Chapter 1.5 Chapter 1.3 and 1.4
2. The intervention logic should show how the identified problems get in the way of achieving the policy objectives, and how measures contained in the alternative options would resolve this. The report should better explain why the problems require a legislative solution. It should better use the available evidence, e.g. the interim evaluation and the Court of Auditors report. The problems and their magnitude need more in-depth analysis, notably in the areas of education and regional outreach. Other relevant problems need assessment, such as administrative costs or burdens for SMEs. The section should also better outline the problems specific to KICs, especially the choice of new ones.	The problem definition has been restructured. Core problems have been identified. Additional evidence on problems, drivers and effects have been added. A problem tree has been added. The remaining issues (e.g. openness, transparency, KICs collaboration, EIT governance) that need to be addressed through legislative changes or technical operational adjustments are brought under the separate heading of "technical issues". The chapter presents a summary of how problems and technical issues can be tackled through the available instruments, i.e. legislative changes or technical adjustments in the current legislative base in order to increase EIT's efficiency, effectiveness and overall coherence, whenever applicable in combination with operational and managerial measures. The intervention logic has been revised and the relations between problems identified and objectives to be achieved are now made clearer.	Chapter 2 Chapter 2.1.- 2.3 Chapter 2.4

3. Based on the improved description of the scope of this initiative, the baseline should include all elements that the Horizon Europe proposal has already determined. It should not assume elements which are still undecided. It should explain the consequences of not acting.	The baseline option has been revised to clearly represent the continuation of EIT's activities as they are today with essential adjustments necessary to align it with the Horizon Europe framework programme. These include in particular collaboration and synergies with relevant Horizon Europe, alignment with the Strategic Planning Process of Horizon Europe, and synergies with the European Innovation Council. The consequences of not acting are explained in the introductory chapters.	Chapter 5.4 Chapter 1.5
4. The options should contain alternative solutions to the identified problems and for the decisions to take, such as the choice of themes for new KICs. The report should make clear what measures are contained in each option, and how they would tackle the problems in practice. The options should explore alternative uses of the available budget. In particular, they should better explain alternatives regarding the number, funding and management of the KICs and of centralised EIT actions. They should also explain how incentives would result in adequate private co-financing. The report should report on the opinions of stakeholders on the options.	The policy options have been differentiated further and additional clarifications on the individual elements of each option have been added. See also point 3 above. The report makes clear what measures are contained within each option and distinguishes more clearly between them in terms of KIC activities (no. of new KICs), EIT horizontal activities and budget allocation for these. Option 2 comprises the direct support actions for entrepreneurial and innovative capacity development of HEIs and introduces the key assumptions and rationale for the action. Option 3 key feature is the creation of EIT hubs in all MS as a main instrument to achieve EIT operational and specific objectives. The key assumptions and rationale for the EIT Hubs are explained. All options are presented with their proposed budgets. The report further explains how incentives would result in private co-financing and lists also mitigation measures. The inputs into the individual options in terms of budget are provided. The differentiation for each option is made clear as regards the administrative budget, the budget to KICs and the budget to horizontal EIT activities. Intervention logic charts are added to outline the links at different levels (i.e. between problems, objectives and options).	Chapter 5.3. Chapter 5.3 Chapter 6.2. Chapter 6.3. Chapter 5.3 Annex 10 + Chapter 5.3.3. Chapter 5.4.4. Chapter 5.4
5. The report should better explain what the probability of success	The impact chapter of the report has been revised in order to better capture the	Chapter 6

is under each option. It should better analyse all relevant impacts, including regulatory costs and benefits, social impacts, and impacts on SMEs. The report should clarify the expected societal return of the different options, including the regional outreach. It should examine whether regional outreach might conflict with agglomeration economies in creating knowledge. How the report arrives at the preferred option should come out more clearly. The report should use clear criteria to compare across the alternatives.	relevant impacts including the regulatory costs and benefits, social impacts and regional outreach and impact. The impact analysis is based on the projection of the key output indicators as follows: • HEIs involved in EIT activities • Students involved in EIT activities • Businesses involved in EIT activities • Products, services, processes or ideas generated • Start-ups supported • Value of KIC co-funding • No. of external participants as a measure of regional activity New set of criteria has been introduced to compare the options. (1) effectiveness in reaching the operational objective (2) efficiency, cost-benefit of managing KICs and cost-benefit of introducing new actions (3) coherence with Horizon Europe and synergies with other EU programmes and policies Simple and user friendly comparison table have been introduced with qualitative assessment of options per criteria and ratings according to their impact.	Chapter 7
6. The evaluation arrangements should define benchmarks for what success of the initiative would look like. In doing so, the report should identify operational objectives and link them with monitoring indicators.	The evaluation and monitoring part has been revised. Specific and operational objectives have been linked to the monitoring indicators for measuring the achievements. Sources of data collection have been added and the processes of monitoring and evaluation as well as responsibilities of involved bodies were clarified.	Chapter 9
7. The presentation of the report should be more reader friendly, avoiding jargon and using plain language. It should enable the reader to understand how the EIT works and cooperates with KICs. The report should be self-standing and independent from annexes and external documents, e.g. the evaluation. The report could use more visual aids, e.g. a problem tree, illustrations and diagrams	The different issues in individual chapters have been complemented with visual tools (charts, graphs, tables) to allow the reader easily capture the complex issues. A native English speaker has proofread the document. The overall presentation and reading of the report has improved in order to reflect a common structure of the presentation.	Entire report

Evidence, sources and quality

The impact assessment is based primarily on the results of the latest evaluation, review and analysis done by the following studies, reports and consultations that are presented below:

- Commission Staff Working Document on the Interim Evaluation of the European Institute of Innovation and Technology (EIT), SWD (2017) 351 final;
- Wilkinson, C. et al. / ICF (2017), Evaluation of the European Institute of Innovation and Technology (EIT);
- European Court of Auditors (2016), Special Report on the EIT
- Report on the strategic issues, perspectives and future of the EIT of the High Level Group set up by Commissioner Tibor Navracsics (published in 2016)
- Study to support the Impact Assessment (SQW, November 2018)
- Directorate-General for Research and Innovation (2018), A new horizon for Europe. Impact assessment of the 9th EU framework programme for research and innovation, SWD(2018) 307.

10.2. Annex 2a: Stakeholder consultation activities

Annex 2A provides a brief synopsis of the outcomes of the consultation activities that have been undertaken as part of the preparation of the impact assessment on the new Strategic Innovation Agenda of the European Institute of Innovation and Technology (EIT) and the revision of the EIT Regulation. Table 1 provides a short overview of the nature, scope and timing of the consultations and the next sections present the results.

Table 1. Scope of the consultation activities

Issue	Type of consultations	Date of consultations
Challenges hampering innovation in Europe	Open Public Consultation (OPC) with 157 responses and 14 written position papers	10 October – 5 December 2018
EIT objectives	OPC with 157 responses and 14 written position papers	10 October – 5 December 2018
EIT impact indicators	Interviews with representatives of DG EAC, EIT and KICs (16 in total)*	February – July 2018
	Online consultation with representatives of KICs (8 responses)*	April – May 2018
	Workshop with representatives of EC, EIT, and KICs*	15 May 2018
Options for improvements in operation of the EIT and the KICs	OPC with 157 responses and 14 written positions	10 October – 5 December 2018
	Interviews with representatives of DG EAC, EIT and KICs (23 in total)	February – September 2018
	Workshop with representatives of EC, and EIT *	15 May 2018
	Stakeholder meeting – Education and Research Organisations/ Associations	22 November 2018
	Stakeholder meeting – Business and Regions Associations	29 November 2018
Themes for the establishment of future KICs	Interviews with representatives of academia, businesses and thematic networks (25 in total)	February – July 2018
	OPC with 157 responses and 14 written positions	10 October – 5 December 2018

** Note: Consultations have been carried out as part of the Study to support the Impact assessment on the Strategic Innovation Agenda of the EIT.*

Findings from the consultation activities

Challenges hampering innovation in Europe

The open public consultation (OPC)[126] conducted by the European Commission showed strong agreement amongst respondents that there is scope for further reinforcing the role of research and innovation in Europe with a view to address global challenges. The majority of respondents also agreed with the following statements:

- the European innovation ecosystem is fragmented
- the transfer of ideas, technologies and talents from education and research into start-ups and technology is not fast enough
- companies with potential for international growth have to cope with the fragmentation and diversity of national markets.

The breakdown of the results by respondents from different country groups (using countries identified as 'innovation leaders and strong innovators' and countries identified as 'moderate and modest innovators'), showed that the results were very similar, with both groups in agreement on many of the statements. However, respondents from 'moderate and modest innovators' tend to agree more that joint activities between education and industry have not been sufficiently integrated within their regional and local ecosystems, and there is insufficient involvement of end-users and citizens in the co-design, experimentation and testing of innovation solutions.

A high degree of consistency was also found when the statements were broken down by respondents distinguishing between citizens and representatives of company/business organisations, academic/research organisations and others. When asked in an open-response question about the factors that hinder active involvement in existing pan-European innovation ecosystems, the most common factors noted were 'lack of visibility and awareness of existing innovation ecosystems and opportunities', 'bureaucracy and administrative complexity' and 'the barriers between nation-states'.

EIT objectives

The respondents to the OPC (157 responses and 14 written positions) provided their view on how best to achieve the three EIT policy objectives. The main actions identified in relation to the three EIT policy objectives were as follows:

- **Objective 1:** To foster, grow, strengthen and develop current or new sustainable innovation ecosystems across Europe.
    - Supporting the involvement of final users in the development of innovative solutions.
    - Harnessing the synergies among existing innovation activities at EU and national levels.
    - Increasing the effectiveness of cooperation and coordination of existing KICs and related activities.

126 An analysis of the results of the OPC is provided in Annex 2B.

- **Objective 2:** To improve the human capital base for innovation through developing talents and enhancing skills and competences, to make entrepreneurship and innovation culture in Europe stronger, more inclusive and more open, and to contribute to the entrepreneurial transformation of higher education institutions across the EU.

    - Providing funding for innovation capacity development and rewarding/recognising universities for becoming more innovative and entrepreneurial.
    - Launching new actions supporting education and human capital development through the identification of future skills needs.

- **Objective 3:** To develop and bring new solutions to global societal challenges to the market by integrating education, business and research, as well as other relevant players (such as municipalities, civil society, large industry, small and medium-sized enterprises, etc.) according to the sector.

    - Development of new products and services, which involve all relevant stakeholders.
    - Making business support services widely available.
    - Increasing support for financial and capital raising services and attracting private funding.

EIT impact indicators

The consultation activities occurred between DG EAC, the EIT and its KICs, and the Joint Research Centre of the Commission tackled two main aspects of the development of the impact indicator framework.

First, it helped in identifying a set of **key principles for the indicator framework** to follow, namely:

- To maximize the consistency and coherence of the impact indicators, including, where possible, to introduce consistent definitions for specific indicators and a more harmonised approach to the measurement of impact, particularly in terms of impact indicators of the new Horizon Europe Programme.
- To include a balanced coverage across the three levels of impact: 1) economic development (e.g. jobs, economic growth), 2) innovation and education system effects (e.g. capacities to innovation, collaborations, networks, and ecosystem effects) and 3) societal benefits (e.g. to cover the foci of KICs, such as on climate, health, energy etc.).
- To address prevailing gaps in the existing core indicator set, in particular to address the outcomes and the longer-term impacts, as well as the effects on different regions.

Second, a **set of aspects to be duly taken into account** to best meet the different stakeholders' perspectives on the impact indicators. The following four key points were pertinent in developing the final set of recommended indicators.

- Clarifying the core purpose of the Indicator Framework – i.e. to provide evidence about the long-term socio-economic impacts of the KIC model but also to acknowledge the role of initial indicators as per the results chain (or logic chain) in terms of how these impacts are brought about.
- Acknowledging the challenges to decide on resource allocation using long-term indicators – i.e. KICs contribute to long-term effects but should not be accountable for them.
- Some expected outcomes/impacts do not fit easily within the indicator framework and would be best assessed through multiple methods of research (rather than single indicators), and in particular through evaluative research where a degree of judgement will be required.
- Challenges to provide evidence about the causality and attribution in the indicator set, and the importance of evaluative research for helping to test causality, or at least the contribution of the KIC model and KIC activities to outcomes and impacts.

The subsequent workshop, survey and consultations with stakeholders on the impact indicators were used to gather further feedback, in particular on the perceived importance and value of different indicators, and the specific challenges and possible solutions in defining and measuring certain indicators. The results were fed into the refinement and finalisation of the recommended indicator set.

Options for improving the operation of the EIT and the KICs

The respondents to the OPC provided their views on the most important aspects for ensuring the financial sustainability of KICs. According to them, a robust financial strategy for a KIC from the outset and continuous monitoring and evaluation of its implementation would be the best strategy.

With regard to the criteria for selecting and implementing new KICs the prevailing views point to the societal impact of the proposed activities, including their potential to address the Sustainable Development Goals.

The main points raised by the **representatives of the university/research associations and organisations** highlight the negative cost-benefit ratio for a university involvement in a KIC and the ineffectiveness of too many currently existing university labels. They also point to 1) the need to make the conditions for university participation simpler and more enabling, and 2) the importance of the regionalisation of universities and their link to Smart Specialisation Strategies. In addition, academic stakeholders consider that EIT educational activities should be complementary and build on already existing experience of innovative universities with regard to collaborative research, problem based learning, developing entrepreneurial courses, creation of incubators with regional authorities and companies, etc. Many of them also stressed the limited involvement of KIC partners in KIC educational activities and the need for more integrated system that would allow innovative educational institutions to participate in KICs on an informal and simplified basis.

The main issues raised by the **representatives of business and regional associations** related to the necessity of linking the EIT and KIC activities to the regional and local Smart Specialization Strategies including the unmet potential for synergies with other funding opportunities (ESFI, regional/local funds). Representatives of business associations pointed out, in particular, to the need to make KICs more open and more easily accessible by potential partners. Furthermore, involvement of all (big and small) companies is considered important. With regard to education, the prevailing views are that the HEIs should play a key role for a more entrepreneurial environment in Europe. Last but not least, emphasis is put on the lack of ambition of the EIT as an institute, in view of the need to further develop its model, to scale up the good lessons learned and to better exploit the critical mass attained.

The interviews with representatives from the EIT, KICs, European Commission, European Parliament and Academia, as well as the stakeholder workshop, provided input on the challenges to the current EIT/KIC model and the options for improvement which has been incorporated in the Impact assessment report.

Possible themes for future KICs

The interviews with representatives of academia, businesses and thematic networks focused on the feasibility and relative merits of setting up future KICs in the following possible areas taking also into account the proposal of the EIT Governing Board: *Security and Resilience*; *Inclusion, Integration and Migration*; *Water, Marine, and Maritime*; *Cultural and Creative Industries*. The prevailing opinion of the interviewees is that the EU has competitive advantage and can deliver further economic growth within all these areas due to its strong R&I base. Furthermore, the KIC model is perceived to be well suited to addressing bottlenecks for innovation in relevant industries and thematic areas.

The respondents to the OPC also suggested other themes such as artificial intelligence; mobility; cultural and creative sectors; sustainable development; and transport.

With regard to the criteria for new KICs the following were particularly identified:

- New KICs should have the potential to enhance the wider EU economic competitiveness without being limited to a specific economic sector (e.g. sufficient water availability and security is required for many sectors to prosper). KICs should also aim to contribute to the evidence-based decision making in public and private sectors, and contribute to EU policy objectives, in particular to sustainable development and quality of life.

- The implementation of new KICs should address the geographical disparity in economic, innovation and social terms so that the benefits of KICs activities could be distributed equally among European regions.

10.3. Annex 2b: Public consultation - Synopsis Report

The Open Public Consultation (OPC) was run as a component of the European Commission's broad-based Impact assessment to support its proposals for revision of the Regulation establishing the European Institute of Innovation and Technology (EIT) (EC No 294/2008) and adoption of a new Strategic Innovation Agenda of the EIT for 2021-2027.

The purpose of the OPC was to gather information, opinions and views from a wide range of stakeholders on 1) the challenges and opportunities in the European research and innovation area, 2) the policy objectives of the EIT, and 3) the policy options to tackle the challenges. The OPC provided an opportunity to 'open up' the data collection exercise to a broad community of individuals and organisations, and give them the opportunity to provide input to the evaluation.

The OPC was managed by DG EAC in line with the principles for consultations set out by the Commission's Better Regulation Guidelines – i.e. participation, openness and accountability, effectiveness, and coherence.

Consultation questionnaire design

The OPC consisted of a structured questionnaire designed by the Commission Services and was accessible for completion online (via the EUSurvey platform). The majority of the questions were closed and provided a number of opportunities for the respondents to provide more detailed open-ended comments. To encourage a good response rate, the length of the questionnaire was kept short, covering 20 questions in total. It consisted of an introductory part (details on the respondents), and three thematic parts - on *challenges and opportunities*, *policy objectives*, and *options*. In addition to responding to concrete questions, the respondents had an opportunity to also submit separate written contributions.

Sample design and questionnaire distribution

The OPC was launched on 10 October 2018 and closed on 5 December 2018. It was open to anybody interested in sharing their opinion on the topic. The consultation was primarily accessible via the European Commission's dedicated public initiatives webpage and was promoted via the European Commission's standard channels for running a public consultation.

The OPC received the following responses:

- 157 completed questionnaires
- 14 written positions[127] – two of these were specific proposals for particular themes to focus on in the future. The remaining 12 provided further detail in line with the points raised in the online questionnaire and/or advocated the specific role(s) that different communities/groups/organisations could play.

127 There were 16 written documents, though two of these duplicated the online responses to the open questions.

The response rate is consistent with what would be expected for an OPC carried out as part of an evaluation exercise.

Data analysis

Both the quantitative and qualitative data from the OPC were analysed. The analysis of the results is based on the following considerations and analytical protocols:

- The data were anonymized with only the key characteristics (e.g. organisation type, and level of innovativeness of the country of residence of the response) being attributed to the responses.
- The relatively small sample size did not allow for a quantitative disaggregation by country of origin of the participants.
- Where relevant, quantitative data were disaggregated between: i) respondents from leading innovators and moderate innovators; and ii) type of organisation respondents represented. However, these disaggregated results need to be treated with some caution as well given the small sample sizes. The following analysis points out where substantial differences between respondents form different types of organization appear.

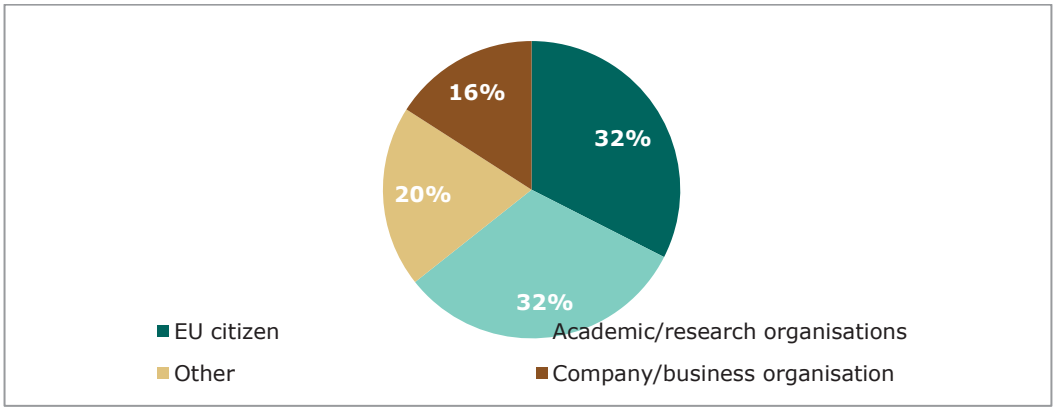
Results of the OPC

Types of respondents

As Figure 1 shows, the most common types of respondent to the OPC were those replying in their private capacity as **EU-citizens** (32% of all respondents) and those responding as representatives of an **academic or research organisation** (32%). **Business organisations** made up 16% of respondents. The **'other'** category includes a mix of representatives from public authorities, non-governmental organisations, environmental organisations and non-EU citizens. Five responses were submitted on behalf of KIC organisations.

Figure 1. The type of the organisation that respondents represented

Q: I am giving my contribution as:



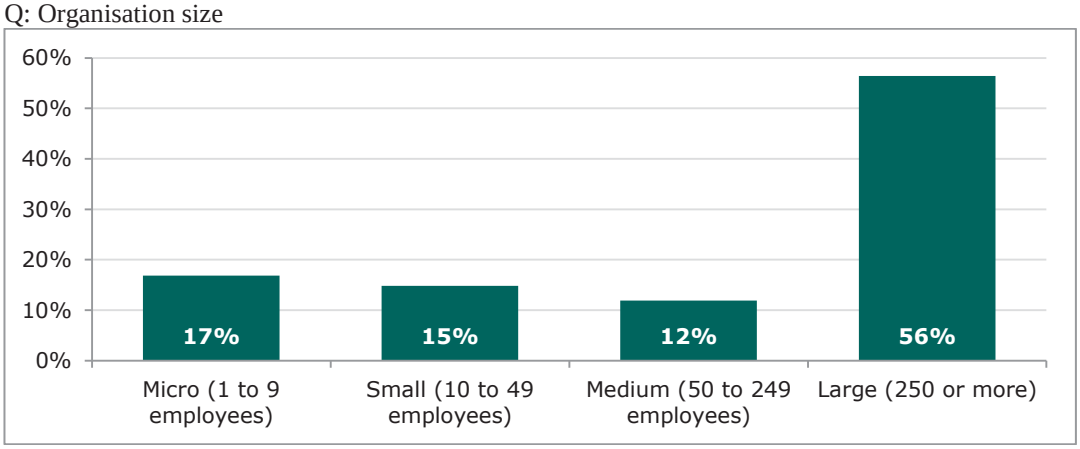
Base: all participants (N=157)
Source: Open Public Consultation

Size of organization or institution

Figure 2 shows the types of organisations represented in the consultation. For those responding on behalf of organisations, more than half (56%) participated on behalf of a large organization (i.e. 250 or more employees). The remainder were split fairly evenly between micro, small and medium-sized entities.

Figure 2. The size of the organisation that respondents represented

Q: Organisation size



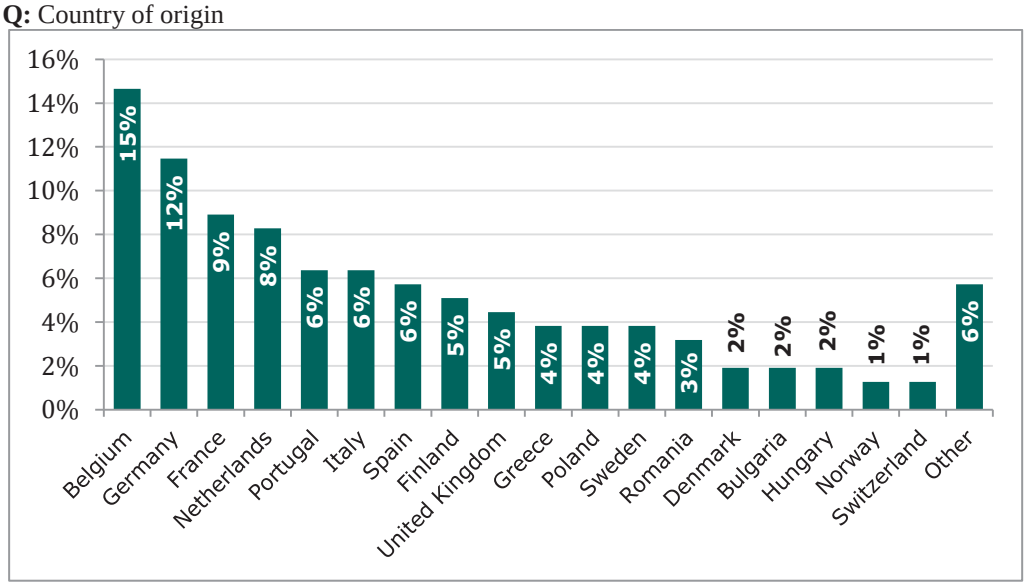
Base: all participants responding on behalf of organisations (N=101)
Source: Open Public Consultation

Country of origin of respondents

As visible from Figure 3 below, the two countries with highest number of respondents were Belgium (15%) and Germany (12%). These were followed by France and the Netherlands, accounting for 9% and 8% of all respondents respectively.

Figure 3. Country of origin of respondents

Q: Country of origin



Base: all participants (N=157)
Note: 'Other' includes countries with one respondent (Latvia, Malaysia, Austria, India, Egypt, Lithuania, China, Brazil, and Ireland); Source: Open Public Consultation

Questions on challenges and opportunities in the European innovation area

The open public consultation included questions on the challenges and opportunities in the European innovation area. The former category included a set of statements related to structural weaknesses that have been identified as hampering innovation in Europe. Respondents were asked to rate these on a scale from *strongly agree* to *strongly disagree*.

In the present section, the results are firstly presented in aggregate, before providing analysis by country groups ('innovation leaders and strong innovators' and 'moderate and modest innovators') and respondent type (EU citizens, a company/business organisation, an academic/research organisation or other). After the statements, the respondents were provided with two open-response questions to share views/feedback on the factors that hinder active involvement of interested parties in existing pan-European innovation ecosystems and other challenges and opportunities in the research and innovation area that are relevant to the operations of the EIT. The analysis of these open-response questions can be consulted at the end of this section.

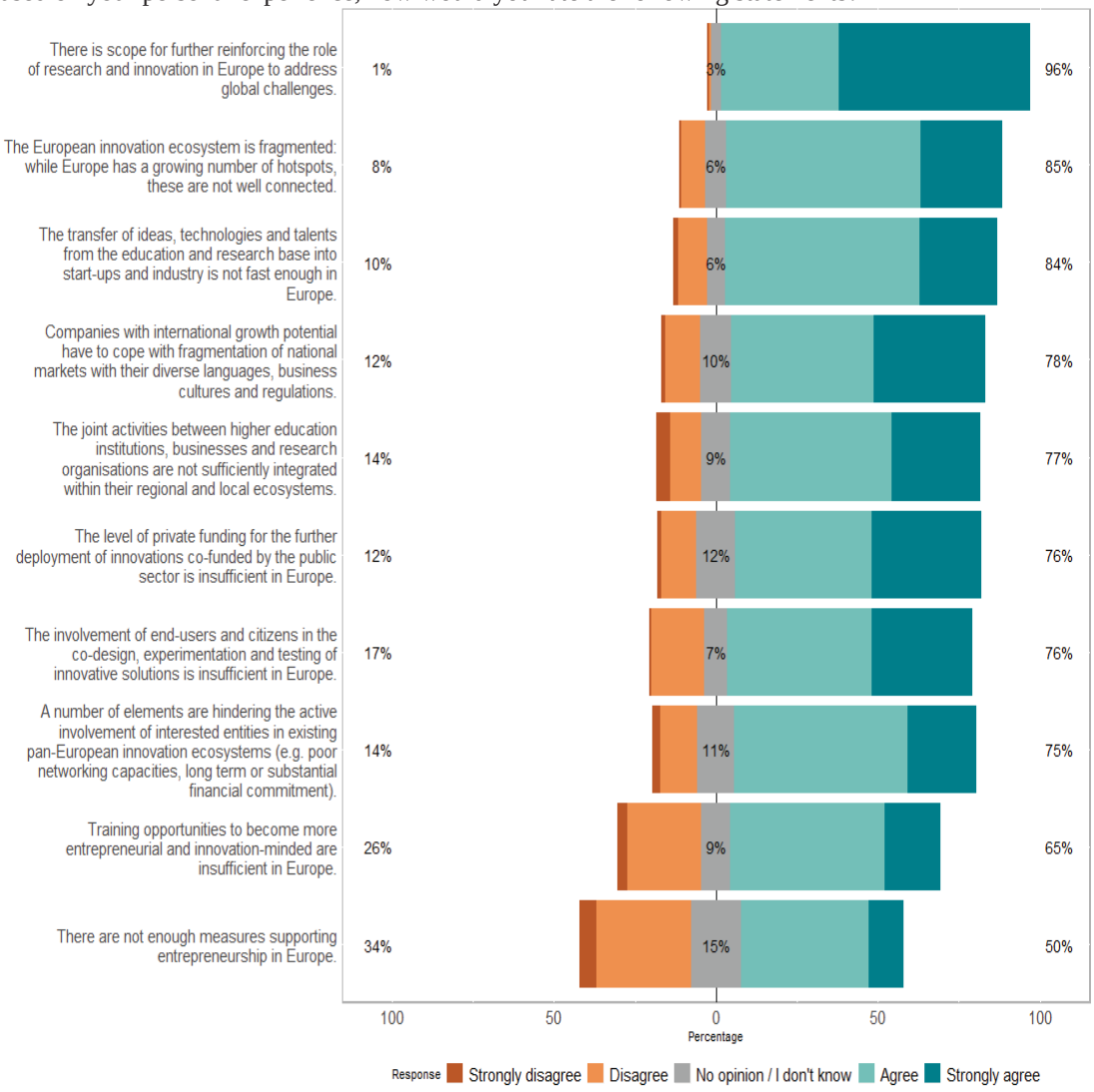
Aggregate results

The results show that almost all (96%) respondents *agreed* or *strongly* agreed with the statement that ***"there is scope for further reinforcing the role of research and innovation in Europe to address global challenges"***. The majority of respondents also agreed with statements about ***the fragmentation of the European innovation ecosystem*** (85%), ***the slow transfer of ideas, technologies and talents from education and research into start-ups and technology*** (84%) and the issue of ***companies with the potential for international growth facing the fragmentation and diversity of national markets*** (78%).

At the other end other scale, over a third (34%) *disagreed* or *strongly disagreed* with the statement that ***"there are not enough measures supporting entrepreneurship in Europe"*** whilst over a quarter (26%) *disagreed* or *strongly disagreed* that ***there are insufficient training opportunities in Europe to become more entrepreneurial and innovation-minded***. Nevertheless, although both statements received the greatest levels of disagreement from respondents, the majority of the participants in the consultation still *agreed* or *strongly agreed* with them (50% and 65%, respectively).

Figure 4. Rating of structural weaknesses, hampering innovation in Europe

Q: A number of structural weaknesses have been identified as hampering innovation in Europe. Based on your personal experience, how would you rate the following statements?



Base: all participants (N=157)
Source: Open Public Consultation

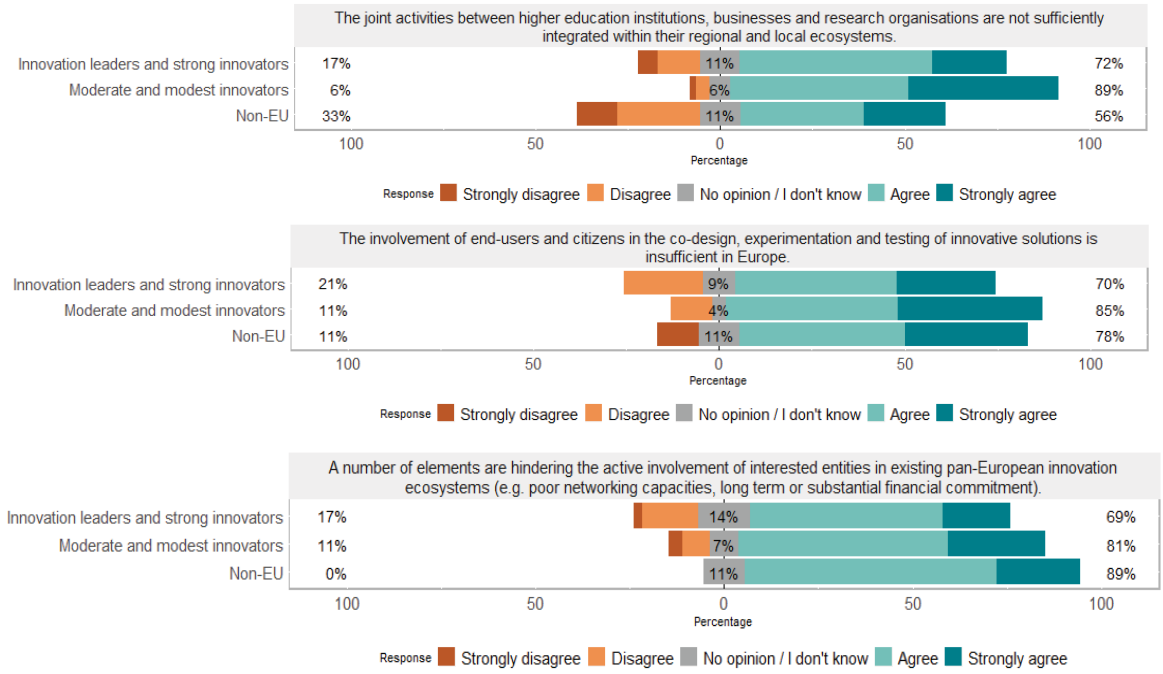
Results by country groups

Responses to each of the statements have also been broken down by whether respondents are 'innovation leaders and strong innovators' (n=94), 'moderate and modest innovators' (n=54) or 'non-EU' (n=9). As there were only nine non-EU respondents, the results for this group have been excluded from our reporting (though they are shown in the charts below for completeness).

On the whole, for a number of statements, the results are remarkably similar when broken down by 'innovation leaders and strong innovators' and 'moderate and modest innovators'. Similar responses were given on statements about the ***fragmentation of the European innovation ecosystem***, (84% and 87% agreed or strongly agreed, respectively) and ***further reinforcing the role of research and innovation in Europe to address global challenges*** (97% and 96%, respectively).

For some statements, however, there are some notable differences in the responses from the two groups (see Figure 5). For example, 89% of 'moderate and modest innovators' agreed or strongly agreed with the statement that "***the joint activities between higher education institutions, businesses and research organisations are not sufficiently integrated within their regional and local ecosystems"***, compared with 72% of 'innovation leaders and strong innovators'. In addition, a slightly higher proportion of 'moderate and modest innovators' (85%) agreed or strongly agreed that, ***in Europe, there is insufficient involvement of end-users and citizens in the co-design, experimentation and testing of innovation solutions***, compared with 'innovation leaders and strong innovators' (70%).

Figure 5: Statements replies by country groups



Base: all participants; Innovation leaders and strong innovators N=94, Moderate and modest innovators N=54, Non-EU N=9.
Source: Open Public Consultation

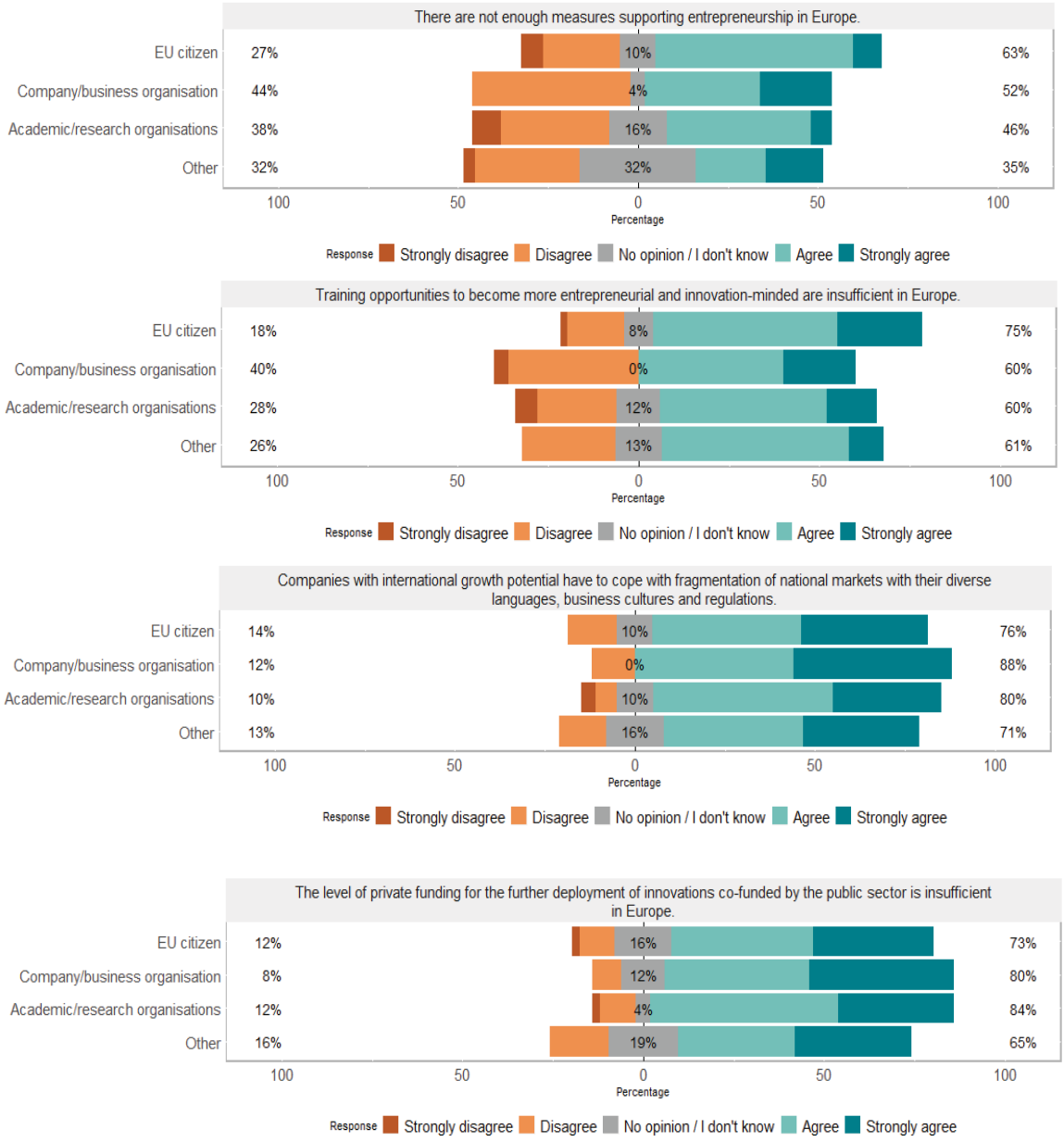
Results by respondent type

Responses to each of the statements have also been broken down by whether respondents are responding in their quality of EU citizens, a company/business organisation, an academic/research organisation or other. Any interpretation of these results should start with an acknowledgement that these results are based on small sample sizes (EU citizens N=51, company/business organisations N=25, academic/research organisations N=50, other N=31).

Overall, there was a high degree of consistency between the groups. For example, ***almost all respondents across the different groups agreed or strongly agreed with the statement that "There is scope for further reinforcing the role of research and innovation in Europe to address global challenges"*** (96% of EU citizens, 100% of company/business organisations, 94% of academic/research organisations and 94% of other respondents).

For some statements there were more mixed responses across respondent types. Almost two-thirds (63%) of EU citizens and over half (52%) of company/business organisations *agreed* or *strongly agreed* that ***there are not enough measures supporting entrepreneurship in Europe***, but only 46% of academic/research organisations and 35% of other respondents did so. In addition, 60% of company/business organisations and 60% of academic/research organisations, compared with 75% of EU citizens, agreed or strongly agreed that **there are *insufficient training opportunities to become more entrepreneurial and innovation-minded***.

Figure 6: Statements replies by respondent type



Base: all participants; Academic/research organisations N=50, Company/business organisations N=25, EU citizens N=51, Other N=31.
Source: Open Public Consultation

"Insufficient information on existing innovation ecosystems and opportunities; lack of knowledge on how one can participate or get involved"

"[Need more] awareness of the opportunities and a common platform to meet and exchange ideas"

"Visibility for pan-European innovation ecosystems needs to be increased"

"More efforts should be directed to better reach potential interested parties of the existing European innovation ecosystems to increase their possibilities of networking"

Factors that hinder involvement in existing pan-European innovation ecosystems

The first open-ended question in this section of the survey asked the respondents to comment on the key factors that hinder the active involvement of interested parties in existing pan-European innovation ecosystems. 88 respondents answered this question and raised a variety of barriers to involvement. The content within each response was coded into one or more categories and later analysed.

From this analysis, **the three most common factors**, mentioned over 20 times in the responses, were **'lack of visibility and awareness of existing innovation ecosystems and opportunities', 'bureaucracy and administrative complexity' and 'the barriers between nation-states'.** Other notable factors mentioned repeatedly (between 5 and 20 times) were '**fragmentation', 'insufficient collaboration and networking', 'funding' and 'a lack of understanding about the needs of small and medium-sized enterprises (SMEs)'**. Finally, other factors raised less than five times in the responses were **'risk aversion', 'a lack of an entrepreneurial mindset', 'insufficient sharing of good practice' and 'issues with measurement'.**

Lack of visibility and awareness around the existing innovation ecosystems and opportunities was among the most common factors of hindering innovation. Some of the comments are highlighted below:

"Insufficient information on existing innovation ecosystems and opportunities; lack of knowledge on how one can participate or get involved"

"[Need more] awareness of the opportunities and a common platform to meet and exchange ideas"

"Visibility for pan-European innovation ecosystems needs to be increased"

"More efforts should be directed to better reach potential interested parties of the existing European innovation ecosystems to increase their possibilities of networking"

Source: Open Public Consultation

One respondent offered a solution to this problem by suggesting that as information "on competitions and grants does not reach those concerned", a "single portal" should be developed and used across European agency projects. This was echoed in separate written submissions, where a recommendation to develop a simpler access to what is available through European support was made.

Another key factor that many raised was **bureaucracy and administrative complexity**. This was often linked to the large amount of paperwork that needed to be filled out, long lead in times for submitting projects, the scope of the work for the application, and the complexity of reporting outputs and impact. This was a common theme in the separate written submissions made to the OPC. These highlighted, for example, the need to: simplify KIC tools and rules; address administrative barriers facing KICs, including through multi-annual funding; and align financial management and reporting with Horizon Europe.

Many respondents noted that **national differences and local context were hindering factors.** Some of the national differences were cultural, educational or linked to language or regulations:

"Still the national barriers, [e.g.] understanding of regional cultures and behaviour, languages,…missing…a seamless qualification and education system with recognition at all levels"

"Different rules in different countries…different regulations regarding personal data"

"Not all member states are equally represented in the different EU structures targeting innovation in the EU. Measures targeting Central and Eastern Europe and the Balkans should be tailor-made to the local context."

Source: Open Public Consultation

Linked to this, some highlighted **fragmentation** either with a lack of connection between different initiatives or with too many unconnected networks and ecosystems without critical mass. Instead, respondents asked for a "one-stop shop" or a few strong "places to be".

The issue of **collaboration and networking**, particularly across different actors, was also highlighted along with the need to join up potential partners at the right time (see quotes below). The additional written submissions echoed this strongly, which partly reflected the nature of the respondents, coming from associations of particular universities, SME communities etc. These contributions pointed to various recommendations, including: drawing in Research and Technology Organisations (RTOs); recognising the role of universities that may not be part of the core stakeholder groups of KICs, e.g. through greater outreach and information-sharing; and adopting appropriate incentives to engage SMEs.

"Insufficient knowledge and networking of academic and business is also an issue"

"Culture of actors according to their affiliation (basic research organisation, RTO, universities/teaching facilities, enterprises). The EIT is necessary to bring together these actors and to "collaborate" together (integration)"

"The facilitators should put extra focus on matchmaking among members within their own ecosystem. Focus should be put on knowledge sharing and promoting partners, there capacities and values for others within the ecosystem"

"Need more local / regional supports for identifying the appropriate partners for them at different moments of their projects"

"Uneven balance between academic expertise and business knowledge of opportunities - academic environment seems much better suited for current setup of innovation projects. Only those companies with sufficient size or very specific expertise seem to be joining innovation ecosystems due to workload and prioritization issues"

Source: Open Public Consultation

A number of issues related to **funding** were raised by respondents. Alongside the need for funding, other issues included ***complex funding rules, lack of commitment to multi-year or long-term funding,*** and ***little low risk follow-up funding for completed projects***.

A lack of understanding around the needs of SMEs that hinder them from getting involved was highlighted:

"Time investment needed, especially for SMEs. Too low chance of success, especially for SMEs, compared to the administrative burden"

"Low participation of SMEs in innovation activities (lack of financial resources and skills)".

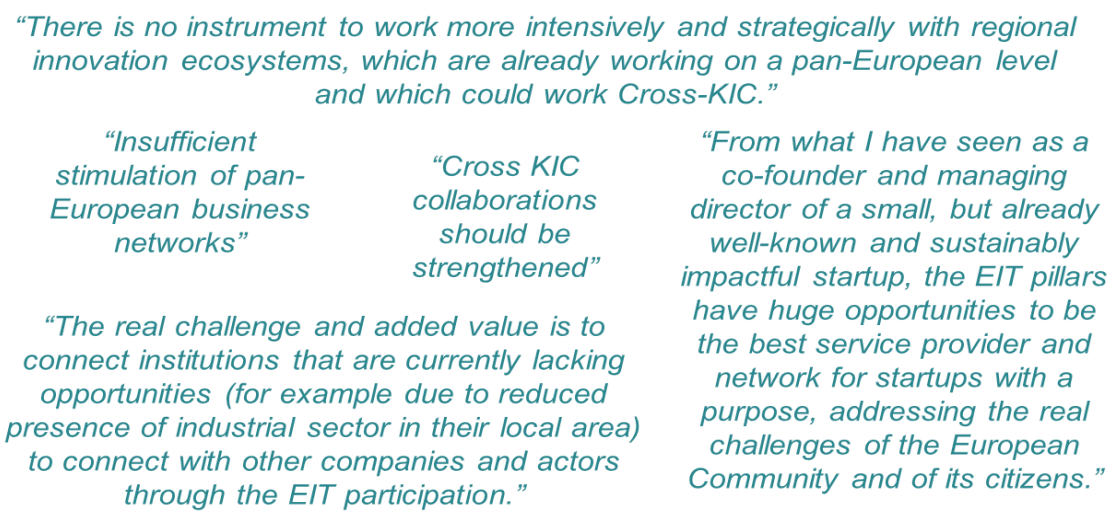
"Too many administrative burdens for SMEs"

"Support programs have not been designed with entrepreneurs in mind. Most seem to be structured such that their target audience appears to be large universities or large corporate innovation divisions. For example, when you win a Climate-KIC grant, you must manage all cashflow for that grant for 18 months before you receive a pay-out. For a large entity this isn't a problem, but for a technology start-up that cannot access debt, this is a major challenge."

Source: Open Public Consultation

Challenges and opportunities in the research and innovation area

The second open-ended question asked respondents to comment on any other challenges and opportunities in the research and innovation area relevant to the operations of the EIT. One of the opportunities that came up most frequently among respondents was to **build upon and strengthen collaborations and networks** at many different levels – between businesses, institutions, KICs, and regional and pan-European innovation ecosystems:



Source: Open Public Consultation

This was also a common theme in a number of written submissions. Some of the raised points include:

- The **integration across KICs** was identified as an opportunity. This included learning exchanges between KICs, and in particular from more to less well-developed KICs, though there was a cautionary note on the context-specificity of certain KICs. In addition, it was noted that tools or mechanisms should be developed to facilitate cross-KIC activity more readily when the opportunities are identified. A broader point was made that technologies developed through KICs are likely to be relevant across boundaries, and often companies do not even see these artificial boundaries. Mechanisms that can facilitate knowledge sharing would be beneficial to industry.
- It was identified that **Horizon Europe** needs to provide mechanisms to facilitate connections and links between innovation ecosystems, for example through greater emphasis of European Innovation Ecosystems action under Pillar III.
- A cautionary note was made that KICs face the risk to become **closed clubs**. They need to have better outreach to other higher education institutions to share lessons, and to provide information on opportunities relevant to the institutions.

Other opportunities, mentioned less frequently by respondents, related to raising **awareness and promoting the EIT** among the general public, connecting the education system to industry – "EIT should be a driving force to implement a more business-oriented approach in Universities and research centres" – and improving the implementation and commercialisation of innovations.

On the other hand, many mentioned **challenges related to funding and investment**. For example, Europe **"**lack[s] a platform offering more visibility of high-potential early stage ventures and technologies among competent investors"; "High quality 'frontier science' needs to be matched equally with high quality, diverse and 'deep' long term funding"; and "Short term budgets…hinder sustainability in innovation partnerships and more long-term strategies".

Other challenges, mentioned less frequently by respondents, related to barriers to participation such as bureaucracy, the **"missing alignment between regional, national and EU research and innovation activities"** and the **difficulties entrepreneurs and start-ups face** to access funding and contribute to the EIT and the KICs as they "lack the operational diversity and internal organizational infrastructure [that] the large companies and the universities have in place to support the formalities of the EU and the EIT KIC". Separate written submissions identified potential routes to addressing these challenges, for instance through associations representing SMEs or the intermediaries that could provide a structured approach to doing so (e.g. the European Business and Innovation Centre Network).

Questions on policy objectives for the EIT

The respondents to the online public consultation were asked to share their opinions with respect to the three policy objectives set for the operation of EIT for the period 2021-2027. In their replies, the participants could choose more than one action to achieve each policy objective. The three most popular suggestions for activities to help pursue each objective are described in the section below.

Policy objective 1: To foster, grow, strengthen and develop current or new sustainable innovation ecosystems across Europe.

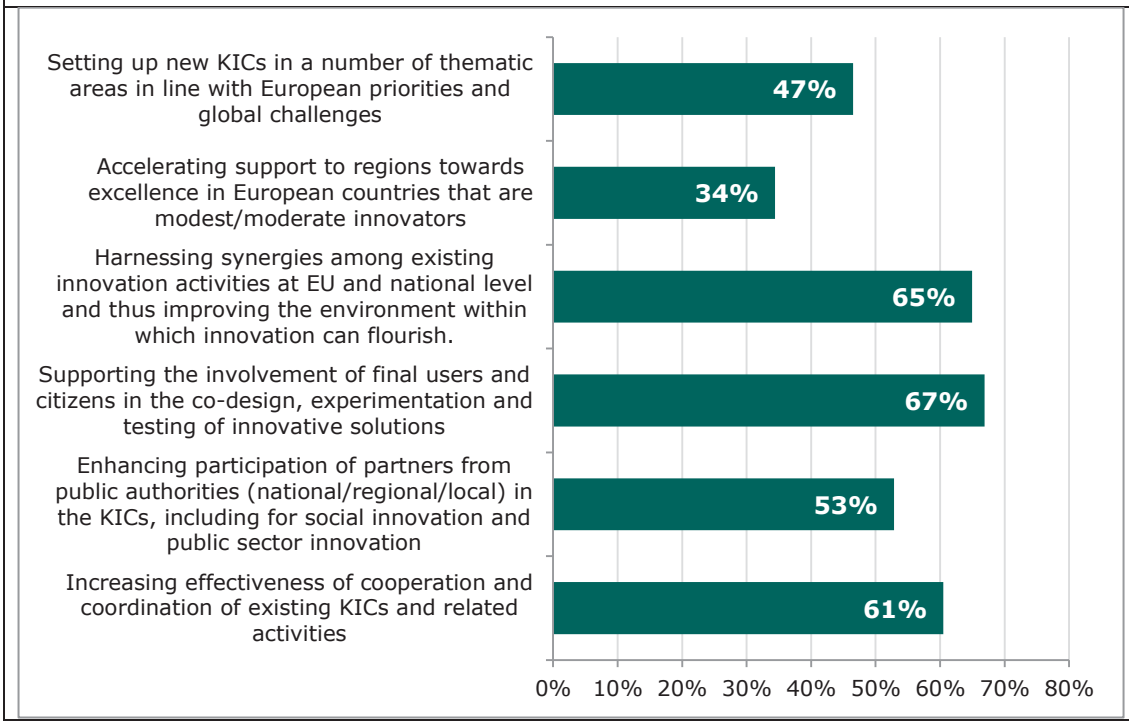
The most often selected action to achieve this policy objective was **supporting the involvement of final users in the development of innovative solutions** (67%). This approach was most popular among respondents from 'other' organisations, EU citizens and company representatives and less so among respondents from academic/research institutions.
Another popular action for achieving the policy objective was **harnessing the synergies among existing innovation activities at EU and national levels** (65%). This option was cited most often by representatives of academic/research organisations and it was more favoured by innovation leaders as opposed to moderate and modest innovators.

Increasing the effectiveness of cooperation and coordination of existing KICs and related activities was another popular option (61%), selected particularly by representatives of academic/research organisations and EU-citizens.

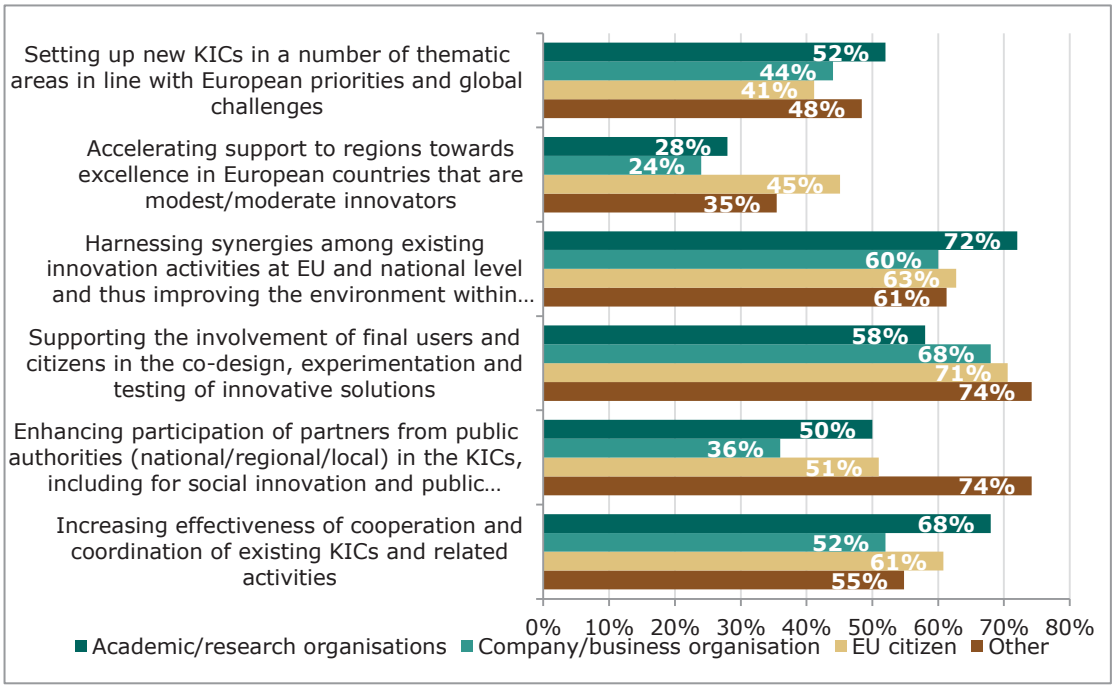
Figure 7. The most relevant activities for the EIT to achieve the Policy Objective 1

Q: In your opinion, what are the most relevant activities for the EIT to best achieve the following policy objectives?

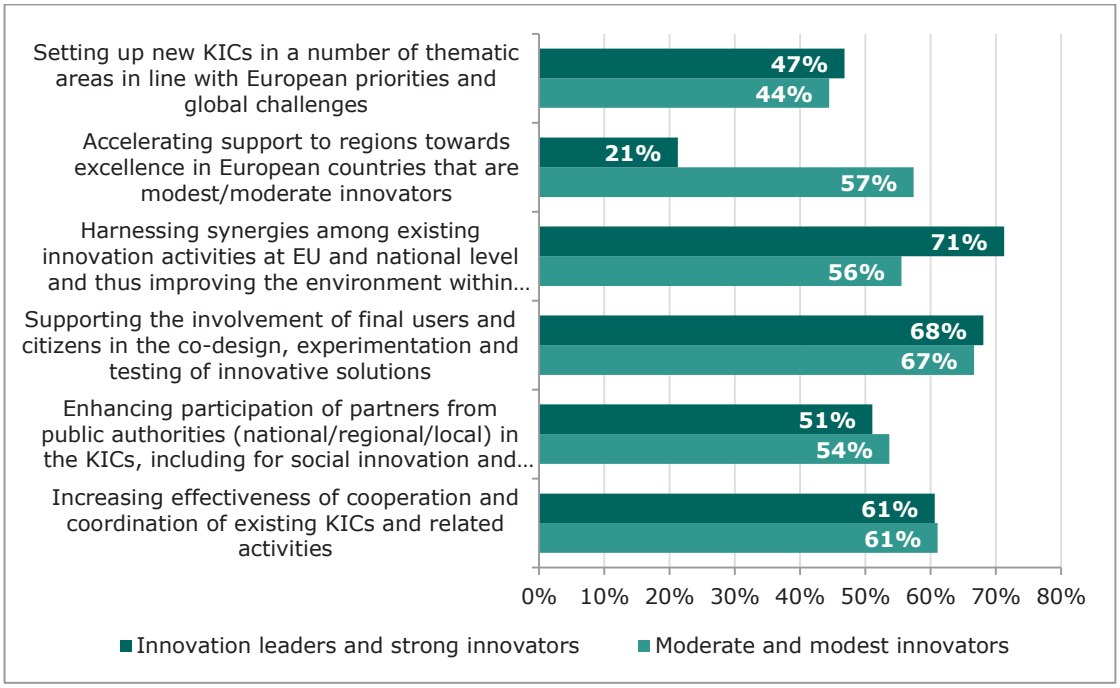
- **Policy objective 1:** To foster, grow, strengthen and develop current or new sustainable innovation ecosystems across Europe by connecting people, disciplines, sectors, organisations and resources within a specific Knowledge and Innovation Community (KIC).



Base: all participants (N=157)
Source: Open Public Consultation
Note: the figures demonstrate the distribution of answers among all respondents. As the respondents had an ability to select several answers up to four), the percentages do not add up to 100%



Base: all participants; Academic/research organisations N=50, Company/business organisations N=25, EU citizens N=51, Other N=31.



Base: 148 respondents: Innovation leaders and strong innovators N=94, Moderate and modest innovators N=54. Non-EU (N=9) respondents are excluded due to the very small sample size.
Source: Open Public Consultation

The respondents were given the option to suggest any additional activities they considered important for achieving the first policy objective. **Making KICs more inclusive by enhancing the participation of a wider range of stakeholders**, such as SMEs, investors, and non-EU stakeholders, was the most widely agreed upon solution (30%), and the breadth of potential stakeholders and means of engagement is illustrated in the quotes below. This appeared to be a particularly important issue, underscored in some of the position papers provided by respondents, which emphasised the importance of creating stronger ties with higher education institutions.

This activity was followed by other suggestions, such as **building a strong network through partnerships with other initiatives** (e.g. Digital Innovation Hubs) (21%) and **removing administrative red tapes**, as the system was perceived as too slow and complex and some requirements such as financial sustainability were put forward for reinterpretation (10%). **Fostering complementarity and avoiding duplication with other current and future EU initiatives**, as well as **reducing the administrative workload of KICs**, associated with application, reporting and evaluation, were some of the more prominently discussed issues in the position papers.

Lastly, introducing a more **bottom-up approach** by involving municipalities and citizens and supporting cross-KIC innovation synergies and projects were recommended by 6% of respondents each, illustrated in some of the quotes below and also was elaborated in several position papers.

"Positively encourage intrapreneurship in private and public-sector organisations, Primary schools, high schools and colleges - this is a challenge for all citizens to be involved in."

"Connect to change-makers beyond the EIT network such as entrepreneurship networks (Sandbox, EO, etc), sustainability investment funds and research institutes or innovation cluster"

"Put in place concrete measures to encourage KCs to work together and increase openness to non-founding private actors (in particular SMEs)."

"Remove or reinterpret the requirement on financial sustainability of KICs and focus on promoting their partnerships of excellence."

"Current way of working of the EIT KICs is too bureaucratic. There are too many layers, too much is spent on governance instead of innovation."

"Consultation of the representatives of the local communities to know their responsibilities and visions"

Source: Open Public Consultation

<u>Policy objective 2:</u> To improve the human capital base for innovation through developing talents and enhancing skills and competence; to make entrepreneurship and innovation culture in Europe stronger, more inclusive and more open, and to contribute to the entrepreneurial transformation of higher education institutions across the EU.

The most popular suggestion for achieving this policy objective was **providing funding for innovation capacity development and rewarding/recognising universities for becoming more innovative and entrepreneurial** (71%). It was embraced most predominantly among academic/research organisation representatives, EU citizens and respondents within the 'other' category as opposed to business representatives.

Another similarly often-selected option was **launching new actions supporting education and human capital development through the identification of future skills needs** (69%). There was consensus across different types of respondent for this option.

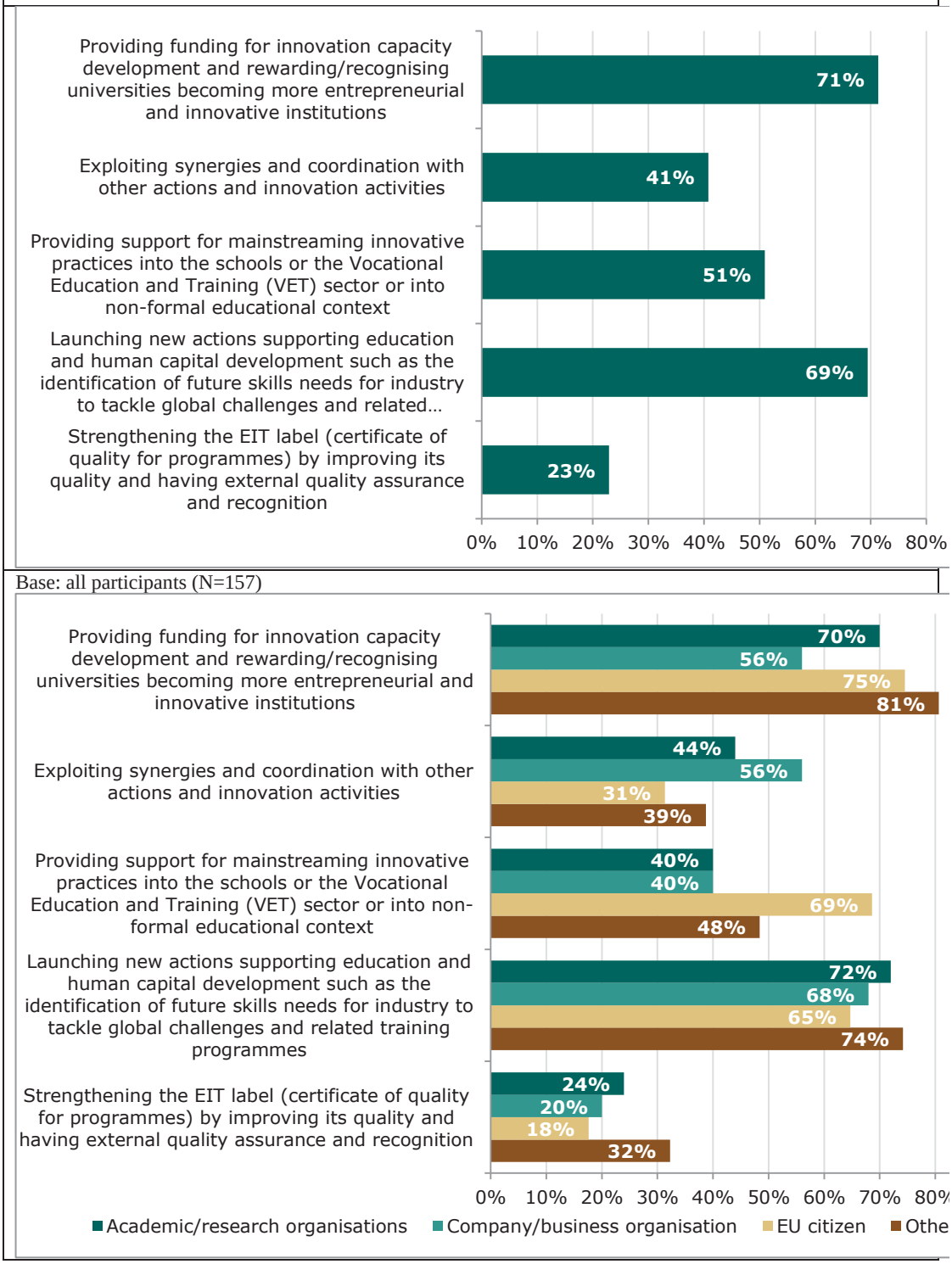
Some actions were much less popular, in particular **strengthening the EIT label** (supported by 23%). Several of the separate written submissions discussed the EIT label. There was a sense that it was not very well-known, though it was noted by one respondent that it potentially had some value outside of Europe. Two respondents highlighted the need to go beyond postgraduate degrees when considering the EIT label, or the education aspect of KIC activities more generally, as innovation needed to be part of the "main" curriculum.

Figure 8. The most relevant activities for the EIT to achieve the Policy Objective 2

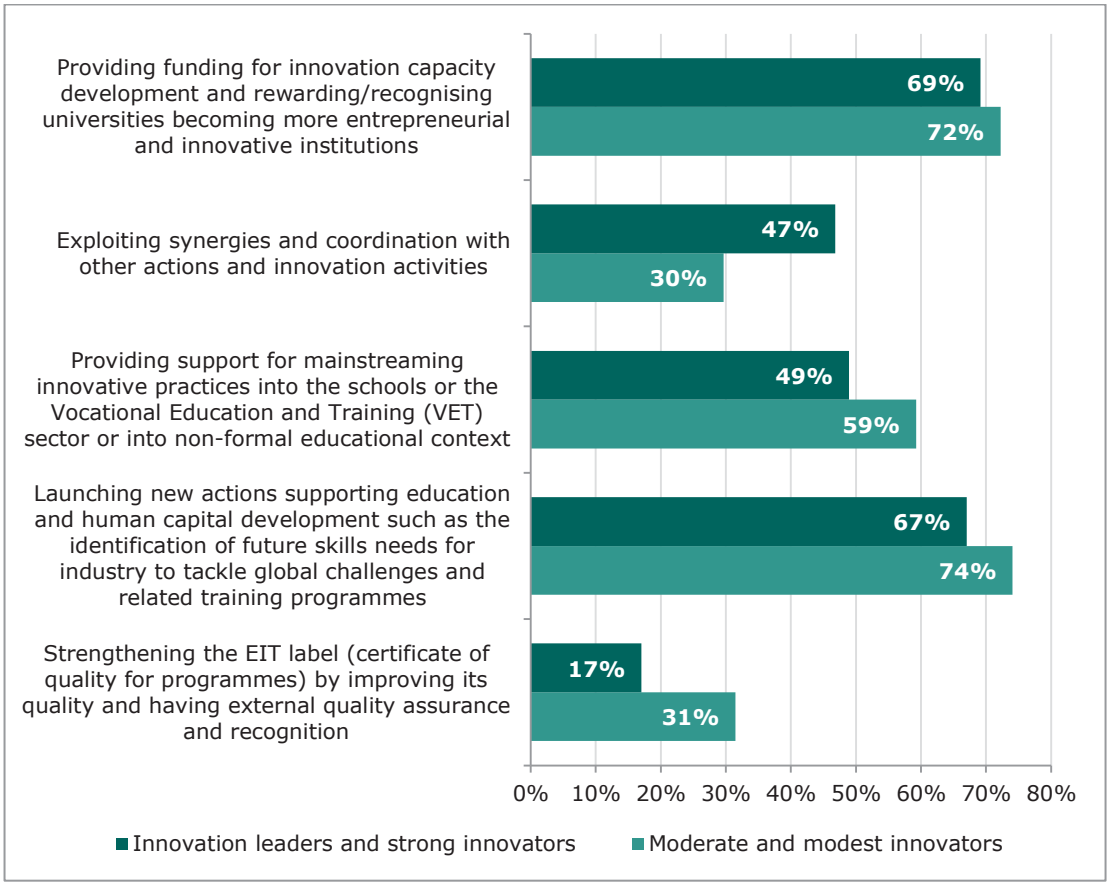
Q: In your opinion, what are the most relevant activities for the EIT to best achieve the following policy objectives?

- **Policy objective 2:** To improve the human capital base for innovation through developing talents and enhancing skills and competences; to make entrepreneurship and innovation culture in Europe stronger, more inclusive and more open, and to contribute to the entrepreneurial transformation of higher education institutions across the EU.

can be best achieved through



Base: all participants; Academic/research organisations N=50, Company/business organisations N=25, EU citizens N=51, Other N=31. Source: Open Public Consultation



Base: 148 respondents: Innovation leaders and strong innovators N=94, Moderate and modest innovators N=54. Non-EU (N=9) respondents are excluded due to the very small sample size.
Source: Open Public Consultation

The respondents were also given the option to suggest any additional activities they considered important for achieving the second policy objective. The most often-suggested activity was providing **affordable and easy access to training** (21%), by creating continued education online course platform of developing short training and empowerment programmes for entrepreneurs. This was followed propositions for **strengthening collaboration between stakeholders** (8%) by creating partnership between industry and higher education and **aligning with other programmes** (8%), such as Erasmus+. **Cross-disciplinary collaboration**, which allows for the exchange of practices, and encouraging innovation at universities by incorporating entrepreneurial courses were each supported by 6% of respondents.

In general, **creating and fostering synergies appeared** to be a prominent issue as it was discussed at length in the position papers. For example, there were suggestions to create specific tools that facilitate the connection between different KICs around common topics, thus avoiding overlaps and fostering collaboration. Additionally, it was emphasised that the focus should not only be on increasing university-business collaborations but also on ensuring the active involvement of local and regional stakeholders. It was suggested that this can be achieved by introducing more transparent participation rules.

"Co-creation of learning opportunities with a broader set of stakeholders, rather than being driven only by knowledge institutions (e.g. academia)."

"Research excellence through exchange of practices, joint development of curricula and lessons learned, pedagogical innovation and the digital transformation of education."

"To enhance the education / qualification system for the existing and future workforce through a modular training program with recognition (ECTS / ECVET) which would be recognized within the EU 27"

"Programs that encourage the creation of ephemeral teams for the development of innovations, through social recognition, incentives and economic prizes"

"Please ensure synergies with the actions in the framework of Erasmus+."

"Pioneer an open European continuing education on-line course portfolio and platform hosted by EIT with the universities and others as content providers. Thus, by passing the KICs since they are to small and too sectorial to become supercritical in size."

"Supporting higher education by active matchmaking with industry"

"Development and insertion of pilot entrepreneurship empowerment programme in the school curriculum in secondary schools"

Source: Open Public Consultation

Policy objective 3: To develop and bring new solutions to global societal challenges to the market.

When asked how the third policy objective could be best achieved, the most favoured approach by the respondents was the **development of new products and services, which involve all relevant stakeholders** (64%). The proportion of responses was evenly distributed among all respondent groups.

Another similarly popular choice was **making business support services widely available** (63%). The distribution between respondent groups was not even, as business respondents seemed to agree with this approach to a lesser extent than the other groups. Additionally, respondents from moderate and modest innovators were more supportive compared to innovation leaders.

Lastly, the majority of respondents also favoured **increasing support for financial and capital raising services and attracting private funding** (61%). This approach seemed to be supported the most by the respondents within the 'other' category and EU-citizens as opposed to academic/research organisation representatives. It also appeared to be much less likely to be selected by innovation leaders.

Conversely, **provision of customised support for specific target groups** (36%) did not

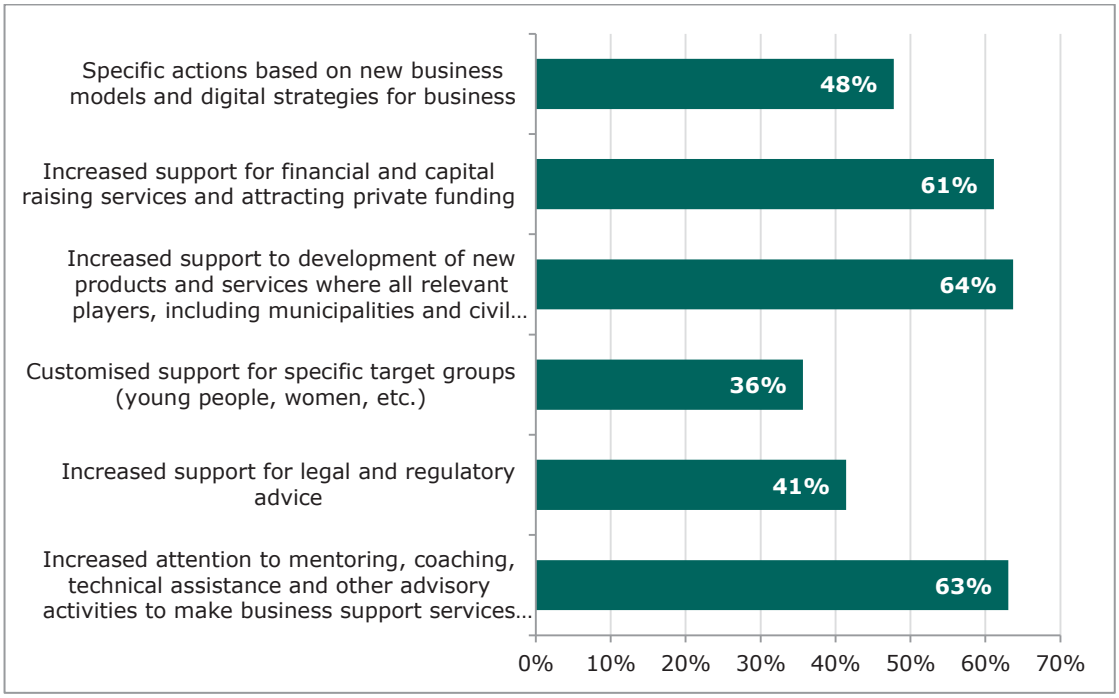
Figure 9. The most relevant activities for the EIT to achieve the Policy Objective 3

Q: In your opinion, what are the most relevant activities for the EIT to best achieve the following policy objectives?

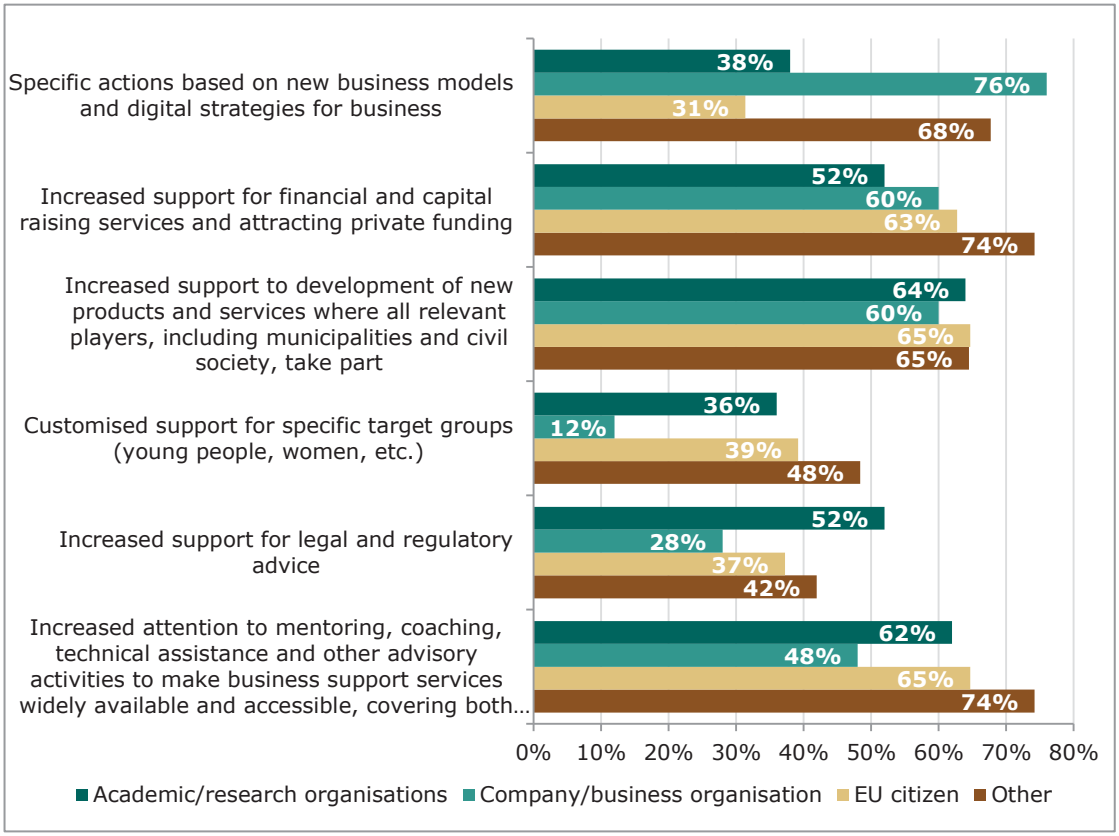
- **Policy objective 3:** To develop and bring new solutions to global societal challenges to the market by integrating education, business and research, as well as other relevant players (such as municipalities, civil society, large industry, small and medium-sized enterprises, etc.) according to the sector.

can be best achieved through:

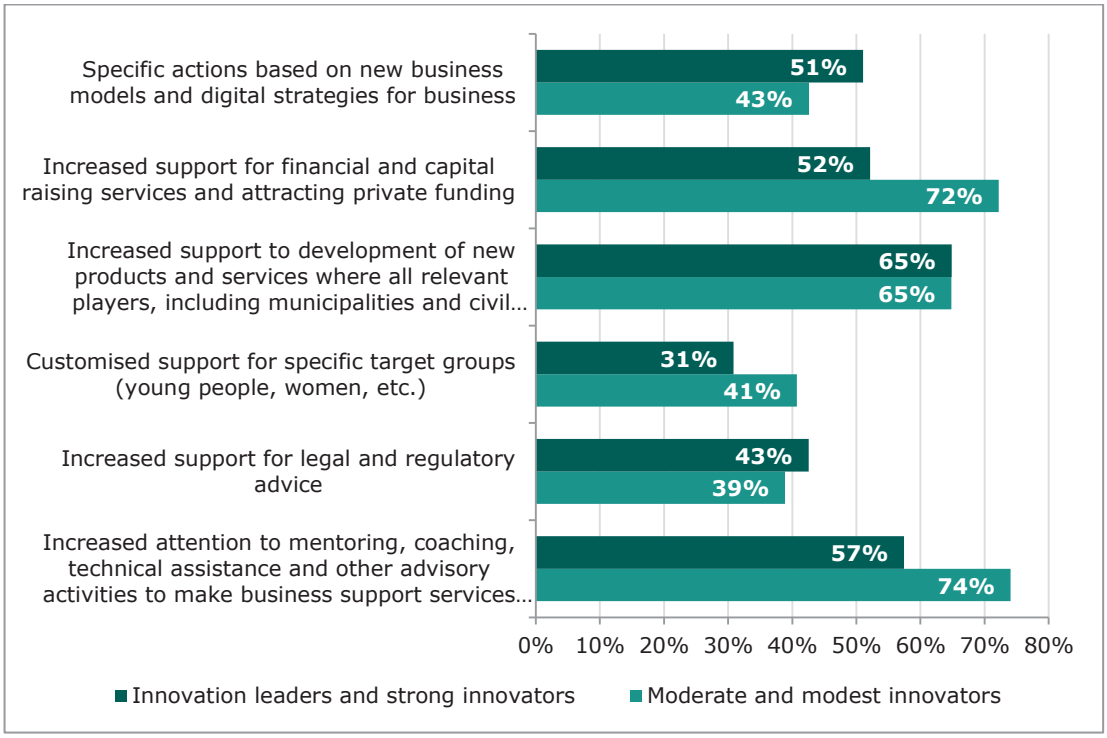
receive a lot of support, particularly by business representatives and respondents from innovation leaders.



Base: all participants (N=157)



Base: all participants; Academic/research organisations N=50, Company/business organisations N=25, EU citizens N=51, Other N=31. Source: Open Public Consultation



Base: 148 respondents: Innovation leaders and strong innovators N=94, Moderate and modest innovators N=54. Non-EU (N=9) respondents are excluded due to the very small sample size.
Source: Open Public Consultation

The respondents were also given the option to put forward any additional activities they considered important for achieving the third policy objective. **Inclusion and collaboration with other European and national programmes** was the most-often suggested activity (24%) by, for example, ensuring a greater eligibility for the participation of local and regional authorities in project proposals. **Involvement of a wider range of stakeholders**, such as regional ecosystems (15%), **collecting and popularising best practices and successful cases** (5%), **incentivising the private sector to take part in innovative projects** (5%) and **standardisation across alternative and competitive technology solution providers** (5%) were some of the more popular activities among the respondents of the survey.
The importance of regional authorities and ecosystems, as well as closer cooperation between the nodes of the knowledge triangle are illustrated in the quotes below:

"Support for standardisation across alternative/competitive technology solution providers"

"Ensuring greater eligibility for the participation of local and regional authorities in project proposals"

"Greater integration into the regional ecosystem via the co – rental centres: Strengthen cooperation with regional and local authorities of innovation ecosystems as well as with regional and local actors"

"Economic drivers should be developed in order to attract private investments targeting the different societal challenges"

"Closer cooperation between education, business and research -> consider the needs of research and business in education plans, promote internships & applied research (eg. PhD studies in industries, etc.)"

The respondents were also asked to list any other *policy objectives* they deemed important for the future of the EIT. Overall, **nurturing the existing innovation ecosystems was the most popular policy objective among the respondents** (30%). They placed emphasis on the role of EIT as a connector. Similarly, **better coordination between stakeholders, resources and initiatives** (17%) **involvement of new stakeholders such as students** (17%), and **provision of SME-specific support** (13%) were some of the other objectives put forward by the respondents of the survey.

"The EIT should not be doing things that a lot of other organisations are doing, but it should be a connector."

"Implement tools that really help SMEs organizations and lead to the application of the Circular Action Plan in view of a real sustainable economy in the fields of water reuse and agriculture"

"EIT has created innovation ecosystems primed for tackling societal challenges and for delivering on the policy priorities of the EU. This should be their mission rather than reverting to EIT and the KICs being an ideas factory for the venture capital engine of the European Innovation Council."

"There should be better coordination at DG EDU, EIT and national governments for the recognition of the EIT Community within the Member States."

"...there is a significant need for better coordination of the fragmented approach to policies and initiatives in an already fragmented landscape. Coordination is the first step and could include coordination of actors, resources, initiatives, policy vision..."

Source: Open Public Consultation

Questions on options to tackle the challenges

The respondents were asked to share their opinions with respect to the options for tackling challenges. First, they provided answers with respect to the most important *aspects for ensuring the financial sustainability of KICs*. According to them, a **robust financial strategy from the outset of a KIC and the continuous monitoring of its implementation and evaluation** was the best strategy (64%), an opinion particularly prevalent among respondents within the 'other' category.

Similarly, **securing other sources of public funding for the operations of KICs** was favoured by respondents (60%) and in particular by those within the 'other' category and academic/research organisations. Strategies such as **strict application of quality management principles** (27%) and **regular membership fees** (27%) were the least popular among the respondents.

The participants were also asked to suggest any other aspects they considered important for achieving the financial sustainability of KICs. The most popular solution according to them was **securing funding from other sources, through national funding, sponsorship by private actors, and grants, among others** (36%). They also suggested **increased monitoring and regulation** (18%), **multi-annual budget planning** (9%) and **increased entrepreneurial focus within KICs** (6%).
The requirement that **funding be awarded for one year** at a time rather than for multiple years was presented in several position papers as impeding participation and suggestions were made to switch to a multi-annual funding model.

"Enhancing the regulations of different (European) financial instruments and grants to facilitate combinations of funding sources."

"Negotiating national funding through the different operational programmes complementary to the EIT funding for the KICs"

"Increase the focus on business creation and entrepreneurial priorities, beyond the implementation "Enhancing the regulations of different (European) financial instruments and grants to facilitate combinations of funding sources."

"Monitoring expenses is vital for the KIC's survival."

"Strict semester control where the project can be stooped if not well administrated"

"Provide KICs with greater entrepreneurial freedom, for instance by giving them the opportunity to determine autonomously how to demonstrate impact, within certain boundaries, and justify the resources invested. This should take into account the challenge of reconciling the goal of delivering societal impact and with that of capturing market value."

"Developing sponsorship as an avenue for financial support (developing avenues for specific private support: Patronage, foundation, etc., rather than public)."

"Current yearly budget allocations need to be replaced by multi-annual budget planning cycles to allow for professional budgeting and multi-annual projects. Decisions on budget allocations must be made well before budget implementation starts which will also enhance predictability."

Source: Open Public Consultation

The respondents were also invited to give suggestions for other suitable ***thematic areas*** that could be implemented through future EIT KICs to deliver on EU priorities and challenges. The following list contains the most-often suggested themes[128]:

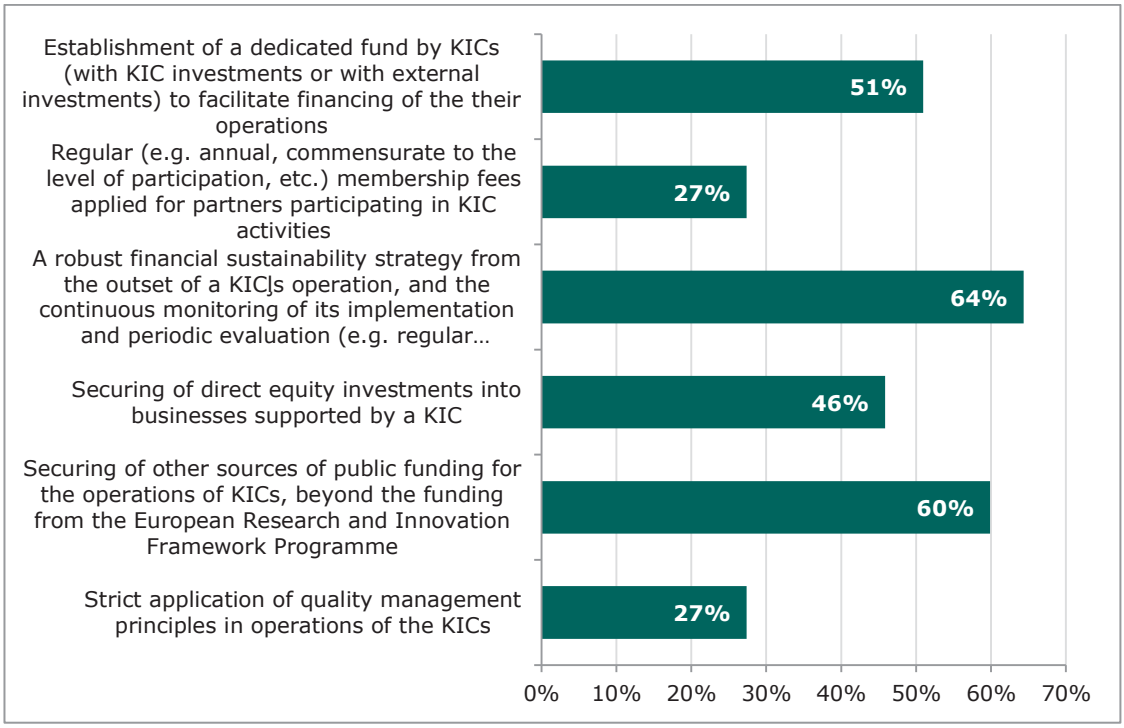
- Water - suggested by 17% (23 respondents)
- Marine sciences - suggested by 9% (12 respondents)
- AI - suggested by 6% (8 respondents)
- Mobility - suggested by 6% (8 respondents)
- Cultural and creative sectors - suggested by 6% (8 respondents)
- Sustainable development - suggested by 5% (7 respondents)
- Transport - suggested by 5% (7 respondents)
- Space and space technologies - suggested by 4% (6 respondents)
- Security - suggested by 4% (6 respondents)
- Circular economy - suggested by 4% (5 respondents)
- Robotics - suggested by 4% (5 respondents)
- Smart cities - suggested by 3% (4 respondents)

The separate position papers also included suggestions for KICs, notably on water/marine/maritime with a vision statement offered for BlueGrowth, and with a similar vision statement offered for nutrients sustainability (relating to agricultural networks).

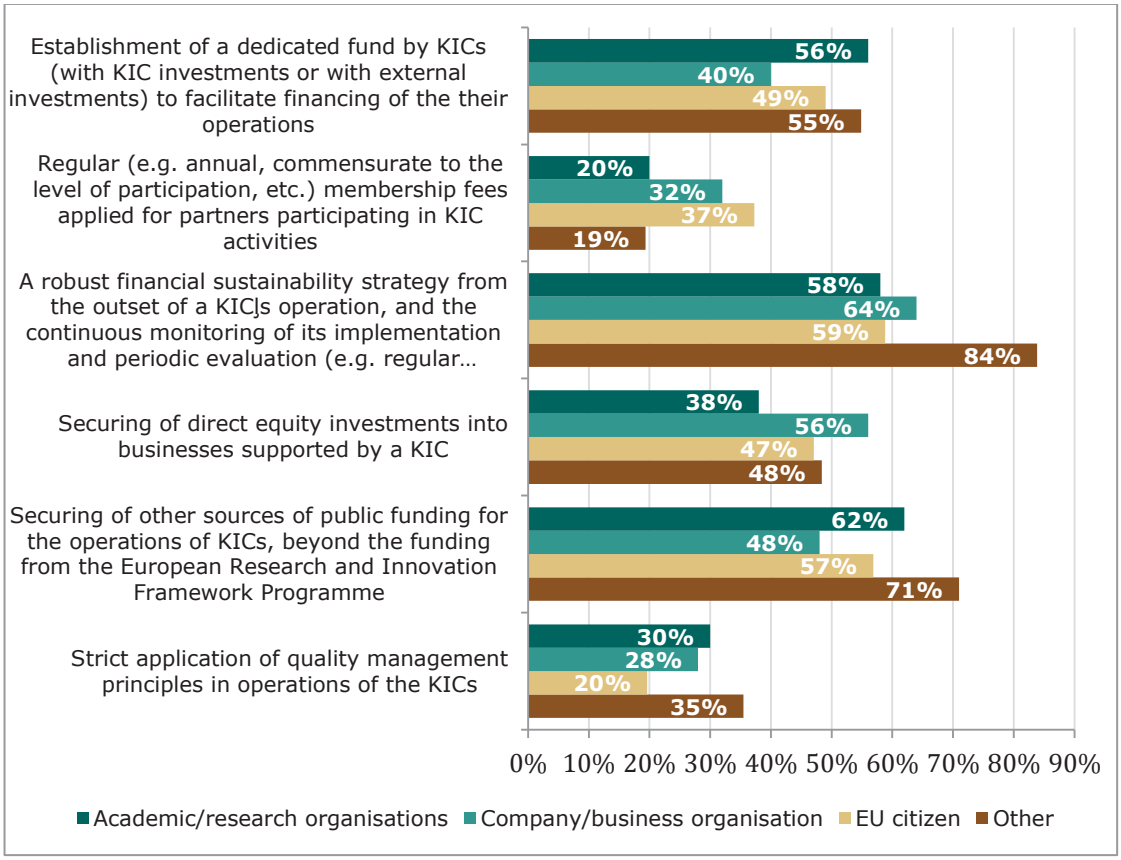
128 The themes suggested where KICs already exist have been filtered out. These are: Energy - suggested by 20% (27 respondents), Health - suggested by 14% (19 respondents), Climate change - suggested by 13% (18 respondents), Digitalisation - suggested by 13% (18 respondents), Food - suggested by 7% (10 respondents)

Figure 10. The most important aspects to ensure financial sustainability of KICs

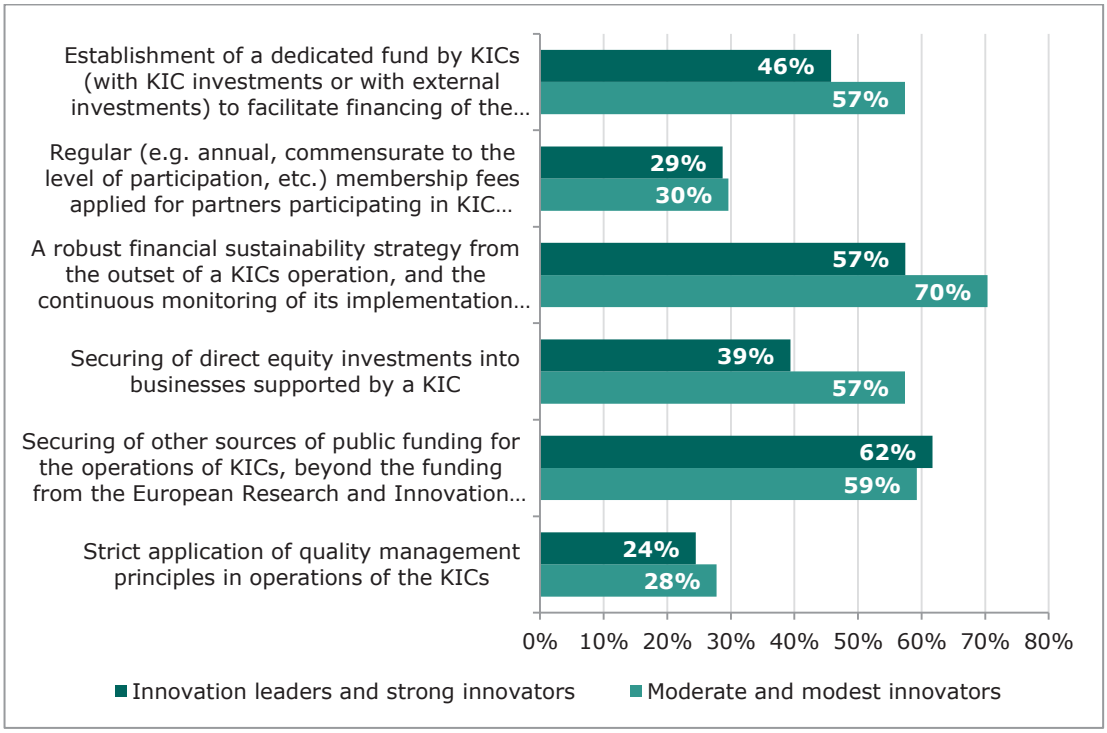
Q: According to the EIT Regulation, KICs shall develop strategies for financial sustainability beyond the funding from the European Research and Innovation Framework Programme (in a time-frame of seven to fifteen years). In your view, which of the following aspects are the most important for ensuring financial sustainability of KICs?



Base: all participants (N=157)



Base: all participants; Academic/research organisations N=50, Company/business organisations N=25, EU citizens N=51, Other N=31. Source: Open Public Consultation



Base: 148 respondents: Innovation leaders and strong innovators N=94, Moderate and modest innovators N=54. Non-EU (N=9) respondents are excluded due to the very small sample size.
Source: Open Public Consultation

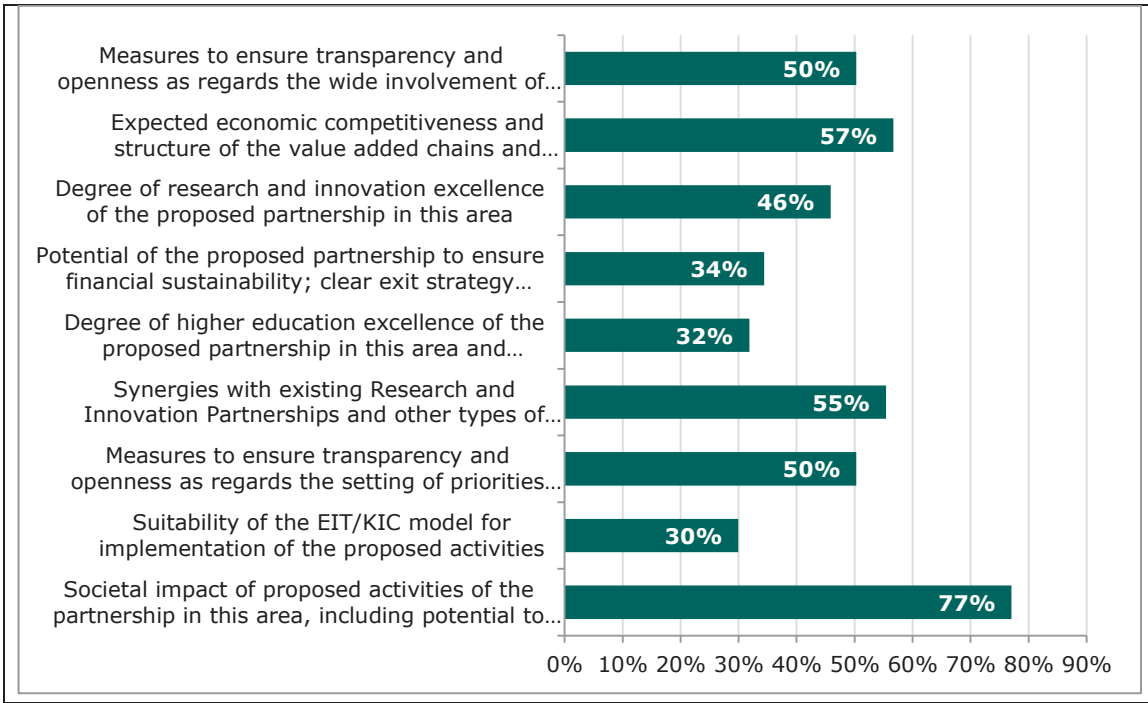
The respondents were also asked to indicate what the most important **criteria were for the selection and implementation of new KICs** in pre-defined thematic areas based on EU priorities. The most popular criterion by far was the **societal impact of the proposed activities, including their potential to address the Sustainable Development Goals (77%)**. This option was particularly popular among the representatives of business and academic/research organisations alike.

Two other criteria that were selected by more than half of the respondents were **expected economic competitiveness and structure of the value-added chain and production strategies of the proposed partnerships (57%)** and **synergies with existing Research and Innovation Partnerships and other types of actions at European, national and regional level (55%)**. The former was significantly more popular among representatives of the academic/research organisation than any of the other groups of respondents and least favoured by moderate/modest innovators. In contrast, the latter criterion was most popular among business organisation representatives.

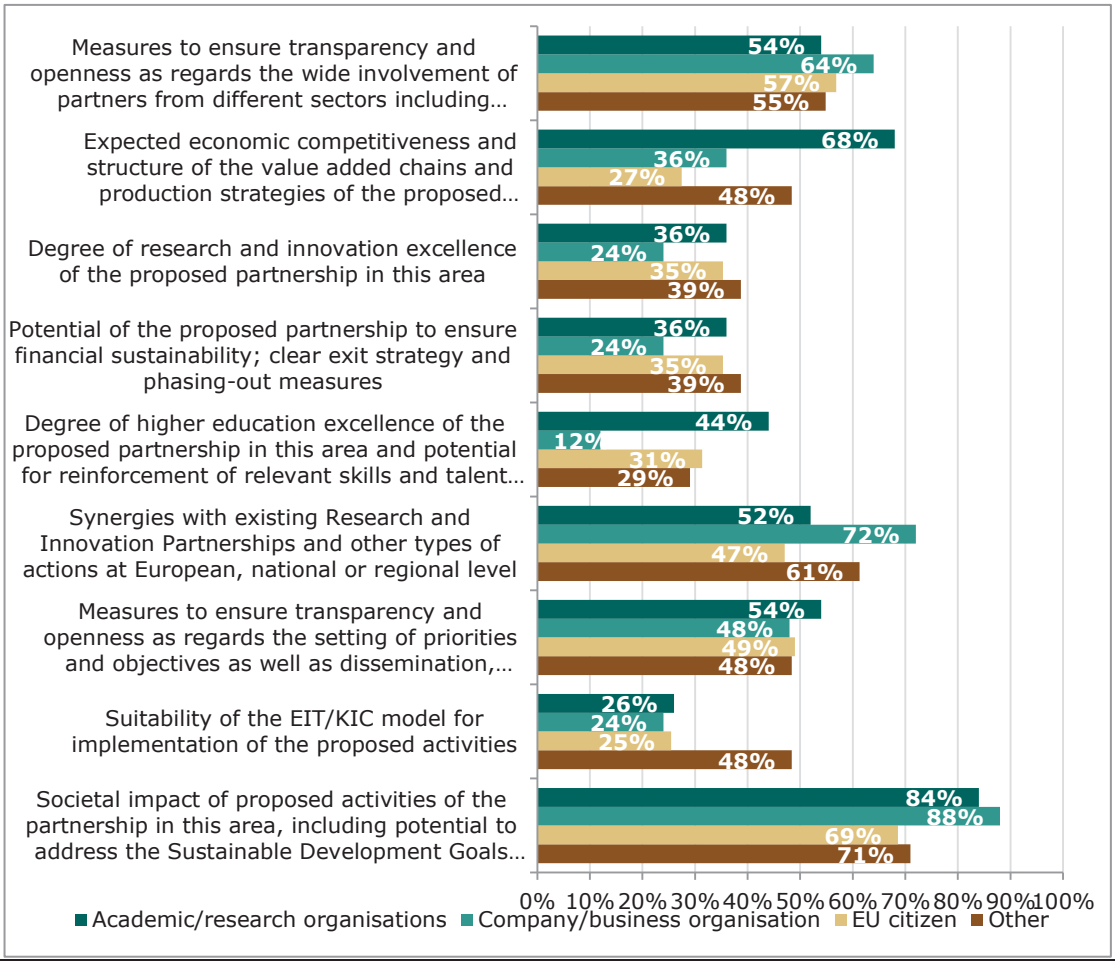
Conversely, criteria such as **suitability of the EIT/KIC model for implementation of the proposed activities** and **degree of higher education excellence of the proposed partnership in this area and potential for reinforcement of relevant skills and talents**, were viewed as the least important by the respondents.

Figure 11. The most important criteria for the selection and implementation of new KICs

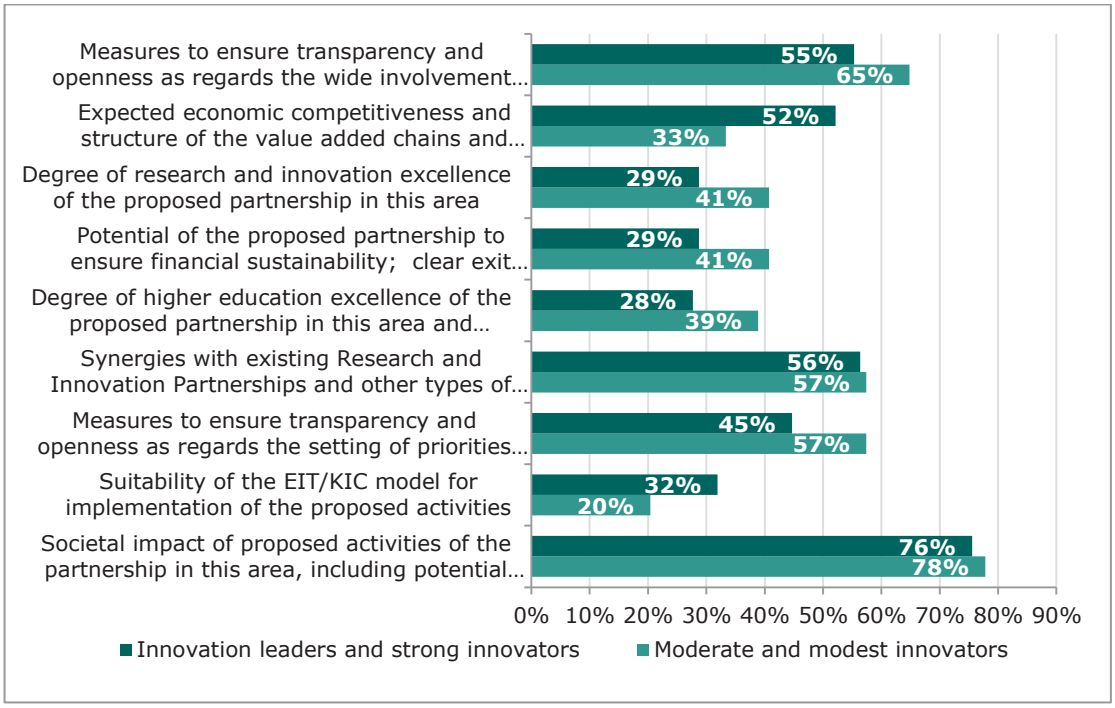
Q: In your opinion, which should be the most important criteria for the selection and implementation of new KICs in pre-defined thematic areas based on EU priorities?



Base: all participants (N=157)



Base: all participants; Academic/research organisations N=50, Company/business organisations N=25, EU citizens N=51, Other N=31. Source: Open Public Consultation



Base: 148 respondents: Innovation leaders and strong innovators N=94, Moderate and modest innovators N=54. Non-EU (N=9) respondents are excluded due to the very small sample size.
Source: Open Public Consultation

The respondents were also given the opportunity to indicate what other criteria they considered important for the selection and implementation of new KICs in pre-defined thematic areas based on EU priorities. The most popular criterion among them was the **potential of the KICs to address important sustainability issues** (e.g. by using metrics such as CO_2 reduction impact) (26%). Other suggestions included the potential for **closing an existing knowledge gap or meeting specific market needs** (13%), **potential or intention for collaboration with other KICs** (13%), **potential positive impact on quality of life** (9%) and **potential for achieving specific EU policy objectives** (9%). The range of criteria are illustrated in the quotes below.

"It should address sustainability, EU energy independence, the energy transition, clean food, circular economy, and give focus in primary GDP growth in the EU"

"Potential of the proposed partnership to provide support to actors concerning technology transfer, Business development, access to finance, education and training"

"Taking into account the planned rationalisation of the 'European Partnerships', the creation of new KICs should only be supported if there is substantial evidence that they are more effectively achieving policy objectives than existing Horizon Europe instruments/components, and if they provide significant added value going beyond existing calls."

"Degree of collaboration with other KICs."

"Potential for closing innovation/economic/social divides in Europe"

"Protecting the availability, accessibility and affordability of a public good like water. This justifies the allocation of public funding. The next 15 years are vital to take action and support highly needed education, research and innovation to reduce the negative impact which is clearly visible on the horizon."

"Cross-over activities between existing KICs will create more added value and innovation than starting new KICs (and again build up new governance structures)."

"Potential for contribution to knowledge-based decision making in public and private sector"

"Improvement of the implementation of the Existing EU policies and International Conventions, with synergies between programmes / actions from local to EU levels"

Source: Open Public Consultation

10.4. Annex 3: Who is affected and how?

Practical implications of the initiative

This annex assesses the different impacts of the identified preferred policy option (Option 2) on the main stakeholders, as well as on the economy as a whole. The key stakeholders that would be affected by the proposed legislation include in particular higher education institutions, businesses and public bodies at EU level (the EIT) as well as various regional actors. Since the proposed intervention is an enabling legislation, the impact both in terms of potential benefits and potential costs would depend on the magnitude of the KIC activities as autonomous organisations.

The general benefits and costs of the preferred option are summarised in Table 1 and Table 2 below, respectively. They present the key costs and benefits which have been identified and assessed during the Impact Assessment process.

Table 1: Overview of benefits

I. Overview of Benefits (total for all provisions) – Preferred Option (Option 2)		
Description	*Amount*129	*Comments*
Direct benefits		
Number of students involved in EIT entrepreneurial education actions	22.500 students	The impact of the new action of the EIT on supporting entrepreneurial and innovative capacity of HEIs will increase through engaging more partners in the education activities, reaching out to more students, facilitating the transformation of good ideas in new ventures and supporting capacity development of higher education institutions
Number of graduates of EIT labelled programmes	10.000 graduates	KICs offer technical education programmes (mainly Masters and PhDs) with a strong focus on soft skills, entrepreneurship and innovation management, mobility aspects, trans-disciplinarity. The EIT Label will be strengthened in its quality assurance mechanisms and will be extended to lifelong learning activities.
Number of Higher Education Institutions (HEI) participating in the EIT entrepreneurial capacity actions	450 HEIs	The EIT will launch a new action by providing support to higher education institutions to further develop their entrepreneurial and innovation capabilities using the HEInnovate framework to design action plans and implement them. By linking financial support (through specific calls for proposals addressing beneficiaries which are not necessarily partners of a KIC) to develop education & training programmes and support the entrepreneurial capacities of higher education institutions in low innovation performing regions, the EIT will contribute to reducing the innovation divide.
Number of innovative products (goods or services) launched on the market as well as new processes, methods, ideas or marketing innovations implemented	4300 products	The number of product innovations (goods or services) launched on the market during and following KIC support or the number of processes and marketing innovations or new/significantly improved methods introduced following KIC support. By innovations, we mean new or significantly improved products (goods or services), processes, ideas or marketing innovations implemented.
Start-ups supported	680 start-ups	Innovative technological solutions can be commercialised by new start-ups, brought to market by existing businesses, implemented to strengthen existing businesses, or used as a basis for further technological development. Through the policy of supporting 'better' and not 'more' start-ups, it is assumed that the number of start-ups generated will not necessarily increase in 2021-2027, but that the quality of the start-ups increases.
Participating organisations from moderate or modest innovator countries	500	Overall participation in ETI and KIC activities of organisations from moderate and modest innovation countries will comprise the current and future RIS participating organisations as well as organisations participating in new action of the EIT on supporting entrepreneurial and innovative capacity of HEIs.

Table 2: Overview of the costs

129 The numbers, where available, arise from the calculations and projections that are detailed in chapter 6 of the main report, the impact analysis.

II. Overview of costs – Preferred option (Option 2)							
		Citizens/ Consumers		KICs (and its partners – businesses, universities, RTOs)		EIT Administrations	
		One-off	Recurrent	One-off	Recurrent	One-off	Recurrent
All considered actions	Direct costs	None	None	For existing KICs: Adapt the monitor system in order to account for the indicators' framework. Compliance and implementation costs arising from adaptation of the funding model for already existing KICs. Costs of applying to become a KIC.	Increased administrative costs due to the need to widen the scope of their monitoring activities and report on additional performance indicators. Annual membership fees of KIC partners - recurrent cost	Put in place the new monitoring system.	Admin costs for improved monitoring and supervision of KICs Increased number of EIT staff to monitor KICs and to manage the EIT own's activities (i.e. support to HEIs to develop their entrepreneurial and innovation capacity). Overall costs of EIT as a central service over 7 years is EUR 70 million
	Indirect costs	None	None		None	None	None

10.5. Annex 4A: Key achievements of the EIT

Source: EIT data

EIT Climate-KIC	EIT InnoEnergy	EIT Digital	EIT Health	EIT Raw Materials
EIT Core KPIs 2013-2017 - EIT labelled programme graduates: 375 - New or improved products/ services/ processes launched: 306 EIT Core KPIs 2017 - Start-ups created by students & graduates from EIT labelled programmes: 2 - Start-ups created as a result of innovation projects: 2 - Start-ups supported by KICs: 266 - Investment attracted by start-ups supported by KICs: 187,832,231.25 EUR - Success stories submitted and accepted by EIT: 58 - External participants* (individuals) in EIT RIS programmes: 22 - External participants* (organisations) in EIT RIS programmes: 33 - Financial Sustainability; revenue of KIC LE: 2,629,576.44 EUR - Financial Sustainability; FS coefficient: 3.72%	EIT Core KPIs 2013-2017 - EIT labelled programme graduates: 707 - New or improved products/ services/ processes launched: 73 EIT Core KPIs 2017 - Start-ups created by students & graduates from EIT labelled programmes: 4 - Start-ups created as a result of innovation projects: 0 - Start-ups supported by KICs: 80 - Investment attracted by start-ups supported by KICs: 32,000,000.00 EUR - Success stories submitted and accepted by EIT: 12 - External participants* (individuals) in EIT RIS programmes: 17 - External participants* (organisations) in EIT RIS programmes: 110 - Financial Sustainability; revenue of KIC LE: 4,932,738.41 EUR - Financial Sustainability; FS coefficient: 6.50%	EIT Core KPIs 2013-2017 - EIT labelled programme graduates: 610 - New or improved products/ services/ processes launched: 219 EIT Core KPIs 2017 - Start-ups created by students & graduates from EIT labelled programmes: 2 - Start-ups created as a result of innovation projects: 9 - Start-ups supported by KICs: 33 - Investment attracted by start-ups supported by KICs: 5,850,000.00 EUR - Success stories submitted and accepted by EIT: 8 - External participants* (individuals) in EIT RIS programmes: 0 - External participants* (organisations) in EIT RIS programmes: 9 - Financial Sustainability; revenue of KIC LE: 2,448,785.07 EUR - Financial Sustainability; FS coefficient: 3.80%	EIT Core KPIs 2013-2017 - EIT labelled programme graduates: n/a - New or improved products/ services/ processes launched: 22 EIT Core KPIs 2017 - Start-ups created by students & graduates from EIT-labelled programmes: 0 - Start-ups created as a result of innovation projects: 0 - Start-ups supported by KIC: 100 - Investment attracted by start-ups supported by KIC: 27,900,000.00 EUR - Success stories submitted and accepted by EIT: 26 - External participants* (individuals) in EIT RIS programmes: 0 - External participants* (organisations) in EIT RIS programmes: 7 - Financial Sustainability; revenue of KIC LE: 6,620,836.00 EUR - Financial Sustainability; FS coefficient: 19.94%	EIT Core KPIs 2013-2017 - EIT-labelled programme graduates: 0 - New or improved products/ services/ processes launched: 7 EIT Core KPIs 2017 - Start-ups created by students & graduates from EIT-labelled programmes: 0 - Start-ups created as a result of innovation projects: 3 - Start-ups supported by KIC: 34 - Investment attracted by start-ups supported by KIC: 3,601,433.00 EUR - Success stories submitted and accepted by EIT: 8 - External participants* (individuals) in EIT RIS programmes: 0 - External participants* (organisations) in EIT RIS programmes: 12 - Financial Sustainability; revenue of KIC LE: 7,148,045.45 EUR - Financial Sustainability; FS coefficient: 21.69%

10.6. Annex 4B: key achievements and challenges as outlined in the EIT interim evaluation[130]:

Key achievements

The EIT evaluation has come to the conclusion that the rationale behind the establishment of the EIT is still valid. The EIT/KICs model which aims at contributing to the development of the EU and Member States innovation capacity in order to tackle societal challenges, through the integration of the knowledge triangle[131], is unique and highly relevant. It targets major structural weaknesses of the innovation capacities in the EU (in key thematic areas) such as the limited entrepreneurial culture, the low level of cooperation between academia and industry and the insufficient development of human potential, and aims to contribute to closing the innovation gap between the EU and its key competitors.

The EIT and the KICs contribute to the Horizon 2020 specific objectives on "societal challenges" and on "Leadership in enabling and industrial technologies". In particular as a result of the strong involvement of industrial participants, KICs innovation activities brought solutions closer to the market and paved the way for industrial and commercial implementation in areas of societal challenges. The KICs innovation projects comprise demonstrators, pilot plants, proofs of concept and help develop solutions in response to a specific business opportunity.

The EIT-KICs model delivers concrete results. The first wave KICs[132] has gained recognition for its activities in the areas of innovation, entrepreneurship and education[133]. The EIT and the KICs add value beyond national initiatives, primarily by focusing on the integration of the knowledge triangle, building new types of cooperation links and facilitating cross-border interactions.

The co-location centres (CLCs)[134] represent a key aspect of the KICs´ business model needed to deliver concrete results on the local level and have an impact on local innovation ecosystems in thematic areas. They have been instrumental for widening the KICs' geographical scope to EU's moderate innovation performers. CLCs have successfully built links with local governments and other institutions or organisations where they are located. However, further efforts are needed for the KICs to become fully integrated into the local innovation ecosystems. Furthermore, KICs' support to the organisations from EU-13 Member States[135], while better than the average of Horizon 2020, remains limited to a small number of these Member States.

KICs cross-border operations give KIC partners and beneficiaries access to peers, investors and customers that they might otherwise find difficult to identify and build links with.

The EIT educational programmes attract high calibre students. Graduates from EIT labelled courses appreciate the multidisciplinary approach, combining technical knowledge with entrepreneurial and innovation education, the direct access to businesses and the international mobility. However, their integration in KICs innovation and

130 SWD (2017) 351 final

131 Knowledge triangle refers to the interaction between research, education and innovation and to an attempt to better link together these key concepts which are key drivers of a knowledge-based society.

132 EIT Climate-KIC, EIT Digital and EIT InnoEnergy

133 EIT (2017), Our Impact from 2010 to 2016, pp. 34-39, provides examples of this recognition.

134 Co-location centre means a geographical area where the main knowledge triangle partners are based and can easily interact, providing the focal point for the KICs' activity in that area.

135 Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia and Slovenia

entrepreneurship activities is still under-exploited and there is room for improvement. Furthermore, KICs´ education activities did not generate so far a significant number of student-led start-ups.

While taking into account the evidence about the concrete results achieved by the EIT in the past years, the impacts are mainly limited to the partners (especially higher education institutions and companies), graduates and start-ups that have directly cooperated with the KICs. When extending the analysis to the systemic impacts of the EIT, the evidence is less clear.

The potential of the EIT and the KICs to contribute to EU policy-making in specific fields is apparent although this potential has not been utilized at its best. The KICs´ efforts to address national and regional administrations and authorities, in particular those involved in designing and delivering Research and Innovation Strategies for Smart Specialization (S3) should be improved.

The administrative expenditure of the EIT has been steadily decreasing over time and is significantly below the 5% threshold set out for Horizon 2020. The time required for the EIT to finalise the grant procedure has steadily decreased overtime. In 2016 the average time to grant was five months.

The KICs´ external revenues mostly originate from membership fees but also from sponsorships, educational services, revenue sharing agreements, equity participation, consulting services, third party (mainly national and regional) grants. The KICs' capacity to achieve financial sustainability is an issue and it may be challenging for KICs to become fully self-financing after 15 years, while maintaining the full range of knowledge triangle activities. Activities which generate less income (e.g. education ones) would be under particular risk as well as other activities with a limited market value. This is confirmed by the High Level Group report of 2016[136].

The EIT model is unique among the EU and Member States innovation support initiatives in tackling relevant societal challenges through strengthening cooperation between partners in business, higher education and research – KTI.[137] The KICs have been successful in involving the diversity of actors in the knowledge triangle, thus contributing to reduce the fragmentation in their sectoral ecosystems. Better dissemination of information about the KTI model, both within the KICs and beyond, in order to make it better understood and foster the implementation of the model in practice, is however needed.

KICs are perceived as communities with a fairly balanced representation of all knowledge triangle actors. Furthermore, KICs managed to attract the most relevant European actors in their respective fields. Most KICs have gone beyond the ‘classical’ actors of the knowledge triangle to also involve other actors such as public authorities (e.g. EIT Climate-KIC) and civil society organisations (e.g. EIT Health) and also actively participated in EU initiatives that promote partnerships among the EC, governments and private actors (e.g. EIT InnoEnergy involvement in the Strategic Energy Technology Plan's various working groups).

136 Report of the High Level Group on the EIT set up by Commissioner Tibor Navracsics, 2016, pp.8 and 9; https://ec.europa.eu/education/sites/education/files/eit-hlg-final-report_en.pdf
137 Knowledge Triangle Integration

The flexibility of the EIT model is suitable and allows for testing potential new initiatives in the area of innovation support, e.g. the EIT Regional Innovation Scheme initiative.

The cross-KICs interactions, through the active support of the EIT, have been steadily increasing. They have resulted in mutual learning and sound evolution of KICs governance and management model.

Key challenges

Key challenges that would need to be addressed to improve the EIT/KIC model have been identified and are presented below:

- Strengthening the EIT/KICs model as a relevant mechanism at EU level in addressing key societal challenges and delivering on Horizon 2020 objectives, in particular, to further improve the linkages between the knowledge triangle activities, especially between innovation and business creation activities

- Better articulating the EIT model and objectives, and further raise the awareness of the EIT brand through strengthening the EIT/KIC communication efforts with a focus on concrete examples, case studies, success stories, results achieved and impact.

- Encouraging cross-KIC collaboration and ever stronger participation of the private sector, in particular SMEs, in KICs activities.

- Making the selection process (through which KICs provide support to innovation projects) more transparent and communicate the selection results to the wider KIC community more efficiently.

- Ensuring synergies and complementarities with other innovation initiatives at EU, national and regional level at both implementation and programming level;

- Increasing the dialogue and interaction with policy-makers at EU, national and regional level with a view to better contribute to EU policy-shaping in respective fields of action;

- Improving the practical integration of KIC activities within regional and local innovation ecosystems and enhance cooperation with regional and local innovation actors, in particular, through better use of the co-location centres, for inter-regional cooperation.

- Increasing further the attractiveness and competitiveness of KICs' education programmes by better monitoring the education offer, in view of improving recruitment procedure and ensuring a high quality, with the goal of increasing KICs´ outreach and reduce the drop-out rate at the application stage; fostering and sharing experience across KICs; strengthening the EIT label, and systematically monitoring the skills acquired, and the outcomes and impact of the courses;

- Taking concrete actions to link KICs and public-private partnerships with similar goals, in order to promote new and emerging curricula in a variety of industrial sectors

- Exploring synergies with Commission's skills development policies and further promote the human capital, entrepreneurial and digital skills development in both formal and informal / non-formal contexts as important elements in any successful innovation ecosystems, in particular at the design of KICs educational programmes.

- Fostering an entrepreneurial mind-set at a broader scale by going beyond formal education and engaging inter alia in executive education, short courses, online learning and vocational training including professional development.

- Enhancing efforts in making KICs' management structures more efficient and effective.

- Measuring and reporting more extensively on activities and achievements related to EU policy priorities in thematic areas; further improving and reviewing the system for monitoring the implementation of EIT and KICs' activities towards Horizon 2020 objectives in order to better measure and capture their direct and indirect results and impact, and taking measures that would allow to better assess the cost effectiveness of KICs in achieving their results.

- Exploring ways to optimise the administrative procedures and reduce the burden imposed on KICs' operations, while making sure the data to assess the actual performance is collected.

10.7. Annex 5: Discarded policy options regarding the EIT under Horizon Europe

As part of the Horizon Europe Impact assessment, taking into account the stakeholder input and suggestions on the improvement of the EU R&I partnership landscape, the following policy alternatives regarding the EIT's future role and operation have been considered and discarded.

Reduction/Discontinuation of EIT KICs interventions

The EIT is highly relevant and has a clear EU added value as there is no other instrument that builds EU-wide ecosystems of education, research, business and other stakeholders (EIT interim evaluation). The reduction of the EIT scope of its intervention or a full or partial phasing out of KICs from the current operating model would bear severe implications and negative impact on the knowledge triangle integration development, the research and innovation performance and the overall research and innovation landscape in Europe.

Continuation of strategic approach to EIT/KICs as implemented under Horizon 2020

EIT/KICs would operate on the basis of initial objectives, scale and operating modes. The key challenge of rationalization of the European R&I partnerships landscape in line with the overall objectives of the future Horizon Europe Programme would not be realised. The coherence between the EIT and other EU innovation policy initiatives and instruments at programming as well as implementation level would not be matched. The key difference between hereby discarded option and the baseline option analyzed in the main body report lies in the proper alignment of the EIT operations with the requirements of Horizon Europe programme in case of baseline option.

Direct integration of KICs into the Framework Programme (without EIT)

As confirmed by the past evaluations, the EIT model comprising the EIT and its Knowledge Innovation Communities (KICs) is valid and working well. The EIT has tailored its support structure to the specific needs and goals of the KICs by providing coordination and steering (i.e. requirements for setting up KICs, performance based funding, simplification). Through systematic focus on cross-KIC activities, sharing of best practices and integrating lessons learnt from the past, the EIT has built up knowledge and experience on which each KIC can draw (i.a. framework for guidance to set up new KICs). In turn, the KICs provide the EIT with practical insights and feedback on what works on the ground and what does not (thus increasing effectiveness and synergies).

The EIT/KIC model is based on a long-term approach to innovation, i.e. KICs are set up bearing in mind a long-term perspective to achieve the impact and their sustainability beyond the direct public financial support. The EIT provides a wide range of services, from education, training and coaching, building and maintaining networks where young entrepreneurs and enterprises connect with future partners and investors in order to take up the research results and bringing them to the market. This goes far beyond the management of EU contracts and projects. The EIT has thus built up a wealth of knowledge and experience on innovation that is unique at a European scale and decoupling of EIT and KICs would cause the effectivity loss. The gradually built-up EIT Community of regular exchange, mutual support and trust would disappear. Further, the current efficiency at the EIT central management level as well as in the management of KIC operations would be lost.

10.8. Annex 6: Selection criteria for establishing KICs

The Commission proposal for establishing the Horizon Europe programme stipulates that European Partnerships, including KICs, should be selected, implemented, monitored, evaluated and phased-out according to five criteria as outlined in Annex III of the proposal[138]. In that light it is necessary to assess to what extent the new Horizon Europe criteria framework on partnerships covers the aspects of the current KIC selection criteria, and whether there is a need for additional selection criteria specific to KICs.

Table 1 provides a mapping of the proposed criteria for the selection of European Partnerships and the criteria the EIT currently uses for the selection of proposals to establish a KIC[139]. The results suggest that the new criteria cover well most of the aspects of the current selection criteria for KICs, and only minor deviations (i.e. additional criteria) will be needed to reflect KICs' specificities.

Annex 9 provides analysis of possible thematic areas for future KICs taking into account criteria for selection and implementation of European partnerships.

Table 1: Mapping of criteria for selection of KICs and the criteria for establishing European Partnerships.

Criteria for selection of KICs	Criteria for establishing European Partnerships	Assessment
1.1. Strategic approach: relevance, specificity and value-added of the strategic approach and proposed focus within the theme; applicability of the KIC model to tackle the societal challenge(s) of Horizon 2020 via a multidisciplinary approach by integrating the Knowledge Triangle and fostering entrepreneurship and innovation throughout Europe	Evidence that the European Partnership is more effective in achieving the related objectives of the Programme, in particular in delivering clear impacts for the EU and its citizens, notably in view of delivering on global challenges and research and innovation objectives, securing EU competitiveness and contributing to the strengthening of the European Research and Innovation Area and international commitments;	Overall the criteria are well aligned. Assessment of the extent to which a KIC is more effective than other forms of partnerships in achieving the related Programme objectives should be carried out as part of the EIT SIA.
1.2. KIC partnership innovation potential: Innovation potential of the partnership to implement the KIC's strategy, demonstrated by the combined strength and quality of the partners (including SMEs), forming a diverse, balanced, collaborative and world-class partnership		
1.3. Synergies: Demonstrate value added and readiness to establish concrete synergies and complementarities, positioning of the KIC vis-à-vis other relevant public, private and third sector initiatives at EU and other levels	Coherence and synergies of the European Partnership within the EU research and innovation landscape	The criteria are well aligned
2.1. Operations: The quality of the KIC leadership team profiles (management and governance	Transparency and openness of the European Partnership as regards the identification of	Alignment can be achieved by pursuing one of the two options: - Set general standards for all

138 European Commission (2018) Proposal for a Regulation of the European Parliament and of the Council establishing Horizon Europe – the Framework Programme for Research and Innovation, laying down its rules for participation and dissemination, COM(2018) 435 final. Annex III

139 EIT (2017) Call for KIC proposals 2018 - Evaluation Criteria, 02519.EIT.2017.I.GB46. <https://eit.europa.eu/sites/default/files/evaluation_criteria_call_for_kics_2018.pdf>

Criteria for selection of KICs	Criteria for establishing European Partnerships	Assessment
teams); effectiveness of the operational structure including selection and connectivity of colocation centres and demonstration how the Knowledge Triangle Integration approach will be implemented on the operational level	priorities and objectives, and the involvement of partners and stakeholders from different sectors, including international ones when relevant	KICs regarding the requirements for selection of specific thematic priorities and involvement of partners and stakeholders - Amend the selection criteria and request all applicants to reflect the proposed principles for selection of priorities and involvement of partners, and stakeholders in the proposals for KICs' partnership (at the application stage).
2.2. KIC business model and financial plan: feasibility of the KIC's business model and financial plan (including EIT and non-EIT resources) for attracting financial resources and achieving financial sustainability in the long term; a plan for the management and exploitation of intellectual property supporting the KIC's business model.	Ex-ante demonstration of the partners' long term commitment, including a minimum share of public and/or private investments	The criteria are well aligned
3.1. Impact and KIC scoreboard: planned pan-European impact on the societal challenge, human capital, job creation, economic growth demonstrated by the strategy; quality and relevance of the outreach (in particular EIT Regional Innovation Scheme); relevance and feasibility of the expected outcomes, outputs and Key Performance Indicators (KPIs) included in a KIC Scoreboard and their contribution to the EIT Scoreboard	Ex-ante demonstration of additionality and directionality of the European Partnership, including a common vision of the purpose of the European Partnership. This vision will include in particular: - identification of measurable expected outcomes, deliverables and impacts within specific timeframes, including key economic value for Europe; - demonstration of expected qualitative and quantitative leverage effects; - approaches to ensure flexibility of implementation and to adjust to changing policy or market needs, or scientific advances; - exit-strategy and phasing-out measures	The criterion for European Partnerships is broader and will require some integrations to the corresponding KICs' selection criteria.. However, some elements are already covered under other KIC selection criteria: - KICs should demonstrate leverage effects when outlining their business model and financial plan as well as the expected synergies. - KICs should demonstrate approaches to ensure flexibility of implementation under the proposed plan of operations - Maximum duration of the financial support is indicated in the EIT Regulation; - KIC exit strategy (including long-term financial sustainability) should be outlined in the KIC business model and financial plan.

3.2 Dissemination of results and communication: dissemination plans for KIC results, including sharing good practices within, between and beyond the KICs, across EU Member States, regions and institutions to ensure a widening of the reach of the EIT and increase of its impact; quality and relevance of the KIC communication strategy including the contribution to building the EIT brand identity	Key elements are covered by the criteria "Evidence of effectiveness in achieving the objectives of the Framework Programme" and "Openness and transparency" where partnership proposals have to describe mechanisms related to communication and dissemination of results.	The EIT criteria has a scope that includes (and goes beyond) what is covered by the relevant Horizon Europe partnership criteria.

Source: IA support study of SQW

10.9. Annex 7: Social network analysis of KICs' partnerships

The Social network analysis[140] examines the level and intensity of cooperation between the KICs partners and supports some of the statements in the problem definition as well as in the impact analysis section of the main IA report, in particular those related to the transparency, openness, effectiveness and efficiency of the activities and operations of the KICs.

The analysis covers the first three KICs as they are most mature: EIT Digital, EIT Climate, and EIT InnoEnergy. It is based on four main indicators: *density and distribution of the network, distribution of KIC beneficiaries by a number of projects and by a number of partners as well as the distribution of funding*. The data on KICs' partners has been extracted from KICs Business Plans for 2014 – 2017[141] manually as well as by the use of automatic text analysis and extraction algorithms.

The analysis came with three main findings:

- EIT Digital and EIT Climate KIC have developed relatively dense networks of partners, whereas the network of EIT InnoEnergy proves to be more fragmented segregated around three clearly pronounced clusters.

- All three KICs have a large share of partners (ranging between 30% in EIT Digital and 83% in EIT InnoEnergy) that participated in less than three projects and engaged in partnerships with a small number of organisations in the period 2014 – 2017.

- The funding is highly concentrated - 5% of the organisations claimed between 31% (EIT Digital) and 64% (EIT InnoEnergy) of - the total funding for a respective KIC in 2016 and 2017. When excluding the KIC central offices and co-location centres, then the top 5% of the beneficiaries receive from 30% (EIT Digital) to 43% (EIT Climate KIC) of total EIT KAVA funding.

EIT Digital

The social network analysis suggests (see figure B4-1) that the partnership structure of EIT Digital cannot be characterised as fragmented. The figure demonstrates that there is only one large cluster and no separate islands of organisations are visible. The results remain valid when additional constraints are introduced to the network, such as limiting the network to organisations that cooperate frequently (see figure B4-2) or introducing budgetary constraints (see Notes below figures B4-1 and B4-2). The density of the social network[142] is 0.195 (with maximum possible value of 1) further strengthening the conclusion that all participating organisations are strongly clustered.

140 This analysis has been carried out by ICF and was part of the study to support the Impact assessment of the EIT, Annex B4, pp. 130-sq.
141 For EIT Climate it covers 2015-2017, because the received Business Plan for 2014 did not contain the relevant Annexes.
142 Density - proportion of direct ties in the network compared to the total number of possible ties.

Though the organisations are in a cluster, around 30% of beneficiaries of EIT Digital participated in one or two projects and engaged with less than 11 partners (see Figure B4-3 and B4-4). Sparse participation could indicate weak ties within the cluster or the disparities between the small number of core and the large number of peripheral partners. In fact, seven organisations (5% of all partners) claimed 31% of the funding in 2016-2017. If the estimates exclude KIC central offices and co-location centres, then the top 5% (7 organisations) claimed approximately 30% of the funding.

Source: EIT data; IA support study of SQW

Figure B4-1. Social network of all organisations that participated in EIT Digital (2014-2017)

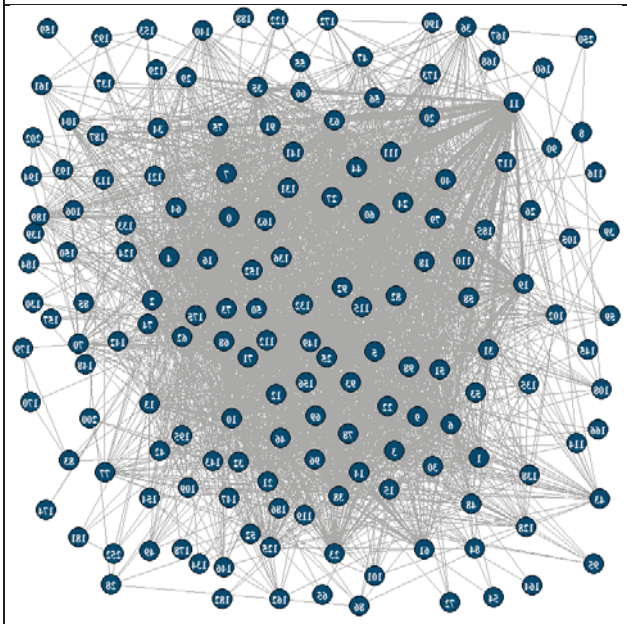
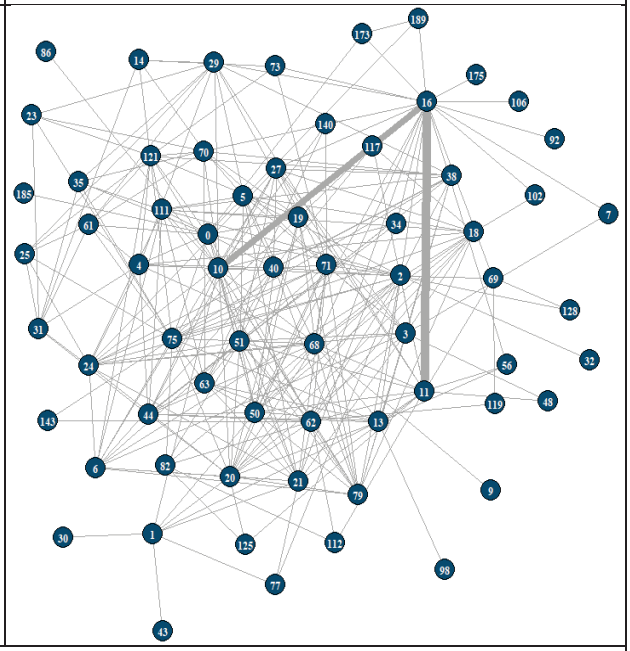


Figure B4-2. Social network of organisations that had 5 or more cooperation's in EIT Digital (2014-2017)



Source: SQW estimates, based on EIT Digital Business Plans (2014/2015/2016/2017)

Figure B4-3. Number of organisations that in 2014-2017 partnered up with a specified number of unique partners in EIT Digital projects

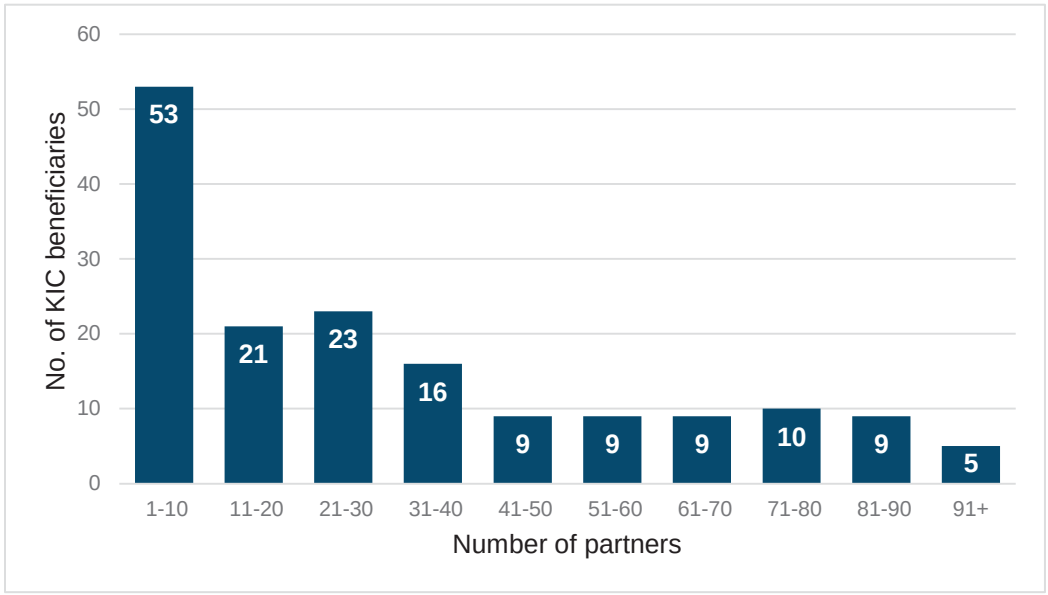
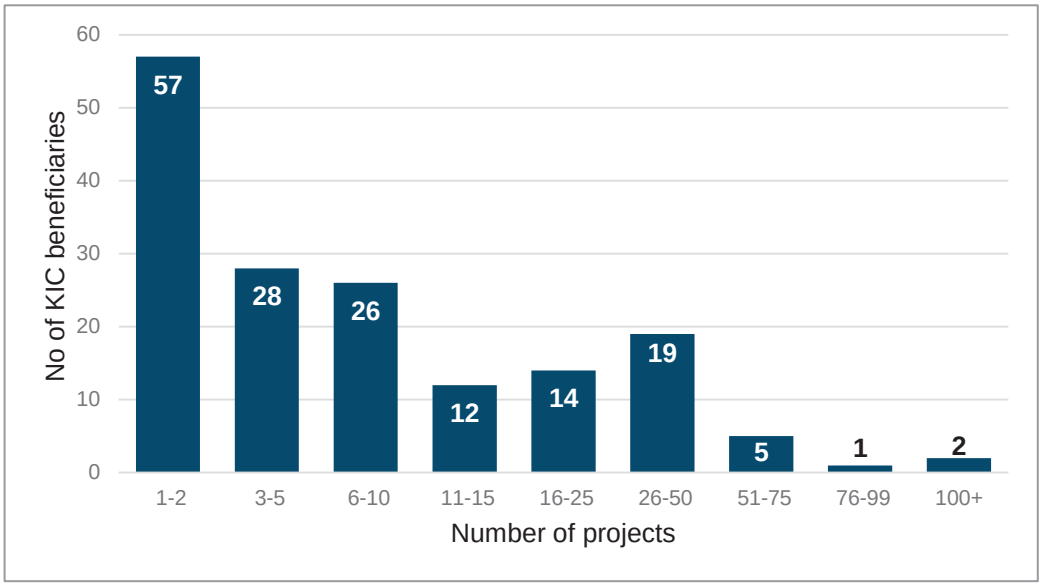


Figure B4-4. Number of organisations that in 2014-2017 participated in a specified number of EIT Digital projects



Notes:

1. The number inside blue circles refers to a unique identifier of an organization that participated in EIT Digital 2014-2017;

2. The width of the grey line indicates the number of cooperation's organisations had;

3. The results changes marginally when budgetary constraints of EUR 10,000 or EUR 100,000 were introduced in to the social networks.

Source: EIT data; IA support study of SQW

EIT Climate KIC

The social network of organisations participating in the EIT Climate KIC looks similar to the EIT Digital one (see figures B4-5). There is one large cluster without an indication of smaller islands of activities. The density of this network is 0.219. This result also stands with additional constraints (see figure B4-6).

However, 47% of KIC beneficiaries participated in only one or two projects (see figure B4-7). This implies that even though there is a strong singular cluster, some organisations are weakly integrated into the system. In addition, this also indicates that activities are strongly concentrated around several organisations. This claim is further supported by the fact that 11 organisations (5% of all organisations that participated in EIT Climate in 2016-2017) claimed 52% of the budget. If the estimates exclude KIC central offices and co-location centres, then top 5% (10 beneficiaries) claimed approximately 43% of the funding. This disparity in funding is much stronger in EIT Climate KIC in comparison to EIT Digital.

*Figure B4-5. Social network of all organizations that participated in EIT Climate (2015-2017)**

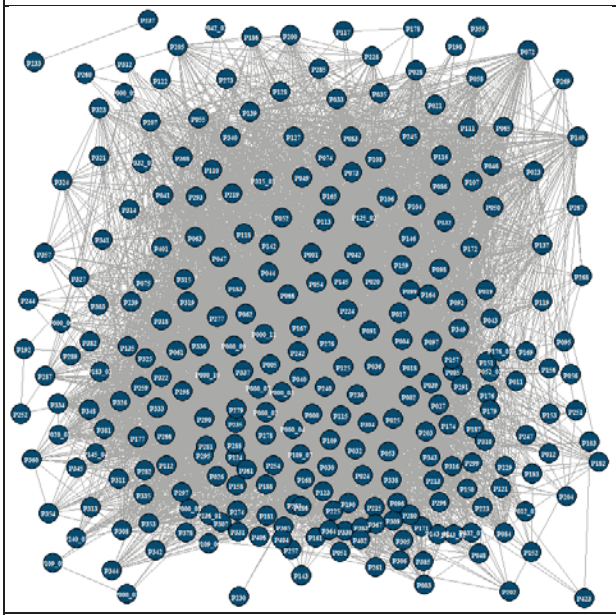
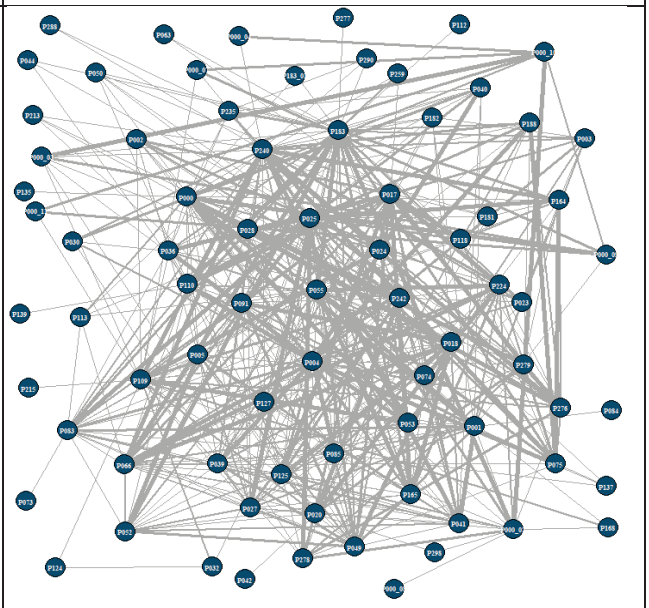


*Figure B4-6. Social network of organisations that had 5 or more cooperation's in EIT Climate (2015-2017)**



Source: SQW study and estimates, based on EIT Climate KIC Business Plans (2015/2016/2017)

Notes:

1.The number inside blue circles refers to a unique identifier of an organization that participated in EIT Digital 2014-2017;

2.The width of the grey line indicates the number of cooperation's organisations had;

3.The results changes marginally when budgetary constraints of EUR 10,000 or EUR 100,000 were introduced in to the social networks.
* The 2014 data was excluded from the analysis as we did not have access to the complete Business Plan for that year

Figure B4-7. Number of organisations that in 2015-2017 partnered up with a specified number of unique partners in EIT Climate KIC projects*

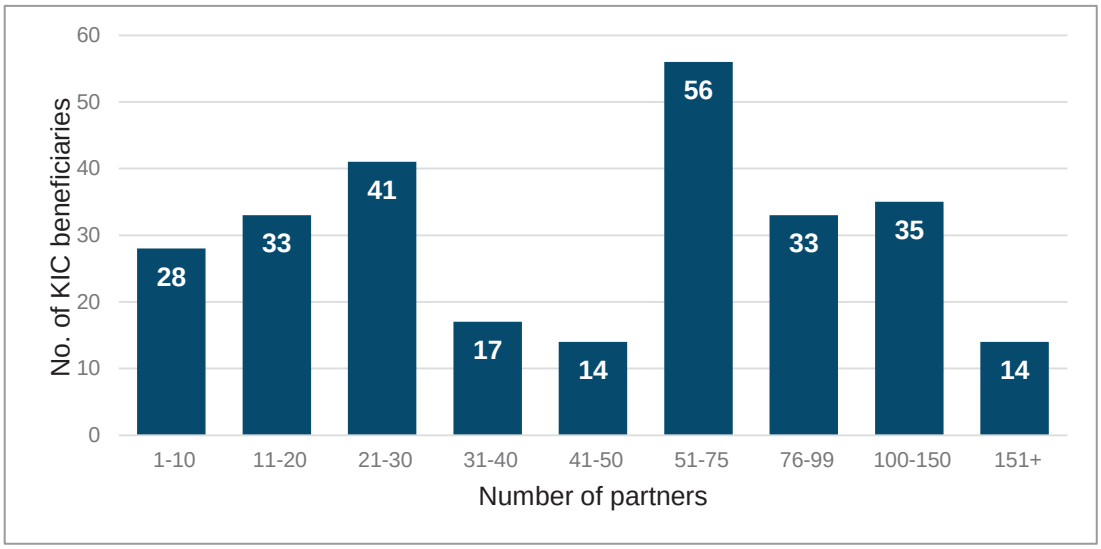
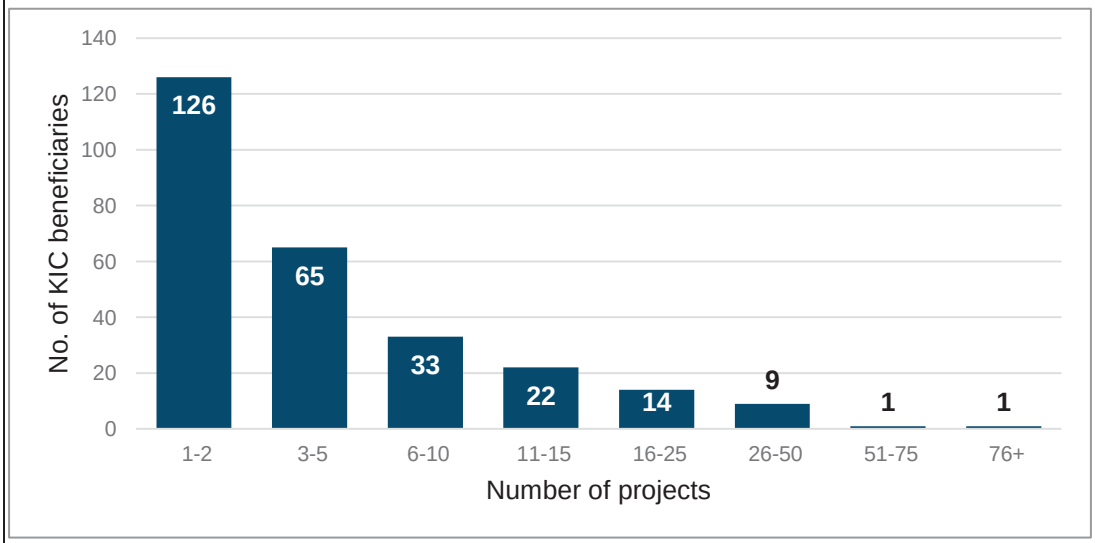


Figure B4-8. Number of organisations that in 2015-2017 participated in a specified number of EIT Climate KIC projects*



Source: Own estimates, based on EIT Climate KIC Business Plans (2015/2016/2017)
* The 2014 data was excluded from the analysis as we did not have access to the Business Plan from that year

EIT InnoEnergy

Unlike other KICs, EIT InnoEnergy is more fragmented. Figure B4-9 shows that organisations participating in the EIT InnoEnergy are divided into three pronounced clusters, while a large number of organisations are on the outskirts. Figure B4-10 provides additional insight by showing that after removing all organisations that participated in EIT InnoEnergy only several times (less than 5), the network becomes very thin. This implies that the fragmentation seen in figure B4-9 is due to some organisations only participating in EIT InnoEnergy ones or twice, and hence not having had the chance to work with many partners. A low Social network density of 0.116 further supports this conclusion. The network in B4-10 could be considered as the core of EIT InnoEnergy community.

The above conclusions are further supported by Figure B4-11, which demonstrates that around 83% of all organisations participated in only one or two EIT InnoEnergy projects. In addition, 5% (11 organisations) in this KIC claimed around 64% of the overall funding in 2016 and 2017. If the estimates exclude KIC central offices and co-location centres, then top 5% (11 organisations) claimed approx. 37% of the funding.

Figure B4-9. Social network of all organizations that participated in EIT InnoEnergy (2014-2017)

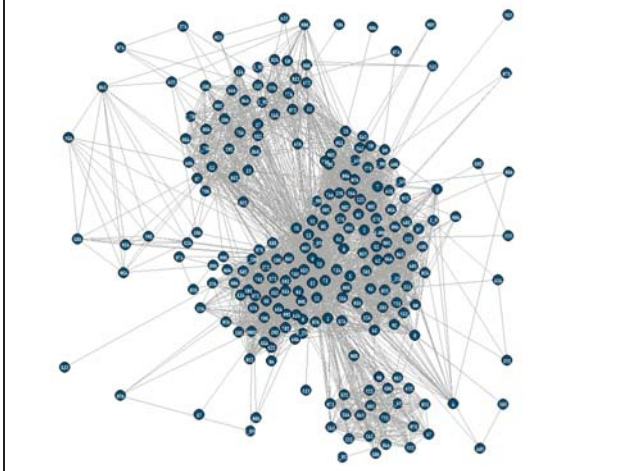
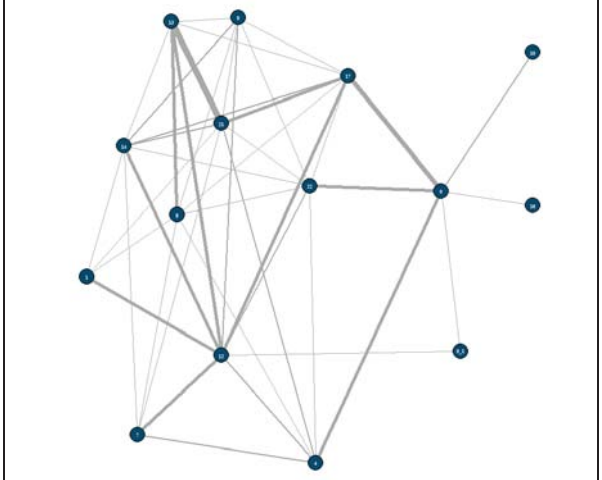


Figure B4-10. Social network of organisations that had 5 or more cooperation's in EIT InnoEnergy (2014-2017)



Source: SQW study and estimates, based on EIT InnoEnergy Business Plans (2014/2015/2016/2017)

Notes: The number inside blue circles refers to a unique identifier of an organization that participated in EIT Digital 2014-2017;
The width of the grey line indicates the number of cooperation's organisations had;
The results changes marginally when budgetary constraints of EUR 10,000 or EUR 100,000 were introduced in to the social networks.

Figure B4-11. Number of organisations that in 2014-2017 partnered up with a specified number of unique partners in EIT InnoEnergy projects

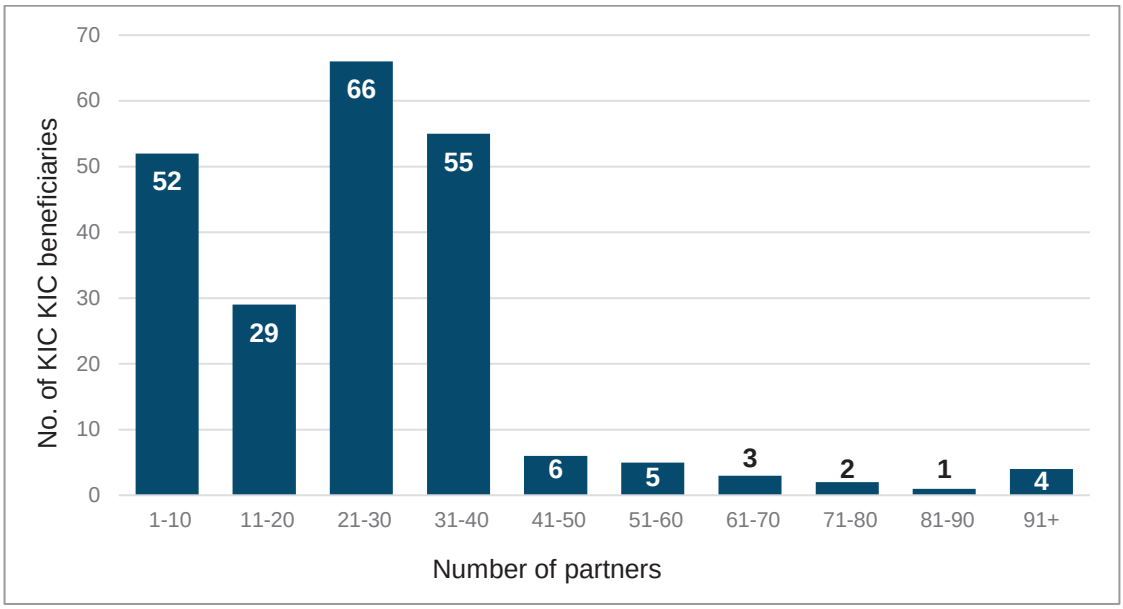
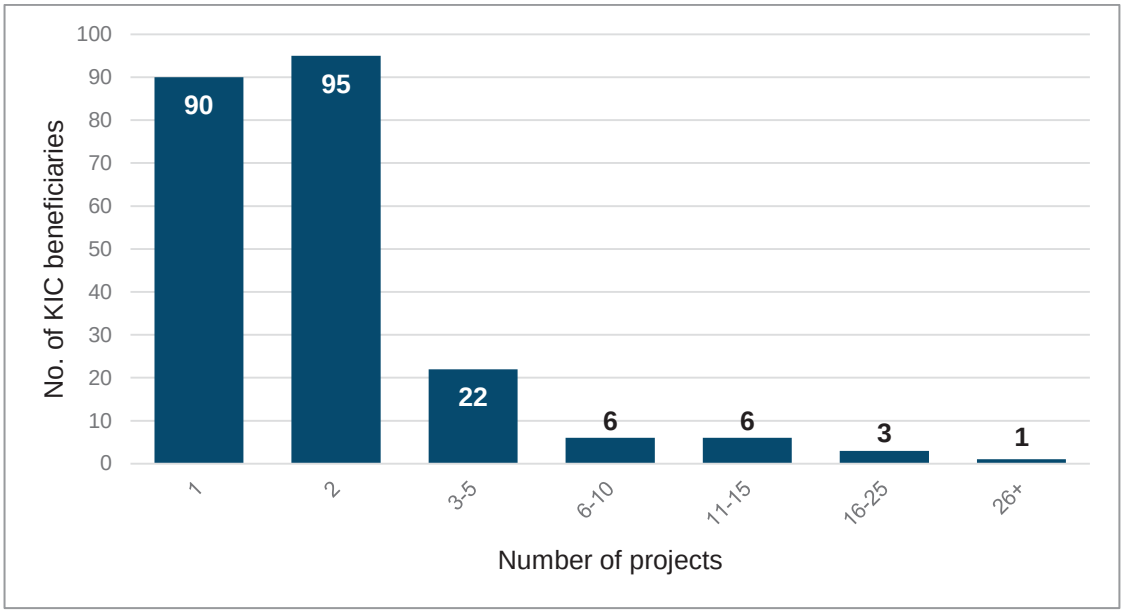


Figure B4-12. Number of organisations that in 2014-2017 participated in a specified number of EIT InnoEnergy projects



10.10. Annex 8: Impact Indicator Framework

The Annex 8 sets out the comprehensive Indicator Framework for the EIT and the KICs. The indicator framework is comprised of the system of indicators proposed for regular monitoring and review by EIT and the KIC. The Framework also includes a sub-set of indicators recommended for less frequent review as part of the evaluative research, which will be timed to coincide with evaluation cycles. The framework comprise the indicators directly relevant to economic development outcomes that stem from the three nodes of the knowledge triangle, the indicators associated with cross-KTI outputs and the development of ecosystems, and the indicators associated with the performance of KICs in operational terms. The Framework does not comprise the societal development indicators, which will be subject to discussion and agreement between the EIT and KICs in terms of definitions, data sources, collection frequencies, etc.

Category	Indicator	Definition	Resource	Current Core KPI	Breakdowns	Source	Frequency	Other	Note (e.g. changes to Core KPI)
Outputs									
Education	No. participants completing eligible EIT/KIC education courses / programmes	Participants should have completed one of the following: • EIT Label courses/programmes • Professional/ workforce courses lasting for at least 5 days • Other non-degree programmes (e.g. Summer schools of 5 days or more and other extra-curricular courses such as entrepreneurship training of 5 days or more) • MOOC/MOOPs of 3 modules or more. Unit of analysis is completions, so individuals completing more than one can be counted twice (or more). No. days and modules completed are provided based on testing feedback but would be subject to agreement between EIT/KICs.							Indicator to be expanded to include a fuller range of courses to reflect the broader suite of education activities of the KICs. The breakdowns required will ensure that time-series comparisons can be made with data already collected on EIT Label courses. Breakdown by each type of education course/ programme. The number of days/modules represent our recommendation to the EIT and are based on the feedback from the testing phase.

Business and enterprise	No. businesses supported	To measure the number of business supported by KIC activities - using current Core KPI definition but extended to businesses of all stages, e.g. KICs should justify that the support provided contributes to the businesses growth/potential growth. Examples of such services are mentoring, consultancy (e.g. access to finance and markets, product/service marketing, legal advice, internationalisation, innovation, match-making, etc). The services should be provided for a minimum period as set by EIT (see "Note" column).		Core KPI broadened to include the total number of businesses that have received some form of eligible support (i.e. not just start-ups). Breakdown by: business stage (i.e. start-ups up to two years old, and established businesses of two years old or more); business size (i.e. SME and large company); and route/type of support received by business-supported (i.e. education courses/programmes, start-up support, innovation projects). The current definition used by EIT is based on services provided for a total period of at least two months. We recommend seeking to redefine the eligibility criteria in terms of person-days of support provided.
Research and innovation	No. of innovation projects progressing towards commercialisation	To measure the number of innovations resulting from innovative projects that have progressed towards commercialisation, defined as one or more of: progress by at least one technology or manufacturing readiness level (TRL/MRL); prototype/proof of concept/beta version developed; product/service/model piloted. The definition may be extended for KIC-specific measures (see "Note" column)		The indicator will be useful for providing an intermediate measure of the progress of innovations, and to help in the contextualisation of outcome indicators. TRL EIT to agree with KICs the precise definition for measuring progress towards commercialisation, due to the use of different measures by KICs. Horizon Europe Indicator to contribute to the measurement of Horizon Europe impact pathway No.7 – innovation outputs.
Research and innovation	No. of innovations produced that have filed for some form of intellectual property (IP) protection	To measure the number of innovations resulting from innovative projects (i.e. filings for some form of intellectual property		

		protection - patents, trademarks, registered designs, copyrights).		
Research and innovation	No. of peer reviewed scientific publications	No. of peer reviewed scientific publications that have been produced as a result of KIC-funded innovation projects.	Horizon Europe WoS	Horizon Europe Definition aligned with Horizon Europe indicator to measure number of peer-reviewed scientific publications. Indicator to contribute to the measurement of Horizon Europe impact pathway No.1 –publications.
KTI (2+ nodes)	No. non-Education partners involved in Education activities	To measure the number of business and other non-Education organisations (e.g. tertiary sector organisations) that are involved in KIC education programmes. Involvement defined as any form of formal engagement, from attending an education service to involvement in the delivery of education programmes.		It is important to note that although it is not immediately obvious what 'good' performance means for this indicator, it is designed to provide contextual information when analysed in combination related indicators that measure the extent of knowledge triangle integration (e.g. Network strength analysis). It also enables an assessment of any particularly high or low concentrations by location.
KTI (2+ nodes)	No. non-business partners involved in business start-up activities	To measure the number of education, research and other non-business organisations (e.g. tertiary-sector organisations) that are involved in KIC start-up activities/programmes. Involvement is defined as any type of formal engagement (e.g. attending a start-up service/activity, involvement in the delivery of start-up activities/programmes).		*As above.*
Operational	No. of organisations 'engaged' with the RIS (by engagement frequency)	To measure the number of organisations that have engaged with each KIC who have also engaged with the RIS – covering the origin of the partner and destination of the engagement (i.e. location and route/type of support). Engagement should be a formal and active participation that has involved dedicating time, resources or funding to an activity.		Disaggregated in terms of the type/intensity of engagement (classified from low to high-intensity engagement, and the frequency of engagement). Location to include the origin of the partner and destination of the engagement – e.g. location(s) in

				which engagement occurs. This indicator provides important contextual information when analysed in combination with related outcome indicators linked to KIC performance in RIS countries (e.g. to inform steps towards improving the performance of 'modest and moderate' innovators) and provides evidence on countries with high or low concentrations.
Operational	No. and % of partners from EIT RIS countries	As per indicator name.		Core KPI expanded to all 'engaged' organisations and whether they have engaged with RIS countries.
Operational	Measure of operational efficiency (e.g. time to grant)	To measure operational efficiency, two "options" are proposed, as follows: • time to grant - % of grants signed within a pre-determined time frame (90 days) • grant utilisation rate – % grant utilised each year		Following the testing phase, we recommend that the EIT select one or both of the proposed "options", through an agreement with the KICs.
Operational	No. of partners making financial contributions to the KIC	To measure a number of partners and donors making cash and in-kind contributions, to be broken down as follows: • contributions to KIC KAVA and KCA activities • contributions to fund KIC operations (e.g. membership fees)		Breakdown by nature of financial contribution and route/type of support received by business receiving investment (e.g. education courses/ programmes, start-up support, innovation projects). Financial contribution breakdowns include: • contributions to KAVA and KCA activities • contributions to KIC operations (e.g. membership fees) Following testing with KICs, we propose the following breakdowns by the size of the financial

	contribution, as follows: • EUR 0 to 9,999k • EUR 10,000 to 49,999 • EUR 50,000 to 99,999 • EUR 100,000 to 249,999 • EUR 250,000 to 499,999 • EUR 500,000 to 999,999 • EUR 1,000,000 plus

Short-term Outcomes				
Economic development	Value of private / public investment mobilised / attracted within N years by supported businesses	To measure the EUR value of private / public capital attracted by businesses in receipt of KIC support (as under output indicator above) or receipt of innovation project funding, within a three years post-support (e.g. last received KIC KAVA support activity).		 Core KPI expanded to the value of investment attracted by businesses supported across activities (as defined in output indicator above) and also including those in receipt of innovation project funding.  Breakdown by route/type of support received by business receiving investment (e.g. education courses/programmes, start-up support, innovation projects)
Economic development	No. start-ups created and surviving for 12 months	To measure the number of sustainable start-ups created as a result of KIC activities, e.g. entrepreneurship support, innovation projects, graduate training. Outcome eligible once a business has started trading and been trading for 12 months.		 Breakdown by route/type of support received by each start-up created (e.g. education courses/ programmes, start-up support, innovation projects).  Data collection will draw on a mix of research, combining programme/monitoring data with a rolling survey with start-ups created as a result of KIC activities one year after they are established, where necessary. There is scope to extend to 3 years post-establishment.
Economic development	No. and % of businesses supported that reported growth in either employment or turnover	To measure the number and % of businesses that report employment and/or turnover growth that is attributable to KIC support. The indicator will be dependent on self-reporting. % should be based on a sample, and then no. calculated through appropriate scaling up and weighting to respondent profile.		 Breakdown by route/type of support received by an organisation supported (e.g. education courses/ programmes, start-up support, innovation projects).  Rolling survey of organisations in receipt of KIC support at set time intervals (i.e. 1, 3 and 5 years post support).

Ecosystem development	No. and % of participants in education programmes that are: • in employment relevant to the KIC • in intrapreneurial roles / roles supporting innovation in their organisation • in managerial roles • contributing to KIC activities (e.g. roles on EIT innovation projects)	To be measured through follow-on surveys of participants, and so dependent on self-reporting of what participants are now doing. This does not need to be attributed to their participation in education programmes. % should be based on a sample, and then no. calculated through appropriate scaling up and weighting to respondent profile.		Rolling survey of participants in education courses/programmes at set time intervals (i.e. 1, 3 and 5 years post completion). Breakdown by each type of education course/ programme.
Ecosystem development	Value of R&D investment changes by engaged businesses	A measure of the value of R&D investment changes attributable to KIC support based on self-reported survey responses.		Breakdown by route/type of support received by each start-up created (e.g. education courses/programmes, start-up support, innovation projects). Rolling survey of organisations in receipt of KIC support at set time intervals (i.e. 1, 3 and 5 years post support). Horizon Europe Indicator to contribute to the measurement of Horizon Europe impact pathway No.9 – amount of public and private investment mobilised.
Ecosystem development	No. products (goods or services) launched on the market	A measure of the number of product innovations (goods or services) launched on the market during and following KIC support based on self-reported survey responses. By innovations, we mean new or significantly improved products (goods or services) sold. Innovations should be reported in the year when they were introduced on the market.		Core KPI extended to measure over a range of set time-intervals (i.e. up to 5 years rather than only 3). Breakdown by route/type of support received by each start-up created (e.g. education courses/ programmes, start-up support, innovation projects). Rolling survey of organisations in receipt of KIC support at set time intervals (i.e. 1, 3 and 5 years post

				support). Horizon Europe Indicator to contribute to Horizon Europe impact pathway No.7 – the measurement of innovations.
Ecosystem development	No. new processes, methods or marketing innovations implemented	A measure of the number of processes and marketing innovations or new/significantly improved methods introduced following KIC support over set time intervals based on self-reported survey responses. Innovations should be reported in the year when they were introduced on the market.	Horizon Europe	Core KPI extended to measure over a range of set time-intervals. Breakdown by route/type of support received by each start-up created (e.g. education courses/ programmes, start-up support, innovation projects). Rolling survey of organisations in receipt of KIC support at set time intervals (i.e. 1, 3 and 5 years post support). Horizon Europe Indicator to contribute to Horizon Europe impact pathway No.7 – the measurement of innovations.
Ecosystem development	Network strength analysis	Recommendation is to assess the number of 'nodes' and 'linkages', and their intensity, within a defined network map for a KIC (e.g. location-based, market- or technology-based). This would be an evaluative assessment, which would be reproduced to examine changes over time.		Reporting in line with timings of evaluative research. Data collection will draw on a mix of research, combining programme/monitoring data with primary research (e.g. surveying/consultations).
Ecosystem development	No. and % high impact ("World-class science") scientific publications	Measured as the number and share of 'high impact' ("World-class science) publications. High impact defined using SciVal's Field-Weighted Citation Impact (FWCI) measure. Indicator to be aligned fully with Horizon Europe indicator.	Horizon Europe	Horizon Europe Definition aligned with Horizon Europe indicator to measure "World-class science" impacts. Indicator to contribute to the measurement of Horizon Europe impact pathway No.1 –world-class science.

Operational	No. success stories submitted to and accepted by EIT	To measure the number of good practices or success stories presented by KICs to the EIT according to a specific format and accepted by the EIT including eligible nominees for the EIT awards. See the "Note" column for the links to evaluative research.		 Reporting in line with timings of evaluative research. In addition to the numbers of cases, the success stories provide the basis for case study examples of the ways in which impacts are brought about, the scope of impacts and the potential scale of impacts. These should be synthesised to help provide an evaluation evidence base, and complemented with other in-depth case studies to understand instances where the EIT/KIC model has proved less successful.

Operational	**Value of KIC funding secured from partners and other donors**	**The value of cash and in-kind contributions, to be broken down as follows:** • **contributions KIC KAVA and KCA activities** • **contributions to fund KIC operations (e.g. membership fees)**	Horizon Europe	**Breakdown by nature of financial contribution and route/type of support received by business receiving investment (e.g. education courses/ programmes, start-up support, innovation projects). Financial contribution breakdowns include:** • **contributions to KAVA and KCA activities** • **contributions to KIC operations (e.g. membership fees)** Horizon Europe **Indicator to contribute to the measurement of Horizon Europe impact pathway No.9 – amount of public and private investment mobilised.**
Operational	Social media/online presence/audience	The sum of followers on three major social media channels: Facebook, Twitter, and LinkedIn.	SM	

Medium- to Long-term Outcomes				
Economic development	Cost savings achieved by direct participants of KIC support (e.g. as a result of implementing new innovations)	To measure the value of cost savings achieved by direct beneficiaries of KIC support that are identified as being due to the support provided by the KIC. Values to be estimated in EUR and based on self-reported assessment as part of follow-up surveys of participants.	Horizon Europe	Rolling survey of organisations in receipt of KIC support at set time intervals (i.e. 1, 3 and 5 years post support). Horizon Europe Indicator to contribute to the measurement of Horizon Europe impact pathway No.7 – economic growth.
Economic development	Jobs created in organisations directly benefiting from KIC support	To measure the number of jobs created by direct beneficiaries of KIC support that are identified as being due to the support provided by the KIC. Values to be estimated in FTE estimates based on self-reported assessment as part of follow-up surveys of participants.	Horizon Europe	*As above.* Horizon Europe Indicator to contribute to the measurement of Horizon Europe impact pathway No.8 – total employment.
Economic development	Jobs safeguarded in organisations directly benefiting from KIC support	To measure the number of jobs safeguarded by direct beneficiaries of KIC support that are identified as being due to the support provided by the KIC. Values to be based on FTE estimates based on self-reported assessment as part of follow-up surveys of participants.	Horizon Europe	*As above.* Horizon Europe Indicator to contribute to the measurement of Horizon Europe impact pathway No.8 – total employment.
Economic development	Revenue growth achieved in organisations directly benefiting from KIC support	To measure the value of revenue growth achieved by direct beneficiaries of KIC support that are identified as being due to the support provided by the KIC. Values to be estimated in EUR and based on self-reported assessment as part of follow-up surveys of participants.	Horizon Europe	*As above.* Horizon Europe Indicator to contribute to the measurement of Horizon Europe impact pathway No.7 – economic growth.

Ecosystem development	**% of businesses that have benefited from KIC support that have engaged in different forms of innovation activities in the last 2 years (defined using CIS activities)**	**A measure of the % of businesses that have benefitted from KIC support that have engaged in different forms of innovation activities, using CIS categories (e.g. In-house R&D; External R&D; Acquisition of machinery, equipment, software & buildings; Acquisition of existing knowledge from other enterprises or organisations; Training for innovative activities; Market introduction of innovations; Design, Other).**		***As above.***
Ecosystem development	Reduction in skills mismatches (e.g. % of engaged employers reporting skills gaps and skills shortages)	For all employers that have engaged with the relevant KIC in any way, to measure the extent to which they experience skills challenges. Challenges are defined as the % of employers (responding to a survey) that have reported: i) skills gaps (i.e. they have employees that do not have the necessary skills to carry out their roles); and ii) skills shortages (i.e. they have unfilled vacancies because applicants did not possess the required skills).		 Rolling survey of organisations/ employers in receipt of KIC support at set time intervals (i.e. 1, 3 and 5 years post support).
Ecosystem development	Policy influence following Horizon Europe impact pathways from the production of policy-relevant findings, to dissemination/engagement, to a material impact on policy (e.g. No. policies [“approaches” or “practices”] influenced [changed or improved])	To assess, using a case-based approach, the nature and scope of policies (defined in terms of “approaches” or “practices”) that have been influenced (i.e. changed or improved) by KIC activities.		 Breakdown by route/type of support that led to policy changes or improvements (e.g. education courses/programmes, start-up support, innovation projects).  Ad-hoc evaluative research, including surveys, consultations with expert stakeholders and textual analysis to identify and verify cases of policy influence (potentially as part of independent evaluation work).
Operational	Measure of financial sustainability	To measure the total revenues generated by the KIC divided by the total expenditure on		

		KIC activities (i.e. KAVAs) in year N.			
Operational	Net Promoter Score on overall satisfaction with EIT / KICs	To measure the satisfaction of all engaged organisations on a scale of 1-10. The Net Promoter Score (NPS) is compiled by dividing the total number of EIT/KIC 'promoters' (defined as those scoring their level of satisfaction as 9 or 10) by the number of EIT/KIC 'detractors' (defined as those scoring their level of satisfaction as 6 or below).			 Breakdown by route/type of support received (e.g. education courses/programmes, start-up support, innovation projects).

Symbol	Description
	Indicator is proposed to be used as part of competitive resource allocation
	Indicator is a prevailing core KPI (expansions/extensions to Core KPIs, where relevant, are described in the "Note" column)
Horizon Europe	Indicator is fully aligned with the Horizon Europe Indicator Framework
	Indicator is to be broken down by the route/type of support received (e.g. education courses/programmes, start-up support, innovation projects), or by some other form of breakdown by "type" (as described in the "Note" column)
	Indicator is to be broken down by location (i.e. country, and reported based on RIS and non-RIS countries)
	Indicator is to be broken down by gender
	Indicator is to be broken down by type of education course/ programme
TRL	Indicator is to be broken down by TRL level (or equivalent measure of progress towards commercialisation
	Indicator is to be broken down into value banding (in EUR)
	Data is to be collected using programme/monitoring data
	Data is to be collected using a survey tool and relies on self-reporting. The relevant survey population is described in the "Note" column
WoS	Data is to be collected from the Web of Science (WoS) databased
SM	Data is to be collected from each KICs social media (SM) account
	Data is to be collected, collated, and reported on annually
	Data is proposed to be collected and analysed in line with evaluative reporting requirements
	Indicator is intended as a learning indicator, or for use in contextualising a combination of indicators. More detail is provided in the "Note" column
	Indicator was included in the testing phase of work

10.11. Annex 9: Analysis of possible themes for future KICs

Introduction

The EIT Regulation stipulates that "the SIA shall define the priority fields and the long-term strategy for the EIT and shall include an assessment of its socioeconomic impact and its capacity to generate the best innovation added-value"[143]. This Annex provides the outline of the indicative priority fields for possible future KICs. The analysis is based on the themes (=priority fields) proposed by the EIT Governing Board in its Strategic Outline on the Future of the EIT[144] and reflected in the draft Strategic Innovation Agenda of the EIT that was submitted to the European Commission (DG EAC) in accordance with Article 17. The assessment of the individual priority fields is based on criteria which are in line with the Horizon Europe Programme and takes into account the Strategic Planning Process of Horizon Europe given the need to ensure synergies and coherence of KICs within the EU research and innovation landscape.

The themes identified and put forward by the EIT Governing Board are:

1) Cultural and Creative Industries,
2) Security and Resilience;
3) Water, Marine, and Maritime;
4) Inclusion, Integration and Migration.

These themes were also included in the Open Public Consultation carried out in the period 10th October to 5th December 2018 by the European Commission (DG EAC). The main results of this OPC show that the EU has competitive advantage and can deliver further economic growth within these areas due to a strong R&I base.

The Commission has cross-checked the themes for future KICs proposed by the EIT by applying the criteria listed below. They build on the criteria used by the EIT (under Horizon 2020) for the themes proposed in the draft SIA that was submitted to the European Commission (DG EAC); are aligned with the future Horizon Europe programme; and are complemented with the new requirements for KICs that will be introduced as part of the revision of the EIT legal basis:

1) Alignment of the theme with the thematic clusters of the Global Challenges and Industrial Competiveness pillar of the future Horizon Europe programme[145]
2) EU economic and R&I strengths and weaknesses in the thematic area
3) Prospects for financial sustainability of a future KIC in a specific thematic area
4) Existing bottlenecks for innovation within a thematic area and extent to which the KIC model could address them
5) Suitability and relevance of the proposed indicator framework (Annex 8) for measuring the impacts of a future KIC within a specific thematic area

Process

143 See Article 17 of the EIT Regulation
144 See for more details the strategic outline published by the EIT GB: https://eit.europa.eu/sites/default/files/eit_strategic_outline_0.pdf
145 The thematic clusters are the following: 1) Health, 2) Inclusive and Secure Society, 3) Digital and Industry, 4) Climate, Energy and Mobility, 5) Food and Natural Resources.

The following table summarises the process undertaken in identification of the future priority fields:

WHO	WHAT	CRITERIA/OBJECTIVES	OUTCOME
EIT (with the help of external experts and the JRC)	**Gap analysis** based on: - **Mapping** of societal challenges already addressed by the existing KICs - **Foresight studies**, in particular the Bohemia study, and aligned with the **Sustainable Development Goals (SDG)s**	**Criteria**: - Potential theme should address **major societal challenges** with a **citizen-centred approach**, **sufficiently broad** and **based on a variety of foresight studies**.	**4 thematic areas** have been identified: - **Security and resilience** - **Inclusion, integration and migration** - **Water, marine and maritime** - **Cultural and creative industries**
EIT (with the help of external experts)	**Analysis** of the 4 identified thematic areas to verify their **suitability to the EIT model** of intervention, and **stakeholders consultation** (notably through INNOVEIT 2017)	**Criteria**: - Fine-tuning of the scope (broad), the **(societal) challenge** and the **citizen-centred approach**. - **Possibility and advantage for Europe** (and complementary or similar initiatives). - **Added value of applying the EIT Model** - Extend to which the area is **already covered through activities by existing KICs**	The work of the experts has resulted in **four reports** (outlining the challenges, the potential impact of addressing them and the EIT added value), **all concluding that the identified challenges could be successfully addressed through the establishment of a KIC** as this would bring high added value. The final result consists of **4 thematic factsheets** included in the draft Strategic Innovation Agenda 2021-2027 submitted to the Commission in December 2017. The EIT GB decided to keep the option of an **open call for KIC** that would be further explored in view of responding to an **emerging challenge in the future**.
European Commission (with the help of external experts through a support study by SQW)	**Assessment** of the themes **proposed by the EIT** against a **set of criteria complementary** to those applied by the EIT and in line with Horizon Europe Programme.	**Criteria**: - **Alignment of the theme with the thematic clusters** of Pillar II of Horizon Europe Programme. - EU economic and R&I **strengths and weaknesses** in the thematic area. - Prospects for **financial sustainability** - Existing **bottlenecks** for innovation within a thematic area and extent to which the KIC model could address them. - Suitability and relevance of the proposed **indicator framework** for measuring the impacts of a future KIC within a specific thematic area.	The assessment resulted in **4 reports** on the proposed priority fields.
European Commission	Inclusion of the themes in the **Open Public Consultation** carried out in the period 10th October to 5th December 2018 by the European Commission (DG EAC).	**Objectives**: - Get **stakeholders' input** on the thematic areas proposed by the EIT as well as other possible ones.	The main results of this OPC showed that the **EU has competitive advantage** and can deliver further economic growth within the 4 thematic areas proposed by the EIT due to a strong R&I base. Other areas emerging from the OPC were either already addressed to a certain extend by the existing KICs or too narrow to be addressed under the EIT KIC model.

European Commission	As part of the Impact Assessment, analysis of the 4 proposed thematic fields building on the previous analytical steps. As preparatory phase of the SPP of Horizon Europe, check of the coherence and complementarity of potential themes with potential EU partnerships.	Objectives: - Identify the thematic areas with the potential to be addressed by a KIC under Horizon Europe programme. - Propose the theme for the first KIC to be launched in 2021. - Propose the themes that would be designated following theStrategic Planning Process (2024-2027). Criteria: - Coherence and synergies with EU R&I and Education landscape - Not covered by planned similar EU initiatives - Fragmentation of the innovation value-chain - Suitability of the EIT model to address innovation bottlenecks - Ability to mobilize investment and sufficient market for innovation - Modernisation/transformation potential of the Education system and skills gap - Regional dimension - Citizen-focus approach - Synergies with and complementarity to existing KICs	The Impact Assessment led to the conclusion that the 4 priority fields Security and Resilience; Inclusion, Integration and Migration; Water, Marine and Maritime; and Cultural and Creative Industries are suitable to be addressed by a KIC under Horizon Europe Programme. The analysis also led to the identification of Cultural and Creative Industries as the thematic priority for the first KIC to be launched under Horizon Europe as it showed the highest degree of maturity of all themes in its assessment against the proposed criteria and demonstrated strong potential to complement and synergise with all existing KICs. Furthermore, as regards the complementarity with both the EU Partnerships as well as the existing KICs, the CCI theme scores higher than the three other areas studied. The remaining 3 thematic areas will be further analysed and assessed during the Strategic Planning Process (2024-2027)

Source: own analysis

Specific priority fields

Cultural and Creative Industries[146]

Cultural and Creative Industries represent a horizontal solution to an array of rising challenges, which are of a permanent nature, and can be addressed through research and innovation activities. These challenges can be grouped into four pillars: 1) Europeans' creativity, cultural diversity and values; 2) European identity and cohesion; 3) European employment, economic resilience, and smart growth; and 4) Europe as a global actor.

146 Creative and Cultural sectors (CCS) means all cultural and creative sectors whose activities are based on cultural values and/or artistic and other creative expressions, whether those activities are market-or non-market-oriented, whatever the type of structure that carries them out, and irrespective of how that structure is financed. Those activities include the development, the creation, the production, the dissemination and the preservation of goods and services which embody cultural, artistic or other creative expressions, as well as related functions such as education or management. The cultural andcreative sectors include inter alia architecture, archives, libraries and museums, artistic crafts, audio-visual (including film, television, video gamesand multimedia), tangible and intangible cultural heritage, design, festivals, music, literature, performing arts, publishing, radio and visual arts (EIF)

The challenges related to the first Pillar, **Europeans' creativity, cultural diversity, and values,** affect citizens' resilience, limit their flexibility, and threaten the preservation of the quality of life.[147] The following points need to be addressed:

- Shortage of cross-cutting skills that are needed for innovation and crucial in light of labour market changes. Video and computer games, literature, publishing, performing and visual arts can offer innovative ways of obtaining skills (e.g. digital skills via video games and creativity in general).
- Innovative practices in heritage services, museums, and libraries and film heritage institutions are crucial to reveal the importance of different cultures and can address the sense of loss of identity that results from globalization[148].

Societal challenges related to the second Pillar, **European identity and cohesion,** can generally be described in terms of lack of 'bridges' connecting different parts of the society and include the following:

- Social exclusion. CCIs favour innovative forms of community participation. Innovations in design, architecture and the use of public spaces, as well as culture-led social innovation, can offer effective ways to raise the quality of life of excluded groups.[149]
- Development of a European identity: culture regularly tops the list of the factors that most create a feeling of community among EU citizens.[150] Our creations reflecting our common cultural heritage and cultural and linguistic diversity highlight the importance of artistic and creative freedom in Europe and are at the heart of the EU project and of the EU identity. There is now evidence that when people have wide access to culture (physically or through digital means) and are actively engaged in cultural activities, they are more likely to understand and adopt shared common values. The 2018 European Year of Cultural Heritage confirmed the importance that citizens attach to their European cultural heritage, both national and non-national. Seven European citizens in ten agree they feel pride in a historical monument or site, work of art or tradition from a European country other than their own, and that living close to places related to Europe's cultural heritage can give people a sense of belonging to Europe (both 70%)[151].
- Discriminatory attitudes towards different cultures. European society faces challenges regarding the inclusion of immigrants and intercultural dialogue. Literature, film, and performing and visual arts are a way of becoming familiar with previously unknown cultures and innovative solutions in museums and libraries (such as education programs, targeted actions to less-represented communities) can foster interaction with migrants and counter stereotyping.

147 Gustafsson C. and Lazzaro E. (2017). Input to EIT's Strategic Innovation Agenda. Future EIT Thematic Areas. Expert analysis. Culture, Cultural Heritage and Creative Industries.
148 OMC Report on Promoting Access to Culture via Digital Means: Policies and Strategies for Audience Development, June 2017
149 OMC Report on Participatory Governance of Cultural Heritage, April 2018
150 Standard Eurobarometer, 2017
151 https://europa.eu/cultural-heritage/toolkits/special-eurobarometer-europeans-and-cultural-heritage_en

Pillar three, **European employment, economic resilience, and smart growth,** addresses economic challenges such as unemployment (especially youth unemployment) and global competition for the brightest minds and capital. Culture-based and creativity-driven innovations boost European competitiveness either directly by creating new enterprises and jobs or indirectly by creating cross-sector benefits to the wider economy, improving quality of life and increasing the attractiveness of Europe. The contribution of culture and creativity to innovation is not limited to the direct impact of the CCIs, since innovation across-the-board is increasingly driven by non-technological factors such as creativity, design and new organisational processes or business models. In particular, cultural and creative industries with distinct value chains (i.e. music, design, fashion, audio-visual, video games, architecture …) have a strong innovation capacity in economic terms and are able to drive innovation in other sectors of the economy.[152] CCIs are early adopters of new technologies and often play a central role in the digital transformation and integration between the digital and physical worlds, which is at the heart of the fourth industrial revolution. The contribution that culture can bring to most creative processes in industry, science or services was highlighted in various experts' reports[153] .

A potential future KIC on CCIs should address cross-innovation, the process through which creative industries share information, collaborate and work with other sectors to promote new thinking, is key to trigger innovation in other sectors of the economy and help services and manufacturing to become more competitive in the global market. CCIs can play a role triggering innovation in other sectors' value chains and in the creation of new business models.

The fourth pillar relates to the role of **Europe as a global actor** and aims at addressing challenges such as:

- The global dynamic of power is currently shifting, yet EU countries retain significant clout in "soft power indexes", also because of their strong performance when it comes to cultural assets.[154] In a world that is becoming increasingly inter-connected, IT innovations would however be essential to enhance the dissemination of the content created in Europe.
- Sustainability and Climate change. The United Nations' Agenda 2030 for sustainable development defines culture as a "crucial enabler" of sustainable development. Some CCIs (e.g. design, architecture, etc.) contribute actively to the sustainable development and drive green innovation, while cultural content (literature, film and the arts) can raise awareness of ecological problems and inform public opinion.

152 The content creation process lies at the heart of the CCS i.e. the artistic process.The created content provides input for both the cultural as well as the creative sub-sectors of the CCS market. However, beyond the classical CCS sub-sectors, the artistic content created has an impact on a wide range of industries that depend on the creative output stemming from CCS: Consumer electronics e.g. TV, Tuners, DVD; Telecom services and hardware e.g. smartphones, computers; Industrial design; Tourism e.g. Cultural heritage, historical sites, recreation parks; Software; Education e.g. cultural and tertiary education

153 Policy Handbook on Promotion of Creative Partnerships, an OMC report from March 2014

154 https://softpower30.com/wp-content/uploads/2018/07/The-Soft-Power-30-Report-2018.pdf, the EU has placed seven countries among the top ten for culture, which helps keeping five EU countries among the top ten in the global index.

- The global digital race. New technologies (i.e. ICTs, AI, IoT, blockchain) are radically transforming the way we live, work and communicate. Seven out of 10 largest firms in terms of market capitalisation are digital. None are European. European CCIs are important generators of content, products and services globally and could play a positive role in the creation of new business models and cross-sectoral value chains.

Alignment with Horizon Europe, including with the Global Challenges and Competitiveness pillar

The Cultural and Creative Industries theme is aligned with EU priorities. It is included as an *area of intervention* on Cultural Heritage under the cluster *Inclusive and Secure Society* of the Global Challenges and Industrial Competitiveness Pillar of the Horizon Europe proposal. A future KIC could provide valuable horizontal inputs across various activities to be carried out in the *Inclusive and Secure Society* cluster and the one on Digital and Industry. Furthermore, it could efficiently complement other parts of the Horizon Europe Programme, the intervention of the existing EIT Digital and the actions foreseen under the new Creative Europe Programme, as well as other EU programmes (Invest EU, cohesion funds, Single Market Programme).

Cluster	Areas of intervention	Relevant broad lines of activities
Inclusive and secure society	Cultural heritage	KIC within the theme can address all lines of activity. It can particularly foster connections between emerging creative sectors and cultural heritage, embed cutting edge technologies including digital ones into heritage studies and sciences, and help cultural heritage to contribute to sustainable development.
	Democracy	KIC within the theme can address the line of activity related to the role of multi-cultural citizenship and identities in relation to democratic citizenship and political engagement.
Digital and Industry	Manufacturing Technologies	KIC within the theme can provide horizontal inputs to most lines of activity since creative and cultural inputs are indispensable in the development of concepts for new products and are vital to help generate added value.

Economic and research capacities of the sector

Culture and creativity are important assets for the economy. Cultural and creative industries in Europe are at the forefront of innovation and at the origin of spill-overs to other sectors. They provide more than 12 million full-time jobs, which amounts to 7.5 % of the EU's work force, creating approximately EUR 509 billion in value added to GDP. CCIs in the EU employ 2.5 times more people than automotive manufacturers and five times more than the chemical industry.[155]

There is an EU trade surplus in cultural goods[156] amounting to EUR 8.7 billion. In addition, 42% of total economic activity in the EU (some EUR 5.7 trillion annually) is generated by IP-

155 http://www.europarl.europa.eu/sides/getDoc.do?type=TA&language=EN&reference=P8-TA-2016-0486
156 Eurostat, 2016 figures, http://ec.europa.eu/eurostat/web/culture

intensive industries – which have a strong connection to CCIs - and approximately 38% of all employment in the EU (82 million jobs) is in industries that have an above-average use of IP rights.[157]

Thriving areas are often places where artistic and cultural producers emerge which puts culture high on the agenda of cities, regions and territories, as recently recognised by the OECD.[158] As demonstrated by the EU Cultural and Creative Cities Monitor[159], leading cultural and creative cities are more prosperous, have more jobs, and more human capital. Former industrial cities are therefore putting investment in culture and creativity at the centre of their local development strategies to support policy objectives ranging from urban regeneration and economic diversification to job creation and social innovation and cohesion.

Regional smart specialisation strategies are being implemented across the EU, and around 6% of all 1,300 regional smart specialisation priorities refer to culture under different angles (e.g. cultural heritage, creative industries, etc.). Culture and creativity are also critical for the economic and social development of low-income cities and regions and can further help address disparity issues across Europe.

Europe's cultural diversity depends on resilient and robust cultural and creative sectors. However those sectors, notably the audiovisual or music sector, are facing a number of challenges, as a result of the increased competition from global players and the digital shift. Producers, distributors, broadcasters, cinema theatres and all types of cultural organizations need to innovate in order to attract new generations of audiences

157 https://www.epo.org/about-us/annual-reports-statistics/annual-report/2016/highlights/economic-impact-of-IP.html
158 http://www.oecd.org/cfe/leed/venice-2018-conference-culture/documents/Culture-and-Local-Development-Venice.pdf
159 https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/cultural-and-creative-cities-monitor-2017-edition

Strengths	Weaknesses
Strong and growing research base. In 2014, 18.7% of patent publications and around 40% of trademarks registered in Europe were related to the CCIs.[160] The number of patents in these sectors have been growing during the last years.[161]	**Lack of cooperation between researchers and research and industry**. There is a lack of coordination of R&D efforts, sharing of methods, results, and best practices.[162] Additionally, most of the research is produced in national languages, which leads to repetition, as researchers are often unaware of similar projects.[163]
Europe is the second CCI market in the world (26% of estimated employment and 31% of estimated revenues).[164] 4% of EU GDP and 7.5% of EU employment are created in CCIs.[165]	**High market concentration.** Three European countries – Germany, United Kingdom, and France – are the absolute leaders in CCIs compared to other European countries, generating around 50% of turnover and added value.[166]
EU is especially strong in the advertising sector (50.4% of global revenues, 52.6% of global employment). Additionally, 39.6% of the global workforce in architecture is working in Europe.[167] **EU is also strong in the sector of fashion (EU export in fashion goods accounts for 12.3%)[168]**	**Insufficient skills provision.** Cultural and creative studies in European universities are mostly focused on the "creative part" and their graduates are not always ready to enter the modern labour market as they lack cross-sectoral (entrepreneurial, digital, financial management) skills.[169] With regards to HE institutions, the EU is trailing behind the USA in Communication & Media studies (while EU universities are performing better in more traditional disciplines such as Art & Design or Performing arts).[170]
Europe's creativity is recognized worldwide	European industries are challenged by digitization and globalization and their powerful impact on the way artists produce and distribute their works and relate to their audiences. The collapse of DVD markets, new consumer expectations and the continued power of US studios together with the rise of global digital giants like Amazon, Itunes, Google and Netflix have impacted the traditional value chain.

160 Austrian Institute for SME Research and VVA Europe (2016). Boosting the competitiveness of cultural and creative industries for growth and jobs. Final report, p. 78.
161 Ibid.
162 Gustafsson C. and Lazzaro E. (2017). Input to EIT's Strategic Innovation Agenda. Future EIT Thematic Areas. Expert analysis. Culture, Cultural Heritage and Creative Industries, p.12.
163 Interviews.
164 EY (2015). Cultural times. The first global map of cultural and creative industries. Study on behalf of the International Confederation of Societies of Authors and Composers (CISAC).
165 Austrian Institute for SME Research and VVA Europe (2016). Boosting the competitiveness of cultural and creative industries for growth and jobs. Final report, p. 62. Gustafsson C. and Lazzaro E. (2017). Input to EIT's Strategic Innovation Agenda. Future EIT Thematic Areas. Expert analysis. Culture, Cultural Heritage and Creative Industries, p.1.
166 De Voldere, I., Durinck E., Mertens, K., Cardon, C., Maenhout, T., Warmerdam, S., Versteegh, M., Canton, E. (2013). Survey on access to finance for cultural and creative sectors. Evaluate the financial gap of different cultural and creative sectors to support the impact assessment of the creative Europe programme. Study prepared for the European Commission, p. 59.
167 Austrian Institute for SME Research and VVA Europe (2016). Boosting the competitiveness of cultural and creative industries for growth and jobs. Final report, p. 43.
168 VVA Europe (2016). Boosting the competitiveness of cultural and creative industries for growth and jobs. Final report, p 67, p. 71
169 Ibid. p. 56, interviews.
170 TopUniversities 2017 ranking.

Financial sustainability of a KIC

The analysis suggests that the characteristics of the theme do not imply any significant risks in terms of financial sustainability of the future KIC. In particular:

- **Membership fees** could generate an income stream if the KIC managed to attract larger CCI companies with long time horizons. As pointed out by the OECD, cultural productions occur in networks of firms where larger corporate entities coexist with numerous small and specialised firms where the output content and design are constantly changing. 90-95% of CCIs organisations in Europe are in fact micro-enterprises (fewer than 10 employees) and freelancers.[171]

- **Income from the provision of services**. This stream could be significant, if some of the most pressing challenges are alleviated: access to finance, integration into global value chains, etc.

- **Capitalisation on return on investment/equity** of incubated start-ups could be challenging. CCIs are characterised by a large number of start-ups and continuous renewal, but scaling up and growth of companies could be an issue. However, recent examples of highly successful and fast growth start-ups, for example in the Virtual Reality, animation or video gaming industry have demonstrated the dynamism of the sector, its major potential and the possibly fast return on investment.

- **Income from education and training.** The interaction between STEM and art and design is driving substantive innovation and creativity. There is therefore a need to encourage education providers to equip students in arts and creativity, business and technology with the knowledge and competences needed to work across cultural and creative sectors and disciplines. This new trend could open opportunities for business model on education.

Potential to address bottlenecks for innovation

The existing KIC model is well designed to address the innovation bottlenecks faced by the CCIs that include emerging sub-sectors as well as very mature ones that undergo a profound digital transformation:

- Lack of entrepreneurship and related skills;
- Lack of platforms for scaling-up of innovations, difficult access to international value added chains;
- Insufficient integration of creative clusters and hubs;
- Disconnection between education, research, and businesses;

There are two additional bottlenecks that a future KIC could successfully address:

First, a KIC in CCIs could tackle structural **obstacles related to the access of private finance** by taking into account the positive experience of the EU Cultural and Creative Sectors Guarantee Facility, as well as the examples of EU countries where investment in knowledge assets is higher than in tangible ones.[172]

171 Gustafsson C. and Lazzaro E. (2017). Input to EIT's Strategic Innovation Agenda. Future EIT Thematic Areas. Expert analysis. Culture, Cultural Heritage and Creative Industries, p.6.
172 https://www.nesta.org.uk/report/uk-investment-in-intangible-assets/

Second, a KIC in CCIs could address **growth challenges and market access** by working in a different and innovative way, with skills development at the core and relying on a larger geographical scale which will allow focusing on complementarities of skills and CCI products and services.

A specific challenge posed by digitisation is the power of big platforms which facilitate access to multiple markets, but at the same time exploit their power by keeping a significant share of generated revenue. Attempts by alternative platforms[173] so far have not been very successful, because of the competitive advantages of incumbents and strong network effects. In only one area, music streaming, the leader is a European company, Spotify, which demonstrates the capacity for European champions to take and keep leadership on global content markets. The EU's Digital Single Market Strategy[174] is addressing some of these challenges, in particular as concerns the so-called "value gap", the fair remuneration of authors and creators, and fairness and transparency in the platforms-to-business transactions. The market for cultural digital services is therefore in evolution, and a re-balancing of the power relations can be expected in the near future.

Suitability of themes vis-à-vis impact indicators

Overall, the impact indicators are relevant for a future KIC in the CCI area. The financial sustainability indicator is also very relevant given the challenges such a KIC might face. The definition of appropriate societal impact indicators should also take into account the breadth of challenges that the CCIs could address. The possibility of a CCI KIC to create co-location centres across Europe would allow a better link with regional initiatives along the Research and Innovation Strategies for Smart Specialisation (RIS3) across Europe. Overall, this theme appears to be particularly well suited for an EIT-KIC model intervention. The degree of maturity of this theme against all criteria envisaged suggests that a KIC on CCI could already be launched at the very beginning of the new programme.

Security and Resilience

In recent years security threats have become more varied and more international, as well as increasingly cross-border and cross-sectorial in nature. The EU and its Member States face new and complex security threats which mainly originate from instability in the EU's immediate neighbourhood[175] and also reflect the rapid technological and social and economic developments in the world. Therefore, the freedom and security of European citizens require anticipation, prevention, and protection from threats as well as resilience, i.e. ability to withstand stress and rapidly recover from disruptions.

This thematic area covers the following specific issues which all require innovative solutions to address the challenges:[176]

- **Identification of threats to citizens, goods, and organisations**. Threats can arise from systemic technological malfunction or targeted malicious activities (e.g. terrorist acts). Hence, there is a need for innovation in tools and systems to monitor and identify signals of threats from large quantities of data.

173 Consider Dailymotion, which is an alternative to YouTube developed in France.
174 https://ec.europa.eu/digital-single-market/en/policies/shaping-digital-single-market
175 Communication on the European Agenda on Security, COM (2015) 185 final
176 Jacquotte O. P., Castor M. (2017). Input to EIT's Strategic Innovation Agenda. Future EIT Thematic Areas. Expert analysis. Security and Resilience, pp. 3-7.

- **Risk and crisis management, the resilience of systems**. Open and interconnected technological and social systems face risks of diverse origins: environment, technology, human, etc. Threats can easily spill over across borders and sectors and therefore have large amplitude of impact. Innovations are needed for developing resilience-capable systems, improving risk and crisis management.

- **Protection of infrastructures and soft targets.** Modern societies are heavily reliant on infrastructures contributing and ensuring the well-being of citizens. Some of them (e.g. water distribution and sanitation, energy creation) are vital to the very life of people and therefore their disruption could have extreme consequences. Hence, there is a need for innovations for protecting infrastructures, improving resilience to disruptions, and localisation of negative impacts.

- **Information security.** Hacking, illegal electronic surveillance, espionage, the spread of misinformation can undermine economic and democratic structures. To address these challenges innovation in cyber security as well as prevention of the spread of deliberately fake information is therefore needed.

- **Human understanding and control of highly automated systems / Artificial Intelligence (AI).** Humans increasingly rely on AI to control critical societal systems, although the algorithms of decision making are not entirely clear. Therefore, there is a need for innovation and applications that could control and protect AI systems and robotic solutions from ill-intentioned attacks.

- **The basic resilience of society.** Societies' capabilities of managing disruptions in the basic societal functions (e.g., water, food, and electricity) are often limited to a few days. Furthermore, there is a need to prepare for mitigation of latent and increasing environmental stress (e.g. water crisis in Cape Town), as well as emerging stressors (e.g. thunderstorm asthma in Birmingham and Melbourne). Innovative solutions are required to improve the capability to manage disruptions and increasing stress in basic societal functions like water, food, and electricity. Furthermore, there is a need for technologies and services making it cheaper and easier for citizens to be prepared for disruptions.

- **System usability.** There is a range of existing systems that could be applied to improve the security and resilience of societies. Nevertheless, they have become overly complex to manage and use for non-specialists. Innovations would therefore help improve user-interfaces and bring the technologies closer to ordinary users.

Alignment with Horizon Europe, including the Global Challenges and Competitiveness pillar

The *Security and Resilience* theme corresponds to the clusters of activities of the Global Challenges and Industrial Competitiveness Pillar as outlined in the Commission proposal for establishing Horizon Europe programme. A KIC established within the Security and Resilience theme could therefore contribute to four areas of intervention under the Inclusive and Secure Society cluster: Democracy, Disaster-Resilient Societies, Protection and Security, and Cybersecurity. Potential work of a KIC on cybersecurity, control of automated systems, and protection of infrastructures could also contribute to the activities carried out within the Digital and Industry cluster.

Cluster	Areas of intervention	Relevant broad lines of activities
Inclusive and secure society	Democracy	KIC within the theme can address lines of activities aiming at addressing populism, extremism, radicalisation, terrorism and including and engaging disaffected and marginalised citizens, as well as enhancing the role of multi-cultural citizenship and identities in relation to democratic citizenship and political engagement.
	Disaster-Resilient Societies	KIC within the theme can address all lines of activities
	Protection and Security	KIC within the theme can address all lines of activities
	Cybersecurity	KIC within the theme can address all lines of activities
Digital and Industry	Key Digital Technologies	KIC within the theme can address most lines of activities, in particular, those related to systems and computing technologies security.
	Artificial Intelligence and Robotics	KIC within the theme can provide horizontal inputs to most lines of activity
	Next Generation Internet	KIC within the theme can provide horizontal inputs to most lines of activity
	Advanced Computing and Big Data	KIC within the theme can provide horizontal inputs to most lines of activity
	Space	KIC within the theme can provide horizontal inputs to the line of activity aiming at developing secure satellite communications for EU governmental actors.

Economic and research capacities of the sector

The European research, Higher Education Institutions, and enterprises are among the major players in the field. Nevertheless, Europe faces fierce competition in this field from the USA and increasingly from China. Furthermore, development of innovations related to security and resilience would require the established players to diversify from defence-related activities. The Table below provides an overview of European strengths and weaknesses in the field of Security and Resilience.

Strengths	Weaknesses
Strong industrial, research, and HE base. The EU security industry has approx. EUR 200 bn. annual turnover and around 5 million employees (including the defence sector)[177]. In 2015, the EU ranked second (behind the USA) in the global security industry, with a global market share of 30%[178]. The EU MSs comprise 5 out of 10 leading countries with the highest average H-index in research fields associated with the theme[179].	**European industrial, research, and HE base** is trailing behind that of the USA. Recently China has also made significant progress in the field[180].
Europe has a strong competitive advantage in advanced engineering and manufacturing. Europe has also made significant progress in building up capacities in information security field (security analytics, threat intelligence, mobile and cloud security)[181].	European businesses and research organisations working in the field are more **focused on defence and aerospace** rather than on security and resilience.[182] The USA and China are leading global efforts in security-related AI and big data systems[183].
New players are emerging, e.g. Baltics (Estonia in particular) are rapidly building up capacities related to information security[184].	**High concentration:** most of the R&D spending, research centres, and innovative enterprises are concentrated in a handful of countries (the UK[185], Germany, France, Italy, Sweden, and the Netherlands)[186].

Financial sustainability of potential KIC

The economic landscape of the theme does not suggest major risks for the financial sustainability of a future KIC. There is a significant number of large innovative enterprises that could be interested in joining the KIC and contributing to its financial sustainability through membership fees. The field is ripe for fast growing innovative start-ups. Hence, a future KIC can expect income stream from return on investment/equity of incubated start-ups. A future KIC could also expect some income from education and provision of services, although this is likely to depend on the quality and uniqueness of the services offered.

177 European Commission (2017). Security research and innovation – Boosting effectiveness of the Security Union. Booklet, p. 5.
178 AmCham EU (2015). Security and Defence. Together for European Growth, p. 7. Retrieved at http://www.amchameu.eu/sites/default/files/publications/files/security_and_defence_brochure_2016_0.pdf
179 Scimago Journal & Country Rank, 2016. The following research subarea were used to estimate the average H-index of countries in the Security and Resilience: (i) Aerospace engineering, (ii) Communication, (iii) Computer networks and communications, (iv) Control and systems engineering, (v) Information systems and management, (vi) Modelling and simulation, (vii) Political science and international relations, (viii) Safety research, (ix) Safety, Risk, reliability and quality.
180 AmCham EU (2015), Scimago Journal & Country Rank, 2016 and interviews.
181 Interviews, AmCham EU (2015) and Optimity advisors (2016).
182 Interviews.
183 Interviews.
184 Interviews.
185 Brexit will further reduce European capacities in this theme.
186 Interviews and previous studies: Jacquotte O. P., Castor M. (2017). AmCham EU (2015). European Parliament (2016). The future of EU defence research.

Potential to address bottlenecks for innovation

There is a large number of bottlenecks for innovation in the field that a future KIC could potentially address. These include:

- **Heavy path-dependency and rigid innovation agendas**. Public funding in the Member States (MS), as well as research and industrial base, are strongly concentrated in traditional defence sectors. Work is typically structured around long-term R&D programmes. As the new security challenges have emerged, attention has shifted towards new areas of work, such as cyber-security, monitoring, and prevention of threats (predominantly terrorism), etc. However, the interviewees suggested that the established industrial players treat innovations for mitigating the newly emerging risks as potential niches, rather than core future markets. Public authorities, firms, and societies at large tend to downplay the likelihood of rare high-impact events. As a result, the markets for non-defence security and resilience innovations are rather shallow (unless high-impact events occur, which leads to a surge in demand).
- **Fragmentation of efforts.** There are strong economic arguments for closer European cooperation. First, MS face similar challenges, but due to a low likelihood of high-impact crises individually each country tends to underinvest in early identification, management, and mitigation of risks. Second, the performance of innovations based on AI and big data significantly improves with larger quantities of data, which is difficult to obtain for low-likelihood events. Hence, the more regions and countries use such innovations, the better they could become. However, the economic arguments are not always compatible with the political determination of governments to develop own systems that constitute part of national security.
- **Neglect of social innovations.** There is a widespread perception that technological innovations are necessary to address challenges related to security and resilience. The interviewed experts argued that while technology definitely has an important role to play, a significant share of the challenges require social innovations, which have been largely neglected to date. This also explains why the uptake of available technologies has been rather weak. Examples of social innovations include: strengthening media literacy to fight the spread of misinformation, prevention of radicalisation, etc.
- **Lack of the necessary skills.** This is particularly relevant for information security, human understanding and control of highly automated systems and Artificial Intelligence, and system usability sub-challenges. For example, Europe is expected to face a shortage of 350,000 experts in cyber security by 2022.[187]

The work of a future KIC could be constrained by several legal and technical obstacles.

- Innovations for early identification of threats can face difficult questions regarding the balance between security and respect for human rights. Hence, application of innovations (e.g. face recognition) that rely on personal data can be subject to regulatory uncertainty in Europe, while countries with looser regulatory regimes (e.g. China) enjoy a competitive advantage in developing such technologies (sometimes at the expense of the respect for human rights).
- There is a lack of 'soft' infrastructure (commonly agreed terminology, frameworks), which inhibit cross-national cooperation in developing innovations in the fields of

187 Global Information Security Workforce Study 2017.

security and resilience.[188] While a future KIC could contribute to the alleviation of these bottlenecks, they span beyond the direct control of Innovation Communities.

- The sectors covered by the theme are very diverse, from information and cybersecurity to resilience of critical infrastructure. Attempts to cover most of the sectors by a future KIC could result in spreading its resources thinly and in the need to develop a coherent overall strategy exploiting the synergies between its members. Therefore, a refinement or possibly a narrower scope of the theme could be considered to ensure greater coherence of economic activities.

Suitability of themes vis-à-vis impact indicators

A future KIC in the field of *Security and Resilience* could adopt a number of strategies. On the one hand, the KIC could aim to transform the mature industries (e.g. defence and security industry, operators of 'hard' and 'soft' infrastructures, ICT) by attracting established players and facilitating diversification of their activities to new areas of security and resilience. On the other hand, the KIC could aim to develop market-creating innovations by facilitating the emergence of new players. Either strategy (or their combination) is likely to contribute to the attainment of the proposed economic medium/long term indicators. As with many of the KICs, the definition of appropriate societal impact indicators will require careful consideration. It is a particular challenge here given the intrinsic difficulties in measuring levels of security and resilience.

Water, Marine, and Maritime

The overuse and mismanagement of natural resources in the last century has placed a great pressure on freshwater ecosystems.[189] At the same time, new technologies and the need to decarbonise the economy are leading to increasing use of marine resources. A major challenge in this field is to create a sustainable, circular, and blue economy that is based on sufficient quantities of water as well as on healthy and functioning freshwater and marine ecosystems with a view to tackle the following points:

- **Water scarcity, drought, and floods.** Continued climate change and over-extraction of fresh water are causing a rise in severity and frequency of water scarcity and droughts. Simultaneously, increasing scale of economic activities in coastal areas, floodplains, and deltas, and the reduction of the natural water retention contribute to the increase in the likelihood and adverse impacts of floods. Therefore, innovative methods and technologies are needed to gather, predict, and disseminate information about waterbodies' safety, potential threats, and mitigation of risks.

188 Lange D., Honfi D., Petersen L., Rod B., Pursiainen C. (2017). Application of Resilience Concepts to Critical Infrastructure in the IMPROVER Project, in EC, Proceedings of the 1st International Workshop on Resilience, p. 39.
189 Bergkamp G. and Vassilopoulou V. (2017). Input to EIT's Strategic Innovation Agenda. Future EIT Thematic Areas. Expert analysis. Water, marine and maritime, p. 2.

- **Marine and freshwater ecosystem degradation.** Waterborne pollution (especially from agriculture) and human activities damage to coastal and marine ecosystems. Waste reduction, improvement in water treatment and less environmentally damaging offshore activity are needed as well as better ways of monitoring the marine environment. The environmental status of 80% of the species and habitats assessed under the EU's Marine Strategy Framework Directive is 'unknown'.

- **Decarbonisation.** All scenarios presented in the Commission's Clean Planet Communication[190] on achieving a zero carbon economy by 2050 include an enormous growth in offshore wind energy – between 10 and 50 times the present capacity. Unprecedented expansion of other activities is also forecast. Installations for energy from tide and waves will shift from demonstration to production. Aquaculture, particularly shellfish and algae, for food and feed will move further offshore and expand at least tenfold to compensate for land lost from food production for biofuels. An ecosystem of service providers for developing, manufacturing, installing, cabling, supplying and maintaining these facilities as well as checking their impact on ecosystems will need to be developed.

- **Circular and blue economies** include two large segments:
    - Water management on land. A relatively small amount of wastewater is currently reused in Europe. At the same time, other countries in the world are increasingly facing water shortages. Therefore, there is a need for innovations to ensure sustainability of freshwater ecosystems. The innovations could include new technologies for water extraction, reuse, and treatment as well as social innovations (e.g. pricing models) that could alter the behaviour of consumers.

    - Blue (marine) economy includes a range of traditional (e.g. shipping, tourism) and newly emerging sectors (e.g. blue biotech). There is a need for a range of innovations to set the traditional sectors along a sustainable growth path as well as to kick-start economic activities of sectors that are in the early stages of development but that have large market opportunities.

Alignment with Horizon Europe, including the Global Challenges and Competitiveness pillar

The scope of the theme corresponds well with the Food and Natural Resources cluster of the Global Challenges and Industrial Competitiveness Pillar as outlined in the Commission proposal for establishing Horizon Europe programme. In particular, a future KIC within this theme could significantly contribute to the following areas of interventions: Seas and Oceans, Circular Systems, Environmental Observation, and Biodiversity and Natural Capital. It would also contribute to the climate, energy and mobility cluster.

190 https://ec.europa.eu/clima/policies/strategies/2050_en

Cluster	Areas of intervention	Relevant broad lines of activities
Climate, energy and mobility	Energy systems and grids Clean transport and mobility	KIC can develop an ecosystem of service providers with special knowledge of challenging offshore conditions that can contribute to expansion of offshore energy that will consolidate European leadership and will be essential for meeting carbon emission targets.
Food and natural resources	Environmental Observation	KIC within the theme can provide horizontal inputs to most lines of activity
	Biodiversity and Natural Capital	KIC within the theme can provide horizontal inputs to most lines of activity
	Food systems	Aquaculture, both freshwater and marine, will play an increasing role in food and feed systems as agricultural land shifts to biofuel production.
	Sea and Oceans	KIC within the theme can address all lines of activities
	Circular Systems	Circular use of water resources, including reduction of water demand, prevention of losses, water reuse, recycling and valorisation of wastewater and governance models for smart water allocation, addressing sources of pollution and tackling other pressures on water resources

Economic and research capacities of the sector

The Water, Marine, and Maritime theme has a relatively strong knowledge base as well as high market potential. The sectors of the highest significance in Europe are the following:

- **Marine supplies.** It has a production value in the EU of around EUR 52.5 bn per year. The largest two players in this sector in the EU are Germany (EUR 12.8 bn.) and Italy (EUR 8.7 bn).[191] Production of marine supplies includes **shipbuilding, boatbuilding, and repair**. Shipbuilding in Europe has an annual turnover of around EUR 13 bn and a workforce of 500 thousand.[192] Italy has the biggest boatbuilding industry in Europe with a share of approx. 28%.[193]

- **Coastal tourism.** Tourism alone makes up nearly 40% of the Blue Economy's value added and 55% of all the people employed in the European Blue Economy.[194] In addition, according to the World Economic Forum Travel and Tourism competitiveness index (2017)[195], half of the countries in the top ten are from the EU[196].

- **Maritime transport**. The share of maritime seaborne trade is estimated to account for around 60-70% of all international trade.[197] EU maritime transport sector has an annual turnover of around EUR 20 bn. and a workforce of 350.000[198]

191 BALance (2014). Competitive position and future opportunities of the European marine supplies industry, Final Report, p. 31.
192 European Commission (2009). A sea change for ocean management. A European strategy for marine and maritime research, p. 8.
193 BALance (2014). Competitive position and future opportunities of the European marine supplies industry, Final Report, p. 33.
194 European Union (2017). Blue Economy in the EU. Retrieved from https://publications.europa.eu/en/publication-detail/-/publication/030d66f1-5564-11e7-a5ca-01aa75ed71a1/language-en
195 World Economic Forum (2017). The Travel & Tourisms Competitiveness Report 2017.
196 Spain, France, Germany, United Kingdom, and Italy.
197 Union for the Mediterranean (2017). Blue economy in the Mediterranean. Report, p. 39.

- **Fisheries and aquaculture.** Fisheries have an annual turnover of around EUR 20 bn and a workforce of 500.000.[199] In 2015, it has produced around 6.4 m tons of live weight equivalent.[200] The volume of EU aquaculture production in 2015 equated to one-fifth of total EU fisheries production and accounted for around EUR 4.1 bn.[201] The largest EU players in the field are Spain (23.3% of all volume), the United Kingdom (16.8%), and France (13%). Conversion of land for biofuel to meet EU's decarbonisation strategy will require increasing food production offshore. Aquaculture can produce protein for food or feed with a lower carbon footprint than terrestrial equivalents.

- **Marine energy.** European companies are among the leaders in developing ocean energy technologies. Around half of the world's tidal energy developers and 60% of wave energy developers are located in the EU. The highest share of tidal and wave energy developers on the global scale are owned by the United Kingdom (19% of tidal and 18% of wave energy developers).[202]

- **Offshore oil and gas.** It is the biggest sector in marine energy and raw materials industry. The size of offshore oil and gas industry in 2012 was EUR 107-133 bn, it employed 25-50.000 people.[203]

- **Blue biotechnology.** The sector accounts for 2-5% of the marine economy and could have an annual turnover of between EUR 302 and EUR 754 m. The competitive advantage of the EU lies in its R&D activities, access to marine resources, and development of infrastructure to support these activities.[204]

- **Water supply and wastewater treatment** sector is increasingly innovative. 2018 Global Cleantech 100 Report[205] presents the top companies in technologies, services, and business models reducing the strains on the hydrological cycle and ensuring reliable access to clean water. Three out of the top 5 companies are of European origin (Organica Water in Hungary, OxyMem in Ireland, and Voltea in the Netherlands).

198 European Commission (2009). A sea change for ocean management. A European strategy for marine and maritime research, p. 8.
199 European Commission (2009). A sea change for ocean management. A European strategy for marine and maritime research, p. 8.
200 Eurostat (2017). Fishery statistics. Retrieved from http://ec.europa.eu/eurostat/statistics-explained/index.php/Fishery_statistics#Total_production
201 Eurostat (2017). Aquaculture statistics. Retrieved from http://ec.europa.eu/eurostat/statistics-explained/index.php/Aquaculture_statistics
202 Magagna D., Shortall R., Telsnig T., Uihlein A., Vasquez Hernandez C. (2017). Supply chain of renewable energy technologies in Europe. An analysis for wind, geothermal and ocean energy. Report for Joint Research Centre.
203 Ecorys (2012). Blue Growth. Scenarios and drivers for Sustainable Growth from the Oceans, Seas and Coasts. Third interim report, p. 98.
204 Remotti L. and Damvakeraki T. (2015). Ocean Research in Horizon 2020: The Blue Growth Potential. Study for the ITRE Committee, p. 14.
205 Cleantech Group (2018). Global'18 Cleantech 100. A Barometer of the Changing Face of Global Cleantech Innovation. Report.

The Table below discusses other strengths and weaknesses in the thematic area in Europe.

Strengths	Weaknesses
Strong research base. In the field of water scarcity, droughts, and floods Europe has the second largest number of patents (behind only Japan).[206]Furthermore, European researchers have produced more research papers on water science and technology in the past fifteen years than researchers from any other country.[207]	**Lack of focus in Higher Education.** The academic programmes tend to be rather broad, whereas the sub-sectors require quite specific knowledge and skills. Additionally, curricula in areas such as engineering, urban design, architecture, and similar do not sufficiently cover issues related to ecology, marine engineering, and management of water.[208]
High market potential. The EU is one of the leaders, alongside China and USA, in marine economy. Counting all activities that depend on the sea, the EU blue economy employs around 5.4 million and has an annual gross value of EUR 500 bn.[209] Maritime industries in the EU represent around 5% of EUs gross domestic product.[210]	Different industries often rely on the same water bodies.[211] This presents a challenge as there is a need to accommodate the **conflicting needs of sectors**. For example, the potential of harvesting marine biotechnologies relies on the quality of water, which may be negatively affected by shipping and industrial aquaculture.
Newly emerging innovative sectors. The divides between researchers and enterprises are less prevalent in emerging sectors, such as biotechnologies, aquaculture and marine energy production.[212] The marine biotechnologies sector is dominated by enterprises that build their business models on innovations and are strongly rooted in research.[213] The energy sector also develops a large number of innovations aimed at improvements in the efficiency of wave, tidal and wind turbines.[214]	**Lack of cooperation.** Less than 20% of R&D organisations in water sciences have an effective cooperation with industries or enterprises.[215]

206 Bergkamp G. and Vassilopoulou V. (2017). Input to EIT's Strategic Innovation Agenda. Future EIT Thematic Areas. Expert analysis. Water, marine and maritime, p. 11.
207 Ibid.
208 Bergkamp G. and Vassilopoulou V. (2017). Input to EIT's Strategic Innovation Agenda. Future EIT Thematic Areas. Expert analysis. Water, marine and maritime, p. 10.
209 European Commission (2012), Blue Growth opportunities for marine and maritime sustainable growth. COM (2012) 494 final, p. 2.
210 EC (2009). A sea change for ocean management. A European strategy for marine and maritime research, p. 8.
211 OECD (2016). The Ocean Economy in 2030, p. 20.
212 BALance (2014). Competitive position and future opportunities of the European marine supplies industry. Final report, p. 119.
213 Interviews.
214 BALance (2014). Competitive position and future opportunities of the European marine supplies industry. Final report, pp. 114-115.
215 Bergkamp G. and Vassilopoulou V. (2017). Input to EIT's Strategic Innovation Agenda. Future EIT Thematic Areas. Expert analysis. Water, marine and maritime, p. 13.

Financial sustainability of a KIC

The analysis suggests that the characteristics of the theme, the structure of value-added chains and strategies of the key players do not imply any significant risks in terms of financial sustainability of the future KIC. It will largely depend on the strategy and business plan of the KIC.

Potential to address bottlenecks for innovation

The key bottlenecks to innovation include lack of engineering and entrepreneurship skills, fragmentation of efforts and disconnect between education, research, and innovation activities[216] as well as an under-developed knowledge base (e.g., up to 50% of the seafloor does not have high-resolution topographic maps[217]). A KIC would be an appropriate instrument in addressing these bottlenecks.

However, due to a very broad definition of the theme, a future KIC would face multiple challenges.

1) The sectors covered by the theme are very diverse, from very mature (e.g. fisheries and shipbuilding) to the newly emerging ones (e.g. blue biotech), and attempts to cover most of the sectors could impede formulation of a coherent KIC strategy. However, a KIC could help transfer lessons learned in traditional industries such as oil and gas to the emerging ones.

2) Most of the sectors rely on relatively distinct value-added chains and knowledge bases, although there are some opportunities for synergies (e.g. shipbuilding knowledge could be used in offshore oil and gas sector). Hence, there is a risk that a KIC will develop only loosely connected networks.

3) Due to geographical, economic, policy, and other reasons, the scientific and economic competence-base is very unequally distributed among the EU MS (see Table below). For instance Mediterranean countries lag the northern countries in renewable energy because of oceanographic conditions such as a narrow continental shelf. But innovation already in the pipeline can overcome these challenges.

All of the above implies that:

- If a future KIC aimed at covering most of the sectors, its resources would be spread widely, but thinly, it would struggle to develop a coherent strategy and exploit the synergies between its members.
- The development of a coherent strategy and priority work fields could take a significant amount of time and resources. The existing KICs that were set-up within very broadly defined areas, such as EIT Climate-KIC or EIT Digital, have spent over five years and used multiple iterations to flesh out their strategy in tackling the socio-economic challenge at hand. Experience already gained under EU research programmes, the integrated maritime policy and the water framework directive could participate in shortening these timescales.

216 ECORYS (2012). Blue Growth Scenarios for Sustainable Growth from the Oceans, Seas and Coasts. Final report.
217 DG MARE (2014). Innovation in the Blue Economy: realising the potential of our seas and oceans for jobs and growth. COM(2014) 254 final/2.

Narrower scope of the theme would therefore facilitate management of the above risks. Refinement of the theme could be considered in terms of ensuring greater coherence of economic activities (e.g. blue economy). A recent study[218] suggested that the largest potential for European R&D to deliver innovation and jobs rests in the following blue economy sectors: aquaculture, marine tourism, coastal protection, blue biotechnology, ocean energy, and seabed mining. However, marine aquaculture is damaged if water quality in outflow from rivers is poor so bringing the two communities together would provide real added value. The priority should remain at ensuring that industry has the skills, technology and entrepreneurship necessary to exploit the potential of the sea for meeting the challenges of a low carbon economy whilst ensuring that this expansion does not compromise the natural capital for future generations.

Maturity of sectors covered by Water, Marine and Maritime theme

Sectors	Leading European countries*
Mature industries	
Coastal tourism, passenger ferry services, cruise tourism, yachting and similar	Most Member States
Inland waterway transport	Most Member States
Deep-sea and short-sea shipping	BE, EL, DE, DK, UK, NO, IT, FR, NL
Shipbuilding and ship repair	DE, DK, IT, NL, RO
Fisheries	DK, ES, FR, NL, UK
Offshore oil and gas	DK, IT, NL, UK, NO
Water supply, treatment and other water management on land	Most Member States
Growing industries	
Aquaculture	EL, ES, IT, FR, NO, UK
Coastal protection	BE, NL
Industries at pre-development stage	
Blue biotech	DE, NO, FR, UK
Blue energy (incl. offshore wind and ocean renewable energy)	DK, ES, FR, IE, PT, SE, UK
Seabed mining	DE, FR, UK

Source: compilation based on Remotti L. and Damvakeraki T. (2015). Ocean Research in Horizon 2020: The Blue Growth Potential; ECORYS (2012) Blue Growth Scenarios for Sustainable Growth from the Oceans, Seas and Coasts, Final report; Deloitte (2017) EU Shipping Competitiveness Study and interviews. Note: * the list is by no means complete.

218 Remotti L. and Damvakeraki T. (2015). Ocean Research in Horizon 2020: The Blue Growth Potential. Study for the ITRE Committee.

Suitability of themes vis-à-vis impact indicators

Overall, the medium/long-term outcome indicators are relevant for a future KIC. However, the targets/expected values of the indicators depend on the strategy of a future KIC (if the scope of the theme is left unchanged). On the one hand, a KIC could focus on improving the quality of ecosystems (e.g. Plastic-free oceans as proposed in the Mazzucato report[219]). In this case, most of the economic impacts (job creation, revenue growth, etc.) on the blue economy would be indirect, attained over a longer period of time, and spread along a wide range of sectors (e.g. tourism, fisheries, blue biotech). On the other hand, a KIC could focus on the development of the most promising fields of the blue economy. This should result in larger short-term economic impacts. However, the two issues are linked and considering them together would avoid unintended consequences.

Inclusion, Integration, and Migration

The European society is facing major demographic changes – rising life expectancy, migration, reducing family sizes, and others. Furthermore, social and economic trends pose challenges for social cohesion and inclusion. The two major interlinked issues within the theme are:

- **Demographic change and the ageing population** has wide ranging implications for the labour market, sustainability of social insurance systems as well as increased demand for care, healthcare, and related services. This creates the need for technological innovations in areas such as healthcare, home care, and housing, innovative solutions for the inclusion of vulnerable elderly groups, and organisational changes in healthcare, education, and social security.

- **Social inclusion and active citizenship as drivers for economic growth.** The share of people at the risk of poverty or social exclusion in the EU MS ranges from 14% to 41.3% in 2015.[220] Poverty and exclusion hinder the development of talents, reduces participation in the labour market and civic engagement as well as undercuts one's self-esteem and self-sufficiency. Two groups are particularly vulnerable in Europe:

    - **Youth** not enrolled in education, employment or training (NEETs). Educational chances of children still strongly depend on the socio-economic status and parents' linguistic background. Disadvantaged children may face lower employment and earning potential, which not only makes them vulnerable but also limits social cohesion and economic growth. Thus, there is a need for social innovations in reaching out to NEETs, fostering their human capital and entrepreneurial skills.

    - **Migrants**: immigrants, refugees, and asylum-seekers. Migrants still face challenges in accessing employment, education, institutions, goods, and services, which limits their participation in society. The inclusion of migrants can strengthen the innovation potential of the EU and help address issues such as labour market shortages. For enhanced inclusion, there is a need for the development of social innovations and social enterprise models, innovative solutions to simplify administration and banking processes.

219 Mazzucato M. (2018). Mission-Oriented Research & Innovation in the European Union. A problem – solving approach to fuel innovation – led growth.
220 LaGro, Yosifova (2017). Input to EIT's Strategic Innovation Agenda. Future EIT Thematic Areas. Expert Analysis. Inclusion and integration, p. 5.

Alignment with Horizon Europe, including the Global Challenges and Competitiveness pillar

The scope of the theme corresponds well with the Inclusive and Secure Society cluster of the Global Challenges and Industrial Competitiveness Pillar as outlined in the Commission proposal for establishing Horizon Europe programme. A KIC established within the Inclusion, Integration, and Migration theme could directly contribute to two areas of intervention: *Democracy* and *Social and Economic Transformations*.

Cluster	Areas of intervention	Relevant broad lines of activities
Inclusive and Secure Society	Democracy	Deliberative and participatory democracy and active and inclusive citizenship, including the digital dimension
		The impact of economic and social inequalities on political participation and democracies, demonstrating how reversing inequalities and combatting all forms of discrimination including gender, can sustain democracy
	Social and Economic Transformations	Social sustainability beyond GDP only indicators especially new economic and business models and new financial technologies
		Tax and benefits systems together with social security and social investment policies with a view to reversing inequalities and addressing the negative impacts of technology, demographics and diversity
		Human mobility in the global and local contexts for better migration governance, integration of migrants including refugees; respect of international commitments and human rights; greater, improved access to quality education, training, support services, active and inclusive citizenship especially for the vulnerable;

Economic and research capacities of the sector

The EU has a broad but patchy research and higher education base in the areas of Inclusion, Integration and Migration. It covers most of the issues within the theme but there is a need for a more concerted effort in order to innovate and address challenges in the field. EU Member States spend large shares of their GDP on social protection and health. There is also increasing awareness of the new market opportunities and social value that can be tapped in the area. The Table below provides an overview of the European strengths and weaknesses in the field of Inclusion, Integration and Migration.

Strengths	Weaknesses
There is significant potential in the European social economy, which accounts for approx. 2 million enterprises (10% of all European businesses) and employs over 11m paid members (or 6% of the employed).[221]	**The untapped potential of social entrepreneurship.** Neither the European funding system nor the legal framework is well-suited to support social entrepreneurship.[222] Due to complicated bureaucratic processes, social enterprises find it difficult to access funding schemes, to support their further development and ultimately achieve sustainability.[223]
Strong research base. The EU MSs comprise 6 out of 10 leading countries with the highest average H-index in research fields associated with the theme.[224]	**The number of European HE institutions ranked as excellent is considerably lower** than the rest of the world. Only three to four European universities were in the top 20 disciplines related to the thematic area.[225]
MS have allocated significant funding to address the challenges. In 2016 the EU spent 19.1% of its GDP on social protection and 7.1% on health[226]**.**	**A large share of providers of social services relies on public funding**, which is highly volatile in times of economic or social crises. This undercuts the development of viable long-term business models.

Financial sustainability of a KIC

There are three groups of players in the thematic area: national and regional authorities, social enterprises and NGOs, and for-profit enterprises. The first two groups are not likely to significantly contribute to the financial sustainability of the future KIC through membership fees or payments for services. Over the past decade, they have faced a combination of fiscal austerity and an increased demand for services due to the migration crisis, residual effects of the financial crisis, etc. For-profit enterprises typically provide services and products at the higher end of the market, e.g. care and support for the disabled or elderly who can afford the services. Hence, while some of the enterprises could contribute to the financial sustainability of the KIC, their interests might not be well-aligned with the social mission of the KIC.

221 Grigore A. (2013). Social economy entities: a worldwide overview, Review of Applied Socio-Economic Research, 6(2).
222 BEPA (2010). Empowering people, driving change. Social Innovation in the European Union, p. 102.
223 LaGro, Yosifova (2017). Input to EIT's Strategic Innovation Agenda. Future EIT Thematic Areas. Expert Analysis. Inclusion and integration, p. 8.
224 Scimago Journal & Country Rank, 2016. The following research subarea were used to estimate the average H-index of countries in the inclusion, integration, and migration thematic area: (i) Aging, (ii) Communication, (iii) Cultural studies, (iv) Demography, (v) Education, (vi) E-learning, (vii) Geography, planning and development, (viii) Geriatrics and gerontology, (ix) Gerontology, (x) Industrial relations, (xi) Occupational therapy, (xii) Organisational behaviour and human resource management, (xiii) Public administration, (xiv) Social psychology, and (xv) Social work.
225 Disciplines considered: Education & Training, Social Policy & Administration, Sociology (3 EU universities in the top 20), Psychology (4 EU universities in the top 20).
226 Eurostat (2018). Government expenditure by function for European Union (28 countries). Retrieved at http://ec.europa.eu/eurostat/statistics-explained/index.php/Government_expenditure_by_function_–_COFOG

The future KIC could contribute to the creation and growth of social enterprises that are renowned for the development of social innovations.[227] However, it is not likely that return on investment/equity of incubated start-ups will constitute a significant stream of KIC's income. First, social enterprises are focused on generating a return for society rather than return on investment.[228] Hence, profits (if any) are usually reinvested in scaling up the services.

Second, to generate a significant return on investment, social enterprises need stable streams of income. Most social enterprises adopt a 'hybrid' business model, i.e. derive their revenues from a combination of the market (sale of goods and services) and non-market (subsidies, grants, donations, etc.) sources. Research shows that public sector funding dominates the revenue streams of social enterprises. For example, around 45% of social enterprises in Italy mainly rely on public funding. In the UK, 52% of social enterprises derive some and 23% derive all their income from the public sector.[229] Hence, financial stability, growth, and ultimately return on investment will to a large extent depend on the level of public funding.

Careers in the field do not offer high financial rewards. This could negatively impact the capacities and/or willingness of prospective students to pay tuition fees for EIT labelled courses. As a result, it is not likely that the future KIC could generate significant income from its education services.

Overall, there are significant risks that the future KIC will not generate sufficient income through traditional sources of revenue (membership fees, the sale of services, and return on investment and tuition fees). Unless the KIC develops alternative income streams, it is not likely to be financially sustainable.

Potential to address bottlenecks for innovation

There is high demand for innovations in the field. However, the interviews and desk research suggest that there are three long-standing challenges to the development and take-up of innovations in the field.

1) **Constraints in scaling-up of innovations**. Traditional businesses predominantly focus on relatively standardised products and services that can be easily traded across markets. Hence, scaling typically involves the growth of business and expansion to new markets. However, the actors within social economy typically focus on the provision of services that are difficult to transfer, because they are generally labour intensive, personalised and relational.[230] As a result, social-innovations face challenges when 'travelling' across social enterprises, policy domains and regions / countries.[231]

2) **Limited access to private finance**. While traditional enterprises aim to maximise shareholder value, the actors in the field of inclusion and integration prioritise social value or seek to strike a balance between the two. As a result, the start-ups and scale-ups are less attractive to the established providers of debt and equity capital. Furthermore, national regulation can also impose additional barriers. For example, social enterprises in the Czech Republic are prohibited from using own assets as collaterals to guarantee loans, while in Romania bank rules place not-for-profit social enterprises among the riskiest borrowers.[232]

227 DG GROWTH. Social enterprises [website]. Retrieved at: http://ec.europa.eu/growth/sectors/social-economy/enterprises_en
228 OECD/European Union (2013). Policy Brief on Social Entrepreneurship.
229 European Commission (2015). A map of social enterprises and their eco-systems in Europe. Synthesis report, pp. 36-37.
230 European Union/OECD (2016) Policy Brief on Scaling the Impact of Social Enterprises.
231 Benton, Glennie (2016). Digital Humanitarianism: How Tech Entrepreneurs Are Supporting Refugee Integration, p. 21.
232 European Commission (2015). A map of social enterprises and their eco-systems in Europe. Synthesis report.

3) **Constraints in distributing profits.** Social enterprises (particularly, if they are registered as non-profits) also face obstacles in distributing profits, which inhibits access to equity finance[233].

To alleviate the challenges, a number of alternative funding instruments have emerged (see below), although their scale and impact remains limited.[234] Hence, national/regional authorities and the Commission stepped-in to support the development of an ecosystem of finance for social enterprises. The EU Programme for Employment and Social Innovation (EaSI) provides loan guarantees for social enterprises as well as supports development of social finance markets in Europe. Furthermore, the European Fund for Strategic Investment's (EFSI) equity instrument supports social enterprises through pilot equity investments.

Alternative funding sources for social enterprises

Source	Explanation	Examples
Solidarity finance	Use of traditional financial instruments (e.g. pension funds, savings, credit) to advance the public good.	Finansol (France, 200 000 subscribers in 2005)
Venture philanthropy	Application of the venture capital model into a social investment strategy to include blended returns (i.e. financial revenues and social benefits).	(Venture Experiment Programme by the Rockefeller Foundation
Institutional investors	Institutional investors such as pension or mutual funds, insurance companies, or traditional banks can target investments in social enterprises either directly or through dedicated funds.	Pension and insurance funds, Donor-advised funds (DAFs): Pioneered by Fidelity's Non-profit Charitable Gift Fund
Individual investors	Highly motivated high net worth individuals or "citizen investors" invest in social enterprises either directly or through dedicated funds.	Angel investors, High Net Worth Investors
Crowdfunding	Web platforms connecting entrepreneurs with multiple "citizen investors"	Kiva; Just giving

Source: OECD/European Union (2013) Policy Brief on Social Entrepreneurship

233 Ibid.
234 Ibid.

The third group of bottlenecks concerns access to the market. In a number of cases, pure markets for inclusion and integration services do not exist, because the end-users (e.g. unemployed youth, migrants, etc.) do not have the means to pay for the services. Hence, service providers rely on funding from charities and regional/national authorities. When markets do exist, social enterprises typically offer products and services at higher price levels in comparison to for-profit enterprises. The price differences arise due to the need to divest some of the revenues for social purposes or due to the adopted production processes (e.g. social enterprises employ lower productivity workers, such as the disabled).[235] Hence, such enterprises strongly rely on socially active consumers and tailored public procurement rules to compete with other providers.

Given the overwhelming constraints and challenges, there would be significant risks for a future KIC in terms of financial sustainability and potential overlaps with other public interventions that aim to address similar societal challenges. A range of national/regional and EU-level instruments have already attempted to address existing challenges in the field with some success and ensuring synergies by a future KIC would be therefore important.

Suitability of theme vis-à-vis impact indicators

Overall, most of the medium/long-term outcome indicators are relevant for a future KIC. However, the characteristics of the theme could have implications on the definition of targets. These are discussed in the table below.

Indicators	Comment
Jobs created / safeguarded in organisations directly benefiting from KIC support.	The indicator is relevant, but it does not capture the additional social value of employing disadvantaged groups, which is a widespread practice of enterprises working in the field. It may be worth considering distributional weights as a means of contextualising this indicator for this particular theme.
Revenue growth achieved in organisations directly benefiting from KIC support	To an extent, this will depend on the level of public funding to inclusion and integration and / or the extent to which the organisations supported by a KIC crowd-out the incumbents.
Cost savings achieved by organisations directly benefiting from KIC support	Highly relevant indicator
% of business that have benefited from KIC support and engaged in different forms of innovation activities in the last two years	Highly relevant indicator
Reduction in skills mismatches	Highly relevant indicator
Financial sustainability coefficient	Highly relevant indicator, but there are significant risks to the financial sustainability of a KIC in this area
Net promoter score on overall satisfaction with EIT / KIC	Highly relevant indicator

235 OECD/European Union (2013) Policy Brief on Social Entrepreneurship.

Contribution to alleviating societal challenge	Social impact indicators are highly relevant, but there are significant challenges in demonstrating the contribution of concrete initiatives or enterprises[236].

10.12. Annex 10: Model-based Analysis on co-funding model for KICs

Model-based analysis of the Commission proposal for the revision of the EIT Regulation carried out by the Commission's Research Joint Centre

Non-technical summary

This Annex describes a model-based analysis assessing impacts of co-funding modalities under the four policy scenarios considered in the EIT Impact Assessment. The analysis consists of two parts: a theoretical model-based analysis and an empirical model-based analysis. Both approaches provide illustrative examples of selected likely key impacts triggered by EIT-supported investments on an additional investment leveraged by the EIT contribution, without aiming to cover the entire spectrum of potential impacts on the EU economy, society and environment. Two channels of the policy adjustment are considered: the co-funding rate and the risk premium component of the cost of capital.

The results from the theoretical analysis suggest that both the co-funding rate and the risk premium matter importantly for the EIT-support on leveraging an additional investment. The higher is the policy ability to reduce financial, technology or market uptake risks, the larger is the potential of the EIT investment support to leverage an additional investment in KIC-supported projects/sectors. Results for the co-funding rate are more nuanced, as higher co-funding rate per se implies higher investment leverage per investor but also fewer investors. A second important result is that the two policy intervention channels – the co-funding rate and the risk premium component of the cost of capital – interact mutually. This implies that, for example, a decrease in the number of investors due to higher co-funding rate could be offset by lowering the risk premium component of the cost of capital.

The results from the empirical simulation analysis confirm that those EIT policy options with the highest capacity to reduce the risk premium component of the cost of capital and impose the highest private investment co-funding rate are leveraging the highest amounts of an additional investment in KIC-supported projects/sectors. Among the four analysed scenarios, these are scenarios S2A and S2B with the highest cumulative leverage effects over the entire 2021-2035 year period. In contrast, scenario S1A performs considerably weaker in terms of leveraging an additional (private) investment. In terms of the EIT financial sustainability, these simulation results suggest that the EIT policy scenarios S2A and S2B are considerably more financially sustainable than the EIT policy scenarios S1A and S1B when a time horizon of two entire programming periods is considered.

236 OECD/European Union (2013). Policy Brief on Social Entrepreneurship.

1 Introduction

The European Institute of Innovation and Technology (EIT) has been set up in response to the need to address major societal challenges by improving the innovation performance of the EU. Among major challenges to the innovation performance is the need for an increased R&D investment in the EU. The overall mission of the EIT is to contribute to a sustainable economic growth and competitiveness of Europe by reinforcing the innovation capacity of the Member States and the Union.

In order to address these challenges and achieve innovation objectives, the EIT provides an investment support in selected policy areas with the greatest benefits for society: Climate, Digital, Innovative Energy, Health, Raw Materials, Urban Mobility and Added Value Manufacturing. The bottom-up approach of the EIT activities aims primarily at creating knowledge and innovation and encouraging greater R&D investment in these policy areas. These are essential to address the knowledge and innovation gap in Europe, thereby supporting the Union's strategic objectives and policy priorities, including a long-term growth and competitiveness but also wider societal impacts.

The objective of the EIT impact assessment is to provide an evidence base for two Commission proposals: (i) the Commission proposal for an amendment of the EIT Regulation, which is its founding legal base; and (ii) the Commission proposal for a new Strategic Innovation Agenda (SIA) for the EIT for the period 2021 – 2027 setting out its strategic priorities and objectives during the Horizon Europe programming period. This Annex provides a scientific support by enlarging the evidence base of potential impacts of alternative EIT funding scenarios.[237]

To study the impact of EIT investment-support measures on private investments, we develop a stylised investment model. Using this model, we undertake a conceptual and simulation analysis by looking at the impact of the co-funding rate and policy-induced changes in the risk premium component of the cost of capital. Both in the theoretical model and simulation analysis we analyse two scenarios with two subs-scenarios: with and without the enforcement of the private co-funding of the investment support and with and without reduction in the risk premium component of the cost of capital. They help us to identify and understand potential implications of alternative EIT funding scenarios.

The results from the theoretical analysis suggest that both the co-funding rate and the risk premium component of the cost of capital matter importantly for the EIT-support on leveraging an additional investment. The higher is the policy ability to reduce financial, technology or market uptake risks, the larger is the potential of the EIT investment support to leverage an additional investment in KIC-supported projects/sectors. Results for the co-funding rate are more nuanced, as higher co-funding rate per se implies higher investment leverage per investor but also fewer investors. A second important result is that the two policy intervention channels – the co-funding rate and the risk premium component of the cost of capital – interact mutually. This implies that, for example, a decrease in the number of

237 A complete description of the analysis presented in this Annex with all the assumptions and sensitivity analysis is provided in JRC reports Kancs, D. (2019) "Economic Impacts of the European Institute of Innovation and Technology Investment Strategies: A Model-based Assessment", JRC Working Papers JRC115573, Joint Research Centre, European Commission; Ivanova, O., Kancs D., and Thissen, M. (2019): Regional Macroeconomic Impacts of EIT Investments in the EU, JRC Working Papers, Joint Research Centre, European Commission.

investors due to higher co-funding rate could be offset by lowering the risk premium component of the cost of capital.

The results from the empirical simulation analysis confirm that those EIT policy options with the highest capacity to reduce the risk premium component of the cost of capital and impose the highest private investment co-funding rate are leveraging the highest amounts of an additional investment in KIC-supported projects/sectors. Among the four analysed scenarios, these are scenarios S2A and S2B with the highest cumulative leverage effects over the entire 2021-2035 year period. In contrast, scenario S1A performs considerably weaker in terms of leveraging an additional (private) investment. In terms of the EIT financial sustainability, these simulation results suggest that the EIT policy scenarios S2A and S2B are considerably more financially sustainable than the EIT policy scenarios S1A and S1B when a time horizon of two entire programming periods is considered.

2 The EIT investment support

Policy impacts on economy, society and environment in general and – due to various inter-sectoral, inter-regional and inter-temporal linkages and interdependencies – EIT investment support effects in particular are diverse and complex. Because of their prominent role in improving the innovative performance of the Member States and the Union, two types of effects of EIT-supported investments are of particular interest in the context of EIT investment support policies: (i) impacts on the EU economy in general (demand effects (e.g. hiring of workers, machinery), structural effects (e.g. productivity and human capital growth), and macroeconomic effects (e.g. on GDP and employment)); and (ii) impacts on the additional investment leverage in particular (existing KIC partner investment, new investors).[238] Increase in the private investment will trigger further impacts on economy (demand, structural, macro-economic, etc.). The main emphasis of the analysis detailed in this Annex is on impacts on the leverage of an additional investment, as these effects very considerably among the three considered EIT funding scenarios. As noted above, there are many more economic impacts, as well as societal and environmental effects which, however, are not considered in the present analysis.

2.1 Impacts on economy

Economic impacts of EIT investment support policies are not only multi-faceted and non-linear, many of them are unobservable and hence cannot be identified by simply looking at data. For example, when the *EIT Digital* invests in a broadband network, direct observable activities include the amount of workers' time required to lay network cables underground, machinery and materials such as the fibre optic cables. The length of cabling kilometres can be observed, the workers' time can be measured – in Figure 1 they are referred to as the *demand effect on the economy*.

The constructed broadband network connects homes and businesses enabling faster communication services. Eventually, these effects can be observed and measured directly too.

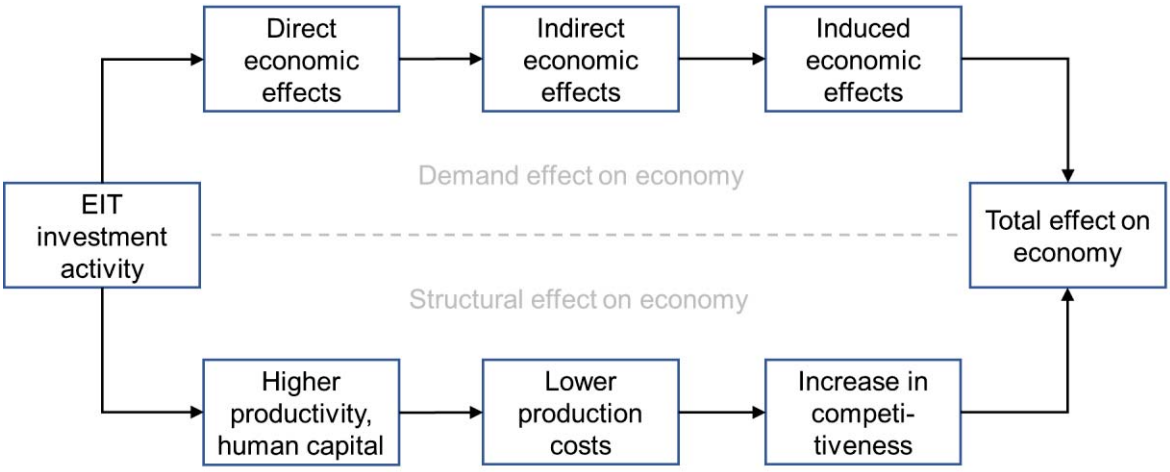
238 For the sake of the notational simplicity, in the context of this impact assessment we refer to all non-EIT investment as a private investment.

It is less straightforward, however, to measure how the new services may help to create new businesses or disrupt existing ones, how productivity may be increasing, fostering the changing nature of work, etc. In Figure 1 they are referred to as the *structural effect on economy*. These structural effects are confounded by other simultaneous developments and policies, making it extremely challenging to establish a causal link to EIT investments. Given that it would be impossible or prohibitively expensive to measure them on a case-by-case basis, a model-based scenario analysis is being used that allows to simulate the potential development of the economy with and without the EIT digital interventions and compare/quantify the difference between alternative policy scenarios.

Another example, the *EIT InnoEnergy* supports the supply of energy produced in a sustainable and affordable manner. The elaboration of such new innovative energy technologies is human capital and physical capital intensive, creating an immediate demand for these factors (highly skilled workers and machinery) in the economy. Again, in Figure 1 they are referred to as the *demand effect on the economy*. These demand effects can be observed and their use and the associated costs can be accounted for relatively straightforwardly.

In the medium- to long-run, the newly innovated sustainable and renewable energy production technologies also reduce the EU economy's dependence on the imported energy, increase the efficiency of the energy production and consumption, as well as create new energy supplying businesses in the EU. In Figure 1 they are referred to as the *structural effect on economy*. These structural effects in the EU economy are associated with a much larger uncertainty – as innovation is an inherently uncertain process – their causality and size are much more challenging to establish. Therefore, a model-based scenario analysis is required, as already noted above.

Figure 1. Mechanics of the EIT investment support impact on economy



Source: JRC illustration

Demand side effects (direct, indirect and induced effects) together with structural effects (e.g. productivity, cost-advantage and competitiveness effects) result in total macro-economic effects on the economy, such as GDP and employment. In Figure 1 they are referred to as the *total effect on economy*. Although, many production, consumption, trade, GDP, employment, etc. can be observed and measured, due to simultaneous developments and confounding factors, it is rather challenging to establish causality between EIT-supported investments and growth of these indicators. For such purposes, a model-based scenario analysis needs to be undertaken that allows to simulate the potential development of the economy with and without EIT interventions and quantify/compare differences in production, consumption, trade, GDP, employment, etc. between alternative policy scenarios.

For a holistic and comprehensive understanding of net effects of EIT-supported investments, in addition to the impact on economy, also inputs and their costs need to be accounted for. Indeed, the EIT investment budget – similarly to the entire EU budget – has certain sources of revenues that can be traced back to taxes paid by households and business in each Member State and region. Part of the required EIT funding comes from extra household savings, part of it comes from borrowing abroad, yet another part is derived from relocating existing savings that may have been invested differently. A similar line of argument applies also to the measurement and tracking of inputs needed to finance these investments. In the context of funding and financing, advantages of using an economic model are that funding can be linked to sources and all inputs and their costs can be thoroughly accounted for.

Finally, there are also spill-overs to other regions and sectors, even those not directly benefiting from EIT-supported investments. For example, through inter-sectoral input-output linkages, through cross-border trade of goods and services, knowledge spill-overs and a spatial diffusion of technology, also not directly supported regions/sectors benefit from EIT-supported investments in the medium- to long-run. On the other hand, policy-induced crowding-in and pro-competitive effects on input and output markets may increase competition and eventually crowd out less competitive companies in some regions/sectors.[239] In Figure 1 they are referred to as the *indirect economic effects*. To be able to consider the full range of such effects − both positive and negative − and to form a more comprehensive view of the total net economic impact, a model-based analysis is required.

2.2 Leverage of an additional investment

Among various impacts on economy, EIT-supported investments affect the investment decisions of private investors in the KIC-supported projects/sectors – Climate, Digital, Innovative Energy, Health, Raw Materials, Urban Mobility and Added Value Manufacturing. Higher private investments may result from both existing KIC beneficiaries (*incumbent companies*) as well as new partners investing in KIC-supported projects/sectors (*new investors*).

EIT-supported investments constitute only part of the total investment in economy, the major part of investment being provided by private and public investors.[240] The extent to which

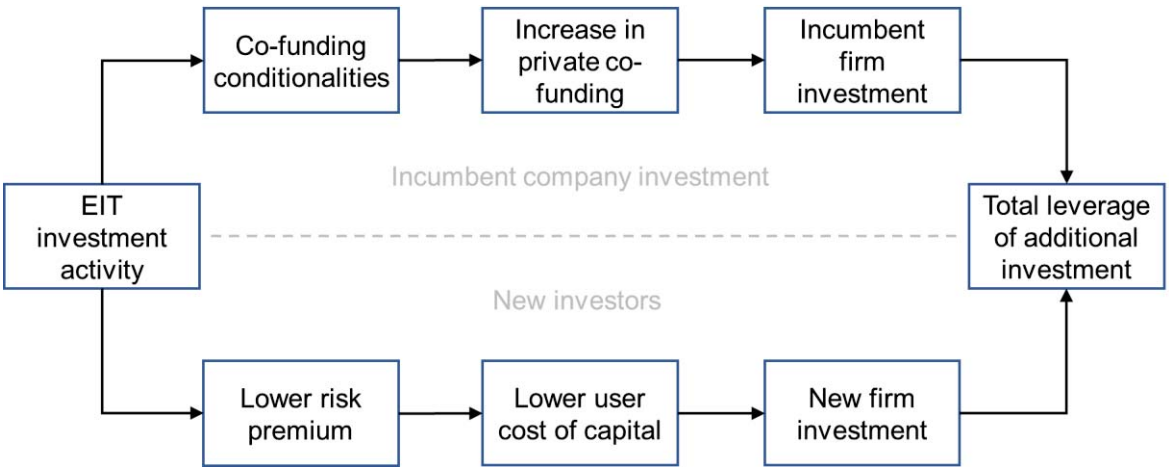
239 Michalek, J., P. Ciaian and D. Kancs, 2016. "Investment Crowding Out: Firm-Level Evidence from Northern Germany," Regional Studies, 50(9), 1579-1594.

240 In the context of this impact assessment we refer to all non-EIT investment as a private investment.

existing KIC beneficiaries engage in KIC project/sector investments can be affected by co-funding rates that are laid down in the EIT legislative framework. For example, in the case of a 50% co-funding rate, the investment provided by KIC beneficiaries have to at least match the investment amount made available by the EIT via KIC (the investment amount provided by private investors can be higher though). In Figure 2 this is referred to as the *incumbent company investment*.

Second, financial instruments, such as the EIT-supported investments, offer the potential to help cushioning financial, technology and market uptake risks. Among others, EIT-supported investments reduce the cost of capital and contribute to an improved risk-reward profile of KIC investment projects. All other things being equal, lower KIC-project-related risks imply lower risk premium which, because of lower capital costs, makes investment in KIC-supported projects/sectors more attractive (compared to other investment alternatives). As a result, more private investors are willing to invest into KIC-supported projects/sectors. In Figure 2 these are referred to as *new investors*.

Figure 2. Mechanics of the EIT investment support impact on private investments



Source: JRC illustration

The two effects together – increase in the incumbent company investment (intensive margin) and increase in the number of investors (extensive margin) – determine the *total leverage effect on an additional investment*. Note that the two adjustment channels of the EIT investment support – the co-funding rate and the risk premium component of the cost of capital – may work in the opposite direction for incumbent and new investors, depending on how exactly the EIT investment support is implemented. For example, whereas higher co-funding rate implies higher additional investment leverage from incumbent investors, it may also imply fewer (particularly risk averse) new investors. As we will see in the next section, this decrease can be offset through a policy intervention, for example, by lowering the risk premium component of the cost of capital.

3 Model-based analysis of the EIT impact on the leverage of an additional investment

One of the main objectives of the EIT is to improve the innovation performance in the EU. Improving the innovation performance requires higher R&D investment, an important part of which should come from private sources. In this section, we develop a stylised investment model and analyse the impact of EIT investment-support measures on the leverage of an additional investment. The ability leverage an additional investment is of particular interest, because the alternative EIT funding scenarios suggest important differences in the KIC ability to leverage an additional investment.

In order to study the impact of EIT investment-support measures on the leverage an additional investment, we develop a simple investment model. Using this model, we undertake a conceptual and simulation analysis by looking at the impact of different co-funding rates and policy-induced changes in the risk premium component of the cost of capital. Both in the theoretical model and simulation analysis we analyse two scenarios with two subs-scenarios: with and without the enforcement of the private co-funding of the investment support and with and without reduction in the risk premium component of the cost of capital. They help us to identify and understand potential implications of differences in co-funding rates between EIT funding scenarios and the role of financial, technology or market uptake risks.

3.1 Theoretical model-based analysis

3.1.1 The model

The model has four types of agents that are active on the capital market: a representative firm (private investor), loan suppliers (banks), capital suppliers (e.g. machinery/technology suppliers) and government (policy framework). Banks provide loans to firm. The firm uses loan to buy capital goods from capital suppliers. The firm uses the services of capital goods to produce final products. The government may intervene in the capital market via an investment support.

The representative firm's output in a given KIC sector is assumed to be a function of the capital amount, K. The production function is represented by $f(K)$ with $f_k > 0$ and $f_{kk} < 0$.[241] Capital, K, is a stock variable, which supplies services used by the firm during the production process. For simplicity, we assume that the entire investment capital, K, is financed from a bank loan, L, at a fixed interest rate, i. The capital good's price is equal to the discounted net present value of future rents. The firm's profit function is given by:

$$\Pi = pf(K) - kK$$

Where k is the rental price of capital, $k = R(i + \delta)$, p is the price of the final product,[242] R is the unit price of the capital good, and δ is the capital depreciation rate. The firm's capital rental unit costs include interest payments, iR, and depreciation costs, δR.[243]

241 f_k and f_{kk} are first and second derivatives of the production function with respect to capital, respectively.

242 For the sake of simplicity, we assume that the analysed regional economy is small and open, which implies that the output price is fixed.

243 For example, if $\delta = 0$ then the capital good is non-depreciable, such as land.

The firm's equilibrium conditions are given by:

$$pf_k = (1+\phi)k = (1+\phi)R(i+\delta)$$

$$K = S$$

$$L = RK$$

Where S is the capital supply function. Equation (2) represents the firm's marginal condition for capital derived from the profit maximisation problem. It represents the firm's decision on the optimal quantity of the capital use by taking into consideration marginal benefits, pf_k, and marginal costs, $(1+\phi)k$, adjusted by the risk premium component of the cost of capital factor, ϕ. The capital equilibrium condition (2) yields a standard capitalisation formula $R = pf_k/(1+\phi)(i+\delta)$, which implies that the capital good's price is equal to the net present value of future capital rents. Parameter ϕ measures the degree of imperfections/uncertainties (defined as the ratio between the marginal profit and the rental price of capital), it is inversely related to the risk premium. If $\phi > 0$, then the firm's marginal value product of capital exceeds the marginal cost of capital, k. The risk premium component of the cost of capital constrain the capital use and hence the firm profitability; everything else equal, by increasing investment, the firm could increase its profit. If $\phi = 0$, then the firm's equilibrium condition (2) is equal with the competitive/perfect capital market result, where $pf_k = k$, implying that all profitable opportunities of the capital use are exploited, if this equilibrium holds.

Equation (3) represents the equilibrium market clearing condition for the capital good, where the capital good's supply, S, equals the firm's demand for capital, K. To simplify the analysis, we assume a perfectly elastic capital supply, implying that the rental price of capital, k, is fixed.[244]

The total firm loan demand, L, is determined by the capital good's price, R, and the quantity of capital invested by firm, K, $L = RK$ in equation (4). Implicitly, we assume that capital costs are exclusively financed through bank loans. The total firm's interest costs on the loan equal iRK,[245] as the firm uses loans to purchase capital goods from capital suppliers. In return, it pays interest costs to the bank on the borrowed loan.

The capital market is illustrated in Figure 5. Condition (2) determines the firm's demand for capital services and in Figure 5 is shown by curve D_{pc} without the risk premium component of the cost of capital ($\phi = 0$), and by curve D_{ic} with the risk premium component of the cost of capital ($\phi > 0$). The vertical difference between D_{pc} and D_{ic} represents the risk premium, $[\phi/(1+\phi)pf_k]$. The horizontal curve, S, represents the supply of capital services. The intersection between demand and supply yields the equilibrium capital rental price and capital use, (k^*, K_{pc}^*) and (k^*, K_{ic}^*), without and with policy-induced reductions in the risk premium component of the cost of capital, respectively. The investment is smaller with than without policy-induced reductions in the risk premium component of the cost of capital, $K_{ic}^* < K_{pc}^*$.

244 This is consistent with the short-run modelling of the capital market, where firms adjust capital quantities as a response to a policy change. Other effects, such as changes in prices and/or quantities of other inputs will take place in the medium to long-run. Usually, in the firm investment literature variable inputs are assumed to change in the short-run, whereas capital is assumed to change in the long-run. Because our objective is to analyse the effect of investment support, changes in the firm capital is a short-run effect of policy changes. In the long-run, adjustment of other inputs and/or prices follow as a reaction to policy-induced capital change.

245 This assumption is not strictly needed in the model to obtain these results. The interest rate, *i*, represents income to capital owners. If one would consider a firm-owned capital, then the interest rate, *i*, would represent the opportunity cost of capital.

3.1.2 EIT investment support

Let α denote the investment co-funding rate of the EIT investment support. The co-funding rate, α, measures the share of the EIT-supported investment (purchase costs of EIT capital investments). In line with EIT co-funding rules, the maximum quantity of capital eligible for support is limited at K_{max}.[246]

In order to ensure a long-term financial sustainability, the EIT investment support aims to increase the quantity or/and the quality of the private investment in the KIC-targeted project/sector, i.e. to create an additionality effect to the EIT investment. In the underlying model this implies to increase the firm's stock of capital relative to the capital stock used by firms at the prevailing market prices of capital before the EIT investment support. With the investment support, the firm's profit function (1) changes to:

$$\Pi = pf(K_{no} + K_s) - kK_{no} - [k - \alpha iR]K_s$$

subject to the investment support constraint $K_s \leq K_{max}$

where K_{no} is the part of capital that does not benefit from the EIT investment support, and K_s is the part of capital that benefits from the investment support, consistent with the implementation regulation of the EIT investment support.

The value of the EIT investment support per unit of capital is equal to the capital price multiplied by the co-funding rate, αR. The firm's loan demand decreases by an equivalent amount resulting in lower loan interest costs. More precisely, the investment support reduces loan interest costs per unit of the supported capital by αiR, i.e. $iR - \alpha iR = (R - \alpha R)i = (1 - \alpha)iR$. This way, the EIT investment support reduces the user cost of capital in the model.

The implementation details of the investment support have important implications for the firm's investment behaviour, particularly in terms of how it affects the user cost of capital and hence the marginal capital profitability. Depending on whether the investment support affects the capital profitability at the margin or not, the firm's equilibrium capital marginal condition (2) changes as follows:[247]

Firm's equilibrium conditions, when the investment support affects the capital profitability at the margin:

$$\frac{\partial \Pi}{\partial K_{no}} = pf_k(K_{no}) - (1 + \phi)k = 0$$
$$\frac{\partial \Pi}{\partial K_s} = pf_k(K_{no} + K_s) - (1 + \phi)(k - \alpha iR) - \lambda = 0$$

Firm's equilibrium conditions, when the investment support does not affect the capital profitability at the margin:

$$\frac{\partial \Pi}{\partial K_s} = pf_k(K_s) - (1 + \phi)(k - \alpha iR) - \lambda = 0$$

246 This is a more realistic assumption, because the actual budget for the EIT is limited and is subject to competition, implying that not all capital benefits from the support. We assume K_{max} sufficiently low; less than the equilibrium quantity of investment in the absence of support (see below).

247 We consider the case when the investment support affects only the firm's interest costs. In general, this is consistent with the implementation of the firm-level investment support. The investment support facilitates the purchase of capital. The depreciation costs (δR) are not eligible for the investment support.

$$\frac{\partial \Pi}{\partial K_{no}} = pf_k(K_s + K_{no}) - (1+\phi)k = 0$$

where λ is the shadow price of the eligibility constraint, $K_s \leq K_{max}$. The profit equation (5) implies that the profitability of capital is higher for the supported capital, K_s, (by αiR) than for the non-supported capital, K_{no}. However, the investment support improves the capital profitability at the margin only in equations (7)-(8) but not in equations (9)-(10). This difference is due to the enforcement/non-enforcement of the private investment co-funding or due to policy-induced changes in the risk premium component of the cost of capital (see further). We illustrate this in Figure 6 for the capital demand without a policy-induced reduction of the risk premium component of the cost of capital, δD_{pc}.[248]

First, consider equations (7)-(8), which describe an EIT policy scenario when the investment co-funding is enforced. The firm's capital equilibrium without the investment support is (k^*, K_{pc}^*). Up to the equilibrium investment without support K_{pc}^*, the investment support has no effect on the marginal capital profitability. Capital K_{pc}^* does not benefit from the investment support (i.e. $K_{no} = K_{pc}^*$), and the capital demand is given by curve D_{pc} (this follows from equation (7)). For investment higher than K_{pc}^*, the investment support increases the capital profitability at the margin (by αiR^*) for the quantity of capital up to K_{max}, which represents the supported capital, $K_s = K_{pcs}^* - K_{pc}^* = K_{max}$ (this follows from equation (8)).[249] This implies a discontinuous firm's capital demand. Starting on the left-hand side in Figure 6, the capital demand is given by curve D_{pc}, D_{pcs}, D_{pc}. By assumption, when the investment co-funding is enforced, equations (7)-(8) always hold. This is because the investment co-funding makes only additional capital eligible for the support. In the presence of the risk premium component of the cost of capital, equations (7)-(8) will hold both with and without the investment co-funding enforced (see further).

Next, consider equations (9)-(10), which describe an EIT policy scenario when the investment co-funding is not enforced. Up to investment K_{pc1}, the investment support increases the profitability of capital at the margin (by αiR^*) up to the maximum quantity $K_{max} = (K_s = K_{pc1} = K_{max})$ and the capital demand is given by curve , D_{pcs1} (this follows from equation (9)). Beyond capital K_{pc1}, the investment support does not affect the firms' marginal profitability, implying that the capital demand is unchanged at D_{pc} (this follows from equation (10)). As above, this implies a discontinuous firm's capital demand. Starting on the left-hand side in Figure 6, the capital demand is given by curve D_{pcs1}, D_{pc}. Note that at the margin, the firm's capital profitability is not affected by the investment support, investment is at K_{pc}^*. Such situation may occur when the investment co-funding is not enforced and there are no policy-induced changes in the risk premium component of the cost of capital, as shown next.

3.1.3 Scenario 1: No enforcement of the private investment co-funding

In this section, we analyse the impact of the EIT investment support on the leverage of an additional investment without the enforcement of the private investment co-funding. From the four scenarios, the EIT policy scenarios S1A and S1B have a zero private investment co-

248 Similar can be shown for the imperfectly competitive demand, D_{ic}.

249 Note that in the case shown in Figure 6, the eligibility constraint $K_s \leq K_{max}$ is binding, $\lambda > 0$. This does not hold in general though. For a sufficiently high maximum eligibility threshold, firm may prefer to not exploit the investment support possibility in full.

funding rate in the first 15 and 10 years, respectively. Hence, they correspond to the situation analysed in this section.

Baseline BL: First, consider a baseline scenario without policy-induced changes in the risk premium component of the cost of capital, implying that the investment support does not affect the capital profitability at the margin. This scenario serves as baseline against which to compare other possible capital market outcomes triggered by policy. In Figure 5, the equilibrium investment without the investment support is K_{pc}^{*}. As above, the maximum eligibility threshold is K_{max}, where $K_{max} < K_{ic}^{*}$.[250] In this case, the equilibrium capital with and without the EIT investment support is K_{pc}^{*}, the entire support (area *FG*) benefits firm and the investment support does not create distortions on the capital market. In equilibrium, firm invests K_{pc1} and receives the investment support up to the maximum, $K_{pc1} = K_{max}$, and gains the full value of the support, area *H* (=area *FG*). However, firm can consider expanding investments by K_{max}. In this case, the equilibrium investment would shift to K_{pc}^{*} and firm's gains would equal to area *G*. Given that area *H* is larger than area *G*, due to a decreasing capital productivity, it does not pay-off to increase capital beyond K_{pc}^{*}, if $K_s < K_{pc}^{*}$.[251] This implies that without a policy-induced reduction of the risk premium component of the cost of capital, private investments are crowded out by subsidised investments; private investments would be undertaken also in absence of an investment support, suggesting no leverage of an additional investment.

Scenario S1: Next, consider a scenario with policy-induced changes in the risk premium component of the cost of capital, implying that the investment support affects the capital profitability at the margin. Because of the capital increase by K_{max} (to K_{ic}^{*}), firm gains from the investment support are equal to area *ABC*, which is more than firm gains (area *H*) obtained if the capital use is kept unchanged at K_{ic}^{*} (Figure 5). Hence, in a scenario with policy-induced changes in the risk premium component of the cost of capital, for firm it is optimal to increase investment by K_{max} whereas the equilibrium capital without the enforcement of the investment co-funding is at K_{ics}^{*}.[252]

250 Note that $K_{max} < K_{ic}^{*}$ also implies that $K_{max} < K_{pc}^{*}$.

251 The intuition behind this result is that without changes in the risk premium component of the cost of capital firms can exploit all profitable investment opportunities even without the investment support. Providing an investment support to firms (such that $K_s < K_{pc}^{*}$) does not alter investment opportunities available to firms. An optimal firm's behaviour is to use the same quantity of capital with and without the investment support.

252 Note that this does not hold in general, only for cases when the mark-up is sufficiently large, as shown in Figure 5.

3.1.4 Scenario 2: Enforcement of the private investment co-funding

In this section, we analyse the impact of the EIT investment support on the leverage of an additional investment under the enforcement of the private investment co-funding. EIT funding conditionalities imply that policy makers enforce private investors to increase their investment by the quantity of the supported investment relative to the equilibrium investment at the prevailing market price of capital. From the four analysed scenarios, the EIT policy scenarios S2A and S2B have the highest private investment co-funding rates and hence most closely corresponds to the scenario analysed in this section.

The equilibrium conditions of the rental price and capital use without the investment support are (k^*, K_{pc}^*) and (k^*, K_{ic}^*) without and with policy-induced changes in the risk premium component of the cost of capital, respectively. Under the enforcement of the private investment co-funding, capital K_{pc}^* and K_{ic}^* is not eligible for the investment support, only capital beyond these levels can be granted an investment support (Figure 5). With the enforcement of the private investment co-funding, the EIT investment support shifts the equilibrium investment from K_{ic}^* to K_{ics}^* with policy-induced changes in the risk premium component of the cost of capital, and from K_{pc}^* to K_{pcs}^* without policy-induced changes in the risk premium component of the cost of capital. In both cases, the quantity of capital increases by the eligibility threshold, K_{max}. Note that only part of capital, K_{max}, benefits from the EIT investment support. Although, the uptake of the EIT investment support is voluntary, firms have incentives to make use of the investment support, because the policy support reduces the user costs of the EIT-supported capital. Indeed, there are important differences on the private investment leverage with or without policy-induced changes in the risk premium component of the cost of capital, as shown next.

Baseline BL: First, consider a scenario without policy-induced changes in the risk premium component of the cost of capital, implying that the investment support does not affect the capital profitability at the margin. This scenario serves as baseline against which to compare other equilibrium investments triggered by alternative policy scenarios. In absence of a policy-induced reduction of the risk premium component of the cost of capital, the additional investment K_{max} generates productivity gains equal to area *GH*, which is less than the rental cost of capital (area *FGH*), implying a net welfare loss equal to area *F*. Area *F* is a deadweight loss resulting from a misallocation of capital recourses. Firm benefits part of the investment support, which is equal to area *G* (equal to productivity gain, area *GH*, plus the policy support, area *FG*, minus the rental costs of capital, area *FGH*). Hence, without policy-induced changes in the risk premium component of the cost of capital, an investment policy which supports the private investment may be welfare decreasing.

Scenario S2: Next, consider a scenario with policy-induced changes in the risk premium component of the cost of capital, implying that the investment support affects the capital profitability at the margin. In presence of policy-induced changes in the risk premium component of the cost of capital, the additional investment K_{max} generates productivity gains equal to area *ABCE* in Figure 5. Policy costs are equal to area *BC*, implying a net welfare gain equal to area *A* (equal to the productivity gain, area *ABCE*, minus the rental costs of capital, area *BCE*).[253] Firm gains are equal to area *ABC*, given by the net productivity gain (area *A*)

253 Note that this is not a general result. If the mark-up is not sufficiently large, then the net effect of the investment support could actually lead to a welfare loss.

and the gain from the support (area *BC*).[254] Hence, by reducing the risk premium component of the cost of capital, an investment support policy with the enforcement of the private investment co-funding may generate welfare gains.

3.2 Model-based scenario analysis

In this section, we empirically analyse four policy scenarios for a targeted EU level intervention on the basis of the Horizon Europe proposal for an EIT budget of 3 Billion EUR. The planning of future EIT expenditures, they will be aligned with the Strategic Planning process with regard to the European Partnerships and the Global Challenges and Industrial Competitiveness pillar of Horizon Europe, while respecting the specificities of the EIT and its funding framework. All four EIT scenarios focus on promoting and supporting sustainable innovation ecosystems across Europe, as envisaged in the Open Innovation pillar of the Horizon Europe proposal and in synergy with the Global Challenges and Industrial Competitiveness pillar of the Horizon Europe proposal.

In order to illustrate how the EIT investment support may affect the leverage of an additional investment, we simulate and discuss in detail results for two NUTS2 regions – Noord-Brabant (NL41) in the Netherlands and Helsinki-Uusimaa (FI1B1) in Finland.[255] These two regions are selected, because the economies of these two EU regions benefiting from the EIT-supported investment are fundamentally different. Second, also the EIT investment support is rather different in these two regions, both in terms of its magnitude and structure (KIC investment areas).

In 2016, the EIT-supported investments in Noord-Brabant in the Netherlands amounted to 2.87 percent of the total regional gross expenditure on R&D (GERD), which was 3012.39 million Euro in NL41.[256] The share of the EIT-supported investment was even higher, when considering the largest beneficiary sectors of the EIT support. For example, in the energy sector the share of the EIT-supported investment (EIT InnoEnergy) was as high as 34.91 percent in the gross sectoral expenditure on R&D in NL41. The EIT-supported investment share was considerably lower in ICT industries (EIT Digital), it amounted to 7.35 percent in the sectoral gross expenditure on R&D in NL41. These innovation data are used for the policy scenario construction (see step 3).

In order to undertake a model-based scenario analysis, first, regional accounts data from the Eurostat (Regional economic accounts - ESA 2010 (reg_eco10)) are used to parameterise and solve the model for the base year (2016). By correctly calibrating the model, we are able to exactly reproduce the base year economy as observed in the Eurostat data. At this step, no policy support is implemented in the model yet.

In a second step, the model is used to construct and simulate the baseline scenario until the year 2035. Simulating the baseline scenario is needed, as the baseline development of

254 In a general equilibrium model, tax distortions and other inter-sectoral and inter-regional spillovers are accounted for to obtain total welfare effects of the investment support.

255 Note that for a comprehensive and holistic capture of all regional and sectoral impacts of EIT-supported investments, all regional and sectoral economies (including those not receiving the EIT support) should be analysed in the model simultaneously; the presented analysis of few selected regions is for an illustrative purpose only.

256 Eurostat: Intramural R&D expenditure (GERD) by sectors of performance and NUTS 2 regions [rd_e_gerdreg]. http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=rd_e_gerdreg

economy without the policy support cannot be observed. The key baseline scenario assumptions are summarised in Tables 1 and 2 (row *Baseline BL*). There is no EIT supported investment implemented in the baseline scenario; baseline indicators, such as, an additional investment leverage will be used as benchmark against which to compare policy scenario outcomes.

In a third step, impacts of the four alternative EIT policy scenarios are encoded in form of model scenarios. The policy scenario construction requires four types of data to approximate the true private investment effect of the EIT investment support: (i) private co-funding rates for each EIT policy scenario; (ii) the average of the pre- and post-risk premium (before and after EIT-supported investments) under the four alternative EIT policy scenarios; (iii) the percentage increase in the capital stock induced by reduction in the risk premium; and (iv) the capital-output ratio.

Table 1: Scenario differences in Noord-Brabant: EIT-supported investment and the private investment co-funding rate, percent

	Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Code	Scenario	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
BL	Baseline	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S1A	Scenario 1A	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
S1B	Scenario 1B	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**20.00**	**40.00**	**60.00**	**80.00**	**90.00**
S2A	Scenario 2A	**0.00**	**0.00**	**0.00**	**0.00**	**20.00**	**20.00**	**20.00**	**30.00**	**30.00**	**30.00**	**30.00**	**50.00**	**60.00**	**70.00**	**80.00**
S2B	Scenario 2B	**0.00**	**50.00**	**50.00**	**50.00**	**50.00**	**50.00**	**50.00**	**50.00**	**50.00**	**50.00**	**50.00**	**50.00**	**50.00**	**50.00**	**50.00**

The private investment co-funding rates under each policy scenario are derived directly from the four alternative EIT funding scenarios and are summarised in Table 1. For the sake of comparability and to facilitate the link between the theoretical and empirical analysis, we denote the analysed scenarios in the same way in both theoretical and simulation sub-sections: *Scenario S1* and *Scenario S2*.[257] As Table 1 suggests, there are import differences both in co-funding rates between the four EIT policy scenarios as well as in the co-funding rate development over time (2021-2035). On average, throughout the entire 15 year period, the highest co-funding rate is in the EIT policy scenario S2B; the lowest in scenario S1A. By the end of the analysed period (2035), the highest private co-funding rate is envisaged in the EIT policy scenario S1B (90%), followed by S2A (80%).

The size of reduction in the risk premium that would come with EIT-supported investments is more difficult to pinpoint, as there are many con-funding factors and econometric estimates are not available for EIT investments yet. Using EIB-supported investments and their impact on the risk premium as an example,[258] together with base year EIT investment data for the Noord-Brabant region and the proposed EIT budget distribution under the four policy scenarios, we estimate that EIT-supported investments would imply a reduction in the risk premium of 32.97 – 43.88% (i.e. the real interest rate would drop by 1.56 – 2.08 percentage points) for EIT-supported investment projects in the Noord-Brabant region in the Netherlands.[259] The likely development of the risk premium in KIC-supported projects/sectors

257 Scenario S1 encompasses two EIT policy sub-scenarios (S1A and S1B); Scenario S2 encompasses two EIT policy sub-scenarios (S2A and S2B).

258 Di Comite, F., D. Kancs and P. Lecca (2016) 'Regional macroeconomic Impacts of EIB Investments in the EU', JRC Report, European Commission, DG Joint Research Centre.

259 Given the uncertainty associated with reduction in the risk premium that would come with EIT-supported investments, we undertake extensive sensitivity analysis with up to 10% lower and 10% higher reductions in the risk premium.

under the four EIT policy scenarios is summarised in Table 2. Among others, differences in the risk premium reduction across scenarios as reported in Table 2 are due to differences in the EIT investment support implementation.

Table 2: Scenario differences in Noord-Brabant: EIT-supported investment and the risk premium of KIC-supported projects/sectors, percentage points

	Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Code	Scenario	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
BL	Baseline	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
S1A	Scenario 1A	**3.68**	**3.68**	**3.68**	**3.67**	**3.63**	**3.61**	**3.57**	**3.54**	**3.51**	**3.52**	**3.48**	**3.48**	**3.47**	**3.46**	**3.44**
S1B	Scenario 1B	**3.66**	**3.66**	**3.66**	**3.61**	**3.59**	**3.55**	**3.55**	**3.56**	**3.51**	**3.48**	**3.38**	**3.27**	**3.08**	**3.02**	**2.92**
S2A	Scenario 2A	**3.65**	**3.65**	**3.65**	**3.65**	**3.60**	**3.59**	**3.55**	**3.53**	**3.45**	**3.38**	**3.28**	**3.18**	**3.05**	**3.00**	**2.93**
S2B	Scenario 2B	**3.65**	**3.65**	**3.65**	**3.58**	**3.54**	**3.47**	**3.45**	**3.40**	**3.39**	**3.35**	**3.34**	**3.29**	**3.24**	**3.20**	**3.18**

The other two types of the required information for the scenario construction – the percentage increase in the capital stock induced by reduction in the risk premium and the capital-output ratio – are computed within the model based on regional economic accounts data.

With the calibrated model and encoded policy scenarios at hand, in a fourth step we undertake a model-based scenario analysis to assess how different EIT funding scenarios (the key differences being stipulated in the four alternative policy scenarios) might affect the behaviour of private investors. We model an exogenous but highly persistent temporary reduction in the risk premium. To examine the model dynamics when the economy is affected by a reduction in the risk premium, EIT-supported investments enter the model through lowering the user cost of capital. Hence, a reduction in the risk premium of investment in KIC-supported projects/sectors triggered by EIT-supported investments would lower the rate of return required by investors to undertake new investment. Decrease in the interest rate implies higher desired capital stock level and thus has a positive impact on the private investment. In other words, as shown in section 3.1, lower the risk premium component of the cost of capital imply lower risk for investors, increasing the willingness of private investors (particularly of risk averse investors) to invest in the KIC-supported projects/sectors (Climate, Digital, Innovative Energy, Health, Raw Materials, Urban Mobility and Added Value Manufacturing). In terms of the EIT financial sustainability this implies that, in order to achieve the same climate, digitalisation, energy, heath etc. EIT objectives, lower amounts of the EIT-supported investment may be required in the medium-to long-run.[260]

260 Ceteris paribus and assuming that productivity gains from a public and private investment in the same EIT policy area would be equal.

The simulated private investment amounts that eventually would be attracted by the EIT-supported investment for each of the four EIT policy scenarios are reported in Table 3.

Table 3: Model-based simulation results: the private investment leverage in the Noord-Brabant region, million EUR

	Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Code	Scenario	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
BL	Baseline	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S1A	Scenario 1A	**174.62**	**176.17**	**178.80**	**179.20**	**180.79**	**182.38**	**183.17**	**183.96**	**184.76**	**186.43**	**191.37**	**198.78**	**206.98**	**213.54**	**216.83**
S1B	Scenario 1B	**194.04**	**195.59**	**198.21**	**198.61**	**200.20**	**201.79**	**202.58**	**203.38**	**204.17**	**212.54**	**230.87**	**258.35**	**286.64**	**309.94**	**321.59**
S2A	Scenario 2A	**202.61**	**207.97**	**211.55**	**213.54**	**221.49**	**229.44**	**233.41**	**237.38**	**241.36**	**243.03**	**254.33**	**271.27**	**292.19**	**308.30**	**316.36**
S2B	Scenario 2B	**254.91**	**258.85**	**271.01**	**271.41**	**273.00**	**274.59**	**275.38**	**276.18**	**276.97**	**278.65**	**283.58**	**290.99**	**299.19**	**305.76**	**309.04**

According to our simulation results, the EIT-supported investment in the Noord-Brabant (NL41) region would attract the highest amount of the private investment under scenario S2B in the short-run: around 271 million Euro in 2023-2024 (see row *S2B* Table 3). In the medium- to long-run, however, the EIT-supported investment in Noord-Brabant would attract comparably high annual amounts of the private investment under three scenarios S1B, S2A and S2B, each of them leveraging 216-221 million Euro in 2035, which suggests convergence in the leverage impact. These results are not surprising, as funding levels are similar and also co-funding rates converge across these three scenarios in the medium- to long-run (see Table 1 above). In contrast, scenario S1A performs considerably weaker in terms of leveraging an additional (private) investment (see row *S1A* Table 3). These simulation results are also consistent with the theoretical analysis presented in section 3.1, according to which – everything else equal – *Scenario S2* is more effective in terms of attracting the private investment than *Scenario S1*.

As regards cumulative leverage effects over the entire 2021-2035 year period, scenarios S2A and S2B seem to be more effective in attractive an additional (private) investment. In terms of the EIT financial sustainability, these cumulative results suggest that the EIT policy scenarios S2A and S2B are considerably more financially sustainable than the EIT policy scenarios S1A and S1B when a time horizon of two entire programming periods is considered.

Table 4 decomposes the simulation results reported in Table 3 into intensive and extensive margins of the private investment growth. More investors investing in the EIT KIC areas implies that the variety of investment ideas/projects and capital input use will be larger. Variety gains in turn can be quantified as welfare gains, as consumers (both households and firms) generally value the variety choice.[261] Hence, an increase in the number of investors (as opposite to an increasing investment size of existing investors) can serve as an additional source of welfare gains triggered by the EIT investment support.

Table 4: Model-based simulation results: the new investors share in the total private investment in the Noord-Brabant region, percent

	Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Code	Scenario	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
BL	Baseline	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S1A	Scenario 1A	**56.06**	**56.17**	**56.33**	**56.36**	**56.48**	**56.61**	**56.65**	**56.69**	**56.73**	**56.86**	**57.11**	**57.43**	**57.68**	**57.83**	**57.90**
S1B	Scenario 1B	**56.96**	**57.07**	**57.22**	**57.26**	**57.38**	**57.51**	**57.55**	**57.14**	**55.85**	**52.81**	**48.29**	**42.54**	**36.33**	**32.04**	**29.87**
S2A	Scenario 2A	**56.71**	**55.92**	**55.60**	**54.84**	**52.91**	**50.76**	**49.08**	**47.84**	**46.61**	**45.18**	**42.97**	**40.30**	**36.82**	**34.30**	**32.92**
S2B	Scenario 2B	**43.50**	**42.76**	**41.70**	**40.62**	**39.64**	**39.76**	**39.80**	**39.84**	**39.88**	**40.01**	**40.26**	**40.59**	**40.84**	**40.99**	**41.05**

261 Kancs D. and P. Persyn (2019) 'Welfare Gains from the Variety Growth', JRC Technical Report JRC114590, European Commission, DG Joint Research Centre.

According to the model-based simulation results reported in Table 4, the new investors' share in the private investment is the highest under the EIT policy scenario S1A, it increases slightly from around 56% in the short-run to almost 58% in the medium- to long-run. Hence, the EIT policy scenario S1A turns out to be the most attractive for new investors, because of less strict co-funding rules and because of the reduced risk premium. However, as noted above, the total private investment would be attracted considerably less under this EIT policy scenario (see Table 3). The new investors share in the private investment in the Noord-Brabant region is considerably lower under EIT policy scenarios S1B, S2A and S2B as, under these scenarios, incumbent firms have to invest more in KIC-supported project/sectors to become eligible to benefit from the EIT investment support, which is due to stricter private investment co-funding requirements. In other words, higher co-funding rate implies higher investment leverage per investor though also fewer investors.

In absolute terms (measured in million Euro), however, Table 4 does not imply that the new investors' investment under EIT policy scenarios S1B, S2A and S2B is lower than under the EIT policy scenario S1A. Note also that, according to the model-based simulations, in all four EIT-policy scenarios the new investors share in the private investment is larger than zero. This result is driven by both incumbent as well as new investor increase in investments due to the reduced risk premium (lower user cost of capital). Depending on the scenario-specific co-funding rate, existing investors adjust their investments to a larger or smaller extent, which provides one mechanisms affecting the new investors share in the private investment.

It has to be noted that these results are sensitive with respect to the EIT investment support implementation details. If, in contrast, the investment additionality condition will be imposed equally to all new and incumbent investors and only for an additional investment, then this will primarily benefit incumbent investors. In contrast, if the investment additionality condition will be imposed equally to all – new and incumbent investors – only for new/additional private investment, then this will benefit primarily incumbent investors.[262] To better understand the mechanics behind these channels of the private investment adjustment, the next section offers a model-based analysis.

Finally, when continuing simulations for the very long-run post-EIT-investment period until 2050 (not reported), we can observe that the reduction in the risk premium leads to higher investment, as the regional economy adjusts to higher aggregate capital intensity. Once the adjustment to higher capital intensity in the simulated Noord-Brabant region is completed, investment falls back to the previous level. Thus, a reduction in the risk premium only has a short- to medium-term effect on the private investment (after the EIT investment support has been phased out) with the adjustment period depending on adjustment rigidities. Nevertheless, the policy-induced structural effects, e.g. an increased productivity, human capital, energy efficiency, lower CO2 emissions, etc., remain in the Noord-Brabant region also in the long-run.

The second simulation example illustrates how EIT investments may affect the economy of the Helsinki-Uusimaa (FI1B1) NUTS2 region in Finland. In 2016, the EIT-supported investments in the Helsinki-Uusimaa region amounted to 0.40 percent of the total regional

262 Brandsma A., P. Ciaian and D. Kancs, 2013. "The Role of Additionality in the EU Cohesion Policies," JRC Working Papers JRC81893, Joint Research Centre.

gross expenditure on R&D (GERD), which was 2897.70 million Euro in FI1B1.[263] As for the above analysed Noord-Brabant (NL41) in the Netherlands, the share of the EIT-supported investment was considerably higher, when considering the largest beneficiary sectors of the EIT-support. In 2016, the two most intensively KIC-supported policy areas in the Helsinki-Uusimaa region were Digital and Raw Materials.

In order to undertake a model-based scenario analysis, we follow the steps outlined above for the Noord-Brabant region in the Netherlands. First, regional accounts data from the Eurostat (Regional economic accounts - ESA 2010 (reg_eco10)) are used to solve the model for the base year (2016). By correctly calibrating the model, we are able to exactly reproduce the base year economy as observed in the Eurostat data. At this step, no policy scenarios are implemented in the model yet.

In a second step, the model is used to construct and simulate the baseline scenario until the year 2035. Simulating the baseline scenario is needed, as the baseline development of economy without the policy support cannot be observed. The key baseline scenario assumptions are summarised in Tables 5 and 6 (row *Baseline BL*). There is no EIT supported investment implemented in the baseline scenario; baseline indicators, such as the private investment, will be used as benchmark against which to compare policy scenario outcomes.

Table 5: Scenario differences in Helsinki-Uusimaa: EIT-supported investment and the private investment co-funding rate, percent

	Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Code	Scenario	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
BL	Baseline	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S1A	Scenario 1A	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
S1B	Scenario 1B	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**20.00**	**40.00**	**60.00**	**80.00**	**90.00**
S2A	Scenario 2A	**0.00**	**0.00**	**0.00**	**0.00**	**20.00**	**20.00**	**20.00**	**30.00**	**30.00**	**30.00**	**30.00**	**50.00**	**60.00**	**70.00**	**80.00**
S2B	Scenario 2B	**0.00**	**50.00**	**50.00**	**50.00**	**50.00**	**50.00**	**50.00**	**50.00**	**50.00**	**50.00**	**50.00**	**50.00**	**50.00**	**50.00**	**50.00**

In a third step, impacts of the four alternative EIT policy scenarios are encoded in form of model scenarios. The private investment co-funding rates under each policy scenario are derived directly from the four alternative EIT funding scenarios and are summarised in Table 5. For the sake of comparability and to facilitate the link between the theoretical and empirical analysis, we denote the analysed scenario in the same way in both theoretical and simulation sub-sections: *Scenario S1* and *Scenario S2*.[264] As Table 5 suggests, there are both import differences in co-funding rates between the four EIT policy scenarios as well as in the co-funding rate development over time (2021-2035). On average, the highest co-funding rate is in the EIT policy scenario S2B; the lowest in scenario S1A. The size of reduction in the risk premium that would come with EIT-supported investments is more difficult to pinpoint, as there are many con-funding factors and econometric estimates are not available for EIT investments yet. Using EIB-supported investments and their impact on the risk premium as an example,[265] together with base year EIT investment data for the Noord-Brabant region and the proposed EIT budget distribution under the four policy scenarios, we estimate that EIT-supported investments would imply a reduction in the risk premium of 10.63 – 25.17% (i.e.

263 Eurostat: Intramural R&D expenditure (GERD) by sectors of performance and NUTS 2 regions [rd_e_gerdreg]. http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=rd_e_gerdreg

264 Scenario S1 encompasses two EIT policy sub-scenarios (S1A and S1B); Scenario S2 encompasses two EIT policy sub-scenarios (S2A and S2B).

265 Di Comite, F., D. Kancs and P. Lecca (2016) 'Regional Macroeconomic Impacts of EIB Investments in the EU', JRC Technical Report, European Commission, DG Joint Research Centre.

the real interest rate would drop by 0.50 – 1.07 percentage points) for EIT-supported investment projects in the Helsinki-Uusimaa region in Finland.[266] The likely development of the risk premium in KIC-supported projects/sectors under the four EIT policy scenarios are summarised in Table 6. Among others, differences in the risk premium reduction across scenarios as reported in Table 6 are due to differences in the EIT investment support implementation. The other two types of the required information for the scenario construction – the percentage increase in the capital stock induced by reduction in the risk premium and the capital-output ratio – are computed within the model, based on Regional economic accounts data. In a fourth step, we use the calibrated model and encoded policy scenarios to undertake a model-based scenario analysis to assess how different EIT funding models (the key differences being stipulated in the four alternative policy scenarios) might affect the behaviour of private investors. We model an exogenous but highly persistent temporary reduction in the risk premium. To examine the model dynamics when the economy is affected by a reduction in the risk premium, EIT-supported investments enter the model through lowering the user cost of capital. The obtained simulation results for Helsinki-Uusimaa are reported in Tables 7 and 8.

Table 6: Scenario differences in Helsinki-Uusimaa: EIT-supported investment and the risk premium of KIC-supported projects/sectors, percentage points

	Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Code	Scenario	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
BL	Baseline	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
S1A	Scenario 1A	**4.90**	**4.90**	**4.90**	**4.86**	**4.83**	**4.80**	**4.76**	**4.73**	**4.69**	**4.66**	**4.61**	**4.58**	**4.54**	**4.52**	**4.50**
S1B	Scenario 1B	**4.91**	**4.91**	**4.91**	**4.88**	**4.85**	**4.83**	**4.80**	**4.77**	**4.71**	**4.62**	**4.49**	**4.33**	**4.14**	**4.04**	**3.93**
S2A	Scenario 2A	**4.90**	**4.90**	**4.90**	**4.86**	**4.81**	**4.75**	**4.69**	**4.63**	**4.58**	**4.49**	**4.40**	**4.28**	**4.14**	**4.06**	**3.99**
S2B	Scenario 2B	**4.86**	**4.86**	**4.86**	**4.80**	**4.75**	**4.70**	**4.65**	**4.60**	**4.55**	**4.50**	**4.45**	**4.40**	**4.35**	**4.33**	**4.30**

The simulation results reported in Table 7 suggest that in the short-run, scenario S2B would leverage the highest amounts of an additional private investment in EIT-supported projects/sectors in the Helsinki-Uusimaa region in Finland: around 78 Million Euro in 2021, 79 Million Euro in 2022 and 82 Million Euro in 2023. In the medium- to long-run, however, the EIT-supported investment in Helsinki-Uusimaa would attract comparably high annual amounts of the private investment under three scenarios S1B, S2A and S2B, each of them leveraging 93-96 million Euro in 2035, which suggests convergence in the leverage impact. These results are not surprising, as funding levels are similar and also co-funding rates converge across these three scenarios in the medium- to long-run (see Table 5 above). In contrast, scenario S1A performs considerably weaker in terms of leveraging an additional (private) investment (see row *S1A* Table 7). These simulation results are also consistent with the theoretical analysis presented in section 3.1, according to which – everything else equal – *Scenario S2* is more effective in terms of attracting the private investment than *Scenario S1*.

As regards cumulative leverage effects over the entire 2021-2035 year period, scenarios S2A and S2B seem to be more effective in attractive an additional (private) investment. In terms of the EIT financial sustainability, these cumulative results suggest that the EIT policy scenarios S2A and S2B are considerably more financially sustainable than the EIT policy scenarios S1A S1B when the horizon of two entire programming periods is considered. Finally, these financial sustainability results comparing the four analysed scenarios are consistent with those presented above for the Noord-Brabant region.

266 Given the uncertainty associated with the reduction in the risk premium that would come with the EIT investment support, we undertake extensive sensitivity analysis with up to 10% lower and 10% higher reductions in the risk premium.

Table 7: Model-based simulation results: the private investment leverage in the Helsinki-Uusimaa region, million EUR

	Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Code	Scenario	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
BL	Baseline	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S1A	Scenario 1A	**53.08**	**53.70**	**54.75**	**54.91**	**55.54**	**56.18**	**56.50**	**56.82**	**57.13**	**57.78**	**59.70**	**62.59**	**65.79**	**68.35**	**69.64**
S1B	Scenario 1B	**60.55**	**61.17**	**62.22**	**62.38**	**63.01**	**63.65**	**63.97**	**64.28**	**64.60**	**66.53**	**71.03**	**77.78**	**84.85**	**90.63**	**93.53**
S2A	Scenario 2A	**64.27**	**65.65**	**66.89**	**67.37**	**69.28**	**71.19**	**72.14**	**73.09**	**74.05**	**74.69**	**77.89**	**82.68**	**88.43**	**92.90**	**95.13**
S2B	Scenario 2B	**78.04**	**79.13**	**82.09**	**82.25**	**82.89**	**83.52**	**83.84**	**84.16**	**84.48**	**85.12**	**87.04**	**89.93**	**93.13**	**95.70**	**96.98**

Although, qualitatively these results for the Helsinki-Uusimaa region are comparable to those for the Noord-Brabant region presented above, the order of magnitude is considerably lower though, which can be seen by comparing Tables 3 and 7. The lower impact on the private investment in the Helsinki-Uusimaa region as compared to the Noord-Brabant region is mainly due to considerably lower EIT-supported investments. These simulation results are also consistent with the theoretical analysis presented in section 3.1, according to which – everything else equal – *Scenario S2* is more effective in terms of attracting the private investment than *Scenario S1*.

Table 8 decomposes the simulation results reported in Table 7 into intensive and extensive margins of the private investment growth. The simulation results reported in Table 8 are comparable to those reported for the Noord-Brabant region in the Netherlands both in terms of the rank order and in terms of magnitude.

Table 8: Model-based simulation results: the new investors share in the total private investment in the Helsinki-Uusimaa region, percent

	Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Code	Scenario	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
BL	Baseline	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S1A	Scenario 1A	**56.07**	**56.19**	**56.34**	**56.38**	**56.51**	**56.64**	**56.68**	**56.72**	**56.76**	**56.89**	**57.15**	**57.48**	**57.73**	**57.88**	**57.94**
S1B	Scenario 1B	**57.00**	**57.11**	**57.27**	**57.30**	**57.43**	**57.56**	**57.61**	**57.20**	**55.91**	**52.85**	**48.30**	**42.52**	**36.31**	**32.02**	**29.85**
S2A	Scenario 2A	**56.76**	**55.96**	**55.64**	**54.88**	**52.93**	**50.76**	**49.08**	**47.85**	**46.61**	**45.19**	**42.99**	**40.34**	**36.86**	**34.35**	**32.98**
S2B	Scenario 2B	**43.52**	**42.78**	**41.72**	**40.64**	**39.66**	**39.79**	**39.83**	**39.87**	**39.91**	**40.04**	**40.30**	**40.63**	**40.88**	**41.03**	**41.09**

Again, it has to be noted that these results are sensitive with respect to the EIT investment support implementation details. If incumbent investors will first be required to increase their co-funding of already existing EIT support before they can benefit from a further EIT investment support, then this will primarily benefit and hence attract new (risk averse) investors. If, in contrast, the investment additionality condition will be imposed equally to all new and incumbent investors and only for an additional investment, then this will primarily benefit incumbent investors. To better understand the mechanics behind these channels of the private investment adjustment, the next section offers a model-based analysis.

4 Sensitivity analysis

In the simulation analysis that we have presented in section 3.2 above, we have assumed a continuation of the current distribution of budget between KIC activities, the EIT-driven activities and the EIT administrative budget, i.e. 97% of the budget would be allocated as grants to KICs and the rest divided between the EIT-driven activities and its administrative budget. Further, we did not assume that any changes would be made to the EIT staff provisions and duration of staff contracts. With respect to the three EIT policy options discussed in the EIT Impact Assessment, these EIT budget distribution assumptions roughly correspond to the EIT Option 1.

In order to explore how sensitive the simulated EIT leverage effects might be with respect to alternative EIT budget distributions, in this section we undertake an extensive sensitivity analysis, selected results of which are presented below. In the presented sensitivity analysis, we investigate the impact of the share of the total funding (3 billion over 2021-2027) that is allocated via KICs as an investment support versus directly via the EIT for improving the business and investment environment in regions. In particular, we reduce the KIC budget share (and increase the EIT budget share accordingly) by 15% in two steps. These two resulting sensitivity analysis scenarios are labelled as SA1 and SA2 (see Table 9), EIT budget distribution assumptions sensitivity analysis scenarios SA1 and SA2 roughly correspond to the EIT Option 2 and 3.

Table 9: The distribution of the EIT budget between KIC activities, EIT own activities and the EIT administrative budget, percent

		KICs budget share in percent (100 = 3 bilion 2021-2027)														
	Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Code	Option	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
BL	Baseline	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SA0	KIC±0	**13.37**	**12.93**	**14.13**	**14.23**	**14.13**	**14.50**	**14.37**	**14.37**	**14.37**	**14.37**	**14.37**	**14.37**	**14.37**	**14.37**	**14.37**
SA1	KIC-15	**11.40**	**11.17**	**12.23**	**12.33**	**12.20**	**12.47**	**12.00**	**12.00**	**12.00**	**12.00**	**12.00**	**12.00**	**12.00**	**12.00**	**12.00**
SA2	KIC-30	**9.67**	**9.37**	**10.23**	**10.27**	**10.23**	**10.37**	**9.93**	**9.93**	**9.93**	**9.93**	**9.93**	**9.93**	**9.93**	**9.93**	**9.93**
		Administrative budget share in percent (100 = 3 bilion 2021-2027)														
	Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Code	Option	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
BL	Baseline	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SA0	AB±0	**0.20**	**0.23**	**0.23**	**0.23**	**0.23**	**0.23**	**0.23**	**0.23**	**0.23**	**0.23**	**0.23**	**0.23**	**0.23**	**0.23**	**0.23**
SA1	AB±0	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**
SA2	AB±0	**0.27**	**0.40**	**0.40**	**0.43**	**0.47**	**0.50**	**0.53**	**0.53**	**0.53**	**0.53**	**0.53**	**0.53**	**0.53**	**0.53**	**0.53**
		EIT activities share in percent (100 = 3 bilion 2021-2027)														
	Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Code	Option	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
BL	Baseline	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SA0	EIT±0	**0.07**	**0.07**	**0.10**	**0.10**	**0.13**	**0.13**	**0.13**	**0.13**	**0.13**	**0.13**	**0.13**	**0.13**	**0.13**	**0.13**	**0.13**
SA1	EIT+15	**0.63**	**1.20**	**1.87**	**2.20**	**2.63**	**2.53**	**2.83**	**2.83**	**2.83**	**2.83**	**2.83**	**2.83**	**2.83**	**2.83**	**2.83**
SA2	EIT+30	**1.23**	**2.53**	**3.70**	**4.30**	**4.63**	**5.27**	**5.33**	**5.33**	**5.33**	**5.33**	**5.33**	**5.33**	**5.33**	**5.33**	**5.33**

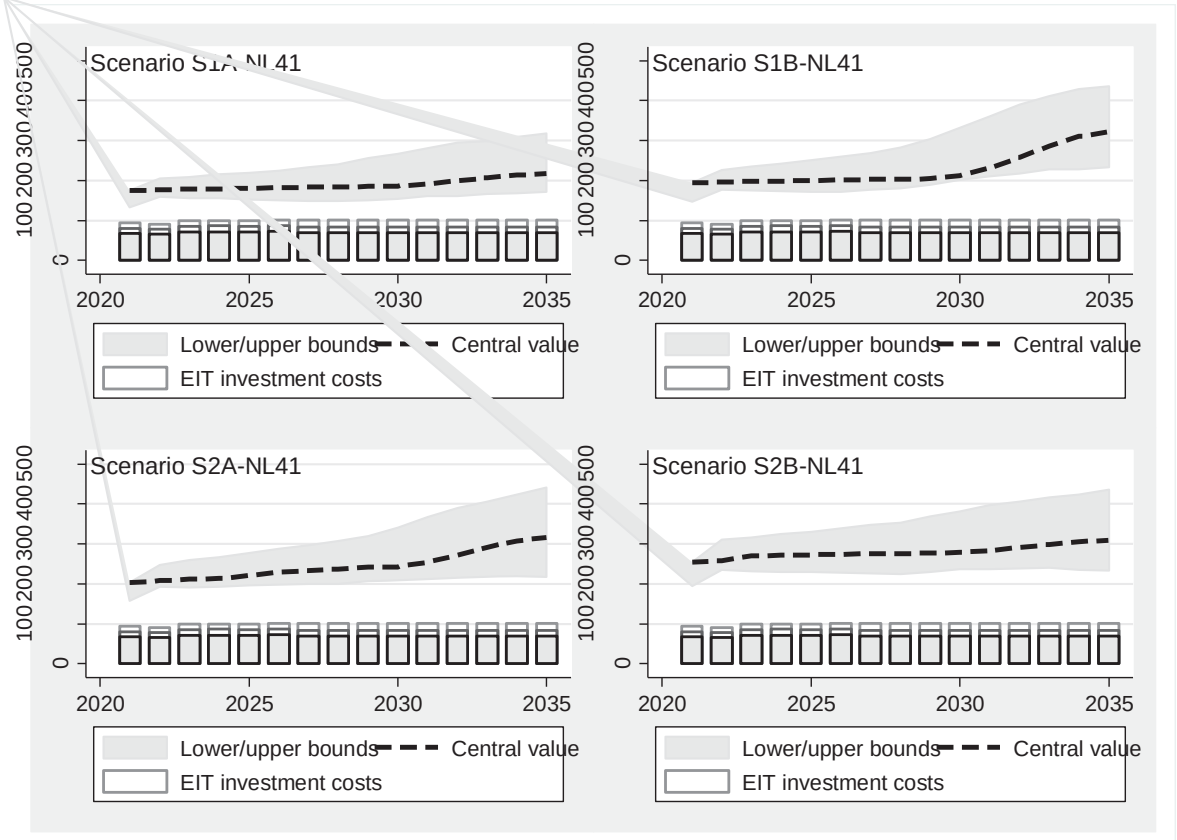
The sensitivity analysis results are presented in Figures 3 and 4. The two Figures plot sensitivity analysis results for the Noord-Brabant (NL41) NUTS2 region in the Netherlands and Helsinki-Uusimaa (FI1B1) NUTS2 region in Finland, respectively. The y axis measures Million Euros, whereas EIT investment costs (bars) and the additional private investment leverage (shaded area) are directly comparable. For convenience, they are plotted in the same units on the y axis.

The sensitivity analysis results for the Noord-Brabant region suggest that the main simulations results presented in Section 3 are still valid also under different EIT budget distributions. First, from these results we can learn that the larger is the EIT budget share allocated via KICs as an investment support of companies, the larger tend to be short- and

medium-term leverage effects compared to long-term effects. In contrast, the larger is the EIT budget share allocated via the EIT for improving the business and investment environment in regions, the larger tend to be medium- and long-term leverage effects compared to short-term effects.

Second, the sensitivity analysis results presented in Figure 3 suggest that there are differences in the magnitude of the private investment leverage effect, when the EIT budget allocation is changed from KICs as an investment support versus directly in favour of the EIT for improving the business and investment environment in regions, and these differences are different across the four analysed EIT policy scenarios (S1A, S1B, S2A and S2B). Importantly, the main message for policy remains the same also under based on sensitivity analysis results: S2A and S2B are considerably more financially sustainable than the EIT policy scenarios S1A and S1B, particularly in the long-run, which is well visible in the upper bounds of shaded areas in Figure 3.

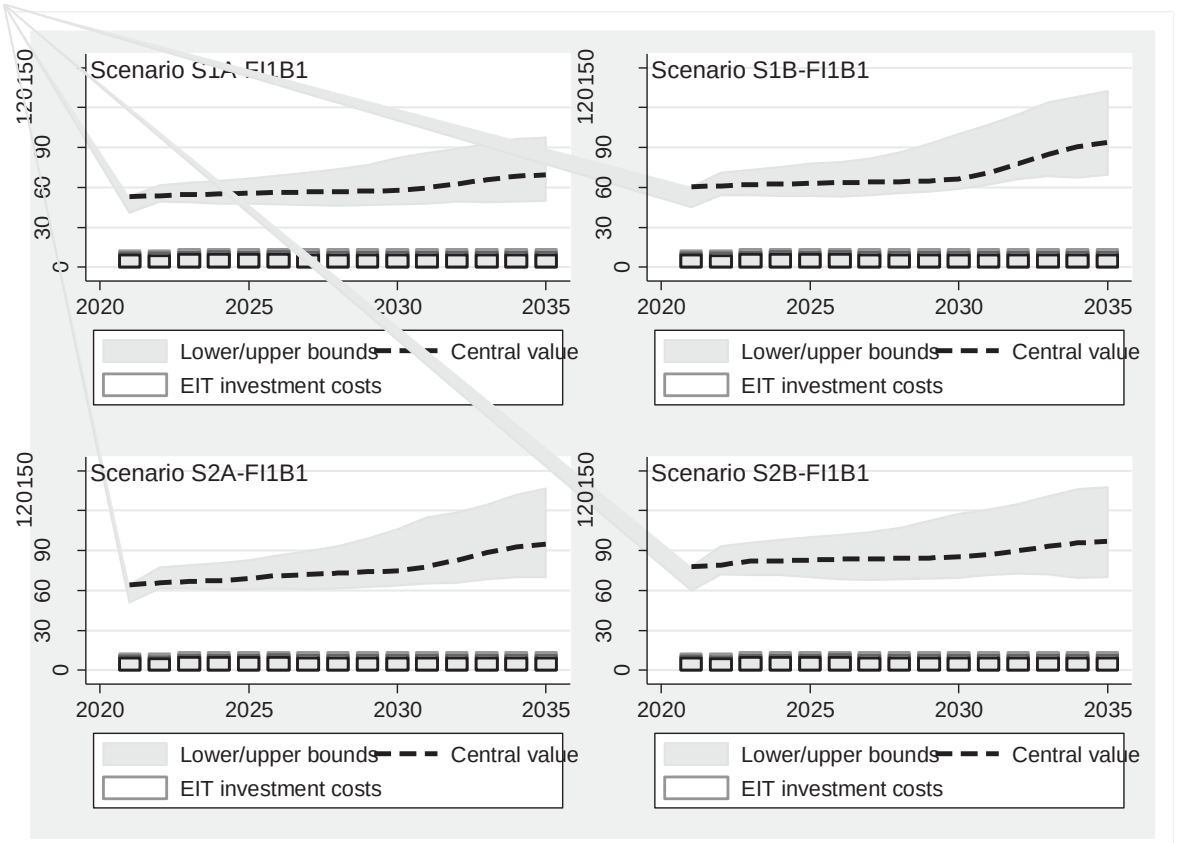
Figure 3. Sensitivity analysis results for the Noord-Brabant region in Million Euro [y axis]: EIT investment costs (bars) and an additional private investment leverage (shaded area)



The sensitivity analysis results for the Helsinki-Uusimaa (FI1B1) NUTS2 region in Finland are reported in Figure 4. Again, we can clearly see that the main simulations results presented in Section 3 are still valid also under different EIT budget distributions. for the Noord-Brabant region, the main message for policy remains the same also under based on sensitivity analysis results: S2A and S2B are considerably more financially sustainable than the EIT policy scenarios S1A and S1B, particularly in the long-run, which is well visible in the upper bounds of shaded areas in Figure 4.

Generally, results from the sensitivity analysis suggest that our simulation results presented in Section 3 are robust and stable with respect to the share of the total funding (3 billion over 2021-2027) that is allocated via KICs as an investment support versus directly via the EIT for improving the business and investment environment in regions. As expected, there are differences in the magnitude of the private investment leverage effect. Qualitatively, however, the above presented simulation results for the four analysed EIT policy scenarios do not change significantly under different EIT budget distributions.

Figure 4. Sensitivity analysis results for the Helsinki-Uusimaa region in Million Euro [y axis]: EIT investment costs (bars) and an additional private investment leverage (shaded area)



5 Conclusions

In this Annex, we investigate the impact of EIT investment-support measures on private investments. We develop and apply a stylised investment model to undertake a conceptual and simulation analysis by looking at the impact of the co-funding rate and policy-induced changes in the risk premium component of the cost of capital. Both in the theoretical model and simulation analysis we analyse two scenarios with two sub-scenarios: with and without the enforcement of the private co-funding of the investment support and with and without reduction in the risk premium component of the cost of capital. They help us to identify and understand potential implications between alternative EIT funding scenarios.

The results from the theoretical analysis suggest that both the co-funding rate and the risk premium component of the cost of capital matter importantly for the EIT-support on

leveraging an additional investment. The higher is the policy ability to reduce financial, technology or market uptake risks, the larger is the potential of the EIT investment support to leverage an additional investment in KIC-supported projects/sectors. Results for the co-funding rate are more nuanced, as higher co-funding rate per se implies higher investment leverage per investor but also fewer investors. A second important result is that the two policy intervention channels – the co-funding rate and the risk premium component of the cost of capital – interact mutually. This implies that, for example, a decrease in the number of investors due to higher co-funding rate could be offset by lowering the risk premium component of the cost of capital.

The results from the empirical simulation analysis confirm that those EIT policy options with the highest capacity to reduce the risk premium component of the cost of capital and impose the highest private investment co-funding rate are leveraging the highest amounts of an additional investment in KIC-supported projects/sectors. Among the four analysed scenarios, these are scenarios S2A and S2B with the highest cumulative leverage effects over the entire 2021-2035 year period. In contrast, scenario S1A performs considerably weaker in terms of leveraging an additional (private) investment. In terms of the EIT financial sustainability, these simulation results suggest that the EIT policy scenarios S2A and S2B are considerably more financially sustainable than the EIT policy scenarios S1A and S1B when a time horizon of two entire programming periods is considered.

Turning to limitations and caveats of our analysis, first, it has to be noted that whereas scenario S1A can clearly be considered the least effective both according to both the theoretical and empirical analysis (because a private investment cofounding is not enforced), based on our stylised investment model, it is not straightforward to distinguish between scenarios S2A and S2B, as long-run results for these two policy scenarios are fairly similar. Under different sets of assumptions related to the estimated reductions in the risk premium component of the cost of capital or in another EU region with a different structure of the regional economy, the results may be different, favouring scenario S2A in one case whereas S2B in another.

Second, it has to be recognised that the theoretical model developed and the simulation analysis undertaken are highly stylised, allowing to identify and decompose only key channels of the private investment adjustment. There are, however, many more economic, societal and environmental effects, which are not considered in the present analysis. Similarly, it has to be reminded that these two regions have served solely as examples to illustrate how EIT investments could affect the EU economy. In order to establish the full impact of EIT investments, a simulation analysis of the entire EU economy should be undertaken.

Further, our results hint at possible challenges in the EIT policy implementation and monitoring stage, particularly regarding the enforcement of the investment co-funding. The reason is that in most cases there are no counterfactual data available to policy makers to check the firm investment level with and without the investment support. Policy makers can only observe the capital use with the investment support. Firms, in contrast, do not have incentives to reveal their true counterfactual investment intentions. This may make the monitoring of the investment additionality costly and hard to realise in praxis.

Figure 5. EIT investment support and additionality with a policy-induced reduction in the risk premium component of the cost of capital

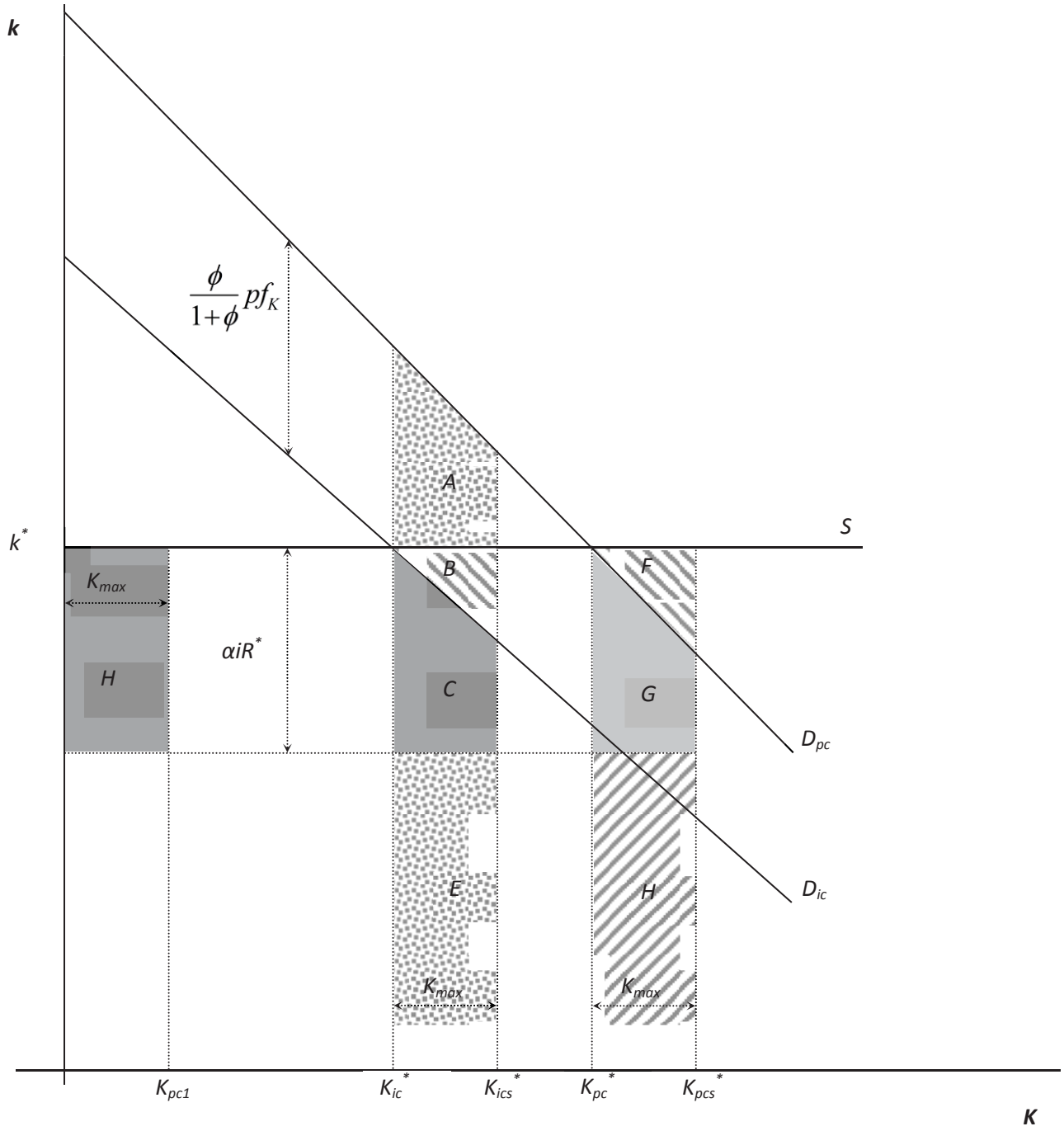
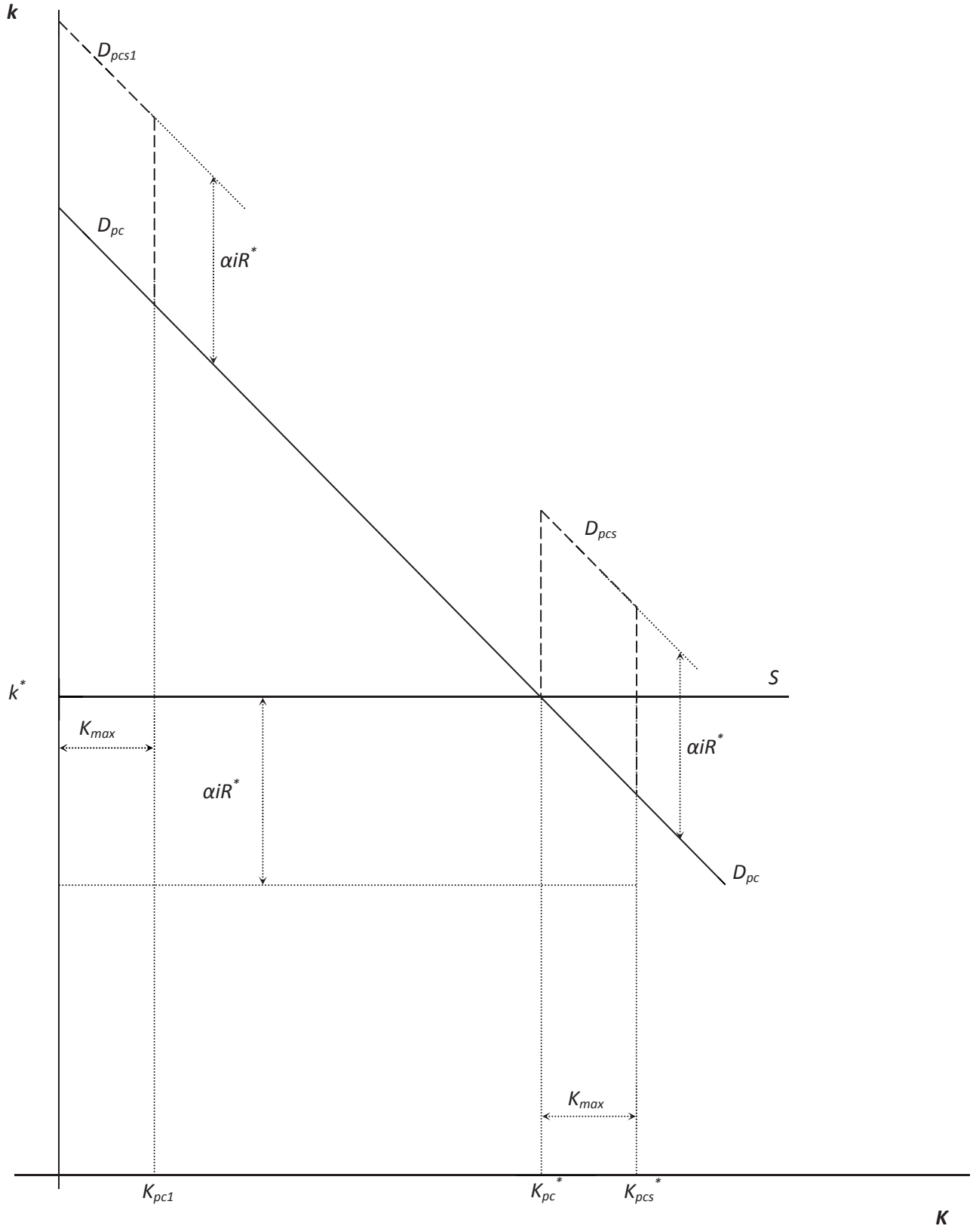


Figure 6. EIT investment support and additionality without a policy-induced reduction in the risk premium component of the cost of capital



10.13. Annex 11: Overview of KIC co-funding rates in 2014-2017

In line with EIT's objective of producing long lasting impact, the KICs are expected to gradually become financially sustainable in the long-term as stipulated in Art. 6 of the EIT Regulation.

According to the EIT Strategic Innovation Agenda 2014-2020, while KICs are not expected to become financially independent from the EIT during its first years of operation, they should gradually reduce its dependency from EIT funding and mobilise other resources, e.g. revenues from activities, IP rights, return on investments or venture capital.

The financial sustainability principle forms an integral part of the KIC's business model. The EIT has developed the principles of financial sustainability that provide the framework for the KICs to achieve the goal and that contain definitions related to financial sustainability, guidance for development of financial sustainability strategies and principles and measures to incentivise KICs sustainability (e.g. (max. EIT contribution over years).

The average KICs own contribution has increased from 9% to 19% of their overall annual budget between 2014 and 2017. Figure 1 provides the development of the KICs own co-funding rates broken down per individual KICs. Similarly Figure 2 provides the changes in EIT contribution to the KICs overall budget over 2014-2017. Figure 7 provides for comparison of co-funding rates over 2014-2017 (% of EIT vs. KICs contribution).

Figure 3 and Figure 4 provides the EIT contribution rates for individual KICs in 2014 and 2017 respectively.

Figure 5 and Figure 6 provides the KIC own contribution rates for individual KICs in 2014 and 2017 respectively.

Figure 1: Development of co-funding rate (% of KICs contribution) in different KICs over 2014-2017; EIT data

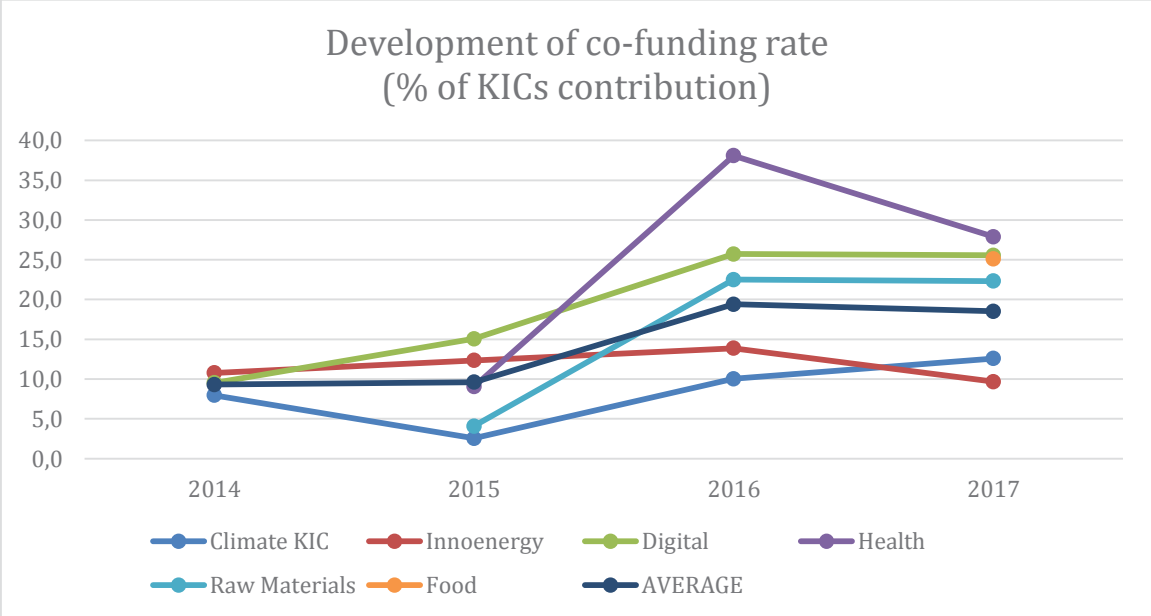


Figure 2: Development of co-funding rate (% of EIT contribution) in different KICs over 2014-2017; EIT data

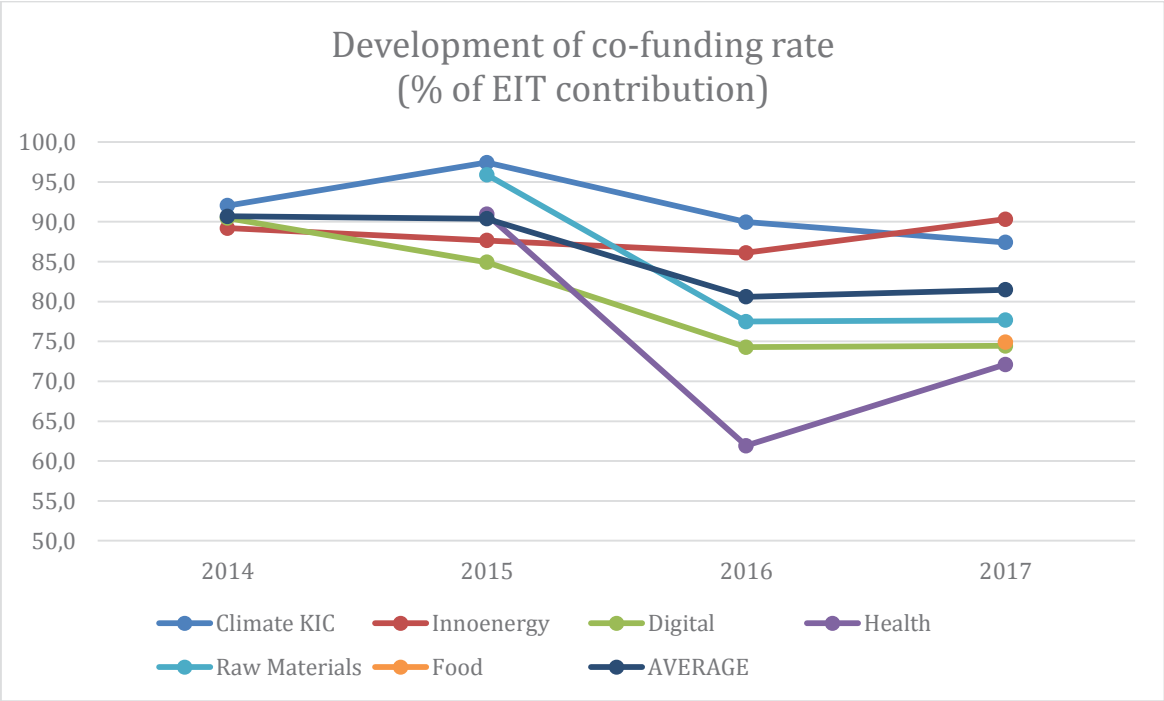


Figure 3: Co-funding rate (% of EIT contribution) in different KICs in 2014; EIT data

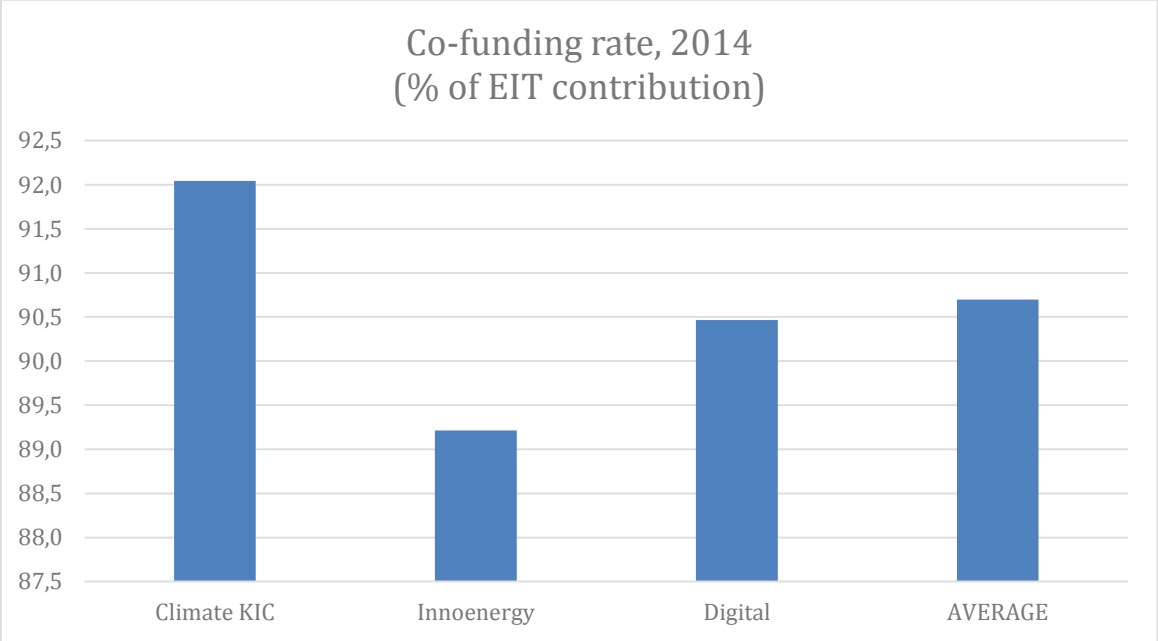


Figure 4: Co-funding rate (% of EIT contribution) in different KICs in 2017; EIT data

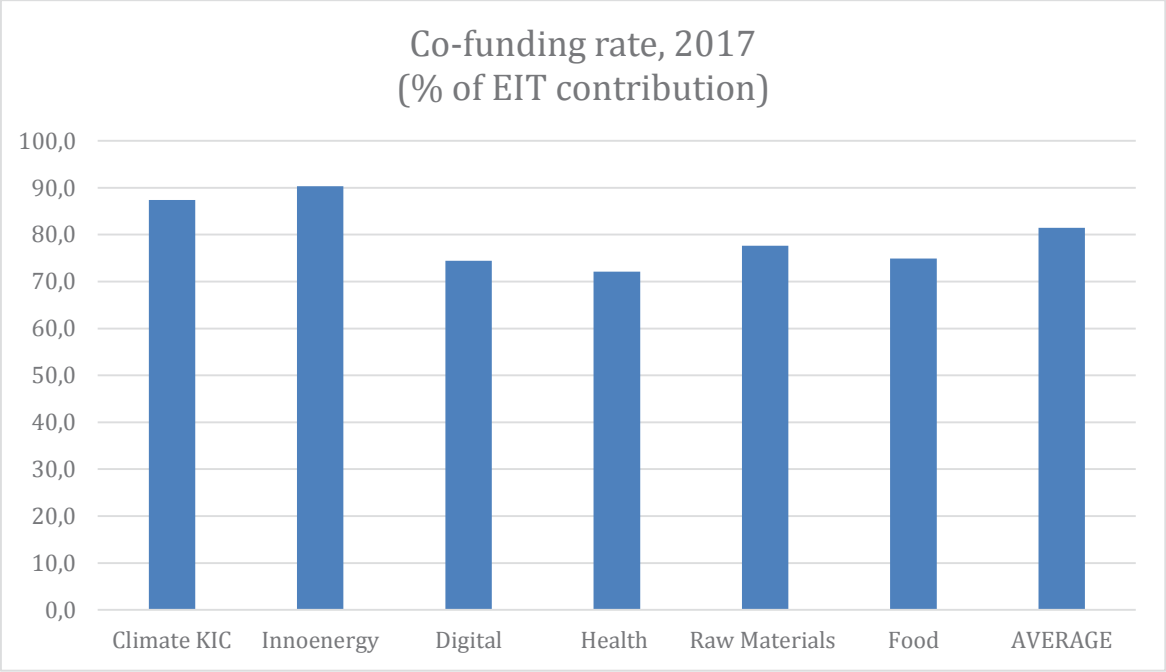


Figure 5: Co-funding rate (% of KICs contribution) in different KICs in 2014; EIT data

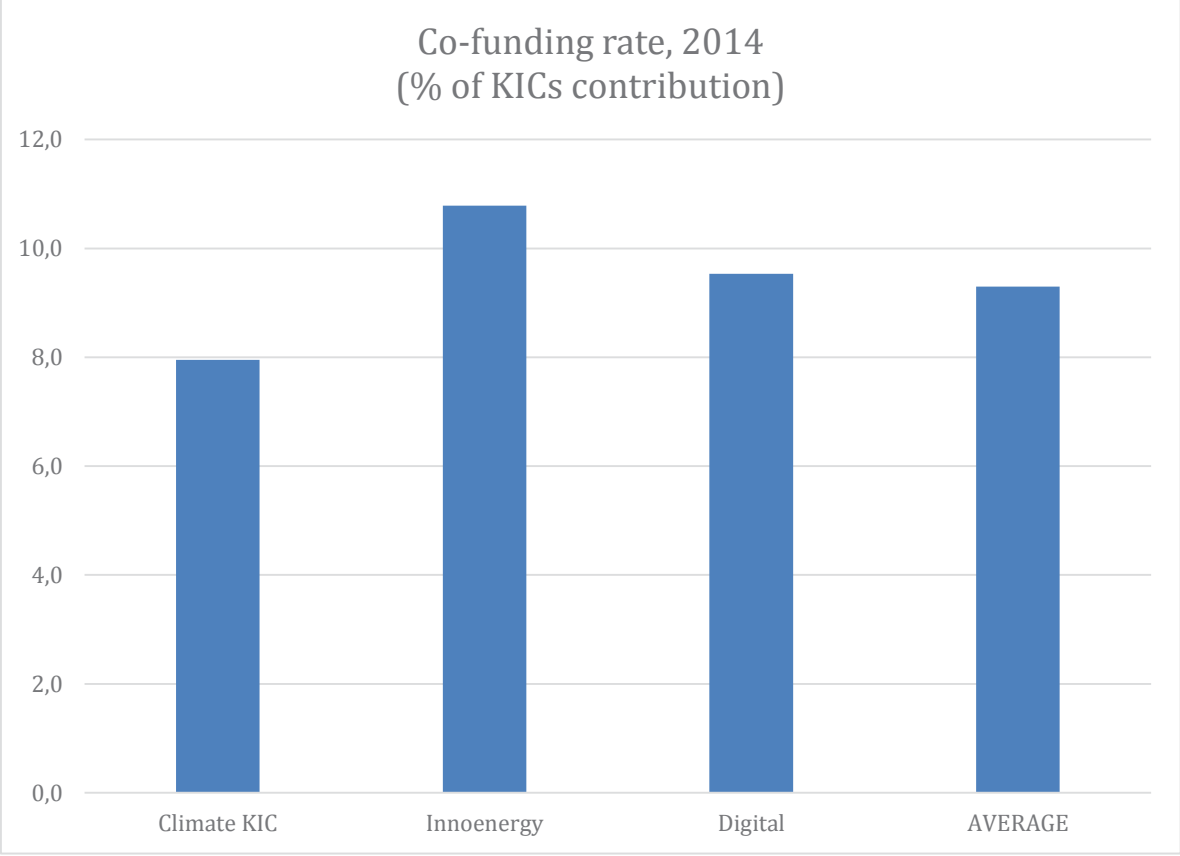


Figure 6: Co-funding rate (% of KICs contribution) in different KICs in 2017; EIT data

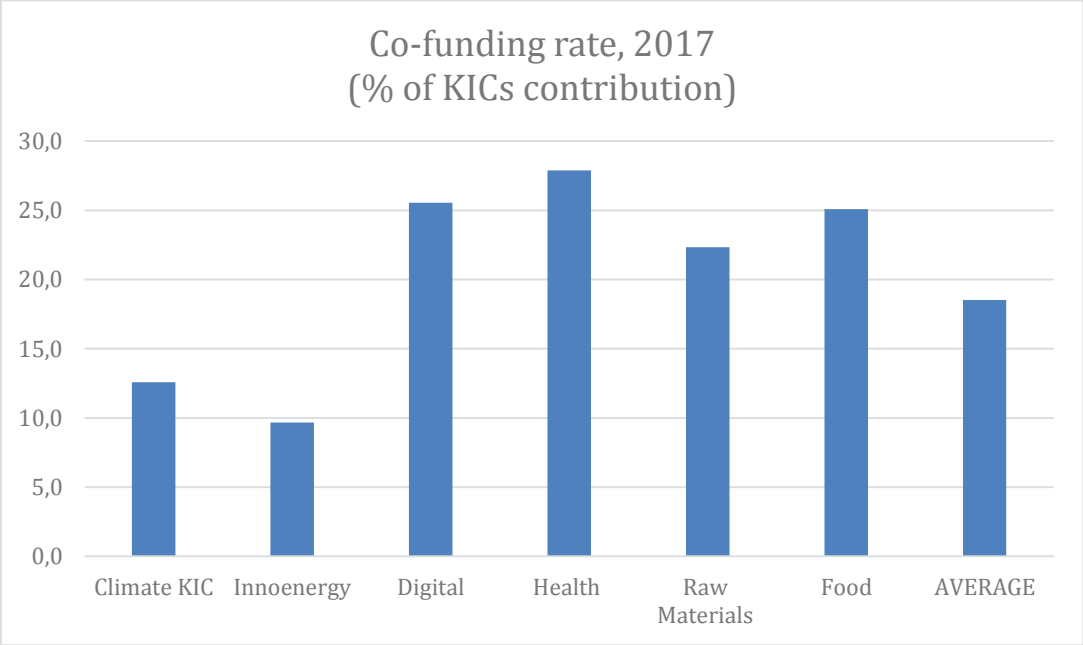
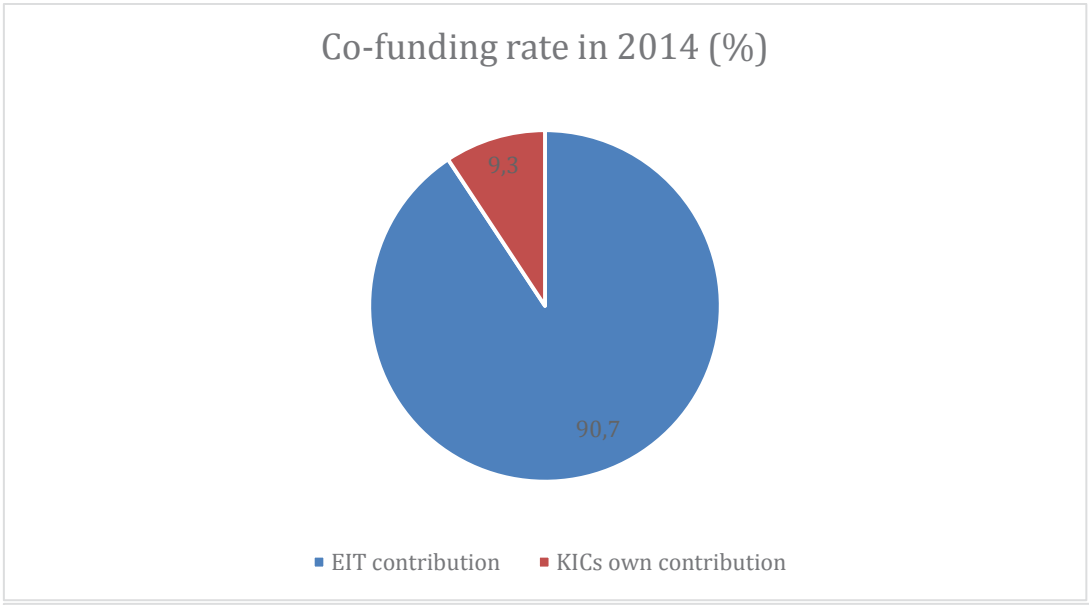
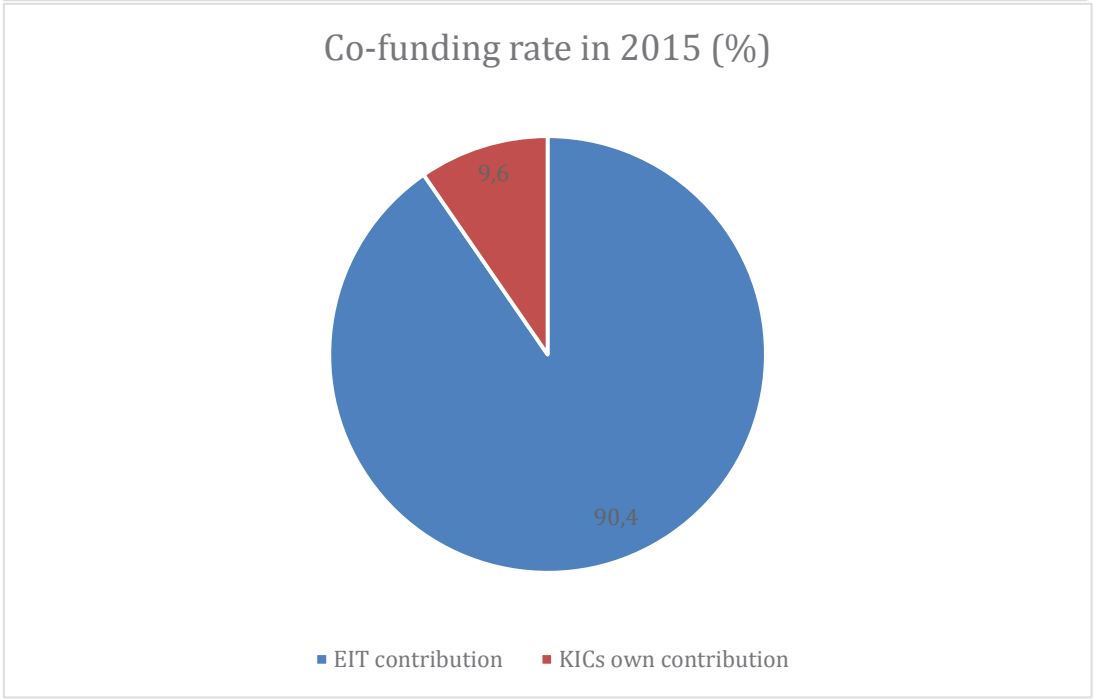
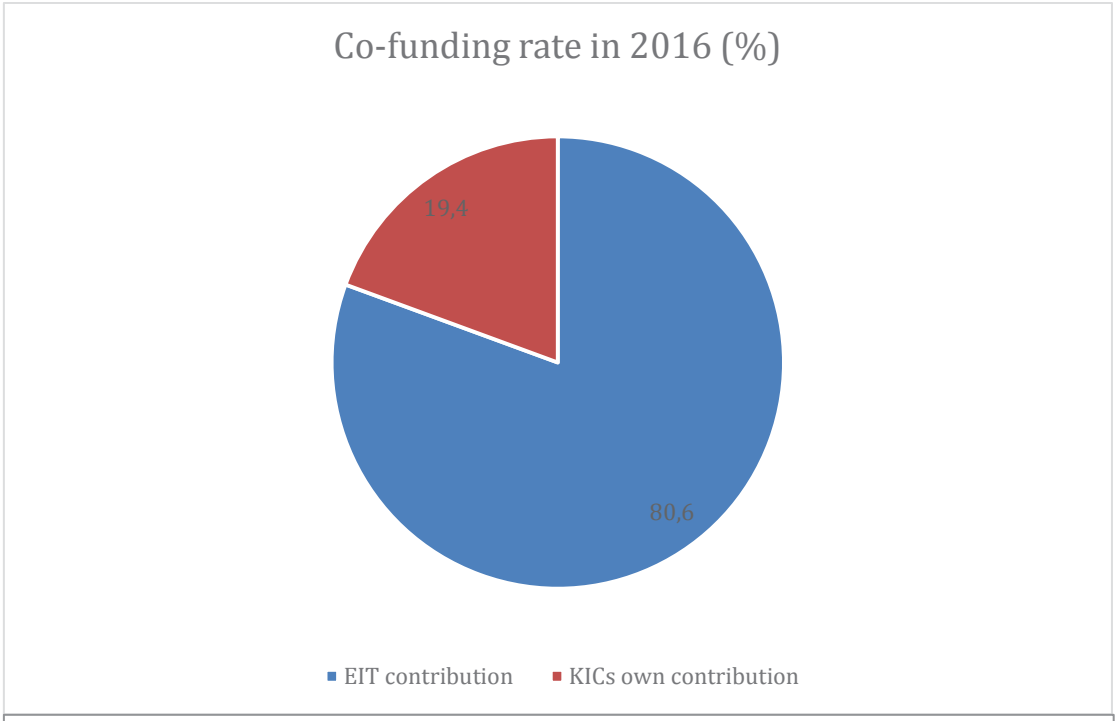
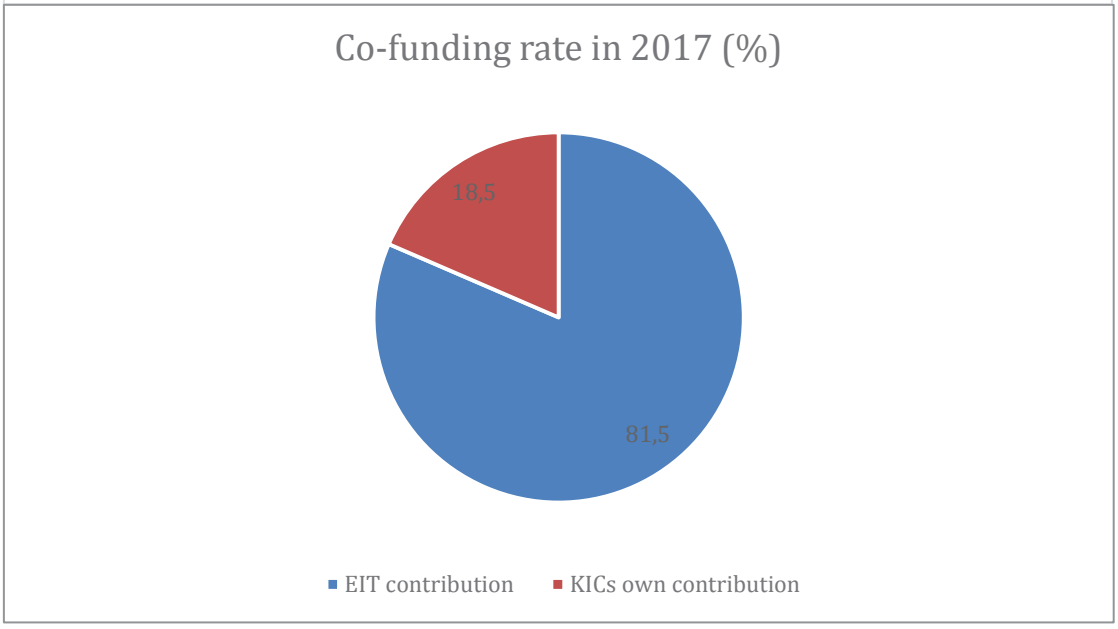


Figure 7: Comparison of co-funding rates over 2014-2017 (% of EIT vs. KICs contribution) ; EIT data






Co-funding rate in 2016 (%)
19,4
80,6
EIT contribution
KICs own contribution


Co-funding rate in 2017 (%)
18,5
81,5
EIT contribution
KICs own contribution