Ecsite is the European network of science centres and museums. Ecsite's vision is to foster creativity and critical thinking in European society, emboldening citizens to engage with science. Active in the field of science engagement, our 350+ members include science centres, museums, research bodies, festivals, universities, planetariums, foundations and learned societies, companies, local authorities… Ecsite members' convening power draws more than 40 million citizens each year to science-related debates, exhibitions, workshops, events or platforms. Ecsite organises each year the largest professional science engagement conference in Europe, with over 1.100 professional mediators.

Ecsite's comments and amendments to Horizon Europe proposal from the European Commission

General comments on the Horizon Europe proposal from the European Commission

1) Horizon Europe proposes a top-down communication approach where the research and innovation results are delivered and explained to citizens. But research shows that such top-down approaches are inadequate:
   - To address the fake news phenomenon
   - To change citizens' behaviour in order to reach the SDG's
   - To acknowledge that citizens do not want to be considered only as consumers or end-users but rather as co-designers and contributors
   - To answer the demand of citizens to be more involved in the governance of research and innovation

2) Contrary to H2020, Horizon Europe does not have a Science for and with Society (SwafS) specific strand. This presents the highly feasible risk of seeing science engagement reduced to top down communication done with outdated modes of science engagement and without the contribution of professional mediators. It also means that no research on science engagement would be done, while the current societal issues (such as fake news, fear of new technologies, pseudoscience) clearly demonstrate that society is changing rapidly and that science engagement needs to keep up with those changes.

3) The connection between research / innovation with the formal and informal education system is too weak. The 21st century skills required for researchers and innovators (such as analytic and cogent reasoning, problem solving, teamwork, critical-thinking, entrepreneurship, ..) are developed and sustained from an early age onwards. Informal learning settings such as science museums are often better equipped with labs and experiments than schools and offer learning approaches suited to the development of those skills.

4) A lack of recognition of the value of SSH in dealing with science and society relations, including on topics such as pseudoscience and fake news, gender equality in research and innovation, or social acceptability of new technologies.

What is needed in Horizon Europe :

a) A science engagement approach with the following definition :
Science engagement : Refers to activities, events, or interactions characterized by mutual learning—not one-way transmission from "experts" to publics—among people of varied backgrounds, scientific expertise, and life experiences who articulate and discuss their perspectives, ideas, knowledge, and values. Goals for science engagement in addition to mutual learning include civic engagement skills and empowerment, increased awareness of the cultural relevance of science, and recognition of the importance of multiple perspectives and domains of knowledge to scientific endeavors.
And the replacement in Horizon Europe of notions such as dissemination, outreach, diffusion with the more encompassing and appropriate notion of science engagement.

b) A specific strand on SwafS that will notably aim at combating post-truth, engage in an appropriate manner young people and adults with science, technology and innovation, ensure gender equality and bring new governance approaches.

c) A specific budget for SwafS activities to the same level as in H2020 (460 million) and consequently, a budget for Horizon Europe higher by 460 million.

d) A stronger integration of formal and informal education with science to develop the 21st century skills needed for research and innovation.

e) A stronger integration of SSH in the research and innovation overall system to tackle science and society relations issues.

Ecsite amendments on Regulation of the European Parliament and of the Council establishing Horizon Europe – the Framework Programme for Research and Innovation, laying down its rules for participation and dissemination

Text from HEU Proposal from EC / Regulation /	Amendments	Justification
Recital (26) (26) With the aim of deepening the relationship between science and society and maximising benefits of their interactions, the Programme should engage and involve citizens and civil society organisations in co-designing and co-creating responsible research and innovation agendas and contents, promoting science education, making scientific knowledge publicly accessible, and facilitating participation by citizens and civil society organisations in its activities. It should do so across the Programme and through dedicated activities in the part 'Strengthening the European Research Area'. The engagement of citizens and civil society in research and innovation **should be coupled with public outreach activities to generate and** sustain public support for the Programme. The programme should also seek to remove barriers and boost synergies between science, technology, culture and the arts to obtain a new quality of sustainable innovation.	***Recital (26)*** (26) With the aim of deepening the relationship between science and society and maximising benefits of their interactions, the Programme should engage and involve citizens and civil society organisations in co-designing and co-creating responsible research and innovation agendas and contents, promoting science education **in formal and informal settings**, making scientific knowledge publicly accessible, and facilitating participation by citizens and civil society organisations in its activities. It should do so across the Programme and through dedicated activities in the part 'Strengthening the European Research Area'. The engagement of citizens and civil society in research and innovation should aim at **developing responsible research and innovation that meet citizens' and civil society's concerns and expectations and at facilitating their participation in the Programme activities**. The programme should also seek to remove barriers and	***Recital (26)*** Education is an important part of the R&I system, from an early age to late adulthood. The whole education ecosystem should be considered, both formal (schools, universities,) and informal (science museums and similar, other learning opportunities) to, notably, promote the 21st century skills needed for research and innovation. The engagement of citizens should not be confused with public outreach. Engagement refers to actions aimed, notably, at mutual learning between different types of stakeholders and does not refer to one-way transmission from experts to publics. (see article 2, (26), amendment). Engagement can include public outreach but is not limited to it. While higher levels of scientific and technological knowledge among citizens are important, “explaining” science will not suffice. “Previous research does not support the notion, however, that increasing public understanding will also lead to more public “buy-in” for science.” Dietram A. Scheufele, University of Wisconsin, in PNAS (Proceedings of the National Academy of Sciences of the United States of America,, August 2013. http://www.pnas.org/content/110/Supplement_3/14040

	boost synergies between science, technology, **social sciences and humanities,** culture and the arts to obtain a new quality of sustainable innovation.	Different engagement modes are needed for re-building science-society interfaces, particularly on emerging technologies. Rather than aiming at generating support for the Programme, the engagement of citizens and civil society should aim at developing multistakeholders approaches essential to reach the SDGs. The Programme should support citizens' needs, not the other way around. It should offer a better balance between market return and public return. Social sciences and humanities need to be much more strongly associated to the R&I system: fake news, changes in citizens behaviours to address climate change, concerns related to the profound transformations that technologies will bring, are some of the many worrying phenomena that can only be addressed by closely working with SSH.
Recital (48) (48) The current system of reimbursement of actual personnel costs should be further simplified building on the project-based remuneration approach developed under Horizon 2020 and further aligned to the Financial Regulation.	***Recital (48)*** (48) The current system of reimbursement of actual personnel costs should be further simplified building on the project-based remuneration approach developed under Horizon 2020 and further aligned to the Financial Regulation. **The use of past year salary costs as stipulated in Horizon 2020 should be replaced with real personnel costs incurred as per national or specific accounting systems.**	***Recital (48)*** H2020 Grant Agreements require that if a financial year is not closed at the end of the reporting period, the hourly rate of the last closed financial year available must be used. Therefore, a project that closes on 31 December can claim the hourly rate of the year in which the personnel costs occurred, while a project finishing in November has to use the rate of the previous year. This is discriminatory to certain projects, discriminatory to women on maternity leave (number of productive hours differs and thus the rate), and does not encourage salary raise for researchers. The personnel costs calculations need to be simpler, closer to actual costs and to national practices.

Recital (55) (new)	***Recital (55) (new)*** **The Programme will recognize the importance of focusing on young people as the next generation of researchers and innovators, while acknowledging the role of other players including parents, teachers, communicators and media. It will continue the development of adapted modes of engagement with young people that promote active participation in the innovation process and encounters with practitioners in research, engineering, science and technology.**	***Recital (55) (new)*** Europe should send a clear message to young people that science, technology and innovation is relevant to them and interesting as a career. To do so, innovative and appropriate modes of engagement are needed.
Recital (56) (new)	***Recital (56) (new)*** **The Programme will recognize that excellent science implies excellent science engagement and communication, and that professional science mediators working with researchers is the best combination for effective science engagement. It will foster continuous innovation in science engagement approaches.**	***Recital (56) (new)*** There is an onus on researchers and policy-makers to explain the rationale and methodology behind decision-making and to take citizens' views into account, but this takes skills and resources and can be uncomfortable. The academic rewards systems rarely encourage researchers to engage with lay publics, and the norms and language researchers use with their peers are ill suited with nonexperts audiences "whose cognitive frameworks and communication patterns are directly at odds with many of these scientific conventions." Yet there are experienced science mediators : science engagement is a professional field on its own, universities train professional mediators who further their knowledge and competencies during their practice. Many science museums perform audience research that could represent an asset to the R&I system.

Recital (57) (new)	***Recital (57) (new)*** **The Programme will mobilize and engage citizens as contributors and co-designers in Research and Innovation, and not only as consumers, will value the knowledge of citizens and their innovative potential, and when relevant, will use the expertise of science engagement organisations to solicit citizens' input into the research and innovation agenda setting. It will acknowledge and nurture the value of citizen-led innovation and DIY science and technology and encourage innovators from all backgrounds notably in FabLabs and Makerspaces.**	***Recital (57) (new)*** Innovation can come from many sectors, and many types of actors. Horizon Europe should be open to and value current and non-traditional practices, just as it should value the creative and innovation potential of citizens.
Article 2 (1) (1) 'research infrastructures' mean facilities that provide resources and services for the research communities to conduct research and foster innovation in their fields. This definition includes the associated human resources, and it covers major equipment or sets of instruments; knowledge-related facilities such as collections, archives or scientific data infrastructures; computing systems, **communication networks**, and any other infrastructure of a unique nature and open to external users, essential to achieve excellence in research and innovation. Where relevant, they may be used beyond research, for example for education or public services and they may be 'single sited', 'virtual' or 'distributed';	***Article 2 (1)*** (1) 'research infrastructures' mean facilities that provide resources and services for the research communities to conduct research and foster innovation in their fields. This definition includes the associated human resources, and it covers major equipment or sets of instruments; knowledge-related facilities such as **museums**, collections, archives or scientific data infrastructures; computing systems, communication **and science engagement** networks, and any other infrastructure of a unique nature and open to external users, essential to achieve excellence in research and innovation, **including excellence in public**	Museums : the definition of ICOM (International Council of Museums, UNESCO) 2007: A museum is a non-profit, permanent institution in the service of society and its development, open to the public, which acquires, conserves, researches, communicates and exhibits the tangible and intangible heritage of humanity and its environment for the purposes of education, study and enjoyment.

	engagement in science and innovation. Where relevant, they may be used beyond research, for example for education or public services and they may be 'single sited', 'virtual' or 'distributed';	
Article 2 (26) (new)	***Article 2 (26) (new)*** **(26) Science engagement : Refers to activities, events, or interactions characterized by mutual learning—not one-way transmission from "experts" to publics—among people of varied backgrounds, scientific expertise, and life experiences who articulate and discuss their perspectives, ideas, knowledge, and values. Goals for science engagement in addition to mutual learning include civic engagement skills and empowerment, increased awareness of the cultural relevance of science, and recognition of the importance of multiple perspectives and domains of knowledge to scientific endeavors.**	***Article 2 (26) (new)*** We use "science engagement" term to refer to "public engagement with science" as described by McCallie et al. (2009) and by the American Association for the Advancement of Science (AAAS).
Article 2 (27) (new)	***Article 2 (27) (new)*** **(27) Impact means qualitative and quantitative impact, including social responsibility and fairness impacts.**	***Article 2 (27) (new)*** The notion of impact is present through the Programme as well as being an evaluation criterion in the proposals; a definition would be useful.
Article 3 (1) (1) The Programme's general objective is to	***Article 3 (1)*** (1) The Programme's general objective is to	***Article 3 (1)*** Aiming at reaching the SDGs without referring to the

deliver scientific, economic and societal impact from the Union's investments in research and innovation so as to strengthen the scientific and technological bases of the Union and foster its competitiveness, including its industry, deliver on the Union strategic priorities, and contribute to tackling global challenges, including the Sustainable Development Goals.	deliver scientific, economic, **environmental** and societal impact from the Union's investments in research and innovation so as to **increase the well-being of the citizens of the Union, strengthen their scientific and technological culture,** strengthen the scientific and technological bases of the Union and foster its competitiveness, including its industry, deliver on the Union strategic priorities, and contribute to tackling global challenges, including the Sustainable Development Goals.	environment does not seem consistent with the SDGs. A research and innovation democratic Europe needs informed citizens with a strong scientific, technological culture.
Article 3 (2)(d) 2. (d) to optimise the Programme's delivery for increased impact within a strengthened European Research Area.	***Article 3 (2)(d)*** 2. (d) to optimise the Programme's delivery for increased impact within a strengthened European Research Area, **build effective cooperation between society and science, attract new talent to science, technology, innovation and entrepreneurs careers, and pair scientific excellence with social awareness and responsibility.**	
Article 4 (1)(4)(c) (new)	***Article 4 (1)(4)(c) (new)*** **(c) Science with and for Society**	***Article 4 (1)(4)(c) (new)*** The specific strand for Science with and for Society (SwafS) currently in H2020 needs to be re-inserted in Horizon Europe. As it stands, Horizon Europe is not engaging citizens nor does it concretely foresee their participation or present approaches or mechanism to work with citizens. A specific SwafS strand is the only way to ensure citizens'

		participation in the Programme, (the level of science engagement of the Missions is not determined), to perform research and innovative practice in science engagement in order to, notably, address fake news, gender issues, to attract young talents to science, to prepare Europeans to emerging and future technologies and to further develop a European scientific and innovation culture. New technologies are and will be merging the physical, digital and biological worlds in ways that will have a profound impact on all aspects of citizens" lives. Dialogues are urgently needed before discourses of fears emerge; humanities are crucial in these debates to openly address issues of ethics, security and economics. All parts of society should be involved in science and innovation processes through platforms to discuss impacts, ethics, risks and benefits of emerging technologies to align their use and outcomes with the values of society. "All technologies implicitly have values baked into them, from the initial idea to how they are developed and deployed. We should recognize this and debate values at all stages of innovation, not just when they hurt someone with a voice. " Klaus Schwab, Founder and Executive Chairman, World Economic Forum in Shaping the Fourth Industrial Revolution, 2018. : Fake news is an urgent issue to explicitly address if one strives for a fact-based Europe. In January 2018, the European Commission set up a high-level group of experts (HLEG) to advise on policy initiatives to counter fake news and disinformation spread online. https://ec.europa.eu/digital-single-market/en/news/final-report-high-level-expert-group-fake-news-and-online-

		disinformation The HLEG recommends a multi-dimensional approach, resting on five pillars designed to: Enhance transparency of the digital information ecosystem; Promote **media and information literacy** to counter disinformation and help users navigate the digital media environment; develop tools for **empowering users and journalists** to tackle disinformation and foster a positive engagement with fast-evolving information technologies; safeguard the diversity and sustainability of the European news media ecosystem, and promote **continued research** on the impact of disinformation in Europe to evaluate the measures taken by different actors and **constantly adjust the necessary responses**. Liz Corbin, Head of News at BBC World News : “Education is also key. We at the BBC have launched a program supporting young people to distinguish between real news stories and fake or false information. “ Tackling fake news should be one of the strong aims of the SwafS programme.
Article 6 (7) 7. Horizon Europe activities shall be primarily delivered through calls for proposals, some of which organised as parts of missions and European Partnerships.	***Article 6 (7)*** 7. Horizon Europe activities shall be primarily delivered through calls for proposals, some of which organised as parts of missions and European Partnerships. **The number of two stage evaluation processes will be increased.**	***Article 6 (7)*** Proposal writing is very costly and with such a low success rate, is discouraging many excellent organisations from applying. 2-step calls might reduce the amounts lost in proposals development.

Article 6 (10) (new)	***Article 6 (10)(new)*** **10. All funded research projects will have a science engagement plan with a relevant and articulated approach. When relevant, research programming and execution will involve civil society and citizens with the help of professional science mediators.**	***Article 6 (10)(new)*** Excellent science goes with excellent science engagement. To the like of a number of research programmes in various countries, the Programme should require a professional science engagement plan for all proposals, monitored like other activities at the project stage.
Article 9 (1) (1) The financial envelope for the implementation of the Framework Programme for the period 2021 – 2027 shall be EUR **94 100 000 000** in current prices for the specific programme referred to in Article 1(3)(a) and, in addition, the amount for the specific programme referred to in Article 1(3)(b), as laid down in Regulation…. establishing the European Defence Fund.	***Article 9 (1)*** (1) The financial envelope for the implementation of the Framework Programme for the period 2021 – 2027 shall be EUR **94 560 000 000** in current prices for the specific programme referred to in Article 1(3)(a) and, in addition, the amount for the specific programme referred to in Article 1(3)(b), as laid down in Regulation…. Establishing the European Defence Fund.	***Article 9 (1)*** This includes the funding for the SwafS strand at the same level as it was in H2020.
Article 9 (2)(d) 2. (d) EUR **2 100 000 000** for Part 'Strengthening the European Research Area' for the period 2021-2027, of which	***Article 9 (2)(d)*** 2. (d) EUR **2 560 000 000** for Part 'Strengthening the European Research Area' for the period 2021-2027, of which	***Article 9 (2)(d)*** This includes the funding for the SwafS strand at the same level as it was in H2020.
Article 9 (2)(d)(3) (new)	***Article 9 (2)(d)(3)(new)*** **2. (d) (3) EUR 460 000 000 for Science with and for Society**	***Article 9 (2)(d)(3) (new)*** This is a fenced budget for SwafS.

Article 18 (11) (new)	***Article 18 (11) (new)*** **11. An operating grants scheme will be developed for non-profit entities that pursue an aim of general Union interest and that are primarily active in the field of science engagement.**	***Article 18 (11)*** Such operating grants exist in other DG's for entities in the fields of health, environment, … Supporting entities that operate at the European level will contribute to a better coordination of activities and increase the engagement power.
Article 26 (3) (new)	***Article 26 (3) (new)*** **3. The number of two stage evaluation processes will be increased.**	***Article 26 (3) (new)*** See article Article 6 (7)
Article 32 –(1) 1. In addition to the criteria set out in Article 197 of the Financial Regulation, for beneficiaries with project-based remuneration, costs of personnel are eligible up to the remuneration that the person is paid for work in similar projects funded by national schemes. Project-based remuneration means remuneration that is linked to the participation of a person in projects, is part of the beneficiary's usual remuneration practices and is paid in a consistent manner.	***Article 32 (1)*** 1. In addition to the criteria set out in Article 197 of the Financial Regulation, for beneficiaries with project-based remuneration, costs of personnel are eligible up to the remuneration that the person is paid for work in similar projects funded by national schemes. Project-based remuneration means remuneration that is linked to the participation of a person in projects, is part of the beneficiary's usual remuneration practices and is paid in a consistent manner. **All personnel eligible costs shall correspond to the rate of the year of the costs incurred and shall use the national accounting procedures.**	***Article 32 (1)*** See article Recital (48)
Article 35 (8) (new)	***Article 35 (8) (new)*** **8. The research and innovation methods**	***Article 35 (8) (new)*** The Programme should focus more on young people as

	will be mediated towards young people in the formal and informal education system.	the next generation of researchers and innovators and as the future European generation. It is much more important for young people to learn about the scientific method – thus developing a critical mind towards fake news – than to learn about research results that will be rapidly outdated.

Ecsite amendments on Annexes I and II to the proposal for a Regulation of the European Parliament and of the Council establishing Horizon Europe – the Framework Programme for Research and Innovation, laying down its rules for participation and dissemination

Text from HEU Proposal from EC / Regulation Annexes /	Amendments	Justification
Annexe I – (4) Through the following activities, this part will, in line with Article 4, optimise the Programme's delivery for increased impact within a strengthened European Research Area. It will also support the Programme's other specific objectives as described in Article 3. While underpinning the entire Programme, this part will support activities that **contribute to a more**	***Annexe I – (4)*** Through the following activities, this part will, in line with Article 4, **address new societal challenges and** optimise the Programme's delivery for increased impact within a strengthened European Research Area. It will also support the Programme's other specific objectives as described in Article 3.	***Annexe I – (4)*** See Justification in Regulation text, Article 4 (1)(4)(c) (new)

knowledge-based and innovative and gender equal Europe, at the front edge of global competition, thereby optimising national strengths and potential across Europe in a wellperforming European Research Area (ERA), where knowledge and a highly skilled workforce circulate freely**, where the outcomes of R&I are understood and trusted by informed citizens and benefit society as a whole**, and where EU policy, notably R&I policy, is based on high quality scientific evidence. Areas of intervention: Sharing Excellence; Reforming and enhancing the European R&I system.	While underpinning the entire Programme, this part will support activities that **build effective and sustained cooperation between science and society, combat fake news, recruit new talent for science and innovation, promote gender equality and pair scientific excellence with excellence in science engagement and with social awareness and responsibility**. **It will contribute to an increased scientific, technical and media literate society, to an innovative and gender equal Europe**, at the front edge of global competition, thereby optimising national strengths and potential across Europe in a well performing European Research Area (ERA), where knowledge and a highly skilled workforce circulate freely, **where the processes and the outcomes of R&I are shared with society for its benefit,** and where EU policy, notably R&I policy, is based on high quality scientific evidence. Areas of intervention: Sharing Excellence; Reforming and enhancing the European R&I system, **Science with and for Society**	
Annexe II - Coordination and support action: action contributing towards the objectives of the Programme, excluding research and innovation activities, such as standardisation, dissemination, awareness-raising and communication,	***Annexe II - (new)*** - Coordination and support action: action contributing towards the objectives of the Programme, excluding research and innovation activities, such as standardisation, **science engagement**	***Annexe II - (new)*** Science engagement is a more encompassing concept, more appropriate to citizens' needs and to current society.

networking, coordination or support services, policy dialogues and mutual learning exercises and studies;	**activities,** networking, coordination or support services, policy dialogues and mutual learning exercises and studies;	

Ecsite amendments on Decision of the European Parliament and of the Council on establishing the specific programme implementing Horizon Europe – the Framework Programme for Research and Innovation

Text from HEU Proposal from EC / Decision /	Amendments	Justification
1. CONTEXT OF THE PROPOSAL ***Reasons and objectives*** […] The proposal is framed by the premise that research and innovation (R&I) **delivers** on citizens' priorities, boosts the Union's productivity and competitiveness, and is crucial for sustaining our socio-economic model and values, and enabling solutions that address challenges in a more systemic way.	***1. CONTEXT OF THE PROPOSAL*** ***Reasons and objectives*** […] The proposal is framed by the premise that research and innovation (R&I) **actively engages citizens in the research and innovation processes from programming to research activities**, that it delivers on citizens' priorities, boosts the Union's productivity and competitiveness, and is crucial for sustaining our socio-economic model and values, and enabling solutions that address challenges in a more systemic way.	***1. CONTEXT OF THE PROPOSAL*** ***Reasons and objectives*** Horizon Europe should be a programme with and for society – and the best way to know citizens' needs is to work with them.
Recital (10)	***Recital (10)*** **(10)The specific objective "Science with and for Society" should build effective cooperation between society and science, attract new talent to science, technology, innovation and entrepreneurs careers, and pair scientific excellence with social awareness and responsibility**.	***Recital (10)*** The specific strand for Science with and for Society (SwafS) currently in H2020 needs to be re-inserted. As it stands, Horizon Europe is not engaging citizens nor does it concretely foresee their participation or present approaches or mechanism to work with citizens. A specific SwafS strand is the only way to ensure citizens' participation in the Programme, (the level of science engagement of the Missions is not determined), to perform research and innovative practice in science

		engagement in order to, notably, address fake news, gender issues, to attract young talents to science, to prepare Europeans to emerging and future technologies and to further develop a European scientific and innovation culture. New technologies are and will be merging the physical, digital and biological worlds in ways that will have a profound impact on all aspects of citizens" lives. Dialogues are urgently needed before discourses of fears emerge; humanities are crucial in these debates to openly address issues of ethics, security and economics. All parts of society should be involved in science and innovation processes through platforms to discuss impacts, ethics, risks and benefits of emerging technologies to align their use and outcomes with the values of society. "All technologies implicitly have values baked into them, from the initial idea to how they are developed and deployed. We should recognize this and debate values at all stages of innovation, not just when they hurt someone with a voice. " Klaus Schwab, Founder and Executive Chairman, World Economic Forum in Shaping the Fourth Industrial Revolution, 2018. : Fake news is an urgent issue to explicitly address if one strives for a fact-based Europe. In January 2018, the European Commission set up a high-level group of experts (HLEG) to advise on policy initiatives to counter fake news and disinformation spread online. https://ec.europa.eu/digital-single-market/en/news/final-report-high-level-expert-group-fake-news-and-online-disinformation The HLEG recommends a multi-dimensional approach, resting on five pillars designed to:

		Enhance transparency of the digital information ecosystem; Promote **media and information literacy** to counter disinformation and help users navigate the digital media environment; develop tools for **empowering users and journalists** to tackle disinformation and foster a positive engagement with fast-evolving information technologies; safeguard the diversity and sustainability of the European news media ecosystem, and promote **continued research** on the impact of disinformation in Europe to evaluate the measures taken by different actors and **constantly adjust the necessary responses**. **Liz Corbin, Head of News at BBC World News :** “Education is also key. We at the BBC have launched a program supporting young people to distinguish between real news stories and fake or false information. “ Tackling fake news should be one of the strong aims of the SwafS programme.
Article 2 (2.)(a) 2. (a) reinforcing and spreading excellence;	***Article 2 (2.)(a)*** 2. (a) reinforcing and spreading excellence**, including excellence in science engagement;**	
Article 2 (2.)(f) 2. (f) fostering open science and ensuring **visibility to the** public and open access to results;	***Article 2 (2.)(f)*** 2. (f) fostering open science and ensuring **the engagement** of the public and open access to results;	

Article 2 (2.)(g) 2. (g) actively **disseminating** and exploiting results, in particular for policy development;	***Article 2 (2.)(g)*** 2. (g) actively **engaging citizens with the research results and process**, and exploiting results, in particular for policy development;	***Article 2 (2.)(g)*** "Previous research does not support the notion, however, that increasing public understanding will also lead to more public "buy-in" for science." Dietram A. Scheufele, University of Wisconsin, in PNAS (Proceedings of the National Academy of Sciences of the United States of America,, August 2013. http://www.pnas.org/content/110/Supplement_3/14040 Engagement modes are needed, more than the dissemination of results, as it is important to engage. citizens with the research process to develop their critical mind towards pseudoscience and fake news.
Article 2 (2.)(l) 2. (l) improving science **communication**;	***Article 2 (2.)(l)*** 2. (l) improving science **engagement**;	
Article 3 (1)(4)(c) (new)	***Article 3 (1)(4)(c) (new)*** **1. (4) (c) Science with and for Society, as described in Annex I, Part 'Strengthening the European Research Area', section 3.**	***Article 3 (1)(4)(c) (new)*** The specific strand for Science with and for Society (SwafS) currently in H2020 needs to be re-inserted in Horizon Europe. As it stands, Horizon Europe is not engaging citizens nor does it concretely foresee their participation or present approaches or mechanism to work with citizens. A specific SwafS strand is the only way to ensure citizens' participation in the Programme, (the level of science engagement of the Missions is not determined), to perform research and innovative practice in science engagement in order to, notably, address fake news, gender issues, to attract young talents to science, to prepare Europeans to emerging and future technologies and to further develop a European scientific and innovation culture.

		New technologies are and will be merging the physical, digital and biological worlds in ways that will have a profound impact on all aspects of citizens" lives. Dialogues are urgently needed before discourses of fears emerge; humanities are crucial in these debates to openly address issues of ethics, security and economics. All parts of society should be involved in science and innovation processes through platforms to discuss impacts, ethics, risks and benefits of emerging technologies to align their use and outcomes with the values of society. Fake news is an urgent issue to explicitly address if one strives for a fact-based Europe. In January 2018, the European Commission set up a high-level group of experts (HLEG) to advise on policy initiatives to counter fake news and disinformation spread online. https://ec.europa.eu/digital-single-market/en/news/final-report-high-level-expert-group-fake-news-and-online-disinformation The HLEG recommends a multi-dimensional approach, among which : Promote **media and information literacy** to counter disinformation and help users navigate the digital media environment; develop tools for **empowering users and journalists** to tackle disinformation and foster a positive engagement with fast-evolving information technologies; promote **continued research** on the impact of disinformation in Europe to evaluate the measures taken by different actors and **constantly adjust the necessary responses**.
Article 4 (1) 1. In accordance with Article 9(1)of Regulation …	***Article 4 (1)*** 1. In accordance with Article 9(1)of	***Article 4 (1)*** A budget of 460 million € is added for the Science with

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.	Regulation … FP/RfP Regulation, the financial envelope for the implementation of the Specific Programme for the period 2021 to 2027 shall be EUR **94 560 000 000** in current prices.	and for Society strand. This is the same budget as in H2020.
Article 5 (1) 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:	***Article 5 (1)*** 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 **and civil society representatives**. The mission board shall advise upon the following:	***Article 5 (1)*** In view of the importance the Missions seem to have in the Programme, representatives of society should be on the missions' boards.
Article 5 (1)(e) 1. (e) **communication**.	***Article 5 (1)(e)*** 1. (e) **science engagement plans adapted to different audiences and with an appropriate range of science engagement levels and that actively involves professional mediators.**	***Article 5 (1)(e)*** Excellency should be sought in all aspects of the research system, including in the science engagement aspects. To the like of a number of research programmes in various countries, the Programme should require a professional science engagement plan for all proposals, monitored like other activities at the project stage.

Ecsite amendments on Annex I of 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

Text from HEU Proposal from EC / Decision Annex /	Amendments	Justification
Annex I - Strategic planning […] 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.	***Annex I - Strategic planning*** […] 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, **citizens' priorities as defined in past Horizon 2020 citizens' consultation projects or in future exercises,** studies and other scientific evidence and take account of relevant existing initiatives at Union and national level. **Each mission will have a science engagement plan adapted to different audiences, with an appropriate range of science engagement levels and done in**	***Annex I - Strategic planning*** The Strategic Plan needs to fully take into account the ultimate beneficiaries of the Programme, that is, European citizens. H2020 funded some projects where citizens were consulted on the focus of the future Programme : these results should be included in the Strategic Planning. Science engagement is both vital for democracy and one of the best ways to have a sustained impact of the Programme's activities. Science engagement is not a one-way communication or explanation of results. Engaging citizens and young people in the research and innovation process is more important than explaining results : it will give them useful skills, and will help them differentiate between pseudoscience and authentic science. The wealth of experience of science engagement professionals is essential to the performance of the Programme. This professional field has to be integrated in the mechanisms of the Programme.

	close collaboration with professional science mediators.	
Annex I - 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 of citizens, industry, public administrations, academia, civil society organisations, and policy makers. For this purpose, Horizon Europe may make use of advances technologies and intelligence tools.	***Annex I – Public Engagement*** Horizon Europe will provide dedicated support for open access to scientific publications, to knowledge repositories and other data sources. **Science engagement** 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 of citizens, industry, public administrations, academia, civil society organisations, and policy makers **according to the needs and requirements defined by each of these target audiences.** For this purpose, Horizon Europe may make use of advances technologies and intelligence tools.	Target audiences' needs are best defined by these same audiences. One should not assume that the European Commission knows these needs.
Pillar 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 adequate supply of excellent researchers; are at the very heart of economic, social and cultural progress in all its forms.	***Pillar 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 adequate **number** of excellent researchers; **a formal and informal education system in connection with R&I**; are at the very heart of economic, social and cultural	***Pillar I – Open Science*** The 21st century skills required for excellent researchers (such as analytic and cogent reasoning, problem solving, teamwork, critical-thinking, entrepreneurship,) are developed and sustained from an early age onwards. Informal learning settings such as science museums are often better equipped with labs and experiments than schools and offer learning approaches suited to the development of those skills.

	progress in all its forms.	
Pillar I – Open science (2)(2)(2) 2.2.2. Broad lines - Training programmes to equip researchers with a diversity of skills relevant to current and future global challenges	***Pillar I – Open science (2)(2)(2)*** 2.2.2. Broad lines - Training programmes **in collaboration with professional science mediators** to equip researchers with a diversity of skills relevant to current and future global challenges	***Pillar I – Open science (2)(2)(2)*** Training programmes should make use of the competencies of professional science mediators. Combining the excellence of a scientist with the excellence of a science engagement professional is the best combination.
Pillar I – Open Science (2)(2)(5) ***2.2.5 Promoting Public Outreach*** 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.	***Pillar I – Open Science (2)(2)(5)*** *2.2.5 Promoting* ***Science engagement*** Broad lines - Public **science engagement** 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.	
Pillar II – Global Challenges and Industrial competitiveness (1)(2)(1) 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	***Pillar II – Global Challenges and Industrial competitiveness (1)(2)(1)*** 1.2.1 Health throughout the Life course People in vulnerable stages of life (birth, infancy, childhood, adolescence, pregnancy, mature and late adulthood),	***Pillar II – Global Challenges and Industrial competitiveness (1)(2)(1)*** People living with the conditions described in the Pillar article have vast knowledge about their conditions. Involving them in the co-design of the solutions will not only

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.	including people with disabilities or injuries, have specific health needs that require better understanding and tailored solutions. **Co-design and close working relations with concerned citizens will be established.** 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.	make for better adapted solutions but will also empower them, thus improving the health systems.
Pillar II – Global Challenges and Industrial competitiveness (1)(2)(1) Broad lines […] - Health education and digital health literacy.	***Pillar II – Global Challenges and Industrial competitiveness (1)(2)(1)*** Broad lines […] - Health education and digital health literacy **via the formal and informal education system.**	***Pillar II – Global Challenges and Industrial competitiveness (1)(2)(1)*** Education needs to be understood with its formal and informal components. Otherwise, Europe is losing an opportunity.
Pillar II – Global Challenges and Industrial competitiveness (1)(2)(2) 1.2.2. 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,	***Pillar II – Global Challenges and Industrial competitiveness (1)(2)(2)– p20*** 1.2.2. Improved understanding **co-defined with the concerned citizens 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	***Pillar II – Global Challenges and Industrial competitiveness (1)(2)(2)–*** See above

healthy, resilient and sustainable living and working environments; to promoting healthy lifestyles and consumption behaviour; and to developing an equitable, inclusive and **trusted** society.	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 and inclusive society**	
Pillar II – Global Challenges and Industrial competitiveness (1)(2)(3) 1.2.3. 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.	***Pillar II – Global Challenges and Industrial competitiveness (1)(2)(3)*** 1.2.3. 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. **Patients' expertise will be solicited and included in the co-design of research.**	***Pillar II – Global Challenges and Industrial competitiveness (1)(2)(3)*** See above.
Pillar II – Global Challenges and Industrial competitiveness (1)(2)(6) 1.2.6. Health Care Systems Broad lines: […] - **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;	***Pillar II – Global Challenges and Industrial competitiveness (1)(2)(6)*** 1.2.6. Broad lines: […] - **New models and approaches leading to** 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;	***Pillar II – Global Challenges and Industrial competitiveness (1)(2)(6)*** Relevant solutions will best be found through relevant approaches and models of governance.

Pillar II – Global Challenges and Industrial competitiveness (2)(1) […] 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.	***Pillar II – Global Challenges and Industrial competitiveness (2)(1)*** […] The EU must promote **citizens' well-being via** 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. 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.	***Pillar II – Global Challenges and Industrial competitiveness (2)(1)*** Growth as such should not be the ultimate aim of the Programme, but rather the well-being of Europeans.
Pillar II – Global Challenges and Industrial competitiveness (2)(2)(3) 2.2.3. 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	***Pillar II – Global Challenges and Industrial competitiveness (2)(2)(3)*** 2.2.3. 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 **formal and informal** education and training to tackle inequalities;	***Pillar II – Global Challenges and Industrial competitiveness (2)(2)(3)*** Citizens manifest in various ways their wish to have a different role in the governance of public authorities : the latter should change in order to mainstream citizens' engagement. Fake news and pseudoscience represent a serious threat to a fact-based decision-making society. Addressing these issues requires citizens with enhanced democratic, social, political and media literacies, allowing them to decode

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, 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.**	– 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, training, support services, active and inclusive citizenship especially for the vulnerable; – **Formal and informal** 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	different sources of information.

– 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.	inequalities and radical changes in markets; – Modernisation of public authorities **to engage citizens in defining their needs and to** meet their expectations regarding service provision, transparency, accessibility, openness, accountability and user centricity **and engagement**. – 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. - **Stimulation of democratic, social, political and media literacies to empower citizens to decode different sources of information and foster critical thinking, from an early age all through life.**	
Pillar II – Global Challenges and Industrial competitiveness (2)(2)(5) 2.2.5. 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	***Pillar II – Global Challenges and Industrial competitiveness (2)(2)(5)*** 2.2.5. 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;	***Pillar II – Global Challenges and Industrial competitiveness (2)(2)(5)*** See above

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.	– 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 by stimulating democratic, social, political and media literacies to empower citizens to decode different sources of information and foster critical thinking, from an early age all through life.**; – 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.	
Pillar II – Global Challenges and Industrial competitiveness (3)(1) 3.1. […] 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.	***Pillar II – Global Challenges and Industrial competitiveness (3)(1)*** 3.1. […] A strong **engagement of industry and of all relevant stakeholders** is essential in setting priorities and developing research and innovation agendas, increasing the leverage of public funding, and ensuring the uptake of results. **Societal acceptability and engagement** are key ingredients for success, as well as a new agenda for industry-relevant skills and standardisation.	***Pillar II – Global Challenges and Industrial competitiveness (3)(1)*** Research and innovation are not the preserve of the industry. Many more stakeholders have to be involved in setting the research priorities.

Pillar II – Global Challenges and Industrial competitiveness (3)(2)(4) 3.2.4. Artificial Intelligence and Robotics 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. Broad Lines – Enabling AI technologies such as explainable AI, unsupervised machine learning and data efficiency and advanced human-machine interactions; – Safe, smart and efficient robotics and complex embodied systems; – User-driven AI technologies for AI-based solutions; – Developing and networking the research competences of AI competence centres across Europe;	***Pillar II – Global Challenges and Industrial competitiveness (3)(2)(4)*** 3.2.4. Artificial Intelligence and Robotics 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. **The integration of humanities in the scientific process and mediated dialogues with citizens will be crucial to openly address ethical, legal and social implications (ESLI) of new research.** Broad Lines – Enabling AI technologies such as explainable AI, unsupervised machine learning and data efficiency and advanced human-machine interactions;	***Pillar II – Global Challenges and Industrial competitiveness (3)(2)(4)*** Artificial Intelligence will profoundly affect people's lives, from skills and employment, to security and social bias, even the definition of humans and machines. "Long-term forecasters warn not to underestimate existential threats if we fail to along the values of AI with human value. … Researchers are therefore currently calling for the discussion of ethical frameworks and values to guide the development and deployment of AI and robotics." K. Schwab, World Economic Forum, *Shaping the Fourth Industrial Revolution*, 2018.

– Technologies for open AI platforms including software algorithms, data repositories, robotics and autonomous systems platforms.	– Safe, smart and efficient robotics and complex embodied systems; – User-driven AI technologies for AI-based solutions; – Developing and networking the research competences of AI competence centres across Europe; – Technologies for open AI platforms including software algorithms, data repositories, robotics and autonomous systems platforms. **- Mediated science engagement activities in safe environments such as science museums, to address ethical issues, economic concerns, and mistrust.**	
Pillar II – Global Challenges and Industrial competitiveness (3)(2)(5) 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	***Pillar II – Global Challenges and Industrial competitiveness (3)(2)(5)*** 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 **citizens**, industry and society building on trust, interoperability, better user	***Pillar II – Global Challenges and Industrial competitiveness (3)(2)(5)*** Europeans are not only consumers.

highly personalised access to objects, information and content, including immersive and trustworthy media, social media and social networking; – 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.	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; – 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.	
Pillar II – Global Challenges and Industrial competitiveness (3)(2)(9) (new) Broad lines -	***Pillar II – Global Challenges and Industrial competitiveness (3)(2)(9)*** Broad lines - Education and motivation for space careers, and engaging with citizens on Space services.	***Pillar II – Global Challenges and Industrial competitiveness (3)(2)(9)*** Space topics, particularly on Earth Observation, easily relate to the daily life and to broad societal concerns and can therefore be used to motivate students to pursue careers in this area, essential for the fast growth envisaged for the space sector until 2030. Therefore, investing in STEM (science, technology, engineering and mathematics) education in basic and secondary schools and in informal education settings is very important for their motivation and qualification. There are specificities in space education - namely the exposure to frontier and fast advancing knowledge and the contact with astronauts and space specialists – that cannot be left solely to educators in the formal education systems. Therefore, the Programme should strongly highlight the need to partner with institutions that are experienced in engaging with schools

		and are agile in absorbing new scientific challenges and adapting support materials to educators´ needs. Science centres, planetaria, museums and NGO´s are the obvious candidates for these partnerships. European citizens must be aware of the relevance of Space services for their daily lives to ensure public support for the sector. On the other hand, only well informed citizens can participate in the creation of a new market to use downstream Earth Observation and Navigation applications through co-creation of applications. There is a vast experience in the use of scientific data by lay people (citizen science) with interesting results both for the dissemination of science and the creation of new knowledge. The Programme should highlight the importance to partner with institutions experienced in the area of mobilisation, stakeholder debate and public engagement like science centres, museums and civil society organizations.
Pillar II – Global Challenges and Industrial competitiveness (4)(2)(5) 4.2.5 Communities and Cities Broad Lines – City/district energy/mobility systems towards the EU-wide deployment of low-carbon, Positive Energy Districts and zero-emission mobility and logistics by 2050, boosting the global competitiveness of integrated EU solutions; – Urban planning, infrastructures and systems including mutual interfaces and interoperability, nature-based solutions and the use of digital	***Pillar II – Global Challenges and Industrial competitiveness (4)(2)(5)*** 4.2.5 Communities and Cities Broad Lines – City/district energy/mobility systems towards the EU-wide deployment of low-carbon, Positive Energy Districts and zero-emission mobility and logistics by 2050, boosting the global competitiveness of integrated EU solutions; – Urban planning, infrastructures and systems including mutual interfaces and interoperability, nature-based solutions and	***Pillar II – Global Challenges and Industrial competitiveness (4)(2)(5)*** Citizens manifest in various ways their wish to have a different role in the governance of local authorities : the latter should change in order to mainstream citizens' engagement.

technologies and space based services and data, taking into account the effects of projected climate change and integrate climate resilience; – Quality of life for the citizens, safe mobility, urban social innovation, cities' circular and regenerative capacity, reduced environmental footprint and pollution; – Global cities research agenda.	the use of digital technologies and space based services and data, taking into account the effects of projected climate change and integrate climate resilience; **– Modernisation of local authorities to actively and meaningfully engage citizens in the local governance;** - Quality of life for the citizens, safe mobility, urban social innovation, cities' circular and regenerative capacity, reduced environmental footprint and pollution; – Global cities research agenda.	
Pillar II – Global Challenges and Industrial competitiveness (5)(1) […] They will also foster participatory approaches to research and innovation, including the multiactor 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**.	***Pillar II – Global Challenges and Industrial competitiveness (5)(1)*** […] They will also foster participatory approaches to research and innovation, including the multiactor approach and develop knowledge and innovation systems at local, regional, national and European levels. Social innovation with citizens' **engagement will be** crucial to encourage new governance, production**, and sustainable and healthy behaviours.**	***Pillar II – Global Challenges and Industrial competitiveness (5)(1)*** Sustainable development should be the goal of the Programme, and not consumption as such.
Pillar II – Global Challenges and Industrial competitiveness (5)(2)(2) Broad lines: – The state and value of biodiversity, terrestrial and marine ecosystems, natural capital and ecosystem services; – Holistic and systemic approaches within a	***Pillar II – Global Challenges and Industrial competitiveness (5)(2)(2)*** Broad lines: – The state and value of biodiversity, terrestrial and marine ecosystems, natural capital and ecosystem services; – Holistic and systemic approaches within a	***Pillar II – Global Challenges and Industrial competitiveness (5)(2)(2)*** Natural history museums preserve precious knowledge through their collections. Research on and digitalisation of these collections is necessary to make them accessible and useful to contemporary research.

socio-ecological framework for the links between biodiversity, ecosystems and ecosystems services and their causality relationships with drivers of change, across different scales and economic activities, including the governance of transition processes to sustainability; – Modelling of trends and integrated scenarios for biodiversity, ecosystem services and good quality of life at different scales and horizons; the potential contribution of biotopes and ecosystems as carbon sinks under various climate change scenarios; – Ecotoxicology of compounds and new pollutants, their interactions and environmental behaviour, and altered biochemical loops under changing climate; – Mainstreaming biodiversity and ecosystem services in decision-making frameworks and accounting systems of governments and businesses, as well as quantification of their benefits; – Adaptable and multi-functional nature-based solutions, addressing challenges in cities, rural and coastal areas related to climate change, natural disasters, biodiversity loss, ecosystem degradation, pollution, and citizens' health and well-being; – Multi-actor living labs approaches engaging authorities, stakeholders, business and civil society in co-designing and co-creating systemic solutions for the preservation, restoration and sustainable use of natural capital the governance of the transition to sutainabilty and sustainable	socio-ecological framework for the links between biodiversity, ecosystems and ecosystems services and their causality relationships with drivers of change, across different scales and economic activities, including the governance of transition processes to sustainability; – Modelling of trends and integrated scenarios for biodiversity, ecosystem services and good quality of life at different scales and horizons; the potential contribution of biotopes and ecosystems as carbon sinks under various climate change scenarios; – Ecotoxicology of compounds and new pollutants, their interactions and environmental behaviour, and altered biochemical loops under changing climate; – Mainstreaming biodiversity and ecosystem services in decision-making frameworks and accounting systems of governments and businesses, as well as quantification of their benefits; – Adaptable and multi-functional nature-based solutions, addressing challenges in cities, rural and coastal areas related to climate change, natural disasters, biodiversity loss, ecosystem degradation, pollution, and citizens' health and well-being; – Multi-actor living labs approaches engaging authorities, stakeholders, business and civil society in co-designing and co-creating systemic solutions for the	

management options in economic activities throughout whole value loops.	preservation, restoration and sustainable use of natural capital the governance of the transition to su**st**ainabilty and sustainable management options in economic activities throughout whole value loops. **- Support to natural history museums in researching their collections and making them relevant to trans-disciplinary research and to public engagement.**	
Pillar II – Global Challenges and Industrial competitiveness (5)(2)(3)	***Pillar II – Global Challenges and Industrial competitiveness (5)(2)(3)*** 5.2.3. Broad lines: […] **- Support to science engagement organisations, notably science centres and museums, in engaging stakeholders with specific indigenous knowledge.**	***Pillar II – Global Challenges and Industrial competitiveness (5)(2)(3)*** Agriculture is clearly a sector with substantial indigenous knowledge, not registered or documented, but held with the ground actors. Organisations specialized in harvesting this individual and collective intelligence should be involved in this part of the Programme.
Pillar II – Global Challenges and Industrial competitiveness (5)(2)(4) 5.2.4. 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	***Pillar II – Global Challenges and Industrial competitiveness (5)(2)(4)*** 5.2.4. 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	***Pillar II – Global Challenges and Industrial competitiveness (5)(2)(****4****)*** Ocean literacy shows that marine topics are multidisciplinary and can easily be used to motivate youngsters for STEM (science, technology, engineering and mathematics) careers. This is essential for the European policy of Blue Growth that aims at harnessing the potential of the ocean and seas for sustainable growth. There are specificities in marine education - namely the exposure to frontier and fast advancing knowledge and the contact with marine and maritime professions – that cannot be left solely to educators and formal education systems.

marine and 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. Broad lines - Sustainable sea and ocean farming, fisheries and mariculture for food, including alternative sources of protein with increased food security, food sovereignty and climate resilience; – 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;	understanding in order to sustainably manage, protect and restore marine and 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. **Research into marine protected area management should also play a part.** 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. Broad lines - Sustainable sea and ocean farming, fisheries and mariculture for food, including alternative sources of protein with increased food security, food sovereignty and climate resilience; – Strengthened resilience of marine	Therefore, the framework Programme should strongly highlight the need to partner with institutions that are experienced in engaging with schools and are agile in absorbing new scientific challenges and adapting support materials to educators´ needs. Science centers, aquaria, museums and NGO´s are the obvious candidates for these partnerships. European citizens must be aware of the relevance of seas and ocean resources and ecosystem services for their daily lives to ensure public support for the sector. On one hand, only well informed citizens can participate in the creation of new markets and services in a sustainable way through co-creation. On the other hand, there is a vast experience in the use of scientific data by lay people (citizen science) with interesting results both for the dissemination of science and the creation of new knowledge such as monitoring the distribution of sea life and marine litter. The framework programme should highlight the importance to partner with institutions experienced in the area of mobilisation, stakeholder debate and public engagement like science centres, museums, aquaria and civil society organizations.

– Ocean governance at **global and regional levels** to ensure conservation and sustainable use of the seas and oceans resources; – Technologies for the digital ocean (seafloor, water column and water surface) connecting services and communities in land-based, climate, space and weather related activities, and promoted through the Blue Cloud as part of the European Open Science Cloud; – Monitoring and predictive/forecasting capacities including sea-level rise and other natural hazards e.g. storms surges, tsunamis; – Blue value-chains, the multiple-use of marine space and growth of the renewable energy sector from seas and oceans, including sustainable microand macro- algae; – 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; – 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.	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; – Ocean governance by **stakeholders engagement at global, regional and local levels** to ensure conservation and sustainable use of the seas and oceans resources; - **Effective management of marine protected areas to ensure long term financing towards their conservation and sustainable use as well as involvement of and benefits to local people** – Technologies for the digital ocean (seafloor, water column and water surface) connecting services and communities in land-based, climate, space and weather related activities, and promoted through the Blue Cloud as part of the European Open Science Cloud; – Monitoring and predictive/forecasting capacities including sea-level rise and other natural hazards e.g. storms surges, tsunamis; – Blue value-chains, the multiple-use of marine space and growth of the renewable energy sector from seas and oceans, including sustainable microand macro-algae;	

	– 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; – 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. - **Education and motivation for marine/maritime careers and engaging with citizens and decision makers for healthy seas and ocean.**	
Pillar II – Global Challenges and Industrial competitiveness (5)(2)(6) 5.2.6. Broad lines – Inclusive bioeconomy patterns with different actors participating in the creation of value, maximising societal impact.	***Pillar II – Global Challenges and Industrial competitiveness (5)(2)(6)*** 5.2.6. Broad lines – Inclusive bioeconomy patterns with different actors **(local authorities, researchers, NGOs, etc)**;	
Part – Strengthening the European Research Area […] In addition, research and innovation are seen by some as distant and elitist without clear benefits for citizens, instilling attitudes that hamper the	***Part – Strengthening the European Research Area –*** […] In addition, research and innovation are seen by some as distant and elitist without clear benefits for citizens, instilling attitudes	***Part – Strengthening the European Research Area –*** The specific strand for Science with and for Society (SwafS) currently in H2020 needs to be re-inserted in the Programme, with a dedicated and fenced budget. Currently,Horizon Europe is not engaging citizens nor does it concretely foresee their participation or present

creation and uptake of innovative solutions, and scepticism about evidence-based public policies. This requires both better linkages between scientists, citizens and policy-makers, and more robust approaches **to pooling scientific evidence itself.** 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), better supported by the EU's research and innovation Framework Programme. Specifically, a well-integrated yet tailored set of EU measures 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. The activities supported under this part addresses ERA policy priorities, while generally underpinning all parts of Horizon Europe. Activities may also be established to foster brain circulation across ERA through mobility of researchers and innovators. The goal is for an EU where knowledge and a highly skilled workforce circulate freely, research outputs are shared rapidly and efficiently, researchers benefit from attractive careers and gender equality is ensured, where Member States	that hamper the creation and uptake of innovative solutions, and scepticism about evidence-based public policies. This requires both better linkages between scientists, citizens and policy-makers, and more robust approaches **to engage citizens with science in a non-top-down approach.** **For this, the interaction between science and society needs to be addressed differently, more intensely, and with science engagement approaches continuously researched, tested and adapted to a changing society.** 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), better supported by the EU's research and innovation Framework Programme. Specifically, a well-integrated yet tailored set of EU measures 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	approaches or mechanism to work with citizens. A specific SwafS strand is the only way to truly ensure citizens' participation in the Programme, (the level of science engagement of the Missions is not determined), to perform research and innovative practice in science engagement in order to, notably, address fake news, gender issues, to attract young talents to science, to prepare Europeans to emerging and future technologies and to further develop a European scientific and innovation culture. New technologies are and will be merging the physical, digital and biological worlds in ways that will have a profound impact on all aspects of citizens" lives. Dialogues are urgently needed before discourses of fears emerge; humanities are crucial in these debates to openly address issues of ethics, security and economics. All parts of society should be involved in science and innovation processes through platforms to discuss impacts, ethics, risks and benefits of emerging technologies to align their use and outcomes with the values of society. Fake news is an urgent issue to explicitly address if one strives for a fact-based Europe. Tackling fake news should be one of the strong aims of the SwafS programme together with a real engagement of citizens. Researching and piloting science engagement approaches is a necessity, now and in the coming years.

develop common strategic research agendas, aligning national plans, defining and implementing joint programmes, and where the outcomes of research and innovation are understood and trusted by informed citizens and benefit society as a whole. This part will contribute de facto to all Sustainable Development Goals (SDGs), but directly to the following: SDG 4 - Quality Education; SDG 5 - Gender Equality; SDG 9 - Industry, Innovation and Infrastructure; SDG 17 - Partnership for the Goals.	efficient and impactful. The activities supported under this part addresses ERA policy priorities, while generally underpinning all parts of Horizon Europe. Activities may also be established to foster brain circulation across ERA through mobility of researchers and innovators. The goal is for an EU where knowledge and a highly skilled workforce circulate freely, research outputs are shared rapidly and efficiently, researchers benefit from attractive careers and gender equality is ensured, where Member States develop common strategic research agendas, aligning national plans, defining and implementing joint programmes, and where the outcomes of research and innovation are understood and trusted by informed citizens and benefit society as a whole. This part will contribute de facto to all Sustainable Development Goals (SDGs), but directly to the following: SDG 4 - Quality Education; SDG 5 - Gender Equality; SDG 9 - Industry, Innovation and Infrastructure; SDG 17 - Partnership for the Goals.	
Part – Strengthening the European Research Area ***(2) Reforming and enhancing the EU research and Innovation system*** Broad lines – **Citizen science, supporting all types of formal, non-formal and informal science**	***Part – Strengthening the European Research Area*** ***(2) Reforming and enhancing the EU research and Innovation system*** **Deleted**	***Part – Strengthening the European Research Area*** ***(2) Reforming and enhancing the EU research and Innovation system*** Replaced with a specific strand and budget for Science for and with Society (SwafS).

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;		
Part – Strengthening the European Research Area ***(3) Science with and for Society (new)***	***Part – Strengthening the European Research Area - (3) Science with and for Society (new)*** SCIENCE WITH AND FOR SOCIETY The aim is to build effective cooperation between science and society, to combat fake news, recruit new talent for science and innovation, to promote gender equality and to pair scientific excellence with excellence in science engagement and with social awareness and responsibility. The strength of the European science and technology system depends on its capacity to harness talent and ideas from wherever they exist and to ensure scientific and technological advancements in line with citizens' needs. This can only be achieved if a fruitful and rich dialogue and active cooperation between science and society is developed to ensure a more responsible science and to enable the development of policies more relevant to citizens. Rapid advances in contemporary scientific research and innovation have led to a rise of important ethical, legal and social issues that affect the relationship between science	***Part – Strengthening the European Research Area - (3) Science with and for Society (new)*** Contrary to H2020, Horizon Europe does not have a Science for and with Society (SwafS) specific strand. This presents the highly feasible risk of seeing science engagement reduced to top down communication done with outdated modes of science engagement and without the contribution of professional mediators. It also means that no research on science engagement would be done, while the current societal issues (such as fake news, fear of new technologies, pseudoscience) clearly demonstrate that society is changing rapidly and that science engagement needs to keep up with those changes.

	and society. To combat fake news, practice and research in science engagement need to be better integrated and should continuously innovate to keep up with the pace of scientific, technological and societal changes. Research, practice and piloting, together with a systemic integration of all relevant actors are essential to promote critical thinking among Europeans and to address the issue of post-truth. Future and emerging technologies represent a significant societal challenge. Europe is in the Fourth Industrial Revolution with immense potentials, both positive and negative that Europeans need to shape with their values of democracy, fairness, ethics and engagement. Improving the cooperation between science and society to enable a widening of the social and political support to science and technology in all Member States is an increasingly crucial issue which the current crisis has greatly exacerbated. Public investment in science requires a vast social and political constituency sharing the values of science, educated and engaged in its processes and able to recognise its contributions to knowledge, society and economic progress. The focus of activities shall be to:	

	(a) make scientific and technological careers attractive to young students, and foster sustainable interaction between all actors of the formal and informal education systems, research institutions, industry and civil society organisations with the development of adapted modes of engagement with young people; (b) counter the post-truth phenomenon by stimulating research, practice and piloting of activities to further develop critical thinking from an early age through late adulthood; (c) promote gender equality, in particular by supporting structural changes in the organisation of research institutions and in the content and design of research activities; (d) support the 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, in order to integrate citizens' interests and values and to increase the quality, relevance, social acceptability and sustainability of research and innovation outcomes in various fields of activity from social innovation to future and emerging technologies; (e) encourage citizens to engage in science through formal and informal science education, and promote the diffusion of science-based activities, namely in science centres and museums and through other	

	appropriate channels; (f) develop the accessibility and the use of the results of publicly-funded research; (g) develop the governance for the advancement of responsible research and innovation by all stakeholders (researchers, public authorities, industry and civil society organisations), which is sensitive to society needs and demands, and promote an ethics framework for research and innovation; (h) take due and proportional precautions in research and innovation activities by anticipating and assessing potential environmental, health and safety impacts; (i) support science engagement, including all types of formal, non-formal and informal science education, and improve the knowledge on science engagement in order to enhance the effectiveness of interactions between scientists, general media and the public.	