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INFORMATION NOTE

From: General Secretariat of the Council

To: Permanent Representatives Committee/Council

Subject: Proposal for a DECISION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on establishing the specific programme implementing Horizon Europe – the Framework Programme for Research and Innovation - Outcome of the European Parliament's proceedings (Strasbourg/Brussels, 10 to 13 December 2018)

I. INTRODUCTION

The rapporteur, Christian EHLER (EPP, DE), presented a report consisting of 275 amendments (amendments 1-275) to the proposal for a Decision on behalf of the Committee on Industry, Research and Energy.

In addition, the political groups tabled the following amendments: Greens/EFA tabled four amendments (amendments 295-298), GUE/NGL five amendments (amendments 278-279 and 292-294) and EFDD twelve amendments (amendments 280-291). Two amendments were tabled by more than 38 MEPs (amendments 276 and 277).

II. VOTE

When it voted on 12 December 2018, the Parliament adopted the following amendments: 1-277.

The amendments adopted are set out in the annex.

At the end of the vote, the proposal was referred back to the Committee, pursuant to Rule 59(4)(4) of the European Parliament's Rules of Procedure, thereby not bringing the Parliament's first reading to a close and opening the negotiations with the Council.

Programme implementing Horizon Europe***I

Amendments adopted by the European Parliament on 12 December 2018 on the proposal for a decision of the European Parliament and of the Council on establishing the specific programme implementing Horizon Europe - the Framework Programme for Research and Innovation (COM(2018)0436 – C8-0253/2018 – 2018/0225(COD))¹

(Ordinary legislative procedure: first reading)

Amendment 1

Proposal for a decision
Citation 5 a (new)

Text proposed by the Commission

Amendment

Having regard to the European Parliament's report on the assessment of Horizon 2020 implementation in view of its interim evaluation and the 9th Framework Programme proposal

Amendment 2

Proposal for a decision
Recital 3

Text proposed by the Commission

Amendment

(3) In order to ensure uniform conditions for the implementation of the Specific Programme, implementing powers should be conferred on the Commission to adopt work programmes for the implementation

(3) In order to ensure uniform conditions for the implementation of the Specific Programme, ***the Commission should be conferred delegated powers to adopt Strategic R&I Plans as well as***

¹ The matter was referred back for interinstitutional negotiations to the committee responsible, pursuant to Rule 59(4), fourth subparagraph (A8-0410/2018).

of the Specific Programme. Those powers should be exercised in accordance with Regulation (EU) No 182/2011 of the European Parliament and of the Council⁴.

implementing powers should be conferred on the Commission to adopt work programmes for the implementation of the Specific Programme. Those powers should be exercised in accordance with Regulation (EU) No 182/2011 of the European Parliament and of the Council⁴.

⁴ Regulation (EU) No 182/2011 of the European Parliament and of the Council of 16 February 2011 laying down the rules and general principles concerning mechanisms for control by the Member States of the Commission's exercise of implementing powers (OJ L 55, 28.2.2011, p. 13)

⁴ Regulation (EU) No 182/2011 of the European Parliament and of the Council of 16 February 2011 laying down the rules and general principles concerning mechanisms for control by the Member States of the Commission's exercise of implementing powers (OJ L 55, 28.2.2011, p. 13)

Amendment 3

Proposal for a decision Recital 5

Text proposed by the Commission

(5) Reflecting the importance of tackling climate change in line with the Union's commitments to implement the Paris Agreement and the United Nations Sustainable Development Goals, this Specific Programme will contribute to mainstream climate actions and to the achievement of an overall target of 25 % of the EU budget expenditures supporting climate objectives. Actions under this Specific Programme are expected to contribute 35% of the overall financial envelope of the Specific Programme to climate objectives. Relevant actions will be identified during the Specific Programme's preparation and implementation, and reassessed in the context of the relevant evaluations and review processes.

Amendment

(5) Reflecting the importance of tackling climate change in line with the Union's commitments to implement the Paris Agreement and the United Nations Sustainable Development Goals, this Specific Programme will contribute to mainstream climate actions and to the achievement of an overall target of 25 % of the EU budget expenditures supporting climate objectives. Actions under this Specific Programme are expected to contribute **at least** 35% of the overall financial envelope of the Specific Programme to **EU** climate objectives **and commitments, where appropriate**. Relevant actions will be identified during the Specific Programme's preparation and implementation, **monitored, reported,** and reassessed in the context of the relevant evaluations and review processes.

Amendment 4

Proposal for a decision

Recital 6

Text proposed by the Commission

(6) The Specific Programme's actions should be used to address market failures or sub-optimal investment situations, ***in a proportionate manner, without duplicating or*** crowding out private financing ***and have a clear European added value.***

Amendment

(6) The Specific Programme's actions should be used to ***reinforce, widen and extend the excellence of the Union's scientific and technological base, tackle major global challenges, increase the Union's industrial leadership, improve quality of life in the Union as well as boost investment,*** address market failures or sub-optimal investment situations, ***leveraging additional funding rather than*** crowding out private financing.

Amendment 5

Proposal for a decision

Recital 6 a (new)

Text proposed by the Commission

Amendment

(6 a) Gender equality is an EU policy priority and a key societal challenge (UN SDG5). Furthermore, the goal of gender equality in society is a crucial driver for the social and industrial transformations required by other SDGs. Gender aspects thus should be appropriately integrated throughout the Programme and specific gender research should be also required to support the implementation and design of better EU gender equality policies.

Amendment 6

Proposal for a decision Recital 6 b (new)

Text proposed by the Commission

Amendment

(6b) The Specific Programme should be implemented in a transparent, participatory and strategic way seeking involvement of stakeholders and civil society. Stakeholder representation and civil society involvement should be balanced, representing various backgrounds.

Amendment 7

Proposal for a decision Recital 7

Text proposed by the Commission

Amendment

(7) Reflecting the important contribution that research and innovation should make to address challenges in food, agriculture, rural development and the bioeconomy, and to seize the corresponding research and innovation opportunities in close synergy with Common Agricultural Policy, relevant actions under the Specific Programme will be supported ***with EUR 10 billion for the*** cluster 'Food ***and*** Natural Resources' for the period 2021-2027.

(7) Reflecting the important contribution that research and innovation should make to address challenges in food, agriculture, rural development and the bioeconomy, ***to make them more sustainable*** and to seize the corresponding research and innovation opportunities in close synergy with Common Agricultural Policy, relevant actions under the Specific Programme will be supported ***in a dedicated*** cluster 'Food, Natural Resources ***and Agriculture***' for the period 2021-2027.

Amendment 8

Proposal for a decision Recital 7 a (new)

Text proposed by the Commission

Amendment

(7 a) The European cultural and creative sectors build bridges between arts, culture, business and technology. Cultural heritage is an integral part of European cohesion and supports the link between tradition and innovation. Preserving cultural heritage and developing creative solutions, in particular in the field of digitalisation, will be a priority of Programme.

Amendment 9

Proposal for a decision Recital 8

Text proposed by the Commission

Amendment

(8) The completion of the Digital Single Market and the growing opportunities from the convergence of digital and physical technologies requires a stepping up of investments. Horizon Europe will contribute to these efforts with a ***substantial increase of spending in main digital research and innovation activities compared to the Research and Innovation Framework Programme Horizon 2020⁶***. ***This should*** ensure that Europe remains at the forefront of global research and innovation in the digital field.

(8) The completion of the Digital Single Market and the growing opportunities from the convergence of digital and physical technologies requires a stepping up of investments. Horizon Europe will contribute to these efforts with a ***dedicated cluster to*** ensure that Europe remains at the forefront of global research and innovation in the digital field.

⁶ ***The Communication from the Commission "A new, modern Multiannual Financial Framework for a***

European Union that deliver efficiently on its priorities post-2020" identifies EUR 13 billion spent in main digital activities under the Research and Innovation Framework Programme Horizon 2020 (<https://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX%3A52018DC0098>).

Amendment 10

Proposal for a decision Recital 8 a (new)

Text proposed by the Commission

Amendment

(8a) Reflecting the importance to communicate better and to a wider audience the added value and the impact of EU actions, the Commission should increase its efforts towards the visibility of Horizon Europe. Similarly, beneficiaries should ensure to give visibility to their achievements from EU funding.

Amendment 11

Proposal for a decision Recital 9

Text proposed by the Commission

Amendment

(9) The types of financing and the methods of implementation under this Decision shall be chosen on the basis of their ability to achieve the specific objectives of the actions and to deliver results, taking into account, in particular, the costs of controls, the administrative burden, and the expected risk of non-

deleted

compliance. For grants, this shall include consideration of the use of lump sums, flat rates and scales of unit costs.

Amendment 12

Proposal for a decision Article 2

Text proposed by the Commission

Article 2

Operational objectives

1. The Specific Programme shall contribute to the general and specific objectives set out in Article 3 of Regulation ... FP/RfP Regulation
2. The Specific Programme has the following operational objectives:
 - (a) reinforcing and spreading excellence;
 - (b) increasing collaboration across sectors and disciplines;
 - (c) connecting *and* developing research infrastructures across the European research area;
 - (d) strengthening international cooperation;
 - (e) attracting, training and retaining researchers and innovators *in the European Research Area*, including through mobility of researchers;
 - (f) fostering open science and *ensuring visibility to the public* and open access to results;
 - (g) actively disseminating and exploiting

Amendment

Article 2

Operational objectives

1. The Specific Programme shall contribute to the general and specific objectives set out in Article 3 of Regulation ... FP/RfP Regulation
2. The Specific Programme has the following operational objectives:
 - (a) *strengthening and widening Europe's scientific and technological base*, reinforcing and spreading excellence;
 - (b) increasing collaboration across sectors and disciplines;
 - (c) connecting, developing *and facilitating wide access, including virtually, to* research infrastructures across the European Research Area;
 - (d) strengthening international cooperation *in S&T to support the Union's excellence*;
 - (e) attracting, training and retaining *EU and international* researchers and innovators, including through mobility of researchers, *with the aim of establishing the European Research Area as the world's most excellent and competitive*;
 - (f) fostering open science and open access to results;
 - (g) actively disseminating and exploiting

results, in particular for policy development;

- (h) supporting the implementation of Union policy priorities;
- (i) reinforcing the link between research **and** innovation and other policies, including Sustainable Development Goals;
- (j) delivering, through R&I missions, on ambitious goals within a set timeframe;
- (k) involving citizens **and end-users in** co-design and co-creation processes;
- (l) improving science communication.
- (m) **accelerating** industrial transformation;
- (n) improving skills **for** innovation;
- (o) stimulating the creation and scale-up of innovative companies, in particular SMEs;
- (p) improving access to risk finance, in particular where the market does not provide viable financing.

3. Within the objectives referred to in paragraph 2, account may be taken of new and unforeseen needs that arise during the period of implementation of the Specific Programme. That may, if duly justified, include responses to emerging opportunities, crises and threats, as well as responses to needs relating to the development of new Union policies.

results, in particular for policy development;

- (h) supporting the implementation of Union policy **goals and** priorities;
- (i) reinforcing the link between research, innovation, **education**, and other policies, including **the** Sustainable Development Goals **and Paris Agreement**;
- (j) delivering, through R&I missions, on ambitious goals within a set timeframe;
- (k) involving **relevant R&I stakeholders, including** citizens, **academia, research organisations and industry, in the** co-design and co-creation processes;
- (l) improving science communication;
- (m) **driving the EU's** industrial transformation **to unlock the potential of Europe's strategic sectors, such as Key Enabling Technologies**;
- (n) improving skills **through training and fostering creativity for research and** innovation;
- (o) stimulating the creation and scale-up of innovative companies, in particular **start-ups and** SMEs;
- (p) improving access to risk finance, **including through synergies with InvestEU**, in particular where the market does not provide viable financing;

(p a) strengthening gender mainstreaming and the integration of the gender dimension in research and innovation;

(p b) maximising scientific, technological, societal and economic impact.

3. Within the objectives referred to in paragraph 2, account may be taken of new and unforeseen needs that arise during the period of implementation of the Specific Programme. That may, if duly justified, include responses to emerging opportunities, crises and threats, as well as responses to needs relating to the development of new Union policies.

Amendment 13

Proposal for a decision Article 3

Text proposed by the Commission

Article 3 Structure

1. In accordance with Article 4(1) of Regulation ... FP/RfP Regulation, the Specific Programme shall consist of the following parts:
- (1) Pillar I 'Open Science' with the following components:
- (a) the European Research Council (ERC), as described in Annex I, Pillar I, section 1;
- (b) Marie Skłodowska-Curie actions (MSCA), as described in Annex I, Pillar I, section 2;
- (c) research infrastructures, as described in Annex I, Pillar I, section 3;
- (2) Pillar II 'Global Challenges and Industrial Competitiveness' **with the following components:**
- (a) cluster 'Health', as described in Annex I, Pillar II, section 1;
- (b) cluster 'Inclusive and **Secure** Society', as described in Annex I, Pillar II, section 2;
- (c) cluster 'Digital **and** Industry', as described in Annex I, Pillar II, section 3;
- (d) cluster 'Climate, Energy and Mobility', as described in Annex I, Pillar II,

Amendment

Article 3 Structure

1. In accordance with Article 4(1) of Regulation ... FP/RfP Regulation, the Specific Programme shall consist of the following parts:
- (1) Pillar I '**Excellent and** Open Science' with the following components:
- (a) the European Research Council (ERC), as described in Annex I, Pillar I, section 1;
- (b) Marie Skłodowska-Curie actions (MSCA), as described in Annex I, Pillar I, section 2;
- (c) research infrastructures, as described in Annex I, Pillar I, section 3;
- (2) Pillar II 'Global Challenges and **European** Industrial Competitiveness'; **including a monobeneficiary, grant-based SME instrument as described in Article 43a of the Regulation and Annex I of the Specific Programme:**
- (a) cluster 'Health', as described in Annex I, Pillar II, section 1;
- (b) cluster 'Inclusive and **Creative** Society', as described in Annex I, Pillar II, section 2;
- (b a) cluster 'Secure Society'**
- (c) cluster 'Digital, Industry **and Space**', as described in Annex I, Pillar II, section 3;
- (d) cluster 'Climate, Energy and Mobility', as described in Annex I, Pillar II,

section 4;

(e) cluster Food *and* Natural Resources', as described in Annex I, Pillar II, section 5;

(f) non-nuclear direct actions of the Joint Research Centre (JRC), as described in Annex I, Pillar II, section 6;

(3) Pillar III '*Open Innovation*' with the following components:

(a) the European Innovation Council (EIC), as described in Annex I, Pillar III, section 1;

(b) *European innovation ecosystems, as described in Annex I, Pillar III, section 2;*

(c) the European Institute of Innovation and Technology (EIT), as described in Annex I, Pillar III, section 3.

(4) Part 'Strengthening the European Research Area' with the following components:

(a) *sharing* excellence, as described in Annex I, Part 'Strengthening the European Research Area', section 1;

(b) reforming and enhancing the European R&I system, as described in Annex I, Part 'Strengthening the European Research Area', section 2.

2. The activities to be carried out under the parts referred to in paragraph 1 are set out in Annex I.

section 4;

(e) cluster Food, Natural Resources *and Agriculture*, as described in Annex I, Pillar II, section 5;

(f) non-nuclear direct actions of the Joint Research Centre (JRC), as described in Annex I, Pillar II, section 6;

(3) Pillar III '*Innovative Europe*' with the following components:

(a) the European Innovation Council (EIC), as described in Annex I, Pillar III, section 1; *including European innovation ecosystems, as described in Annex I, Pillar III, section 2;*

deleted

(b) the European Institute of Innovation and Technology (EIT), as described in Annex I, Pillar III, section 3;

(4) Part 'Strengthening the European Research Area' with the following components:

(a) *spreading* excellence *and widening participation*, as described in Annex I, Part 'Strengthening the European Research Area', section 1;

(b) reforming and enhancing the European R&I system, as described in Annex I, Part 'Strengthening the European Research Area', section 2.

2. The activities to be carried out under the parts referred to in paragraph 1 are set out in Annex I.

Amendment 14

Proposal for a decision

Article 4

Text proposed by the Commission

Article 4

Budget

1. In accordance with Article 9(1) of Regulation ... FP/RfP Regulation, the financial envelope for the implementation of the Specific Programme for the period 2021 to 2027 shall be **EUR 94 100 000 000 in current** prices.

2. The amount referred to in paragraph 1 of this Article shall be distributed among the components set out in Article 3(1) of this Decision in accordance with Article 9(2) of Regulation ... FP/RfP Regulation. The arrangements of Article 9(3) to (8) of Regulation ... FP/RfP Regulation shall apply.

Amendment

Article 4

Budget

1. In accordance with Article 9(1) of Regulation ... FP/RfP Regulation, the financial envelope for the implementation of the Specific Programme for the period 2021 to 2027 shall be **120 000 000 000 in 2018** prices.

2. The amount referred to in paragraph 1 of this Article shall be distributed among the components set out in Article 3(1) of this Decision in accordance with Article 9(2) of Regulation ... FP/RfP Regulation. The arrangements of Article 9(3) to (8) of Regulation ... FP/RfP Regulation shall apply.

Amendment 15

Proposal for a decision
Article 5

Text proposed by the Commission

Article 5

Missions

1. For each mission, a mission board **may** be established. It shall be composed of **around** 15 high level individuals including **relevant end-users'** representatives. The mission board shall advise **upon** the following:

Amendment

Article 5

Missions

1. For each mission, a mission board **shall** be established **for co-designing and steering implementation**. It shall be composed of **15 to 20 independent** high level individuals including **R&I** representatives **from various sectors and disciplines, academia, research and technology organisations, industry of all sizes, national, regional authorities and civil society organisations. The members of the mission board shall be appointed by the Commission following an independent and transparent procedure, including an**

- (a) content of work programmes and their revision as needed for achieving the mission objectives, ***in co-design with stakeholders and the public where relevant***;
- (b) adjustment actions, or termination if appropriate, based on implementation assessments of the mission;
- (c) selection of expert evaluators, briefing of expert evaluators and evaluation criteria and their weighting;
- (d) framework conditions which help achieve the objectives of the mission;
- (e) communication.

2. Specific provisions to enable an efficient and flexible portfolio approach ***may*** be set out in the work programme provided for in Article 11.

open call for expressions of interest. The mission board shall advise ***on*** the following:

- (a) content of ***relevant*** work programmes and their revision as needed for achieving the mission objectives;
- (b) adjustment actions, or termination if appropriate, based on implementation assessments of the mission;
- (c) selection of expert evaluators, ***prevention of conflict of interest of expert evaluators***, briefing of expert evaluators and evaluation criteria and their weighting ***in addition to the standard criteria, namely “excellence; impact; and quality and efficiency of the implementation”***;
- (d) framework conditions which help achieve the objectives of the mission ***in line with Union priorities***;
- (e) communication.

(e a) clear and measurable mission targets and possible outcomes;

(e b) evaluation of social impact and business potential of the mission;

2. Specific provisions to enable an efficient and flexible portfolio approach ***shall*** be set out in the work programme provided for in Article 11.

2 a. The content of the missions, details on the implementation, including their scope, indicators, measurable targets and milestones, estimated budget and synergies with other Union funds and links with European Partnerships shall be laid down in Strategic R&I Plans, as outlined in Annex I of this Decision.

2 b. Missions shall be implemented through open calls within the work programmes of the relevant clusters, calling for project proposals which are contributing to the mission and which are situated in one or more of the intervention areas of the clusters.

Amendment 16

Proposal for a decision

Article 6

Text proposed by the Commission

Article 6

European Research Council

1. The Commission shall establish a European Research Council ("ERC"), for implementing the actions under Pillar I 'Open Science' which relate to the ERC. The ERC shall succeed the ERC set up by Decision C(2013) 1895⁷.

2. The ERC shall be composed of the independent Scientific Council provided for in Article 7 and the dedicated implementation structure provided for in Article 8.

3. The ERC shall have a President who shall be chosen from among senior and internationally respected scientists.

The President shall be appointed by the Commission following a transparent recruitment process involving an independent dedicated search committee, for a term of office limited to four years, renewable once. The recruitment process and the candidate selected shall have the approval of the Scientific Council.

The President shall chair the Scientific Council and shall ensure its leadership and liaison with the dedicated implementation structure, and represent it in the world of science.

4. The ERC shall operate according to the principles of scientific excellence, autonomy, efficiency, effectiveness, transparency and accountability. It shall ensure continuity with ERC actions

Amendment

Article 6

European Research Council

1. The Commission shall establish a European Research Council ("ERC"), for implementing the actions under Pillar I '**Excellent and** Open Science' which relate to the ERC. The ERC shall succeed the ERC set up by Decision C(2013) 1895⁷.

2. The ERC shall be composed of the independent Scientific Council provided for in Article 7 and the dedicated implementation structure provided for in Article 8.

3. The ERC shall have a President who shall be chosen from among senior and internationally respected scientists.

The President shall be appointed by the Commission following a transparent recruitment process involving an independent dedicated search committee, for a term of office limited to four years, renewable once. The recruitment process and the candidate selected shall have the approval of the Scientific Council.

The President shall chair the Scientific Council and shall ensure its leadership and liaison with the dedicated implementation structure, and represent it in the world of science.

4. The ERC shall operate according to the principles of scientific excellence, autonomy, efficiency, effectiveness, transparency and accountability. It shall ensure continuity with ERC actions

conducted under Decision .../EC.

5. The activities of the ERC shall support research carried out across all fields by individual and transnational teams in competition at the European level.

6. The Commission shall act as the guarantor of the autonomy and integrity of the ERC and shall ensure the proper execution of the tasks entrusted to it.

The Commission shall ensure that the implementation of the ERC actions is in accordance with the principles set out in paragraph 4 of this Article as well as with the overall strategy for the ERC, referred to in point (a) of Article 7(2), established by the Scientific Council.

⁷ OJ C 373, 20.12.2013, p. 23

conducted under Decision .../EC.

5. The activities of the ERC shall support research carried out across all fields by individual and transnational teams in competition at the European level.

Support to innovation, i.e via the Proof of Concept scheme, should continue in order to encourage faster translation of new discoveries into commercial or socially valuable products, processes, and services. To contribute to this, excellent ERC applicants who have passed the threshold but could not be funded due to lack of resources are eligible to the proof of concept.

5 a. A seal of excellence shall be awarded to a beneficiary of the ERC proof of concept, if the proposal is eligible, has passed applicable thresholds and could not be funded.

6. The Commission shall act as the guarantor of the autonomy and integrity of the ERC and shall ensure the proper execution of the tasks entrusted to it.

The Commission shall ensure that the implementation of the ERC actions is in accordance with the principles set out in paragraph 4 of this Article as well as with the overall strategy for the ERC, referred to in point (a) of Article 7(2), established by the Scientific Council.

⁷ OJ C 373, 20.12.2013, p. 23

Amendment 17

Proposal for a decision Article 7

Text proposed by the Commission

Article 7

Amendment

Article 7

ERC Scientific Council

1. The Scientific Council shall be composed of scientists, engineers and scholars of the highest repute and appropriate expertise, of both women and men in different age groups, ensuring a diversity of research areas and acting in their personal capacity, independent of extraneous interests.

The members of the Scientific Council shall be appointed by the Commission, following an independent and transparent procedure for their identification agreed with the Scientific Council, including a consultation of the scientific community and a report to the European Parliament and the Council.

Their term of office shall be limited to four years, renewable once, on the basis of a rotating system which shall ensure the continuity of the work of the Scientific Council.

2. The Scientific Council shall establish:

- (a) the overall strategy for the ERC;
- (b) the work programme for the implementation of the ERC activities;
- (c) the methods and procedures for peer review and proposal evaluation on the basis of which the proposals to be funded are determined;
- (d) its position on any matter which from a scientific perspective may enhance achievements and impact of the ERC and the quality of the research carried out;
- (e) a code of conduct addressing, *inter alia*, the avoidance of conflict of interests.**

The Commission shall depart from the positions established by the Scientific Council in accordance with points (a), (c), **(d), and (e)** of the first subparagraph only when it considers that the provisions of this Decision have not been respected. In that case, the Commission shall adopt measures to maintain continuity in the implementation of the specific programme

ERC Scientific Council

1. The Scientific Council shall be composed of scientists, engineers and scholars of the highest repute and appropriate expertise ensuring a diversity of research areas and acting in their personal capacity, independent of extraneous interests.

The members of the Scientific Council shall be appointed by the Commission, following an independent and transparent procedure for their identification agreed with the Scientific Council, including a consultation of the scientific community and a report to the European Parliament and the Council.

Their term of office shall be limited to four years, renewable once, on the basis of a rotating system which shall ensure the continuity of the work of the Scientific Council.

2. The Scientific Council shall establish:

- (a) the overall strategy for the ERC;
- (b) the work programme for the implementation of the ERC activities;
- (c) the methods and procedures for peer review and proposal evaluation on the basis of which the proposals to be funded are determined;
- (d) its position on any matter which from a scientific perspective may enhance achievements and impact of the ERC and the quality of the research carried out;

The Commission shall ***establish a code of conduct addressing, *inter alia*, the avoidance of conflict of interests and*** depart from the positions established by the Scientific Council in accordance with points (a), (c), ***and (d)*** of the first subparagraph only when it considers that the provisions of this Decision have not been respected. In that case, the

and the achievements of its objectives, setting out the points of departure from the Scientific Council positions and duly motivating them.

3. The Scientific Council shall act in accordance with the mandate set out in Pillar I of Annex I, section 1.

4. The Scientific Council shall act exclusively in the interest of achieving the **ERC**, according to the principles set out in Article 6. It shall act with integrity and probity and carry out its work efficiently and with the greatest possible transparency.

Commission shall adopt measures to maintain continuity in the implementation of the specific programme and the achievements of its objectives, setting out the points of departure from the Scientific Council positions and duly motivating them.

3. The Scientific Council shall act in accordance with the mandate set out in Pillar I of Annex I, section 1.

4. The Scientific Council shall act exclusively in the interest of achieving the **ERC's goals**, according to the principles set out in Article 6. It shall act with **complete independence**, integrity and probity and carry out its work efficiently and with the greatest possible transparency **and openness maximising ERC's contribution to achieving the EU R&I policy objectives and Horizon Europe's goals in particular**.

Amendment 18

Proposal for a decision Article 9

Text proposed by the Commission

Article 9

The European Innovation Council

1. The Commission shall establish a European Innovation Council (EIC) **for implementing actions under Pillar III 'Open Innovation' which relate to the EIC. The EIC shall operate according to the following principles: focus on breakthrough and disruptive innovation, autonomy, ability to take risk, efficiency, effectiveness, transparency and accountability.**

Amendment

Article 9

The European Innovation Council

1. The Commission shall establish a European Innovation Council (EIC) **in accordance with article (7a) of the Regulation.**

1 a. The EIC shall be built into two instruments, the Pathfinder and the

Accelerator, as described in Annex I of this Decision. The EIC instruments shall be continuously evaluated in order to support innovation in a systematic way.

1 b. Where appropriate, the EIC objectives and actions shall be linked to other parts of the Programme as well as to other national and Union Funds, in particular the EIT and InvestEU.

2. The EIC shall include the High Level Board ("EIC Board") provided for in Article 10.

3. The Commission shall ensure that the implementation of the EIC is:

(a) in accordance with the principles set out in paragraph 1 of this Article, taking due account of the opinion of the EIC Board on the overall strategy for the EIC, referred to Article 10(1)(a); and

(b) does not lead to distortions of competition contrary to the common interest.

4. For the purpose of managing EIC blended finance, the Commission shall make use of indirect management, or where this is not possible, may establish a special purpose vehicle. The Commission shall seek to ensure the participation of other public and private investors. Where this is not possible at the initial set up, the special purpose vehicle will be structured in such a way that it can attract other public or private investors in order to increase the leverage effect of the Union contribution.

2. The EIC shall include the High Level Board ("EIC Board") provided for in Article 10.

3. The Commission shall ensure that the implementation of the EIC is:

(a) in accordance with the principles set out in paragraph 1 of this Article, taking due account of the opinion of the EIC Board on the overall strategy for the EIC, referred to Article 10(1)(a); and

(b) does not lead to distortions of competition contrary to the common interest.

4. For the purpose of managing EIC blended finance, the Commission shall make use of indirect management, or where this is not possible, may establish a special purpose vehicle. The Commission shall seek to ensure the participation of other public and private investors. Where this is not possible at the initial set up, the special purpose vehicle will be structured in such a way that it can attract other public or private investors in order to increase the leverage effect of the Union contribution.

4 a. The Commission shall ensure cooperation between the EIC and EIT, especially through its KICs.

Amendment 19

Proposal for a decision Article 10

Text proposed by the Commission

Article 10

The EIC Board

1. The EIC Board shall advise the Commission upon:
 - (a) the overall strategy for the EIC component under Pillar III '**Open Innovation**';
 - (b) the work programme for the implementation of the EIC actions;
 - (c) the criteria for assessment of the innovativeness and risk profile of the proposals and the appropriate balance of grants, equity and other forms of financing for the EIC accelerator;
 - (d) the identification of strategic portfolio of projects;
 - (e) the profile of programme managers.

2. The EIC Board may upon request address recommendations to the Commission on:

- (a) any matter which from an innovation perspective may enhance and foster innovation eco-systems across Europe, the achievements and impact of the objectives of the EIC component and the capacity of innovative firms to roll out their solutions;
- (b) identify in cooperation with relevant Commission services possible regulatory barriers faced by entrepreneurs, in particular those awarded support under the EIC component;
- (c) emerging technology trends from EIC's portfolio, to inform the programming in other parts of the Specific Programme;
- (d) identifying specific issues where advice from the EIC Board is needed.

The EIC Board shall act in the interest of

Amendment

Article 10

The EIC Board

1. The EIC Board shall advise the Commission upon:
 - (a) the overall strategy for the EIC component under Pillar III '**Innovative Europe**';
 - (b) the work programme for the implementation of the EIC actions;
 - (c) the criteria for assessment of the innovativeness and risk profile of the proposals and the appropriate balance of grants, equity and other forms of financing for the EIC accelerator;
 - (d) the identification of strategic portfolio of projects;
 - (e) the profile of programme managers.

(e a) the systematic and continuous evaluation process of the EIC actions;

2. The EIC Board may upon request, ***and wherever appropriate in coordination with the EIT Governing Board,*** address recommendations to the Commission on:

- (a) any matter which from an innovation perspective may enhance and foster innovation eco-systems across Europe, the achievements and impact of the objectives of the EIC component and the capacity of innovative firms to roll out their solutions;
- (b) identify in cooperation with relevant Commission services ***and the EIT*** possible regulatory barriers faced by entrepreneurs, in particular those awarded support under the EIC component;
- (c) emerging technology trends from EIC's portfolio, to inform the programming in other parts of the Specific Programme;
- (d) identifying specific issues where advice from the EIC Board is needed.

The EIC Board shall act in the interest of

achieving the objectives of the EIC **component**. It shall act with integrity and probity and carry out its work efficiently and with transparency.

The EIC Board shall act in accordance with its mandate set out in Pillar III of Annex I, section 1.

3. The EIC Board shall be composed of 15 to 20 high level individuals drawn from various parts of Europe's innovation ecosystem, including entrepreneurs, **corporate leaders**, investors **and** researchers. It shall contribute to outreach actions, with EIC Board members striving to enhance the prestige of the EIC brand.

The members of the EIC Board shall be appointed by the Commission, following an open call for nominations or for expression of interests or both, whichever the Commission will find more appropriate,, and taking into account the need for balance in expertise, gender, age and geographical distribution.

Their term of office shall be limited to **two** years, renewable **twice**, with a rolling appointments system (members **appointed** every two years).

4. The EIC Board shall have a President who shall be appointed by the Commission following a transparent recruitment process. The President shall be a high profile **public** figure **linked to the** innovation **world**.

The President shall be appointed for a term of office limited to **four** years, renewable once.

The President shall chair the EIC Board, prepare its meetings, assign tasks to members, and may establish dedicated sub-groups, in particular to identify emerging

achieving the objectives of the EIC **taking into account EU's industrial strategy, its competitiveness and global challenges**. It shall act with integrity and probity and carry out its work efficiently and with transparency **and openness, avoiding distortion of competition in the internal market**.

The EIC Board shall act in accordance with its mandate set out in Pillar III of Annex I, section 1.

3. The EIC Board shall be composed of 15 to 20 **independent** high level individuals drawn from various parts of Europe's **research and** innovation ecosystem, including entrepreneurs **from companies of all sizes, economists**, investors, researchers **and academic experts on innovation policy**. It shall contribute to outreach actions, with EIC Board members striving to enhance the prestige of the EIC brand.

The members of the EIC Board shall be appointed by the Commission, following an open call for nominations or for expression of interests or both, whichever the Commission will find more appropriate and taking into account the need for balance in expertise, gender, age and geographical distribution.

Their term of office shall be limited to **three** years, renewable **once**, with a rolling appointments system (**half of the** members **exchanged** every two years).

4. The EIC Board shall have a President who shall be appointed by the Commission following a transparent recruitment process. The President shall be a high profile figure **with a proven expertise in research and** innovation.

The President shall be appointed for a term of office limited to **three** years, renewable once.

The President shall chair the EIC Board, prepare its meetings, assign tasks to members, and may establish dedicated sub-groups, in particular to identify emerging

technology trends from EIC's portfolio. He or she shall promote the EIC, act as interlocutor with the Commission and represent the EIC in the world of innovation. The Commission *may* provide for administrative support for the President to undertake his or her duties.

5. A code of conduct addressing, inter alia, the avoidance of conflict of interests shall be established by the Commission. Members of the EIC Board *are expected to* accept the code of conduct upon assuming office.

technology trends from EIC's portfolio. He or she shall promote the EIC, *its role in achieving the Programme and the Union's R&I goals*, act as interlocutor with the Commission and represent the EIC in the world of *research and* innovation. The Commission *shall* provide for administrative support for the President to undertake his or her duties.

5. A code of conduct addressing, inter alia, the avoidance of conflict of interests shall be established by the Commission. Members of the EIC Board *must* accept the code of conduct upon assuming office.

Amendment 20

Proposal for a decision Article 11

Text proposed by the Commission

Article 11
Work programmes

Amendment

Article 11
Strategic Planning and Work programmes
-1. The implementation of the specific programme shall be based on Specific R&I Plans defined every two years, through delegated acts in accordance with Article 6 of the Regulation and following a transparent, inclusive and strategic multiannual planning process of research and innovation activities, in particular for the pillar 'Global Challenges and European Industrial Competitiveness'. Mandatory multi-stakeholder consultations with national authorities, the European Parliament, and RDI stakeholders' representatives, including civil society, about priorities and the suitable types of action and forms of implementation, including for missions and European partnerships, shall ensure the necessary inter-disciplinary and cross-

sectoral perspectives and alignment with other relevant existing initiatives at Union, national and regional level. This will contribute to leveraging additional private and public funding and thereby strengthening the ERA, as described in Annex I of this Decision.

1. The Programme shall be implemented by work programmes referred to in Article 110 of Financial Regulation. ***They shall be prepared following a strategic planning process as described in Annex I to this Decision.***

Work programmes shall set out, where applicable, the overall amount reserved for blending operations.

2. The Commission shall adopt separate work programmes, by means of implementing acts, for the implementation of actions under the following components, as set out in Article 3(1) of this Decision :

(a) the ERC, where the work programme shall be established by the Scientific Council under point (b) of Article 7(2), in accordance with the advisory procedure referred to in Article 12(3). The Commission shall depart from the work programme established by the Scientific Council only when it considers that it is not in accordance with the provisions of this Decision. In that case, the Commission shall adopt the work programme by means of an implementing act in accordance with the examination procedure referred to in Article 12(4). The Commission shall duly motivate this measure;

(b) all clusters under the pillar 'Global Challenges and Industrial Competitiveness', MSCA, research infrastructures, support to innovation ecosystems, ***sharing*** excellence and reforming and enhancing the European R&I System, in accordance with the examination procedure referred to in Article 12(4);

(c) the EIC, where the work programme shall be prepared following the advice of

1. ***Following the strategic R&I plan,*** the Programme shall be implemented by work programmes referred to in Article 110 of Financial Regulation.

Work programmes shall set out, where applicable, the overall amount reserved for blending operations.

2. The Commission shall adopt separate work programmes, by means of implementing acts, for the implementation of actions under the following components, as set out in Article 3(1) of this Decision:

(a) the ERC, where the work programme shall be established by the Scientific Council under point (b) of Article 7(2), in accordance with the advisory procedure referred to in Article 12(3). The Commission shall depart from the work programme established by the Scientific Council only when it considers that it is not in accordance with the provisions of this Decision. In that case, the Commission shall adopt the work programme by means of an implementing act in accordance with the examination procedure referred to in Article 12(4). The Commission shall duly motivate this measure;

(b) all clusters under the pillar 'Global Challenges and ***European*** Industrial Competitiveness', MSCA, research infrastructures, support to ***European*** innovation ecosystems, ***spreading*** excellence and ***widening participation,*** reforming and enhancing the European R&I System, in accordance with the examination procedure referred to in Article 12(4);

(c) the EIC, where the work programme shall be prepared following the advice of

the EIC Board under point (b) of Article 10(1), in accordance with the examination procedure referred to in Article 12(4);

(d) the JRC, where the multi-annual work programme shall take into account the opinion provided by the Board of Governors of the JRC referred to in Decision 96/282/Euratom.

3. In addition to requirement in Article 110 of the Financial Regulation, the work programmes referred to in paragraph 2 of this Article shall, as appropriate, contain:

(a) an indication of the amount allocated to each action *and* mission and an indicative implementation timetable;

(b) for grants the priorities, the selection and award criteria and the relative weight of the different award criteria and the maximum rate of funding of the total eligible costs;

(c) the amount allocated to blended finance in accordance with Articles 41 to 43 of Regulation ... FP/RfP Regulation:

(d) any additional obligations for beneficiaries, in accordance with Articles 35 and 37 of the FP/RfP Regulation.

the EIC Board under point (b) of Article 10(1), in accordance with the examination procedure referred to in Article 12(4);

(d) the JRC, where the multi-annual work programme shall take into account the opinion provided by the Board of Governors of the JRC referred to in Decision 96/282/Euratom.

3. In addition to requirement in Article 110 of the Financial Regulation, the work programmes referred to in paragraph 2 of this Article shall, as appropriate, contain:

(a) an indication of the amount *and budgetary share in relation to the Programme* allocated to each action, mission *and European Partnership* and an indicative implementation timetable;

(b) for grants the priorities, the selection and award criteria and the relative weight of the different award criteria and the maximum rate of funding of the total eligible costs;

(c) the amount allocated to blended finance in accordance with Articles 41 to 43 of Regulation ... FP/RfP Regulation;

(d) any additional obligations for beneficiaries, in accordance with Articles 35 and 37 of the FP/RfP Regulation.

Amendment 21

Proposal for a decision Article 12 a (new)

Text proposed by the Commission

Amendment

Article 12 a

Steering Board for Health

1. The Commission shall establish a Steering Board for Health for implementing the actions under Pillar II 'Global Challenges and European

Industrial Competitiveness' which relates to 'Health'.

2. The Steering Board for Health shall be composed of 15 to 20 high level individuals drawn from across disciplines and activities, in the fields of research, innovation, public health and wellbeing.

3. The Steering Board for Health shall focus on the following principles: coordination and synergies between EU and national health programmes, as well as between the Health cluster and other parts of Horizon Europe, including missions and partnerships. The Board shall promote patients and society engagement, providing scientific advice and recommendations. The actions should promote value-oriented health research, better health solutions and reduce health inequalities.

4. The Steering Board for Health shall contribute to:

(a) the strategy for the cluster 'Health',

(b) the blueprint for steering coordination and cooperation between the health programmes, the related pillars, such as the EIC, ERC, as well as within Strategic Partnerships and the EU structural funds. The blueprint shall ensure more visibility and coordination of the existing financial mechanisms allocated to health research, shall steer coordination and cooperation, and shall develop the work programmes and missions related to Health,

(c) the methods and procedures for designing, selecting and implementation of the health missions,

(d) providing for citizens' participation and engagement in a bottom-up decision making process,

(e) fostering sustainability in funding strategies and mechanisms allowing for long-term projects and ambitious missions,

(f) ensuring fruitful transnational research collaborations that maximize the

European potential and translate results into health systems,

(g) increasing the use of multidisciplinary research between disease areas where commonalities exist and thereby decreasing duplication and isolated research,

(h) increasing visibility of Horizon Europe and its benefit for EU citizens, addressing fragmentation of responsibilities for science and research within the EU governing bodies, streamlining the existing funding mechanisms.

5. The Steering Board for Health shall provide a comprehensive research strategy and steering in developing the work programmes and missions related to Health in complementarity with the dedicated mission Board.

6. The Steering Board for Health shall be an independent science-led stakeholder group, composed of actors from biomedical research and innovation, other relevant sectors of research and industry and with strong participation of patient representatives and citizens.

7. The members of the Steering Board for Health shall be appointed by the Commission, following an open call for nominations or for expression of interests or both, as appropriate, and taking into account the need for balance in expertise, gender, age and geographical distribution. Their term of office shall be limited to two years, renewable twice, with a rolling appointments system (members appointed every two years).

8. The Steering Board for Health shall have a Chair who shall be appointed by the Commission following a transparent recruitment process. The President shall be a high profile public figure linked to the health research field.

9. The activities and outcome of the Board shall be reviewed and reported in the Programme's interim evaluation, where

measures to prolong, adapt or close the group according to the review shall be identified.

Amendment 22

Proposal for a decision Annex I – Programme activities

Text proposed by the Commission

PROGRAMME ACTIVITIES

The following will be applied in the implementation of the Programme.

Strategic Planning

The implementation of Horizon Europe's *programme-level* objectives *in an integrated manner will be ensured by multiannual Strategic Planning. Such planning* will provide *the* focus on impact for the Programme *overall* and coherence between its different pillars, as well as synergy with other EU programmes and support to *and from* other EU policies.

Amendment

PROGRAMME ACTIVITIES

The following will be applied in the implementation of the Programme.

Strategic Planning

The implementation of Horizon Europe *shall be steered by an inclusive and transparent strategic planning process of the research and innovation activities funded by the Programme. The Strategic Planning process shall lead to* the implementation of Horizon Europe's *programme* objectives *by defining the funding priorities. It* will provide focus on impact for the Programme and coherence between its different pillars, as well as synergy with other EU programmes and support to other EU policies.

The strategic planning process and the adoption of the strategic R&I plan by means of a delegated act will increase ownership and understanding for the purpose of the Programme by a wider public and will allow the co-legislators, stakeholders and Member States to be fully informed on the envisaged initiatives. The Strategic Planning process will help to develop and implement policy for the relevant areas covered, at Union level as well as complementing policies in the Member States while ensuring that main European policy targets are reflected and supported by Horizon

Europe with adequate resources. It will allow simplification of the funding landscape, avoid duplication and overlaps between funding possibilities while leveraging additional private and public funding and promote faster dissemination and uptake of research and innovation results.

A systemic, cross-disciplinary, cross-sectoral and cross-policy approach to research and innovation will ensure that societal and economic challenges can be tackled, knowledge is generated and where possible, give rise to new competitive and sustainable businesses and industries, social and technological innovation, fostering competition, stimulating private investments and preserving the level playing field in the internal market.

The Strategic Planning will promote strong engagement with citizens and civil society organisations **at all stages of** research and innovation, the co-creation of knowledge, effective promotion of gender equality, including the integration of the gender dimension in research and innovation **content**, and will **ensure and** promote the adherence to the highest ethics and integrity standards.

It will include extensive consultations and exchanges with Member States, the European Parliament **as appropriate, and with various** stakeholders **about** priorities, including missions, under the 'Global Challenges and Industrial Competitiveness' pillar, and the suitable types of **action to use**, in particular European partnerships.

The Strategic Planning **process** will promote strong engagement with citizens and civil society organisations **in** research and innovation, the co-creation of knowledge, effective promotion of gender equality, including the integration of the gender dimension in research and innovation, and will promote the adherence to the highest ethics and integrity standards.

In order to respond to those objectives, the Commission will launch an open consultation phase with Member States, the European Parliament, **and a variety of** stakeholders, **including the scientific community, research and technology organisations, industry, civil society organisations, among others. The consultation will cover the Programme's strategic** priorities including missions under the Global Challenges and **European** Industrial Competitiveness pillar, and the suitable types of **instruments**, in particular **the** European partnerships. **Results of the consultation will be published on a dedicated web page, which should also provide the details on the content and process defining the Strategic Planning.**

As regards European partnerships, the Strategic R&I Plan will outline and give the rationale for the creation, merge and phasing out of the European partnerships. The positively reviewed Joint Technology Initiatives and Contractual Public Private Partnerships, should be considered for continuation beyond 2020 due to their added-value in delivering social and economic impact as well as leveraging private investment and their contribution to synergies of funds.

On-going and potential new KICs will be defined in the legislative proposal for a Decision of the European Parliament and the Council on the EIT Strategic Innovation Agenda, in line with the Strategic R&I Plan. Nevertheless, the creation of any new KIC should be subject to adequate funding, allowing the existing KICs to develop the ecosystems, build partnerships and pursue and implement efficiently their ambitious objectives.

'FET Flagships' supported under Horizon 2020 will continue to be supported under the Programme. As they present substantial analogies with missions, other 'FET flagships', may be supported under this Framework Programme as missions geared towards future and emerging technologies. The missions should strengthen the collaborative aspects of the Programme and complement existing European partnerships, which could work as supporting implementation pillars of the missions. The missions will have technological and societal elements and will also be defined in close cooperation with all relevant DGs. The Strategic Planning process will define the missions according to Article 7 of the Regulation and Article 5 of this Decision.

Based on such extensive consultations, the Strategic Planning will identify common objectives and common areas for activities such as partnership areas (the proposed legal basis sets out only the instruments and criteria that will guide their use) and mission areas.

The Strategic Planning will help to develop and realise the implementation of policy for the relevant areas covered, at EU level as well as complementing policy and policy approaches in the Member States. EU policy priorities will be taken into consideration during the Strategic Planning process to increase the contribution of research and innovation to the realisation of policy. It will also take into account foresight activities, studies and other scientific evidence and take account of relevant existing initiatives at EU and national level.

The Strategic Planning *will promote synergies* between Horizon Europe and other Union Programmes, *including the Euratom programme, thus becoming* a point of reference for research and innovation in all related programmes across the EU budget *and non-funding instruments. This will also promote faster dissemination and uptake of research and innovation results and avoid duplication and overlaps between funding possibilities. It will* provide the frame for linking the direct research actions of the Joint Research Centre and other actions supported under the Programme, including the use of results *for support to* policy.

A Strategic Plan will lay out a multiannual strategy for realising content in the work programme (as set out in Article 11), while retaining sufficient flexibility to respond rapidly to unexpected opportunities and crises. As Horizon Europe is a programme for 7 years, the economic, societal and policy context in which it will operate may change significantly during its life-time. Horizon Europe needs to be able to swiftly adapt to these changes. There will therefore be the possibility to include support for activities beyond the descriptions set out below, where this is duly justified, to address major developments or unforeseen events, policy needs, or crisis situations, for example in response to serious threats to health

The Strategic Planning *process will identify existing links* between Horizon Europe and other Union Programmes, *and offer possibilities for synergies between EU, regional and national funds. Horizon Europe will become* a point of reference for research and innovation in all related programmes across the EU budget *in order to help deliver the EU's political priorities and objectives. It* will also provide the frame for linking the direct research actions of the Joint Research Centre and other actions supported under the Programme, including the use of results *to* support policy.

arising for example from epidemics.

In the implementation of Horizon Europe, particular attention will be paid to ensuring a balanced and broad approach to research and innovation, which is not only limited to the development of new products processes and services on the basis of scientific and technological knowledge and breakthroughs, but also incorporates the use of existing technologies in novel applications and continuous improvement and non-technological and social innovation. A systemic, cross-disciplinary, cross-sectoral and cross-policy approach to research innovation will ensure that challenges can be tackled while also giving rise to new competitive businesses and industries, fostering competition, stimulating private investments and preserving the level playing field in the internal market.

In the 'Global Challenges and Industrial Competitiveness' and the 'Open Innovation' Pillars, research and innovation will be complemented with activities which operate close to the end-users and the market, such as demonstration, piloting or proof-of-concept, excluding however commercialisation activities going beyond the research and innovation phase. This will also include support to demand-side activities that help accelerate the deployment and diffusion of a broad range of innovations. Emphasis will be put on non-prescriptive calls for proposals.

Under the 'Global Challenges and Industrial Competitiveness' pillar, building on experience in Horizon 2020, the social sciences and the humanities will be fully integrated across all clusters, including specific and dedicated activities. Likewise, activities involving marine and maritime research and innovation will be implemented in a strategic and integrated manner in line with the EU Integrated Maritime Policy, the Common Fisheries Policy Policies and international

commitments.

'FET Flagships' supported under Horizon 2020 will continue to be supported under this Programme. As they present substantial analogies with missions, other 'FET flagships', if any, will be supported under this Framework Programme as missions geared towards future and emerging technologies.

Science and Technology Cooperation dialogues with the EU's international partners and policy dialogues with the main world regions will make important contributions to the systematic identification of opportunities for cooperation which, when combined with differentiation by country/region, will support priority setting.

While the European Institute of Innovation and Technology's (EIT) focus on innovation ecosystems makes it naturally fit within the Open Innovation pillar of Horizon Europe, the planning of the EIT Knowledge and Innovation Communities (KICs) will be aligned through the Strategic Planning process with the Global Challenges and Industrial Competitiveness pillar.

Fast Track to Research and Innovation

Horizon Europe will provide the possibility for beneficiaries to apply for funding in a faster manner, where provided for in the Work Programme's of all clusters, EIC and "spreading excellence", covering research and innovation activities. Building on the success of the existing Fast Track to Innovation instrument in Horizon 2020, this approach will have a bottom-up-driven logic on the basis of continuously open calls and "time to grant" not exceeding six months. In the "spreading excellence" part, this approach will support less developed EU countries to access funds in a faster and bottom-up manner. This modality will be applied to at least 15% of the Programme's budget.

Dissemination and Communication

Horizon Europe will provide dedicated support for open access to scientific publications, to knowledge repositories and other data sources. Dissemination and knowledge diffusion actions will be supported, also from cooperation with other EU programmes, including clustering and packaging results and data in languages and formats for target audiences and networks for citizens, industry, public administrations, *academia*, civil society organisations, and policy makers. For this purpose, Horizon Europe may make use of advanced technologies and intelligence tools.

There will be appropriate support for mechanisms to communicate the programme to potential applicants (e.g. National Contact Points).

The Commission will also implement information and communication activities relating to Horizon Europe, to promote the fact that results were obtained with the support of EU funding. They will also seek to raise public awareness on the importance of research and innovation and the broader impact and relevance of EU funded research and innovation, by means of e.g. publications, media relations, events, knowledge repositories, databases, multi-channel platforms, websites or a targeted use of social media. Horizon Europe will also provide support to the beneficiaries to communicate their work and its impact to society at large.

Exploitation and Market Uptake

The Commission will establish comprehensive measures for exploitation of Horizon Europe results and the knowledge produced. This will accelerate exploitation towards market uptake and boost the impact of the Programme.

The Commission will systematically identify and record the results of the research and innovation activities under the

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Exploitation and Market Uptake

The Commission will establish comprehensive measures for exploitation of Horizon Europe results and the knowledge produced, ***which will also include promoting standardisation***. This will accelerate exploitation towards market uptake and boost the impact of the Programme.

The Commission will systematically identify and record the results of the research and innovation activities under the

Programme and transfer or disseminate these results and knowledge produced in a non-discriminatory fashion to industry and enterprises of all sizes, public administrations, *academia*, civil society organisations and policy-makers, in order to maximise the European added value of the Programme.

International Cooperation

Greater impact will be obtained through aligning actions with other nations and regions of the world within an international cooperation effort of unprecedented scale. Based on mutual benefit, partners from across the world will be invited to join EU efforts as an integral part of initiatives in support of EU action for sustainability, reinforced research and innovation excellence, and competitiveness.

International joint action will ensure effective tackling of global *societal* challenges and Sustainable Development Goals, access to the world's best talents, expertise and resources, and enhanced supply and demand of innovative solutions.

Working Methodologies for Evaluation

The use of high quality independent expertise in the evaluation process underpins the engagement of the programme across all stakeholders, communities and interests, and is a prerequisite for maintaining the excellence and relevance of the funded activities.

Programme and transfer or disseminate these results and knowledge produced in a non-discriminatory fashion to industry and enterprises of all sizes, public administrations, *scientific community*, civil society organisations and policy-makers, in order to maximise the European added value of the Programme. ***A specific monitoring procedure will be implemented for the new European Innovation Council.***

International Cooperation

Greater impact will be obtained through aligning actions with other nations and regions of the world within an international cooperation effort of unprecedented scale. Based on mutual benefit, partners from across the world, ***including the scientific community, industry, civil society organisations, governments and NGOs*** will be invited to join EU efforts as an integral part of initiatives in support of EU action for sustainability, reinforced research and innovation excellence, and competitiveness. ***The transfer of knowledge, sharing of capacity and infrastructure between the partners internationally will drive shared approaches and regulation that will bring synergistic trading to all parties.***

International joint action will ensure effective tackling of global challenges and Sustainable Development Goals, access to the world's best talents, expertise and resources, and enhanced supply and demand of innovative solutions.

International collaboration will be designed around common goals. This will facilitate European researchers to engage with the best researchers in their field.

Working Methodologies for Evaluation

The use of high quality independent expertise in the evaluation process underpins the engagement of the programme across all stakeholders, communities and interests, and is a prerequisite for maintaining the excellence and relevance of the funded activities.

The Commission or funding body will ensure the impartiality of the process, and avoid conflicts of interest in line with Article 61 of the Financial Regulation.

Exceptionally, when justified by the requirement to appoint the best available experts and/or by the limited size of the pool of qualified experts, independent experts assisting or being members of the evaluation committee may evaluate specific proposals for which they declare a potential interest. In this case, the Commission or funding body shall take all necessary remedial measures to ensure the integrity of the evaluation process. The evaluation process will be managed accordingly, including a stage involving an interaction between diverse experts. The evaluation committee will take into account the particular circumstances when identifying proposals for funding.

The Commission or funding body will ensure the impartiality of the process, and avoid conflicts of interest in line with Article 61 of the Financial Regulation.

When justified by the requirement to appoint the best available experts and/or by the limited size of the pool of qualified experts, independent experts assisting or being members of the evaluation committee may evaluate specific proposals for which they declare a potential interest. In this case, the Commission or funding body shall take all necessary remedial measures to ensure the integrity of the evaluation process, *including in regards to conflicts of interests*. The evaluation process will be managed accordingly, including a stage involving an interaction between diverse experts. *The use of this process will be reported in the annual monitoring report of the Programme*. The evaluation committee will take into account the particular circumstances when identifying proposals for funding.

Amendment 23

Proposal for a decision Annex I – part I

Text proposed by the Commission

I OPEN SCIENCE

The search for breakthroughs in understanding and the acquisition of knowledge; the world class facilities needed to achieve this including physical and *knowledge infrastructures* for research and innovation as well as the means to openly disseminate and share knowledge; and an adequate supply of excellent researchers; are at the very heart of economic, social and cultural progress in

Amendment

I **EXCELLENT AND OPEN** SCIENCE

The search for breakthroughs in understanding and the acquisition of knowledge; the world class facilities needed to achieve this including physical and *e-infrastructures* for research and innovation as well as the means to openly disseminate and share knowledge; and an adequate supply of excellent researchers *and innovators*; are at the very heart of economic, social and cultural progress in

all its forms.

Open and excellent science is inextricably linked to the achievement of world leading innovation. Scientific and technological paradigm shifts have been identified as key drivers for productivity growth, competitiveness, wealth, **sustainable development** and social progress. Such paradigm shifts have historically tended to originate from the public-sector science base before going on to lay the foundations for whole new industries and sectors.

Public investment in research, especially through universities and public research institutions (PRIs) and research facilities, often undertakes the longer-term, higher-risk research and complements the activities of the private sector. Besides this it creates **skills**, knowhow and experience, new scientific instruments and methodologies, as well creating the networks which transmit the latest knowledge.

European science and researchers have been and continue to be at the forefront in many areas. But this is not a position we can take for granted. There is ample evidence to show that as the pace of research continues to grow, so the number of countries competing to be the best is increasing as well. The traditional challenge from countries such as the United States is now being joined by economic giants such as China and India, from the newly industrialising parts of the world in particular, and from all countries where governments recognise the manifold and abundant returns which derive from investing in research.

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Open and excellent science is inextricably linked to the achievement of world leading innovation. Scientific and technological paradigm shifts have been identified as key drivers for productivity, **sustainable and inclusive growth and development**, competitiveness, wealth, and social progress. Such paradigm shifts have historically tended to originate from the public-sector science base before going on to lay the foundations for whole new industries and sectors.

Public investment in research, especially through universities and public research institutions (PRIs) and research facilities, often undertakes the longer-term, higher-risk research and complements the activities of the private sector. Besides this it creates **highly skilled human resources**, knowhow and experience, new scientific instruments and methodologies, as well creating the networks which transmit the latest knowledge.

European science and researchers have been and continue to be at the forefront in many areas. But this is not a position we can take for granted. There is ample evidence to show that as the pace of research continues to grow, so the number of countries competing to be the best is increasing as well. The traditional challenge from countries such as the United States is now being joined by economic giants such as China and India, from the newly industrialising parts of the world in particular, and from all countries where governments recognise the manifold and abundant returns which derive from investing in research.

Amendment 24

Proposal for a decision

Annex I – part I – point 1 – point 1.1

1.1. Rationale

Although the EU remains the largest producer of scientific publications in the world, **it is essentially a 'mass producer' of knowledge with, relative to its size, comparatively few centres of excellence that stand out at the world level and with large areas of average and poor performance.** Compared with the US and now China to some degree, the EU **still tends to follow** a 'distributed excellence model' in which resources are spread across a larger number of researchers and research institutions. Another challenge is that in many EU countries the public sector **still** does not offer sufficiently attractive conditions for the best researchers. These factors compound Europe's relative unattractiveness in the global competition for scientific talent.

The global research landscape is evolving dramatically and becoming increasingly multipolar as a result of a growing number of emerging countries, in particular China, expanding their scientific production. So whereas the EU and the United States accounted for nearly two-thirds of world expenditure on research and development in 2000, this share had fallen to less than half by 2013.

The ERC supports the best researchers with flexible, long-term funding to pursue ground breaking, high-gain/high-risk research. It operates autonomously led by an independent Scientific Council made up of scientists, engineers and scholars of the highest repute and appropriate expertise and diversity. The ERC is able to draw on a wider pool of talents and ideas than

1.1. Rationale

The EU remains the largest producer of scientific publications in the world. Compared with the US and now China to some degree, the EU **follows** a 'distributed excellence model' in which resources are spread across a larger number of researchers and research institutions. Another challenge is that in many EU countries the public sector **investment in research is below any acceptable threshold and thus** does not offer sufficiently attractive conditions for the best researchers. These factors compound Europe's relative unattractiveness in the global competition for scientific talent.

The global research landscape is evolving dramatically and becoming increasingly multipolar as a result of a growing number of emerging countries, in particular China, expanding their scientific production. So whereas the EU and the United States accounted for nearly two-thirds of world expenditure on research and development in 2000, this share had fallen to less than half by 2013. **In addition, the European Innovation Scoreboard 2018 confirmed that public and private R&D expenditures across the EU remains below 2010 levels and falls short in meeting the long-standing objective to devote 3% of GDP to R&D activities.**

The ERC supports the best researchers, **including young researchers**, with flexible, long-term funding to pursue ground breaking, high-gain/high-risk research. It operates autonomously led by an independent, **gender and discipline-balanced**, Scientific Council made up of scientists, engineers and scholars of the highest repute and appropriate expertise

would be possible for any national scheme, reinforcing *excellence* through the way in which the best researchers and the best ideas compete against each other.

Frontier research funded by the ERC has a substantial direct impact in the form of advances at the frontiers of knowledge, opening the way to new and often unexpected scientific *and* technological results and new areas for research. In turn, this generates radically new ideas which drive innovation and business inventiveness and tackle societal challenges. The ERC also has a significant structural impact, driving up the quality of the European research system over and above the researchers and actions it funds directly. ERC-funded actions and researchers set an inspirational target for frontier research in Europe, raising its profile and making it more attractive for the best researchers worldwide as a place to work, and work with. The prestige of hosting ERC grant- holders creates competition between Europe's universities and research organisations to offer the most attractive conditions for top researchers and can indirectly help them to assess their relative strengths and weaknesses and bring about reforms.

The gap between the research performance of the US and the EU countries has narrowed over the 10 years since the ERC was established. The ERC funds a relatively small percentage of all European research, but from this achieves a disproportionately high scientific impact. The average citation impact of the research supported by the ERC is comparable to that of the world's top elite research universities. The ERC's research performance is extremely high when compared with the world's largest research funders. The ERC funds a great deal of frontier research in many of the research areas that have received the highest

and diversity. The ERC is able to draw on a wider pool of talents and ideas than would be possible for any national scheme, reinforcing *excellent research in all fields of science* through the way in which the best researchers and the best ideas compete against each other.

Frontier research funded by the ERC has a substantial direct impact in the form of advances at the frontiers of knowledge, opening the way to new and often unexpected scientific, technological *and societal* results and new areas for research. In turn, this generates radically new ideas which drive innovation and business inventiveness and tackle societal challenges. The ERC also has a significant structural impact, driving up the quality of the European research system over and above the researchers and actions it funds directly. ERC-funded actions and researchers set an inspirational target for frontier research in Europe, raising its profile and making it more attractive for the best researchers worldwide as a place to work, and work with. The prestige of hosting ERC grant- holders creates competition between Europe's universities and research organisations to offer the most attractive conditions for top researchers and can indirectly help them to assess their relative strengths and weaknesses and bring about reforms.

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numbers of citations, including those areas that are rapidly emerging. Although ERC funding is targeted to frontier research it has resulted in a substantial number of patents.

So there is clear evidence that the ERC attracts and funds excellent researchers through its calls and ERC actions are producing a substantial number of the most significant and high impact research findings worldwide in emerging areas leading to breakthroughs and major advances. The work of ERC grantees is **also highly** interdisciplinary and ERC grantees collaborate internationally and publish their results openly across all fields of research including the social sciences and humanities.

There is also already evidence of the longer term impacts of ERC grants on careers, on training highly skilled **postdocs** and **PhDs**, on raising the global visibility and prestige of European research and on national research systems through its strong benchmarking effect. This effect is particularly valuable in the EU's distributed excellence model because ERC funded status can replace and serve as a **more accurate** indicator of research quality than recognition based on the status of institutions. This allows ambitious individuals, institutions, regions and countries to seize the initiative and scale up the research profiles in which they are particularly strong.

numbers of citations, including those areas that are rapidly emerging. Although ERC funding is targeted to frontier research it has resulted in a substantial number of patents.

So there is clear evidence that the ERC attracts and funds excellent researchers through its calls and ERC actions are producing a substantial number of the most significant and high impact research findings worldwide in emerging areas leading to breakthroughs and major advances. The work of ERC grantees is **expected also to become increasingly** interdisciplinary and ERC grantees collaborate internationally and publish their results openly across all fields of research including the social sciences and humanities.

There is also already evidence of the longer term impacts of ERC grants on careers, on training highly skilled **researchers, doctoral** and **post doctoral degree holders**, on raising the global visibility and prestige of European research and on national research systems through its strong benchmarking effect. This effect is particularly valuable in the EU's distributed excellence model because ERC funded status can replace and serve as a **reliable** indicator of research quality than recognition based on the status of institutions. This allows ambitious individuals, institutions, regions and countries to seize the initiative and scale up the research profiles in which they are particularly strong.

Amendment 25

Proposal for a decision

Annex I – part I – point 1 – point 1.2 – point 1.2.1

1.2. Areas of intervention

1.2. Areas of intervention

1.2.1. Frontier Science

1.2.1. Frontier Science

Research funded by the ERC is expected to lead to advances at the frontier of knowledge, with scientific publications of the highest quality, to research results with high societal **and** economic **potential** impact and with the ERC setting a clear and inspirational target for frontier research across the EU, Europe and internationally. Aiming to make the EU a more attractive environment for the world's best scientists, the ERC will target a measurable improvement in the EU's share of the world's top 1 % most highly cited publications, and aim at a substantial increase in the number of excellent researchers from outside Europe which it funds. ERC funding shall be awarded in accordance with the following well-established principles. Scientific excellence shall be the sole criterion on which ERC grants are awarded. The ERC shall operate on a 'bottom-up' basis without predetermined priorities.

Research funded by the ERC is expected to lead to advances at the frontier of knowledge, with scientific publications of the highest quality, to research results with **potential** high societal, economic **and environmental** impact and with the ERC setting a clear and inspirational target for frontier research across the EU, Europe and internationally. Aiming to make the EU a more attractive environment for the world's best scientists, the ERC will target a measurable improvement in the EU's share of the world's top 1 % most highly cited publications, and aim at a substantial increase in the number of excellent researchers from outside Europe which it funds. ERC funding shall be awarded in accordance with the following well-established principles. Scientific excellence shall be the sole criterion on which ERC grants are awarded. The ERC shall operate on a 'bottom-up' basis without predetermined priorities.

Broad Lines

Broad Lines

- Long-term funding to support excellent investigators and their research teams to pursue ground-breaking, high-gain/high-risk research;
- Starting researchers with excellent ideas to make the transition to independence while consolidating their own research team or programme;
- New ways of working in the scientific world with the potential to create breakthrough results and facilitate commercial and social innovation potential of funded research;
- Sharing experience and best practices with regional and national research funding agencies to promote the support of excellent researchers;

- Long-term funding to support excellent investigators and their research teams to pursue ground-breaking, high-gain/high-risk research;
- Starting researchers with excellent ideas to make the transition to independence while consolidating their own research team or programme;
- New ways of working in the scientific world with the potential to create breakthrough results and facilitate commercial and social innovation potential of funded research;
- Sharing experience and best practices with regional and national research funding agencies **as well as other Union bodies** to promote the support of excellent

- Raising the visibility of ERC programmes.

researchers;

- Raising the visibility of ERC programmes.

Amendment 26

Proposal for a decision

Annex I – part I – point 1 – point 1.3 – point 1.3.1 – paragraph 2 – point 2 – indent 4

Text proposed by the Commission

- review and **assess** the ERC's achievements and the quality and impact of the research funded by the ERC and **make** recommendations for corrective or future actions;

Amendment

- **periodically submit to external** review and **assessment** the ERC's achievements and the quality and impact of the research funded by the ERC and **accordingly, adopt** recommendations **and draw guidelines** for corrective or future actions;

Amendment 27

Proposal for a decision

Annex I – part I – point 2 – point 2.1

Text proposed by the Commission

2.1. Rationale

Europe needs **a** highly-skilled and resilient human **capital base** in research and innovation that can easily adapt to and find sustainable solutions for future challenges, such as major demographic changes in Europe. To ensure excellence, researchers need to be mobile, collaborate and diffuse knowledge across countries, sectors and disciplines, with the right combination of knowledge and skills to tackle societal challenges and support innovation.

Amendment

2.1. Rationale

Europe needs highly-skilled and resilient human **resources** in research and innovation that can easily adapt to and find sustainable solutions for **current and** future challenges, such as major demographic changes in Europe. To ensure excellence, researchers need to be mobile, **have access to top quality infrastructure in many fields**, collaborate and diffuse knowledge across countries, sectors and disciplines, with the right combination of knowledge and skills to tackle societal challenges and

Europe is a scientific powerhouse with around 1.8 million researchers working in thousands of universities, research centres and world-leading companies. However, it is estimated that the EU will need to train and employ at least one million new researchers by 2027 in order to achieve the targets being set for increased investment in research and innovation. This need is particularly acute in the non-academic sector. The EU must reinforce its efforts to entice more young women and men to a career in research, to attract researchers from third countries, retain its own researchers and reintegrate European researchers working elsewhere back to Europe. In addition, in order to more widely spread excellence, the conditions under which researchers perform must be further improved throughout the European Research Area (ERA). In this respect, stronger links are needed notably with the European Education Area (EEA), the European Regional Development Fund (ERDF), and European Social Fund (ESF+).

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Europe is a scientific powerhouse with around 1.8 million researchers working in thousands of universities, research centres and world-leading companies. However, it is estimated that the EU will need to train and employ at least one million new researchers by 2027 in order to achieve the targets being set for increased investment in research and innovation. This need is particularly acute in the non-academic sector.

The EU must reinforce its efforts to entice more young women and men to a career in research, to attract researchers from third countries, retain its own researchers and reintegrate European researchers working elsewhere back to Europe.

To achieve these goals, attention should also be paid to schemes adding more flexibility for researchers of both sexes to ensure work-life balance.

Mobility programs should also ensure effective equal opportunities and include specific measures to remove obstacles to the mobility of researchers, in particular female ones.

In addition, in order to ***ensure synergies and*** more widely spread excellence, ***the Seal of Excellence label will continue to be applied to calls under MSCA and*** the conditions under which researchers perform must be further improved

These challenges can best be addressed at EU level due to their systemic nature and to the cross-country effort needed to solve them.

The Marie Skłodowska-Curie Actions (MSCA) focus on excellent research that is fully bottom-up, open to any field of research and innovation from basic research up to market take-up and innovation services. This includes research fields covered under the Treaty on the Functioning of the European Union and the Treaty establishing the European Atomic Energy Community (Euratom). If specific needs arise and additional funding sources become available, the MSCA may target certain activities in specific challenges (incl. identified missions), types of research and innovation institutions, or geographical locations in order to respond to the evolution of Europe's requirements in terms of skills, research training, career development and knowledge sharing.

The MSCA are the main *instrument* at EU-level for attracting researchers from third countries to Europe, thus making a major contribution to global cooperation in research and innovation. Evidence shows that the MSCA not only have a positive impact on individuals, organisations, and at system level, but also yield high-impact and breakthrough research results while at the same time contributing significantly to societal as well as strategic challenges. Long-term investment in people pays off, as indicated by the number of Nobel Prize winners who have been either former MSCA fellows or supervisors.

Through global research competition between scientists and between host organisations from both the academic and

throughout the European Research Area (ERA). In this respect, stronger links are needed notably with the European Education Area (EEEdA), the European Regional Development Fund (ERDF), and European Social Fund (ESF+).

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The MSCA, *jointly with the ERC*, are the main *instruments* at EU-level for attracting researchers from third countries to Europe, thus making a major contribution to global cooperation in research and innovation. Evidence shows that the MSCA not only have a positive impact on individuals, organisations, and at system level, but also yield high-impact and breakthrough research results while at the same time contributing significantly to societal as well as strategic challenges. Long-term investment in people pays off, as indicated by the number of Nobel Prize winners who have been either former MSCA fellows or supervisors.

Through global research competition between scientists and between host organisations from both the academic and

non-academic sector, and through the creation and sharing of high-quality knowledge across countries, sectors and disciplines, the MSCA contribute notably to the goals of the 'Jobs, growth and investment' agenda, the EU Global Strategy and to the United Nations Sustainable Development Goals.

The MSCA contribute to making the ERA more effective, competitive and attractive on a global scale. This can be achieved by focusing on a new generation of highly-skilled researchers and providing support for emerging talent from across the EU and beyond; by fostering the diffusion and application of new knowledge and ideas to European policies, the economy and society, inter alia through improved science communication and public outreach measures; by facilitating cooperation between research-performing organisations; and by having a pronounced structuring impact on the ERA, advocating an open labour market and setting standards for quality training, attractive employment conditions and open recruitment for all researchers.

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Amendment 28

Proposal for a decision

Annex I – part I – point 2 – point 2.2 – point 2.2.2 – paragraph 1

Text proposed by the Commission

The EU needs a strong, resilient and creative human resource base, with the right combination of skills to match the future needs of the labour market, to innovate and to convert knowledge and ideas into products and services for economic and social benefit. This can be achieved through training researchers to further develop their core research competences as well as enhance their

Amendment

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transferable skills such as a creative and entrepreneurial mindset. This will allow them to face current and future global challenges, and improve their career prospects and innovation potential.

their transferable skills such as a creative and entrepreneurial mindset ***including the understanding of the benefits that standards bring to market new products and services***. This will allow them to face current and future global challenges, and improve their career prospects and innovation potential. ***This can be achieved, where appropriate, in complementarity with the EIT's educational activities.***

Amendment 29

Proposal for a decision

Annex I – part I – point 2 – point 2.2 – point 2.2.3

Text proposed by the Commission

2.2.3. Strengthening Human **Capital** and Skills Development across the European Research Area

In order to foster excellence, promote cooperation between research-performing organisations and create a positive structuring effect, high-quality training standards, good working conditions and effective career development of researchers need to be more widely spread across the ERA. This will help modernise or enhance research training programmes and systems as well as increasing institutions' worldwide attractiveness.

Broad Lines

- Training programmes to foster excellence and spread best practices across institutions and research and innovation systems;
- Cooperation, production and diffusion of knowledge within the EU and with third countries.

Amendment

2.2.3. Strengthening Human **Resources** and Skills Development across the European Research Area

In order to foster excellence, promote cooperation between research-performing organisations and create a positive structuring effect, high-quality training standards, good working conditions and effective career development of researchers need to be more widely spread across the ERA. This will help modernise or enhance research training programmes and systems as well as increasing institutions' worldwide attractiveness, ***developed in cooperation with other parts of Horizon Europe.***

Broad Lines

- Training programmes to foster excellence and spread best practices across institutions and research and innovation systems;
- Cooperation, production and diffusion of knowledge within the EU and with third countries.

Amendment 30

Proposal for a decision

Annex I – part I – point 2 – point 2.2 – point 2.2.5

Text proposed by the Commission

2.2.5. Promoting Public Outreach

The awareness of the programme's activities and the public recognition of researchers need to be enhanced across the EU and beyond, to raise the global profile of the MSCA and to develop a better understanding of the impact of researchers' work on citizens' daily lives, and to encourage young people to embark on research careers. This can be achieved through better dissemination, exploitation and diffusion of knowledge and practices.

Broad Lines

- Public outreach initiatives to stimulate interest in research careers, especially amongst young people;
- Promotion activities to raise the global profile, visibility and awareness of the MSCA;
- Diffusion and clustering of knowledge through cross-project collaboration and other networking activities such as an alumni service.

Amendment

2.2.5. Promoting Public Outreach

The awareness of the programme's activities and the public recognition of researchers need to be enhanced across the EU and beyond, to raise the global profile of the MSCA and to develop a better understanding of the impact of researchers' work on citizens' daily lives, and to encourage young people, *in particular women*, to embark on research careers. This can be achieved through better dissemination, exploitation and diffusion of knowledge and practices.

Broad Lines

- Public outreach initiatives to stimulate interest in research careers, especially amongst young people;
- Promotion activities to raise the global profile, visibility and awareness of the MSCA;
- Diffusion and clustering of knowledge through cross-project collaboration and other networking activities such as an alumni service *and national contact points*.

Amendment 31

Proposal for a decision

Annex I – part I – point 3 – point 3.1

3.1. Rationale

State of the art research infrastructures provide key services to research and innovation communities, playing an essential role in extending the frontiers of knowledge. Supporting research infrastructures at the EU level helps to mitigate what in many cases is the reality of scattered national research infrastructures **and** pockets of scientific excellence, as well as **tackling the low** circulation of knowledge across silos.

The overall aim is to endow Europe with world-class sustainable research infrastructures open and accessible to all researchers in Europe and beyond, which fully exploit their potential for scientific advance and innovation. Key objectives are to reduce the fragmentation of the research and innovation ecosystem, avoiding duplication of effort, and better coordinate the development **and use** of research infrastructures. It is crucial to support open access to research infrastructures for all European researchers as well as, through the European Open Science Cloud (hereafter 'EOSC'), increased access to digital research resources, specifically tackling the currently sub-optimal embracement of open science and open data practises. Equally, the EU needs to tackle the rapid increase of global competition for talent by attracting third country researchers to work with European world-class research infrastructures. Increasing the competitiveness of European industry is also a major objective, supporting key technologies and services relevant for research infrastructures and their users, thus improving the conditions for supply of innovative solutions.

3.1. Rationale

State of the art research infrastructures provide key services to research and innovation communities, playing an essential role in extending the frontiers of knowledge. Supporting **all types of** research infrastructures, **including small and medium-sized ones and those financed from ERDF**, at the EU level helps to mitigate what in many cases is the reality of scattered national **and regional** research infrastructures, **complementing and upgrading** pockets of scientific excellence, as well as **increasing the** circulation of knowledge across silos.

The overall aim is to endow Europe with world-class sustainable research infrastructures open and accessible to all researchers **and innovators** in Europe and beyond, which fully exploit their potential for scientific advance and innovation. Key objectives are to reduce the fragmentation of the research and innovation ecosystem, **ensure continuous modernisation**, avoiding duplication of effort, and better coordinate the development, **use and accessibility** of research infrastructures.

Past framework programmes have made a significant contribution towards the more efficient and effective use of national infrastructures as well as developed with the European Strategy Forum on Research Infrastructures (ESFRI) a coherent and strategy-led approach to policy making on pan-European research infrastructures. This strategic approach has generated clear advantages, including reducing duplication of effort with more efficient overall use of resources, as well as standardising processes and procedures.

EU supported activity will provide added value through: consolidating and optimised existing research infrastructures alongside efforts to develop new infrastructures; establishing the European Open Science Cloud (EOSC) as an effective scalable and sustainable environment for data-driven research; the interconnection of national and regional research and education networks, enhancing and securing high-capacity network infrastructure for massive

It is *also* crucial to support open access to research infrastructures for all European researchers as well as, through the European Open Science Cloud (hereafter 'EOSC'), increased access to digital research resources, specifically tackling the currently sub-optimal embracement of open science and open data practises. Equally, the EU needs to tackle the rapid increase of global competition for talent by attracting third country researchers to work with European world-class research infrastructures. Increasing the competitiveness of European industry is also a major objective, supporting key technologies and services relevant for research infrastructures and their users, thus improving the conditions for supply *and utilisation* of innovative solutions.

Past framework programmes have made a significant contribution towards the more efficient and effective use of national infrastructures *and towards the removal of barriers for transnational access*, as well as developed with the European Strategy Forum on Research Infrastructures (ESFRI) a coherent and strategy-led approach to policy making on pan-European research infrastructures. This strategic approach has generated clear advantages, including reducing duplication of effort with more efficient overall use of resources, as well as standardising *and harmonising* processes and procedures. *Strengthening and opening existing excellent R&I networks as well as creating new ones where appropriate, will also be a priority under this heading.*

EU supported activity will provide added value through: consolidating and optimised existing research infrastructures, *including e-infrastructures*, alongside efforts to develop new infrastructures; establishing the European Open Science Cloud (EOSC) as effective scalable and sustainable environment for data-driven research, the interconnection of national and regional research and education networks, enhancing and securing high-capacity

amounts of data and access to digital resources across borders and domain boundaries; overcoming barriers preventing the best research teams from accessing the best research infrastructures services in the EU; fostering the innovation potential of research infrastructures, focused on technology development and co-innovation as well as increased use of research infrastructures by industry.

And the international dimension of EU research infrastructures must be reinforced, fostering stronger cooperation with international counterparts and international participation in European research infrastructures for mutual benefit.

Activities will contribute to different Sustainable Development Goals (SDGs) such as: SDG 3 – Good Health and Well-Being for People; SDG 7 – Affordable and Clean Energy; SDG 9 – Industry Innovation and Infrastructure; SDG 13 – Climate Action.

network infrastructure for massive amounts of data and access to digital resources across borders and domain boundaries; overcoming barriers preventing the best research teams from accessing the best research infrastructures services in the EU; fostering the innovation potential of research infrastructures, focused on technology development and co-innovation as well as increased use of research infrastructures by industry.

And the international dimension of EU research infrastructures must be reinforced, fostering stronger cooperation, **access and connectivity** with international counterparts and international participation in European research infrastructures for mutual benefit.

Activities will contribute to different Sustainable Development Goals (SDGs) such as: SDG 3 – Good Health and Well-Being for People; SDG 7 – Affordable and Clean Energy; SDG 9 – Industry Innovation and Infrastructure; SDG 13 – Climate Action.

Amendment 32

Proposal for a decision

Annex I – part I – point 3 – point 3.2 – point 3.2.1

Text proposed by the Commission

3.2.1. Consolidating the Landscape of European Research Infrastructures

The establishment, operation and long-term sustainability of research infrastructures identified by ESFRI is essential for the EU to ensure a leading position in frontier research, the creation and use of knowledge and the competitiveness of its industries.

Amendment

3.2.1. Consolidating the Landscape of European Research Infrastructures

The establishment, operation and long-term sustainability of research infrastructures **including the ones** identified by ESFRI, **as well as maximising their involvement in excellent Horizon Europe's projects**, is essential for the EU to ensure a leading position in frontier research, the creation and use of knowledge and the competitiveness of its industries.

The European Open Science Cloud (EOSC) should become an effective and comprehensive delivery channel for research infrastructures services and should **provide** Europe's research communities **with** the next generation of data services for harvesting, storing, processing (e.g. analytics, simulation, visualisation services) and sharing big science data. The EOSC should also provide researchers in Europe with **access to** the majority of data generated and collected by research infrastructures as well **as** to HPC and exascale resources deployed under the European Data Infrastructure (EDI)¹³.

The pan-European research and education network will link together and enable remote access to research infrastructures and research resources, by providing interconnectivity between universities, research institutes and research and innovation communities at EU level as well as international connections to other partner networks worldwide.

Broad Lines

- The life-cycle of pan European research infrastructures through the design of new research infrastructures; their preparatory and implementation phase, their early-phase operation in complementarity with other funding sources, as well as the consolidation and optimisation of the research infrastructure ecosystem by monitoring the ESFRI landmarks and facilitating service agreements, evolutions, mergers or decommissioning of pan-European research infrastructures;
- The European Open Science Cloud, including: scalability and sustainability of the access channel; effective federation of European, national, regional and institutional resources; its technical and policy evolution to cope with new research needs and requirements (e.g. usage of sensitive data sets, privacy by design); data

The European Open Science Cloud (EOSC) should become an effective and comprehensive delivery channel for research infrastructures services and should **allow** Europe's research communities **to develop** the next generation of data services for harvesting, storing, processing (e.g. analytics, simulation, visualisation services) and sharing big science data. The EOSC should also provide researchers in Europe with **services encouraging the storage and processing of** the majority of data generated and collected by **researchers inside and outside of** research infrastructures **and should** as well **give access** to HPC and exascale resources deployed under the European Data Infrastructure (EDI)¹³.

The pan-European research and education network will link together and enable remote access to research infrastructures and research resources, by providing interconnectivity between universities, research institutes and research and innovation communities at EU level as well as international connections to other partner networks worldwide.

Broad Lines

- The life-cycle of pan European research infrastructures through the design of new research infrastructures; their preparatory and implementation phase, their early-phase operation in complementarity with other funding sources, as well as the consolidation and optimisation of the research infrastructure ecosystem by monitoring the ESFRI landmarks and facilitating service agreements, evolutions, mergers or decommissioning of pan-European research infrastructures;
- The European Open Science Cloud, including: scalability and sustainability of the access channel; effective federation of European, national, regional and institutional resources; its technical and policy evolution to cope with new research needs and requirements (e.g. usage of sensitive data sets, privacy by design); data

inter-operability and compliance with the FAIR principles; and a wide user base;

- The pan-European research and education network underpinning the EOSC and EDI as well as enabling the delivery of HPC/data services in a cloud based environment capable of coping with extreme large data sets and computational processes.

¹³ The European Data Infrastructure will underpin the European Open Science cloud by providing world-class High Performance Computing capability, high speed connectivity and leading-edge data and software services.

inter-operability and compliance with the FAIR principles; and a wide user base;

- The pan-European research and education network underpinning the EOSC and EDI as well as enabling the delivery of HPC/data services in a cloud based environment capable of coping with extreme large data sets and computational processes.

¹³ The European Data Infrastructure will underpin the European Open Science cloud by providing world-class High Performance Computing capability, high speed connectivity and leading-edge data and software services.

Amendment 33

Proposal for a decision

Annex I – part I – point 3 – point 3.2 – point 3.2.2

Text proposed by the Commission

3.2.2. Opening, Integrating and Interconnecting Research Infrastructures

The research landscape will be significantly enhanced through ensuring openness to key international, national and regional research infrastructures for all EU researchers and integrating their services when necessary so as to harmonise access conditions, improve and enlarge service provision and encourage common development strategy of high tech components and advanced services through innovation actions.

Broad Lines

- Networks that bring together national and regional funders of research infrastructures for the co-funding of trans-national access of researchers;

Amendment

3.2.2. Opening, Integrating and Interconnecting Research Infrastructures

The research landscape will be significantly enhanced through ensuring openness to key international, national and regional research infrastructures for all EU researchers **and innovators** and integrating their services when necessary so as to harmonise access conditions, improve and enlarge service provision and encourage common development strategy of high tech components and advanced services through innovation actions.

Broad Lines

- Networks that bring together national and regional funders of research infrastructures for the co-funding of trans-national access of researchers;

– Networks of *pan EU*, national and regional research infrastructures *addressing global challenges* for the provision of access to researchers as well as for the harmonisation and improvement of the infrastructures' services;

– Integrated networks of research infrastructures for development and implementation of a common strategy/roadmap for technological development required to improve their services through partnership with industry; as well as high-tech components in areas such as scientific instrumentation; and for fostering the use of research infrastructures by industry, e.g. as experimental test facilities.

– Networks of *pan-European*, national and regional research infrastructures, *including small and medium-sized ones*, for the provision of access to researchers as well as for the harmonisation and improvement of the infrastructures' services;

– Integrated networks of research infrastructures for development and implementation of a common strategy/roadmap for technological development required to improve their services through partnership with industry; as well as high-tech components in areas such as scientific instrumentation; and for fostering the use of research infrastructures by industry, e.g. as experimental test facilities.

Amendment 34

Proposal for a decision Annex I – part II

Text proposed by the Commission

II GLOBAL CHALLENGES AND INDUSTRIAL COMPETITIVENESS

Many of the challenges which confront the EU are also global *challenges*. The scale and complexity of the problems are vast, and need to be matched by the appropriate *money*, resources and effort in order to find solutions. These are precisely the areas where the EU must work together; smart, flexible and joined-up for the benefit and well-being of our citizens.

Greater impact can be obtained through aligning actions with other nations and regions of the world within an unprecedented international cooperation *along the lines* indicated by the

Amendment

II GLOBAL CHALLENGES AND *EUROPEAN* INDUSTRIAL COMPETITIVENESS

In an interconnected world, many of the challenges which confront the EU are also global. The scale and complexity of the problems are vast, and need to be matched by the appropriate *financial and human* resources and effort in order to find solutions. These are precisely the areas where the EU must work together; smart, flexible and joined-up for the benefit and well-being of our citizens.

Greater impact can be obtained through aligning actions with other nations and regions of the world within an unprecedented international cooperation *as* indicated by the Sustainable Development

Sustainable Development Goals and the Paris climate agreement. Based on mutual benefit, partners from across the world will be invited to join EU efforts as an integral part of research and innovation for sustainability.

Research and innovation are key drivers of sustainable growth and industrial competitiveness, and they will contribute to finding solutions to today's problems, to reverse as quickly as possible, the negative and dangerous trend that currently links economic development, the use of natural resources and social issues, and turn it into new business opportunities.

The EU will benefit as user and producer of technologies and industries **showcasing** how modern industrialised, sustainable inclusive, open and democratic society and economy can function and develop. The growing economic-environmental-social examples of the sustainable industrial economy of the future will be fostered and boosted, be they for: health and well-being for all; or **resilient** inclusive and secure societies; or available clean energy and mobility; or a digitised economy and society; or a transdisciplinary and **creative** industry; or space marine or land-based solutions; or food and nutrition solutions; sustainable use of natural resources climate protection and **adaptation**, all generating wealth in Europe and offering higher quality jobs. Industrial transformation will be crucial.

Research and innovation under this pillar of Horizon Europe is grouped into integrated clusters of activities. Rather than addressing sectors, the investments aim at systemic changes for our society and economy along a sustainability vector. These will only be achieved if all actors, both private and public, engage in co-designing and co-creating research and innovation; bringing together end-users, scientists, technologists, producers,

Goals and the Paris climate agreement. Based on mutual benefit, partners from across the world will be invited to join EU efforts as an integral part of research and innovation for sustainability.

Research and innovation are key drivers of sustainable **development, including** growth and industrial competitiveness, and they will contribute to finding solutions to today's problems, to reverse as quickly as possible, the negative and dangerous trend that currently links economic development, the use of natural resources and social issues, and turn it into **jobs and new business opportunities and economic, social and environmental development.**

The EU will benefit as user and producer of **knowledge**, technologies and industries. **It can showcase** how modern industrialised, sustainable inclusive, open and democratic society and economy can function and develop. The growing economic-environmental-social examples of the sustainable industrial economy of the future will be fostered and boosted, be they for: health and well-being for all; or inclusive and **creative societies; or** secure societies; or available clean energy and mobility; or a digitised economy and society; or a transdisciplinary and **effective** industry; or space marine or land-based solutions; or food and nutrition solutions; sustainable use of natural resources climate protection and **mitigation**, all generating wealth in Europe and offering higher quality jobs. Industrial transformation will be crucial.

Research and innovation under this pillar of Horizon Europe is grouped into integrated clusters of activities. Rather than addressing sectors, the investments aim at systemic changes for our society and economy along **an inclusiveness and a sustainability vector.** These will only be achieved if all actors, both private and public, engage in co-designing and co-creating research and innovation; bringing together end-users, **researchers**, scientists,

innovators, businesses, educators, citizens and civil society organisations. Therefore, none of the thematic clusters is intended for only one set of actors.

Clusters will develop and apply digital, key enabling and emerging technologies as part of a common strategy to promote the EU's industrial leadership. Where appropriate this will use EU space-enabled data and services.

There will be support to bring technology from lab to market and to develop applications including pilot lines and demonstrators, measures to stimulate market uptake and to boost private sector commitment. Synergies with other programmes will be maximised.

The clusters will boost the quick introduction of first-of-its-kind innovation in the EU through a broad range of embedded activities, including communication, dissemination and exploitation, standardisation as well as support to non-technological innovation and innovative delivery mechanisms, helping create innovation friendly societal, regulatory and market conditions such as the innovation deals. Pipelines of innovative solutions originating from research and innovation actions will be established and targeted to public and private investors as well as other relevant EU and national programmes.

technologists, *designers*, producers, innovators, businesses, educators, citizens and civil society organisations. Therefore, none of the thematic clusters is intended for only one set of actors.

Clusters will support knowledge creation in all its stages of development, including early stage research activities, complemented by cross-cutting support to ambitious, long-term, large-scale research initiatives geared towards future and emerging technologies (FET Flagships) initiated under the previous framework programme: Human Brain Project, Graphene, Quantum Technologies and Future Battery Technologies.

Clusters will *also* develop and apply digital, key enabling and *future* emerging technologies as part of a common strategy to promote the EU's industrial leadership. Where appropriate this will use EU space-enabled data and services.

There will be support to bring technology from lab to market and to develop applications including pilot lines and demonstrators, measures to stimulate market uptake and to boost private sector commitment. Synergies with other *parts of Horizon Europe, especially the EIT, as well as other* programmes will be maximised.

The clusters will boost the quick introduction of first-of-its-kind innovation in the EU, *while studying its impact on society*, through a broad range of embedded activities, including communication, dissemination and exploitation, standardisation as well as support to non-technological innovation and innovative delivery mechanisms, helping create innovation friendly societal, regulatory and market conditions such as the innovation deals. Pipelines of innovative solutions originating from research and innovation actions will be established and targeted to *leverage additional* public and private investors as well as other relevant EU and national

programmes.

Special attention will be put into supporting SMEs across Pillar 2 in collaborative parts and via a dedicated mono-beneficiary, grant-based SME Instrument. All clusters shall dedicate an appropriate amount to the SME instrument, which will be fully bottom up, with continuously open calls and a number of cut-off dates, dedicated exclusively to incremental innovation. Only SMEs will be allowed to apply for funding, including via collaborations or subcontracting. Projects must have a clear European dimension and contribute to EU added value.

Support via the SME instrument will be provided in three phases, based on the model on Horizon Europe:

- Phase 1: Concept and feasibility assessment:

SMEs will receive funding to explore the scientific or technical feasibility and the commercial potential of a new idea (proof of concept) in order to develop an innovation project. A positive outcome of this assessment, in which the linkage between project-topic and potential user/buyer needs is an important issue, will allow for funding under the following phase(s).

- Phase 2: R&D, demonstration, market replication:

With due attention to the innovation voucher concept, research and development will be supported with a particular focus on demonstration activities (testing, prototype, scale-up studies, design, piloting innovative processes, products and services, validation, performance verification etc.) and market replication encouraging the involvement of end users or potential clients. Innovation Vouchers will promote the participation of young entrepreneurs.

- Phase 3: Commercialisation:

This phase will not provide direct funding other than support activities, but aims to facilitate access to private capital and innovation enabling environments. Links with the EIC and InvestEU will be foreseen. SMEs will also benefit from support measures such as networking, training, coaching and advice. In addition, this phase may connect to measures promoting pre-commercial procurement and procurement of innovative solutions.

Amendment 35

Proposal for a decision

Annex I – part II – point 1 – point 1.1

Text proposed by the Commission

1.1. Rationale

The EU Pillar of Social Rights asserts that everyone has the right to timely access to affordable, preventive and curative health care of good quality. This underlines the EU's commitment to the UN's Sustainable Development Goals calling for universal health coverage for all at all ages by 2030, leaving no one behind, and ending preventable deaths.

A healthy population is vital for a stable, sustainable and inclusive society, and improvements in health are crucial in reducing poverty, in fostering social progress and prosperity, and in increasing economic growth. According to the OECD a 10% improvement in life expectancy is also associated with a rise in economic growth of 0.3-0.4% a year. Life expectancy in the EU increased by 12 years since its establishment as a result of tremendous improvements achieved in the quality of life, education, health *and care of its people*. In 2015, overall life expectancy at

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birth was 80.6 years in the EU compared to 71.4 years globally. In the past years, it increased in the EU on average by 3 months annually.

Health **research and innovation** research and innovation have played a significant part in this achievement but also in improving productivity and quality in the health and care industry. However, the EU continues to face novel, newly emerging or persisting challenges that are threatening its citizens and public health, the sustainability of its health care and social protection systems, as well as the competitiveness of its health and care industry. Major health challenges in the EU include: the lack of effective health promotion and disease prevention; the rise of non-communicable diseases; the spread of antimicrobial drug resistance and the emergence of infectious epidemics; increased environmental pollution; the persistence of health inequalities among and within countries affecting disproportionately people that are disadvantaged or in vulnerable stages of life; the detection, understanding, control, prevention and mitigation of health risks in a rapidly changing social, urban and natural environment; the increasing costs for European health care systems and the progressive introduction of **personalised** medicine approaches and digitalisation in health and care; and the increasing pressure on the European health and care industry to remain competitive in and by developing health innovation vis-a-vis new and emerging global players.

80.6 years in the EU compared to 71.4 years globally. In the past years, it increased in the EU on average by 3 months annually.

Health research and innovation have played a significant part in this achievement but also in improving productivity and quality in the health and care industry **as well as in providing the knowledge basis for healthier people and for better patient care. Health research has unique features, connecting and interacting closely with innovation, patient care and population health, and operating in a multidisciplinary environment with complex regulation.**

However, the EU continues to face novel, newly emerging or persisting challenges that are threatening its citizens and public health, the sustainability of its health care and social protection systems, as well as the competitiveness of its health and care industry. Major health challenges in the EU include: **the increased cases of cancer**; the lack of effective health promotion and disease prevention; the rise of non-communicable diseases; the spread of

antimicrobial drug resistance and the emergence of infectious epidemics; increased environmental pollution; the persistence of health inequalities among and within countries affecting disproportionately people that are disadvantaged or in vulnerable stages of life; the *early* detection, understanding, control, prevention and mitigation of health risks in a rapidly changing social, urban and natural environment; *increasing the number of healthy life years; the high costs of some innovative health tools and technologies for end-users*; the increasing costs for European health care systems and the progressive introduction of *precision* medicine approaches *including the relevant research* and digitalisation in health and care; and the increasing pressure on the European health and care industry to remain competitive in and by developing health innovation vis-a-vis new and emerging global players.

Digital health solutions have created many opportunities to solve the problems of care services and to address the other emerging issues of ageing society. Challenges also include taking full advantage of the progressive introduction of the opportunities that digitalisation in health and care provide without jeopardising the right to privacy and data protection. Digital devices and software have been developed to diagnose, treat and facilitate patients' self-management of illness, including chronic diseases. Digital technologies are also increasingly used in medical training and education and for patients and other healthcare consumers to access, share and create health information.

These health challenges are complex, interlinked and global in nature and require multidisciplinary, cross-sectorial and transnational collaborations. Research and innovation *activities* will build close linkages between *discovery*, clinical, epidemiological, environmental and socio-economic research as well as with

Today's health challenges are complex, interlinked and global in nature and require multidisciplinary, cross-sectorial, *translational* and transnational collaborations, *including with low-and middle-income countries*. Research and innovation will build close linkages between clinical, epidemiological, *ethical*,

regulatory sciences. They will harness the combined skills of academia and industry and foster their collaboration with health services, patients, policy-makers and citizens in order to leverage on public funding and ensure the uptake of results in clinical practice as well as in health care systems. They will foster strategic collaboration at EU and international level in order to pool the expertise, capacities and resources needed to create economies of scale, scope and speed as well as to share the expected benefits and financial risks involved.

The research and innovation activities of this global challenge will develop the knowledge base, build the research and innovation capacity and develop the solutions needed for a more effective promotion of health and the prevention, treatment and cure of diseases. Improving health outcomes will in turn result in increased life expectancy, healthy active lives and productivity of working age people, and sustainability of health and care systems.

Addressing major health challenges will contribute to the EU's policy goals and strategies, notably to the EU Pillar of Social Rights, the EU Digital Single Market, the EU Directive on cross-border healthcare, and the European One Health Action Plan against antimicrobial resistance (AMR), and to the implementation of the relevant EU regulatory frameworks. It will also support the EU's commitment to the United Nation's 2030 Agenda for Sustainable Development and those in the context of other UN organisations and international

environmental and socio-economic research as well as with regulatory sciences. They will harness the combined skills of academia and industry and foster their collaboration with health services, patients, policy-makers, ***civil society organisations*** and citizens in order to leverage on public funding and ensure the uptake of results in clinical practice as well as in health care systems. They will foster strategic collaboration at EU and international level in order to pool the expertise, capacities and resources needed to create economies of scale, scope and speed as well as to share the expected benefits and financial risks involved.

Studies and research under this cluster shall take into account the gender perspective and differences.

The research and innovation activities of this global challenge will develop the ***human resources and*** knowledge base, build the research and innovation capacity and develop the solutions needed for a more effective promotion of health and the prevention, treatment and cure of diseases. Improving health outcomes will in turn result in increased life expectancy, ***generalised healthy and*** active lives and productivity of working age people, and sustainability of health and care systems.

Innovation in the field of rapid diagnostic techniques and new antibiotics may prevent the development of antimicrobial resistance and will be promoted.

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initiatives, including the global strategies and plans of action of the World Health Organization (WHO).

initiatives, including the global strategies and plans of action of the World Health Organization (WHO).

A High-Level group will support achieving these aims, namely, the Steering Board for Health. It shall ensure coordination with other EU and national research programmes as well as synergies between the health cluster and other parts of Horizon Europe, including missions and partnerships. It will be science-led and include all relevant stakeholders, with strong participation of society, citizens and patients. It will be tasked to provide steering and advice in developing the work programme and missions related to health.

Activities will contribute directly to the following Sustainable Development Goal (SDGs) in particular: SDG 3 – Good Health and Well-Being for People; SDG13 – Climate Action.

Activities will contribute directly to the following Sustainable Development Goal (SDGs) in particular: SDG 3 – Good Health and Well-Being for People; SDG13 – Climate Action; ***and indirectly to SDGs 1 – No poverty; SDG 5 – Gender equality; SDG 6 – Clean water and sanitation; SDG 10 – Reduced inequalities.***

Amendment 36

Proposal for a decision

Annex I – part II – point 1 – point 1.2 – point 1.2.1

Text proposed by the Commission

1.2.1. Health throughout the Life Course

People in vulnerable stages of life (birth, infancy, childhood, adolescence, pregnancy, mature and late adulthood), including people with disabilities or injuries, have specific health needs that require better understanding and tailored solutions. This will allow reducing related health inequalities and improving health outcomes to the benefit of active and

Amendment

1.2.1. Health throughout the Life Course

People in vulnerable stages of life (birth, infancy, childhood, adolescence, pregnancy, mature and late adulthood), including people with disabilities, ***special needs*** or injuries, have specific health needs that require better understanding and tailored solutions. This will allow reducing related health inequalities and improving health outcomes to the benefit of active and

healthy ageing throughout the life course, in particular through a healthy start of life reducing the risk of mental and physical diseases later in life.

Broad Lines

- **Early development** and the aging process throughout the life course;
- Maternal, paternal, infant and child health as well as the role of parents;

- Health needs of adolescents;

- Health consequences of disabilities and injuries;
- Independent and active life for the elderly and/or disabled people;
- Health education and digital health literacy.

healthy ageing throughout the life course, in particular through a healthy start of life reducing the risk of mental and physical diseases later in life.

Broad Lines

- **Age-related diseases** and the aging process throughout the life course;
- Maternal, paternal, infant and child health, **including child and maternal survival**, as well as the role of parents;
- **Health needs and long-term consequences associated with high mortality and long-term morbidity, especially related to childhood issues;**
- Health needs of adolescents, **including psychological wellbeing;**
- **Aetiology of disabilities and** health consequences of disabilities and injuries;
- Independent and active life for the elderly and/or disabled people;
- Health education and digital health literacy;
- **Regeneration of aged or damaged organs and tissue;**
- **Angiogenesis, arterial pathology, myocardial ischemia and structural pathology of the heart and biomarkers and genetics of cardiovascular diseases;**
- **Treatment of chronic diseases.**

Amendments 37, 276 and 277

Proposal for a decision

Annex I – part II – point 1 – point 1.2 – point 1.2.2

Text proposed by the Commission

1.2.2. Environmental and Social Health Determinants

Amendment

1.2.2. Environmental and Social Health Determinants

Improved understanding of health drivers and risk factors determined by the social, economic and physical environment in people's everyday life and at the workplace, including the health impact of digitalisation, pollution, climate change and other environmental issues, will contribute to identify and mitigate health risks and threats; to reducing death and illness from exposure to chemicals and environmental pollution; to supporting environmental-friendly, healthy, resilient and sustainable living and working environments; to promoting healthy lifestyles and consumption behaviour; and to developing an equitable, inclusive and trusted society.

Broad Lines

- Technologies for assessing hazards, exposures and health impact of chemicals, pollutants and other stressors, including climate-related and environmental stressors, and combined effects of several stressors;
- Environmental, occupational, social and behavioural factors impacting physical and mental health and well-being of people and their interaction, with special attention to vulnerable and disadvantaged people;
- Risk assessment, management and communication, supported by improved tools for evidence-based decision-making, including alternatives to animal testing;
- Capacity and infrastructures to collect, share and combine data on all health determinants, including exposure, health and diseases at EU and international level;
- Health promotion and primary

Improved understanding of health drivers and risk factors determined by the social, economic and physical environment in people's everyday life and at the workplace, including the health impact of digitalisation, pollution, **rapid urbanisation**, climate change and other **national and transnational** environmental issues, will contribute to identify, **prevent and mitigate** health risks and threats; **to identifying and** to reducing death and illness from exposure to chemicals and environmental pollution; to supporting **safe** environmental-friendly, healthy, resilient and sustainable living and working environments; to promoting healthy lifestyles and consumption behaviour; and to developing an equitable, inclusive and trusted society.

Broad Lines

- **Safe and effective** technologies **and methodologies** for assessing hazards, exposures and health impact of chemicals, pollutants and other stressors, including climate-related and environmental stressors, and combined effects of several stressors;
- Environmental, **including built environment (design and construction)**, occupational, **economic, political**, social and behavioural factors impacting physical and mental health and well-being of people and their interaction, with special attention to vulnerable and disadvantaged people **as well as people with disabling or impairing conditions**;
- Risk assessment, management and communication, **including information sharing**, supported by improved tools for evidence-based decision-making, including alternatives to animal testing;
- Capacity and infrastructures to collect, share and combine data on all health determinants, including exposure, health and diseases at EU and international level;
- Health promotion and primary

prevention interventions.

prevention interventions.

- ***Research on measures to plan, implement and monitor rehabilitation throughout the life course.***

- ***Research on measures to plan and implement early individual rehabilitation programmes (EIRP) for children affected by disabling pathologies.***

Amendment 38

Proposal for a decision

Annex I – part II – point 1 – point 1.2 – point 1.2.3

Text proposed by the Commission

1.2.3. Non-Communicable and Rare Diseases

Non-communicable diseases (NCDs), including rare diseases, pose a major health and societal challenge and call for more effective approaches in prevention, treatment and cure, including ***personalised*** medicine approaches.

Broad Lines

- Diagnostics for earlier and more accurate diagnosis and for patient-adapted treatment;
- Prevention and screening programmes;
- Integrated solutions for self-monitoring, health promotion, disease prevention, and management of chronic conditions and multi-morbidities;
- Treatments ***or*** cures, including both pharmacological and ***nonpharmacological*** treatments;

Amendment

1.2.3. Non-Communicable and Rare Diseases

Non-communicable diseases (NCDs), including rare diseases, pose a major health and societal challenge and call for more effective approaches in prevention, ***diagnosis***, treatment and cure, including ***precision*** medicine approaches.

Broad Lines

- Diagnostics for earlier and more accurate diagnosis and for ***timely*** patient-adapted treatment;
- ***Infrastructure and capabilities to harness the potential of genomic medicine advances into standard clinical practice;***
- Prevention and screening programmes;
- Integrated solutions for self-monitoring, health promotion, disease prevention, and management of chronic conditions and multi-morbidities;
- ***Safe, effective and accessible*** treatments, cures ***or other therapeutic strategies***, including both pharmacological and ***non-pharmacological*** treatments;

- Palliative care;
 - Assessment of comparative effectiveness of interventions and solutions;
 - Implementation research to scale up health interventions and support their uptake in health policies and systems.
- Palliative care;
 - ***Collaborative research on molecular, structural and cell biology, experimental therapies, genetics, genomics and environmental bases of human cancer;***
 - ***The genomic frontier, epidemiology, bioinformatics, pathology and challenges of precision medicine in rare diseases, neurodegenerative diseases and oncology;***
 - ***Areas of high-unmet clinical need, such as rare cancers including paediatric cancers;***
 - Assessment of comparative effectiveness of interventions and solutions;
 - Implementation research to scale up health interventions and support their uptake in health policies and systems.

Amendment 39

Proposal for a decision

Annex I – part II – point 1 – point 1.2 – point 1.2.4

Text proposed by the Commission

1.2.4. Infectious Diseases

Protecting people against cross-border health threats is a major challenge for public health, calling for effective international cooperation at EU and global level. This will involve prevention, preparedness, early detection, treatment and cure of infectious diseases, and also tackling antimicrobial resistance (AMR) following a 'One Health approach'.

Amendment

1.2.4. Infectious Diseases

Protecting people against ***communicable diseases and*** cross-border health threats is a major challenge for public health, calling for effective international cooperation at EU and global level. This will involve prevention, preparedness, early detection, treatment and cure of infectious diseases, and also tackling antimicrobial resistance (AMR) following a 'One Health approach'. ***The continue spread of antimicrobial resistant bacteria, including super bacteria, will equally have significant detrimental impact on the economy and environment. Preventing their***

development and spread will also be one of the priorities under this heading. In addition, the World Health Organisation has defined a list of neglected diseases that lack private sector R&I investments due to limited commercial incentives. More ambitious public investments are needed to address the burden of such poverty-related and neglected diseases.

Broad Lines

- Drivers for the emergence or re-emergence of infectious diseases and their spread, including transmission from animals to humans (zoonosis), or from other parts of the environment (water, soil, plants, food) to humans;
- Prediction, early detection and surveillance of infectious diseases, including antimicrobial resistant pathogens, healthcare-associated infections and environmental related factors;
- *Vaccines*, diagnostics, treatments and *cures for* infectious diseases, including *co-morbidities and co-infections*;
- Effective health emergency preparedness, response and recovery measures and strategies, involving communities;
- Barriers to the implementation and uptake of medical interventions in clinical practice as well as in the health system;
- Trans-border aspects of infectious diseases and specific challenges in low- and middle-income countries (LMICs), such as tropical diseases.

Broad Lines

- Drivers for the emergence or re-emergence of infectious diseases and their spread, including transmission from animals to humans (zoonosis), or from other parts of the environment (water, soil, plants, food) to humans *and the implementation of empirical preventive solutions that minimize transmission*;
- Prediction, early detection and surveillance of infectious diseases, including antimicrobial resistant pathogens, healthcare-associated infections and environmental related factors;
- *Suitable, safe and efficient* diagnostics, *medical technologies*, treatments and *vaccines for prevention and prophylaxis of* infectious diseases, including *research and discovery of novel vaccine, advance immunization technologies and regulatory sciences*;
- Effective health emergency preparedness, response and recovery measures and strategies, involving communities;
- Barriers to the implementation and uptake of medical interventions in clinical practice as well as in the health system;
- Trans-border aspects of infectious diseases and specific challenges in low- and middle-income countries (LMICs), such as *neglected* tropical diseases, *AIDS, tuberculosis and malaria. Development of new treatment methods for infectious diseases to counteract antimicrobial resistance.*

Amendment 40

Proposal for a decision

Annex I – part II – point 1 – point 1.2 – point 1.2.5

Text proposed by the Commission

1.2.5. Tools, Technologies and Digital Solutions for Health and Care

Health technologies and tools are vital for public health and contributed to a large extent to the important improvements achieved in the quality of life, health and care of people, in the EU. It is thus a key strategic challenge to design, develop, deliver and implement suitable, trustable, safe, and cost-effective tools and technologies for health and care, taking due account of the needs of people with disabilities and the aging society. These include artificial intelligence and other digital technologies, offering significant improvements over existing ones, as well as stimulating a competitive and sustainable health-related industry that creates high-value jobs. The European health-related industry is one of the critical economic sectors in the EU, accounting for 3% of GDP and 1.5 million employees.

Broad Lines

- Tools and technologies for applications across the health spectrum and any relevant medical indication, including functional impairment;

- Integrated tools, technologies and digital solutions for human health, including mobile and telehealth;

Amendment

1.2.5. Tools, Technologies and Digital Solutions for Health and Care

Health technologies and tools are vital for public health and contributed to a large extent to the important improvements achieved in the quality of life, health and care of people, in the EU. It is thus a key strategic challenge to design, develop, deliver and implement suitable, trustable, safe and cost-effective tools and technologies for health and care, taking due account of the needs of people with disabilities and the aging society. These include ***the key enabling technologies, artificial intelligence, robotics, big data, quantum technology*** and other digital ***tools and*** technologies, offering significant improvements over existing ones, as well as stimulating a competitive and sustainable health-related industry that creates high-value jobs. The European health-related industry is one of the critical economic sectors in the EU, accounting for 3% of GDP and 1.5 million employees.

Broad Lines

- Tools and technologies for applications across the health spectrum, ***including the manufacturing of health technologies*** and any relevant medical indication, including functional impairment;

- ***Artificial intelligence and robotics for health technologies and tools;***

- Integrated tools, technologies and digital solutions for human health, including mobile and telehealth;

- ***Personalised, digital health approaches based on "Digital Twins",***

- Piloting, large-scale deployment, optimisation, and innovation procurement of health and care technologies and tools in real-life settings including clinical trials and implementation research;
- Innovative processes and services for the development, manufacturing and rapid delivery of tools *and* technologies *for health and care*;
- The safety, efficacy and quality of tools and technologies for health and care as well as their ethical legal and social impact;
- Regulatory science for health technologies and tools.

accurate data-driven computer models of key biological processes of the human body, allowing identification of the best therapy per individual, health prevention and maintenance measures;

- Piloting, large-scale deployment, optimisation, and innovation procurement of health and care technologies and tools in real-life settings including clinical trials and implementation research;
- Innovative processes and services for the development, manufacturing and rapid delivery of *care* tools, technologies, *medicines and vaccines*;
- The safety, efficacy and quality of tools and technologies for health and care as well as their ethical legal and social impact;
- Regulatory science for health technologies and tools;
- *Tools, technologies and digital solutions to increase the safety of medical decisions.*

Amendment 41

Proposal for a decision

Annex I – part II – point 1 – point 1.2 – point 1.2.6

Text proposed by the Commission

1.2.6. Health Care Systems

Health systems are a key asset of the EU social systems, accounting for 24 million employees in the health and social work sector in 2017. It is a main priority to render health systems accessible, cost-effective, resilient, sustainable and trusted as well as to reduce inequalities, including by unleashing the potential of data-driven and digital innovation for better health and person-centred care building on open

Amendment

1.2.6. Health Care Systems

Health systems are a key asset of the EU social systems, accounting for 24 million employees in the health and social work sector in 2017. It is a main priority to render health systems accessible, cost-effective, resilient, sustainable and trusted as well as to reduce inequalities, including by unleashing the potential of data-driven and digital innovation for better health and person-centred care building on open

European data infrastructures. This will advance the digital transformation of health and care.

Broad Lines

- Reforms in public health systems and policies in Europe and beyond;
- New models and approaches for health and care and their transferability or adaptation from one country/region to another;
- Improving health technology assessment;
- Evolution of health inequality and effective policy response;
- Future health workforce and its needs;

- Improving *timely* health information and use of health data, including electronic health records, with due attention to security, privacy, interoperability, standards, comparability and integrity;

- Health systems resilience in absorbing the impact of crises and to accommodate disruptive innovation;
- Solutions for citizen and patient empowerment, self-monitoring, and interaction with health and social care professionals, for more integrated care and a user-centred approach;
- Data, information, knowledge and

European data infrastructures. This will advance the digital transformation of health and care. ***The future infrastructure should rely on secure storages, such as 5G deployment, conditions for IoT development as well as high performance computing centres.***

Broad Lines

- Reforms in public health systems and policies in Europe and beyond;
- New models and approaches for health and care and their transferability or adaptation from one country/region to another;
- Improving health technology assessment;
- Evolution of health inequality and effective policy response;
- Future health workforce and its needs;

- ***Develop schemes for specialised training of healthcare professionals, training and developing technical know-how and new ways of working meeting innovation in e-health;***

- Improving *timeliness and quality of* health information, ***as well as the infrastructure for the effective collection*** and use of health data, including electronic health records, with due attention to security, privacy, interoperability, standards, comparability and integrity; ***health information and use of health data, including electronic health records, with due attention to security, trust, privacy, interoperability, standards, comparability, integrity;***

- Health systems resilience in absorbing the impact of crises and to accommodate disruptive innovation;
- Solutions for citizen and patient empowerment, self-monitoring, and interaction with health and social care professionals, for more integrated care and a user-centred approach;
- Data, information, knowledge and

best practice from health systems research at EU-level and globally.

best practice from health systems research at EU-level and globally.

Amendment 42

Proposal for a decision

Annex I – part II – point 2 – introductory part

Text proposed by the Commission

2. CLUSTER 'INCLUSIVE AND **SECURE** SOCIETY'

Amendment

2. CLUSTER 'INCLUSIVE AND **CREATIVE** SOCIETY'

Amendment 43

Proposal for a decision

Annex I – part II – point 2 – point 2.1

Text proposed by the Commission

2.1. Rationale

The EU stands for a unique way of combining economic growth with social policies, with high levels of social inclusion, shared values embracing democracy, human rights, gender equality and the richness of diversity. This model is constantly evolving and needs to deal with the challenges from amongst other things, globalisation and technological **change**. ***Europe also has to respond to the challenges arising from persistent security threats. Terrorist attacks and radicalisation, as well as cyber-attacks and hybrid threats, raise major security concerns and put particular strain on societies.***

The EU must promote a model of inclusive and sustainable growth while reaping the

Amendment

2.1. Rationale

The EU stands for a unique way of combining **prosperity**, economic growth **and sustainability** with social policies, with high levels of social inclusion, shared values embracing democracy, human rights, gender equality and the richness of diversity. This model is constantly evolving and needs to deal with the challenges from amongst other things, **digitalisation**, globalisation, and technological **evolution**.

The EU must promote a model of inclusive and sustainable growth while reaping the

benefits of technological advancements, enhancing trust in and promoting innovation of democratic governance, combatting inequalities, unemployment, marginalisation, discrimination and radicalisation, guaranteeing human rights, fostering cultural diversity and European cultural heritage and empowering citizens through social innovation. The management of migration and the integration of migrants will also continue to be priority issues. The role of research and innovation in the social sciences and the humanities in responding to these challenges and achieving the EU's goals is fundamental.

benefits of technological advancements, enhancing trust in and promoting innovation of democratic governance, combatting inequalities, unemployment, marginalisation, discrimination and radicalisation, guaranteeing human rights, fostering cultural diversity and European cultural heritage and empowering citizens through social innovation. The management of migration and the integration of migrants will also continue to be priority issues.

The role of research and innovation in the social sciences and the humanities ***and in the cultural and creative sector***, in responding to these challenges and achieving the EU's goals is fundamental. ***Due to its broad spectrums, size, and impact in today's digital transformation, these sectors contribute significantly to our economy. As interrelations between social and technological innovation are complex, and rarely linear, further research, including cross-sectoral and multidisciplinary research, is needed into the development of all types of innovation and activities funded to encourage its effective development into the future.***

European citizens, state institutions and the economy need to be protected from the continued threats of organised crime, including firearms trafficking, drug trafficking and trafficking in human beings. Strengthening protection and security through better border management is also key. Cybercrime is on the increase and related risks are diversifying as the economy and society digitalise. Europe needs to continue its efforts to improve cybersecurity, digital privacy, personal data protection and combat the spread of false and harmful information in order to safeguard democratic and economic stability. Lastly, further efforts are required to limit the

effects on lives and livelihoods of extreme weather events which are intensifying due to climate change, such as floods, storms or droughts leading to forest fires, land degradation and other natural disasters, e.g. earthquakes. Disasters, whether natural or man-made, can put at risk important societal functions, such as health, energy supply and government.

The magnitude, complexity and trans-national character of the challenges call multi-layered EU action. Addressing such critical social, political, cultural and economic issues, as well as security challenges, only at national level would carry the danger of inefficient use of resources, fragmented approaches and dissimilar standards of knowledge and capacity.

Security research is part of the wider comprehensive EU response to security threats. It contributes to the capability development process by enabling the future availability of technologies and applications to fill capability gaps identified by policy-makers and practitioners. Already, funding to research through the EU's framework programme has represented around 50% of total public funding for security research in the EU. Full use will be made of available instruments, including the European space programme (Galileo and EGNOS, Copernicus, Space Situational Awareness and Governmental Satellite Communications). Synergies are sought with the activities supported by EU-funded defence research and duplication of funding is avoided. Cross-border collaboration contributes to developing a European single security market and improving industrial performance, underpinning the EU's autonomy.

Research and Innovation activities in this Global Challenge will be overall aligned with the Commission's priorities on Democratic Change; Jobs, Growth and Investment; Justice and Fundamental Rights; Migration; A Deeper and Fairer

Research and Innovation activities in this Global Challenge will be overall aligned with the Commission's priorities on Democratic Change; Jobs, Growth and Investment; Justice and Fundamental Rights; Migration; A Deeper and Fairer

European Monetary Union; Digital Single Market. It will respond to the commitment of the Rome Agenda to work towards: "a social Europe" and "a Union which preserves our cultural heritage and promotes cultural diversity". It will also support the European Pillar of Social Rights, *and the Global Compact for safe, orderly and regular migration. Security research responds to the commitment of the Rome Agenda to work towards "a safe and secure Europe", contributing to a genuine and effective Security Union. Synergies with the Justice Programme and with the Rights and Values Programme, which support activities in the area of access to justice, victims' rights, gender equality, non-discrimination, data protection and promotion of the European citizenship will be exploited.*

Activities will contribute directly to the following Sustainable Development Goals (SDGs) in particular: SDG 1 - No Poverty; SDG 4 - Quality Education; SDG – Decent Work and Economic Growth; SDG 9 – Industry, Innovation and Infrastructure; SDG 10 - Reducing Inequalities; SDG 11- Sustainable Cities and Communities; SDG 16 – Peace, Justice and Strong Institutions.

European Monetary Union; Digital Single Market. It will respond to the commitment of the Rome Agenda to work towards: "a social Europe" and "a Union which preserves our cultural heritage and promotes cultural diversity". It will also support the European Pillar of Social Rights.

Activities will contribute directly to the following Sustainable Development Goals (SDGs) in particular: SDG 1 - No Poverty; SDG 4 - Quality Education; ***SDG 5 Gender equality***; SDG 8 – Decent Work and Economic Growth; SDG 9 – Industry, Innovation and Infrastructure; SDG 10 - Reducing Inequalities; SDG 11- Sustainable Cities and Communities; SDG ***12 – Responsible consumption and production***; SDG 16 – Peace, Justice and Strong Institutions, ***SDG 17 – Partnership for the goals.***

Amendment 44

Proposal for a decision

Annex I – part II – point 2 – point 2.2 – point 2.2.1 – paragraph 2

Text proposed by the Commission

Amendment

Broad Lines

Broad Lines

– The history, evolution and efficacy of

– The history, evolution and efficacy of

democracies, at different levels and in different forms; digitisation aspects and the effects of social network communication and the role of education *and* youth policies as cornerstones of democratic citizenship;

– Innovative approaches to support the transparency, responsiveness, accountability effectiveness and legitimacy of democratic governance in full respect of fundamental rights and of the rule of law;

– Strategies to address populism, extremism, radicalisation, terrorism and to include and engage disaffected and marginalised citizens;

– Better understand the role of journalistic standards and user-generated content in a hyper-connected society and develop tools to combat disinformation;

– The role of multi-cultural citizenship and identities in relation to democratic citizenship and political engagement;

– The impact of technological and scientific advancements, including big data, online social networks and artificial intelligence on 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

democracies, at different levels and in different forms, *such as movements for dialogue among cultures, cooperation among nations and peace among religions*; digitisation aspects *including media and digital literacy* and the effects of social network communication and the role of education, youth policies *and cultural participation* as cornerstones of democratic citizenship;

– Innovative approaches to support the transparency, responsiveness, accountability effectiveness and legitimacy of democratic governance, *including fight against corruption*, in full respect of fundamental *and human* rights and of the rule of law,

– *Impact of technologies on individual lifestyles and behaviours*;

– Strategies to address populism, extremism, radicalisation, *discrimination and hate speeches*, terrorism and to *actively* include, *empower* and engage disaffected, *vulnerable* and marginalised citizens;

– *New approaches to deal with the link between immigration and xenophobia, and the causes of migration*;

– Better understand the role of journalistic standards and user-generated content in a hyper-connected society and develop tools to combat disinformation;

– The role of multi-cultural citizenship and identities in relation to democratic citizenship and political engagement;

– The impact of technological and scientific advancements, including big data, online social networks and artificial intelligence on 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.

inequalities and combatting all forms of discrimination including gender, can sustain democracy;

– *New approaches to science diplomacy.*

Amendment 45

Proposal for a decision

Annex I – part II – point 2 – point 2.2 – point 2.2.2 – introductory part

Text proposed by the Commission

Amendment

2.2.2. *Cultural Heritage*

2.2.2. *Culture and Creativity*

Amendment 46

Proposal for a decision

Annex I – part II – point 2 – point 2.2 – point 2.2.2

Text proposed by the Commission

Amendment

2.2.2. Cultural Heritage

2.2.2. Cultural Heritage

The European Cultural and Creative sector builds bridges between arts, culture, business and technology. Furthermore, especially in the field of digitalisation, Cultural and Creative Industries (CCIs) play a key role in reindustrialising Europe, are a driver for growth and are in a strategic position to trigger innovative spill-overs in other industrial sectors, such as tourism, retail, media and digital technologies and engineering. In Horizon Europe, creativity and design will be a cross-cutting issue that will be integrated in projects throughout the programme in order to support new technologies,

Cultural heritage is *the fabric of our lives, meaningful to* communities, groups and societies, giving a sense of belonging. It is the bridge between the past and the future of our societies. It is a driving force of local economies and a powerful source of inspiration for creative and cultural *industries*. Accessing, conserving, safeguarding and restoring, interpreting and harnessing the full potential of our cultural heritage are crucial challenges now and for future generations. Cultural heritage is the major input and inspiration for the arts, traditional craftsmanship, the cultural, *entrepreneurial and creative* sectors that are drivers of sustainable economic growth, new job creation and external trade.

Broad Lines

- Heritage studies and sciences, with cutting edge technologies including digital ones;
- Access to and sharing of cultural heritage, with innovative patterns and uses and participatory management models;
- Connect cultural heritage with emerging creative sectors;
- The contribution of cultural heritage to sustainable development through conservation, safeguarding and regeneration of cultural landscapes, with the EU as a laboratory for heritage-based innovation and cultural tourism;
- Conservation, safeguarding, enhancement and restoration of cultural heritage *and* languages with the use of cutting edge technologies including digital;
- *Influence of* traditions, *behavioural*

business models and competences as well as translating creative and interdisciplinary solutions into economic and social value.

Cultural heritage is *an integral part of the cultural and creative sectors. Cultural heritage represents traces and expressions from the past that gives attributed-meaning to and is used by* communities, groups and societies, giving a sense of belonging. It is the bridge between the past and the future of our societies. It is a driving force of local economies and a powerful source of inspiration for the creative and cultural *sector*. Accessing, conserving, safeguarding and restoring, interpreting and harnessing the full potential of our cultural heritage are crucial challenges now and for future generations. Cultural heritage is the major input and inspiration for the arts, traditional craftsmanship, the cultural, *the creative and the entrepreneurial* sectors that are drivers of sustainable economic growth, new job creation and external trade.

Broad Lines

- Heritage studies and sciences, with cutting edge technologies including digital ones;
- Access to and sharing of cultural heritage *and related information*, with innovative patterns and uses and participatory management models;
- Connect cultural heritage with emerging creative sectors;
- The contribution of cultural heritage to sustainable development through conservation, safeguarding, *development* and regeneration of cultural landscapes, with the EU as a laboratory for heritage-based innovation and cultural tourism;
- Conservation, safeguarding, enhancement and restoration of cultural heritage, languages *and traditional skills and crafts* with the use of cutting edge technologies including digital;
- *Importance of pluralistic and*

patterns, perceptions and beliefs on values *and sense of belonging*.

diverse traditions, *customs*, perceptions and beliefs on values *in the development of communities*;

– *Establish a “European Cultural Heritage Cloud”, a research and innovation collaboration space granting accessibility of cultural heritage through new technologies as well as encouraging and facilitating transmission of know-how and skills, providing the opportunity to set up individual workgroups and project structures, and constituting a European cultural counterpart to commercially driven cloud services. This will be preceded by an impact assessment.*

Amendment 47

Proposal for a decision

Annex I – part II – point 2 – point 2.2 – point 2.2.3

Text proposed by the Commission

2.2.3. Social and Economic Transformations

European societies are undergoing profound *socio-economic* transformations, especially as a result of globalisation and technological innovations. At the same time there has been an increase in income inequality in most European countries¹⁴. Forward-looking policies are needed, with a view to promoting inclusive growth and reversing inequalities, boosting productivity (including advancements in its measurement) and human capital, responding to migration and integration challenges and supporting intergenerational solidarity and social mobility. Education and training systems are needed for a more equitable and prosperous future.

Amendment

2.2.3. Social, **Cultural** and Economic Transformations

European societies are undergoing profound *socio-cultural-economic* transformations, especially as a result of globalisation and technological innovations. At the same time there has been an increase in income inequality in most European countries¹⁴. Forward-looking policies are needed, with a view to promoting inclusive growth and reversing inequalities, boosting productivity (including advancements in its measurement) and human capital, **improving citizens living and working conditions**, responding to migration and integration challenges and supporting intergenerational solidarity and social mobility **and cultural integration**. **Accessible, inclusive, innovative and high-quality**, education and training

Broad Lines

– Knowledge base for advice on investments and policies especially education and training, for high value added skills, productivity, social mobility, growth, social innovation and job creation. The role of education and training to tackle inequalities;

– Social sustainability beyond GDP only indicators especially new economic and business models and new financial technologies;

– Statistical and other economic tools for a better understanding of growth and innovation in a context of sluggish productivity gains;

– New types of work, the role of work, trends and changes in labour markets and income in contemporary societies, and their impacts on income distribution, non-discrimination including gender equality and social inclusion;

– 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,

systems are needed for a more equitable and prosperous future.

Broad Lines

– Knowledge base for advice on investments and policies especially education and training, for high value added skills, productivity, social mobility, growth, social innovation and job creation. The role of education and training to tackle inequalities;

– ***Cross-scientific research combining economic cultural and social impact of technological change;***

– Social sustainability beyond GDP only indicators, especially new economic and business models, ***such as social economy*** and new financial technologies;

– Statistical and other economic ***and quantitative*** tools for a better understanding of growth and innovation in a context of sluggish productivity gains;

– New types of work, the role of work, trends and changes in labour markets and income in contemporary societies, and their impacts on income distribution, non-discrimination including gender equality and social inclusion;

– Tax and benefits systems together with social security and social investment policies, ***tax havens and tax justice*** with a view to reversing inequalities and addressing the negative impacts of technology, demographics and diversity;

– ***Strategies to address demographic change, urbanisation versus outward migration from rural areas, tackling socio-economic exclusion and enhancing quality of life in rural areas, including through the use of cutting edge technology and digital solutions;***

– 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;

- Education and training systems to foster and make the best use of the EU's digital transformation, also to manage the risks from global interconnectedness and technological innovations, especially emerging online risks, ethical concerns, socio-economic inequalities and radical changes in markets;
- Modernisation of public authorities to meet citizens' *expectation* regarding service provision, transparency, accessibility, openness, accountability and user centricity.
- Efficiency of justice systems and improved access to justice based on judiciary independence and rule of law principles, with fair, efficient and transparent procedural methods both in civil and criminal matters.

¹⁴ OECD Understanding The Socio-Economic Divide in Europe, 26 January 2017.

training, support services, active and inclusive citizenship especially for the vulnerable;

- Education and training systems to foster and make the best use of the EU's digital transformation, also to manage the risks from global interconnectedness and technological innovations, especially emerging online risks, ethical concerns, socio-economic inequalities and radical changes in markets;
- Modernisation of public authorities to meet citizens' *expectations and needs* regarding service provision, transparency, accessibility, openness, accountability and user centricity;
- Efficiency of justice systems and improved access to justice based on judiciary independence and rule of law principles, with fair, efficient, *accessible* and transparent procedural methods both in civil and criminal matters.

- *Identification of existing and emerging gender gaps and needs related to global transformations, and development of innovative methods to deal with gender stereotypes and gender biases.*

¹⁴ OECD Understanding The Socio-Economic Divide in Europe, 26 January 2017.

Amendment 48

Proposal for a decision

Annex I – part II – point 2 – point 2.2 – point 2.2.4

Text proposed by the Commission

2.2.4. *Disaster-Resilient Societies*

Disasters arise from multiple sources,

Amendment

2.2.4. *Social sciences and humanities*

whether natural or man-made, including those from terrorist attacks, climate-related and other extreme events (including from sea level rises), from forest fires, heat waves, floods, earthquakes, tsunamis and volcanic events, from water crises, from space weather events, from industrial and transport disasters, from CBRN events, as well as those from resulting cascading risks. The aim is to prevent and reduce the loss of life, harm to health and the environment, economic and material damage from disasters, ensure food security as well as to improve the understanding and reduction of disaster risks and post-disaster lesson learning.

Social sciences and humanities research shall be integrated into each of the priorities of Horizon Europe, contributing in particular to the evidence base for policymaking at international, Union, national, regional and local level. In addition to this integration, specific support shall be provided along the following broad lines, also support policy-making.

Broad Lines

- *Technologies and capabilities for first responders for emergency operations in crisis and disaster situations;*
- *The capacities of society to better manage and reduce disaster risk, including through nature-based solutions, by enhancing prevention, preparedness and response to existing and new risks*
- *Interoperability of equipment and procedures to facilitate cross-border operational cooperation and an integrated EU market.*

Broad Lines

- *Analysis and development of social, economic and political inclusion and inter-cultural dynamics in Europe and with international partners;*
- *Greater understanding of the societal changes in Europe and their impact;*

- *Tackling of major challenges concerning European models for social cohesion, immigration, integration, demographic change, ageing, disability, education, poverty and social exclusion;*
- *Support research to understand identity and belonging across communities, regions and nations.*

Amendment 49

Proposal for a decision

Annex I – part II – point 2 – point 2.2 – point 2.2.5

Text proposed by the Commission

Amendment

2.2.5. Protection and Security

deleted

There is a need to protect citizens from and to respond to security threats from criminal including terrorist activities and hybrid threats; to protect people, public spaces and critical infrastructure, from both physical (including CBRN-E) attacks and cyber-attacks; to fight terrorism and radicalisation, including understanding and tackling terrorist ideas and beliefs; to prevent and fight serious crime, including cybercrime, and organised crime; to support victims; to trace criminal financial flows; to support the use of data for law enforcement and to ensure the protection of personal data in law enforcement activities; to support air, land and sea EU border management, for flows of people and goods. It is essential to maintain flexibility rapidly to address new security challenges that may arise.

Broad Lines

– *Innovative approaches and technologies for security practitioners (such as police forces, border and coast guards, customs offices), public health practitioners, operators of infrastructure and those managing open spaces;*

- *Human and social dimensions of criminality and violent radicalisation, in relation to those engaged or potentially engaged in such behaviour as well as to those affected or potentially affected;*
- *The mind-set of citizens, public authorities and industry to prevent the creation of new security risks and to reduce existing risks, including those from new technologies such as Artificial Intelligence;*
- *Combatting disinformation and fake news with implications for security;*
- *Interoperability of equipment and procedures to facilitate cross-border and inter-agency operational cooperation and develop an integrated EU market.*
- *Ensuring the protection of personal data in law enforcement activities, in particular in view of rapid technological developments.*

Amendment 50

Proposal for a decision

Annex I – part II – point 2 – point 2.2 – point 2.2.6

Text proposed by the Commission

Amendment

2.2.6. Cybersecurity

deleted

Malicious cyber activities not only threaten our economies but also the very functioning of our democracies, our freedoms and our values. Cyber threats are often criminal, motivated by profit, but they can also be political and strategic. Our future security and prosperity depend on improving our ability to protect the EU against cyber threats. The digital transformation requires improving cybersecurity substantially, to ensure the protection of the huge number of IoT devices expected to be connected to the internet, including

those controlling power grids, cars and transport networks, hospitals, finances, public institutions, factories, homes. Europe must build resilience to cyber-attacks and create effective cyber deterrence.

Broad Lines

- *Technologies across the digital value chain (from secure components to cryptography and self-healing software and networks);*
- *Technologies to address current cybersecurity threats, anticipating future needs, and sustaining a competitive industry;*
- *A European cybersecurity competence network and competence centre.*

Amendment 51

**Proposal for a decision
Annex I – part II – point 2 a (new)**

Text proposed by the Commission

Amendment

2 a. CLUSTER 'SECURE SOCIETY'

2a.1 Rationale

In a context of transformations and growing global interdependencies and threats, research and innovation to ensure Europe's security is paramount.

Despite the fact that Europe is free from large-scale military aggressions, there is now the need to respond to the challenges arising from new security threats.

Terrorist attacks of various kind, violent radicalisation, as well as cyber-attacks and hybrid threats, raise major security concerns and put particular strain on societies. EU has to tackle these challenges and ensure public safety while

preserving individual freedom and fundamental rights.

Security research is part of the wider EU efforts to meet this and other challenges. It contributes to the capability development process by enabling future availability of technologies, solutions and applications to fill gaps identified by policy-makers, and end-users, especially public authorities.

Such research and innovation responds to the commitment of the Rome Agenda to work towards "a safe and secure Europe", contributing to the Security Union. Synergies with the Justice Programme and with the Rights and Values Programme, which support activities in the area of access to justice, victims' rights, gender equality, non-discrimination, data protection and promotion of the European citizenship will be exploited.

Full use will be made of available instruments, including the European space programme (Galileo and EGNOS, Copernicus, Space Situational Awareness and Governmental Satellite Communications).

Europe needs to continue its research and innovation efforts to improve cybersecurity, digital privacy, personal data protection and combat the spread of false and harmful information in order to safeguard prosperity, democratic and economic stability. Terrorism, violent radicalisation, ideologically motivated violence, cultural goods trafficking, cyber-attacks, organised crime, tax avoidance and environmental crime and disasters, are some examples of areas to be tackled under this cluster.

In order to anticipate, prevent and manage risks and threats, it is not only necessary to commit to research but furthermore to develop and apply innovative technologies, solutions, foresight tools and knowledge, stimulate cooperation between providers and public

users, find solutions, prevent and combat the abuse of privacy and breaches of human rights, while ensuring European citizens' individual rights and freedom.

To enhance complementarity in research and innovation, public security authorities shall be enforced in efforts of multi- and international exchange and cooperation. Public security authorities shall be invigorated to participate in EU research and innovation efforts to further their capabilities to cooperate and communicate on all appropriate levels, to exchange data, to benefit from common standards in technologies, procedures, equipment, and up-to-date results in crime related sciences, training, and supporting advantages of expert knowledge.

Furthermore, procurement shall be developed to support prototypes and facilitate the testing and acquisition of pre-market innovative solutions by public entities.

Activities will contribute directly to the following Sustainable Development Goals (SDGs) in particular: SDG 1 - No Poverty; SDG 4 - Quality Education; SDG – Decent Work and Economic Growth; SDG 9 – Industry, Innovation and Infrastructure; SDG 10 - Reducing Inequalities; SDG 11- Sustainable Cities and Communities; SDG 16 – Peace, Justice and Strong Institutions.

2a.2 Areas of Intervention

2a.2.1 Organised Crime; Terrorism, Extremism, Radicalisation and Ideologically Motivated Violence

Organised Crime, terrorism, extremism, violent radicalisation and ideologically motivated violence cause high risks to citizens as well as to Europe's society, economy and democratic stability. The perpetrators range from individual actors to highly organised criminal structures, also operating internationally. Research and innovation, including in humanities and technologies are required to detect,

prevent and counter their activities and their causes.

Broad Lines

- Human and social dimensions of criminality and violent radicalisation, in relation to those engaged or potentially engaged in such behaviour as well as to those affected or potentially affected;

- Innovative approaches and technologies for security end-users, especially public security authorities;

- Technologies and standards of operation for protecting infrastructure, open and public spaces;

- Prediction, detection, prevention, and protection against attempts and perpetrators of serious and organised crime, ideologically motivated radicalisation, violence and terrorism, including support to its victims;

2a.2.2 Border Protection Management

To advance safety and security within the EU requires research and innovation to strengthen the abilities of border protection and management. This includes area reconnaissance and surveillance (air, ground, sea), stable cooperation and data-exchange with foreign authorities, including interoperability capabilities with local, regional, national and international command-, control- and communication-centres as well as implementing solutions for border-protection, incident responding, risk-detection and crime-prevention. Further, to include is research on predictive policing and algorithm-based early warning applications, automated surveillance technologies using various kinds of sensors, while taking into account fundamental rights. While evaluating their impact and potential to enhance security efforts and solution, technologies and equipments should contribute to the integrity of those approaching external borders by especially land and sea.

Research should support the improvement of the integrated European border management, including through increased cooperation with candidate, potential candidate and EU Neighbourhood Policy countries. It will further assist EU efforts managing migration.

Broad Lines

- Identifying forged and otherwise manipulated documents;*
- Detecting illegal transportation/trafficking of persons and goods;*
- Furthering response capabilities to border incidents;*
- Modernisation of border areal reconnaissance and surveillance equipment;*
- Improving direct cooperation of security authorities of both sides in the respective border area for cross-border measures to ensure continuous persecution of offenders and suspects.*

2a.2.3 Cyber-Security, Privacy, Data Protection

Malicious and hostile cyber activities threaten our societies and citizens, the stable and secure functioning of public authorities and institutions, economies and also the very functioning of Europe's democratic institutions, our freedoms and values. Incidents involving public institutions have occurred already and are likely to increase in the course of further integration of digital and cyber applications in administrative and economic procedures as well as in private and individual use.

Cybercrime is on the increase, related risks are diversifying as the economy and society digitalise further on. Europe needs to continue its efforts to improve cybersecurity, digital privacy, personal data protection and combat the spread of false and harmful information in order to safeguard democratic and economic

stability.

Future security and prosperity depend on improving abilities to protect the EU against such threats, to prevent, detect and counter malicious cyber activities, often requiring close and rapid cross-border cooperation. Especially the digital transformation requires improving cybersecurity substantially, to ensure the protection of the huge number of IoT devices expected to be connected to the internet, Europe must keep up all efforts to enforce resilience to cyber-attacks and promote effective deterrence.

Broad Lines

- Combatting disinformation and fake news with implications for security, including the protection of electoral registration and evaluation/counting systems and communication (election security); developing capabilities to detect the sources of manipulation, while preserving freedom of speech and access to information.*
- Expanding detection, prevention, defence and countering technologies;*
- Strengthening abilities to decipher and decrypt cyber-attacks for public authorities;*
- Technologies to detect and monitor illicit electronic way of payment and financial flows;*
- Increase scientific and technological abilities of responsible authorities, especially European Police Office, European Cybercrime Centre and European Network and Information Security Agency;*
- Ensuring the protection of personal data in law enforcement activities, particularly in view of rapid technological developments;*
- Technologies across the digital value chain (from secure components to cryptography, distributed ledger technologies, behavioural based security*

and resilient and self-healing software and networks);

- Technologies, methods and best practices to address, prevent, mitigate and recover from cybersecurity threats, anticipating future needs, and sustaining a competitive industry with high availability, including improving knowledge and awareness concerning cybersecurity risks and consequences;

- Improving the protection of personal data by promoting easy-to-use solutions for devices used by citizens and consumers;

- Secure software and hardware development and test facilities for security testing of software and hardware.

2a.2.4 Protecting Critical Infrastructures and Improving Disaster Response

New technologies, processes, methods and dedicated capabilities will help to protect critical infrastructures, including e-infrastructures, systems and services which are essential for the proper functioning of society and economy, including communications, transport, finance, health, food, water, energy, logistic and supply chain, and environment.

Disasters arise from multiple sources, whether natural, man-made or resulting from cascading risks. Efforts are required to limit the effects on lives and livelihoods. The aim is to prevent and reduce harm to health and the environment, economic and material damage, to ensure food and medicine supply, security and basic means of communication.

Broad Lines

- Technologies and capabilities for first responders for emergency operations in crisis and disaster situations including disaster response for victims and early warning systems;

- Capacities of society to better manage

and reduce disaster risk, including through nature and community know-how-based solutions, by enhancing prevention, preparedness and response to existing and new risks, improving the resilience of these various infrastructures, including through disaster-resilient institutional, political and governance structures;

- Enhancing moving capabilities for search and rescue equipment, vehicles, supply and forces;

- Technologies, equipment and procedures to prevent the outbreak of or to contain pandemics;

- Improving multi-layer public alert systems, especially considering vulnerable persons;

- Improvement of the availability of specialised air- and ground vehicles to fight large-scale and forest fires as well as improving its rapid deployment.

2a.2.5 Piracy and Counterfeit of Products

Countering piracy and counterfeit of products remain of serious concern for the European economy, cultural and creative sector and citizens alike. These illicit activities cause serious losses of taxes, revenues and personal income as well as putting employment in Europe at risk.

Deficient products imply risks for causing damage to persons and property. Such impacts need to be addressed and solutions be found to tackle piracy and counterfeit of products as well as to enforce appropriate public authorities to prevent, detect, investigate and counter these crimes and related illegal activities in cooperation.

To include are efforts to promote the protection of intellectual property.

Broad Lines

- Promoting techniques of identifying products;

- Enhancing protection of original parts and goods;

- Technologies to control transported products (real-time) and data-exchange between producers, transporters, custom-authorities and recipients.

2a.2.6 Supporting the Union's external security policies through conflict prevention and peace-building

Research, new technologies, capabilities and solutions are required to support the Union's external security policies in civilian tasks, ranging from civil protection to humanitarian relief, border management or peace-keeping and post-crisis stabilisation, including conflict prevention, peace-building and mediation.

Broad Lines

- Research on conflict resolution and restoration of peace and justice, on early identification of factors leading to conflict and on the impact of restorative justice processes;

- Promoting interoperability between civilian and military capabilities in civilian tasks ranging from civil protection to humanitarian relief, border management or peace-keeping.

- Technological development in the area of dual-use technologies to enhance interoperability between civil protection and military forces and amongst civil protection forces worldwide, as well as reliability, organisational, legal and ethical aspects, trade issues, protection of confidentiality and integrity of information and traceability of all transactions and processing.

- Developing of command and control capabilities for civil missions.

2a.2.7 Promoting Coordination, Cooperation and Synergies

To ensure the ability to deploy, manage, control and command inter-authority procedures up-to-date technology and standards are required. The aim ought to

be to equip public authorities and other forces to be deployed with exchangeable equipment, to integrate EU-wide standard procedures of operation, responding, reporting and data-exchange.

An adequate budget should be allocated to agencies to further promote their ability to participate in as well as from EU research and innovation and in order to manage relevant projects, to exchange demands, results and ambitions as well as to cooperate and coordinate efforts with other agencies and certain non-EU authorities like Counter-Terrorism Group and Interpol. As for security related research and innovation these are especially European Policy College, European Aviation Safety Agency, European Centre for Disease Prevention and Control, European Monitoring Centre for Drugs and Drug Addiction, European Maritime Safety Agency, European Network and Information Security Agency, European Agency for the operational management of large-scale IT Systems in the area of freedom, security and justice, European Union Intellectual Property Office, European Police Office, European Border and Coast Guard Agency and European Union Satellite Centre.

To enhance synergies with EU-funded defence research, exchange and consultation mechanisms should be put in place with defence research associated authorities for civilian purposes.

Standards will play an important role as they ensure common development, production and implementation as well as abilities of exchange, interoperability and compatibility of services, procedures, technologies and equipment.

Broad Lines

- Technologies and equipment with basic operation requirements to be applicable by all Member States authorities of the same line (police, rescue, disaster management, communication etc.)

equally;
- Interoperability of equipment and procedures to facilitate cross-border and inter-agency operational ability.

Amendment 52

Proposal for a decision Annex I – part II – point 3 – introductory part

Text proposed by the Commission

3. CLUSTER 'DIGITAL **AND**
INDUSTRY'

Amendment

3. CLUSTER 'DIGITAL, INDUSTRY
AND SPACE'

Amendment 53

Proposal for a decision Annex I – part II – point 3 – point 3.1

Text proposed by the Commission

3.1. Rationale

To ensure industrial competitiveness and the capacity to address the global challenges ahead, the EU must reinforce and maintain its technological and industrial capacities in the key areas that underpin the transformation of our economy and society.

EU industry provides one out of five jobs and two thirds of private sector R&D investments and generates 80% of EU exports. A new wave of innovation, involving a merging of physical and digital technologies, will trigger huge opportunities for EU industry and improve the quality of life for EU citizens.

Amendment

3.1. Rationale

To ensure industrial competitiveness and the capacity to address the global challenges ahead, the EU must reinforce and maintain its technological and industrial capacities in the key areas that underpin the transformation of our economy and society.

EU industry provides one out of five jobs and two thirds of private sector R&D investments and generates 80% of EU exports. A new wave of innovation, involving a merging of physical and digital technologies, will trigger huge opportunities for EU industry and improve the quality of life for EU citizens.

Digitisation is a major driver. As it continues at a rapid pace across all sectors, investment in priority areas ranging from artificial intelligence to next generation internet, high performance computing, photonics **and** nano-electronics, becomes essential for the strength of our economy **and the sustainability of our society**. Investing, producing and using ICT provides a major boost to EU economic growth, amounting to an increase of 30% between 2001 and 2011 alone.

Key enabling technologies¹⁵ underpin the blending of the digital and the physical worlds, central to this new global wave of innovation. Investing in the development, demonstration **and** deployment of key enabling technologies, and ensuring a secure, sustainable and affordable **supply** of raw and advanced materials, will secure EU strategic autonomy and help EU industry to significantly reduce its carbon and environmental footprints.

Specific future and emerging technologies **may** also be pursued as **appropriate**.

Space is of strategic importance; around 10% of the EU's GDP depends on the use of space services. The EU has a world-class space sector, with a strong satellite manufacturing industry and a dynamic downstream services sector. Space provides important tools for communication, navigation, and surveillance and opens up many business opportunities especially in combination with digital technologies and other sources of data. The EU must make the most of these opportunities by fully exploiting the potential of its space programmes Copernicus, EGNOS and Galileo, and by protecting space and ground infrastructures against threats **from space**.

Digitisation is a major driver. As it continues at a rapid pace across all sectors, investment in priority areas ranging from artificial intelligence to next generation internet, high performance computing, photonics, **quantum technologies**, nano-electronics, **smart data etc.** becomes essential for the strength of our economy. Investing, producing and using ICT provides a major boost to EU economic growth, amounting to an increase of 30% between 2001 and 2011 alone.

Key enabling technologies¹⁵ underpin the blending of the digital and the physical worlds, central to this new global wave of innovation. Investing in the development, demonstration, deployment **and standardisation** of key enabling technologies, and ensuring a secure, sustainable and affordable **sourcing, use and management** of raw and advanced materials, will secure EU strategic autonomy and help EU industry to significantly reduce its carbon and environmental footprints **and hence costs for society in terms of externalities**.

Specific future and emerging technologies **should** also be pursued as **the grounds on which next breakthroughs innovations are based**.

Space is of strategic importance; around 10% of the EU's GDP depends on the use of space services. The EU has a world-class space sector, with a strong satellite manufacturing industry and a dynamic downstream services sector. Space provides important tools for communication, navigation, and surveillance and opens up many **research, innovation and** business opportunities especially in combination with digital technologies and other sources of data. The EU must make the most of these opportunities by fully exploiting the potential of its space programmes Copernicus, EGNOS and Galileo, **as well as encouraging amongst other the development of the downstream sector and the applications for the final users**

The EU has the unique chance of being a global leader and increase its share of world markets, by showcasing how digital transformation, leadership in key enabling and space technologies, the transition *to a* low-carbon, circular economy *and* competitiveness *can reinforce each other through scientific and technological excellence.*

To make the digitised, circular, low-carbon and low-emission economy a reality, action is needed at EU level because of the complexity of value chains, the systemic and multi-disciplinary nature of the technologies and their high development costs, and the cross-sectoral nature of the problems to be addressed. The EU must ensure that all industrial players, and society at large, can benefit from advanced and clean technologies and digitisation. Developing technologies alone will not suffice. Industrially-oriented infrastructures, including pilot lines, will help set up EU businesses and in particular SMEs deploy these technologies and improve their innovation performance.

A strong engagement of industry is essential in setting priorities and developing research and innovation agendas, increasing the leverage of public funding, and ensuring the uptake of results. Societal understanding and acceptance are key ingredients for success, as well as a new agenda for industry-relevant skills and standardisation.

Bringing together activities on digital, key enabling and space technologies, as well as a sustainable supply of raw materials, will

and by protecting space and ground infrastructures against threats.

The EU has the unique chance of being a global leader and increase its share of world markets, by showcasing how digital transformation, leadership in key enabling and space technologies *unlocking scenarios for the transition towards net-zero GHG emissions economy including low-carbon technologies and strategies for decarbonisation, bio-based and* circular economy, *ensuring* competitiveness and *societal understanding of these technologies and evolutions.*

To make the digitised, circular, low-carbon and low-emission economy a reality, action is needed at EU level because of the complexity of value chains, the systemic and multi-disciplinary nature of the technologies and their high development costs, and the cross-sectoral nature of the problems to be addressed. The EU must ensure that all industrial players, and society at large, can benefit from advanced and clean technologies and digitisation. Developing technologies alone will not suffice. *New sustainable business models*, industrially-oriented infrastructures, including pilot lines, will help set up EU businesses and in particular SMEs deploy these technologies and improve their innovation performance. *In this context cultural and creative sector also play a major role as drivers of digital transformation and ICT-driven innovation in Europe.*

Therefore, a strong engagement of industry is essential in setting priorities and developing research and innovation agendas, increasing the leverage of *additional public and private* funding, and ensuring the uptake of results. Societal understanding and acceptance are key ingredients for success, as well as a new agenda for industry-relevant skills and standardisation.

Bringing together activities on digital, key enabling and space technologies, as well as a sustainable supply of raw materials, will

allow for a more systemic approach, and a faster and more profound digital and industrial transformation. **It** will ensure that research and innovation in these areas feed into, and contribute to the implementation of, the EU's policies for industry, digitisation, environment, energy and climate, circular economy, raw and advanced materials and space.

Complementarity will be ensured with activities under the Digital Europe Programme, to respect the delineation between both Programmes and avoid any overlaps.

Activities will contribute directly to the following Sustainable Development Goals (SDGs) in particular: SDG 8 - Decent Work and Economic Growth; SDG 9 - Industry, Innovation and Infrastructure; SDG 12 - Responsible Consumption and Production; SDG-13 Climate Action.

¹⁵ The Key Enabling Technologies of the future include advanced materials and nanotechnology, photonics and micro- and nano-electronics, life science technologies, advanced manufacturing and processing, artificial intelligence and digital security and connectivity

allow for a more systemic approach, and a faster and more profound digital and industrial transformation. **This** will ensure that research and innovation in these areas feed into, and contribute to the implementation of, the EU's policies for industry, digitisation, environment, energy and climate, **mobility**, circular economy, raw and advanced materials and space.

Complementarity will be ensured with activities under the Digital Europe Programme, to respect the delineation between both Programmes and avoid any overlaps.

Activities will contribute directly to the following Sustainable Development Goals (SDGs) in particular: SDG 8 - Decent Work and Economic Growth; SDG 9 - Industry, Innovation and Infrastructure; SDG 12 - Responsible Consumption and Production; SDG-13 Climate Action.

¹⁵ The Key Enabling Technologies of the future include advanced materials and nanotechnology, photonics and micro- and nano-electronics, life science technologies, advanced manufacturing and processing, artificial intelligence and digital security and connectivity

Amendment 54

Proposal for a decision

Annex I – part II – point 3 – point 3.2 – point 3.2.1

Text proposed by the Commission

3.2.1. Manufacturing Technologies
Manufacturing is a key driver of employment and prosperity in the EU, producing over three quarters of the EU's global exports and providing over a 100 million direct and indirect jobs. The key

Amendment

3.2.1. Manufacturing Technologies
Manufacturing is a key driver of employment and prosperity in the EU, producing over three quarters of the EU's global exports and providing over a 100 million direct and indirect jobs. The key

challenge for EU manufacturing is to remain competitive at a global level with smarter **and** more customised products of high added value, **produced at much lower energy costs**. Creative and cultural inputs **will** be vital to **help generate added value**.

Broad Lines

- Breakthrough manufacturing technologies such as additive manufacturing, industrial robotics, human integrated manufacturing systems, also promoted via an EU network of industrially-oriented infrastructures;
- Breakthrough innovations using different enabling technologies (e.g. converging technologies, artificial intelligence, data analytics, industrial robotics, bio-manufacturing, advanced batteries technologies) across the value chain;
- Skills and workspaces fully adapted to the new technologies, in line with European social values;
- Flexible, high-precision, zero-defect and zero-waste cognitive plants and smart manufacturing systems meeting customer needs;
- Breakthrough innovations in techniques for exploring construction sites, for full automation for on-site assembly and prefabricated components.

challenge for EU manufacturing is to remain competitive at a global level with smarter, more customised **and more energy and resource efficient** products of high added value **and reduced carbon footprint, including less waste and pollution**. Creative and cultural inputs, **as well as perspectives from social sciences and humanities on the relation between technology and people, will also** be vital to **achieve these goals**.

Broad Lines

- Breakthrough manufacturing technologies such as additive manufacturing, **modelling, simulation,** industrial **automation and** robotics, human integrated manufacturing systems, also promoted via an EU network of industrially-oriented infrastructures;
- Breakthrough innovations using different enabling technologies (e.g. converging technologies, artificial intelligence, data analytics, industrial robotics, **sustainable** bio-manufacturing, advanced batteries technologies) across the value chain;
- Skills and workspaces fully adapted to the new technologies, **including ergonomics, and which are** in line with European social values **and needs**;
- Flexible, high-precision, zero-defect and zero-waste cognitive plants and smart **and energy efficient** manufacturing systems meeting customer needs;
- Breakthrough innovations in techniques for exploring construction sites, for full automation for on-site assembly and prefabricated components.

Amendment 55

Proposal for a decision

Annex I – part II – point 3 – point 3.2 – point 3.2.2 – paragraph 1

Text proposed by the Commission

Maintaining and autonomously developing strong design and production capacities in essential digital technologies such as micro- and nano-electronics, photonics, software and systems, and their integration as well as advanced materials for these applications will be essential for a competitive EU.

Amendment

Maintaining and autonomously developing strong design and production capacities in essential digital technologies such as micro- and nano-electronics, photonics, software and systems, and their integration **and standardisation**, as well as advanced materials for these applications will be essential for a competitive EU. **Key enabling digital technologies are essential to fill the gap between cutting edge research and market creating innovations.**

Amendment 56

Proposal for a decision

Annex I – part II – point 3 – point 3.2 – point 3.2.2 – paragraph 2

Text proposed by the Commission

- Nano-electronics design and processing concepts responding to the specific requirements of digital transformation and global challenges, in terms of functionality, energy consumption and integration;
- Sensing technologies and their co-integration with computational units as the enabler of the Internet of Things, including innovative solutions on flexible and conformable materials for **human-friendly** interacting objects;
- Technologies as complements or alternatives to nano-electronics, such as neuromorphic computing powering artificial intelligence applications, or integrated quantum computing;
- Computing architectures and low-power processors for a wide range of

Amendment

- Nano-electronics design and processing concepts responding to the specific requirements of digital transformation and global challenges, in terms of **performance**, functionality, energy **sharing and** consumption **and efficiency** and integration;
- Sensing technologies and their co-integration with computational units as the enabler of the Internet of Things, including innovative solutions on flexible and conformable materials for **safe, secure, human- and environment-friendly** interacting objects;
- Technologies as complements or alternatives to nano-electronics, such as neuromorphic computing powering artificial intelligence applications, or integrated quantum computing;
- Computing architectures and low-power processors for a wide range of

applications including edge computing, digitisation of industry, big data and cloud, smart energy and connected and automated driving;

- Computing hardware designs delivering strong guarantees of trusted execution, with built-in privacy and security protection measures for input/output data as well as processing instructions;
- Photonics technologies enabling applications with breakthrough advances in functionality and performance;
- System engineering technologies to support fully autonomous systems for trustworthy applications interacting with the physical world, including in industrial and safety critical domains;
- Software technologies enhancing **software** quality, security and reliability with improved service life, increasing development productivity, and introducing built-in artificial intelligence and resilience in software;
- Emerging technologies expanding digital technologies and bridging the gap from proofs of concept in research to industrial feasibility for relevant markets.

applications including edge computing, digitisation of industry, **automation and robotics**, big data and cloud, smart energy and connected and automated driving;

- Computing hardware designs delivering strong guarantees of trusted execution, with built-in privacy and security protection measures for input/output data as well as processing instructions;
- Photonics technologies enabling applications with breakthrough advances in functionality, **integration** and performance;
- System engineering technologies to support fully autonomous systems for trustworthy applications interacting with the physical world, including in industrial and safety critical domains;
- Software **and hardware** technologies enhancing quality, security and reliability with improved service life, increasing development productivity **and interoperability**, and introducing built-in artificial intelligence and resilience in software;
- Emerging technologies expanding digital technologies and bridging the gap from proofs of concept in research to industrial feasibility for relevant markets;
- ***Digital Technologies for cultural and creative industries, including audio-visual, archives and libraries, publishing, to develop new tools to create access, exploit and preserve digital content.***
- ***Development of novel eco-innovation business models and alternative resource and energy-efficient production approaches.***

Amendment 57

Proposal for a decision

Annex I – part II – point 3 – point 3.2 – point 3.2.3 – paragraph 1

Text proposed by the Commission

The EU is a global leader in advanced materials and associated processes, which make up 20% of its industry base and form the root of nearly all value chains through the transformation of raw materials. To remain competitive and meet citizens' needs for sustainable, safe and advanced materials, the EU must improve the recyclability of materials, reduce the carbon and environmental footprint, and drive cross-sectoral industrial innovation by supporting new applications in all industry sectors.

Amendment

The EU is a global leader in advanced materials and associated processes, which make up 20% of its industry base and form the root of nearly all value chains through the transformation of raw materials. To remain competitive and meet citizens' needs for sustainable, safe and advanced materials, ***including eco-friendly alternatives***, the EU must improve the ***durability, reusability and*** recyclability of materials, reduce the carbon and environmental footprint, and drive cross-sectoral industrial innovation by supporting new applications ***and standardisation*** in all industry sectors.

Amendment 58

Proposal for a decision

Annex I – part II – point 3 – point 3.2 – point 3.2.3 – paragraph 2

Text proposed by the Commission

Broad Lines

- Materials (including plastic, bio-, nano-, two-dimensional, smart and multi-materials) designed with new properties and functionalisation and meeting regulatory requirements (while not leading to increased environmental pressures during their production, use or end-of-life);
- Integrated materials processes and production following a customer-oriented and ethical approach, including pre-normative activities and life-cycle assessment, sourcing and management of raw materials, durability, reusability and recyclability, safety, risk assessment and management;

Amendment

Broad Lines

- Materials (including plastic, ***bioplastics***, bio-, nano-, two-dimensional, smart and multi-materials) designed with new properties and functionalisation and meeting regulatory requirements (while not leading to increased environmental pressures ***and negative externalities*** during their production, use or end-of-life);
- Integrated materials processes and production following a customer-oriented and ethical approach, including pre-normative activities and life-cycle assessment, ***sustainable*** sourcing and management of raw materials, durability, reusability and recyclability, safety, risk assessment and management;

- Materials enablers like characterisation (e.g. for quality assurance), modelling, piloting and upscaling;
- An EU innovation *ecosystem of* technology infrastructures¹⁶, identified and prioritised in agreement with Member States, which provide services to accelerate technological transformation and uptake by EU industry, notably by SMEs; this will cover all key technologies necessary to enable innovations in the field of materials;
- Analysis of future and emerging trends in advanced materials and other key enabling technologies;
- Solutions based on design, architecture and general creativity, with a strong user orientation, for adding value to industrial sectors and the creative industries.

¹⁶ These are public or private facilities that provide resources and services primarily for the European industry to test and validate key enabling technologies and products. Such infrastructures may be single sited, virtual or distributed, and must be registered in a Member State or a third country associated to the Programme.

- Materials enablers like characterisation (e.g. for quality assurance), modelling, piloting and upscaling;
- An EU innovation *network of research and* technology infrastructures¹⁶, identified and prioritised in agreement with Member States *and taking into account the ESFRI roadmap*, which provide services to accelerate technological transformation and uptake by EU industry, notably by SMEs, this will cover all key technologies necessary to enable innovations in the field of materials;
- Analysis of future and emerging trends in advanced materials and other key enabling technologies;
- Solutions based on design, architecture and general creativity, with a strong user orientation, for adding value to industrial sectors and the creative industries, *including the fashion industry*.

¹⁶ These are public or private facilities that provide resources and services primarily for the European industry to test and validate key enabling technologies and products. Such infrastructures may be single sited, virtual or distributed, and must be registered in a Member State or a third country associated to the Programme.

Amendment 59

Proposal for a decision

Annex I – part II – point 3 – point 3.2 – point 3.2.4 – paragraph 1

Text proposed by the Commission

Making any object and device intelligent is one of the megatrends. Researchers and innovators developing Artificial Intelligence (AI) and offering applications

Amendment

Making any object and device intelligent is one of the megatrends. Researchers and innovators developing Artificial Intelligence (AI) and offering applications

in Robotics and other areas will be key drivers of future economic and productivity growth. Many sectors including health, manufacturing, construction, and farming will use and further develop this key enabling technology, in other parts of the Framework Programme. Developments must ensure the safety of AI-based applications, assess *the* risks and mitigate *its* potential for malicious use and unintended discrimination such as gender or racial bias. It must also be ensured that AI is developed within *a* framework which respects the EU's values and the Charter of Fundamental Rights of the European Union.

in Robotics and other areas will be key drivers of future economic and productivity growth. Many sectors including health, *transport*, manufacturing, construction, and farming will use and further develop this key enabling technology, in other parts of the Framework Programme. Developments must ensure the safety of AI-based applications, assess *their* risks and mitigate *their* potential for malicious use and unintended discrimination such as gender or racial bias. It must also be ensured that AI is developed within *an ethical* framework which respects the EU's values and the Charter of Fundamental Rights of the European Union.

Amendment 60

Proposal for a decision

Annex I – part II – point 3 – point 3.2 – point 3.2.4 – paragraph 2 – indent 4

Text proposed by the Commission

- Developing and networking the research competences of AI competence centres across Europe;

Amendment

- Developing and networking the research *and innovation* competences of AI competence centres across Europe;

Amendment 61

Proposal for a decision

Annex I – part II – point 3 – point 3.2 – point 3.2.5 – paragraph 1

Text proposed by the Commission

The Internet has become a key enabler of the digital transformation of all sectors of our economy and society. The EU needs to take the lead in driving the next generation Internet towards a human-centric

Amendment

The Internet has become a key enabler of the digital transformation of all sectors of our economy and society. The EU needs to take the lead in driving the next generation Internet towards a human-centric

ecosystem in line with our social and ethical values. Investing in technologies and software for the Next Generation Internet will improve EU **industrial** competitiveness in the global economy. Optimising EU wide take up will require large-scale cooperation across stakeholders.

ecosystem **and technical development towards accessible, secure and reliable network services**, in line with our social and ethical values. Investing in technologies and software for the Next Generation Internet will improve EU competitiveness in the global economy. Optimising EU wide take up will require large-scale cooperation across stakeholders **and the development of European and international standardisation.**

Amendment 62

Proposal for a decision

Annex I – part II – point 3 – point 3.2 – point 3.2.5 – paragraph 2

Text proposed by the Commission

Broad Lines

- Technologies and systems for trusted and energy-efficient smart network and service infrastructures (connectivity beyond 5G, software defined infrastructures, Internet of things, cloud infrastructures, cognitive clouds), enabling real-time capabilities, virtualisation and decentralised management (ultrafast and flexible radio, edge computing, **blockchains**, shared contexts and knowledge);
- Next Generation Internet applications and services for consumers, industry and society building on trust, interoperability, better user control of data, transparent language access, new multi modal interaction concepts, inclusive and highly personalised access to objects, information and content, including immersive and trustworthy media, social media and social networking;

Amendment

Broad Lines

- Technologies and systems for trusted and energy-efficient smart network and service infrastructures (connectivity beyond 5G, software defined infrastructures, Internet of things, cloud infrastructures, cognitive clouds), enabling real-time capabilities, virtualisation and decentralised management (ultrafast and flexible radio, edge computing, **cryptology based technologies, distributed ledgers**, shared contexts and knowledge);
- Next Generation Internet applications and services for consumers, industry and society building on trust, interoperability, **interconnectivity**, better user control of data, transparent language access, new multi modal interaction concepts, inclusive and highly personalised access to objects, information and content, including immersive and trustworthy media, social media and social networking **as well as solutions for secure transactions and services over shared infrastructures**;

– Software-based middleware, including distributed ledger technologies, working in highly distributed environments, facilitating data mapping and data transfer across hybrid infrastructures with inherent data protection, embedding artificial intelligence, data analytics, security and control in Internet applications and services predicated on the free flow of data and knowledge.

– Software-based middleware, including distributed ledger technologies, working in highly distributed environments, facilitating data mapping and data transfer across hybrid infrastructures with inherent data protection, embedding artificial intelligence, data analytics, security and control in Internet applications and services predicated on the free flow of data and knowledge;

- ***Technologies and tools for system of systems integration for societal and industrial applications to ensure scalable, efficient and reliable network performance suited for massive service deployment.***

Amendment 63

Proposal for a decision

Annex I – part II – point 3 – point 3.2 – point 3.2.6 – paragraph 2

Text proposed by the Commission

Broad Lines

– High Performance Computing (HPC): next generation of key exascale and post-exascale technologies and systems (e.g. low-power microprocessors, software, system integration); algorithms, codes and applications, and analytic tools and test-beds; industrial pilot test-beds and services; supporting research and innovation for a world-class HPC infrastructure, including the first hybrid HPC / Quantum computing infrastructure in the EU;

– Big Data: Extreme-performance data analytics; "Privacy by design" in the analysis of personal and confidential Big Data; technologies for full-scale data platforms for re-use of industrial, personal

Amendment

Broad Lines

– High Performance Computing (HPC): ***development of the*** next generation of key exascale and post-exascale technologies and systems (e.g. low-power microprocessors, software, system integration); ***dedicated hardware,*** algorithms, codes and applications, and analytic tools and test-beds; industrial pilot test-beds and services; supporting research and innovation for a world-class HPC infrastructure, including the first hybrid HPC / Quantum computing infrastructure in the EU;

– Big Data: Extreme-performance data analytics; ***secure and integrity-preserving*** "Privacy by design" in the analysis of personal and confidential Big Data; technologies for full-scale data platforms

and open data; data management, interoperability and linking tools; data applications for global challenges;

- Reduced carbon footprint of ICT processes, covering hardware, software, sensors, networks, storage and data centres, and including standardised assessments.

for re-use of industrial, personal and open data; data management, interoperability and linking tools; data applications for global challenges;

- Reduced carbon footprint of ICT processes, covering hardware, software, sensors, networks, storage and data centres, and including standardised assessments.

Amendment 64

Proposal for a decision

Annex I – part II – point 3 – point 3.2 – point 3.2.6 a (new)

Text proposed by the Commission

Amendment

3.2.6 a. Quantum Technologies

Quantum Technologies (QT) exploit the enormous advancements in our ability to detect and manipulate single quanta (atoms, photons, electrons). This could revolutionize the whole information value chain from software to hardware and from communications to data mining and AI. Europe is home to world leading researchers in this field and there is currently a global race to transfer scientific advances into market-ready applications. This key enabling technology will have a profound cross-sectorial impact, providing European citizens and industry for example with fundamentally more performing computation (leading, amongst other, to more reliable healthcare, improved chemicals and materials, optimized and thus more sustainable use of resources, more efficient engineering), more secure telecommunications, and many other revolutionary applications.

Broad Lines

- ***Quantum computing and simulation, including hardware development of***

different architectures and physical platforms, and algorithm and software development;

– Quantum networks for secure transmission of data and for sharing quantum resources, both ground- and space-based;

– Quantum sensors, imaging systems and metrology standards, exploiting coherent quantum systems and entanglement;

– Testbeds and user facilities for the above-mentioned technologies.

Amendment 65

Proposal for a decision

Annex I – part II – point 3 – point 3.2 – point 3.2.7 – paragraph 2

Text proposed by the Commission

Primary raw materials will continue to play an important role in the circular economy and attention must be paid to their sustainable production. In addition, entirely new materials, products and processes should be designed for circularity. Building a circular industry will have several advantages for Europe: It will lead to a secure, sustainable and affordable supply of raw materials, which will in turn protect the industry against scarcity of resources and price volatility. It will also create new business opportunities and innovative, more efficient ways of producing.

Amendment

Primary raw materials will continue to play an important role in the circular economy and attention must be paid to their sustainable **sourcing, usage and** production. In addition, entirely new materials, products and processes should be designed for circularity. Building a circular industry will have several advantages for Europe: It will lead to a secure, sustainable and affordable supply of raw materials, which will in turn protect the industry against scarcity of resources and price volatility. It will also create new business opportunities and innovative, more efficient ways of producing.

Amendment 66

Proposal for a decision

Annex I – part II – point 3 – point 3.2 – point 3.2.7 – paragraph 3

Text proposed by the Commission

The objective is to develop affordable breakthrough innovations and deploy a combination of advanced technologies and processes so as to extract maximum value from all resources.

Amendment

The objective is to develop affordable breakthrough innovations and deploy a combination of advanced ***and digital*** technologies and processes so as to extract maximum value from all resources.

Amendment 67

Proposal for a decision

Annex I – part II – point 3 – point 3.2 – point 3.2.7 – paragraph 4

Text proposed by the Commission

Broad Lines

- Industrial symbiosis with resource flows between plants across sectors and urban communities; processes and materials, to transport, transform, re-use and store resources, combining the valorisation of by-products, waste and CO₂;
- Valorisation and life-cycle assessment of materials and product streams with use of new alternative feedstocks, resource control, material tracking and sorting;
- Products for enhanced life-cycle performance, durability, upgradeability and ease ***of*** repair, dismantling and recycling;
- Recycling industry, maximising potential and safety of secondary materials and minimising pollution, quality downgrading, and quantity dropouts after treatment;

Amendment

Broad Lines

- Industrial symbiosis with resource flows between plants across sectors and urban communities; processes and materials, to transport, transform, re-use and store resources, combining the valorisation of by-products, waste and CO₂;
- Valorisation and life-cycle assessment of materials and product streams with use of new alternative feedstocks, resource control, ***including new business models, automation and digital technologies for*** material tracking and sorting;
- Products ***development, including their design,*** for enhanced life-cycle performance, durability, ***re-usability, repairability,*** upgradeability and ease ***remanufacturing,*** repair, dismantling and recycling;
- Recycling industry, maximising potential and safety of secondary materials and minimising pollution, quality downgrading, and quantity dropouts after treatment;

- Elimination of substances of concern in the production and end-of-life phases; safe substitutes, and safe and cost-efficient production technologies;
- Sustainable supply *or* substitution of raw materials, including critical raw materials, covering the whole value chain.

- ***Safe heading and*** elimination of substances of concern in the production and end-of-life phases; safe substitutes, and safe and cost-efficient production technologies;
- Sustainable supply ***and/or*** substitution ***options*** of raw materials, including critical raw materials, covering the whole value chain.

Amendment 68

Proposal for a decision

Annex I – part II – point 3 – point 3.2 – point 3.2.8 – paragraph 1

Text proposed by the Commission

Industrial sectors, including energy-intensive industries, contribute millions of jobs and their competitiveness is key for the prosperity of our societies. However, they account for 20% of the global greenhouse gas emissions and have a high environmental impact (particularly in terms of air, water and soil *pollutants*).

Amendment

Industrial sectors, including energy-intensive industries, contribute millions of jobs and their competitiveness is key for the prosperity of our societies. However, they account for 20% of the global greenhouse gas emissions and have a high environmental impact (particularly in terms of air, water and soil *pollution*). ***Therefore, industries, especially those that are energy-intensive, should further improve energy efficiency in order to gain in competitiveness and lower EU's energy demand. An increased integration of renewable energy sources through the development of new power-driven industrial techniques and processes is of major importance for industrial transformation.***

Amendment 69

Proposal for a decision

Annex I – part II – point 3 – point 3.2 – point 3.2.8 – paragraph 2

Text proposed by the Commission

Breakthrough **technologies** to achieve significant reductions in greenhouse gases and pollutants, **often** combined with **the** technologies for circular **industry above**, will lead to strong industrial value chains, revolutionise manufacturing capacities **and improve the global competitiveness of industry; and** at the same time make key contributions to our targets for climate action and environmental quality.

Amendment

Large-scale breakthrough **scientific and technological research** to achieve significant **energy** reductions in greenhouse gases and pollutants, combined **for example** with technologies for circular **economy and digital technologies**, will lead to strong industrial value chains, revolutionise manufacturing capacities at the same time make key contributions to our targets for climate action and environmental quality.

Amendment 70

Proposal for a decision

Annex I – part II – point 3 – point 3.2 – point 3.2.8 – paragraph 3

Text proposed by the Commission

- Process technologies, including heating and cooling, digital tools **and** large-scale demonstrations for process performance and efficiency; substantial reductions or avoidance of industrial emissions of greenhouse gases and pollutants, including particulate matter;
- Industrial CO₂ valorisation;
- Electrification and use of **unconventional** energy sources within industrial plants, **and energy and resource exchanges between industrial plants (for**

Amendment

- Process technologies, including heating and cooling, **process agents and** digital tools, **especially in the form of** large-scale demonstrations for process performance and efficiency; substantial reductions or avoidance of industrial emissions of greenhouse gases and pollutants, including particulate matter;
- Industrial CO₂ valorisation, **including technologies and solutions to reduce GHG emissions from fossil fuel-based power generation, via CO₂ capture and utilisation;**
- **Carbon direct avoidance through the application of renewable based electrolytical hydrogen and renewable electrical power.**
- Electrification and use of **clean** energy sources within industrial plants, **in order to reduce fossil energy carriers, in particular for energy intensive** industrial

instance via industrial symbiosis);

- Industrial products that require low or zero carbon emissions production processes *through the life cycle*.

processes.

- Industrial products *and materials* that require low or zero carbon emissions production processes.

Amendment 71

Proposal for a decision

Annex I – part II – point 3 – point 3.2 – point 3.2.9 – paragraph 2

Text proposed by the Commission

The EU will support synergies between space and key enabling technologies (big data, advanced manufacturing, robotics and artificial intelligence); foster a thriving and entrepreneurial and competitive space sector; and *help* secure non-dependence in accessing and using space in a safe and secure manner. Activities will be roadmap-based, taking account of the ESA harmonisation process and relevant Member States initiatives, and will be implemented with ESA, as appropriate.

Amendment

The EU will support synergies between space and key enabling technologies (big data, advanced manufacturing, *quantum technologies*, robotics and artificial intelligence); *will* foster a thriving and entrepreneurial and competitive space sector; and *will help to* secure non-dependence in accessing and using space in a safe and secure manner. *Upstream* activities will be roadmap-based, taking account of the ESA harmonisation process and relevant Member States initiatives, and will be implemented with ESA, as appropriate. *Downstream activities will be market driven and respond to user needs and will be implemented with the Agency for the Space Programme.*

Amendment 72

Proposal for a decision

Annex I – part II – point 3 – point 3.2 – point 3.2.9 – paragraph 3 – indent 1

Text proposed by the Commission

- European Global Navigation Satellite Systems (Galileo and EGNOS): innovative

Amendment

- European Global Navigation Satellite Systems (Galileo and EGNOS): innovative

applications, global uptake including international partners, solutions improving robustness, authentication, integrity of services, development of fundamental elements such as chipsets, receivers and antennas, sustainability of supply chains, new technologies (e.g. quantum technologies, optical links, reprogrammable payloads), towards sustained exploitation of services for impact on societal challenges. Next generation systems development for new challenges such as security or autonomous driving;

– Copernicus: innovative applications, global uptake and international partners, robustness and evolution of services, sustainability of supply chains, sensors, systems and mission concepts (e.g. High Altitude Platforms, drones, light satellites); calibration and validation; sustained exploitation of services and impact on societal challenges; Earth observation data techniques, big data, computing resources and algorithmic tools. Next generation systems development for new challenges such as climate change, and security;

– Space Situational Awareness: robust EU capacity to monitor and forecast state of the space environment e.g. space weather, space debris and near Earth objects, and new service concepts, such as space traffic management, applications and services to secure critical infrastructure in space and on Earth;

– Secure Satellite Communications for EU governmental actors: solutions for the widest possible range of governmental users and associated user equipment in architectural, technological and system solutions for space infrastructure, supporting the EU's autonomy;

– End-to-end satellite Communications for citizens and businesses: cost-effective, advanced satellite communications to

applications, global uptake including international partners, solutions improving robustness, authentication, integrity of services, development of fundamental elements such as chipsets, receivers and antennas, sustainability of supply chains, new technologies (e.g. quantum technologies, optical links, reprogrammable payloads), **improved accessibility and increased diversity of applications** towards sustained exploitation of services for impact on societal challenges. Next generation systems development for new challenges such as **natural disaster risk reduction**, security or autonomous driving;

– Copernicus: innovative applications, global uptake and international partners, robustness and evolution of services, sustainability of supply chains, sensors, systems and mission concepts (e.g. High Altitude Platforms, drones, light satellites); calibration and validation; sustained exploitation of services and impact on societal challenges; Earth observation data techniques, big data, computing resources and algorithmic tools. Next generation systems development for new challenges such as **disaster risk reduction**, climate change, and security;

– Space Situational Awareness: robust EU capacity to monitor and forecast state of the space environment e.g. space weather, space debris and near Earth objects, **sensors**, and new service concepts, such as space traffic management, applications and services to secure critical infrastructure in space and on Earth;

– Secure, **quantum-safe** satellite communications for EU governmental actors: solutions for the widest possible range of governmental users and associated user equipment in architectural, technological and system solutions for space infrastructure, supporting the EU's autonomy;

– End-to-end satellite Communications for citizens and businesses: cost-effective, advanced satellite communications to

connect assets and people in underserved areas, as part of 5G-enabled ubiquitous connectivity and development of the Internet of Things (IoT), and contributing to the Next Generation Internet (NGI) infrastructure. Enhanced ground segment and user equipment, standardisation and interoperability to ensure EU industrial leadership;

- Non-dependence and sustainability of the supply chain: increased technology readiness levels in satellites and launchers; associated space and ground segments, and production and testing facilities. To secure EU technological leadership and autonomy, improved supply chain sustainability, reduced dependence on non-EU critical space technologies and improved knowledge of how space technologies can offer solutions to other industrial sectors;

- Space ecosystem: in-orbit validation and demonstration services, including rideshare services for light satellites; space demonstrators in areas such as hybrid, smart or reconfigurable satellites, in-orbit manufacturing and assembly, launcher reusability, in-orbit servicing and micro-launchers; breakthrough innovations, and technology transfer, in areas such as recycling, green space, artificial intelligence, robotics, digitisation, cost-efficiency, miniaturisation;

- Space science: exploitation of scientific data delivered by scientific and exploration missions, combined with the development of innovative instruments in an international environment; contribution to precursor scientific missions for the evolution of the Space Programme.

connect assets and people in underserved areas, as part of 5G-enabled ubiquitous connectivity and development of the Internet of Things (IoT), and contributing to the Next Generation Internet (NGI) infrastructure. Enhanced ground segment and user equipment, standardisation and interoperability to ensure EU industrial leadership;

- Non-dependence and sustainability of the supply chain: increased technology readiness levels in satellites and launchers; associated space and ground segments, and production and testing facilities. To secure EU technological leadership and autonomy, improved supply chain sustainability, reduced dependence on non-EU critical space technologies and improved knowledge of how space technologies can offer solutions to other industrial sectors;

- Space ecosystem: in-orbit validation and demonstration services, including rideshare services for light satellites; space demonstrators in areas such as hybrid, smart or reconfigurable satellites, in-orbit manufacturing and assembly, launcher reusability, in-orbit servicing and micro-launchers; breakthrough innovations, and technology transfer, in areas such as recycling, *clean space*, green space, artificial intelligence, robotics, digitisation, cost-efficiency, miniaturisation;

- Space science: exploitation of scientific data delivered by scientific and exploration missions, combined with the development of innovative instruments in an international environment; contribution to precursor scientific missions for the evolution of the Space Programme;

- ***Space AI and robotics: novel solutions for space missions e.g. space assembly, space manipulation, cognitive space systems, robot-human collaboration in space.***

Amendment 73

Proposal for a decision

Annex I – part II – point 4 – point 4.1

Text proposed by the Commission

The intersection of research and innovation on climate, energy and mobility will address in a highly integrated and effective way, one of the most important global challenges for the sustainability and future of our environment and way of life.

To meet the objectives of the Paris Agreement the *EU* will need to transition to ***low-carbon, resource-efficient and resilient economies and societies***. This will ***be based on*** profound changes in technology and services, ***to*** the ways in which businesses and consumers behave, as well as ***involving*** new forms of governance. Limiting the increase of global average temperature to well below 2°C, and pursuing efforts to limit the temperature increase to 1.5°C, requires ***rapid progress in decarbonising the energy system and substantially reducing*** greenhouse-gas (GHG) emissions ***from*** the transport sector¹⁷. ***It will also need*** new impetus to accelerate the pace of developing next-generation breakthroughs as well as demonstrating and deploying innovative technologies and solutions, using also the opportunities provided by digital and space technologies. This will be pursued through an integrated approach encompassing decarbonisation, resource efficiency, reduction of air pollution, access to raw materials ***and*** circular economy.

Amendment

The intersection of research and innovation on climate, energy and mobility will address in a highly integrated and effective way, one of the most important global challenges for the sustainability and future of our environment, ***economy*** and way of life.

To meet the objectives of the Paris Agreement the ***Union*** will need to ***unlock scenarios for the transition towards net-zero GHG emissions economy including low-carbon technologies and strategies for decarbonisation***. This will ***entail*** profound changes in ***the*** technology and services, ***that underpin*** the ways in which ***industries produce, and*** businesses and consumers behave. ***The transformation of the energy market will take place through interaction of technology, infrastructure, the market as well as policy and regulatory frameworks including*** new forms of governance. ***Therefore, there is a need for systematic innovations in the energy, buildings, industry and transport sectors.***

Limiting the increase of global average temperature to well below 2°C, and pursuing efforts to limit the temperature increase to 1.5°C, requires ***reductions in*** greenhouse-gas (GHG) emissions ***through decarbonization, energy savings, and the***

deployment of renewable energy sources and the electrification of industrial processes which encompass both the energy and the transport sectors¹⁷. Currently, the transport sector represents almost a quarter of the Union's GHG emissions.

New impetus *is needed* to accelerate the pace of developing next-generation breakthroughs as well as demonstrating and deploying innovative technologies and solutions, using also the opportunities provided by *key enabling technologies, digital technologies* and space technologies. This will be pursued through an integrated approach encompassing decarbonisation, *renewable energy* resource *and energy* efficiency, reduction of air pollution, access to raw materials, *including critical raw materials, and the circular economy. Particular attention should be paid to sector coupling (i.e. of electricity, heating and cooling, industry and transport sector) in all intervention areas, which is important for a successful energy and transport transition.*

To achieve this, the Union will also foster participatory approaches to research and innovation, including the multi-actor approach and develop knowledge and innovation systems at local, regional, national and European levels. Insights from social sciences and humanities, social innovation with citizens' engagement will be crucial to encourage new governance models, production and consumption patterns.

Progress in *these* sectors - *but* also across the spectrum of EU industry including agriculture, buildings, industrial processes and *product use*, and waste management - will require continued efforts to better understand the mechanisms of climate change and the associated impacts across the economy and society, exploiting synergies with national activities, other *EU* types of actions and international cooperation.

Progress in *the energy and transport* sectors - *and* also across the spectrum of EU industry including agriculture, buildings, industrial processes and *product-use*, and waste management *and recycling* - will require continued *and reinforced* efforts to better understand the mechanisms of climate change and the associated impacts across the economy and society, exploiting synergies with national activities, other *Union* types of actions and international cooperation.

Over the past decade, considerable advances have been made in climate science, in particular in observations and data assimilation and climate modelling. However, the complexity of the climate-system and the need to support implementation of the Paris Agreement, the Sustainable Development Goals and EU policies necessitate a reinforced effort to fill the remaining knowledge gaps.

The EU has established a comprehensive policy framework in the Energy Union strategy, with binding targets, legislative acts and research and innovation activities aiming to lead *in developing and deploying efficient energy production systems based on renewables*.

Transport ensures the mobility of people and goods necessary for an integrated European single market, territorial cohesion and an open and inclusive society. At the same time, transport has significant negative effects on human health, congestion, land, air quality and noise, as well as safety resulting in numerous premature deaths and increased socio-economic costs. Therefore, *sustainable* mobility and transport networks need to become clean, safe, smart, secure, silent, reliable and affordable, offering a seamless integrated door-to-door service.

The issues faced by the transport and energy sectors go however beyond the need for emission reduction. There are several challenges to be tackled, including the increasing penetration of digital and space-based technologies, changes in user behaviour and mobility patterns, new market entrants and disruptive business models, globalisation, increasing international competition and an older, more urban and increasingly diverse, population.

Both sectors are major drivers of Europe's

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The EU has established a comprehensive policy framework in the Energy Union strategy, with binding targets, legislative acts and research and innovation activities aiming to lead *to a highly energy efficient and renewables based energy system*.

Transport ensures the mobility of people and goods necessary for an integrated European single market, territorial cohesion and an open and inclusive society. At the same time, transport has significant negative effects on human health, congestion, land, air quality and noise, as well as safety resulting in numerous premature deaths and increased socio-economic costs. Therefore, mobility and transport networks, *in particular in urban areas*, need to become clean, *efficient, environmentally- and economically-sustainable*, safe, smart, *innovative*, secure, silent, reliable and affordable, offering a seamless integrated door-to-door service.

The issues faced by the transport and energy sectors go, however, beyond the need for emission reduction. There are several challenges to be tackled, including *renewable energy, sustainable fuels, energy storage and security of supply*, the increasing penetration of digital, *automated*, and space-based technologies, changes in user behaviour and mobility patterns, new market entrants and disruptive business models, globalisation, increasing international competition and an older, more urban and increasingly diverse, population.

Both *the energy and the transport* sectors

economic competitiveness and growth. The EU has upwards of 1.6 million people working in the field of renewables and energy efficiency. Transportation and the storage sectors employ more than 11 million in the EU, accounting for around 5% of GDP and 20% of exports. The EU is a world leader in vehicle, aircraft and vessel design and manufacturing, while patenting of innovative clean energy technologies places the EU in second place worldwide.

Finding new ways to accelerate the deployment of *clean* technologies and solutions for the decarbonisation of the European economy requires also increased demand for innovation. This can be stimulated through the empowerment of citizens as well as socio-economic and public sector innovation and will lead to approaches broader than technology-driven innovation. Socio-economic research covering inter alia user needs and patterns, foresight activities, environmental, economic, social and behavioural aspects, business cases and models and pre-normative research for standard setting, will also facilitate actions fostering regulatory, financing and social innovation, skills, as well as engagement and empowerment of market players and consumers.

Activities under this Cluster contribute in particular to the goals of the Energy Union, as well as to those of the Digital Single Market, the Jobs, Growth and Investment agenda, the strengthening of the *EU* as a global actor, the new *EU* Industrial Policy Strategy, the Circular Economy, the Raw

are major drivers of Europe's economic competitiveness and growth. The EU has upwards of 1.6 million people working in the field of renewables and energy efficiency. Transportation and the storage sectors employ more than 11 million in the EU, accounting for around 5% of GDP and 20% of exports. The EU is a world leader in vehicle, aircraft and vessel design and manufacturing, while patenting of innovative clean energy technologies, ***including technologies in renewable energy***, places the EU in second place worldwide.

Finding new ways to accelerate the deployment of ***renewable-based and energy-efficient*** technologies and ***other non-technological*** solutions for the decarbonisation of the European economy requires also increased demand for innovation. This can be stimulated through the empowerment of citizens as well as socio-economic and public sector innovation ***and public procurement*** and will lead to approaches broader than technology-driven innovation. Socio-economic research covering inter alia user needs and patterns, foresight activities, environmental, economic, social and behavioural aspects, business cases and models and pre-normative research for standard setting, will also facilitate actions fostering regulatory, financing and social innovation, skills, as well as engagement and empowerment of ***all*** market players and consumers. ***Technologies that advance sector coupling also have the potential to strengthen the domestic manufacturing industry. In the transport sector, the role of applied research and trials aiming at market deployment of innovations is crucial.***

Activities under this Cluster contribute in particular to the goals of the Energy Union, ***the Paris Agreement commitments***, as well as to those of the Digital Single Market, the Jobs, Growth and Investment agenda, the strengthening of the ***Union*** as a global actor, the new ***Union*** Industrial

Materials Initiative, the Security Union and the Urban Agenda, *as well as* the Common Agricultural Policy of the *EU* as well as *EU* legal provisions to reduce noise and air pollution.

Policy Strategy, the Circular Economy *Action Plan*, *the European Battery Alliance Initiative*, the Raw Materials Initiative, *the EU Bioeconomy Strategy*, the Security Union and the Urban Agenda, the Common Agricultural Policy of the *Union*, as well as *Union* legal provisions to reduce noise and air pollution. *They also contribute to helping Member States achieve the national emission reduction targets. Complementarity and synergies with activities under other Union Programmes should be ensured.*

Given the number of European Technology and Innovation Platforms (ETPs) in this field, calls within this cluster should take into account their recommendations.

Activities will contribute directly to the following Sustainable Development Goals (SDGs) in particular: SDG 7 - Affordable and Clean Energy; SDG 9 - Industry, Innovation and Infrastructure; SDG 11 - Sustainable Cities and Communities; SDG 13 - Climate Action.

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¹⁷ Substantial decarbonisation of other sectors is addressed in other areas of the Horizon Europe Global Challenges and Industrial Competitiveness pillar.

¹⁷ Substantial decarbonisation of other sectors is addressed in other areas of the Horizon Europe Global Challenges and *European* Industrial Competitiveness pillar.

Amendment 74

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.1 – paragraph 1

Text proposed by the Commission

Effective implementation of the Paris Agreement has to be based on science, requiring continuously updating of our

Amendment

Effective implementation of the Paris Agreement has to be based on science, requiring continuously updating of our

knowledge on the climate-earth system, as well as the mitigation and adaptations options available, allowing for a systemic and comprehensive picture of challenges and opportunities for the *EU's* economy. On this basis, science-based solutions for a cost-effective transition *to* a low-carbon, *climate-resilient and resource-efficient society* will be developed.

knowledge on the climate-earth system, as well as the mitigation and adaptations options available, allowing for a systemic and comprehensive picture of challenges and opportunities for the *Union's* economy. On this basis, science-based solutions for a cost-effective transition *towards* a low carbon *or net-zero GHG emission economy* will be developed.

Amendment 75

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.1 – paragraph 2 – indent -1 (new)

Text proposed by the Commission

Amendment

-1 Identifying key processes in the polar regions for a better development of management options that minimise the negative impacts on ecosystems and improve insight into global climate;

Amendment 76

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.1 – paragraph 2 – indent 2

Text proposed by the Commission

Amendment

– *Decarbonisation* pathways, mitigation actions and policies covering all sectors of the economy, compatible with the Paris Agreement and the United Nations Sustainable Development Goals;

– *GHG emission reduction* pathways, mitigation actions and policies covering all sectors of the economy, compatible with the Paris Agreement and the United Nations Sustainable Development Goals;

Amendment 77

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.1 – paragraph 2 – indent 4

Text proposed by the Commission

– Adaptation pathways and policies for vulnerable ecosystems, critical economic sectors **and** infrastructure **in the EU (local/regional/national), including improved risk assessment tools.**

Amendment

– Adaptation pathways and policies, **including improved risk assessment and reduction tools**, for vulnerable ecosystems, critical economic sectors, **critical infrastructure and urban environments at local, regional, national and Union levels;**

Amendment 78

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.1 – paragraph 2 – indent 4 a (new)

Text proposed by the Commission

Amendment

- **Models for strengthening climate diplomacy as a driver for international cooperation.**

Amendment 79

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.2 – paragraph 1

Text proposed by the Commission

The EU aims to be world leader in affordable, secure **and** sustainable energy technologies improving its competitiveness in global value chains and its position in growth markets. Diverse climatic,

Amendment

The EU aims to be **the** world leader in affordable, secure, sustainable **and renewable** energy technologies, **thus** improving its competitiveness in global value chains and its position in growth

geographical, environmental and socio-economic conditions in the EU as well as the need to ensure energy security and access to raw materials, dictate a broad portfolio of energy solutions, including of non-technical nature. As regards renewable energy technologies, costs need to decrease further, performance must improve, **integration into the energy system must be improved and** breakthrough technologies need to be developed. As regards fossil fuels, **decarbonising** their usage will be essential to meet the climate objectives.

markets. Diverse climatic, geographical, environmental and socio-economic conditions in the EU as well as the need to ensure **the reduction of energy consumption, energy efficiency**, security **energy supply** and access to raw materials, **especially critical ones**, dictate a broad portfolio of energy solutions, including **those** of non-technical nature. **The energy transition will challenge the EU to lead in developing solutions for an upgraded market design while system integration needs to be significantly improved.** As regards renewable energy technologies, costs need to decrease further **and** performance must improve. **This requires support for incremental and disruptive research in advanced technologies. In addition, new** breakthrough technologies need to be developed **and deployed, while established technologies need to be improved.** As regards fossil fuels **and feedstock, reducing** their usage will be essential to meet the climate objectives.

Amendment 80

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.2 – paragraph 2 – indent 1

Text proposed by the Commission

- Renewable energy technologies **and solutions for power** generation, heating and cooling, **sustainable transport** fuels **and** intermediate carriers, at various scales and development stages, adapted to geographic conditions and markets, both within the **EU** and worldwide;

Amendment

- Renewable energy technologies, **including marine energy** generation **and its different sub-sectors, such as wind, current and wave power**, heating and cooling, fuels, intermediate carriers, **such as power-to-gas and hydrogen**, at various scales and development stages, adapted to geographic conditions and markets, both within the **Union** and worldwide;

Amendment 81

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.2 – paragraph 2 – indent 1 a (new)

Text proposed by the Commission

Amendment

- ***Highly energy efficient low-carbon or decarbonised solutions for power generation;***

Amendment 82

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.2 – paragraph 2 – indent 2

Text proposed by the Commission

Amendment

- Disruptive renewable energy technologies for ***new*** applications and breakthrough solutions;

- Disruptive renewable energy technologies for ***both new, established or highly-enhanced*** applications and breakthrough solutions;

Amendment 83

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.2 – paragraph 2 – indent 2 a (new)

Text proposed by the Commission

Amendment

- ***Next generation technology solutions, including the development of new materials, manufacturing processes and operations methods to increase industrial competitiveness in clean energy technology;***

Amendment 84

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.2 – paragraph 2 – indent 2 b (new)

Text proposed by the Commission

Amendment

- ***Research and development of new business models, solutions and services for creating favourable market conditions at the regulatory, administrative and financing levels for renewables, end-user energy efficient technologies and solutions.***

Amendment 85

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.3 – paragraph 1

Text proposed by the Commission

Amendment

The expected growth of variable electricity production and shift towards more electric heating, cooling and transport ***dictates the need for*** new approaches ***to manage*** energy grids. ***Next to decarbonisation***, the goal is to ensure energy affordability, security and stability of supply, achieved through investments in innovative network infrastructure technologies ***and*** innovative system management. Energy storage in different forms will play a key role in providing services to the grid, ***also*** improving and reinforcing network capacities. Exploiting synergies between different networks (e.g. electricity grids, heating and cooling networks, gas networks, transport recharging and refuelling infrastructure, hydrogen, and

The expected growth of variable electricity production and ***the*** shift towards more electric heating, cooling and transport ***needs*** new approaches ***towards the management of*** energy grids ***and the deployment of decentralised energy solutions. In addition, gas infrastructures also plays an important role in integrating renewable and low-carbon gases.***

telecom networks) and actors (e.g. industrial sites, data centres, self-producers) will be crucial **for enabling** the smart, integrated operation of the relevant infrastructures.

In addition to the reduction of GHG emissions, the goal is to ensure energy affordability, *energy savings*, security and stability of supply. *This can be* achieved through investments in *sector coupling and related* innovative network infrastructure *and* technologies, *increased flexibility of dispatchable power generation, notably from flexible renewable sources*, innovative system management, *as well as by facilitating actions fostering regulatory and social innovation, skills, and engaging and empowering market players, consumers and communities*. Energy storage in different forms will play a key role in providing services to the grid, *and in* improving and reinforcing network capacities. Exploiting synergies between different networks (e.g. electricity grids, heating and cooling networks, gas networks *& storage*, transport recharging and refuelling infrastructure, hydrogen *infrastructure*, and telecom networks) and actors (e.g. industrial sites, *network operators*, data centres, self-producers *and consumers, renewable energy communities*), *as well as increasing demand-response and developing and integrating European and international standards*, will be crucial *to enable* the smart, integrated operation of the relevant infrastructures.

Amendment 86

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.3 – paragraph 2 – indent 1

Text proposed by the Commission

- Technologies and tools for **electricity** networks to integrate renewables and new loads such as electro-mobility **and** heat pumps;

Amendment

- Technologies and tools for **existing** networks to integrate renewables and new loads such as electro-mobility, **electrolysers, fuel cells**, heat pumps, **industrial hydrolysis, electricity storage and decentralized renewable energy, as key-elements for a cost-efficient, secure, highly energy efficient and renewables based energy system**;

Amendment 87

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.3 – paragraph 2 – indent 2 a (new)

Text proposed by the Commission

- **Demonstration of stable and reliable energy systems and grids on local and regional level, driven by variable and flexible renewable energy**;

Amendment

Amendment 88

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.3 – paragraph 2 – indent 3

Text proposed by the Commission

- Integrated approaches to match renewable energy production and consumption at local level including on islands, based on new services and

Amendment

- Integrated approaches to **increase, improve and** match renewable energy production and consumption at local level including on islands, based on new services and **technologies (including peer-to-peer,**

community initiatives;

distributed ledger technologies, virtual net metering arrangements) as well as community initiatives (including active consumers and renewable energy self-consumers, acting individually or jointly, renewable energy communities and local energy communities);

Amendment 89

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.3 – paragraph 2 – indent 3 a (new)

Text proposed by the Commission

Amendment

- *Systemic impact analysis of new energy technologies, like flexible renewable generation, renewable based hydrogen and synthetic gas for energy storage; research and integrated approaches to convert natural gas grids into green hydrogen grids or grids transporting bio-methane or synthetic methane;*

Amendment 90

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.3 – paragraph 2 – indent 4

Text proposed by the Commission

Amendment

– Network flexibility and synergies between the different energy sources, networks, infrastructures and actors;

– Network **and generation** flexibility **and supply reliability, including demand-response**, and synergies between the different energy sources, networks, infrastructures (**including existing ones**) and actors; **sector-coupling technologies in order to facilitate storage and harness**

the transportation potential of energy;

Amendment 91

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.3 – paragraph 2 – indent 4 a (new)

Text proposed by the Commission

Amendment

- *Clean solutions that can deliver on system reliability, complementing and going beyond renewables and electrification-based storage.*

Amendment 92

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.4 – introductory part

Text proposed by the Commission

Amendment

4.2.4. Buildings *and Industrial Facilities* in Energy Transition

4.2.4. Buildings in Energy Transition

Amendment 93

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.4 – paragraph 1

Text proposed by the Commission

Amendment

Buildings *and industry installations* play an increasingly active role in their interaction with the energy system.

Buildings play an increasingly active role in their interaction with the energy system. Therefore, they are crucial elements in the

Therefore, they are crucial elements in the transition *to* renewable energy.

transition *towards* renewable energy *sources and higher energy efficiency*.

Amendment 94

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.4 – paragraph 2

Text proposed by the Commission

Buildings are an important factor for quality of life of citizens. Integrating different technologies, appliances *and* systems and linking various energy uses, buildings as well as their inhabitants and users represent a very high potential for energy generation, storage and efficiency improvements.

Amendment

Buildings are an important factor for *the* quality of life of citizens. Integrating different technologies, appliances, systems *and standards* and linking various energy uses, buildings as well as their inhabitants and users represent a very high potential for *climate change mitigation*, energy generation, *energy savings and* storage and efficiency improvements.

Amendment 95

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.4 – paragraph 3

Text proposed by the Commission

Industries, and especially those that are energy-intensive, could further improve energy efficiency, and favour the integration of renewable energy sources.

Amendment

deleted

Amendment 96

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.4 – paragraph 4 – indent 1

Text proposed by the Commission

- Electricity and heat between **an** industrial plant and an energy system operator;

Amendment

- Electricity and heat **exchanges** between **buildings**, industrial plant and an energy system operator;

Amendment 97

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.4 – paragraph 4 – indent 3

Text proposed by the Commission

- Relevant processes, design and materials;

Amendment

- **Optimisation and sustainability of** relevant processes, design and materials;

Amendment 98

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.4 – paragraph 4 – indent 4

Text proposed by the Commission

- Smart buildings and large mobility hubs (ports, airports, logistic centres) as active elements of wider energy networks and of innovative mobility solutions;

Amendment

- Smart buildings and large mobility hubs (ports, airports, **railway stations and** logistic centres) as active elements of wider energy networks and of innovative mobility solutions;

Amendment 99

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.4 – paragraph 4 – indent 5

Text proposed by the Commission

- **Buildings** life-cycle design, construction, operation and dismantling, taking into account circularity **and** environmental performance, for energy and resource efficiency, climate resilience, and recycling;

Amendment

- **New modalities, including smart tools and appliances, for** life-cycle design, construction (**including using light-weight and renewable materials**), operation and dismantling **of buildings**, taking into account circularity, environmental performance, **sustainability and economic efficiency** for energy and resource efficiency, climate resilience, **impact in terms of GHG emissions** and recycling;

Amendment 100

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.4 – paragraph 4 – indent 6

Text proposed by the Commission

- New business models, approaches and services for renovation financing, enhancement of construction skills, engagement of buildings occupants and other market actors;

Amendment

- New business models, approaches and services for renovation financing, **such as prefinancing schemes with on-bill repayment**, enhancement of construction skills, engagement of buildings occupants and other market actors, **such as local authorities or renewable energy communities**;

Amendment 101

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.4 – paragraph 4 – indent 7

Text proposed by the Commission

- Energy performance of buildings

Amendment

- Energy performance of buildings monitoring and optimisation, **in line with**

monitoring and optimisation;

the objectives laid out in the Energy Performance of Building Directive (Directive 2018/844), including use of advanced building energy management systems;

Amendment 102

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.4 – paragraph 4 – indent 8

Text proposed by the Commission

Amendment

- | | |
|---|----------------|
| – <i>Tools and smart appliances for energy efficiency gains in buildings;</i> | <i>deleted</i> |
|---|----------------|

Amendment 103

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.4 – paragraph 4 – indent 9

Text proposed by the Commission

Amendment

- | | |
|--|--|
| – Renovation processes of existing buildings towards 'Nearly Zero Energy Buildings'; | – Renovation processes of existing buildings towards 'Nearly Zero Energy Buildings' <i>and innovative technologies</i> ; |
|--|--|

Amendment 104

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.4 – paragraph 4 – indent 9 a (new)

Text proposed by the Commission

Amendment

- ***Flexible energy production, demand-response, optimisation of energy storage.***

Amendment 105

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.4 a (new)

Text proposed by the Commission

Amendment

4.2.4 a. Industrial facilities in the Energy Transition

Industries, and especially those that are energy-intensive, should further improve energy efficiency and ***reduce their energy*** consumption, and favour the integration of renewable energy sources. ***Industrial facilities' role in the energy system is changing, due to the need to reduce emissions, based on direct or indirect electrification, also a source of materials for production processes (e.g. hydrogen). Industrial and manufacturing complexes where many different processes take place near to each other can optimise the exchange of flows of energy and other resources (raw materials) between them.***

Broad lines

- ***Conversion technologies for the sustainable utilization of carbon sources to increase resource efficiency and reduce emissions, including hybrid energy systems for the industry and energy sector with a decarbonisation potential;***
- ***Demonstration of direct and indirect electrification of energy intensive industrial processes;***

- *Tools and infrastructure for process control of production plants to optimise energy flows and materials in interaction with other production plants and the energy system;*
- *Flexibility and efficiency of electricity, feedstock and heat in industrial plants and the energy system;*
- *Improved or new processes, design and materials to efficiently use or produce heat, cold, energy storage;*
- *Improved material efficiency, which reduces the demand for energy intensive bulk materials.*

Amendment 106

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.4 b (new)

Text proposed by the Commission

Amendment

4.2.4 b. Coal regions in transition

Nearly half of the Member States are challenged to prepare coherent strategies focusing on regions facing the challenges of phasing out lignite, coal and other fossil fuel-based energy generation. This priority will seek complementarities with other EU instruments and programmes.

Broad lines

- Support the development of inclusive and just transitions strategies; addressing societal, socio-economic and environmental impacts along with reconversion of sites;

- Technologies and models to unlocking the potential of these regions; including how to best attract alternative innovative business;

- Research on how to revitalise these regions in terms of sustainable

employment and growth perspectives, including research on reskilling of workers.

Amendment 107

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.5 – paragraph 1

Text proposed by the Commission

It is estimated that by 2050, more than 80% of the EU's population will live in urban areas, consuming the lion's share of available resources, including energy, and being areas particularly vulnerable to the adverse meteorological change impacts worsened by climate change and natural disasters already now and increasingly in the future. A key challenge is to significantly increase the overall energy and resource efficiency as well as climate-resilience of Europe's cities in a holistic fashion, targeting the building stock, energy systems, mobility, climate change, as well as water, soil, air quality, waste and noise. Synergies with ERDF-funded urban policy and actions should be investigated and exploited.

Amendment

It is estimated that by 2050, more than 80% of the EU's population will live in urban areas, consuming the lion's share of available resources, including energy, and being areas particularly vulnerable to the adverse meteorological change impacts worsened by climate change and natural disasters already now and increasingly in the future. A key challenge is to significantly increase the overall energy and resource efficiency as well as climate-resilience of Europe's **communities and** cities in a holistic fashion, targeting the building stock, energy systems, **transport and** mobility, climate change **mitigation**, as well as water, soil, air quality, waste and noise. Synergies with ERDF-funded urban policy and actions should be investigated and exploited.

Amendment 108

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.5 – paragraph 2 – indent 1

Text proposed by the Commission

– **City/district** energy/mobility systems towards the **EU-wide** deployment of low-

Amendment

– **City/district/rural** energy/mobility systems towards the **Union-wide**

carbon, Positive Energy Districts and zero-emission mobility and logistics by 2050, boosting the global competitiveness of integrated EU solutions;

deployment of low-carbon, Positive Energy Districts and zero-emission mobility and logistics by 2050, boosting the global competitiveness of integrated EU solutions;

Amendment 109

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.5 – paragraph 2 – indent 2

Text proposed by the Commission

- Urban planning, infrastructures and systems including mutual interfaces and interoperability, nature-based solutions and the use of digital technologies and space based services and data, taking into account the effects of projected climate change and integrate climate **resilience**;

Amendment

- Urban **and rural** planning, infrastructures and systems including mutual interfaces and interoperability, **standardisation**, nature-based solutions, and the use of **secure** digital technologies and space based services and data, taking into account the effects of projected climate change and integrate climate **change mitigation**;

Amendment 110

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.5 – paragraph 2 – indent 3

Text proposed by the Commission

- Quality of life for the citizens, safe mobility, urban social innovation, cities' circular and regenerative capacity, reduced environmental **footprint** and pollution;

Amendment

- Quality of life for the citizens, safe **and multi-modal** mobility **including walking and cycling**, urban **and rural** social innovation, cities' circular and regenerative capacity, reduced environmental **impact** and pollution;

Amendment 111

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.6 – paragraph 1

Text proposed by the Commission

The shift towards clean technologies, connectivity and automation will depend on the timely design and manufacture of aircraft, vehicles and vessels integrating different technologies and accelerating their introduction. Increasing comfort, efficiency, affordability, while minimising lifecycle impact on the environment, human health and on energy use remain objectives of paramount importance. Innovative, highly capable transport infrastructure is essential for the proper functioning of all transport modes in view of increased mobility demand and rapidly changing technology regimes. An integrated approach to infrastructure and vehicle/vessel/aircraft development deserves particular attention also in order to minimise energy and environmental impact.

Amendment

The shift towards clean technologies, connectivity and automation will depend on the timely design and manufacture of aircraft, vehicles and vessels integrating different technologies and accelerating their introduction. Increasing comfort, efficiency, affordability, while minimising lifecycle impact ***on the climate***, on the environment, human health and on energy use remain objectives of paramount importance. Innovative, highly capable transport infrastructure is essential for the proper functioning of all transport modes in view of increased mobility demand and rapidly changing technology regimes. An integrated approach to infrastructure and vehicle/vessel/aircraft development deserves particular attention also in order to minimise energy and environmental impact.

Amendment 112

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.6 – paragraph 2 – indent 2

Text proposed by the Commission

– Vehicle/vessel/aircraft concepts and designs, including their spare parts, using improved materials and structures, efficiency, energy storage and recovery, safety and security features with ***less*** environment and health impact.

Amendment

– Vehicle/vessel/aircraft concepts and designs, including their spare parts, ***module elements***, using improved ***advanced*** materials and structures, ***software solutions and updates***, ***advanced security systems against piracy***, efficiency, energy storage and recovery, safety and security features

with *minimised* environment and health impact.

Amendment 113

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.7 – paragraph 1

Text proposed by the Commission

For the EU to reach its air quality, climate, and energy goals, including a 60% reduction in green-house gas emissions by 2050 as well as noise reduction, will require *rethinking* the whole mobility system including users, vehicles, fuels *and* infrastructures. *It* will also require the deployment of low-emission alternative energies and market uptake of zero-emission vehicles/vessels/aircrafts. In addition to the harmful effects of greenhouse gas emissions, transport contributes significantly to poor air quality and noise in Europe with negative consequences for the health of citizens¹⁸. Building on progress with electrification *and* the use of fuel cells for cars, buses and light duty vehicles it is essential to accelerate research and innovation solutions for other sectors such as aviation, maritime and inland navigation *and lorries*.

¹⁸ Around one-third of EU citizens live in urban areas with concentration levels of pollutants above legal thresholds

Amendment

Reaching air quality, climate, and energy goals, as well as noise reduction, will require *the Union to rethink* the whole mobility system including users, vehicles, fuels, *CO2 measure schemes*, infrastructures, *space use, as well as new transport solutions*. *The Union* will also require the deployment of low-emission alternative energies and market uptake of zero-emission vehicles/vessels/aircrafts. In addition to the harmful effects of greenhouse gas emissions, transport contributes significantly to poor air quality and noise in Europe, with negative consequences for the health of citizens¹⁸. Building on *existing* progress with *the production and use of alternative fuels*, electrification, *hydrogen technologies, biofuels and biogas*, the use of fuel cells, *the improvement of combustion engines and their adaptation to renewable fuels and other sustainable technologies* for cars, buses, *trucks* and light duty vehicles, it is essential to accelerate research and innovation solutions for other sectors such as aviation, *the rail sector*, maritime and inland navigation.

¹⁸ Around one-third of EU citizens live in urban areas with concentration levels of pollutants above legal thresholds

Amendment 114

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.7 – paragraph 2 – indent 1

Text proposed by the Commission

- **Electrification** of all transport modes (e.g. batteries, fuel cells, hybridisation, etc.) **including** new technologies for vehicle/vessel/aircraft powertrains, fast charging/refuelling, energy harvesting and user-friendly and accessible interfaces with the charging infrastructure, ensuring interoperability and seamless services provision; development and deployment of competitive, safe, high-performing and sustainable batteries for low and zero-emission vehicles;

Amendment

- **Decarbonisation** of all transport modes, **including through electro mobility** (e.g. **recyclable** batteries, fuel cells, **all types of** hybridisation, etc.) **and** new technologies for vehicle/vessel/aircraft powertrains, fast charging/refuelling, energy harvesting and user-friendly and accessible interfaces with the **re-fuelling** **and** charging infrastructure, ensuring interoperability and **a** seamless services provision; development and deployment of competitive, safe, high-performing, **recyclable** and sustainable batteries for low and zero-emission vehicles;

Amendment 115

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.7 – paragraph 2 – indent 2

Text proposed by the Commission

- Sustainable new fuels and new smart vehicles/vessels/aircraft for existing and future mobility patterns and supporting infrastructure; technologies and user-based solutions for interoperability and seamless services provision;

Amendment

- Sustainable new fuels and new smart vehicles/vessels/aircraft for existing and future mobility patterns and supporting infrastructure; technologies and user-based solutions for interoperability and seamless services provision; **quieter and more environmentally friendly aircraft;**

Amendment 116

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.7 – paragraph 2 – indent 3

Text proposed by the Commission

- **Reducing** the impact of mobility on the environment and human health.

Amendment

- **Minimising** the impact of mobility on the environment and human health, **including by exploring the potential of a new generation of remote sensors to measure pollution in the mobility sector.**

Amendment 117

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.8 – paragraph 1

Text proposed by the Commission

Smart mobility will help ensure the efficiency, safety and resilience of door-to-door mobility and all its components, in particular by using digital technologies, advanced satellite navigation (EGNOS/Galileo), and artificial intelligence. New technologies will help to optimise the use and efficiency of transport infrastructure and networks, improving multi-modality and connectivity, optimising traffic management **and** enable innovative transport solutions and services, thus reducing congestion and negative environmental impacts, providing better mobility and logistics services for citizens and businesses. Connected and automated mobility together with the enabling infrastructure will improve efficiency and safety in all transport modes..

Amendment

Smart mobility will help ensure the efficiency, safety and resilience of door-to-door mobility and all its components, in particular by using **new** digital technologies, advanced satellite navigation (EGNOS/Galileo), and artificial intelligence. New technologies, **including system of systems**, will help to optimise the use and efficiency of transport infrastructure and networks, improving multi-modality and connectivity, optimising, traffic management, enable innovative transport solutions, **standards** and services, thus reducing congestion and negative environmental impacts, providing better mobility and logistics services for citizens and businesses. Connected and automated mobility together with the enabling infrastructure will improve efficiency and safety in all transport modes.

Amendment 118

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.8 – paragraph 2 – indent 1

Text proposed by the Commission

- Digital **network-and** traffic management: advanced decision support systems; next generation traffic management (including multi-modal network and traffic management); contributing to seamless, multimodal and interconnected mobility for passengers and freight; use and limitations of big data; use of innovative satellite positioning/navigation (EGNOS/Galileo);

Amendment

- Digital **network**, traffic, **space use and** management: advanced decision support systems; next generation traffic management (including multi-modal network and traffic management); contributing to seamless, multimodal and interconnected mobility for passengers and freight; use and limitations of big data; use of innovative satellite positioning/navigation (EGNOS/Galileo) **understanding new behaviour related to changing mobility**;

Amendment 119

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.8 – paragraph 2 – indent 3

Text proposed by the Commission

- Rail technologies and operations for a high-capacity, silent, interoperable, and automated railway system;

Amendment

- Rail technologies and operations for a high-capacity, **attractive**, silent, **fully connected**, interoperable, **cross-border** and automated railway system **for passenger as well as freight transport requirements**;

Amendment 120

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.8 – paragraph 2 – indent 4

Text proposed by the Commission

- Connected, cooperative and automated mobility systems and services, including technological solutions and non-technological issues.

Amendment

- Connected, cooperative ***interoperable*** and automated mobility systems and services, including technological solutions and non-technological issues ***such as changes in user behaviour and mobility patterns;***

Amendment 121

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.8 – paragraph 2 – indent 4 a (new)

Text proposed by the Commission

- ***New or improved services and business models through which the user interacts with the different smart modalities;***

Amendment

Amendment 122

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.8 – paragraph 2 – indent 4 b (new)

Text proposed by the Commission

- ***Concept, development, consequences, design, research, validation and methods as part of safe automated vehicle driving in mixed traffic;***

Amendment

Amendment 123

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.8 – paragraph 2 – indent 4 c (new)

Text proposed by the Commission

Amendment

- ***Smart shipping solutions for safer, more efficient waterborne operations;***

Amendment 124

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.8 – paragraph 2 – indent 4 d (new)

Text proposed by the Commission

Amendment

- ***New systems and technologies for port management and connection.***

Amendment 125

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.9 – paragraph 1

Text proposed by the Commission

Amendment

Massive, concentrated and decentralised storage solutions (comprising chemical, electrochemical, electrical, mechanical and thermal) for the energy system will increase efficiency, flexibility, technology independence and accessibility as well as the security of supply. Low-emission, decarbonised transport will require a growing share of electrical and/or other alternatively fuelled vehicles, with better-

Massive, concentrated and decentralised storage solutions (comprising chemical, electrochemical, electrical, mechanical and thermal) for the energy system will increase efficiency, flexibility, technology independence and accessibility as well as the security of supply. Low-emission, decarbonised transport will require a growing share of electrical and/or other alternatively fuelled vehicles, with better-

performing and cheaper, recyclable and reusable batteries, as well as local provision of *synthetic/renewable* fuels such as hydrogen and innovative solutions for on-site storage.

performing and cheaper, *highly* recyclable and reusable batteries *with a low environmental impact*, as well as *the* local provision of *low carbon* fuels such as *low-carbon or renewables based* hydrogen and innovative solutions for on-site storage.

Amendment 126

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.9 – paragraph 2 – indent 1

Text proposed by the Commission

– Technologies including liquid and gaseous *renewable* fuels and their associated value chains, for daily to seasonal energy storage needs;

Amendment

– Technologies including liquid and gaseous *low carbon* fuels and their associated value chains, for daily to seasonal energy storage needs, *including their impacts on the environment and climate*;

Amendment 127

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.9 – paragraph 2 – indent 2

Text proposed by the Commission

– Batteries and the EU value chain, including design, large-scale battery cell production technologies, reuse and *recycling* methods;

Amendment

– Batteries and the EU value chain, including design, large-scale battery cell production technologies, *high power and high energy density, fast charging rates, low environmental impact*, reuse and *high recyclability, advanced materials solutions for energy storage* methods *as well as standardisation needs*;

Amendment 128

Proposal for a decision

Annex I – part II – point 4 – point 4.2 – point 4.2.9 – paragraph 2 – indent 3

Text proposed by the Commission

– **Low zero-carbon hydrogen** **including** fuel cells, **and** the EU value chain from design to end use across various applications.

Amendment

– **Renewables-based, electrolyzes** fuel cells, **across** the EU value chain from design to end use across various applications.

Amendment 129

Proposal for a decision

Annex I – part II – point 5 – introductory part

Text proposed by the Commission

5. CLUSTER 'FOOD **AND** NATURAL RESOURCES'

Amendment

5. CLUSTER 'FOOD, NATURAL RESOURCES **AND AGRICULTURE**'

Amendment 130

Proposal for a decision

Annex I – part II – point 5 – point 5.1 – paragraph 1

Text proposed by the Commission

Human activities are exerting increasing pressure on soils, seas and oceans, water, air, biodiversity and other natural resources. Nourishing the planet's growing population is directly dependent on the health of natural systems and resources. However, combined with climate change, humanity's growing demand for natural

Amendment

Human activities are exerting increasing pressure on soils, seas and oceans, water, air, biodiversity and other natural resources. Nourishing the planet's growing population is directly dependent on the health of natural systems and resources. However, combined with climate change, humanity's growing demand for natural

resources creates environmental pressures that go far beyond sustainable levels, affecting ecosystems and their capacity to provide services *for* human well-being. The concepts of the circular economy, *the* bioeconomy and the blue economy provide an opportunity to balance environmental, social and economic goals and to set human activities on a path to sustainability.

resources creates environmental pressures that go far beyond sustainable levels, affecting ecosystems and their capacity to provide services *maintaining* human well-being *in the long term*. ***Growth in food production is not matching growth in the global population and therefore we require breakthroughs in intensification of sustainable food production. At the same time, we must ensure that nutrition and health are central to our food production systems.***

The concepts of the circular economy, ***agroecology, sustainable agriculture,*** bioeconomy and the blue economy provide an opportunity to balance environmental, social and economic goals and to set human activities on a path to sustainability.

Amendment 131

Proposal for a decision

Annex I – part II – point 5 – point 5.1 – paragraph 2

Text proposed by the Commission

Meeting the goals of sustainable development, guaranteeing the production and consumption of safe and healthy food, promoting sustainable practices in agriculture, aquaculture, fisheries and forestry, ensuring access to clean water, soil and air for all, cleaning up the seas *and* oceans, preserving and restoring the planet's vital natural systems and environment requires that we harness the potential of research and innovation. But the pathways for the transition to sustainability and ways to ***overcome resilient*** barriers are hardly understood. Making the transition to sustainable consumption and ***production and*** restoring ***planetary health requires investing in technologies,*** new business models, *and* social and environmental innovation. This

Amendment

Meeting the goals of sustainable development, ***and greenhouse gas (GHG) emission reduction,*** guaranteeing the production and consumption of safe and healthy food, promoting sustainable practices in agriculture, ***livestock,*** aquaculture, fisheries and forestry, ensuring access to clean water, soil and air for all, cleaning up the seas, oceans *and inland waters,* preserving and restoring the planet's vital natural systems and environment requires that we harness the potential of research and innovation. But the pathways for the transition to sustainability and ways to ***overcome resilient*** barriers are hardly understood. Making the transition to sustainable ***production,*** consumption and restoring ***ecosystems and natural resources, as well***

creates new opportunities for a sustainable, resilient, innovative and responsible European economy, boosting resource efficiency, productivity and competitiveness, **and generating** jobs and growth.

strengthening and nourishing the resource base upon which agriculture depends require investment in scientific and technological research, standardisation and new business models that support social and environmental innovation, **including internalizing costs to the environment in our economies, gathering more and better quality data on the impact of different policies.** This creates new opportunities for a sustainable, resilient, innovative and responsible European economy, boosting resource efficiency, **the capacity and status of natural resources, long-term** productivity and competitiveness, **rural viability, as well as high-quality jobs and sustainable economic and social** growth.

Amendment 132

Proposal for a decision

Annex I – part II – point 5 – point 5.1 – paragraph 3

Text proposed by the Commission

Activities will build a knowledge base and deliver solutions to: sustainably manage and use natural resources from land and **sea - and** enhance the **role** of terrestrial and aquatic systems **as** carbon **sinks**; ensure food and nutrition security, **providing** safe, healthy and nutritious diets; accelerate the transition from a fossil-based linear economy to a resource efficient, resilient, low emission, low-carbon circular economy, and supporting the development of a sustainable bio-based economy and the blue economy; and develop resilient and vibrant rural, coastal and urban areas.

Amendment

Multi- and trans-disciplinary approaches utilising the expertise and experience of actors along value chains will help build a knowledge base and deliver solutions to: **protect**, sustainably manage and use natural resources from land and **water**; enhance the **sustainable growth** of terrestrial and aquatic systems; **increase** carbon **sequestration**; ensure **sufficient** food and nutrition security, **avoid waste and overproduction and provide** safe, healthy and nutritious diets; **accelerate the transition towards sustainable approaches in all forms of agriculture, including conventional and organic agriculture**; accelerate the transition from a fossil-based linear economy to a resource efficient, resilient, low emission, low-carbon circular economy, and supporting the development

of a sustainable bio-based economy and the blue economy; and develop resilient and vibrant rural, coastal and urban areas.

Amendment 133

Proposal for a decision

Annex I – part II – point 5 – point 5.1 – paragraph 4

Text proposed by the Commission

They will help to maintain and enhance the provision of biodiversity and secure the long-term provision of ecosystem services, **climate adaptation and carbon sequestration (both on land and sea)**. *They will help* reduce **greenhouse gas (GHG)** and other emissions, waste and pollution from primary production (both terrestrial and aquatic), processing, consumption and other human activities. They will trigger investments, supporting the shift towards a circular economy, bioeconomy and blue economy, whilst protecting environmental health and integrity.

Amendment

Furthermore, meeting these goals will help to maintain and enhance the provision of **biodiversity, both wild and cultivated, and to secure the long-term provision of ecosystem services, climate change mitigation and adaptation and carbon sequestration (both on land and water)**. **They will help maintain** biodiversity and secure the long-term provision of ecosystem services **as well as** reduce **GHG** and other emissions, waste and pollution from primary production (both terrestrial and aquatic), processing, consumption and other human activities. They will trigger investments, supporting the shift towards a circular economy, **sustainable agriculture**, bioeconomy and blue economy, whilst protecting environmental health, **sustainability** and integrity. **This priority will also aim to improving the knowledge base on the state of biodiversity by developing, validating and standardising comparable Union-wide methodologies.**

Amendment 134

Proposal for a decision

Annex I – part II – point 5 – point 5.1 – paragraph 5

Text proposed by the Commission

They will also foster participatory approaches to research and innovation, including the multi-actor approach and develop knowledge and innovation systems at local, regional, national and European levels. Social innovation with citizens' engagement and trust in innovation will be crucial to encourage new governance, production and consumption patterns.

Amendment

They will also foster participatory approaches to research and innovation, including the multi-actor approach and develop knowledge and innovation systems at local, regional, national and European levels. ***Including all actors along the agri-food supply chain in the co-creation and sharing of knowledge would support the development and implementation of sustainable agriculture innovations that address food system challenges, including adaptation to climate change and mitigation.*** Social innovation with citizens' engagement and trust in innovation will be crucial to encourage new governance, production and consumption patterns.

Amendment 135

Proposal for a decision

Annex I – part II – point 5 – point 5.1 – paragraph 6

Text proposed by the Commission

As these challenges are complex, interlinked and global in nature, activities will follow a systemic approach, cooperating with Member States and international partners, with other funding sources and with other policy initiatives. This will involve user-driven exploitation of environmental big data sources, such as those from Copernicus, EGNOS/Galileo, INSPIRE, EOSC, GEOSS, CEOS, EMODnet.

Amendment

As these challenges are complex, interlinked and global in nature, activities will ***also*** follow a systemic approach, cooperating with Member States and international partners, with other funding sources and with other policy initiatives. This will involve user-driven exploitation of environmental big data sources, such as those from Copernicus, EGNOS/Galileo, INSPIRE, EOSC, GEOSS, CEOS, EMODnet.

Amendment 136

Proposal for a decision

Annex I – part II – point 5 – point 5.1 – paragraph 7

Text proposed by the Commission

Research and innovation activities under this Cluster contribute in particular to the implementation of the goals of: the Environmental Action Programme, the Common Agricultural Policy, the Common Fisheries policy, the Food Law legislation, the Maritime policy, the Circular Economy Action Plan, the EU Bioeconomy Strategy, **and the 2030** climate and energy framework as well as EU legal provisions to reduce air pollution.

Amendment

Research and innovation activities under this Cluster contribute in particular to the implementation of the goals of: the Environmental Action Programme, the Common Agricultural Policy, the Common Fisheries policy, the Food Law legislation, the Maritime policy, the Circular Economy Action Plan, the EU Bioeconomy Strategy, **the EU 2020 Biodiversity Strategy, the EU Green Infrastructure strategy, the EU Forest Strategy, the EU's** climate and energy framework **in consistency with the Paris Agreement**, as well as EU legal provisions to reduce air pollution. **Actions will be strongly linked to existing Union partnerships, in particular PRIMA, also in view of contributing to science diplomacy.**

Amendment 137

Proposal for a decision

Annex I – part II – point 5 – point 5.1 – paragraph 8

Text proposed by the Commission

Activities will contribute directly to the **following** Sustainable Development Goals (SDGs) in particular: SDG 2 – Zero Hunger; **SD** 6 - Clean Water and Sanitation; SDG 11 – Sustainable Cities and Communities; SDG 12 - Responsible Consumption and Production; SDG 13 – Climate Action; SDG 14 – Life Below Water; SDG 15 - Life on Land.

Amendment

Activities will contribute directly to the Sustainable Development Goals (SDGs) in particular: SDG 2 – Zero Hunger; **SDG 3 – Good Health and Wellbeing; SDG 6 -** Clean Water and Sanitation; SDG 11 – Sustainable Cities and Communities; SDG 12 - Responsible Consumption and Production; SDG 13 – Climate Action; SDG 14 – Life Below Water; SDG 15 - Life on Land.

Amendment 138

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.1 – paragraph 1

Text proposed by the Commission

The capacity to observe the environment underpins research and innovation¹⁹ for the sustainable use and monitoring of food and natural resources. Improved spatio-temporal coverage and sampling intervals at reduced cost, as well as big data access and integration from multiple sources provide new ways to monitor, understand and predict the Earth system. There is a need for a wider deployment, exploitation and update of new technologies and continued research and innovation to address gaps in Earth Observation (EO) on land and *sea* and in the atmosphere, collaborating in particular through the Global Earth Observation System of Systems (GEOSS) and its European component EuroGEOSS.

¹⁹ Earth Observation will support research and innovation under other intervention areas within this Global Challenge as well as other relevant parts of Horizon Europe.

Amendment

The capacity to observe the environment underpins research and innovation¹⁹ for the sustainable use and monitoring of food and natural resources. Improved spatio-temporal coverage and sampling intervals at reduced cost, as well as big data access and integration from multiple sources provide new ways to monitor, understand and predict the Earth system. There is a need for a wider deployment, exploitation and update of new technologies and continued research and innovation to address gaps in Earth Observation (EO) on land and *water* and in the atmosphere, collaborating in particular through the Global Earth Observation System of Systems (GEOSS) and its European component EuroGEOSS.

¹⁹ Earth Observation will support research and innovation under other intervention areas within this Global Challenge as well as other relevant parts of Horizon Europe.

Amendment 139

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.1 – paragraph 2 – indent 3

Text proposed by the Commission

– Biodiversity status, ecosystem protection, climate mitigation *and* adaptation, food security, agriculture and forestry, land use and land use change,

Amendment

– Biodiversity status, *assessment of ecosystem services and their value*, ecosystem protection, climate *change* mitigation, *the* adaptation *of species and*

urban and peri-urban development, natural resources management, ocean **exploitation and** conservation, maritime security, and other relevant domains;

ecosystems, food security, agriculture, **soil fertility** and forestry, land use and land use change, **rural**, urban and peri-urban development, natural **protection, restoration and** resources management, ocean, **sea and inland water conservation and exploitation**, maritime security, and other relevant domains;

Amendment 140

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.1 – paragraph 2 – indent 4

Text proposed by the Commission

– User oriented applications including their scaling up, to contribute to the management of European natural resources and ecosystems services and their related value chain.

Amendment

– User oriented applications including their scaling up, to contribute to the **preservation, restoration and** management of European natural resources and ecosystems services and their related value chain.

Amendment 141

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.1 – paragraph 2 – indent 4 a (new)

Text proposed by the Commission

Amendment

- **Comprehensive and sustainable global environmental observation and information system, including through fostering cooperation between climate modelling communities and environmental observation and data management communities;**

Amendment 142

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.1 – paragraph 2 – indent 4 b (new)

Text proposed by the Commission

Amendment

- *Effects of invasive alien species on biodiversity, ecosystem services and productivity, including new tools to prevent and combat them;*

Amendment 143

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.1 – paragraph 2 – indent 4 c (new)

Text proposed by the Commission

Amendment

- *Improved integrated forecasting, assessment of risks and vulnerability to disasters linked to natural and man-made disturbances, including developing early warning systems;*

Amendment 144

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.1 – paragraph 2 – indent 4 d (new)

Text proposed by the Commission

Amendment

- *Ecological and socio-cultural coherence of territorial models, with particular attention to the interaction of nature and society resulting from territorial policy and strategies.*

Amendment 145

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.2 – paragraph 2 – indent 1

Text proposed by the Commission

- The state and value of biodiversity, terrestrial and marine ecosystems, natural capital and ecosystem services;

Amendment

- The state and value of ***global and local*** biodiversity, terrestrial and marine ***and aquatic*** ecosystems, natural capital and ecosystem services; ***analysis on the causes and potential solutions for decline in biodiversity***;

Amendment 146

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.2 – paragraph 2 – indent 4

Text proposed by the Commission

- Ecotoxicology of compounds and new pollutants, their interactions and environmental behaviour, and altered biochemical loops under changing climate;

Amendment

- Ecotoxicology of compounds and new pollutants, ***chemical substances and*** their interactions and environmental behaviour, and altered biochemical loops under changing climate;

Amendment 147

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.3 – paragraph 1

Text proposed by the Commission

Resilient and sustainable farming and forestry systems provide economic, environmental and social benefits in a changing context for primary production. In addition to contributing to food and nutrition security, they feed into dynamic value chains, manage land and natural resources as well as deliver a range of vital public goods including carbon sequestration, biodiversity preservation, pollination *and* public health. Integrated approaches are needed to promote the multiple functions of agro- and forest (eco)systems taking into account the changing context for primary production, notably in relation to climate and environment, resource availability, demography and consumption patterns. It is also necessary to address the spatial and socio-economic dimension of agriculture and forestry activities and mobilise the potential of rural areas.

Amendment

Resilient and sustainable farming and forestry systems provide economic, environmental and social benefits in a changing context for primary production. In addition to contributing to food and nutrition security, they feed into dynamic value chains, manage land and natural resources as well as deliver a range of vital public goods including carbon sequestration, biodiversity preservation, pollination, *as well as* public health *and wellbeing*. Integrated approaches are needed to promote the multiple functions of agro- and forest (eco)systems taking into account the changing context for primary production, notably in relation to climate and environment, resource availability, demography and consumption patterns. It is also necessary to address the *impact and* spatial and socio-economic dimension of agriculture and forestry activities and mobilise the potential of rural areas.

Amendment 148

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.3 – paragraph 2 – indent -1 (new)

Text proposed by the Commission

Amendment

– ***Improving monitoring and indicators of biodiversity, ecosystem functions and services in rural areas and agroecological systems, and supporting public participation in co-learning and improving the status of farming ecosystems;***

Amendment 149

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.3 – paragraph 2 – indent 1

Text proposed by the Commission

- Methods, technologies and tools for sustainable and resilient production in farming and forestry;

Amendment

- Methods, technologies and **innovative** tools for sustainable and resilient production in farming, **including terrestrial and marine**, and forestry, **and for the most efficient use of water resources**;

Amendment 150

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.3 – paragraph 2 – indent 3

Text proposed by the Commission

- Climate and environmental impact of activities in the primary sector; potential of agriculture and forestry **as** carbon **sinks** and for mitigation of greenhouse gas emissions including negative emissions approaches;

Amendment

- Climate and environmental impact of activities in the primary sector **and along the value chain**; the potential of agriculture and forestry **in increasing substitution and carbon storage, for example through sustainable biomass production** and for mitigation of greenhouse gas emissions including negative emissions approaches;

Amendment 151

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.3 – paragraph 2 – indent 4

Text proposed by the Commission

- Plant pests and diseases and animal health and welfare; alternatives to the use of contentious pesticides, antibiotics and

Amendment

- Plant pests and diseases and animal health and welfare; alternatives to the use of contentious **chemical** pesticides, antibiotics and other substances, **taking**

other substances;

into account biodiversity conservation and high biodiversity agro-ecosystem approaches;

Amendment 152

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.3 – paragraph 2 – indent 4 a (new)

Text proposed by the Commission

Amendment

- *Open data systems which foster the sharing of plant, pathogen and environmental data and knowledge that enable further scientific research, environmental planning and development of commercial products;*

Amendment 153

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.3 – paragraph 2 – indent 6

Text proposed by the Commission

Amendment

– The use and delivery of ecosystems services in agriculture and forestry systems applying ecological approaches and testing nature-based solutions from farm to landscape levels for an environmentally friendly agriculture;

– The use and delivery of ecosystems services in agriculture and forestry systems applying ecological approaches and testing nature-based solutions from farm to landscape levels for an environmentally friendly agriculture *addressing challenges related to climate change, biodiversity loss, ecosystem degradation, agricultural pollution, and citizens' health and well-being;*

Amendment 154

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.3 – paragraph 2 – indent 7

Text proposed by the Commission

- Agricultural and forestry systems from farm to landscape levels; the use and delivery of ecosystem services in primary production;

Amendment

- **Innovative** agricultural and forestry systems from farm to landscape levels; the use and delivery of ecosystem services in primary production;

Amendment 155

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.3 – paragraph 2 – indent 8

Text proposed by the Commission

- Innovations in farming at the interfaces between agriculture, aquaculture and forestry and in urban areas;

Amendment

- Innovations in farming at the interfaces between agriculture, aquaculture and forestry and in urban **and rural** areas;

Amendment 156

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.3 – paragraph 2 – indent 10

Text proposed by the Commission

- Digital innovations in farming, forestry **and** across value chains and rural areas through the use of data and development of infrastructures, technologies and governance models;

Amendment

- Digital innovations in farming **and forestry, including precision farming and forestry techniques**, across value chains and rural areas through the use of data and development of infrastructures, **AI, machine learning algorithms, robotics** technologies and governance models

including the development of demonstration farms;

Amendment 157

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.3 – paragraph 2 – indent 11 a (new)

Text proposed by the Commission

Amendment

- *Transition towards integrated and diversified food and farming systems and agronomic practices, including the use of precision technologies, agroecological and ecological intensification approaches to benefit all types of agriculture;*

Amendment 158

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.3 – paragraph 2 – indent 11 b (new)

Text proposed by the Commission

Amendment

- *New plant breeding strategies aimed at sustainable higher yield, improved quality and added economic and environmental benefits;*

Amendment 159

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.3 – paragraph 2 – indent 11 c (new)

Text proposed by the Commission

Amendment

- ***Development of products, tools and practices, to support sustainable agricultural practices, including improving knowledge on the impact of different agricultural practices on soil quality and regeneration.***

Amendment 160

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.4 – introductory part

Text proposed by the Commission

Amendment

5.2.4. *Sea and* Oceans

5.2.4. ***Seas, Oceans, Inland Waters and the Blue Economy***

Amendment 161

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.4 – paragraph 1

Text proposed by the Commission

Amendment

Seas and oceans' ***natural capital and ecosystem services offer*** significant socio-economic and welfare benefits. This potential is at risk because of the severe pressure from human and natural stressors such as pollution, overfishing, climate change, sea-level rise and extreme weather events. To prevent seas ***and*** oceans from reaching a point of no return, it is necessary to strengthen our knowledge and understanding in order to sustainably manage, protect and restore marine and

The rich biodiversity of seas, oceans and inland waters offers significant socio-economic and welfare benefits. This potential is at risk because of the severe pressure from human and natural stressors such as pollution, overfishing, climate change, sea-level rise, ***unsustainable water use*** and extreme weather events. To prevent seas, oceans ***and inland waters*** from reaching a point of no return, it is necessary to strengthen our knowledge and understanding in order to sustainably

coastal ecosystems **and** prevent marine pollution, in a context of an improved and responsible ocean governance framework. This will also include research to sustainably unlock the vast and unexploited economic potential of seas **and** oceans aiming at producing more food without increasing **pressures on them**, and also **contribute to** alleviate pressure on land, **freshwater and ocean** resources. There is a need for partnering approaches, including sea basin and macro-regional strategies, extending beyond the EU (e.g. in the Mediterranean, the Baltic, the Black Sea, the Atlantic, the Caribbean Sea and in the Indian Ocean); and for contributing to International Ocean Governance commitments, initiatives like the United Nations Decade of Ocean Science for Sustainable Development and commitments linked to the conservation of marine biological diversity in areas beyond national jurisdiction.

manage, protect and restore marine and coastal ecosystems, prevent marine pollution, in a context of an improved and responsible ocean governance framework. This will also include research to sustainably unlock the vast and unexploited economic potential of seas, oceans **and inland waters**, aiming at producing more food without increasing **pressure** and also alleviate pressure on land **and water** resources. There is a need for partnering approaches, including sea basin and macro-regional strategies, extending beyond the EU (e.g. in the Mediterranean, the Baltic, the Black Sea, the Atlantic, the Caribbean Sea and in the Indian Ocean); and for contributing to International Ocean Governance commitments, **the Sustainable Development Goals**, initiatives like the United Nations Decade of Ocean Science for Sustainable Development and commitments linked to the conservation of marine biological diversity in areas beyond national jurisdiction.

Amendment 162

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.4 – paragraph 2 – indent 1

Text proposed by the Commission

– Sustainable **sea and ocean farming**, fisheries and **mariculture** for food, including alternative sources of protein with increased food security, food sovereignty and climate resilience;

Amendment

– Sustainable fisheries and **responsible aquaculture** for food, including alternative sources of protein with increased food security, food sovereignty and climate resilience;

Amendment 163

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.4 – paragraph 2 – indent 1 a (new)

Text proposed by the Commission

Amendment

- ***Developing new bio products based on marine organisms, with a wide range of applications opening new products and services opportunities;***

Amendment 164

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.4 – paragraph 2 – indent 2

Text proposed by the Commission

Amendment

- Strengthened resilience of marine ecosystems thereby ensuring ***seas and ocean*** health, combating and mitigating the effects of natural and human pressures like pollution and plastics, eutrophication, acidification, ***seas and oceans*** warming, sea level rise, considering the intersection between land ***and sea*** and fostering a circular approach;

- Strengthened resilience of marine ecosystems thereby ensuring ***the health of seas, oceans and inland waters, preventing,*** combating and mitigating the effects of natural and human pressures like pollution, ***chemicals*** and plastics, ***including microplastics, overfishing,*** eutrophication, acidification, warming, ***invasive species,*** sea level rise, considering the intersection between land, ***aquatic environment*** and fostering a circular approach;

Amendment 165

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.4 – paragraph 2 – indent 3

Text proposed by the Commission

Amendment

- Ocean governance at global and regional levels to ensure conservation and

- Ocean governance at global and regional levels to ensure conservation, and

sustainable use of the seas *and* oceans resources;

sustainable use of the seas, oceans *and inland waters* resources *and its natural capital*;

Amendment 166

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.4 – paragraph 2 – indent 6

Text proposed by the Commission

– Blue value-chains, the multiple-use of *marine* space and growth of the renewable energy sector from seas *and* oceans, including sustainable micro- and macro- algae;

Amendment

– Blue value-chains, the multiple-use of space and growth of the renewable energy sector from seas, oceans *and inland waters*, including sustainable *production of* micro- and macro- algae; *modern aquatic production systems on land supporting an environmentally-neutral biomass production*;

Amendment 167

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.4 – paragraph 2 – indent 7

Text proposed by the Commission

– Nature-based solutions based on *marine* and coastal ecosystem dynamics, biodiversity and multiple ecosystem services, which will enable systemic approaches to sustainably use the resources of seas *and* oceans, contribute to environmental protection, *coastal* management, and adaptation to climate change;

Amendment

– Nature-based solutions based on *aquatic* and coastal ecosystem dynamics, biodiversity and multiple ecosystem services, which will enable systemic approaches to sustainably use the resources of seas, oceans *and inland water*, contribute to environmental (*including coastal*) protection, *restoration and* management, and adaptation to climate change;

Amendment 168

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.4 – paragraph 2 – indent 8

Text proposed by the Commission

- Blue innovation including in the blue and digital economies, across coastline areas, coastal cities and ports in order to strengthen resilience of coastal areas and increase citizens' benefits.

Amendment

- Blue innovation including in the blue and digital economies, across coastline areas, coastal cities and ports, in order to strengthen resilience of coastal areas and increase citizens' **and visitor** benefits;

Amendment 169

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.4 – paragraph 2 – indent 9

Text proposed by the Commission

- Better understanding of the role of oceans for climate change mitigation and adaptation.

Amendment

- Better understanding of the role of oceans **and other aquatic environments** for climate change mitigation and adaptation.

Amendment 170

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.5 – paragraph 1

Text proposed by the Commission

The combined effects of population growth, resource scarcity and overexploitation, environmental degradation, climate change and migration create unprecedented challenges which

Amendment

The combined effects of population growth, resource scarcity and overexploitation, environmental degradation, climate change and migration create unprecedented challenges which

require food system transformation (FOOD 2030).²⁰ Current food production and consumption are largely unsustainable while we are confronted with the double burden of malnutrition, characterised by the coexistence of undernutrition and obesity. Future food systems need to deliver sufficient safe, healthy and quality food for all, underpinned by resource efficiency, sustainability (including the reduction of GHG emissions, pollution and waste production), linking land and *sea*, reducing food waste, enhancing food production *from the seas and oceans* and encompassing the entire 'food value chain' from producers to consumers – and back again. This needs to go hand in hand with development of the food safety system of the future and the design, development and delivery of tools, technologies and digital solutions that provide significant benefits for consumers and improve the competitiveness and sustainability of the food value chain. Furthermore, there is a need to foster behavioural changes in food consumption and production patterns as well as to engage primary producers, industry (including SMEs), retailers, food service sectors, consumers, and public services.

²⁰ SWD(2016) 319 final: European Research and Innovation for Food and Nutrition Security

require food system transformation (FOOD 2030).²⁰ Current food production and consumption are largely unsustainable while we are confronted with the double burden of malnutrition, characterised by the coexistence of undernutrition and obesity. Future food systems need to deliver sufficient safe, healthy and quality food for all, underpinned by resource efficiency, sustainability (including the reduction of GHG emissions, pollution and waste production), linking land and *aquatic environments*, reducing food waste, enhancing food production and encompassing the entire 'food value chain' from producers to consumers – and back again. This needs to go hand in hand with development of the food safety system of the future and the design, development and delivery of tools, technologies and digital solutions that provide significant benefits for consumers and improve the competitiveness, *efficiency* and sustainability of the food value chain. Furthermore, there is a need to foster behavioural changes in food consumption and production patterns, *for example via food labelling*, as well as to *better* engage *all actors, including* primary producers, industry (including SMEs), retailers, food service sectors, consumers, and public services.

²⁰ SWD(2016) 319 final: European Research and Innovation for Food and Nutrition Security

Amendment 171

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.5 – paragraph 2 – indent 1

Text proposed by the Commission

- Sustainable and healthy diets for people's well-being across their lifespan;

Amendment

- Sustainable and healthy diets for people's well-being across their lifespan; ***ensuring that food production and processing systems are designed from the ground up with nutritional needs in mind;***

Amendment 172

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.5 – paragraph 2 – indent 1 a (new)

Text proposed by the Commission

- ***The use of new genomic and metabolomics technologies to recognise and meet the different nutritional needs of our global population;***

Amendment

Amendment 173

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.5 – paragraph 2 – indent 2

Text proposed by the Commission

- ***Personalised*** nutrition especially for vulnerable groups, to mitigate the risk factors for diet-related and non-communicable diseases;

Amendment

- ***New*** nutrition ***approaches*** especially for vulnerable groups, to mitigate the risk factors for diet-related and non-communicable diseases, ***including food intolerance;***

Amendment 174

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.5 – paragraph 2 – indent 3

Text proposed by the Commission

- Consumers' behaviour, lifestyle and motivations, promoting social innovation and societal engagement for better health and environmental sustainability throughout the entire food value chain;

Amendment

- Consumers' behaviour, lifestyle and motivations, ***analysed from a multi-disciplinary perspective (psychological and cultural)***, promoting social innovation and societal engagement for better health and environmental sustainability, throughout the entire food value chain;

Amendment 175

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.5 – paragraph 2 – indent 4

Text proposed by the Commission

- Modern food safety and authenticity systems, enhancing consumer confidence in the food system;

Amendment

- Modern food safety, ***traceability*** and authenticity systems, enhancing consumer confidence in the food system;

Amendment 176

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.5 – paragraph 2 – indent 4 a (new)

Text proposed by the Commission

Amendment

- ***Identification of protein sources and further development of protein plants and their processing for use as food and feed;***

Amendment 177

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.5 – paragraph 2 – indent 6

Text proposed by the Commission

- Environmentally sustainable, circular and resource efficient food systems from land and *sea*, towards zero food waste throughout the entire food system, through reuse of food and biomass, recycling of food waste, new food packaging, demand for tailored and local food;

Amendment

- Environmentally sustainable, circular and resource efficient food systems from land and *aquatic environments*, towards zero food waste throughout the entire food system, through reuse of food and biomass, recycling of food waste, new food packaging, demand for tailored and local food;

Amendment 178

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.5 – paragraph 2 – indent 7

Text proposed by the Commission

- Innovation and food systems for place-based innovation and empowerment of communities, fostering fair trade and pricing, inclusiveness and sustainability through partnerships between *industry*, local authorities, researchers and society.

Amendment

- Innovation and food systems for place-based innovation and empowerment of communities, fostering fair trade and pricing, inclusiveness and sustainability through partnerships between *industries*, local authorities, researchers and society;

Amendment 179

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.5 – paragraph 2 – indent 7 a (new)

Text proposed by the Commission

Amendment

- ***The development of the circular bioeconomy, maximising food production and processing cycles to optimise the value of our resources and minimise environmental impact.***

Amendment 180

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.6 – paragraph 1

Text proposed by the Commission

Amendment

Bio-based innovation lays the foundations for the transition away from a fossil-based economy by encompassing the sustainable sourcing, industrial processing and conversion of biomass from land and *sea* into bio-based materials and products. It also capitalises on the potential of living resources, life sciences and industrial biotechnology for new discoveries, products and processes. Bio-based innovation, including technologies, can bring new economic activities and employment to regions and cities, contribute to revitalising rural and coastal economies and strengthen the circularity of the bioeconomy.

Bio-based innovation lays the foundations for the transition away from a fossil-based economy by encompassing the sustainable sourcing, industrial processing and conversion of biomass from land and ***water*** into bio-based materials and products. It also capitalises on the potential of living resources, life sciences and industrial biotechnology ***as well as ongoing standardisation work*** for new discoveries, products and processes. Bio-based innovation, including technologies, can bring new economic activities and employment to regions and cities, contribute to revitalising rural and coastal economies and strengthen the circularity of the bioeconomy, ***thus supporting the transition towards a low-carbon resource efficient society.***

Amendment 181

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.6 – paragraph 1 a (new)

Text proposed by the Commission

Amendment

Bio-based innovation systems require collaboration across the sectors and the value chain. Potential and impact of the various sources of biomass should be carefully assessed.

Amendment 182

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.6 – paragraph 2 – indent 1

Text proposed by the Commission

Amendment

– Sustainable biomass sourcing and production systems, focusing on high-value applications and uses, social and environmental sustainability, impact on climate and biodiversity reduction targets and overall resource efficiency;

– Sustainable ***and equitable*** biomass sourcing and production systems, focusing on high-value applications and uses, social, ***economic*** and environmental sustainability, impact on climate and biodiversity reduction targets and overall resource efficiency;

Amendment 183

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.6 – paragraph 2 – indent 3

Text proposed by the Commission

Amendment

– Bio-based value chains, materials, including bio-inspired materials, products and processes with novel qualities, functionalities and improved sustainability (including reducing greenhouse gases emissions), fostering the development of advanced biorefineries using a wider range

– Bio-based value chains, materials, including bio-inspired materials, products and processes with novel qualities, functionalities and improved sustainability (including reducing greenhouse gases emissions), fostering the development of advanced biorefineries using a wider range of biomass ***and further developing***

of biomass;

existing and new biogenic fuels; better use of bio-based waste and sidestreams;

Amendment 184

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.6 – paragraph 2 – indent 4

Text proposed by the Commission

- Biotechnology, including cross sectoral cutting-edge biotechnology, for application in competitive, sustainable and novel industrial processes, environmental services and consumer products²¹ ;

²¹ Health biotechnology applications will be addressed by the Health cluster under this pillar.

Amendment

- Biotechnology, including cross sectoral cutting-edge biotechnology, for application in competitive, sustainable and novel **agricultural**, industrial processes, environmental services and consumer products²¹ ;

²¹ Health biotechnology applications will be addressed by the Health cluster under this pillar.

Amendment 185

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.6 – paragraph 2 – indent 5

Text proposed by the Commission

- Circularity of the bio-based economy through technological, systemic, social and business model innovation to **radically** increase the value generated per unit of biological resources, keeping the value of such resources in the economy for longer and supporting the principle of the cascading use of sustainable biomass through research and innovation;

Amendment

- Circularity of the bio-based economy through technological, systemic, social and business model innovation to increase the value generated per unit of biological resources, keeping the value of such resources in the economy for longer and supporting the **transition towards sustainable materials and the** principle of the cascading use of sustainable biomass through research and innovation;

Amendment 186

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.6 – paragraph 2 – indent 5 a (new)

Text proposed by the Commission

Amendment

- ***Bio-based value chains including new innovative material, material combinations and other innovative concepts and products;***

Amendment 187

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.7 – paragraph 1

Text proposed by the Commission

Amendment

Circular production and consumption systems will provide benefits to the European economy by reducing resource dependency and increasing the competitiveness of enterprises, and to European citizens by creating new job opportunities and reducing pressures on the environment and climate. Beyond industrial transformation, the transition to a low-emission, resource efficient and circular economy will also need a broader system shift that requires systemic eco-innovative solutions, new business models, markets and investments, enabling infrastructure, social innovation changes in consumer behaviour, and governance models stimulating multi-stakeholder collaboration to ensure that the intended system change achieves better economic, environmental and social outcomes²².
Opening for international cooperation **will**

Circular production and consumption systems will provide benefits to the European economy **and society** by reducing resource dependency and increasing the competitiveness of enterprises, and to European citizens by creating new job opportunities and reducing pressures on the environment and climate. Beyond industrial transformation, the transition to a low-emission, resource efficient and circular economy will also need a broader system shift that requires systemic eco-innovative solutions, new business models, markets and investments, **revision or development of new standards** enabling infrastructure, social innovation changes in consumer behaviour, and governance models stimulating multi-stakeholder collaboration to ensure that the intended system change achieves better economic, environmental and social

be important for comparability, generating and sharing knowledge and avoiding duplication of efforts, e.g. through international initiatives such as the International Resource Panel.

outcomes²². *Where appropriate*, opening for international cooperation *can* be important for comparability, generating and sharing knowledge and avoiding duplication of efforts, e.g. through international initiatives such as the International Resource Panel.

²² The activities in Circular Systems Area of Intervention are complementary to those of Low-Carbon and Clean Industry in the Digital and Industry cluster.

²² The activities in Circular Systems Area of Intervention are complementary to those of Low-Carbon and Clean Industry in the Digital and Industry cluster.

Amendment 188

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.7 – paragraph 2 – indent 1

Text proposed by the Commission

– Systemic transition to a resource-efficient and circular economy, with new paradigms in consumer interaction, new business models for resource efficiency and environmental performance; products and services stimulating resource efficiency during the whole lifecycle; systems for sharing, reuse, repair, remanufacturing, recycling and composting;

Amendment

– Systemic transition to a resource-efficient and circular economy, with new paradigms in consumer interaction, new business models for resource *and energy* efficiency and environmental performance; products and services stimulating resource efficiency during the whole lifecycle; systems for sharing, reuse, repair, remanufacturing, recycling and composting;

Amendment 189

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.7 – paragraph 2 – indent 3

Text proposed by the Commission

– Solutions for sustainable and

Amendment

– Solutions for sustainable and

regenerative development of cities, peri-urban areas and regions, integrating the circular economy transformation with nature-based solutions, technological, digital, social, cultural and territorial governance innovations;

regenerative development of cities, peri-urban **and rural** areas and regions, integrating the circular economy transformation with nature-based solutions, technological, digital, social, cultural and territorial governance innovations;

Amendment 190

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.7 – paragraph 2 – indent 3 a (new)

Text proposed by the Commission

Amendment

- ***Adaptation to a fully circular approach involving innovative waste management and treatment solutions that allows for the recovery of resources and nutrients as well as food waste management in urban areas;***

Amendment 191

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.7 – paragraph 2 – indent 4

Text proposed by the Commission

Amendment

- Eco-innovation for prevention and remediation of environmental pollution from hazardous substances and chemicals of emerging concern; looking also at the interface between chemicals, products and waste;

- Eco-innovation for prevention and remediation of environmental pollution from hazardous substances and chemicals of emerging concern; looking also at the interface between ***ecosystems***, chemicals, products and waste;

Amendment 192

Proposal for a decision

Annex I – part II – point 5 – point 5.2 – point 5.2.7 – paragraph 2 – indent 5 a (new)

Text proposed by the Commission

Amendment

- ***Increased understanding of the drivers and barriers for an up-take of bio-based products through research on circular economy marking, labelling, application of standards, certification schemes, public procurement and regulatory activities, including from a global competition perspective.***

Amendment 193

Proposal for a decision

Annex I – part II – point 6 – point 6.1 – paragraph 1

Text proposed by the Commission

Amendment

High-quality and trusted scientific evidence is essential for good public policies. New initiatives and proposals for EU legislation need transparent, comprehensive and balanced evidence, whereas implementation of policies needs evidence to measure and monitor their impact and progress.

High-quality and trusted scientific evidence is essential for good public policies. New initiatives and proposals for EU legislation need transparent, comprehensive and balanced evidence, whereas implementation of policies needs evidence ***and transparency*** to measure and monitor their impact and progress.

Amendment 194

Proposal for a decision

Annex I – part II – point 6 – point 6.2 – point 6.2.1 – paragraph 1

Text proposed by the Commission

Amendment

Knowledge and data are growing exponentially. If policy makers are to make

Knowledge and data are growing exponentially. If policy makers are to make

sense and use of this they must be reviewed and filtered. There is also a need for cross-cutting scientific methods and analytical tools for use by all Commission services, especially to anticipate upcoming societal challenges and support better regulation. This includes innovative processes to engage stakeholders and citizens in policy-making issues.

sense and use of this they must be reviewed and filtered. There is also a need for cross-cutting scientific methods and analytical tools for use by all Commission services, especially to anticipate ***and/or to timely react to*** upcoming societal challenges and support better regulation. This includes innovative processes to engage stakeholders and citizens in policy-making issues.

Amendment 195

Proposal for a decision

Annex I – part II – point 6 – point 6.2 – point 6.2.1 – paragraph 2 – indent 4

Text proposed by the Commission

– Data management, data sharing and coherence.

Amendment

– ***FAIR*** data management, data sharing and coherence.

Amendment 196

Proposal for a decision

Annex I – part II – point 6 – point 6.2 – point 6.2.2 – introductory part

Text proposed by the Commission

6.2.2. Global Challenges

Amendment

6.2.2. Global Challenges ***and European competitiveness***

Amendment 197

Proposal for a decision

Annex I – part II – point 6 – point 6.2 – point 6.2.2 – paragraph 1

Text proposed by the Commission

The JRC will contribute to the specific EU policies and commitments addressed by the **five** Global Challenges clusters, notably the EU's commitment to the Sustainable Development Goals.

Amendment

The JRC will contribute to the specific EU policies and commitments addressed by the **six** Global Challenges clusters, notably the EU's commitment to the Sustainable Development Goals.

Amendment 198

Proposal for a decision

Annex I – part II – point 6 – point 6.2 – point 6.2.2 – paragraph 2 – point 2 – introductory part

Text proposed by the Commission

2. Inclusive and **secure** society

Amendment

2. Inclusive and **creative** society

Amendment 199

Proposal for a decision

Annex I – part II – point 6 – point 6.2 – point 6.2.2 – paragraph 2 – point 2 – indent 1

Text proposed by the Commission

– Research on inequality, poverty and exclusion, social mobility, cultural diversity, and skills; assessment of social, demographic and technological transformations on the economy and on society;

Amendment

– Research on inequality, poverty and exclusion, social mobility, cultural diversity, and skills; assessment of social, demographic, **geographic** and technological transformations on the economy and on society;

Amendment 200

Proposal for a decision

Annex I – part II – point 6 – point 6.2 – point 6.2.2 – paragraph 2 – point 2 – indent 2

Text proposed by the Commission

– Support to the preservation of cultural heritage;

Amendment

– ***Research on the economic and social contribution of the cultural and creative sectors, including the development of statistics and support to the preservation of tangible and intangible cultural heritage;***

Amendment 201

Proposal for a decision

Annex I – part II – point 6 – point 6.2 – point 6.2.2 – paragraph 2 – point 2 – indent 3 a (new)

Text proposed by the Commission

Amendment

- ***Research on the social impact of scientific and technological changes on Member States and regions, including citizens;***

Amendment 202

Proposal for a decision

Annex I – part II – point 6 – point 6.2 – point 6.2.2 – paragraph 2 – point 2 a (new)

Text proposed by the Commission

Amendment

2 a. Secure society

Amendment 203

Proposal for a decision

Annex I – part II – point 6 – point 6.2 – point 6.2.2 – paragraph 2 – point 3 – introductory part

Text proposed by the Commission

Amendment

3. Digital *and* Industry

3. Digital, Industry *and Space*

Amendment 204

Proposal for a decision

Annex I – part II – point 6 – point 6.2 – point 6.2.2 – paragraph 2 – point 3 – indent 4

Text proposed by the Commission

Amendment

– *Research on nanotechnology and other Key Enabling Technologies;*

deleted

Amendment 205

Proposal for a decision

Annex I – part II – point 6 – point 6.2 – point 6.2.2 – paragraph 2 – point 4 – indent 1

Text proposed by the Commission

Amendment

– Support to implementation of the EU climate, energy and transport policies, transition *to a low-carbon* economy and strategies for decarbonisation towards 2050; analysis of integrated national climate and energy plans; assessment of decarbonisation pathway in all sectors, including agriculture and Land Use Land Use Change and Forestry;

– Support to implementation of the EU climate, energy and transport policies, *unlocking scenarios for the transition towards net-zero GHG emissions* economy *including low-carbon technologies* and strategies for decarbonisation; analysis of integrated national climate and energy plans; assessment of decarbonisation pathway in all sectors, including agriculture and Land Use Land Use Change and Forestry;

Amendment 206

Proposal for a decision

Annex I – part II – point 6 – point 6.2 – point 6.2.2 – paragraph 2 – point 4 – indent 2

Text proposed by the Commission

- Assessment of risks **in** vulnerable ecosystems and critical economic sectors and infrastructure, with focus on adaptation strategies;

Amendment

- Assessment of risks **and potential solutions for** vulnerable ecosystems and critical economic sectors and infrastructure, with focus on **mitigation and** adaptation strategies;

Amendment 207

Proposal for a decision

Annex I – part II – point 6 – point 6.2 – point 6.2.2 – paragraph 2 – point 4 – indent 3

Text proposed by the Commission

- Analysis of the R&I dimension of Energy Union; assessment of EU competitiveness in the global clean energy market;

Amendment

- Analysis of the R&I dimension of Energy Union; assessment of EU competitiveness in the global clean, **in particular renewables**, energy market;

Amendment 208

Proposal for a decision

Annex I – part II – point 6 – point 6.2 – point 6.2.2 – paragraph 2 – point 4 – indent 5

Text proposed by the Commission

- Analysis of energy use of buildings, smart and sustainable cities, and industries;

Amendment

- Analysis of energy use **and climate change mitigation potential** of buildings,

smart and sustainable cities, and industries;

Amendment 209

Proposal for a decision

Annex I – part II – point 6 – point 6.2 – point 6.2.2 – paragraph 2 – point 4 – indent 8

Text proposed by the Commission

– Support *to energy* transition, including *the Covenant of Mayors, clean energy for EU Islands, sensitive regions, and Africa*;

Amendment

– Support *the* transition *towards decarbonised energy systems*, including *highly efficient and renewables-based systems*;

Amendment 210

Proposal for a decision

Annex I – part II – point 6 – point 6.2 – point 6.2.2 – paragraph 2 – point 5 – introductory part

Text proposed by the Commission

5. Food *and* Natural Resources

Amendment

5. Food, Natural Resources *and Agriculture*

Amendment 211

Proposal for a decision

Annex I – part II – point 6 – point 6.2 – point 6.2.2 – paragraph 2 – point 5 – indent 1

Text proposed by the Commission

– Research on land, soil, forests, air, water, marine resources, raw materials and biodiversity to support the effective preservation, restoration and sustainable use of natural capital, including sustainable

Amendment

– Research on land, soil, forests, air, water, marine resources, raw materials and biodiversity to support the effective preservation, restoration and sustainable use of natural capital, including *equitable*

resources management in Africa ;

and sustainable resources management in Africa;

Amendment 212

Proposal for a decision

Annex I – part II – point 6 – point 6.2 – point 6.2.2 – paragraph 2 – point 5 – indent 3

Text proposed by the Commission

- Assessment of climate change and potential mitigation and adaptation measures for agricultural *and* fisheries policies, including food security;

Amendment

- Assessment of climate change and potential mitigation and adaptation measures for agricultural, fisheries *and forestry* policies, including food security;

Amendment 213

Proposal for a decision

Annex I – part II – point 6 – point 6.2 – point 6.2.2 – paragraph 2 – point 5 – indent 4

Text proposed by the Commission

- Monitoring and forecasting of agricultural resources in EU and neighbourhood countries;

Amendment

- Monitoring and forecasting of agricultural *and forestry* resources in EU and neighbourhood countries;

Amendment 214

Proposal for a decision

Annex I – part II – point 6 – point 6.2 – point 6.2.3 – paragraph 1

Text proposed by the Commission

The JRC will contribute to innovation and

Amendment

The JRC will contribute to innovation and

technology transfer.. It will support the functioning of the internal market and the economic governance of the Union. It will contribute to development and monitoring of policies targeting a more social and sustainable Europe. It will support the EU's external dimension and international goals and help in promoting good governance. A well-functioning internal market with a strong economic governance and fair social system will foster innovation *and* competitiveness.

technology transfer. It will support the functioning of the internal market and the economic governance of the Union. It will contribute to development and monitoring of policies targeting a more social and sustainable Europe. It will support the EU's external dimension and international goals and help in promoting good governance. A well-functioning internal market with a strong economic governance and fair social system will foster innovation, competitiveness, *jobs creation, social inclusion and well-being.*

Amendment 215

Proposal for a decision

Annex I – part II – point 6 – point 6.2 – point 6.2.4 – paragraph 2 – indent 5

Text proposed by the Commission

- Open science and open data.

Amendment

- Open science and open *FAIR* data.

Amendment 216

Proposal for a decision

Annex I – part II – point 6 – point 6.2 – point 6.2.5 – paragraph 2 – indent 1

Text proposed by the Commission

- Implementation of regional and urban policies, smart specialisation strategies, strategies for economic transformation of regions in transition, integrated urban development strategies and data;

Amendment

- Implementation of regional and urban policies, smart specialisation strategies, strategies for economic transformation of regions in transition, integrated urban *and rural* development strategies and data;

Amendment 217

Proposal for a decision

Annex I – part III

Text proposed by the Commission

III **OPEN INNOVATION**

Open innovation is a vital paradigm for the EU to continue delivering prosperity to its citizens and meeting challenges of the future. Implementing it requires a systemic, cross-cutting and multifaceted approach. Europe's economic progress, social welfare and quality of life rely on its ability to boost productivity and growth, which, in turn, depends heavily on its ability to innovate. Innovation is also key to solving the major challenges that lie ahead for the EU.

Like its predecessors, Innovation is at the heart of Horizon Europe. The quest for new ideas, products and processes is driving Horizon Europe objectives and implementing modalities, from strategic programming to calls, and is present from the onset to the end of any project supported, from 'blue-sky' research to industrial or technological roadmaps and missions.

Yet, innovation deserves specific measures, as the EU must decisively enhance the conditions and environment European innovation can thrive, so that ideas are quickly shared between actors in the innovation ecosystem, and new ideas and technologies swiftly transformed into the products and services needed for the EU to deliver.

Recent decades have seen the emergence of major and global new markets in entertainment, media, health care, lodging and retail, based on breakthrough innovations in ICT, biotech, internet and the platform economy. These market-creating innovations, which impact the EU

Amendment

III **INNOVATIVE EUROPE**

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Yet, innovation deserves specific measures, as the EU must decisively enhance the conditions and environment European innovation can thrive, so that ideas are quickly shared between actors in the innovation ecosystem, and new ideas and technologies swiftly transformed into the products and services needed for the EU to deliver.

Recent decades have seen the emergence of major and global new markets in entertainment, media, **communication**, health care, lodging and retail, based on breakthrough innovations in ICT, biotech, internet and the platform economy. These market-creating innovations, which impact

economy as a whole, are deployed by fast growing and often new companies. But only a few originate in the EU.

A new global wave of breakthrough innovation is coming up, one that will be based on more 'deep-tech' technologies such as block-chain, artificial intelligence, genomics and robotics, and other technologies, which may *also* emerge from individual innovators and communities of citizens. They have in common that they are taking shape at the intersection between different technologies, industry sectors and scientific disciplines, offering radically new combinations of products, processes, services and business models, and have the potential to open up new markets worldwide. Additional sectors such as manufacturing, financial services, transport or energy will also be impacted.

Europe has to ride that wave. It is well positioned as the new wave comes in 'deep-tech' areas, such as artificial intelligence, quantum technologies, clean energy sources, where Europe has some competitive advantages regarding science and knowledge, and can build on close public-private cooperation (e.g. in health care or energy).

For Europe to lead that new wave of breakthrough innovation, the following underlying challenges need to be met:

- Improve the transformation of science into innovation in order to accelerate the transfer of ideas, technologies and talent from the research base into start-ups and industry;

- Speed up industrial transformation: European industry is lagging behind in

the EU economy as a whole, are deployed by fast growing and often new companies. But only a few originate *and thrive* in the EU.

A new global wave of breakthrough *and disruptive* innovation, *including social and technological*, is coming up, one that will be based on more 'deep-tech' technologies such as block-chain, artificial intelligence, genomics and robotics, and other technologies, which may *not only* emerge *from companies or research organisations, but also* from individual innovators and communities of citizens. They have in common that they are taking shape at the intersection between different technologies, industry sectors and scientific disciplines, offering radically new combinations of products, processes, services, *standards* and business models, and have the potential to open up new markets worldwide. Additional sectors such as manufacturing, financial services, transport or energy will also be impacted.

Europe has to ride that wave. It is well positioned as the new wave comes in 'deep-tech' areas, such as artificial intelligence, quantum technologies, clean energy sources, where Europe has some competitive advantages regarding science and knowledge, and can build on close public-private cooperation (e.g. in health care or energy).

For Europe to lead that new wave of breakthrough innovation, the following underlying challenges need to be met:

- Improve the transformation of science into innovation in order to accelerate the transfer of ideas, technologies and talent from the research base into start-ups and industry;

- *Increase the collaboration between all types of innovators, in particular between start-ups, SMEs and larger companies, improving their driving force and creating new ecosystems;*

- Speed up industrial transformation: European industry is lagging behind in

embracing new technologies and scaling up: 77% of the young and big R&D companies are in US or Asia and only 16% are based in Europe;

– Increase risk finance to overcome financing gaps: Europe's innovators suffer from a low supply of risk finance. Venture capital is key to turning breakthrough innovations into world-leading companies but, in Europe, it is less than a quarter of the amounts raised in the US and in Asia. Europe must bridge the 'Valleys of death', whereby ideas and innovations fail to reach the market due to the gap between public support and private investment, in particular with regard to high-risk breakthrough innovations and long-term investments;

– Enhance and simplify the European landscape for funding and supporting research and innovation: the multitude of funding sources provides a complex landscape for innovators. EU intervention has to cooperate and coordinate with other initiatives at European, national and regional level, public and private, to better enhance and align supporting capacities, and provide for an easy-to-navigate landscape for any European innovator;

– Overcome fragmentation to the innovation ecosystem. While Europe is home to a growing number of hotspots, these are not well connected. Companies with international growth potential have to cope with fragmentation of national markets with their diverse languages, business cultures and regulations.

In order to cope with that new global wave of breakthrough innovation, EU support to breakthrough innovators requires an agile, simple, seamless and tailored approach. Policy to develop and deploy breakthrough innovations and scale-up companies has to be bold in taking risks and must take into account the above-mentioned challenges and add value to related innovation activities implemented by individual Member State.

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Horizon Europe's *Open Innovation* pillar, in cooperation with other EU policies and in particular the InvestEU Programme, is designed to deliver such tangible results. It builds on lessons learned and on experience gained under the previous framework programmes, in particular from activities targeting future technologies and innovation (such as Future Emerging Technologies (FET) and Fast Track to Innovation (FTI)), SMEs (such as the SME Instrument), but also private and corporate finance (such as FP7 RSFF, Horizon 2020 InnovFin), all part of the 'EIC pilot' activities launched for the period 2018-2020.

Based on these experiences, this Pillar provides for the launch of the European Innovation Council (EIC), which will promote breakthrough innovation with rapid scale-up potential at global level and with dedicated types of actions and activities:

- Supporting the development of future and emerging breakthrough innovations;
- Bridging financing gaps in the development, deployment and scaling up of market-creating innovations;
- Increasing the impact and visibility of EU innovation support.

Whilst the EIC will directly support breakthrough innovations, the overall environment from which European innovations nurture and emerge must be further developed and enhanced: it must be a common European endeavour to support innovation all across Europe, and in all dimensions and forms, including through complementary EU and national policies and resources whenever possible. Hence,

Horizon Europe's *Innovative Europe* pillar, in cooperation with other EU policies and in particular the InvestEU Programme, is designed to deliver such tangible results. It builds on lessons learned and on experience gained under the previous framework programmes, in particular from activities targeting future technologies and innovation (such as Future Emerging Technologies (FET) and Fast Track to Innovation (FTI)), SMEs (such as the SME Instrument), but also private and corporate finance (such as FP7 RSFF, Horizon 2020 InnovFin), all part of the 'EIC pilot' activities launched for the period 2018-2020.

Based on these experiences, this Pillar provides for the launch of the European Innovation Council (EIC), which will promote breakthrough *research and* innovation with rapid scale-up potential at global level and with dedicated types of actions and activities:

- Supporting the development of future and emerging breakthrough innovations, *including through targeted collaborative research*;
- *Promoting the spreading and uptake of innovation in industrial and other economic value chains*;
- Bridging financing gaps in the development, deployment and scaling up of market-creating innovations;
- Increasing the impact and visibility of EU innovation support;
- *Creating synergies in other parts of the Programme.*

Whilst the EIC will directly support breakthrough innovations, the overall environment from which European innovations nurture and emerge must be further developed and enhanced: it must be a common European endeavour to support innovation all across Europe, and in all dimensions and forms, including through complementary EU and national policies and resources whenever possible. Hence,

this Pillar provides also for:

- Renewed and reinforced coordination and cooperation mechanisms with Member States and Associated Countries, but also with private initiatives, in order to support all types of European innovation ecosystems and their actors;
- Support to the European Institute of Innovation and Technology (EIT) and Knowledge and Innovation Communities (KICs).

Additionally, as a continued effort to enhance risk-finance capacities for research and innovation in Europe and where necessary, this pillar will link with the InvestEU programme. Building on the successes and the experiences gained under Horizon 2020 InnovFin, as well as under EFSI, the InvestEU Programme will enhance access to risk finance for bankable research organisations, innovators and entrepreneurs, in particular for SMEs and small midcaps, as well as for investors.

this Pillar provides also for:

- Renewed and reinforced coordination and cooperation mechanisms with Member States and Associated Countries, but also with private initiatives, in order to support all types of European innovation ecosystems and their actors;
- **Enhanced** support to the European Institute of Innovation and Technology (EIT) and Knowledge and Innovation Communities (KICs).

Additionally, as a continued effort to enhance risk-finance capacities for research and innovation in Europe and where necessary, this pillar will link with the InvestEU programme. Building on the successes and the experiences gained under Horizon 2020 InnovFin, as well as under EFSI, the InvestEU Programme will enhance access to risk finance for bankable research organisations, innovators and entrepreneurs, in particular for SMEs and small midcaps, as well as for investors.

Amendment 218

Proposal for a decision

Annex I – part III – point 1 – point 1.1 – paragraph 1

Text proposed by the Commission

The objective of the EIC is to identify, develop and deploy breakthrough and disruptive innovations (including technologies), and support the rapid scale-up of innovative firms at EU and international levels along the pathway from ideas to market.

Amendment

The objective of the EIC is to identify, develop and deploy breakthrough and disruptive innovations (including **radically new** technologies) and support the rapid scale-up of innovative firms at EU and international levels along the pathway from ideas to market.

Amendment 219

Proposal for a decision

Annex I – part III – point 1 – point 1.1 – paragraph 2

Text proposed by the Commission

The EIC will be implemented primarily through two complementary types of action, namely the Pathfinder for advanced research, for the early stages of **technology** development, and the Accelerator for innovation and market deployment actions, including the pre-mass commercialisation stages and company growth. With the idea to offer a single one-stop shop and a single process of support, the Accelerator will **also** award blended finance, combining grants with equity investments. It will in addition also channel access to loans provided under the InvestEU programme.

Amendment

The EIC will be implemented primarily through two complementary types of action, namely the **EIC** Pathfinder for advanced research, for the early stages of **scientific and technological research and** development, and the **EIC** Accelerator for innovation and market deployment actions, including the pre-mass commercialisation stages and company growth. With the idea to offer a single one-stop shop and a single process of support, the Accelerator will award blended finance, combining grants with equity investments. It will in addition also channel access to loans **and guarantees** provided under the InvestEU programme. **At least 70% of the EIC's budget will be dedicated to start-ups and SMEs.**

Amendment 220

Proposal for a decision

Annex I – part III – point 1 – point 1.1 – paragraph 3 – indent 1

Text proposed by the Commission

– Focus on breakthrough and disruptive innovations, including social, that have the potential to create new markets, **as opposed to those which make incremental improvements in existing products, services or business models;**

Amendment

– Focus on breakthrough and disruptive innovations, including social, that have the potential to create new markets **or enable new solutions, as well as research on potential radically new technologies;**

Amendment 221

Proposal for a decision

Annex I – part III – point 1 – point 1.1 – paragraph 3 – indent 2

Text proposed by the Commission

- Be mainly bottom-up, open to innovations from all fields of science, technology and applications in any sector, while also enabling targeted support for emerging breakthrough or disruptive technologies of potential strategic significance;

Amendment

- Be mainly bottom-up, open to **targeted** innovations **and research** from all fields of science, technology and applications in any sector, while also enabling targeted support for emerging breakthrough or disruptive technologies of potential strategic significance;

Amendment 222

Proposal for a decision

Annex I – part III – point 1 – point 1.1 – paragraph 3 – indent 3

Text proposed by the Commission

- Innovations that cut across different scientific, technological (e.g. combining physical and digital) fields and sectors will be encouraged;

Amendment

- Innovations **and research** that cut across different scientific, technological (e.g. combining physical and digital) fields and sectors will be encouraged;

Amendment 223

Proposal for a decision

Annex I – part III – point 1 – point 1.1 – paragraph 3 – indent 4

Text proposed by the Commission

- They will be centred on innovators, simplifying procedures and administrative requirements, making use of interviews to help assess applications, and ensuring fast decision making;

Amendment

- They will be centred on innovators **and researchers**, simplifying procedures and administrative requirements, making use of interviews to help assess applications, and ensuring fast decision making;

Amendment 224

Proposal for a decision

Annex I – part III – point 1 – point 1.1 – paragraph 4

Text proposed by the Commission

As well as financial support, innovators will have access to EIC business advisory services providing to projects coaching, mentoring and technical assistance, and pairing innovators with peers, industrial partners and investors. Innovators will also have facilitated access to expertise, facilities (including innovation hubs²³) and partners from across EU supported activities (including those of the EIT, in particular through its KICs).

²³ These are public or private facilities that offer access to latest knowledge and expertise on digital and related enabling technologies necessary for companies to become more competitive with regard to production, services and business processes.

Amendment

As well as financial support, innovators will have access to EIC business advisory services providing to projects coaching, mentoring and technical assistance, and pairing innovators with peers, industrial partners and investors. Innovators will also have facilitated access to expertise, facilities (including **research infrastructures and** innovation hubs²³) and partners from across EU supported activities (including those of the EIT, in particular through its KICs).

²³ These are public or private facilities that offer access to latest knowledge and expertise on digital and related enabling technologies necessary for companies to become more competitive with regard to production, services and business processes.

Amendment 225

Proposal for a decision

Annex I – part III – point 1 – point 1.1 – paragraph 5

Text proposed by the Commission

Particular attention will be paid to ensuring proper and efficient complementarity with individual or networked Member States initiatives, including in the form of

Amendment

In addition, particular attention will be paid to ensuring proper and efficient complementarity with individual or networked Member States initiatives,

European *Partnership*.

including in the form of European *Partnerships*.

Amendment 226

Proposal for a decision

Annex I – part III – point 1 – point 1.1 – point 1.1.1 – introductory part

Text proposed by the Commission

1.1.1. The Pathfinder for Advanced Research

Amendment

1.1.1. The **EIC** Pathfinder for Advanced Research

Amendment 227

Proposal for a decision

Annex I – part III – point 1 – point 1.1 – point 1.1.1 – paragraph 2

Text proposed by the Commission

The Pathfinder overall objective will be to nurture potential market creating innovation out of breakthrough technological ideas, and bring them to demonstration stage or development of business cases or strategies for further take-up by the Accelerator or any other market deployment solution. To that end, the Pathfinder will initially support the earliest stages of scientific and technological research and development, including proof of concept and prototypes for technology validation.

Amendment

The Pathfinder overall objective will be to nurture potential market creating innovation out of breakthrough **scientific and** technological ideas, and bring them to demonstration stage or development of business cases or strategies for further take-up by the Accelerator or any other market deployment solution. To that end, the Pathfinder will initially support the earliest stages of scientific and technological research and development, including **cutting-edge research**, proof of concept and prototypes for technology validation.

Amendment 228

Proposal for a decision

Annex I – part III – point 1 – point 1.1 – point 1.1.1 – paragraph 3

Text proposed by the Commission

In order to be fully open to broad-sweeping explorations, opportunities of serendipity and unexpected ideas, concepts and discoveries, the Pathfinder will be mainly implemented through **a** continuous **open call** for bottom-up proposals. The Pathfinder will also provide for competitive challenges to develop key strategic objectives²⁴ calling for deep-tech and radical thinking. Regrouping of selected projects into thematic or objective driven portfolios will allow establishing critical mass of efforts and structuring new multidisciplinary research communities.

²⁴ These could include topics such as Artificial Intelligence, Quantum technologies, Biocontrol or Second generation digital twins, or any other topics identified in the context of the Horizon Europe Strategic programming (including with Member States' networked programmes).

Amendment

In order to be fully open to broad-sweeping explorations, opportunities of serendipity and unexpected ideas, concepts and discoveries, the Pathfinder will be mainly implemented through continuous, **competitive and open calls** for bottom-up proposals **with cut off dates**. The Pathfinder will also provide for competitive challenges to develop key strategic objectives²⁴ calling for deep-tech and radical thinking. Regrouping of selected projects into thematic or objective driven portfolios will allow establishing critical mass of efforts and structuring new multidisciplinary research communities.

²⁴ These could include topics such as Artificial Intelligence, Quantum technologies, Biocontrol or Second generation digital twins, or any other topics identified in the context of the Horizon Europe Strategic programming (including with Member States' networked programmes).

Amendment 229

Proposal for a decision

Annex I – part III – point 1 – point 1.1 – point 1.1.1 – paragraph 5

Text proposed by the Commission

The Pathfinder will be open to all types of innovators, from individuals to universities, research organisations and companies, in particular **startups** and SMEs, and from single beneficiaries to multi-disciplinary consortia. In the case of

Amendment

The Pathfinder will be open to all types of innovators, from individuals to universities, research **and technology** organisations and companies, in particular **start-ups** and SMEs, and from single beneficiaries to multi-disciplinary

single beneficiary projects, larger companies will not be permitted. The Pathfinder will be implemented in close coordination with other parts of Horizon Europe, in particular with the European Research Council (ERC), the Marie Skłodowska-Curie Actions (MSCA), and the **Knowledge and Innovation Communities (KICs)** of the European Institute of Innovation and Technology (EIT) activities. It will also be implemented in close coordination with Member States programmes and activities.

consortia. In the case of single beneficiary projects, larger companies will not be permitted. ***In order to ensure synergies and avoid duplication***, the Pathfinder will be implemented in close coordination with other parts of Horizon Europe, in particular with the European Research Council (ERC), the Marie Skłodowska-Curie Actions (MSCA), and the European Institute of Innovation and Technology (EIT) activities. It will also be implemented in close coordination with Member States programmes and activities.

Amendment 230

Proposal for a decision

Annex I – part III – point 1 – point 1.1 – point 1.1.2 – paragraph 2

Text proposed by the Commission

Consequently the Accelerator will provide financial support to not yet 'bankable' or investors-attractive innovators and companies that have the ambition to develop and deploy in EU and international markets their breakthrough innovations and to scale up rapidly. For that purpose it will build on the experience from the Phases 2 and 3 of Horizon 2020 SME Instrument and from Horizon 2020 InnovFin, in particular through the addition of non-grant components and the ability to support larger and longer investments.

Amendment

Consequently the Accelerator will provide financial support to not yet 'bankable' or investors-attractive innovators and companies that have the ambition to develop and deploy in EU and international markets their breakthrough innovations and to scale up rapidly. For that purpose it will build on the experience from the Phases 2 and 3 of Horizon 2020 SME Instrument and from Horizon 2020 InnovFin, in particular through the addition of non-grant components and the ability to support larger and longer investments. ***Cooperation with EIT and its KICs and synergies with their accelerators' activities will be ensured.***

Amendment 231

Proposal for a decision

Annex I – part III – point 1 – point 1.1 – point 1.1.2 – paragraph 3 – indent 2

Text proposed by the Commission

– Support for investment in equity²⁷ or other repayable forms, so as to bridge innovation activities with effective market deployment, including scale-up, in a manner that does not crowd out private investments or distorts competition in the internal market. When relevant it will channel the innovator to access to debt financing (e.g. loans) provided by the InvestEU programme.

²⁷ Usually no more than 25% of the voting rights. In exceptional cases, the EU may secure the acquisition of a blocking minority to protect European interests in essential areas, e.g. cyber security.

Amendment

– Support for investment in equity²⁷ or other repayable forms, so as to bridge innovation activities with effective market deployment, including scale-up, in a manner that does not crowd out private investments or distorts competition in the internal market. When relevant it will channel the innovator to access to debt financing (e.g. loans **or guarantees**) provided by the InvestEU programme.

²⁷ Usually no more than 25% of the voting rights. In exceptional cases, the EU may secure the acquisition of a blocking minority to protect European interests in essential areas, e.g. cyber security.

Amendment 232

Proposal for a decision

Annex I – part III – point 1 – point 1.1 – point 1.1.2 – paragraph 4

Text proposed by the Commission

Support will be awarded through a single process and with a single decision, providing the supported innovator with a single global commitment to financial resources covering the various stages of innovation down to market deployment including pre-mass commercialisation. The full implementation of the awarded support will be subject to milestones and review. The combination and volume of financing will be adapted to the needs of the *firm*, its size and stage, the nature of the technology/innovation and the length of the innovation cycle. It will cover financing

Amendment

Support will be awarded through a single process and with a single decision, providing the supported innovator with a single global commitment to financial resources covering the various stages of innovation down to market deployment including pre-mass commercialisation. The full implementation of the awarded support will be subject to milestones and review. The combination and volume of financing will be adapted to the needs of the **beneficiary**, its size and stage, the nature of the technology/innovation and the length of the innovation cycle. It will cover

needs until replacement by alternative sources of investment.

financing needs until replacement by alternative sources of investment.

Amendment 233

Proposal for a decision

Annex I – part III – point 1 – point 1.1 – point 1.1.2 – paragraph 5

Text proposed by the Commission

For innovations with high **technological** risks ('deep tech') the support will always include a grant component covering the innovation activities. Where the various risks are reduced (technological, market, regulatory, etc.), the relative importance of the reimbursable advance component is expected to increase.

Amendment

For innovations with high risks (**for example**, 'deep tech') the support will always include a grant component covering the innovation activities, **which may be performed in collaboration with public research organisations as partner or through subcontracting**. Where the various risks are reduced (technological, market, regulatory, etc.), the relative importance of the reimbursable advance component is expected to increase.

Amendment 234

Proposal for a decision

Annex I – part III – point 1 – point 1.1 – point 1.1.2 – paragraph 7

Text proposed by the Commission

The Accelerator will mainly operate through a continuously open and bottom-up call, targeting individual entrepreneurs (mainly start-ups and SMEs), with a particular attention paid to young and to women innovators. This open and bottom-up call will be complemented by targeted support for on emerging breakthrough or disruptive technologies of potential strategic significance. Proposals may also be submitted by investors, including public

Amendment

The Accelerator will mainly operate through a continuously open, **competitive** and bottom-up call **with cut-off dates**, targeting individual entrepreneurs (mainly start-ups and SMEs), with a particular attention paid to young and to women innovators. This open and bottom-up call will be complemented by targeted support for on emerging breakthrough or disruptive **innovations and** technologies of potential strategic significance. Proposals may also

innovation agencies, but the support will be awarded to the company.

be submitted by investors, including public innovation agencies, but the support will be awarded to the company.

Amendment 235

Proposal for a decision

Annex I – part III – point 1 – point 1.1 – point 1.1.2 – paragraph 8

Text proposed by the Commission

The Accelerator will allow for fast-track take-up of innovations stemming from ***Pathfinder-supported*** projects from the Pathfinder, from similar Member States 'advanced research programmes' and from other pillars of the EU Framework ***Programmes***²⁸, in order to support them to reach the market. This identification of projects supported in other pillars of Horizon Europe and also previous Framework Programmes will be based on pertinent methodologies, such as the Innovation Radar.

²⁸ Such as ERC Proof of Concept, from projects supported under the 'Global Challenges and Industrial Competitiveness' Pillar, startups emerging from the KICs of the European Institute of Innovation and Technology, ... Including from Horizon 2020 activities, particularly project selected under Horizon 2020 SME Phase 2 and related Seal of Excellence financed by Member States, (existing and future) European Partnerships.

Amendment

The Accelerator will allow for fast-track take-up of innovations stemming from ***supported*** projects from the Pathfinder, from similar Member States 'advanced research programmes', ***from the EIT KICs*** and from other pillars of the EU Framework ***Programme***²⁸, in order to support them to reach the market. This identification of projects supported in other pillars of Horizon Europe and also previous Framework Programmes will be based on pertinent methodologies, such as the Innovation Radar.

²⁸ Such as ERC Proof of Concept, from projects supported under the 'Global Challenges and ***European*** Industrial Competitiveness' Pillar, startups emerging from the KICs of the European Institute of Innovation and Technology, ... Including from Horizon 2020 activities, particularly project selected under Horizon 2020 SME Phase 2 and related Seal of Excellence financed by Member States, (existing and future) European Partnerships.

Amendment 236

Proposal for a decision

Annex I – part III – point 1 – point 1.1 – point 1.1.3 – paragraph 1 – indent 1

Text proposed by the Commission

– EIC business acceleration services in support of Pathfinder and Accelerator activities and actions. The aim will be to connect the EIC Community of funded innovators, including funded Seal of Excellence, to investors, partners **and** public buyers. It will provide a range of coaching and mentoring services to EIC actions. It will provide innovators with access to international networks of potential partners, including industrial ones, to complement a value chain or develop market opportunities, and find investors and other sources of private or corporate finance. Activities will include live events (e.g. brokerage events, pitching sessions) but also, the development of matching platforms or use of existing ones, in close relation with financial intermediaries supported by the InvestEU and with the EIB Group. These activities will also encourage peer exchanges as a source of learning in innovation ecosystem, making particular good use of Members of the High Level Advisory board of the EIC and EIC Fellows;

Amendment

– EIC business acceleration services in support of Pathfinder and Accelerator activities and actions. The aim will be to connect the EIC Community of funded innovators, including funded Seal of Excellence, to investors, partners, public **and private** buyers. It will provide a range of coaching and mentoring services to EIC actions. It will provide innovators with access to international networks of potential partners, including industrial ones, to complement a value chain or develop market opportunities, and find investors and other sources of private or corporate finance. Activities will include live events (e.g. brokerage events, pitching sessions) but also, the development of matching platforms or use of existing ones, in close relation with financial intermediaries supported by the InvestEU and with the EIB Group. These activities will also encourage peer exchanges as a source of learning in innovation ecosystem, making particular good use of Members of the High Level Advisory board of the EIC and EIC Fellows. ***These additional EIC activities focused on breakthrough/high-risk innovations will complement the similar portfolio of the EIT activities targeting entrepreneurs, innovators and start-ups. EIC is encouraged to make use of the KICs expertise and experience when providing support to innovators.***

Amendment 237

Proposal for a decision

Annex I – part III – point 1 – point 1.1 – point 1.1.3 – paragraph 1 – indent 3

Text proposed by the Commission

– EIC Challenges, i.e. inducement prizes, to help develop **novel solutions to global challenges**, bring in new actors **and** develop new communities. EIC recognition prizes will include iCapital, the Social Innovation Inducement Prize, and the Women Innovators' Prize.²⁹ The design **of its** prizes will be linked **to EIC to** other parts of the **Framework** programme, including missions and **other funding bodies**. Opportunities for cooperation with organisations (such as enterprises, universities, research organisations, business accelerators, charities and foundations) will be explored.

²⁹ The EIC prizes will take over the management of prizes launched under Horizon 2020 and provide for the design and implementation of new inducement prizes and recognition awards.

Amendment

– EIC Challenges, i.e. inducement prizes, to help develop **new breakthrough innovations**, bring in new actors, develop new **R&I** communities **and networks as well as give visibility to achievements from EU funding**. EIC recognition prizes will include iCapital, **the EU Challenge Prize**, the Social Innovation Inducement Prize, and the Women Innovators' Prize.²⁹ The design **and implementation of these** prizes will be linked **with** other parts of the Programme, including **the** missions and **the EIT in order to ensure complementarity and avoid duplications**. Opportunities for cooperation with organisations (such as enterprises, universities, research organisations, business accelerators, charities and foundations) will be explored.

²⁹ The EIC prizes will take over the management of prizes launched under Horizon 2020 and provide for the design and implementation of new inducement prizes and recognition awards.

Amendment 238

Proposal for a decision

Annex I – part III – point 1 – point 1.2 – point 1.2.1 – paragraph 1

Text proposed by the Commission

The High Level Advisory Board of the EIC (EIC Board) will assist the Commission in implementing the EIC. **As well as advising** on the EIC work programmes, **the EIC Board will take an active role in advising the** management and **following** up actions. It will have a communication function, with members playing an ambassadorial

Amendment

The High Level Advisory Board of the EIC (EIC Board) will assist the Commission in implementing the EIC. **It will be composed of representatives including academic experts on innovation policy, research and technology organisations, entrepreneurs, venture capitalists, among others, in accordance with Article 9 of**

role helping to stimulate innovation in the EU. Communication channels will include attendance at key innovation events, social media, constitution of an EIC community of innovators, engaging with key media with a focus on innovation, common events with incubators and acceleration hubs.

this Decision.

For the implementation of the EIC, the Commission will, with the support of the EIC Board, provide:

- clear differentiation between the addressed targeted groups and their distinct needs;*
- details on how it will implement the mixed support (grant, equity, loan and guarantee);*
- solid mechanism for systematic and real-time evaluation of the instruments to ensure quick policy learning process and development of innovation patterns, including the selection and implementation of indicators;*
- cooperation between EIC and the EIT to ensure complementarity and avoid duplication;*
- further definition of the role and responsibilities of the programme managers;*
- description of tools to attract risk capital investors in case of highly risky projects;*
- definition of the innovation objectives in terms of product, process, marketing and services;*
- measurement of the driving force of beneficiaries.*

The Board will also advise on the EIC work programmes, management and follow up actions. It will have a communication function, with members playing an ambassadorial role helping to stimulate innovation in the EU. Communication channels will include attendance at key innovation events, social media, constitution of an EIC community of innovators, engaging with key media with a focus on innovation, common events with

incubators and acceleration hubs. *The EIT's Governing Board and EIC Board will cooperate to exploit synergies and increase added value to innovators and entrepreneurs in the Union.*

Amendment 239

Proposal for a decision

Annex I – part III – point 1 – point 1.2 – point 1.2.1 – paragraph 2

Text proposed by the Commission

The EIC Board will provide recommendations to the Commission regarding innovation trends or initiatives needed to enhance and foster the EU innovation ecosystem, including potential regulatory barriers. The Board's advice should also identify emerging areas of innovation to be taken into account in the activities under the Global Challenges and Industrial Competitiveness pillar and missions. In this way, the Board is expected to contribute to the overall coherence of the Horizon Europe programme.

Amendment

The EIC **Board along with the EIT Governing** Board will provide recommendations to the Commission regarding innovation trends or initiatives needed to enhance and foster the EU innovation ecosystem, including potential **technical as well as** regulatory barriers. The Board's advice should also identify emerging areas of innovation to be taken into account in the activities under the Global Challenges and **European** Industrial Competitiveness pillar and missions. In this way, the Board is expected to contribute to the overall coherence of the Horizon Europe programme.

Amendment 240

Proposal for a decision

Annex I – part III – point 1 – point 1.2 – point 1.2.2 – paragraph 5

Text proposed by the Commission

In particular, programme managers will oversee the implementation of Pathfinder calls, and propose evaluation rankings **in**

Amendment

In particular, programme managers will oversee the implementation of Pathfinder calls, and propose evaluation rankings,

view of consistent strategic portfolio of projects, expected to make essential contributions to the emergence of potential societal or economic market creating innovations.

based on clear and transparent criteria as defined in the Regulation, consistent *with a* strategic portfolio of projects, expected to make essential contributions to the emergence of potential *scientific*, societal or economic *radically new future technologies or* market creating innovations.

Amendment 241

Proposal for a decision

Annex I – part III – point 2 – point 2.1 – paragraph 1

Text proposed by the Commission

To fully harness the potential of innovation involving researchers, entrepreneurs, industry and society at large, the EU must improve the environment within which innovation can flourish at all levels. This will mean contributing to the development of an effective innovation ecosystem at EU level, and encouraging cooperation, networking, and the exchange of ideas, funding and skills among national and local innovation ecosystems.

Amendment

To fully harness the potential of innovation involving researchers, entrepreneurs, industry and society at large, the EU must improve the environment within which innovation can flourish at all levels. This will mean contributing to the development of an effective innovation ecosystem at EU level, and encouraging cooperation, networking and the exchange of ideas, *developing open innovation processes*, funding and skills among national and local innovation ecosystems.

Amendment 242

Proposal for a decision

Annex I – part III – point 2 – point 2.1 – paragraph 2

Text proposed by the Commission

The EU must also aim to develop ecosystems that support social innovation and public sector innovation, in addition to innovation in private enterprises. Indeed,

Amendment

The EU must also aim to develop ecosystems that support social innovation, *and encourage knowledge transfer* and public sector innovation, in addition to

the government sector must innovate and renew itself in order to be able to support the changes in regulation and governance required to support the large-scale deployment of new technologies and a growing public demand for the more efficient and effective delivery of services. Social innovations are crucial to enhance the welfare of our societies.

innovation in private enterprises. Indeed, the government sector must innovate and renew itself in order to be able to support the changes in regulation, and governance required to support the large-scale deployment of **innovations, including** new technologies and a growing public demand for the more efficient and effective delivery of services. Social innovations are crucial to enhance the welfare of our societies. ***As Europe's largest innovation network, the EIT KICs will play an important role in the development of such ecosystems and in the implementation of this priority. They make the case for desired interregional cooperation by linking innovation ecosystems on a pan-European scale.***

Amendment 243

Proposal for a decision

Annex I – part III – point 2 – point 2.2 – paragraph 1 – introductory part

Text proposed by the Commission

As a first step the Commission will organise an **EIC** Forum of Member States and Associated countries' public authorities and bodies in charge of national innovation policies and programmes, with the aim of promoting coordination and dialogue on the development of the EU's innovation ecosystem. Within this **EIC** Forum, the Commission will:

Amendment

As a first step the Commission will organise an **Innovation** Forum of Member States and Associated countries' public authorities and bodies in charge of national innovation policies and programmes, with the aim of promoting coordination and dialogue on the development of the EU's innovation ecosystem. Within this **Innovation** Forum, ***the involved stakeholders and EU bodies, including the EIT, the EIC Board and the Commission*** will:

Amendment 244

Proposal for a decision

Annex I – part III – point 2 – point 2.2 – paragraph 1 – indent 3

Text proposed by the Commission

– Enhance coordination between national **innovation programmes and** the EIC, so as to stimulate operational synergies and avoid overlap, by sharing data on programmes and their implementation, resources and expertise, analysis and monitoring of technological and innovation trends, and by interconnecting respective innovators' communities;

Amendment

– Enhance coordination between national, **the EIT as well as** the EIC so as to stimulate operational synergies and avoid overlap, by sharing data on programmes and their implementation, resources and expertise, analysis and monitoring of technological and innovation trends, and by interconnecting respective innovators' communities;

Amendment 245

Proposal for a decision

Annex I – part III – point 2 – point 2.2 – paragraph 2

Text proposed by the Commission

Activities will be implemented to ensure effective complementarity between EIC's types of action and their specific focus on **breakthrough** innovation, with activities implemented by Member States and Associated Countries, but also by private initiatives, in order to support all types of innovation, reach out to all innovators across the EU, and provide them with enhanced and adequate support.

Amendment

Activities will be implemented to ensure effective complementarity **and cooperation** between **EIT and** EIC's types of action and their specific focus on innovation, with activities implemented by Member States and Associated Countries, but also by private initiatives, in order to support all types of innovation, reach out to all innovators across the EU, and provide them with enhanced and adequate support.

Amendment 246

Proposal for a decision

Annex I – part III – point 2 – point 2.2 – paragraph 3 – introductory part

Text proposed by the Commission

Amendment

To that end, the *EU* will:

To that end, the *involved EU bodies* will:

Amendment 247

Proposal for a decision

Annex I – part III – point 2 – point 2.2 – paragraph 3 – indent 1

Text proposed by the Commission

Amendment

– Promote and co-fund joint innovation programmes managed by authorities in charge of public national, regional or local innovation policies and programmes, to which private entities supporting innovation and innovators *may* be associated. Such demand-driven joint programmes may target, among others, early stage and feasibility study support, *academia-enterprise* cooperation, support to high-tech SMEs' collaborative research, technology and knowledge transfer, internationalisation of SMEs, market analysis and development, digitalisation of low-tech SMEs, financial instruments for close to market innovations activities or market deployment, social innovation. They may also include joint public procurement initiatives, enabling innovations to be commercialised in the public sector, in particular in support of the development of new policy. This could be particularly effective to stimulate innovation in public service areas and to provide market opportunities to European innovators.

– Promote and co-fund joint innovation programmes managed by authorities in charge of public national, regional or local innovation policies and programmes, to which private entities supporting innovation and innovators *should* be associated. Such *supply and* demand-driven joint programmes may target, among others, early stage and feasibility study support, cooperation *between academia, research organisations and enterprises*, support to high-tech SMEs' collaborative research, technology and knowledge transfer, internationalisation of SMEs, market analysis and development, digitalisation of low-tech SMEs, financial instruments for close to market innovations activities or market deployment, social innovation. They may also include joint public procurement initiatives, enabling innovations to be commercialised in the public sector, in particular in support of the development of new policy. This could be particularly effective to stimulate innovation in public service areas and to provide market opportunities to European innovators. *When managed at the local level, these programmes should allow transnational partnerships, should be coherent with the smart specialisation strategies and support synergies with*

Amendment 248

Proposal for a decision

Annex I – part III – point 2 – point 2.2 – paragraph 3 – indent 2

Text proposed by the Commission

- Support also joint programmes for mentoring, coaching, technical assistance and other services that are delivered close to innovators, by networks such as Enterprise Europe Network (EEN), clusters, pan-European platforms such as Startup Europe, local innovation actors, public but also private, in particular incubators and innovation hubs that could moreover be interconnected to favour partnering between innovators. Support **may** also be given to promote soft skills for innovation, including to networks of vocational institutions and in close **relation** with the ***European Institute of Innovation and Technology***;

Amendment

- Support also joint programmes for mentoring, coaching, technical assistance and other services that are delivered close to innovators, by networks such as Enterprise Europe Network (EEN), clusters, pan-European platforms such as Startup Europe, local innovation actors, public but also private, in particular incubators and innovation hubs that could moreover be interconnected to favour partnering between innovators. Support **should** also be given to promote soft skills for innovation, including to networks of vocational institutions and in close **cooperation** with the ***EIT***.

Amendment 249

Proposal for a decision

Annex I – part III – point 3 – point 3.1 – paragraph 1

Text proposed by the Commission

As the report of the High Level Group on maximising the impact of EU research and innovation (the Lamy High level Group) clearly states, the way forward is 'to educate for the future and invest in people who will make the change'. In particular, European universities are called to

Amendment

As the report of the High Level Group on maximising the impact of EU research and innovation (the Lamy High level Group) clearly states, the way forward is 'to educate for the future and invest in people who will make the change'. In particular, European universities are called to

stimulate entrepreneurship, tear down disciplinary borders and institutionalise strong non-disciplinary academia-industry collaborations. According to recent surveys, access to talented people is by far the most important factor influencing the location choices of European founders of start-ups. Entrepreneurship education and training opportunities play a key role in cultivating future innovators and in developing the abilities of existing ones to grow their business to greater levels of success. Access to entrepreneurial talent, together with access to professional services, capital and markets on the EU level, and bringing key innovation actors together around a common goal are key ingredients for nurturing an innovation ecosystem. There is a need to coordinate efforts across the *EU* in order to create a critical mass of interconnected EU-wide entrepreneurial clusters and ecosystems,

stimulate entrepreneurship, tear down disciplinary borders and institutionalise strong non-disciplinary academia-industry collaborations. According to recent surveys, access to talented people is by far the most important factor influencing the location choices of European founders of start-ups. Entrepreneurship education and training opportunities play a key role in cultivating future innovators and in developing the abilities of existing ones to grow their business to greater levels of success. Access to entrepreneurial talent, together with access to professional services, capital and markets on the EU level, and bringing key innovation actors together around a common goal are key ingredients for nurturing an innovation ecosystem ***and creating successful innovation models and best practices at regional, national, and European levels.*** There is a need to coordinate efforts across the *EU* in order to create a critical mass of interconnected EU-wide entrepreneurial clusters and ecosystems.

Amendment 250

Proposal for a decision

Annex I – part III – point 3 – point 3.1 – paragraph 1 a (new)

Text proposed by the Commission

Amendment

The EIT is today's Europe's largest integrated innovation ecosystem, with over 1,000 excellent partners from business, research and education and beyond. The EIT's innovation model works and remains particularly relevant in removing barriers to innovation at Member State and regional level. The EIT will address these issues by promoting structural changes in the European innovation landscape. It will do so by fostering the integration of education,

research and innovation of the highest standards, notably through its Knowledge and Innovation Communities (KICs), thereby creating new environments conducive to innovation, and by promoting and supporting a new generation of entrepreneurial people and by stimulating the creation of innovative spin-offs and start-ups.

Amendment 251

Proposal for a decision

Annex I – part III – point 3 – point 3.1 – paragraph 2 – introductory part

Text proposed by the Commission

Efforts are still needed to develop ecosystems where researchers, innovators, industries and governments can easily interact. Innovation ecosystems, in fact, still do not work optimally due to a number of reasons such as:

Amendment

Efforts are still needed to develop **and promote** ecosystems where researchers, innovators, industries and governments can easily interact. Innovation ecosystems, in fact, still do not work optimally due to a number of reasons such as:

Amendment 252

Proposal for a decision

Annex I – part III – point 3 – point 3.1 – paragraph 3

Text proposed by the Commission

To address future challenges, embrace the opportunities of new technologies and contribute to sustainable economic growth, jobs, competitiveness and the well-being of Europe's citizens, there is the need to further strengthen Europe's capacity to innovate by: fostering the creation of new environments conducive to collaboration and innovation; strengthening the

Amendment

To address future challenges, embrace the opportunities of new technologies and contribute to sustainable economic growth, jobs, competitiveness and the well-being of Europe's citizens, there is the need to further strengthen Europe's capacity to innovate by: fostering the creation of new environments conducive to collaboration and innovation; strengthening the

innovation capabilities of academia and the research sector; supporting a new generation of entrepreneurial people; stimulating the creation and the development of innovative ventures.

innovation capabilities of academia and the research sector; supporting a new generation of entrepreneurial **and research** people; stimulating the creation and the development of innovative ventures, **as well as promoting and giving visibility to the research and innovation achievements from EU funding to the wider public.**

Amendment 253

Proposal for a decision

Annex I – part III – point 3 – point 3.1 – paragraph 4 a (new)

Text proposed by the Commission

Amendment

The EIT will address these challenges in line with its strategic objectives for the period 2021-2027, to be laid down in the legal proposal for the Strategic Innovation Agenda of the EIT.

Amendment 254

Proposal for a decision

Annex I – part III – point 3 – point 3.2 – point 3.2.1 – paragraph 1

Text proposed by the Commission

Amendment

The EIT will play a reinforced role in strengthening sustainable innovation ecosystems across Europe. In particular, the EIT will continue to operate primarily through its Knowledge and Innovation Communities (KICs), the large-scale European partnerships that address specific societal challenges. **It** will continue to strengthen innovation ecosystems around them, by fostering the integration of research, innovation and education.

The EIT will play a reinforced role in strengthening sustainable innovation ecosystems across Europe, **providing solutions to the most pressing global challenges our societies are facing.** In particular, the EIT will continue to operate primarily through its Knowledge and Innovation Communities (KICs), the large-scale European partnerships that address specific societal challenges. **The KICs** will continue to strengthen innovation

Furthermore, EIT will contribute to bridge existing gaps in innovation performance across Europe by expanding its Regional Innovation Scheme (EIT RIS). The EIT will work with innovation ecosystems that exhibit high innovation potential based on strategy, thematic alignment and impact, in close synergy with Smart Specialisation Strategies and Platforms.

ecosystems around them, by fostering the integration of research, innovation and education. Furthermore, EIT will contribute to bridge existing gaps in innovation performance across Europe by expanding its Regional Innovation Scheme (EIT RIS). The EIT will work with innovation ecosystems that exhibit high innovation potential based on strategy, thematic alignment and impact, in close synergy with Smart Specialisation Strategies and Platforms.

Amendment 255

Proposal for a decision

Annex I – part III – point 3 – point 3.2 – point 3.2.1 – paragraph 2 – indent 1

Text proposed by the Commission

- Reinforcing the effectiveness of the existing KICs and setting up new ones ***in a limited number of thematic areas***;

Amendment

- Reinforcing the effectiveness of the existing KICs and setting up new ones ***to tackle global challenges***;

Amendment 256

Proposal for a decision

Annex I – part III – point 3 – point 3.2 – point 3.2.1 – paragraph 2 – indent 2

Text proposed by the Commission

- Accelerating regions towards excellence in countries that are modest or moderate innovators.

Amendment

- Accelerating regions towards excellence in countries that are modest or moderate innovators ***in close cooperation with relevant regional funds***.

Amendment 257

Proposal for a decision

Annex I – part III – point 3 – point 3.2 – point 3.2.2 – paragraph 1

Text proposed by the Commission

The EIT education activities will be reinforced to foster innovation and entrepreneurship through better education and training. A stronger focus on human capital development will be grounded on the expansion of existing EIT KICs education programmes in the view of continuing to offer students and professionals high quality curricula based on innovation and entrepreneurship in line in particular with the EU industrial and skills strategy. This may include researchers and innovators supported by other parts of Horizon Europe, in particular MSCA. The EIT will also support the renewal of European Universities and their integration in innovation ecosystems by stimulating and increasing their entrepreneurial potential and capabilities and encouraging them to better anticipate new skills requirements.

Amendment

The EIT education activities will be reinforced to foster innovation and entrepreneurship through better education and **training, including vocational** training. A stronger focus on human capital development will be grounded on the expansion of existing EIT KICs education programmes in the view of continuing to offer students and professionals high quality curricula based on innovation and entrepreneurship in line in particular with the EU industrial and skills strategy. This may include researchers and innovators supported by other parts of Horizon Europe, in particular MSCA. The EIT will also support the renewal of European Universities and their integration in innovation ecosystems by stimulating and increasing their entrepreneurial potential and capabilities and encouraging them to better anticipate new skills requirements.

Amendment 258

Proposal for a decision

Annex I – part III – point 3 – point 3.2 – point 3.2.2 – paragraph 2 – indent 1

Text proposed by the Commission

– Development of innovative curricula, taking into account the future needs of industry, and cross-cutting programmes to be offered to students, entrepreneurs and professionals across Europe and beyond where specialist and sector specific

Amendment

– Development of innovative curricula, taking into account the future needs of industry **and society**, and cross-cutting programmes to be offered to students, entrepreneurs and professionals across Europe and beyond where specialist and

knowledge is combined with entrepreneurial and innovation oriented skills, such as digital and key enabling technologies high-tech skills;

sector specific knowledge is combined with entrepreneurial and innovation oriented skills, such as digital and key enabling technologies high-tech skills;

Amendment 259

Proposal for a decision

Annex I – part III – point 3 – point 3.2 – point 3.2.2 – paragraph 2 – indent 3

Text proposed by the Commission

– Development of innovation and entrepreneurship capabilities of the higher education sector, by leveraging the EIT Community expertise in linking education, research and business;

Amendment

– Development ***and dissemination*** of innovation and entrepreneurship capabilities of the higher education sector, by leveraging ***and promoting*** the EIT Community expertise in linking education, research and business;

Amendment 260

Proposal for a decision

Annex I – part III – point 3 – point 3.2 – point 3.2.2 – paragraph 2 – indent 4 a (new)

Text proposed by the Commission

Amendment

- ***EIT Awards, i.e. the EIT's well-established recognition prize for the development of novel solutions to global challenges and the reward of young talents and innovators.***

Amendment 261

Proposal for a decision

Annex I – part III – point 3 – point 3.2 – point 3.2.3 – introductory part

Text proposed by the Commission

Amendment

3.2.3. New solutions to ***the market***

3.2.3. New solutions to ***address global challenges***

Amendment 262

Proposal for a decision

Annex I – part III – point 3 – point 3.2 – point 3.2.3 – paragraph 1

Text proposed by the Commission

Amendment

The EIT will facilitate and empower entrepreneurs, innovators, educators, students and other innovation actors to work together in cross-disciplinary teams to generate ideas and transform them into both incremental and disruptive innovations. Activities will be characterised by an open innovation and cross-border approach, with a focus on including relevant Knowledge Triangle activities that are pertinent to making them a success (e.g. project's promoters can improve their access to: specifically qualified graduates, start-ups with innovative ideas, non-domestic firms with relevant complementary assets etc.).

The EIT will facilitate and empower entrepreneurs, innovators, ***designers***, educators, students and other innovation actors to work together in cross-disciplinary teams to generate ideas and transform them into both incremental and disruptive innovations. Activities will be characterised by an open innovation and cross-border approach, with a focus on including relevant Knowledge Triangle activities that are pertinent to making them a success (e.g. project's promoters can improve their access to: specifically qualified graduates, start-ups with innovative ideas, non-domestic firms with relevant complementary assets etc.).

Amendment 263

Proposal for a decision

Annex I – part III – point 3 – point 3.2 – point 3.2.3 – paragraph 2 – indent 1

Text proposed by the Commission

Amendment

– Support to the development of new products ***and*** services where Knowledge

– Support to ***turn research into*** the development of new products, services ***and***

Triangle actors will collaborate to *make* solutions *market-ready*;

markets where Knowledge Triangle actors will collaborate to *bring* solutions *to global challenges*;

Amendment 264

Proposal for a decision

Annex I – part III – point 3 – point 3.2 – point 3.2.4 – paragraph 2 – indent 2

Text proposed by the Commission

- Planning and implementation of EIT activities in order to maximise synergies and complementarities with the actions under the Global Challenges and Industrial Competitiveness *Pillar*;

Amendment

- Planning and implementation of EIT activities in order to maximise synergies and complementarities with the actions under the *Excellent and Open Science and Global Challenges and European Industrial Competitiveness Pillars and when appropriate, contribution to these actions*;

Amendment 265

Proposal for a decision

Annex I – part III – point 3 – point 3.2 – point 3.2.4 – paragraph 2 – indent 3

Text proposed by the Commission

- Engage with EU Member States at both national and regional level, establishing a structured dialogue and coordinating efforts to enable synergies with existing national initiatives, in order to identify, share and disseminate good practices and learnings;

Amendment

- Engage with EU Member States at both national and regional level, establishing a structured dialogue and coordinating efforts to enable synergies with existing *and future* national initiatives, in order to identify, share and disseminate good practices and learnings;

Amendment 266

Proposal for a decision

Annex I – part III – point 3 – point 3.2 – point 3.2.4 – paragraph 2 – indent 3 a (new)

Text proposed by the Commission

Amendment

- *Share and disseminate innovative practices and learnings and contribute to innovation policy in Europe, where appropriate in conjunction and close cooperation with other parts of Horizon Europe.*

Amendment 267

Proposal for a decision

Annex I – part III – point 3 – point 3.2 – point 3.2.4 – paragraph 2 – indent 4

Text proposed by the Commission

Amendment

- Provision of input to innovation policy discussions and contribution to the implementation of EU policy priorities by continuously working with all relevant European Commission services, other EU programmes and their stakeholders, and further exploring opportunities within policy implementing initiatives;

- Provision of input to innovation policy discussions and contribution to the **design and** implementation of EU policy priorities by continuously working with all relevant European Commission services, other EU programmes and their stakeholders, and further exploring opportunities within policy implementing initiatives;

Amendment 268

Proposal for a decision

Annex I – part 4 – paragraph 5

Text proposed by the Commission

Amendment

The EU now needs to raise the bar on the quality and impact of its research and innovation system, requiring a revitalised

The EU now needs to raise the bar on the quality and impact of its research and innovation system, requiring a revitalised

European Research Area (ERA)³¹, better supported by the EU's research and innovation Framework Programme. Specifically, a well-integrated yet tailored set of EU measures³² is needed, combined with reforms and performance enhancements at national level (to which the Smart Specialisation Strategies supported under the European Regional Development Fund can contribute) and, in turn, institutional changes within research funding and performing organisations, including universities. By combining efforts at EU level, synergies can be exploited and the necessary scale can be found to make support to national policy reforms more efficient and impactful.

³¹ Council Conclusions on the ERA Roadmap, 19 May 2015 [To be updated as necessary].

³² TFEU Article 181.2

European Research Area (ERA)³¹, better supported by the EU's research and innovation Framework Programme. Specifically, a well-integrated yet tailored set of EU measures³² is needed, combined with reforms and performance enhancements at national level (to which the Smart Specialisation Strategies supported under the European Regional Development Fund can contribute ***substantially, if consistent with strong national research strategies and funding*** and, in turn, institutional changes within research funding and performing organisations, including universities. By combining efforts at EU level, synergies can be exploited and the necessary scale can be found to make support to national policy reforms more efficient and impactful.

³¹ Council Conclusions on the ERA Roadmap, 19 May 2015 [To be updated as necessary].

³² TFEU Article 181.2

Amendment 269

Proposal for a decision

Annex I – part 4 – point 1 – introductory part

Text proposed by the Commission

1. **SHARING** EXCELLENCE³³

³³ ***A criterion based on research and innovation excellence will be used to define those Member States and Associated Countries where legal entities need to be established in order to be eligible to submit proposals as coordinators under 'sharing excellence'.***

Amendment

1. **SPREADING EXCELLENCE AND WIDENING PARTICIPATION**

This criterion will address the dimensions of the overall economic performance (GDP), research performance and innovation performance in a combined manner normalised to the size of the related countries. The countries identified with this criterion are called 'eligible countries' in the context of 'sharing excellence'. On the basis of Article 349 TFEU, legal entities from Outermost Regions will be also fully eligible as coordinators under 'sharing excellence'.

Amendment 270

Proposal for a decision

Annex I – part 4 – point 1 – paragraph 1

Text proposed by the Commission

Reducing disparities in research and innovation performance by sharing knowledge and expertise across the EU will help countries and regions that are lagging behind in terms of research and innovation performance, including the EU outermost regions, to attain a competitive position in the global value chains. Activities may also be established to foster brain circulation right across ERA and better exploitation of existing (and possibly jointly managed EU programmes) research infrastructures in the targeted countries through mobility of researchers and innovators.

Amendment

Reducing disparities in research and innovation performance by sharing knowledge and expertise across the EU ***and by widening participation in the programme*** will help countries and regions that are lagging behind in terms of research and innovation performance, including the EU outermost regions ***and less developed regions***, to attain a competitive position in the global value chains ***and the Union to fully benefit from R&I potential of all Member States***. Activities may also be established to foster brain circulation right across ERA and better exploitation of existing (and possibly jointly managed EU programmes) research infrastructures in the targeted countries through mobility ***and virtual collaboration*** of researchers and innovators ***and strengthening, and where appropriate, setting up new R&I networks and R&I initiatives on the base of those infrastructures***.

Amendment 271

Proposal for a decision

Annex I – part 4 – point 1 – paragraph 3

Text proposed by the Commission

Broad Lines

- Teaming, to create new centres of excellence or upgrade existing ones in eligible countries, ***building on partnerships*** between leading scientific institutions and partner institutions;
- Twinning, to significantly strengthen a university or research organisation from an eligible country in ***a defined field***, by linking it with internationally-leading research institutions from other Member States or Associated Countries.
- ERA Chairs, to support universities or research organisations attract and maintain high quality human resources under the direction of an outstanding researcher and research manager (the 'ERA Chair holder'), and to implement structural changes to achieve excellence on a sustainable basis.
- European Cooperation in Science and Technology (COST), involving ambitious conditions regarding the inclusion of eligible countries, and other measures to provide scientific networking, capacity building and career development support to researchers from these target countries. 80% of the total budget of COST will be

Amendment

Broad Lines

- Teaming, to create new centres of excellence or upgrade existing ones in eligible countries, ***including small and medium sized research infrastructures and those funded by ERDF, by ensuring cooperation in all stages of research*** between leading scientific institutions and partner institutions; ***Applicants need to clearly show that projects are linked with national and/or regional R&I strategies to be able to apply for funding under this broad line.***
- Twinning, to significantly strengthen a university or research organisation from an eligible country in ***all fields of research*** by linking it with internationally-leading research institutions from other Member States or Associated Countries. ***Applicants need to clearly show that projects are linked with national and/or regional R&I strategies to be able to apply for funding under this broad line.***
- ERA Chairs, to support universities or research organisations attract and maintain high quality human resources under the direction of an outstanding researcher and research manager (the 'ERA Chair holder'), and to implement structural changes to achieve excellence on a sustainable basis.
- European Cooperation in Science and Technology (COST), involving ambitious conditions regarding the inclusion of eligible countries, and other measures to provide scientific networking, capacity building and career development support to researchers from these target countries. 80% of the total budget of COST will be

devoted to actions fully aligned with the objectives of this intervention area.

devoted to actions fully aligned with the objectives of this intervention area.

- ***“Excellence Initiatives”, to support innovative initiatives aiming to strengthen research and innovation excellence in the eligible countries, including supporting training to improve R&I managerial skills, attractiveness prizes, strengthening innovation ecosystems as well as the creation of R&I networks, including on the basis of research infrastructures financed by the EU. Applicants need to clearly show that projects are linked with national and/or regional R&I strategies to be able to apply for funding under this broad line.***

- ***Widening fellowships and prizes, to attract and enable excellent researchers of any nationality to acquire and transfer new knowledge into widening countries. Prizes shall be awarded in particular to projects attracting scientists wishing to establish themselves in widening countries. This scheme will be complementary with other parts of the Programme, in particular with Marie Skłodowska Curie actions.***

Amendment 272

Proposal for a decision

Annex I – part 4 – point 1 – paragraph 5

Text proposed by the Commission

This intervention area will support the Horizon Europe specific objectives: Spread and connect excellence across the EU; Reinforce the creation of high quality knowledge; Increase cross-sectorial, cross-disciplinary cross-border cooperation.

Amendment

The ***Spreading Excellence and widening participation priority*** will support the Horizon Europe specific objectives: Spread and connect excellence across the EU ***and widen participation in the Programme***; Reinforce the creation of high quality knowledge; Increase cross-sectorial, cross-disciplinary cross-border cooperation. ***All actions will encourage synergies with***

other national and EU funds, particularly with ERDF, Cohesion Policy and ESF+, in line with regional research and innovation smart specialisation strategies and operational programmes.

Amendment 273

Proposal for a decision

Annex I – part 4 – point 2 – paragraph 2 – indent 5

Text proposed by the Commission

– Providing researchers with attractive career environments, skills and competences needed in the modern knowledge economy³⁶. Linking the ERA and the European Higher Education Area by supporting the modernisation of universities and other research and innovation organisations, through recognition and reward mechanisms to spur actions at national level, as well as incentives promoting the adoption of open science practices, entrepreneurship (and links to innovation ecosystems), trans-disciplinarity, citizen engagement, international and *inter-sectoral* mobility, gender equality plans and comprehensive approaches to institutional changes. In that context, also complementing the Erasmus programme support for the European Universities initiative, in particular *its* research *dimension*, as part of developing new joint and integrated long term and sustainable strategies on education, research and innovation based on trans-disciplinary and cross-sectoral approaches to make the knowledge triangle a reality, providing impetus to economic growth.

³⁶ Including notably the European Charter

Amendment

– Providing researchers with attractive career environments, skills and competences needed in the modern knowledge economy³⁶. Linking the ERA and the European Higher Education Area by supporting the modernisation of universities and other research and innovation organisations, through recognition and reward mechanisms to spur actions at national level, as well as incentives promoting the adoption of open science practices, entrepreneurship (and links to innovation ecosystems), trans-disciplinarity, citizen *and civil society* engagement, international and *cross sectoral* mobility, gender equality plans and comprehensive approaches to institutional changes. In that context, also complementing the Erasmus programme support for the European Universities initiative, in particular *through financing research and innovation projects within these networks*, as part of developing new joint and integrated long term and sustainable strategies on education, research and innovation based on trans-disciplinary and cross-sectoral approaches to make the knowledge triangle a reality, providing impetus to economic growth.

³⁶ Including notably the European Charter

for researchers, the code of conduct for the recruitment of researchers, EURAXESS and RESAVER Pension Fund.

for researchers, the code of conduct for the recruitment of researchers, EURAXESS and RESAVER Pension Fund.

Amendment 274

Proposal for a decision

Annex I – part 4 – point 2 – paragraph 2 – indent 6

Text proposed by the Commission

- Citizen science, supporting all types of formal, non-formal and informal science education, including engagement of citizens in the co-design of research and innovation agenda settings and policy, in the co-creation of scientific content and innovation through transdisciplinary activities;

Amendment

- Citizen science supporting all types of formal, non-formal and informal science education, including ***assessing the barriers for and encouraging*** engagement of citizens in the co-design of research and innovation agenda settings and policy, in the co-creation of scientific content and innovation through transdisciplinary activities.

Amendment 275

Proposal for a decision

Annex II – paragraph 1

Text proposed by the Commission

Programme Committee configurations

List of configurations of the Programme Committee in accordance with Article 12(2):

1. Strategic configuration: Strategic overview of the implementation of the whole programme, coherence across the different parts of the programme, missions and Strengthening the European Research Area

Amendment

Programme Committee configurations

List of configurations of the Programme Committee in accordance with Article 12(2):

1. Strategic configuration: Strategic overview of the implementation of the whole programme, coherence across the different parts of the programme, missions and Strengthening the European Research Area

2. European Research Council (ERC) and Marie Skłodowska-Curie Actions (MSCA)
3. Research Infrastructures
4. Health
5. Inclusive and *Secure* Society

6. Digital *and* Industry
7. Climate, Energy and Mobility
8. Food *and* Natural Resources

9. The European Innovation Council (EIC) and European Innovation ecosystems

2. European Research Council (ERC) and Marie Skłodowska-Curie Actions (MSCA)
3. Research Infrastructures
4. Health
5. Inclusive and *Creative* Society
- 5 a. *Secure Society***

6. Digital, Industry *and Space*
7. Climate, Energy and Mobility
8. Food, Natural Resources *and Agriculture*

9. The European Innovation Council (EIC) and European Innovation ecosystems

