

Resilient Europe

Societal Challenge 6: Europe in a changing world –
inclusive, innovative and reflective societies

Recommendations to the European Commission developed by the Advisory
Group on Societal Challenge 6

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1. Introduction – Europe at a turning point

1.1 The central challenge

The rationale and objective of Societal Challenge 6 (SC6) is to foster greater understanding of a culturally and socially rich and diverse Europe and how it needs to adopt new paradigms for change in a context of unprecedented transformation and growing global interdependence. New policies and actions will need to provide new solutions and support inclusive, innovative and reflective European societies. SC6 is itself a core component of the research and innovation actions foreseen within Horizon 2020 in responding to the economic crisis to promote sustainable growth and job creation, and to address people's concerns about their livelihoods, safety and environment. It will also support Europe's opportunities in research, innovation and technology for developing its society and economy and for strengthening its global position.

Alongside technology, and especially Information and Communication Technology (ICT), Social Sciences and Humanities (SSH) research and innovation has a leading and sustaining role in SC6. Its prime purpose is to enhance understanding of societal conditions, to ensure transformative and structural changes take account of these in promoting future prosperity, well-being and cohesion, and to make sure that innovation, including technology innovation, draws fully on Europe's creativity, diversity, and cultural strengths. In turn, SC6 in H2020 fully addresses the pillars of the Europe 2020 Strategy and the policy areas indicated in the Strategic Agenda of the Commission. It directly supports the need to develop inclusive societies which are smart, sustainable and resilient; innovative societies which promote new forms of innovation drawing on the potential of all people, genders and generations; reflective societies grounded in Europe's heritage, history and culture; and which strengthen its role in the world.

Central to the issues addressed by SC6 are the huge challenges Europe faces in reducing inequality and social exclusion. With 80 million people at risk of poverty and 14 million young people not in education, employment or training, it is clear that Europe has not yet overcome the economic crisis which has led to unemployment rates of 12% in general and 20% among the youth¹. At the same time, there is great potential for Europe through the opportunities provided, for example by new forms of innovation and by engaging citizens, to surmount these challenges. Supporting inclusive, innovative and reflective societies is a prerequisite for a resilient and sustainable European future.

1.2 The task and work of the SC6 Advisory Group

The Advisory Group is tasked with providing advice on relevant objectives and scientific, technological and innovation priorities pertaining to all activities within SC6. The five Thematic Priorities presented here are designed on this basis within the remit of Horizon 2020, and represent the full consensual view of the Advisory Group. They are designed to build on and exploit work in relevant areas undertaken in previous Framework Programmes and in the preceding 2014-2015 work programme. The proposed priorities for the next work programme 2016-2017 are also linked to work envisaged under other Societal Challenges and with other significant European policies and actions.

¹ <http://ec.europa.eu/programmes/horizon2020/en/h2020-section/europe-changing-world-inclusive-innovative-and-reflective-societies>

1.3 The five Thematic Priorities recommended by the SC6 Advisory Group

The diagram depicts the five Thematic Priorities underpinning the necessity of developing a resilient Europe built on inclusive, innovative and reflective societies.

Of prime importance is the Advisory Group's conviction that the research and innovation actions recommended and presented in this report are designed as a coherent programme aimed to develop a Resilient Europe built on these five Thematic Priorities as a whole given their strong interrelationships and synergies. This means, in the first place, that it is not possible to prioritise between the five

main themes. Secondly, and even more importantly, the goal of a Resilient Europe with its five main research and innovation priorities should be considered a 'flagship programme' that would not achieve its potential in forthcoming work programmes if dismantled by the piecemeal selection of a number of disparate and unrelated topics. The Advisory Group has the unanimous conviction that the research and innovation actions presented in this report are important and urgent, and are designed to attract Europe's best researchers. This will only be possible if a coherent work programme encompassing a limited number of sizeable and interrelated research and innovation priorities is implemented.

The Advisory Group wishes to stress that the five Thematic Priorities presented in the report should also be actively considered for support and inclusion in other relevant instruments designed by the European Commission, both within as well as beyond the Horizon 2020 programme. Within Horizon 2020, research and innovation on many of the topics in this report can be supported through the Marie Skłodowska-Curie programme or through training networks funded by actions of the Excellent Science pillar, whilst within the Future Emerging Technology pillar and the Industrial Leadership pillar actions can support the development of the creative and cultural industries and of innovative ICT products for an open and engaging public sector. Outside H2020, the education programme of the European Union and Erasmus+ are well positioned to develop inter-disciplinary and cross-sectoral initiatives to enhance the skills of all European citizens, professional and non-professional, young and old, women and men. This should have the goal to disseminate understanding about identities and cultural diversity in Europe, as well as to equip future generations with knowledge of the place of Europe in the world and the skills to strengthen this in the future.



1.4 Some high level principles

A number of high level principles and considerations have been employed by the SC6 Advisory Group in arriving at their recommendations. First, there is a clear need for understanding through studying

Europe's history - and the history of Europe's interconnectedness with the rest of the world - how we have reached where we are today. However, this is but a first step in designing the future we want and designing the research and innovation actions needed to support this goal. Second, we need to ensure our proposals for the five Thematic Priorities can make a real impact. A leap forward is needed by combining the talents and humanity of Europe's people with the assets of diversity and heritage, and by leveraging the power of technology as much as possible, in an integrative way that benefits Europe's society and economy. Third, the actions proposed are viewed as policy levers for change, as outcomes leading to positive societal change that in turn find solutions to the grand societal challenges Europe faces.

Fourth, change, especially the often necessary structural transformatory change needed, also depends on willingness to change, the urgency of action, and the multitude of different European contexts in which this takes place. This means that research funders in Member States need to align their research programmes at least partly with the research programme tackling the societal challenge of 'Europe in a changing world', thereby also helping to create a real European Research Area. Fifth, we also realise that research and innovation in themselves do not make an impact, so that direct engagement and inclusion of all stakeholders is required. Sixth, at the core of our recommendations is the need to build in sustainability considerations for the long term, not only in environmental terms although this has high importance, but also in relation to economic, social and political sustainability. Seventh, and especially given that SC6 pivots on Europe in a changing world, it is critical to see Europe as a reliable and active global player. Europe's global role has changed dramatically in the last fifty years and is destined to change further in future, so it is imperative that Europe's economic, political and moral strength as a 'super' partner is enhanced and strengthened.

Lastly, but not exhaustively, it is important to stress that the Advisory Group recommends that close attention be paid in implementing these five Thematic Priorities to the conduct of the research and innovation, the methods to be used, and the ethical, gender, diversity and equality issues and objectives which must be addressed.

1.5 Coherent structure for presenting the five Thematic Priorities

The five Thematic Priorities recommended by the SC6 Advisory Group are presented in the following five chapters of this report in no order of priority. The structure of each presentation follows the mandated seven questions, *viz*:

Section 1: Key challenges and assumptions

- Question 1: What is the biggest challenge in the field concerned which requires immediate action under the next Work Programme? Which related innovation aspects could reach market deployment within 5-7 years?
- Question 2: What are the key assumptions underpinning the development of this challenge (research & innovation, demand side and consumer behaviour, citizens' and civil society's concerns and expectations)?

Section 2: Expected outputs, impacts and international cooperation

- Question 3: What is the output that could be foreseen, what could the impact be, what would success look like, and what are the opportunities for international linkages?

Section 3: Bottlenecks and gaps

- Question 4: Which are the bottlenecks in addressing these areas, and what are the inherent risks and uncertainties, and how could these be addressed?
- Question 5: Which gaps (science and technology, markets, policy) and potential game changers, including the role of the public sector in accelerating changes, need to be taken into account?

Section 4: New actions needed to address research and innovation challenges

- Question 6: In which areas is the strongest potential to leverage the EU knowledge base for innovation and, in particular, ensure the participation of industry, SMEs and public administrations? What is the best balance between bottom-up activities and support to key industrial roadmaps?
- Question 7: Which areas have the most potential to support integrated activities, in particular across the societal challenges and applying key enabling technologies in the societal challenges and vice versa; and cross-cutting activities such as social sciences and humanities, responsible research and innovation including gender aspects, and climate and sustainable development? Which types of interdisciplinary activities will be supported?

2. Understanding Europe. The changing role of European culture and society

2.1 Key challenges and assumptions

Studying the human aspects of the world, the Social Sciences and Humanities (SSH) are vital to the understanding of the cultural and linguistic construction, historical emergence and on-going transformation of identities and social networks as well as the resistance offered to such transformations. Social sciences and humanities research can shed light on the origins and development of the dialogue between an overarching European identity and local/regional allegiances; it can explain the results of past migrations and the perspectives of current and future immigrants; it can elucidate the vague but all-pervasive agency of culture and cultural (self-) representation in these identity formations; it can facilitate an understanding of how European citizens see themselves, and operate as reasonable citizens of the world; it can identify the most crucial aspects of the dynamic tension between centres and peripheries; it can explain processes of state formation, democracy, gender equality, individualism, civil society and public sphere; it can provide answers to questions which are, at the same time, both historically and discursively relevant and urgently topical.

SSH is well positioned to understand the process of Europeanisation. This is a recurring idea which has frequently emerged in various versions during the last two thousand years. However, today the version promoted by the European Union faces not only 'hard' economic and political challenges, but also seems to be losing faith in the promotion of 'soft' integration through a common identity and a European public/cultural space. The frequently voiced hope of solving this dilemma via technocratic and mechanistic means ignores the fact that technology cannot replace understanding, but instead

provides new opportunities to facilitate access to and interpretation of Europe's rich cultural and historical diversity.

The optimism of the 'founders' of the European commonwealth regarding progressive adoption of continentally shared norms, values, beliefs, rules and common practices has weakened. At the same time, anti-European formal and informal political movements and organisations are emerging and gaining popularity. Typically referring to identity-forming efforts of the past, a few promote more or less nationalistic, xenophobic, fundamentalist and sometimes even racist ideologies, which find fertile ground among people disillusioned by their perception of the failed promises of a better common future. There are historically-determined differences in these collective worldviews. Backward looking societies tend to prioritise historic differences, defend their own 'independence' and often use this as a pretext for domination. Forward looking societies tend to focus on European commonalities, such as the ideals of democracy, the welfare state, equal opportunities, tri-partite social partners, cooperation, justice, human rights, solidarity and dignity. Understanding these dynamics is crucial to explaining and predicting future developments.

Europe's complex history and heterogeneity have high value and are rich assets, but at the same time can also be constant sources of contention, giving rise to both positive and negative developments. The construction, legitimation, and transformation of identities and social structures involve complex processes that are historical, cultural, linguistic and social, as well as political and economic in nature. They encompass and influence all aspects of the life of individuals, communities and societies that have been adapting to constant challenge over many centuries. Understanding change and adaptation as socio-historical processes is a necessary condition for imagining future scenarios.

Europe's diversity (including its economic cultures) is a source of positive dynamism but also results in tensions which may retard development or even explode into dangerous internal and geopolitical conflicts, as recently witnessed. The emergent instability does not result from economic and political causes alone. It derives also from unsolved conflicts and from diverse identities, which have their roots not only in contemporary ideologies, but also in historical dark legacy of Europe. It is therefore imperative to better understand how national politics have been shaped by history and culture.

Europe is home to huge diversity and wealth of cultural heritage, ranging from archaeological artefacts, sites and architecture, to landscapes, socio-political and economic institutions and traditions. We are responsible to future generations for safeguarding this heritage and the lessons it conveys, but also for learning how to use it to address societal challenges and to develop cultural and creative industries. Heritage is also an important ingredient of national and regional identities. Understanding this function may help build some of the basics of a European identity, whilst the settlement of significant populations from outside the continent is increasingly forcing Europe to reinterpret its own identity and heritage. In its philosophy, science and art, Europe possesses an impressive and still influential heritage of reflection on society and humanity that remains undervalued and often ignored when Europe's present and future in a globalised world is debated and determined. European heritage is not just a factor that can decisively influence the way a globalised world takes shape; it is also deeply affected by the process of globalisation itself – an issue addressed by the regional and global change Thematic Priority (see chapter 0).

Promoting understanding of the richness of Europe's heritage does not preclude us from embracing technology but rather challenges us to better understand the way in which the increasing prevalence

of digital media is changing the role, form and function of a shared European cultural space. Whilst Europe's culture and society are assets and sources of innovation in and of themselves, ICT is likewise a means to help unlock and exploit their full potential. Within this context, the creation of an active community focused on the communalities of the Union's heritage, rather than its national constituent parts, is hard to imagine without support from modern information and communication technologies. Accordingly, the Thematic Priority 'Understanding Europe' should also drive innovation; it cannot stay solely at the level of understanding.

2.2 Expected outputs, impacts and international opportunities

Exploring Europe's richness of cultural diversity as a value, asset and a source of innovation can reinforce European cohesion, unity and mutual understanding, and thereby assist the EU's competitiveness, growth and attractiveness to the rest of the world. Cultural diversity and diverse heritage can also be important inspirational sources for entrepreneurs within Europe's cultural and creative industries. National priorities do not always have room to invest much in culture and national heritage, but, as studies of cultural and creative industries show, they can, particularly in the current digital era, become a growth engine for the common benefit of Europe by exploiting the rich diversity of Europe's constituent parts.

SSH research and innovation will contribute to increase our knowledge of past economic and social trends as well as of all factors influencing the development of people, regions and nations, and thus further our understanding of the value and lessons of the past for both the present and the future. In order to understand "who we are?", we need to study "where we came from?" and how this happened. This knowledge can contribute to better predictions of "where we are going?".

We need to understand how cultural differences are being defined and what these cultures have in common, what their temporal and spatial manifestations are, as well as their political, societal and economic structures, objectives and constraints. Better understanding of other cultures and societies with their history, heritage, values and self-images will improve inter-cultural interactions and mutual understanding. In order to contribute to individual and societal development, we should consider how to adapt formal education and embrace the positive potential of digital technologies in order to embed the knowledge, skills and attitudes needed for greater unity and cohesion of European society, build a common identity and facilitate active participation in the democratic system – linking also to Thematic Priorities in chapters 6 (on capacities) and 4 (on engaging in the public sector).

2.3 Bottlenecks and gaps

The major long-term trends in European history since the early Middle Ages have resulted in a number of systemic regional differences, which make it highly problematic to speak about 'the' European Cultural Model. Historically determined differences between the North and the South, as well as between the East and the West, have left marked traces in the way societies developed culturally. However, many of the common characteristics have slowly spread over Europe, and hence to much of the rest of the world, as Europe became dominant through its expansion in the 19th and 20th centuries. This period saw a growing convergence around processes of state formation, democracy, non-discrimination, solidarity, individualism, dignity, justice, human rights, gender equality, civil society and the public sphere. Despite periodic inhibitions, this complex process led to the situation today when we are trying to move closer than ever to a still nascent 'European Cultural Model', however this is understood. This process now needs reflective reinforcement by continental-scale studies.

We need to list and propagate European commonalities/values to create a common ground of understanding which enables positive development. Such commonalities include similar historical experiences from ancient Greek and Roman times, religion shifts, comprising feudalism, through the renaissance and birth of science, early commercialisation, the industrial revolution and working class cultures, the 'triumph' of capitalism, progressive waves of democracy, women's emancipation, the massive disruptions of the 20th Century (rise and fall of fascism and communism), the new economies, new societies, new states, etc. Both, successes and failures (dark periods in history) need to be reflected and remembered as lessons for the future.

While both history and present trends have great influence on current society, there is also a pressing need to understand people and societal challenges. As individuals or groups, people have a special role in shaping European society and the challenges it now faces. In order to overcome negative trends, a key is to identify the whole set of factors influencing the formation of individual people, their beliefs and values, knowledge and skills – starting from the family environment, formal and informal education, economic and regional factors, etc.

Traditional humanistic research has aspired to understand phenomena and social transformations as well as to clarify probabilities, whilst explanation and prediction are primarily the domain of the socio-economic and natural sciences. Contemporary humanities naturally interact in their research with other disciplines and need to combine methodologies from both sets of disciplines to ensure that SSH becomes embedded in a broad variety of programmes.

New methods and technologies are needed to undertake innovative research especially in the humanities. The diverse tools developed under the umbrella of 'digital humanities' (network analysis, data and text mining) should be developed further in order to successfully research complex questions in an innovative manner. New methods and technologies are also needed to effectively promote the results of the proposed research in order to ensure they can make a substantial contribution to shaping a 'European Cultural Model'. Modern and digital methodologies should be developed in order to enable researchers to ask new questions and to use new datasets.

Both a problem-oriented, interdisciplinary approach as well as the translation of research findings into evidence-based policy recommendations, require special attention. In the whole SSH sector, but particularly in the humanities, there is a great need for interfaces that, on the one hand, assist policy

makers in the articulation of questions in such a way that researchers can come up with solutions, and, on the other hand, give policy makers access to the rich resources of academia. A serious investment in this kind of interface, where academic research meets policy, is needed.

2.4 New actions needed to address the research and innovation challenges

- The challenges which Europe faces are fundamentally human in nature and thus need a humanistic approach. Therefore, it is the 'duty' of SSH to show how differences can lead to creativity and innovation, how conflicts can be reconciled, how shared senses of purpose may emerge. We need time-deep research to understand how these societal challenges and especially the identity challenge (broadly taken) can help us address, in concrete and pragmatic terms, actual tensions. This is the research field for the humanities, which study the past in order to understand how it contributed to shape the present. In turn, grasping the present allows making mindful and reflective decisions for the future.
- Understanding the existence and use of multiple identities needs interdisciplinary research in order to uncover their historic roots, to identify the variety of conceptual and cognitive systems involved, and to define their contents and manifestations. Studying cultural diversity and preserving European heritage both require a fundamentally inter-disciplinary agenda, the development of transnational comparative research tools and international or even continental-scale cooperation. It is necessary to identify, analyse and develop appropriate responses to the ethical challenges of contemporary societies because a 'common' ethical reflection is indispensable for the development of European unity.
- Although research is needed to understand every aspect of Europe's culture and society, in the next few years European funding should focus on research and innovation actions with regard to the following questions:
 - How to use the understanding of history as a springboard to enhance European cohesion, well-being, welfare and unity, while challenging the narratives of voices which question the tenets and even existence of European values? (This links to Thematic Priority 'Facing the turbulence of regional and global change' presented in chapter 0.)
 - How to turn the diversity of European cultures into a source of innovation and development, as well as into a foundation of the cultural and creative industries?
 - How to democratise access to identity-forming cultural heritage? How to develop and promote novel forms of access and understanding of the past – for example, virtual museums and innovative manufacturing such as 3D printing? (This links to Thematic Priority 'Facing the turbulence of regional and global change' presented in chapter 0.)
 - How to include the heritage and history of the large groups of non-European migrants in the European narrative and how to turn this heritage and history into a source of cultural, social and economic strength? (This links to Thematic Priority 'Facing the turbulence of regional and global change' presented in chapter 0.)
 - How to better engage citizens to interpret the past and accept current diversities?

- How to develop new methods and technologies to undertake innovative research in the social sciences and humanities?

Cross-links to other challenges and pillars are potentially with SC7 (secure societies) to understand and shape solutions addressing the needs of the European Union based on understanding the past and diversities of cultures; with Science with and for Society in developing reflective societies being aware of the past, and with Industrial Leadership pillars (LEIT ICT and Innovation in SMEs) in promoting creative and cultural industries.

3. Promoting a collaborative, creative and sustainable economy

3.1 Key challenges and assumptions

Europe's current economic system, despite its tremendous success over many decades in providing growth, jobs and prosperity as well as resources for the welfare state, exhibits regular and sometimes prolonged periods during which these benefits are undermined and sometimes reversed. Even during high growth, the economy often becomes exclusive leading to inequality and considerable wastage of societal assets. The lives of people and communities on the wrong side of social and economic divides are wasted and become a drag on society rather than a benefit for all. The challenge is to identify and promote complementary economic models, innovative infrastructures, networks and collaborative spaces that match otherwise wasted assets with social and economic needs. These new models and growth paradigms need to be economically and socially sustainable and ensure inclusion and improved well-being for the whole population, whilst also being globally competitive.

The assumption is that a greater range of economic, social, human, and cultural capital can be valorised to complement traditional monetary assets and make a significant contribution to sustainable growth and well-being. The emerging economic and technological opportunities shaping Europe's societies and economies require new innovative growth policies to address these challenges through research and understanding, which also takes account of the need to adapt Europe's underlying institutional structures.

3.2 Expected outputs, impacts and international opportunities

The current market system is extremely good at 'sweating' assets on the supply side, so that commercial producers are incentivised to squeeze to maximum extent their financial, human and other assets and thereby increase productivity and performance. However, on the consumption and demand side, there is huge waste resulting from the widespread practice of exclusive asset ownership. In the last decade this is starting to be challenged by a new sharing economy growing from a small base, in which mainly individuals share with others an increasing range of their assets. These include time, skills, competences, tools, buildings, spaces, vehicles, facilities of all types, organisational capacities and even financial resources, much of which is enabled by ICT developments like crowdsourcing and crowdfunding. ICT can very efficiently match idle assets with new forms of demand, not otherwise possible, thereby enabling these outputs to be realised. The sharing economy is starting to supplement exclusive ownership with new forms of common, collective and collaborative ownership. The sharing movement started as mainly non-profit activities but is now spreading to the entrepreneurial and profit sector with examples like ZipCar and Airbnb

for renting out shared cars and accommodation space respectively, and which have since had impact as global market leaders.

A new important trend, beyond the shared consumption of existing under-used assets, is their use for developing new business models around the collaborative creation, innovation and production of new assets, including products, services and content. The impacts of this collaborative economy are already emerging, starting with 'pro-sumers' (individuals who are both producers and consumers) mainly in the digital sector. However, greater impact is possible through the collaborative innovation and production of physical goods and services. Indeed, an important driver of this trend is the process of integration between the physical and the virtual worlds, for example around 3D and audio-visual tools, virtual reality, artificial intelligence and immersive spaces. This virtual-physical interface can have huge potential to generate new economic and social value resulting in new products, stronger businesses and social growth drawing on the full range of both monetisable and non-monetisable assets.

Another area of significant potential impact, alongside the collaborative economy, is new business models being developed around the so-called creative economy, or the economy of creative industries. This is based on individual talents and skills that include all the capabilities and interests of many more people, rather than assuming that most of the population are largely passive consumers. It also promotes self-reliance, self-esteem and self-worth, often at community level and drawing on the assets of cultural heritage. This adds both economic and social value to communities, many of which were previously disadvantaged or threatened, and enhances the development of smart localities and smart cities.

Existing collaborative and creative economy examples include the so-called maker-movement emerging from Europe's networks of FabLabs using new additive manufacturing processes like 3D-printing and automation, as well as ICT incubation and start-up hubs and many other creative and cultural industries. They also support the personalisation of products, content and services through trends towards so-called 'mass customisation' where most production takes place only when specifically ordered by a customer, thus increasing impact as well as efficiency by not wasting assets on products not needed. Mass customisation is strongly enabled by digitisation and modularisation, both of which offer a wide range of opportunities for collaborative work through co-innovation, co-configuration, and co-production, as well as modular contributions from, from example, creative SMEs, to the 'standard toolbox' of creative practitioners.

Much of this is supported by new digital entrepreneurship and digital cultures in the intersection between creativity and ICT. Culture and creativity are processes and attributes intimately bound up with the imagining and generation of new ideas, products or ways of interpreting the world, each of which can have monetary and non-monetary benefits. They also support the customisation of products, content and services, that increases impact and efficiency by not wasting assets on outputs not needed. Sustainability is enhanced by putting otherwise idle assets to work, and by exploiting more extensively the talents and competences of many more people. Such new forms of innovation are also important outcomes of the collaborative, creative and sustainable economy, and many developments are already taking place around open and social innovation which potentially include all actors and stakeholders.

These developments are also taking place in a Europe of rising inequality and poverty, so new concepts such as inclusive and frugal innovation and entrepreneurship are becoming important.

These are largely bottom-up approaches which recognise the scarcity of traditional assets like large scale finance and other resources, can exploit idle assets at the grass-roots, and are able to generate creative solutions with high impact at prices affordable by, as well as conditions appropriate to, the target group. The international dimension is also important: for example many of the initiatives and movements around the collaborative and creative economy arise outside of Europe, such as in North America, Australasia and in East Asia, and especially in South Korea and Japan, although China is also experimenting with creative economy initiatives. Similarly, the tools of inclusive innovation are deployed in international development contexts, and indeed much of the growth and impact is self-generated in countries like Brazil, Kenya, South Africa and India, despite often challenging human conditions.

3.3 Bottlenecks and gaps

The biggest range of bottlenecks slowing the development of collaborative, creative and sustainable economies are inappropriate structural and governance systems, such as regulation, legal provisions and incentives. Like existing IPR and insurance systems, these have developed to serve the largely monetised economic system in which exclusive asset ownership and use are paramount, and where small-scale and individual creativity and entrepreneurship are rarely supported or incentivised. Another important bottleneck is Europe's risk-averse culture, which has hardly accepted managed risk, nor the value of experimentation where failure is fine as long as it promotes learning and any damage is containable. This is linked to often weak entrepreneurial ecosystems, which should enable collaborative economic models and innovative infrastructures to flourish. This means that the necessary business investments as well as public policy and governance structures, which can fully integrate the potential of the collaborative, creative and sustainable economy into formal business and policy frameworks, are largely lacking.

There are also barriers to fully exploiting mass customisation, such as operational feasibility as it requires high process agility and short development cycles. Flexibility, integration and responsiveness in meeting fragmented demand and heterogeneous niches is necessary, as is integrating customers into the value chain, and addressing the challenges of leveraging the economies of integration to compensate for the ones of scale in the traditional economy. The innovative application of ICT can help address many of these challenges by exploiting the internet's 'long-tail' which is already changing the economy from the small number of mass markets typical of the 20th Century's mass production and consumption paradigm, to the 21st Century's economic landscape which is witnessing the mass proliferation of small markets.

3.4 New actions needed to address research and innovation challenges

- Profound understanding of the economic, social and institutional functioning of the new economic and social paradigms in Europe is needed, as is how and which policies should be put in place to facilitate a successful transformation and take-up of existing opportunities.
- A broader understanding is required of Europe's past, existing and semi-mature collaborative and creative economy innovations for continuous learning about what works and what does not, to maximise future innovation efforts and ensure efficient and effective public investments. For instance, ICT is already scaling the impact of many innovations globally,

whilst some local clusters already practice effective collaborative innovation and have developed very successful innovative partnerships and collaboration models.

- Actions should examine a number of innovation issues, such as:
 - The economic, social, legal and governance bottlenecks slowing the development of the collaborative and creative economy, including regulation, incentives and risk cultures. (This links to Thematic Priority 'Building an open, engaging and innovative public sector' presented in chapter 4.)
 - The larger scale impact of sharing, collaborative and creative activities, the types of under-used or idle assets in society and the economy, and how they might be identified, negotiated, orchestrated and scaled to create new value and sustainable wealth. (This links to Thematic Priority 'Building an open, engaging and innovative public sector' presented in chapter 4.)
 - Requirements for the mass customisation, co-innovation, co-configuration, and co-production of products, services and content through modularisation and digitisation, the role of SMEs in these new processes, and creating platforms for creative SMEs, for example around 'standard toolboxes' for niche markets.
 - The role of pro-sumers, start-ups, initiative takers and champions in developing and valorising entrepreneurial, creative and cultural skills in Europe. (This links to Thematic Priority 'Overcoming inequalities by developing Europe's human and social capacities' presented in chapter 6.)
 - The impacts on communities, structurally marginalised individuals and groups, and the role of the collaborative and creative economy in tackling inequality and poverty, as well as contributing to improved self-esteem and quality of life. (This links to Thematic Priorities 'Building an open, engaging and innovative public sector' and 'Overcoming inequalities by developing Europe's human and social capacities' presented in chapters 4 and 6.)
 - The respective roles and impacts of different alternative economic and social modes of production, consumption and use, for example of: formal and commercial activities versus informal and voluntary activities; exclusive versus shared asset ownership models; and access- and use-based business models.
 - Using Europe's creativity to boost the creative and cultural industries as elements of the innovation system, and how new ideas, new technologies and new processes of transformative change are translated into new economies.
 - The participation of citizens in collaborative and creative activity, the motivations, skills and literacies needed, and the social and cultural conditions for participation required. (This links to Thematic Priority 'Overcoming inequalities by developing Europe's human and social capacities' presented in chapter 6.)
 - The role of testing and experimentation in such actions, given that many business models are nascent and hardly explored.

- The scaling and growing potential of successful new models beyond the hyper-local and largely volunteer- and elite-driven milieu it largely occupies at present.
- The various roles and developments of ICT including the cloud, web 2.0 and web 3.0 tools, big data and data analytics, as well as mobile and social media. In addition, the intersection between creativity and ICT, and the use and effectiveness of ICT in enhancing and converting social and cultural as well as economic assets in new goods, services and content, and in relation to other key technologies like 3D-printing, automation and value chain rationalisation.
- Understanding and tackling the reasons why Europe lags in some of these developments, and what we can learn from, adapt and collaborate with other countries and economic-social-cultural systems where collaborative and creative economic models seem to be having greater impacts and success.
- Inter-disciplinary research is needed incorporating the social sciences, especially economics and political economy, social and inclusive innovation, new business models, sociology, and behavioural psychology; the humanities and especially the role of cultural assets; the circular economy and sustainability issues; and participatory governance and regulation; as well as the use and impacts of ICT.

Cross-links to other challenges and pillars are potentially with SC1 (health, demographic change and well-being) in relation to personalising health and care, and with SC2 (food security, sustainable agriculture etc.) concerning new bio-based industries. Other links are with SC 3 (secure, clean and efficient energy), SC4 (smart, green and integrated transport), and SC5 (climate action, environment, resource efficiency and raw materials) with their focus on maximising scarce resource use, with SWAFS, as well as with SC7 (secure societies) in building resilience in our societies. Further cross-cutting aspects are with the Industrial Leadership pillars (LEIT ICT and Innovation in SMEs) in promoting creative and cultural industries, and with related EU policies such as support to digital entrepreneurship, start-ups and SMEs (Innovation in SMEs, and others), as well as initiatives around the circular economy.

4. Building an open, engaging and innovative public sector

4.1 Key challenges and assumptions

Together with most of the globe, Europe faces acute economic, social and sustainability challenges, many of which have longstanding causes but have been significantly sharpened by the recent financial crisis. Compounding these challenges, the governance systems composed of public sector institutions and administrative, legal, public policy and public service structures, and not least their participatory and democratic arrangements, are increasingly underperforming. They have not kept pace with rapid societal and technological change, and require some quite fundamental structural and long-term reforms through public sector innovation and modernisation to fully meet Europe's 2020 and longer-term challenges. The public sector plays a huge economic role as regulator, service provider and employer. It accounts for more than 25% of total European employment and between 20% and 50% of GDP across different countries. An efficient and productive public sector can thus be a strong driver of economic growth and social development through its support for, and governance of, the whole of society including both private and civil sectors.

There is a strong consensual assumption across countries that public sector innovation is a means to address budgetary pressures through greater efficiency and structural reform in which ICT is a key enabler. This can also lead to more effective service design that can meet new societal demands and reconnect with citizens to rebuild trust and legitimacy. Although public sector innovation and modernisation are challenging, they can provide solutions by adopting a longer-term, structural and reforming agenda. The mainly cost-cutting strategy implemented during the immediate post-crisis period, which on its own can lead to diseconomies in the longer-term, should be supplemented by increasing social and economic investment to tackle inequalities and poverty. ICT is an important enabler in these public sector strategies that can often improve systems around health, welfare, education, jobs, prosperity and sustainability, as well as in overcoming structural and social inequalities.

4.2 Expected outputs, impacts and international opportunities

Public sector reform over the last decade, often supported by ICT, has resulted in large administrative burden reductions through cost savings for governments. It has also contributed to more effective services for companies and citizens, whether delivered electronically or in traditional ways through improved targeting, personalisation and impact, as well as to improved policy modelling and evaluation. To meet the challenges Europe faces, however, the public sector should go much further and achieve greater impacts by becoming significantly more open and by empowering all societal actors, so that people do not only feel governed but also that they are themselves part of governance structures with real influence. It should involve everyone in creating public value that is more than efficiency and prosperity, but also contributes towards building trust, cohesion, well-being, quality of life and the environment for ordinary people.

Greater focus on research and innovation actions with emphasis on structural re-design and policy innovation and experimentation can help drive the public sector modernisation process. This will involve institutional, organisational, human resource and procedural reforms to develop more efficient and effective services and to reconnect with citizens through participatory decision-making frameworks. It will also involve extensive exploration of innovative ICT. In this way, the public sector can achieve much more than at present by being fully open and working to engage all parts of society, for example by using ICT to enhance the orchestration and deployment of its own assets together with those of wider actor networks.

An important output across many areas of its activities is for the public sector to facilitate and coordinate a broad open collaboration platform, defined as an open environment and ecosystem with clear frameworks, guidelines, resources, incentives and tools supported by ICT. This should be available to all actors to collaborate in producing public value as well as value which directly benefits the actors individually, for example through the development of shared services, infrastructures and processes. Many of these impacts can be achieved through the public sector's role in identifying and managing all of society's assets and making them available to actors through brokerage, matching and orchestration functions.

In this context, an open, engaging and innovative public sector, enabled by ICT linking across government entities, as well as with actors outside government, is a key ingredient. The roles of public administration and governance at different levels should become more creative and tangible, including at regional and local level where the public sector is more visible and directly impacts

people's everyday lives. Smart places, and especially smart cities where the urban scale is sufficient to have real power but also local enough to have genuine relevance, provide high impact value-creating ecosystems. Here, the public sector can support and interact with actors in providing services, facilities, utilities and meaningful engagement to improve prosperity and well-being. A more innovative role for the public sector can also deliver greater impacts at European level based on proportionality, inter-regional and cross-border initiatives and services, as well as providing support for the digital single market.

At the international scale, these issues go beyond Europe, given that trade and investment are global: an increasing part of Europe's economies are global in extent, large multi-national corporations act at global level, finance (in particular) is a global industry with billions of Euros moved around globally literally each second. In this context, there is a need to link to the United Nations' current efforts to establish a new set of sustainable development goals to underpin its post-2015 global development agenda. Here, good governance through institutional strength and competence are being promoted to meet the global challenges, supported by ICT, also in cooperation with the World Bank, the OECD and the world's governments.

4.3 Bottlenecks and gaps

There are many barriers and gaps slowing public sector modernisation and innovation. Significant inertia exists in systems and structures that have evolved over centuries, both in organisational as well as human resource terms. For the purpose of collaborating across the public sector and with other actors, there is widespread lack of ICT, semantic and organisational interoperability, so that it is not possible operationally to share or exchange data and other assets even when relevant policies are in place to back up the will to reform. Management tends to be reluctant to collaborate and share assets as this is considered risky and giving up power and control, and this is compounded by a lack of appropriate individual and organisational skills, awareness and attitudes. These gaps need to be tackled by ambitious change management programmes alongside legal and structural change that provide the right incentives and opportunities for public sector staff to participate in and feel ownership of the process.

There is a difficult balancing act between cooperation, sharing, openness and transparency on the one hand, and privacy, data protection and security on the other. In changing and adapting the roles of the public sector in these ways, there are also real concerns that such changes will result in new types of risk. These include disintegrated delivery and accountability when services or policies are the responsibility of different actors, quality standards are more difficult to determine and maintain with many designers and suppliers, the danger of data and content mis-use, and digital elite formation with new types of digital divides.

4.4 New actions needed to address the research and innovation challenges of public governance

- Improved understanding is needed of the historical development of Europe's governance systems and the socio-cultural and political developments underpinning them. Focus should be on how public sector modernisation and public governance transformation and innovation can take place to address Europe's challenges and the potential role of ICT in this. Research and innovation needs to explore how improved public governance frameworks can

be established that are efficient and effective, which generate trust and greater legitimacy and which can reconnect with citizens.

- Actions should look at a number of innovation issues, such as:
 - More effective organisational, institutional, regulatory and administrative structures, that also focus on public sector management, leadership and human resources. Examples where improved structures and operations could be more effective include better management of the increasing demands on, and complexity of, public health, care and elderly services, as well as the coordination and governance of fiscal and tax regimes to counter Europe's increasing problems with tax avoidance and corruption. (This links also to Thematic Priority 'Overcoming inequalities by developing Europe's human and social capacities' presented in chapter 6.)
 - Public sector collaboration that leverages all available societal assets to achieve more than at present, such as developing integrated, co-created, innovative and user-driven services both bottom-up and top-down, including at local and city level where service use and citizen engagement are greatest, as well as focusing on personalisation, design thinking, behavioural and ethnographic approaches. (This links also to Thematic Priority 'Promoting a collaborative, creative and sustainable economy' presented in chapter 3.)
 - Collaboration and sharing across the public sector and with other actors, including assets like open data, people, competences, organisational assets, facilities, buildings, environmental amenities and resources, infrastructures, tools, technologies and finance. (This links also to Thematic Priorities 'Promoting a collaborative, creative and sustainable economy' and 'Overcoming inequalities by developing Europe's human and social capacities' presented in chapters 3 and 6.)
 - Open engagement with all actors, not only in relation to decision- and policy-making but also in re-designing structures, processes, planning, community building, conflict resolution and asset management.
 - The transparency and accountability of public governance to reconnect with all citizens, regardless of age or gender differences, and to restore trust in processes, decisions and policies.
 - Public policy innovation and experimentation that can improve both the functions and the decisions of the public sector, for example through crowdsourcing, open and evidence-based policy modelling and monitoring, as well as increase the trust in and the perceived legitimacy of government.
 - The broad spectrum of public value creation, spanning from efficiency and prosperity to also include cohesion, well-being and quality of life for ordinary people.
- To support the above, some enabling technology is already being built, such as the cloud, web 2.0 and web 3.0 tools, big data and data analytics, as well as social media, mobile devices, open APIs and app development. In addition, many more ICT innovations and deployments are envisaged, such as:

- The role of ICT in public sector modernisation and innovations in public participatory governance, as deployed by the public sector itself as well as by other actors (including civil society, social movements and commercial organisations) interacting amongst themselves and with government in digital ecosystems and networks.
- The impact of G4 and G5 mobile, ubiquitous computing and not least the internet of things, where everything is connected and where computers speak directly with each other and via sensors as well as with people, has huge potential impact on public services, public governance and public engagement. Virtual reality, artificial intelligence and gamification can be deployed in policy impact assessments as well as to design individualised and self-controlled services, for example in health, education and mobility, by meshing the virtual and physical worlds through augmented reality.
- It will be important to deploy testing and experimentation actions both to better understand what works and what does not in terms of the size and types of impacts, and how to scale and disseminate these where relevant.
- Inter-disciplinary research is needed incorporating history, political science and policy-making, legal and administrative studies, public sector innovation, governance and regulation, sociology and behavioural psychology, as well as the fundamental role ICT is playing and can play in these areas in future.

Cross-links to other challenges and pillars are especially with all other Societal Challenges as regards European and Member State governance structures, operations and performance, as well as with SC7's focus on secure societies. Potential links are also to SC1 (health, demographic change and well-being) in relation to social services, and to SC3 (secure, clean and efficient energy) regarding smart cities and communities. Some relation is also seen with Science with and for Society (SWAFS) to explore the involvement of citizens in innovation actions and research.

5. Facing the turbulence of regional and global change

5.1 Key challenges and assumptions

Europe is increasingly confronted with the impact of global and regional changes. In Europe and its neighbourhood, authoritarian rule is being re-established while violence, civil wars and terrorism threaten the stability of Eastern Europe and the Mediterranean region. The growth of radical Islamic groups, a development linked to explosive population growth, economic stagnation and political repression in the Middle East and North Africa in the last thirty years, threatens the safety and security of Europe. Increasing migration from Africa, Asia and the Middle East creates tensions in European societies as well as humanitarian tragedies. The rise of Asia challenges the western-dominated world order and balance of power, while impacting global culture and economic development. Climate change will affect water supplies in the Middle East with the potential to further destabilise the region. The actions of transnational public or private non-state actors reinforce the phenomena of globalisation, which often imbue a feeling in European citizens that their national governments cope and manage rather than decide and steer. Europe is facing the turbulence of regional and global change, but this Thematic Priority is as much a topic within the Societal Challenge on Innovative, Inclusive and Reflective Societies (SC 6) as it should be a central

theme within the Challenges on Security (SC 7) and Climate Change (SC 5) if not within other Challenges.

It is important for Europe to be a strong partner in our neighbourhood, as well as globally, and to promote stability, prosperity and democracy in the countries closest to the Union and on the European continent. We want to maintain good Eastern and Southern neighbourhood policies. Due to the disturbing incidents in Crimea and Eastern Ukraine, our Eastern neighbourhood is now being tested. Also, the fact that Russia's actions surprised the world indicates that more insightful knowledge is needed to enable us better anticipate that country's role and aspirations as a global player.

In order to become a more effective actor in its neighbourhood and beyond, the European Union has to improve its capacities for defining, prioritising, explaining, assessing and promoting its policy objectives with other world regions. In this regard, it also has to improve its capacities for anticipating and responding to the evolution and impacts of globalisation, and the new priorities and alliances being set by emerging countries. To achieve this, the EU has to draw on its knowledge base and academic resources, both to attain a deeper understanding of the forces at work in its neighbourhood and the world at large and of its European heritage. The EU is built upon European values which are grounded in a complex of classical and enlightenment philosophy, scientific discovery, education and art that has exerted and is still exerting global influence, but is being changed in the process. Key concepts like democracy, secularism, human rights, equal opportunities, class and legitimacy have developed in Europe since the 17th century, and have become part of the political vocabulary worldwide, although with often widely different meanings in different parts of the globe. Today, the long-held universality of European values is increasingly being challenged by the relative effectiveness of new alternate models, like the combination of authoritarian political rule and economic liberalism in China and elsewhere.

Europe will gain huge benefit, both social and economic, if it participates in a discourse that draws on worldwide sources of reflection on the meaning and direction of economics, policies, artistic practices and human life in general. It follows from the above that Europe is exceptionally well placed to do so. The function of art (including music, design, literature, architecture) in shaping and binding together societies, and enhancing and extending inclusiveness and identity in the process, is of special interest in this context. Societies in Asia and Latin America are increasingly aware of the importance of such a shared discourse, and actively seek allegiances and discussion with their European counterparts in order to shape their future. New multidisciplinary and transnational SSH research with partners worldwide is necessary to secure Europe's role in this global discourse that is also going to define Europe's position in the future. Furthermore, in order to continue and guarantee such discourse, research is needed into how the ability to participate in global reflective societies is to be anchored in European education as a necessary ingredient. For this, SSH research can draw on both European and worldwide theories and practices of education and innovation in the field. Innovative approaches are needed as familiar and tried and tested policies and initiatives are no longer tenable given the rapid changes Europe now confronts.

5.2 Expected outputs, impacts and international opportunities

Immediate challenges which should be addressed are the position of the European Union vis-à-vis its Eastern neighbourhood including the Eurasian Economic Union, the stability of the Mediterranean Region, mass migration and the development of radical Islam. Research will enable us to better understand developments in Russia and its neighbourhood, the Middle East and elsewhere, affecting these topics. Another output will be the development of evidence-based and innovative policy approaches which will be able to strengthen Europe's position in relation to these developments.

Moreover, in order to strengthen Europe's position in the larger world, research on the mutual influence and ties between the world regions and on the way Europe and its heritage are viewed from outside are needed. SSH can contribute to knowledge of the deeply interconnected histories of Asia, Africa, Latin America and Europe. As an outcome of this research, Europe and its global partners will be able to shape a shared discourse on the role of European values in the world and a shared reflection on the meaning and direction of economics, policies, artistic practices and human life. This will strengthen Europe's position in shaping the global future, and will also help create greater international inclusiveness around shared values like democracy, human rights, the rule of law, and transparency in public affairs, as championed and often pioneered in Europe.

In addition, considering Europe's commitment to contribute to a more democratic and peaceful world, innovative and inclusive research and action is needed to allow Europe to improve its external policy. Important areas of focus include the increasingly diverse and innovative ways countries emerging from authoritarian rule or armed conflict deal with their violent past, the role of economic issues and ICT in mobilising the general public and the role of international actors therein, and the emergence of electorally legitimised authoritarianism on Europe's fringes in a number of countries.

Finally, research should enable Europe's policy makers and political leaders to develop evidence-based policies to engage with social media and with innovative ICT, which are extensively used by extremists to reach out and transmit their messages both inside and outside the EU, and to develop evidence-based answers to the pressure of mass migrations towards the EU.

5.3 Bottlenecks and gaps

In particular, the growing importance of Asia, Africa and Latin-America on the world scene requires investment in the field of Asian, African and Latin-American studies. Building and enhancing competence in the analysis of transcultural entanglements is a critical asset in the understanding of complex, global interactions the 21st century has to deal with. As Commissioner Geoghegan-Quinn said: *"While of course we need to understand Europe, we also need to understand other cultures and societies as well so that we can improve our relationships and interactions with them. This can only be achieved with proper knowledge of their languages, history, values and cultural heritage – all these aspects are at the core of 'area studies' and they are ripe for further research"*².

The main risk to be avoided is undoubtedly that of a new essentialism. However tempting the reporting on current events and the political debate may make it look, a conceptualisation based on the thesis of a 'clash of civilisations' that sees the world in terms of 'us' and 'them' is academically

² Máire Geoghegan-Quinn, "The future of Social Sciences and Humanities in Horizon 2020", Speech at the British Academy London - 10 November 2011. http://europa.eu/rapid/press-release_SPEECH-11-741_en.pdf

irresponsible and politically dangerous. The relationship between Europe and the other regions is, and always has been, interactive, fluid and historically specific.

One potential bottleneck would be the inability to link the diverse expertise in the field of area studies. The EU should foster and integrate European networks of area specialists with a view to enhance dialogue and collaborative research within these networks, as well as between them and their counterparts in other regions of the world. These networks should be encouraged to develop joint research infrastructures and programmes of mobility enabling regular cooperation and exchanges with their counterparts in the regions concerned based on common values. The interaction would mobilise a truly international movement to tackle the challenges above, as well as to stimulate both sides to think out of habitual boxes. It would also help European researchers gain access to local resources and ensure that their output resonates with local specialists on the ground.

The nature of the main research needs described above requires an interdisciplinary approach. This also needs to address the fact that most international issues that Europe must face provide both opportunities, such as the positive effects of migration from outside the EU given demographic ageing inside, as well as challenges, like problems around identity, integration, and strains on services. One example of the latter is: the issue of religious and political radicalisation of Muslim youth in the Middle East can only be adequately addressed if the resources of students of religion and politics, sociologists, economists, demographers and historians are combined. Defining the issue only as a counter-terrorism problem offers no long-term solutions. Of course, area studies are a field that has had a very strong interdisciplinary tradition ever since its inception in the nineteen-forties.

It falls to the academic community to inform public opinion and to counter populist misrepresentations with quality research effectively disseminated through media spanning scholarly publications, teaching materials, the press, and policy briefs.

If a problem-oriented, critical, interdisciplinary approach imposes itself, translation of research findings into evidence-based policy recommendations is another issue that requires special attention. In the whole SSH sector, but particularly in the humanities, there is great need for interfaces that, on the one hand, assist policy makers in the articulation of questions in such a way that researchers can identify solutions, and, on the other hand, give policy makers access to the rich resources of academia. A serious investment in this kind of interface, where academic research meets policy, is needed if the research is to strengthen the global position of the European Union. Specifically, an annual European Policy Forum could be instituted in Brussels bringing together members of relevant European research networks with European diplomats and EEAS³ representatives.

5.4 New actions needed to address the research and innovation challenges

- Research is needed to increase the understanding of Europe's role and position in the globalised world. Europe's political, economic, social and cultural relations with Asia, Africa and the Americas need maintenance and continuing reflection, which can be stimulated by research in partnership with scholars from these regions. New multidisciplinary and transnational SSH research with partners worldwide is necessary to secure Europe's role in

³ EEAS - European External Action Service (<http://www.eeas.europa.eu/>)

the global discourse that draws on worldwide sources of reflection on the meaning and direction of economics, politics, artistic practices, inequalities and exclusion, as well as human life in general – this will also help to define Europe’s position in the future.

- Furthermore, in order to continue and guarantee such discourse, research is needed into how the ability to participate in global inclusive, innovative and reflective societies is to be anchored in European education, also through innovative tools, as a necessary ingredient. For this, SSH research can draw on both European and worldwide theories and practices of education and innovation in the field.
- Although research is needed to understand Europe’s relations with all parts of the world, in the next few years European funding should focus on research and innovation with regard to:
 - The societal transformations within the crescent at the south and southeast of Europe which sees the resilience of radical and fundamentalist religious groups, a reverse of democratic development, the failing of states, civil war and growing inequality and poverty. Understanding these developments can inform European policy makers to design new policies which can help stabilise societies in North-Africa and the Middle East, and to counterbalance with innovative policies and tools the societal pressures responsible for large waves of migration to the EU, especially via its southern and south-eastern borders.
 - The role of social media and the internet in processes which lead to the destructive radicalisation of many young people of Europe and beyond, and into ways to counterbalance these influences. This research can lead to innovative cyber-policies promoting more secure, inclusive and prosperous environments. (This links to Thematic Priority ‘Understanding Europe’ presented in chapter 2.)
 - Ways to build and maintain stability in the Eastern neighbourhood also by grass-root partnerships. For this purpose, multidisciplinary research is needed to build partnerships and to bring stability to the Eastern neighbourhood over the long run.
 - The role of European values in the world, together with establishing a shared reflection on the meaning and direction of economics, politics, artistic practices, inequalities and exclusion, as well as human life in general, between Europe and its global partners in Africa, Asia and the Americas. This will strengthen Europe’s position in shaping the global future and the emerging 21st century world order. (This links to Thematic Priority ‘Understanding Europe’ presented in chapter 2.)

Cross-links to other challenges and pillars are potentially with SC2 (food security, sustainable agriculture etc.) concerning the deprivation of land giving rise to social unrest, SC5 (climate action, environment, resource efficiency and raw materials) concerning the water crisis which affects the Middle East and fuels radicalism and civil war in the region, with SC7 (secure societies), with the Spreading Excellence and Widening Participation initiative, and with Science with and for Society. This thematic area is also highly connected with international research, especially when it comes to understanding the specificities of cultures creating tensions towards others that diffuse into Europe or impact Europe’s stability and global position.

6. Overcoming inequalities by developing Europe's human and social capacities

6.1 Key challenges and assumptions

A well-functioning, smart, innovative, reflective and inclusive Europe embarking on participative open governance, on an innovative and creative economy and on the richness of culture, heritage and diversity, will only work on the basis of well-developed human and social capacities. Existing and newly emerging imbalances in our societies pose tremendous challenges to Europe's societal wealth and the growth of its economies. Such imbalances are for example (i) social divides and distinct kinds of discrimination and isolation, for example because of gender, religion, belief, race, disabilities, education, immigration, and age; (ii) high unemployment rates in certain regions, especially of young people and of marginalised groups, at the same time as (iii) lack of qualified human resources in many sectors and regions; and (iv) the increasing risk of poverty and the increasing gap between rich and poor due to the post-financial and economic crisis and austerity policies, which also deeply impact the current middle classes of national populations in Western societies. Likewise, demographic change and improved health contribute to higher longevity while at the same time (v) human resources, represented by for example the elderly, lie idle. Effective policies and counteractions are required to diminish the increasingly emerging tensions resulting from these imbalances and divides. Measures are needed to ensure equality of opportunity, as well as to activate idle resources that can contribute to social welfare, human well-being, social inclusion and sustainable economic growth, for example by leveraging the positive assets of diversity. At the same time, effective measures need to contribute to lowering the high costs of social welfare systems to overcome imbalances.

Key questions to be addressed are for example: How can capacities of special groups (i.e. groups discriminated on the basis of disability, gender, ethnicity or age) be built to make them feel engaged in their communities and to make them creative, innovative and productive by linking them to open access and knowledge sources, which can improve their community's productivity and growth as well as their social engagement in open participatory governance? How can retired people's knowledge and capacities be re-activated, for example for contributing to train and build up capacities of youngsters, marginal groups, or of people in disadvantaged regions or in disadvantaged educational systems? How can the demand side (economy, government, civil society such as voluntary actors) and the 'supply' side of human and social capacities, be better aligned across Europe, and, in particular, how can marginalised groups (including immigrants from outside the European Union) be enabled to participate fully in European society? How can the digital opportunities of open and free training and knowledge access be leveraged in a way to contribute to a better matching of demand and supply. How can digital tools enable marginalised groups or disadvantaged regions to benefit more effectively from building human and social capacities, and in turn contribute to reduce the increasing gap of rich versus poor communities across Europe and within Member States?

The key assumption is that large disparities in human and social capacities are counterproductive to social inclusion, open and participatory governance and to an innovative, sustainable and creative economy. They also constrain the exploitation of the rich common heritage of European regions as well as the opportunities the digital era offers. An emerging big need is to build, to sustain, and to activate competences and capacities of particular groups that lie idle or that potentially might

develop into disruptive and damaging activities, or even undermine the common welfare of Europe. These include the marginalised, the elderly, unemployed of any age and gender, precariously employed and less developed regions. These assumptions are based on the known availability of, and ubiquitous access to, well-equipped facilities of ICT systems. This also depends on the willingness of those possessing knowledge and capacities to engage with the unemployed, precariously employed and marginalised groups, and in less developed regions to support capacity building. Finally, we assume that if no effective counteractions are taken, tensions will increase, the future prosperity of Europe will be endangered and growth of Europe will decrease especially in relation to global partners, and the full potential of the human and social capital of European societies will not be leveraged effectively.

6.2 Expected outputs, impacts and international opportunities

Investing in the building up of social and human capacities across Europe, and in particular of the unemployed, precariously employed groups, disadvantaged regions and neighbourhoods and in structurally marginalised groups, will result in outputs such as better qualifications and the improved readiness of people to actively participate (and be re-integrated) in the job market and in socially responsive communities. Better qualifications, especially in digital and creative capacities, will enable marginalised groups and people in disadvantaged educational environments to undertake innovative and creative entrepreneurial initiatives, independent of geographical borders and without the need necessarily to physically move to where job offers are available.

Revitalised communities seeking equal opportunities for all, high rates of employment across all ages of the potential workforce and of different genders, and an increase in social enterprise, will contribute to more stability, welfare and growth. Such revitalised communities will be able to overcome potential tensions resulting from the inequalities of the underprivileged, less qualified and marginalised groups, by proactively building capacities and opportunities for engaging in creative and innovative businesses (such as in the digital and creative industries as outlined in chapter 3), and in social communities. This will also contribute to reducing the divides between rich and poor.

Ensuring and activating high standards of social and human capacities with equal opportunities across Europe (as an output) will contribute to the much enhanced global position of Europe as a strong economy with an innovative, creative and culturally rich environment, high standards of living, welfare, and rewarding and enriching work, in all European regions. New innovative open governance that builds on the engagement of civil society in democratic processes and in collaborative public and social (community) service provision, will benefit greatly from the innovative capacities of citizens, including capacities of reflectiveness, social responsiveness and enablement through innovative and modern ICT. Likewise, innovative, sustainable and collaborative economies will benefit from the contributions leveraged by shared training and capacity models producing – as an output – creative competences across many groups. These include young digital natives, retired experts, the unemployed, precariously employed middle classes and marginalised groups in otherwise disadvantaged regions.

Finally, better social and human capacities will contribute to the mobilisation of workforces across sectors, organisations and countries. This will facilitate increased knowledge flows and improve Europe's ability to promote structural changes leading to societies that employ available competences (inclusion), make practical use of generated knowledge (innovation), while preserving

the underlying fabric of societies (reflection). This could also enable individuals to remain in the workforce longer, to reduce their health care costs and to take advantage of the opportunities offered by increased longevity. Frameworks and incentives for more mobility of highly specialised and in-demand workers across Europe are among the outcomes expected in this respect.

6.3 Bottlenecks and gaps

A number of barriers and gaps hinder or slow down the development of human and social capacities, especially in underprivileged regions, of the middle/working classes and of marginalised groups. First, the current paradigm of education, training and capacity building focuses on existing economic and societal demands. New models of capacity building need to complement this by also bringing the capacities of creativity, entrepreneurial thinking and of digital capacities – together with the skills of socially responsive and reflective thinking – to relatively under-served and underprivileged communities, groups and regions in order to capitalise and release their potential. Capacity building concepts do not yet leverage the full potential of emerging open access training, skills acquisition and personal development possible via new digital media in order to enhance the ‘supply side’. In general, there is a sense that educational systems, which historically were built as providers of equality, have over the last decades been unable to keep this role and even in some European countries have reinforced existing inequalities.

Second, there has been a lot of concern over the role of the welfare state. Created and expanded mostly after the 2nd World War as an effective provider of equality, it has in recent decades been described as too costly and too ineffective. If the demise of the welfare state is not an option in Europe, how to reform it is open to much debate. Is the social investment state a pragmatic solution elsewhere? Are targeted social transfers useful to counteract increasing inequalities? Should public services be reformed to address inequalities head on?

Third, capacities and resources are currently lying idle because traditional models of employment in our societies expect that when people ‘retire’ their knowledge and expertise is “redundant and no longer needed”. While our societies are getting older, many regions across Europe are also enjoying better health into more advanced ages, so the capacities of these older population cohorts can provide a huge reservoir of knowledge and skill assets. This is of high potential value for building societal and human capital amongst the youth, in areas of poor educational availability and attainment, and amongst marginalised groups. At the same time, in most European countries, inequalities between old and young generations have increased and young people nowadays have often the impression that historically, the old generation has accumulated advantages, which it is reluctant to share with young people: solidarity between generations is thus under tension. Fourth, there is currently limited mobility and flexibility of people to move and take a job where the demand is, or to move and/or to provide training and educational offers in underprivileged regions or to communities of marginalised groups. Fifth, the number of relevant and good quality online open access training and learning resources (such as so-called MOOCs, massive open online courses) is still very limited and probably not accessible to special groups (i.e. groups discriminated on the basis of disability, gender or ethnicity) or in disadvantaged regions. This is often because of lacking infrastructure or because of material not being in the language(s) needed or not fitting the capacity building requirements of special groups or regions.

6.4 New actions needed to address the research and innovation challenges

Integrated and multi-disciplinary research and innovation actions are needed:

- To contribute to better understand the underlying factors causing inequalities and, on this basis, to develop innovative concepts, enablers and supportive tools and instruments to strengthen social and human capacities, especially in fostering participation and actions contributing to equal opportunities across Europe. In this regard, it is of utmost importance to assess the current reforms of the welfare states in Europe, including such important aspects as health and housing, consumption styles and private debts for instance.
- To contribute to better understand the phenomena and motivational factors of developing social and human capacities of, for example, the structurally underprivileged. This should further evolve into new innovative and flexible models of capacity building and of effectively activating resources (for example of the elderly and retired groups, but also of the unemployed or of immigrants, especially those with special skills) that might otherwise continue to lie idle. Research and innovation actions should investigate what incentives and innovative 'business' models could be applied, including sharing and collaborative economy models, open access to educational resources, and mentoring models (such as the elderly with younger generations or marginalised groups or in less privileged regions). Findings should contribute to encourage young people into the job market or to set up as entrepreneurs, to spur inter-generational solidarity in the development of civil society, to strengthen equal opportunities and reduce discrimination, or to explore regional strategic cooperation between Member States to better leverage resources. (This links to the three Thematic Priorities presented in chapters 2, 3 and 4).
- To research (i.e. reflect and understand) the particularities of underprivileged groups and/ or regions and neighbourhoods and to develop and provide new innovative – collaborative and open access – models of capacity building that go beyond the current paradigm of educational and training offers. Basic infrastructures are prime conditions, while research and innovation actions can also benefit from transnational collaborative (partnering) models and international collaboration. The other side of the coin is research on the accumulation of wealth with its links to the international mobility of assets, tax evasion, elite connections and the non-regulation of financial activities. The social construction of income inequalities is also an important social phenomenon with strong impacts on the (non-) capacity of governments to regulate incomes and taxation.
- To research, develop and provide educational and training resources for the building capacities needed to contribute to a creative and innovative collaborative economy, and to participate and engage in open governance models, thereby leveraging reflection and the social responsiveness of individuals (learning from history, critically assessing tensions and directions of opinions, being socially aware and contributing to communities – including the integration of immigrants or other marginalised groups). Focus should also be on contributing to a better understanding of the richness and diversity of European regions for generating innovations and contributing to economic growth, jobs and high social welfare standards. (This links to all four other Thematic Priorities presented in chapters 2, 3, 4 and 0.)

- To link education, research, innovation and entrepreneurship initiatives together to help young people, marginalised groups as well as underprivileged regions, to engage in social enterprise and in innovations without necessarily having to move location. (This links to Thematic Priority ‘Promoting a collaborative, creative and sustainable economy’ presented in chapter 3.)

Multidisciplinary research in social and human capacities that also involves ICT skills and ICT as a medium for capacity building should be leveraged to bring forward new innovation models of education and capacity building involving, in particular, less privileged groups and regions to establish more equal opportunities. Wider knowledge transfer and diffusion will create higher value and impact to improve European economic growth and wealth, and to evolve towards a more innovative, reflective and resilient Europe.

Cross-links to other challenges and pillars are with all other societal challenges, as social and human capacities as well as equal opportunities are crucial preconditions for innovations and developments in the different SC areas and in overcoming inequalities, as well as in activating social and human capacities currently unused or under-used. Synergies need to be explored with Innovation in SMEs regarding the social and human capacities needed, thereby contributing to releasing the otherwise idle resources of, for example marginalised groups and disadvantaged regions; with SWAFS in engaging with groups outside the mainstream to build social and human capacities; and with Spreading Excellence and Widening Participation when it comes to overcoming the divides experienced by less privileged regions and to activate their capacities. Other priority instruments such as Structural Funds need to be explored as well, to help unlock currently unused place-based knowledge and capacity assets that can contribute to jobs and growth as well as to a resilient Europe.

7. Synopsis of recommendations and synergies with H2020 research and innovation

This concluding section will briefly draw together the overarching recommendations presented in these proposals for a strengthened and pivotal research and innovation effort within Societal Challenge 6 concerned with Europe in a changing world and how to build a resilient Europe based upon inclusive, innovative and reflective societies. It will also reflect on how these proposed research and innovation recommendations link to, and can provide synergies with, the H2020 programme’s other research initiatives as well as more broadly support Europe’s efforts to move successfully into a post-crisis period.

7.1 Recommendations for a resilient Europe

The SC6 Advisory Group strongly recommends that the goal of a Resilient Europe with its five main research and innovation priorities should be considered a ‘flagship programme’ with wide depth and reach. Given its focus on bringing together resources and knowledge from many different fields, technologies and disciplines, underpinned by the social sciences and humanities to ensure actions and impacts take account of and can help effect real change, it will also be able to act as a platform and a coherent interdisciplinary framework for the other societal challenge areas. Its broad links, strong interrelationships and deep synergies with these other areas will make it possible to increase the relevance and impact of Europe’s combined research effort and ensure the whole becomes much

more than the sum of its parts. The SC6 Advisory Group would like to stress that the proposed ‘flagship programme’ will not achieve its potential in forthcoming work programmes if dismantled by the piecemeal selection of a number of disparate and unrelated topics. On the contrary, the SC6 Advisory Group urges research funders in Member States to align their research programmes at least partly with the research programme proposed in this report.

The challenges which Europe faces are fundamentally human in nature and thus require to be understood by the social sciences and humanities. This understanding is essential for the successful implementation of policies that ensures that the continent employs available competences and turns generated knowledge into practical use, while safeguarding human and cultural values. This human and social understanding should then be used reflectively and in an innovative and inclusive manner to address the continent’s main challenges, using advanced and applied science and technology knowledge and skills for tackling both short- and long-term problems responsibly and coherently. On the one hand, the understanding of history can be a springboard to enhance European cohesion and unity, and on the other, the diversity of European cultures can be an important source of innovation and development, for example to help boost the cultural and creative industries. ICT plays an important role both in democratising access to identity-forming cultural heritage and in developing and promoting new ways of seeing Europe, as well as new products and services facilitating the engagement of citizens in interpreting the past and forging a prosperous and peaceful future. ICT alongside new forms of social innovation, open and public governance and social and human capacity building also enable researchers in the social sciences and humanities to ask new questions, to develop new methodologies and to contribute to capacities needed.

The recent economic and financial crisis is slowly being redressed through an understanding of what happened and why, and the contours needed for a more resilient economy and society, which are able to tackle inequality and poverty, are becoming better understood. An emerging set of new economic models to supplement and help reform existing models, is already having important impacts on entrepreneurship, ways of working and job creation. Sharing, collaborative and creative forms of both consumption and production need to be supported for tackling economic and social needs. Such approaches should valorise and deploy otherwise idle social and economic assets, both tangible and intangible. Solutions need also to support sustainable development and the sustainable use of resources. They are expected to generate new jobs and new livelihoods, as well as use more open forms of innovation, which are also social and inclusive and thus more sustainable in the longer term. Again, both existing and new ICT is an essential enabler, including web 2.0 and web 3.0 tools, the cloud and big data, as is exploring the interface between the virtual and physical worlds.

Underpinning Europe’s policy, governance, investment and social support response to the crisis and its aftermath is the need for a more open, engaging and innovative public sector. This will continue to be the biggest actor in Europe, both because of its economic importance and because of its responsibility for ensuring that fundamental structures and systems around health, education, jobs, prosperity and sustainability are in place and are able to address Europe’s growing inequality and poverty. However, to meet these requirements, the public sector needs to undertake some quite radical and far reaching structural re-design, and to adopt new approaches to policy innovation and experimentation, which can drive the modernisation process. ICT has already provided many benefits to public sector reform, for example by reducing its costs and administrative burden, but much more needs to be done through innovating and deploying digital technologies in new ways to design better policies and to co-create new services using, for example, open data, as well as to reconnect with

citizens. This must take place at all levels, from local, to national, European and on a global scale through international cooperation, given that many 21st Century challenges do not respect political borders, and the biggest impacts are seen when the public sector as a whole is joined-up, interconnected and collaborative.

Europe is also increasingly confronted with the impact of global and regional changes, both in its near neighbourhood of Eastern Europe and the Mediterranean, as well as further afield. Mass migration, tensions and conflict in the Middle East, the emergence of radical Islam, and not least the rise of Asian powers and prosperity, all combine to challenge Europe both globally and at home, as well as to offer opportunities to enhance Europe's position and certainly to change its approach and self-understanding. It is important for Europe to be a strong partner in its neighbourhood, as well as globally, and to promote stability, prosperity and democracy as the only clear path to solve global challenges. A problem-oriented, interdisciplinary set of research and innovation actions is needed by developing interfaces that, on the one hand, assist policy makers in the articulation of questions in such a way that researchers can identify solutions, and, on the other hand, to give policy makers access to the rich resources of academia. Research is needed to increase the understanding of Europe's role and position in the globalised world. Europe's political, economic, social and cultural relations with Asia, Africa and the Americas need understanding and continuing reflection, which can be stimulated by research in partnership with scholars from these regions. One example is the role of social media and the internet in processes which lead to the unwanted and destructive radicalisation of many youth in Europe and beyond. Ways to counterbalance these influences are also required, for example by developing innovative models for building the reflective capacities of youth groups which also engage other community members such as elderly people. This research can lead to innovative and inclusive cyber-policies promoting more secure and prosperous environments.

A Europe which is successful, prosperous and playing an enhanced and positive role in the world is only possible on the basis of well-developed human and social capacities. Large disparities in these capacities are counterproductive to Europe's aspirations, future well-being, jobs and inclusivity. Investing in the building up of social and human capacities across Europe, and in particular in disadvantaged regions and in marginalised groups, will result in outputs such as better qualifications and the improved readiness of people to actively participate (and be re-integrated) in the job market and in socially responsive communities. Better qualifications, especially in digital and creative capacities, will enable the precariously employed, unemployed working class, marginalised groups and people in disadvantaged educational environments to undertake innovative and creative entrepreneurial initiatives, independent of geographical borders and without the need necessarily to physically move to where job offers are available. Ensuring and activating high standards of social and human capacities with equal opportunities across Europe will contribute to the much enhanced global position of Europe as a strong economy with an innovative, creative and culturally rich environment, high standards of living, welfare, and rewarding and enriching work, in all European regions.

In sum, the recommendations of the SC6 Advisory Group can collectively address Europe's main challenges in a coherent, responsible and positive way, and thereby provide a strong framework to assist in successfully solving them. Prime among these challenges are the need to tackle the jobs and growth crisis, reduce inequality and poverty, as well as build and release the potential of human and social capacities and many of society's unused assets, both tangible and intangible. Also of utmost importance is to re-cast Europe's global role through better understanding of Europe's past and of

the cultures and societies of other regions in the world relevant to Europe by providing more coherent, effective and innovative policies and actions for the future. Europe has the talent, the enterprise and the inventiveness to grow, prosper and succeed in the world better than ever before. All the people of Europe, of whatever background, gender or location need to be involved. The innovation cycle needs to include everyone. The Union must be stronger outside and more caring inside, basing its stance and actions on human rights, a strong ethical base, and an understanding of the interconnectedness of both Europe and the world.

7.2 Inter-linked and synergistic research and innovation

As already described, there are numerous, strong and important cross-cutting linkages and synergies with the other Societal Challenges.

In *Understanding Europe. The changing role of European culture and society*, cross-links to other challenges and pillars are potentially with SC7 (secure societies) to understand and shape solutions addressing the needs of the European Union based on understanding the past and diversities of cultures; with Science with and for Society in developing reflective societies being aware of the past, and with the Industrial Leadership pillars (LEIT ICT and Innovation in SMEs) in promoting creative and cultural industries.

The *Promoting a collaborative, creative and sustainable economy* Thematic Priority has numerous links to other challenges and pillars, including with SC1 (health, demographic change and well-being) in relation to personalising health and care, and with SC2 (food security, sustainable agriculture etc.) concerning new bio-based industries. Other links are with SC 3 (secure, clean and efficient energy, SC4 (smart, green and integrated transport), and SC5 (climate action, environment, resource efficiency and raw materials) with their focus on maximising scarce resource use, as well as with SC7 (secure societies) in building resilience in our societies. Further cross-cutting aspects are with the Industrial Leadership pillars (LEIT ICT and Innovation in SMEs) in promoting creative and cultural industries, and with related EU policies such as support to digital entrepreneurship, start-ups and SMEs (Innovation in SMEs, and others), as well as initiatives around the circular economy.

Cross-links between *Building an open, engaging and innovative public sector* with other challenges and pillars are especially with all other Societal Challenge pillars as regards the importance of European and Member State governance structures, operations and performance acting as enabler. Potential links are also to SC1 (health, demographic change and well-being) in relation to social services, and to SC3 (secure, clean and efficient energy) regarding smart cities and communities, and with SC7's focus on secure societies. Some relation is also seen with Science with and for Society (SWAFS) to explore the involvement of citizens in innovation actions and research.

Facing the turbulence of regional and global change has cross-links to other challenges and pillars including SC2 (food security, sustainable agriculture etc.) concerning the deprivation of land giving rise to social unrest, SC5 (climate action, environment, resource efficiency and raw materials) concerning the water crisis which affects the Middle East and fuels radicalism and civil war in the region, with SC7 (secure societies), with the Spreading Excellence and Widening Participation initiative, and with Science with and for Society. This thematic area is also highly connected with international research, especially when it comes to understanding the specificities of cultures creating tensions towards others that diffuse into Europe or impact Europe's stability and global position.

Cross-links between *Overcoming inequalities by developing Europe's human and social capacities* exist with all other societal challenges, as social and human capacities are crucial preconditions for innovations and developments in the different SC areas and in overcoming inequalities as well as in activating social and human capacities currently unused or under-used. Synergies need to be explored with Innovation in SMEs regarding the social and human capacities needed thereby contributing to releasing the otherwise idle resources of, for example marginalised groups and disadvantaged regions; with SWAFS in engaging with groups outside the mainstream to build social and human capacities; and with Spreading Excellence and Widening Participation when it comes to overcoming the divides experienced by less privileged regions and to activate their capacities. Other priority instruments such as Structural Funds need to be explored as well, to help unlock currently unused place-based knowledge and capacity assets that can contribute to jobs and growth as well as to a resilient Europe.

In addition to the above areas of cross fertilisation and support, linkages can be made with FET and LEIT ICT, as these are opening up to involve societal aspects and to better understand the transformational role of innovative digital / technological solutions, as crucial pillars of the digital era. They provide opportunities for new forms of the sharing, collaborative and creative economy, to facilitate innovative engagement and the reconnection of citizens in society through public sector innovation, as well as to enable the exploration of innovative and inclusive facilities for capacity building and for overcoming social, economic and digital divides wherever these are found. The provision of appropriate research infrastructures also cuts across all five Thematic Priorities of SC6 and can provide incentives and motivations for talented researchers and innovators to move to and/or stay in Europe, as well as in the regions of Europe that might be less privileged. In SC6, both gender and ethical aspects need to be considered within all Thematic Priorities, and collaboration should be sought for example with the Gender Dimension. International collaboration is also a highly important component of all Thematic Priorities in terms of what Europe can learn from developments elsewhere as well as contribute, where global partnerships can help advance Europe's position in jobs and growth, and in ensuring a socially inclusive and reflective society. Marie Skłodowska-Curie actions are relevant as well, especially, when studying societal challenges embarking on multidisciplinary and inter-sectoral research projects.

Outside H2020, the Structural and Social Funds, as well as activities in the Social Investment Package and the education programme of the European Union, Erasmus+, can provide support and synergies for example in spatial and workplace development and in enhancing the skills and competences of all people living in Europe for both vocational and no-vocational settings.

Annex I: Summary of answers to the seven questions by AG members

HORIZON 2020 ADVISORY GROUP FOR SOCIETAL CHALLENGE 6

Answers received from:

Mari Jose Aranguren, Geir Asheim, Hans Degryse, Wim van den Doel, Elisabetta Gourova, Jenifer Harper (inputs on earlier version of summary document), Egle Jaskuniene, Riitta Kosonen, Tomas Kostelecky, Maria Kousis, Ewa Latoszek, Sonia Livingstone, Jeremy Millard, Sofia Morgado, Emilie Normann (question 1), Andrea Peto (inputs on earlier version of summary doc.), Manfred Thaller, Maria A. Wimmer

Note: The summary is structured along the seven questions posed by the European Commission to all Advisory Groups in order to identify Thematic Priorities and draw recommendations for the next work programmes 2016-17 of Horizon 2020. The brief statements below (ordered along expert's last name) are extracted from the documents above listed experts provided in more elaborated documents, or some experts added to a previous version of this summary document. Synthesis of these inputs by the rapporteur and the co-chairing team has led – together with the discussions along the meetings of the Advisory Group - to grouping the inputs along common Thematic Priorities, which resulted in the report the AG compiled and delivered by mid-July 2014.

1. What is the biggest challenge in the field concerned which requires immediate action under the next Work Programme? Which related innovation aspects could reach market deployment within 5-7 years?

*Simpler formulation of question as formulated in the second meeting of the AG: **What is the biggest challenge?***

- Innovation to increase productivity and competitiveness in Europe: critical to change the way of doing research – should be driven by societal needs; research programs should be defined among the researchers in cooperation with other actors => suggested method: Action Research (Aranguren)
- Economic, technological and demographic changes are rapid, while cultural transformations are much slower; transformations create new inequalities resulting in greater tensions (Asheim)
- To combine improved longevity, research on longevity risk and medical technology with a sustainable financing is key. This involves interdisciplinary approaches which is key for “optimisation under constraints”, and paying sufficient attention to SMEs as SMEs are a key factor in innovation and growth (Degryse)
- Tensions and opportunities emerging from the EU integration processes may create more differentiation; Coping with the financial and economic crisis of the last years; societies at

different levels build upon the social, cultural, linguistic, historical and institutional arrangements they have developed. This social infrastructure may be highly effective in tackling challenges and in increasing a society's resilience, but it may also be an obstacle, for instance, when this infrastructure loses its dynamism and its adaptability, or when it is governed by special interests. Key challenge therefore to analyse and develop policy recommendations for ideal European Social / Financial / Political / Cultural Models, and to find answers to the questions: (i) how the European Social Model can be adapted and preserved, (ii) how Europe's political institutions can be renewed (European Political Model), (iii) how Europe's financial structure can be strengthened (European Financial Model) and (iv) how Europe's unique cultural structure can be made more of an asset than today (European Cultural Model). (Doel)

- Building the necessary competences of young people. High speed of change of technologies exposes educational institutions with big challenges to adapt and deliver the competences required by economy and society (Gourova)
- Linked to Aranguren's statement: How to ensure that research developments reach and benefit society, how to ensure that researchers understand the need for the kind of societal end impacts to their work to emerge and take effect. (Harper)
- Linked to Gourova's statement: need for anticipatory capacities at different levels of policy making and development of multi skilling and multi competences (Harper)
- Encouraging social and cultural enterprise and entrepreneurship, especially among young people- especially those who are marginalised by society or the education system or both. How to make these young people feel engaged in their communities and how to make them productive by linking them to open access knowledge sources which can improve the communities' productivity and growth. Connecting these young people together worldwide and providing support through with mentors (Harper)
- Providing tangible support to communities in conflict in Europe and worldwide to identify innovative solutions (Harper)
- Support ways to provoke, educate and evaluate creative competences (Jaskuniene)
- Need to find new sources for economic growth and need for social innovation in international business that supports economic interaction between European and Russian/Chinese firms. A transparent and commonly shared value system to be developed to boost international business, including dialogue of firms in both countries (European, Russian/Chinese), involving also the public sector. Also, a bigger socioeconomic and political cross-border structure is needed (Kosonen)
- Key challenges are: How to retain/improve economic competitiveness on a global market while not to sacrifice the social welfare, social security of citizens and social cohesion on a socially acceptable ("European") level; How to cope with the demographic changes; How to assure that its states/businesses/citizens has access to sources of energy that are reliable and competitively priced (Kostelecky)
- To analyse how rising contentions can be studied to address Horizon 2020 concerns on Europe's future competitiveness as well as its well-being and unity, under sustainable

development objectives; Three types of contentions: political, environmental and economic contentions; A socially conscious and responsible science, i.e. a socially-relevant science and technology – linking to “Excellent Science” and “Industrial Leadership” – is needed (Kousis)

- Biggest challenges: Single market; Effectiveness of the financial regulatory systems and the banking systems and its governance; Strong partnership with other actors of transnational transformations; Encouraging activity of young people on the job market as well as intergenerational solidarity together with fostering the development of civil society; Partnering with third countries; Regional strategic cooperation between Member States, including a better use of human and natural resources; The man vs. technology relationship in the workplace (Latoszek)
- Key challenges: (a) How to reduce/manage the adverse consequences of growing socio-economic inequalities and stratification across Europe. (b) The position of youth in the transition to adulthood and employment. (c) Rise in extreme political opinion in many European countries, and its causes, consequences, and possible forms of alleviation. (d) Identification of cultural/social/political sources of difference versus harmony across Europe, affecting practices of daily life, domesticity, education, values, politics, governance; (e) Changing skill and literacies demands on the public, including but not restricted to children and young people, as the workplace, education, and diverse everyday contexts change with increased complexity and uncertainty, risk and technological/systems change; (f) Citizen participation in European and national political processes (Livingstone)
- The governance systems (including the interaction and interrelation of the roles, relationships and activities of all societal actors) we have available in Europe to resolve many so-called ‘wicked’ problems arising from financial crisis and other pressing global challenges (global warming, demographic changes like ageing and migration, sustainable growth and jobs, inequality and poverty, bio-diversity, dwindling natural resources, energy and not least peace and security) are increasingly dysfunctional and have not kept pace with faster and faster change nor technological opportunities. Today and in the foreseeable future, complex societal problems can no longer be solved by the state alone (the visible hand), or by the market alone (the invisible hand); now also all and any partnerships and groups (many hands) are needed. Open governance enabled by ICT, which cuts across government entities, as well as in principle, all societal actors, is key to addressing society’s wicked problems and in contributing to better development outcomes at all levels (Millard)
- Urgent need for new forms of governance system which are open, transparent, efficient, effective and innovative. They need to be responsive, accountable, participative, inclusive, and equitable if they are to address the ‘democratic deficient’, which will also make them more effective in the longer term as policies and institutions become more accepted and respected. Such broader open governance systems will need to both reach across many parts and levels of the public sector as well to other appropriate actors outside government. In many contexts, open governance is about linking and integrating the worlds inside government, as well as linking and integrating these with the worlds outside government for the specific purpose of creating public value. Information and Communication Technology (ICT) is a key enabler in making this possible. (Millard)

- Inclusiveness as a means to develop a broader sense of society, considering (1) strengthening a common European "ethos", an identity based in values like justice, human rights, equal opportunities, freedom, i.e. citizenship and identity; (2) bridging unbalances (e.g. education, economic, gender, cultural); (3) structural change - societal (e.g. demographic, economic, productive system, different partnerships) and its representation (e.g. political, institutional, civic). Related innovation aspects could include Design in 2 fundamental levels: 1. Smart cities considering the various urban dimensions, such as a. networks and collective spaces, b. functional structure, c. flexible and multilevel planning and design; 2. Sustainable inclusive design also considering various dimensions, as a. Industry, per se (e.g. car, ICT devices) to b. Services (e.g. education, transportation systems) (Morgado)
- Next challenges and investments need to consider the status quo, i.e. 'post-adaptation and recovering phase' after several years beyond the financial crisis and having in mind the H2020 research programme settled for 2014-15. Investments should consider: (i) empowering European economy following the financial crisis; (ii) increasing employment-rates, particular youth employment; (iii) frameworks and incentives for more mobility of highly specialised and sought after European workforce; (iv) diminishing the growing divide between rich and poor and the growing inequality; (v) continuous investment in AAL, with extra resources and smarter use of resources, to cope with the rise in elderly population; (vi) strengthening efforts for an integrated Europe amidst a number of radical political movements gaining support and disenfranchisement amongst youth; (vii) increasing efforts to internationalise SMEs, and ensuring and aligning to a larger extend SME services and products with third sector needs and engagement; (viii) ensuring full use of innovation investments (Norman)
- The European model is built on continuous economic growth, equality and state intervention. This model is in crises as alternative and successful models are emerging. So far the political responses were only limited to ignoring equality and reintroducing othering as a state policy. The social and cultural responses are limited to protest and the hollow promise to return to the days before the crisis became visible. (Peto)
- We need a European understanding of our heritage to shape the digital world. Hence, we need research into the cultural – and more general: historical - heritage of the Union, with new approaches, which try to study the communalities of the national traditions, not their national peculiarities. "Contrasted research", i.e. complementing national studies with comparative analysis among distinct nations at European level shall be applied. The growing market of cultural heritage items has a huge potential of generating profit by products and services in media and tourism, which may provide access to history through e.g. Augmented Reality or Virtual Reality (Thaller)
- Engagement of citizens and businesses in comprehensive public sector service provision and in smooth governance of State therewith exploiting the potentials of innovative ICT, involving also interoperable building blocks to make Europe a leading innovator to support global trade and global exchanges; Understanding the value-add of service provision and service consumption on both sides, the customer side and the government actors (Wimmer)

2. What are the key assumptions underpinning the development of this challenge (research & innovation, demand side and consumer behaviour, citizens' and civil society's concerns and expectations)?

*Simpler formulation of question as formulated in the second meeting of the AG: **What are the key assumptions underlying this challenge?***

- Effectiveness of research depends on the capability to transfer the knowledge generated in the research to the users (market, public policy...). Hence co-generating new knowledge by users and researchers and doing research in a more interactive and collaborative way are necessary (Aranguren)
- Even though increasing the education level is the key for boosting innovation and competitiveness, promotion of educational quality and the selection and dedication of talented youth in educational programs are the result of endogenous processes. Understanding the effects of different societal models is therefore needed to bring about development needed to promote economic growth (Asheim)
- Incentives to innovate depend on the expected adoption by consumer, where Governments have an important "standard setting" and governance role to optimise decisions driven by both demand and supply, such that investment and usage of technology take place to maximize social welfare; and where research is to take place in a more interactive way, exploiting also big data (Degryse)
- Only a resilient and dynamic Europe which stresses history, language and strong local traditions as well as strong and reformed European institutions can address the known and unknown societal challenges of today and the future and can make sure Europe plays a prominent role in the world. To guarantee a resilient and dynamic Europe in the future can only be reached when Europe finds answers to the questions: (i) how the European Social Model can be adapted and preserved, (ii) how Europe's political institutions can be renewed, (iii) how Europe's financial structure can be strengthened and (iv) how Europe's unique cultural structure can be made more of an asset than today (Doel)
- Lack of sufficient collaboration with industrial stakeholders in teaching, students practice and thesis preparation; Essential also to nurture from an early age creativity, communication, team working and collaboration skills, as well as management and entrepreneurial skills (Gourova)
- Public administration being too big and bureaucratic, often not providing proper and timely services (a burden both for citizens and enterprises). Particular needs and assumptions: (i) changing regulations and requirements for industry; (ii) people paying taxes expect certain level of services (Gourova)
- Changing behaviour and incentives of researchers, linking projects and initiatives together to produce end impacts which benefit society. Less emphasis on publications and citations and more emphasis on end user benefits at least through dedicated H2020 calls (Harper)
- Bringing young people more directly into research and innovation programmes tailored for them but of societal and community relevance (Harper)

- Linkage to international cooperation approach which is less driven primarily by high level political and economic interests and focused on functional cooperation addressing societal needs (Harper)
- Education system forming new competences obligatory for specialist of new generation; Clarifying the IT impact on social layers, which allows to optimize the solutions, Economy creating new vehicles of added value; Culture implementing new facilities of sociocultural integration (Jaskuniene)
- Both Russia and China are business environments characterised by prominent culture of distrust between firms and the public sector, firms and their business partners and between firms and their labour force. Governing these relations has made firms hide at least part of the operation. Parallel to the networks of distrust, there are also exclusive networks of trust where predatory behaviour does not take place. This further undermines free competition. In many instances, the unhealthy relations of trust and distrust undermine possibilities for normal transparent international cooperation. (Kosonen)
- Encourage an intense enough dialogue/ collaboration among researchers, businesses, and public administrations on European, national, and sub-national levels to more intensively link actors from Old Europe with the ones from the New Europe therewith enabling to spread innovations and ideas more quickly around the whole Europe (Kostelecky)
- Civil society having the opportunity to learn from the past to confront the issues it is currently facing (Kousis)
- Revalue demand side of innovation processes, both at MS and at EU level; Multilateral discussions of experts from governments, media, economic zones and academia and interdisciplinarity; Building new forms of research groups and networking; Involving and using ICT to promote and disseminate knowledge; Learning about the implications of ICT in work environments (Latoszek)
- Across multiple spheres, society is becoming more complex for citizens and consumers while safety nets are withdrawn and individual literacies/decision-making are increasingly risky yet consequential; States struggle more to govern or regulate (given more cross-border and transnational flows); Need for building new forms of trusted organisations or networks for governance (e.g. of the internet, or of migration, or crime); and Need for research that enables engagement of citizens with Horizon 2020 and the societal challenges (Livingstone)
- Public sector, enabled and sometimes even driven by ICT, becoming transformed, e.g. through business process reengineering, and shrinking in size and becoming 'lean' in order to "do more with less"; complementary to this, an 'open government' (i.e. government as an institutional actor) which is itself embedded in broader open governance systems encompassing all of society's actors, is becoming crucial. It will orchestrate networks of actors to tackle society's needs, but, unlike in the narrower 'lean-government' model, the public sector does not thereby always need to become smaller. A 'lean' government might indeed save some money in a narrow context, but this in some situations could lead to overall loss of public value and thus additional costs on society, if other actors or actor configurations are not able to produce the value needed in the context of a shrunken public sector. (Millard)

- The basic assumption is that consumption is the model which regulates relationships is in crisis. The agenda of civil society organisations are either taken over by the state (Hungarian model) constructing a new, state funded civil sector or become vulnerable in the “donor brokering” process to international actors using them for their own agenda. (Peto)
 - (1) Humanities research must focus more strongly on trans-national phenomena (European Humanities); (2) Digital frameworks need to make it easy to integrate cultural heritage content from different backgrounds into integrated offerings (European trans-national information platforms); (3) Content has to be offered in such a way that it can most easily be integrated into the most popular platforms in use today, but also be re-used with future technologies (Future proof digital content); (4) Such content has to be available for NGOs and citizens’ organizations (Collaborative heritage); and (5) “Humanities” and “technical innovation” must not be seen as contradictory, they should support each other. (Thaller)
 - Support multidisciplinary research and innovation research and development involving industry and public sector as well as individuals and entrepreneurs, and figuring out the needs, expectations and willingness of engaging on the civil and business sector sides for public governance and engagement in public service provisioning (Wimmer)
3. What is the output that could be foreseen, what could the impact be, what would success look like, and what are the opportunities for international linkages?

*Simpler formulation of question as formulated in the second meeting of the AG: **What should be the output and expected impact?***

Outputs and expected impact

- Co-generated knowledge more actionable, effectiveness and efficiency of research increased, research more demand and challenge oriented and innovation improved (Aranguren)
- New capabilities to facilitate collaborative research processes, new modes of (shared) leadership (Aranguren)
- Increased ability to promote structural changes leading to societies that employ available competence (inclusion), make practical use of generated knowledge (innovation), while preserving the underlying fabric of societies (reflection) (Asheim)
- More flexible workplace and improved working environments to combine working longer, reducing health care costs and maybe reducing longevity risks (Degryse)
- Understanding how “things interact, correlate and are caused” to develop sustainable budgets (Degryse)
- An ideal-typical European Social Model featuring a respective welfare regime, proper and flexible labour-market regulations, a well-developed and institutionalised system of industrial relations, and a style of economic and social policy-making involving relevant stakeholders through consultations. A new European Financial Model building on relational (private) banking with high trust and low transaction costs, but also with institutional structures that enable mobilisation and access to direct resources to ensure productive financial innovations and real economic value creation in the economy while preventing them from going astray,

and with a common Currency – the Euro. The European Political Model fosters a novel form of multinational, multi-state, multi-level, and thus essentially “compound” system which will into a large scale democratic and legitimate polity. The European Cultural Model – while becoming a broader yet still homogenous Europe – also alleviates the continuing existence of long-established, sometimes conflicting identities and allegiances at different levels, and accommodates the emergence of new identities as a result of Europeanisation, globalisation, and the integration of new migrant groups. The results of the research on above models should be translated into clear policy recommendations for ideal European Social / Financial / Political / Cultural Models. A policy unit shall be responsible for the translation of the research outcomes into policy recommendations (Doel)

- More creative, better qualified and motivated young people; Higher trust in institutions; More satisfied and better served citizens and industrial stakeholders; Improved environment for doing business; Higher awareness of EU citizens and improved image of other EU countries; Overcoming nationalists influence (Gourova)
- Productive Europe in terms of tangible innovative products processes and services; Revitalised communities, youth employment, increase in social enterprise reducing the burden on the state; Resolved conflicts, lowered illegal migrant flows and related loss of life and displacements; More mobile workforce across sectors, organizations, countries increasing knowledge flows (Harper)
- Homogeneous society along a certain development stage to minimise inconveniences provoked by IT explosion for particular social groups (Jaskuniene)
- Increasing economic interaction supports modernisation and technological upgrading in Russia and China, which in turn creates better business opportunities for European firms (Kosonen)
- A more closely integrated Europe - not in terms of inter-governmental process of political integration of EU but rather more closely integrated/linked (national) societies in Europe which will facilitate quick and effective sharing of information, knowledge, know-how, and the best practices across Europe, and which will help to productively use the comparative advantages of various EU Member States for the benefit of the Europe as a whole (Kostelecky)
- Policies aiming to decrease contention through a) strengthening the role of public education, b) solidarity bioethics, which includes “welfare state and social welfare arrangements, but also contracts between different private actors and international declarations or treaties” and the creation of jobs under sustainable development and ICT approaches which would improve the implementation of the precautionary principle (Kousis)
- A strategic and integrated approach to innovation which optimizes synergies between and within different actors; Understanding ongoing processes in postmodern organisation and recognising sources of changes affecting it. Addressing the challenges mentioned should result in reducing job insecurity and gender insecurity, and in achieving smarter specialisations (Latoszek)

- Social research will provide the evidence, which supports the development of policy responses and the long term vision which is at the core of Europe 2020 strategy (Livingstone)
- Public sector does not have a monopoly on public value creation, but it does have in most situations the prime role in ensuring that public value is created. Existing and new ICT is transforming the ability of government to act in these ways. At the core of an open governance system is an open government institution, and is the sine qua non for ICT-enabled public sector innovation. Main components (outputs) of such a system are: open assets, open services, open engagement. These need to be both more efficient and also much more effective as governance systems through coordinated research, policy and practice at all levels, local, regional, national as well as European. (Millard)
- Developing tools to understand the present situation as the questions of the future cannot be answered by the responses, vocabulary of yesterday. The heritage of the communism as a failure of the European progressive politics needs an honest reflection as it has implications for equality policy, the founding stone of the European project. (Peto)
- (1) A closer integration of the European cultural heritage, embodied in interactive and collaborative content; (2) an increased presence of European content in the infosphere and a closer integration of information offered from and on different European countries; (3) success determined by a greater awareness of the joint European heritage, i.e. by an increase of trans-national information objects; and (4) What increases the awareness of a greater European tradition into which the national and regional ones are embedded, cannot fail to increase the awareness of an even more encompassing one beyond the borders of the Union (Thaller)
- An excellent global position of Europe as a strong economy and innovative, culturally rich environment with high standards of living and working; and Europe as a big networked community with a strong collaborative approach to caring for, as a citizen, as a business, as well as a government; Multidisciplinary research will bring forward new innovation models and will complement capacities; Wider knowledge transfer and diffusion will bring a higher value add and impact (Wimmer)

Needs mentioned along the outputs and expected impact

- Needs: (i) a better understanding of the formation, functioning and effects of the legal, economic, political, social and cultural infrastructures (models); (ii) strong European institutions needing reform of the political and legal framework of EU, especially to create a better functioning Economic and Monetary Union (Doel)
- Public authorities need to focus on (i) building trust and confidence – in institutions and their representatives; (ii) orientation towards real needs of citizens – reconsidering what kind of services are needed by economy and society, and how to be delivered; (iii) balancing supply and demand – especially when the state is investing in infrastructure development and providing subsidies to other organisations (e.g. research and education) (Gourova)
- Need: Researchers and practitioners call for ways of sharing best practice and learning from the mistakes of others, via platforms and international linkages. Yet few such platforms exist,

and the effort required to make them effective is systematically underestimated (Livingstone)

- Corporations are operating on a different premise than democracy. The present situation is very challenging as in the present post-democracy situation, democratic governance seems to be reaching out for models for transnational cooperations which proved during the economic crises. The values and basic principles of the cooperation need to be defined before trusting corporations to take part in social engineering. (Peto)
- Needs: (1) Humanities' research must focus more strongly on trans-national phenomena. ("European Humanities."); (2) We need digital frameworks, which make it easy to integrate cultural heritage content from different backgrounds (including, but not stopping at differences in language) into integrated offerings. ("European trans-national information platforms."); (3) Content has to be offered in such a way, that it can most easily be integrated into the most popular platforms in use today, but also be re-used with future technologies. ("Future proof digital content."); (4) Such content has to be available for NGOs and citizens' organizations. ("Collaborative heritage.") (Thaller)
- Needs: (a) Research programmes at EC replacing national / regional foci of the way in which Europe's national heritage is mainly treated today, by creating the vision of a truly European heritage. (b) Both to support this research and to popularise its findings, research to defining a technical model for digital content, which easily connects to current technical platforms, stays useful after technology changes, however. (c) Finally, to make Europe's industry more independent from large multinational corporations and open the market for SMEs, implement the digital content in such a way that it can be created with small initial capital and plug easily into an infrastructure which is provided publicly. (Thaller)
- Ensuring continuity of good results through sustainability models and through wider knowledge transfer and diffusion of solutions – embarking on digital media (Wimmer)

Opportunities for international linkages

- Helping innovation attempts to make investment decisions more worthwhile and the adoption decisions by users more coordinated (Degryse)
- Helping to soften the financing problem of an ageing society and of longevity risks;
- International linkages are vital yet expensive in people's time to discuss, trust and negotiate: this must be provided for if European research is not to repeat the mistakes of others and miss new opportunities (Livingstone)
- Learning from micro stories and best practices can help trying to put together the bigger puzzle. At the moment Europe is very much divided: what counts as a valid and acknowledged experience: white, middle class, male, North/Eastern European which is not sustainable in the long run. (Peto)

4. Which are the bottlenecks in addressing these areas, and what are the inherent risks and uncertainties, and how could these be addressed?

*Simpler formulation of question as formulated in the second meeting of the AG:
Which are the bottlenecks?*

- Expectation of actors that researchers give the recipe without the involvement of the actor; researchers want to publish without taking into account usefulness of research for innovation (Aranguren)
- Bad governance and poor institutions (Asheim)
- Risks and uncertainties: (i) new reforms, willingness of national stakeholders; (ii) lack of funding and vision by national authorities to focus on education and culture (Gourova)
- Need to change mind sets of academia, change in current work patterns, structures, incentives (Harper)
- Strictly regulated professional research communes that are self-orientated with narrow specialisation vs. market orientated researches do not stimulate or even predict the international and interdisciplinary development; Sciences in general and concrete research tending to isolate from “casual problems” (Jaskuniene)
- Being strong powers, Russia and China are not willing to “westernize” their business cultures according to models introduced from the outside. Social innovations must have a collaborative nature from the beginning (Kosonen)
- A strict “national approach” might lead to inter-national competition within the EU in areas like tax dumping, lowering of the standards of social welfare, immigration policies, “brain gain” policies (Kostelecky)
- Potential marginalisation of SSH research within H2020 (Kostelecky)
- Austerity policies and economic practices tend to intensify economic, political and environmental contention. They could be addressed through more humanistic policies and a more active role of the public sector (Kousis)
- Amount of funding available for SC 6; imbalance between small and large scale projects; MS strongly absorbed by national level issues which puts another difficulty to EU to manage a common approach in implementing relevant policies and getting both understanding and approval for them (Latoszek)
- Society’s tendency to repeat its own mistakes; technological innovations not meeting the needs of the users, and the conditions of the use of such technologies have not been studied alongside (Livingstone)
- Plans for embedding SSH across the entire research ecosystem must be clearly and systematically evaluated - requiring the collection of data at the point of application in order that subsequent evaluation of whether funding has been allocated fairly is to be feasible; Review structures should cover wide and interdisciplinary experts (Livingstone)

- Barriers to developing open governance systems and the sharing and openness this implies are e.g. the lack of technical, semantic and organisational interoperability; management tends to be reluctant to share data and other resources; concerns that sharing assets can result in loss of knowledge and thereby loss of value; need to balance sharing, openness and transparency with privacy, data protection and security (Millard)
- The new open governance systems vision emphasises collaboration, sharing and transparency between actors with complementary role specialisation moving towards a value network and ecosystem approach to government. In changing and adapting the roles of government in this way, real concerns exist that such changes will result in new types of risk, for example: (i) loss of control and blurred accountability of services (by whom to whom?), (ii) quality standards are more difficult to determine and maintain with many designers and suppliers, (iii) privacy and data security (iv) danger of data and content misuse (v) digital elite formation – new digital divides? (vi) information and data overload – or is this more a filter failure? (Millard)
- Time of implementation and assessment, complexity in terms of actors and expertise needed, difficulties in obtaining the envisaged result, possibility of triggering side effects (which could turn out positive, despite their unexpectancy) and development of trends in correlated areas (e.g. Smart approaches to rehabilitating shrinking urban fabrics that might turn potential to other interrelated actions, such as knowledge based economy fabrics, the case of Lisbon, successful in livability, vitality, economic expenditure, social integration and citizenship) (Morgado)
- Gaps between legislation and implementations in reality (e.g. European Directives and Informal Agreements vs. national implementations in Urban planning or of Gender Equality Plans); Austerity measures hitting middle classes so that these are no longer integrated in a platform that allows to accede to proper levels of healthcare, education, justice, etc. (GINI indicators back to 10 years ago) and negatively impacting otherwise mature societies; Political conditions and a growing conflict situation in several sensitive areas in Europe and in-between Europe and near neighbour countries; Possible growing levels of intolerance and violence against the one who differs; A certain perception of political dispersion and passiveness from the people in general (e.g. increasing abstention rates in the last EU elections); Post-secularization and the recrudescence of blemished regions, thorn by religious and cultural diversity, and emergence of new leaderships not always aligned with a European social model based in equality and fairness, which eventually led to an idea of a welfare state after WWII.; Justice, Finance and Governance independency to be reinforced by strong policies and active implementation of effective social tools. (Morgado)
- Constitute risk is the inability of neoliberal market oriented academia to understand the context it operates. The development of a normalising meta-language is not solving the problem but it is a part of the problem as academic agenda setting is moving farer and farer from burning issues. (Peto)
- Humanities – and the treatment of cultural heritage – still deeply rooted in national or regional narratives. In order not to drying up research with the end of funding, a trans-national European narrative should be discussed together with various national Humanities / cultural heritage fora. Also, stronger insistence is necessary that cultural heritage related

projects produce results, which remain visible and maintainable after the end of the projects. Finally, digital content is currently too much linked to short-term presentation media; basic research producing viable results of sustainable media content that is useful for longer periods and that does not *describe* the problem, but will *solve* it is needed. (Thaller)

- Involvement of citizens or businesses in public service provision and in public policy making in terms of co-creation and co-production are still not widely used models of governance; current trials do not involve large numbers of people and hence do not reach out widely (Wimmer)
- Multidisciplinary research is still seldom and difficult to run, and current EC project setups do not yet foster so well sustainability and wider knowledge diffusion (more incentives or even some kind of enforcement may be needed) (Wimmer)

5. Which gaps (science and technology, markets, policy) and potential game changers, including the role of the public sector in accelerating changes, need to be taken into account?

*Simpler formulation of question as formulated in the second meeting of the AG: **What are the new possibilities in research methodology?***

- Action research demanding engagement and time of actors (change in behaviour of actor needed); incentives for researchers to acquire capabilities to support knowledge transfer and transformations in a collaborative way (Aranguren)
- Key game changer: improvement of societal models, leading to successful social organization and constructive political processes, ensuring good governance and solid institutions in public sector (Asheim)
- International governance and reciprocal behaviour between citizens, groups of citizens, and countries to relax the budget and financing constraints. Public sector should invest in infrastructure and aim to coordinate investment policies of firms; Fostering interdisciplinary innovation through clusters (Degryse)
- Combining top down and bottom up research, with work packages addressing the four themes (European Social Model, European Financial Model, European Political Mode, European Cultural Model), but also with funding for competitive calls (Doel)
- Policy to be based on real needs, people-centred, less lobbying, SMEs real support, less bureaucracy by management of EU Structural Funds at national level – aligned with EU FP7/H2020 practice and rules; and S&T to have real priorities set with targeted funding, linked to demand by economy and society, cohesion of national and EU efforts (Gourova)
- New measures targeting social enterprise based on research and innovation; New measures to link projects and initiatives to drive end impacts of societal benefit (Harper)
- Lack of homogeneity in different fields of activities, which provoke miscommunication (Jaskuniene)
- Social innovation needed for common values to be created in a combined top-down and bottom-up manner with cooperation between firms and the public sector (Kosonen)

- Lack of systematic “basic research” about what is going on in society; lack of communication between researchers and potential users of applied research (risk that researchers may not know what problems users have and potential users may not be aware what researchers can offer to them) (Kostelecky)
- Key role of public sector in facilitating the initiation, building and sustaining of networks among various actors from research, business, civic society that would tackle societal challenges we are facing (Kostelecky)
- Trust, values and beliefs, conflict and security, instability in the global economy, technological surprise, and rampant vulnerability (Kousis)
- Public sector may be able to play a role in accelerating changes, especially in promoting sustainable and innovative ICT (Kousis)
- New approach requires multilateral discussions of experts (Latoszek)
- Still too little investment in fundamental research (MS funding bodies not sufficiently funding this); Concentration is on supporting priority areas defined by short-term policy imperatives, while there seems to be little space for long-term investment in fundamental science, which leads to a serious risk of losing the capacity to investigate and understand our increasingly complex society (Livingstone)
- Five main gaps to be tackled for achieving open governance systems: (i) Public sector as a broad open collaboration ‘platform’, at least for some of its functions, (ii) By establishing collaboration platforms at many levels, government’s role changes to one of enabler and facilitator, as well as arbiter, coordinator, and regulator for the activities of others in delivering public value, (iii) provide tools, guidance and incentives for collaboration (iv) Government has an increasing role in managing societal assets, (v) the purpose of seeing the public sector as a platform is to ensure the appropriate creation and deployment of public value (Millard)
- Links between policies and their effective implementation; Technology as a means to achieve, ease and promote participation, partnerships; Development of a sense of belonging to the process, thus targeting trust, fairness, high quality. (Morgado)
- The problem is the selective acknowledgement and potentials of the different actors which leads to losing trust and to polarisation. (Peto)
- A European identity will not arise spontaneously, but it needs to be nurtured. Also, cultural heritage / Humanities researchers and their computer science / information technology partners have fundamentally different expectations towards interdisciplinary projects. A new understanding of the way in which such interdisciplinary projects are implemented is needed. (Thaller)
- Engagement of distinct stakeholders in new innovative public governance models, exploitation of available data as well as stakeholder inputs to support public service provision and policy decision making. To enable better understanding and trust in simulation models, involve amongst others the linking up of data for new knowledge, ensuring traceability and transparency in policy decision making, and exploitation of augmented reality and

visualisation means to support quick understanding of the key aspects of a policy context and of alternative policy options (Wimmer)

6. In which areas is the strongest potential to leverage the EU knowledge base for innovation and, in particular, ensure the participation of industry, SMEs and public administrations? What is the best balance between bottom-up activities and support to key industrial roadmaps?

*Simpler formulation of question as formulated in the second meeting of the AG: **What potentials for public-private-civil partnerships exist?***

- To foster research at regional level and to facilitate engagement of different actors in the research; foster training programs and research with the productive and innovations systems of each region (Aranguren)
- Combination of bottom up/top down strategies; governance and institutions important (Asheim)
- Combining experience with entrepreneurial spirit is a fantastic human capital potential in Europe. Stimulating research at universities, coordinating efforts on key areas, and making timely decisions on standards may allow to employ the growth potential. Cooperation of universities with SMEs and the industry may lever up the innovation potential and lead to new industrial roadmaps (Degryse)
- Education (specific skills of young people and researchers), RTD stakeholders (knowledge transfer and collaboration with other stakeholders in innovation life-cycle, incl. open innovation), Industry (motivation for collaboration with research and educational organisations) (Gourova)
- In communities and among marginalized groups and socially responsible young people, researchers etc. (Harper)
- Involve creative possibilities into industry to reform and push all European systems into new tracks (Jaskuniene)
- Good quality research and well educated inhabitants represent the most important capital on which to base European success; investment in education to be high priority; combining economic growth and innovations with the social security and the good quality of life the strongest potential for future development (Kostelecky)
- Growing inequalities must be met through the strengthening of public education in order to leverage the EU knowledge base for innovation (Kousis)
- Industries such as Artificial Intelligence, robotics, mobile computer applications and medical science are strongest contenders, but they need support and insight of humanistic discourse to help them manage the new type of an organisation with a balanced relationship between technology and man (Latoszek)
- EU has emerging leadership in social innovation and entrepreneurship and the potential for leveraging this growing community for adoption of models, both to business and to public

bodies, is significant. Transfer of new models to business already has some prominence but the opportunity for public service innovation has been under-investigated (Livingstone)

- New types of governance business model (including ones enabled by ICT) can help to (i) exploit existing and often under-used assets through bottom-up ad-hoc processes, (ii) contextualise the implementation of ICT and other tools and approaches – starting from the needs of the citizen (perhaps mediated by people or organisations closest to them) rather than government, (iii) enable leadership, ownership and accountability at the grassroots (iv) usher in new (power) relationships between professionals and citizens, (v) build widespread skills and competences amongst the population (vi) because they start from the bottom, address not just the direct service needs of citizens but also helps give them self-fulfilment and esteem (this is also an aspect of the ‘design thinking’ approach) (vii) re-use and mash existing public sector assets, data and other resources (viii) typically involve much less finance, have much shorter development cycles, and include a whole range of actors compared to traditional top-down initiatives (Millard)
 - 1. The areas of shared responsibilities and integrated or co-management; 2. Close bonds between society, researchers and policy makers, with a view to effective implementation of proposals (Morgado)
 - The purpose should be promoting a future which is not based on promoting micro interests but one which offers an emotionally attractive identification position for negotiating an inclusive subject position. (Peto)
 - (mobile) Apps and eBooks, which are deployed within frameworks, which are supported and maintained by public administrations will create numerous possibilities for SMEs. However, specific peculiarities of mobile devices are still largely ignored by the cultural heritage industry. Europe must not rely on big vendors (e.g. Apple, Kindle, etc.) to create strictly controlled networks within which digital content can be made available. (Thaller)
 - An infrastructure enabling to market many small individual items of information, which can be created with a low initial investment, opens up value-generating potentials for SMEs. If such an infrastructure is missing, SMEs will always be under the control of the large companies controlling such an infrastructure. (Thaller)
 - Engagement of stakeholders (involving public, private and civil sector actors) in policy development and in co-creation and co-production of public services, leading to new innovative models of public governance thereby ensuring value-add and benefits to all stakeholders, fostering community networks and strengthening of economic growth, human capital and social welfare in a dynamically evolving Europe that is linked well on a global scope (Wimmer)
7. Which areas have the most potential to support integrated activities, in particular across the societal challenges and applying key enabling technologies in the societal challenges and vice versa; and cross-cutting

*Simpler formulation of question as formulated in the second meeting of the AG: **How can interdisciplinary research be used?***

- Action research a contribution to transversal innovation (Aranguren)
- Public policy initiatives focusing on education, social and welfare sectors; social science and humanities contributing to increase the understanding of the effects of different societal models for effective public policy initiatives (Asheim)
- Cross-disciplinary research combining the depth of each discipline with the spillovers towards other disciplines thereby involving topics such as big data, sustainable energy, health care, combined with an optimal supply of external and internal finance, optimal corporate and societal governance (Degryse)
- SSH research will investigate the three major questions that need to be answered to build the ideal-typical European Social Model (ESM): (i) related to change: to what extent has the ideal type of ESM continued to orient the policies of European governments, as well as their – and their citizens’ – vision of European distinctiveness? (ii) related to internal variation: to what extent are differences within Europe today as great as – or even greater than – those between Europe and other world areas? (iii) related to the future: even assuming a positive answer to the first question and a negative one to the second, can the ESM stand the challenge of globalization, and if so, how? SSH research will help to understand what went wrong with the current European Financial Model and how the new model can be designed with institutional structures that fit the European context. The European Political Model can strongly benefit from empirical and theoretical research of the evolving relationship between experimentalist forms of governance and changing practices of democratic representation at both national and European levels, not least in response to the Euro crisis. For the European Cultural Model, SSH can help to understanding of the cultural and linguistic construction, historical emergence and on-going transformation of identities as well as the resistances offered to such transformations; and it can explain processes of state formation, democracy, gender equality, individualism, civil society and public sphere, etc. (Doel)
- Cultural and creative industries (as local and regional growth engine, and tool for building values and awareness raising), and factories of the future, future Internet-based enterprise systems (Gourova)
- Linking education, research, innovation and entrepreneurship initiatives together to help young people engage in social enterprise and innovation; Linking research and innovation to conflict resolution; Linking related projects and initiatives through top up funding to move to end impacts of societal benefit (Harper)
- Areas disposing big amounts of digital databases, which can be transferred via internet or other “low cost” media, e.g. “lifelong learning”, creative industries, media design etc. (Jaskuniene)
- Interdisciplinary research combining e.g. international business, sociology, soci-economic geography, law and political studies needed to discover and understand the role and function of informal institutions in Russian and Chinese business in their complexity (Kosonen)
- Building integrated activities from the bottom, and systematically encouraging integrated activities (really working together) with “middle sized” interdisciplinary research projects (Kostecky)

- Areas applying 1) ICT enabling technologies are likely to be in research, education and training systems, and 2) sustainable development, green growth projects which offer green jobs. In both of these a perspective of a socially conscious and responsible science, i.e. a socially-relevant science and technology would lead to avoiding related problems and could be promoted through 3) education. (Kousis)
- Interdisciplinary approach (Latoszek)
- Cross-cutting activities in relation to SSH, gender, learning (across settings) are vital. A host of ICT-related issues is also cross-cutting such as access to information across different spheres, yet there are also huge issues of access, ethics, critical judgement and participation regarding the knowledge environment (Livingstone)
- 1. Most potential areas and cross-cutting activities could include a. design as a way of implementing tangible results involving different fields, targeting inclusiveness, with reference to e.g. science, technologies and environment- including cities, the system of open spaces, infrastructures); 2. "Out of the box" approach at all levels and in all fields (e.g. The role of textile research and industry in fashion design, ICT and transports, health care, household's amenities, its role in the societal fabrics improvement of the quality of life, income increase and regional/national/international competitiveness) (Morgado)
- Neither digital nor multi/inter/trans/disciplinarity could serve as a philosophers's stone to solve the problems we are unable to identify and very easily can just reconstruct even aggravate inclusions and differences. A deep and critical understanding of what digital turn means in humanities and social sciences can contribute to the redefinition of priorities. The uncritical belief in individuals without acknowledging structures will necessarily lead to regression. (Peto)
- Strictly interdisciplinary, systematic research into the possibilities to handle multilingual cultural heritage material in such a way that it supports (a) the conceptualisation of Humanities' research questions, which go genuinely beyond the national / regional reference frame, and develops (b) from that conceptualisation digital content which maximises reusability. Such interdisciplinary research needs to enforce the development of new approaches in the understanding of Europe's heritage as well as new concepts in the packaging of digital content to remain usable across technology changes. (Thaller)
- Multidisciplinary research involving innovative research and developments and building on sustainability models, knowledge transfer and impact measures beyond one project cycle. Innovative technologies to be explored with the involvement of wider stakeholders and users, and over longer time periods, accompanied with empirical research to understand barriers of use, mismatches of interests, and the wider impact of solutions (Wimmer)

Annex II: List of Advisory Group members

Family Name	First name	Affiliation	Country
ALLIEZ	Pierre	INRIA	France
ARANGUREN	Mari Jose	Deusto Business School & Basque Institute of Competitiveness	Spain
ARCHIBUGI	Daniele	Italian National Research Council	Italy
ASHEIM	Geir B.	University of Oslo	Norway
BASON	Christian	Mind-Lab	Denmark
CASSINGENA HARPER	Jennifer	Malta Council for Science and Technology	Malta
DEGRYSE	Hans	KU Leuven	Belgium
FIRMHOFFER	Robert	Copernicus Science Centre	Poland
GLIDDEN	Julia	21c Consultancy	United Kingdom
GOUROVA	Elissaveta	Sofia University	Bulgaria
JAŠKŪNIENĖ	Eglė	Vilnius Gediminas Technical University	Lithuania
KOSONEN	Riitta	Aalto University School of Business	Finland
KOSTELECKY	Tomas	Institute of Sociology of the Academy of Science of the Czech Republic	Czech Republic
KOUSIS	Maria	University of Crete	Greece
LATOSZEK	Ewa	Warsaw School of Economics & Polish European Community Studies Association	Poland
LIVINGSTONE	Sonia	London School of Economics and Political Science	United Kingdom
MACKIEWICZ	Wolfgang	Freie Universität Berlin	Germany
MILLARD (Rapporteur)	Jeremy	Danish Technology Institute	Denmark
MORGADO	Sofia	University of Lisbon	Portugal
NORMANN	Emilie	Aalborg University	Denmark
PETO	Andrea	Central European University	Hungary
POBLET	Marta	Autonomous University of Barcelona & RMIT University	Spain
SIGMUND	Axel	VDI/VDE-IT, Institute for Innovation and Technology	Germany
STENROS	Anne	KONE Corporation	Finland
THALLER	Manfred	Universität zu Köln	Germany
URBANCZYK (Vice chair)	Przemyslaw	Cardinal Wyszyński University and Polish Academy of Sciences	Poland
VAN DEN DOEL (Vice chair)	Wim	Leiden University & League of European Research Universities (LERU)	Netherlands
VERELLEN	Franciscus	Ecole Française d'Extrême-Orient & EFEO Hong Kong Center	France
VINCE	Russ	University of Bath	United Kingdom
WIMMER (Chair)	Maria A.	University of Koblenz-Landau	Germany