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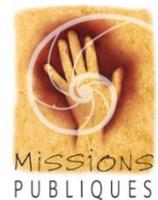
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1. Executive Summary

The project Citizen and Multi-Actor Consultation on Horizon 2020 (CIMULACT) aimed at improving the engagement of citizens in the process of formulation of the research agenda in Europe by providing inputs to the Horizon 2020 Work Programme 2018 – 2020 and consequently to the preparation of the Framework Programme 9. The CIMULACT project adopted co-creation and multi-actor procedures involving citizens and experts from 30 European countries. In the course of the project a number of intermediate results were gathered in key deliverables targeted to the needs of European and national research policy making. These deliverables included 179 citizens' visions and 48 research programme scenarios finally transformed into the final 23 research topics. This effort was acknowledged in the Interim Evaluation of Horizon 2020 where CIMULACT was mentioned as one example that had been already able to deliver significant inputs to Horizon 2020.[1] This report (D5.3) assesses the impact of the CIMULACT project from two points of view:

i)   The impact on the European research agenda, particularly the use of the project outcomes in the process of designing the recent Work Programme of Horizon 2020 (H2020 WP 2018 – 2020) and a possible further utilization of its results in the formulation of the Framework Programme 9.

ii)   The impact on the partners of the project, including further uses of the methodology as well as co-creation and public engagement activities.

The first part of the report assesses the impact of CIMULACT on the H2020 WP 2018 – 2020. The reference in the general introduction to H2020 WP 2018 – 2020 confirms the use of the results of the CIMULACT project in its formulation[2]. In order to provide deeper insight into the utilization of citizens' wishes and needs, the assessment proceeds in two ways: a) by comparing the final 23 citizen-based research topics[3] of the CIMULACT project with the H2020 WP 2018 – 2020 topics; b) by gathering opinions of research policy officers from various Commission services (DGs) on the actual use of the CIMULACT outcomes in the formulation of the H2020 WP 2018 – 2020 by means of an online survey and interviews.

A clear overlap between 15 of the final 23 CIMULACT research topics and 22 topics from H2020 WP 2018 – 2020 was identified. It means that 65% of the CIMULACT research topics have been covered by the H2020 WP 2018 – 2020. The majority of the CIMULACT research topics referred to Work Programmes 1 (Health), 2 (Food security) and 6 (Europe in a

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[1] Interim Evaluation of Horizon 2020 Annex 2. Available at: https://ec.europa.eu/research/evaluations/pdf/archive/h2020_evaluations/swd(2017)221-annex-2-interim_evaluation-h2020.pdf#view=fit&pagemode=none

[2] General introduction of the Horizon 2020 Work Programme 2018 – 2020. Available at: http://ec.europa.eu/research/participants/data/ref/h2020/wp/2018-2020/main/h2020-wp1820-intro_en.pdf

[3] In this report we worked with the final 23 research topics that were elaborated at the Pan-European conference which was the final phase of the CIMULACT process

changing world). No CIMULACT research topic corresponded explicitly to Work Programme 7 (Secure societies).

This thematic correspondence indicates the similarity between citizens' wishes and needs, and the overall thematic focus of the European research agenda; however, this assessment does not provide any insight into unique contributions from CIMULACT to the final topics, in terms of perspectives not considered before the influence from CIMULACT. Neither does it reveal to what extent and way the CIMULACT research topics were specifically used in the formulation of the H2020 WP 2018 – 2020. In order to reveal that, a survey focused on the experience and opinions of research policy officers was carried out and several complementary interviews were conducted.

The respondents of the survey and interviews indicated that the approach of gathering and prioritizing citizens' wishes and needs adopted by CIMULACT was relevant and highly appreciated. They agreed that citizens are competent to suggest directions for research topics. Moreover, research topics based on the wishes and needs of citizens can also help to distinguish between real citizens' problems and political pressure.

Furthermore, interviews proved that the CIMULACT project affected the H2020 WP 2018 – 2020. It was also found that the CIMULACT results served an important role as a justification of aspects of the most recent Work Programme of H2020. The coverage of issues, their novelty and compatibility with other sources was appreciated.

The availability of the CIMULACT final results ten months prior to the publishing of the H2020 WP 2018 – 2020 enabled the responsible officers to ensure or gain confidence that the research agenda of the EU matched with citizens' interest and needs. The CIMULACT results provide support to the overall principle of H2020, that citizens should to have their say towards the focus of the research agenda, by providing a unique input, and while being the ultimate beneficiaries of the invested research funds. This was also proved by the report on the comparison of CIMULACT research topics[4] with expert oriented foresight studies (Deliverable 5.2).[5] The Deliverable 5.2 showed that the themes of the CIMULACT topics generally were well represented within expert foresight studies (10 out of 16 studies include one or more references to research topics identified in CIMULACT), but that the CIMULACT topics added new and unique perspectives, especially on societal aspects, which were not represented in expert-based foresight.

The approached policy officers considered the CIMULACT a good and helpful instrument for the engagement of citizens, and the methodology adequate for trustworthy outputs and appreciated benefits of the genuine consultation process. They indicated a high

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[4] In Deliverable 5.2 the analysis based on 46 topics (23 final topics and 23 potential ones)

[5] Deliverable 5.2: Report on comparison of research topics from CIMULACT with those from expert oriented foresight studies. Available at: http://www.cimulact.eu/wp-content/uploads/2018/04/D5.2_Report-on-comparison-expert-oriented-foresight-studies-compressed.pdf

demand for projects like CIMULACT that would gather the views of citizens and build on public engagement processes in a systematic and transparent way.

The survey and interviews confirmed that the CIMULACT project proved to be a highly worthwhile and value-adding experience of public engagement, and the demand for projects with methodology like CIMULACT, based on co-creation and utilising views of citizens, would remain high. The impact of projects like CIMULACT on the formulation of research priorities might increase in the future, particularly if the timing of the project fits with the schedule of the development of a given research agenda within Framework Programme 9 – according to interviewees, CIMULACT outcomes are also relevant for the preparation of FP9. Also, if the new FP supports the public engagement in R&I, projects like CIMULACT should be fully utilised in its formulation. Interviews revealed that projects that have an ambition to influence the formulation of R&I agendas should deliver their results more than a year before the publication of the agenda.

Generally, to increase the actual use of the project results, it is also necessary to put great effort on dissemination among, and close collaboration with, the policy makers and relevant EC policy officers. Although the overall outreach of the CIMULACT project has been large, its outcomes were disseminated among the Commission services, and events were organized by the responsible project officer and CIMULACT partners, the awareness of the 23 CIMULACT research topics was limited likely due to lack of understanding of their high relevance to the research agenda in preparation. It is important to develop ways to ensure that the relevant policy officers can be reached in time to increase the impact of projects like CIMULACT. For this purpose, the project officer and associated POs need also be willing to put an effort into this task as the project partners only have access to the EC policy officers through their own project officer.

The second part of the report focuses on the assessment of the project procedures and their impact on consortium partners. The assessment is based on feedback obtained from participants of the events and from "impact-targeted" questions regarding the actual and further use of co-creation/public engagement approaches, as well as partners' experience with stakeholders' familiarization with the methods and results.

Citizens themselves, experts, national stakeholders, and policy makers confirmed that citizens were able to provide interesting, valuable, and plausible ideas about future and corresponding research needs.

CIMULACT developed 11 new or adjusted participatory methods (summarized in an Inspiration catalogue[6]) that proved to be adequate during the project. These methods have already served as an inspiration as well as practical tools for researchers and other institutions interested in co-creation and public engagement.

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[6] Deliverable 5.1: Inspiration catalogue. Available at: http://www.cimulact.eu/wp-content/uploads/2018/04/D5.1_Inspiration-Catalogue-for-consulting-different-groups-compressed.pdf

Consortium partners gained valuable new experience in co-creation and public engagement. They had an exceptional opportunity to experiment with various methods under the guidance and supervision of experienced partners. At least half of the project partners have already adopted the methods used in the course of the CIMULACT project and some of the partners have even applied whole methods, or some of their aspects, in their other work activities. Improved methodological knowledge, networking, acquirement of new recruitment approaches, and facilitation skills belong among "other" benefits that the project brought to the consortium partners.

CIMULACT brought together citizens and experts in a close collaboration. It was an important experience particularly for initially sceptical scientists. New links and shared interests have emerged among project partners, resulting in new collaboration opportunities as well as in cooperation with various stakeholders.

Last but not least, the project paid important attention to dissemination and promotion in order to increase the impact of the CIMULACT project and its results. Effective dissemination activities helped enhance interest of the project beneficiaries about co-creation/public engagement approaches. The CIMULACT project was presented on many occasions at the regional, national, and European levels (e.g. STOA Panel of the European Parliament or The 3rd European Technology Assessment Conference). OECD chose CIMULACT as a good practice case for the engagement of citizens in an open science agenda setting[7]. These activities helped to share the acquired knowledge on the practicality of co-creation/public engagement approaches with the research community and policy makers. They resulted in the establishment of new networks capable of pursuing co-creation/public engagement activities in the areas of R&I in the future.

Table 1: A selection of the achievements of the CIMULACT project

The reference to CIMULACT in the General introduction of the Horizon 2020 Work Programme 2018 – 2020 as an input to the H2020 WP 2018 – 2020 and as an example of FP project enabling direct interactions with citizens
CIMULACT presented in the Interim Evaluation of Horizon 2020 as a project that had already produced significant inputs into Horizon 2020
15 of 23 research topics with thematic overlap in 22 topics of the H2020 WP 2018 – 2020

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[7] OECD Science, Technology and Innovation Policy Papers. No. 50. December 2017. Available at: https://www.oecd-ilibrary.org/docserver/74edb6a8-en.pdf?expires=1522742677&id=id&accname=guest&checksum=EEE39CAC6D6E363C36C104B2DA16741F

The CIMULACT project affected the H2020 WP 2018 – 2020 and in some cases CIMULACT research topics led to a concrete WP 2018 – 2020 call or specific parts of the call (findings based on interviews with policy officers)

CIMULACT has added important aspects to the EU research agenda by providing new future-oriented perspectives to themes under the Grand Challenges

The CIMULACT citizen-based topics had unique qualities as compared to expert foresight studies (findings from Deliverable 5.2)

CIMULACT was chosen by OECD as one of a good practice case for engagement of citizens in Open Research Agenda Setting

CIMULACT outcomes remain relevant for the preparation of Framework Programme 9

CIMULACT developed 11 new or adjusted participatory methods (summarized in the Inspiration catalogue)

Most of the CIMULACT Consortium partners already adopted new/adjusted participatory methods in their working activities

Consortium partners gained or improved skills in areas of methodological knowledge, acquirement of new recruitment approaches and facilitation

New (working) networks within the consortium and between individual partners and national institutions, stakeholders were established

Large overall outreach of the CIMULACT project:

- around 902 dissemination activities of consortium partners
- 4 reviewed scientific publications
- 126 presentations at workshops and conferences

Two presentations at an OECD workshop on Open Science (June 2017, Seoul): 1) methods and experience with Open Agenda Setting; 2) the CIMULACT project

CIMULACT presented within intro to the session on The Future of Science through Citizens Engagement at the STOA Panel of the European Parliament (March 2017, Brussels)

CIMULACT presented within session on Responsible Research Agendas at The 3rd European Technology Assessment Conference (May 2017, Cork)

CIMULACT presented at a conference on the Future of the Research System to 450 Norwegian research administrators, politicians and university representatives (March 2017, Oslo)

1. Introduction

CIMULACT stands for 'Citizen and Multi-Actor Consultation on Horizon 2020' (the EU Framework Programme for Research and Innovation). The project engaged citizens, along with a wide range of other actors, in the co-creation of a European Research and Innovation agenda, thereby making it more relevant and accountable to society. The project contributed to this development by establishing and improving a genuine dialogue between citizens, stakeholders, scientists, and policymakers where visions and scenarios for desirable and sustainable futures could be developed, debated, and transformed into recommendations and suggestions for research and innovation policies and topics.

The CIMULACT project created visions, scenarios, and topics that connect societal needs with future expected advances in science and their impact on technology, society, environment etc. The project worked on the assumption that these visions and societal needs will be integrated into the Horizon 2020 Work Programme 2018 – 2020. The results should also be valuable for the next R&I framework programme (FP9) as well as for national R&I agendas.

This report assesses the impact of the CIMULACT project´s final output (23 citizen-based research topics) that served as one of the sources for the formulation of topics in the Horizon 2020 Work Programme 2018 – 2020[8]. In particular, the report assesses (i) how CIMULACT research topics correspond to H2020 WP 2018 – 2020, and (ii) processes leading to the formulation of research topics, i.e. the methodology and its further use at the European and national level.

The aims of the report are reflected in its structure; the first part of the report assesses the impact of CIMULACT results on the H2020 WP 2018 – 2020 and possible future effects on the formulation of the Framework Programme 9.

The second part is then focused on potential impacts of the project on the CIMULACT consortium partners, including a further use of the methodology as well as co-creation and public engagement activities.

Process overview

In the next paragraphs we briefly review the process in which the initial citizens' visions of the future were translated into research topics presented to the European Commission in support of the Research Work Programme 2018 – 2020. This process included 6 consequent steps comprising 7 activities (see Figure 1).

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[8] General introduction of the Horizon 2020 Work Programme 2018 – 2020. Available at: http://ec.europa.eu/research/participants/data/ref/h2020/wp/2018-2020/main/h2020-wp1820-intro_en.pdf

National Citizen Vision Workshops (NCVs): From November 2015 to January 2016, a series of National Citizen Vision Workshops (NCVs) were held in each of the 30 participating European countries. More than 1000 citizens joined the workshops in order to formulate visions for a sustainable and desirable future across Europe. During the NCVs, 179[9] concrete and unique visions were formulated. The NCVs were built on a method aimed at using citizens' every-day life experience, and consortium partners adopted the same format of NCVs in order to comply with the unified approach. <u>These visions are crucial and absolutely central in all of the project's results.</u>[10]

Clustering workshop: In February 2016 the 179 citizen visions were brought to a clustering workshop where 26 CIMULACT consortium partners, 11 external experts, and "creative thinkers" clustered the visions into 26 "social needs" (i.e. needs as defined by the citizens in their original visions for sustainable and desirable futures). For practical reasons, the consortium partners merged the 26 social needs into the following 12 domains of social needs:
1. Equality
2. Unity and Cohesion
3. Citizenship Awareness and Participation
4. Holistic Health
5. Sustainable Food
6. Life Long Processes
7. Strength-Based Education and Experiential Learning
8. Harmony with Nature
9. Personal Developments
10. Green Habitats
11. Sustainable Economy
12. Sustainable Energy

Co-creation workshop: The 'social needs' guided the future work of CIMULACT which included a co-creation workshop held in Milan in April 2016 where approx. 100 citizens, experts, and consortium partners met to co-create 48 research programme scenarios[11] based on the 12 social needs including the visions.

In the next step, citizens, a broad spectrum of experts, and policy makers were consulted on prioritisation and enrichment of the potential research programmes. This consultation took two forms: **National Research and Policy Workshops and Online Research & Policy Consultations**:

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[9] All 30 participating countries developed six visions except for Ireland which produced five.

[10] CIMULACT Deliverable 1.3: Vision Catalogue – Encompassing the visions from all 30 countries. Available at: http://www.cimulact.eu/wp-content/uploads/2016/06/D1.3final.pdf

[11] CIMULACT Deliverable 2.1: First draft of social needs based research programme scenarios. Available at: http://www.cimulact.eu/wp-content/uploads/2017/03/CIMULACT-D2.1_final.pdf

National Research and Policy Workshops (NRPs): The 48 research programme scenarios guided the next phase of the project that included the NRPs held in early autumn 2016. All NRPs participants (in total 977) were introduced to a minimum of 8 different research programme scenarios before or during the workshop. Participants enriched at least 4 of these research programme scenarios. The project partners had the opportunity to experiment with methods, as they could choose between a set of three suggested methods or develop their own.[12]

Online Research & Policy Consultations (ORPs): In parallel to the NPRs, the 48 research programme scenarios were discussed through an open, cross-European, online consultation. The scope of the online consultation was primarily to validate and prioritize the 48 research programme scenarios. Participants (overall 3.458) assessed the relevance of the 48 research programme scenarios and supported their assessment with arguments and additional research questions. [13]

Core-partner meeting to compile the results: In November 2016 the CIMULACT core partners met to compile the results of all engagement activities from the Co-creation workshop, NRPs, and ORPs. The objective of the meeting was to prepare the results in a way that would make it easy for the European Commission to continue working with them. The result was 48 suggestions of research topics consisting of the challenge, scope, and expected impact of the proposed research, as well as the ORPs rating.

Pan-European Conference: In December 2016 a pan-European Conference was held to finalise the social needs-based 48 suggestions of research topics. During this highly interactive conference, 46 CIMULACT partners, 11 experts in different fields, 2 advisors, and 16 project officers from the European Commission worked together and revised the suggestions of research topics in light of the results obtained from NRPs and ORPs held from August till October 2016. The outcomes of this conference were the final 23 research topics[14] and about 40 policy recommendations. Each topic represented citizens' desirable future and reflected their expectations, desires and concerns for Europe.

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[12] CIMULACT Deliverable 3.2: Programmes and concepts for all citizen and multi-actor consultations. Available at: http://www.cimulact.eu/wp-content/uploads/2017/09/D3.2-Programmes-and-concepts_compressed.pdf

[13] CIMULACT Deliverable 4.2 – European Report on Online Consultation Results. Available at: http://www.cimulact.eu/wp-content/uploads/2017/04/Report-online-consultation.pdf

[14] CIMULACT Deliverable 2.2: Social needs based research programme scenarios including 10 to 15 simulated calls for H2020. Available at: http://www.cimulact.eu/wp-content/uploads/2017/03/CIMULACT-Deliverable-2.2-2017_low_res.pdf

Figure 1: Graphical illustration of the CIMULACT process from citizens' visions to research topics and policy options
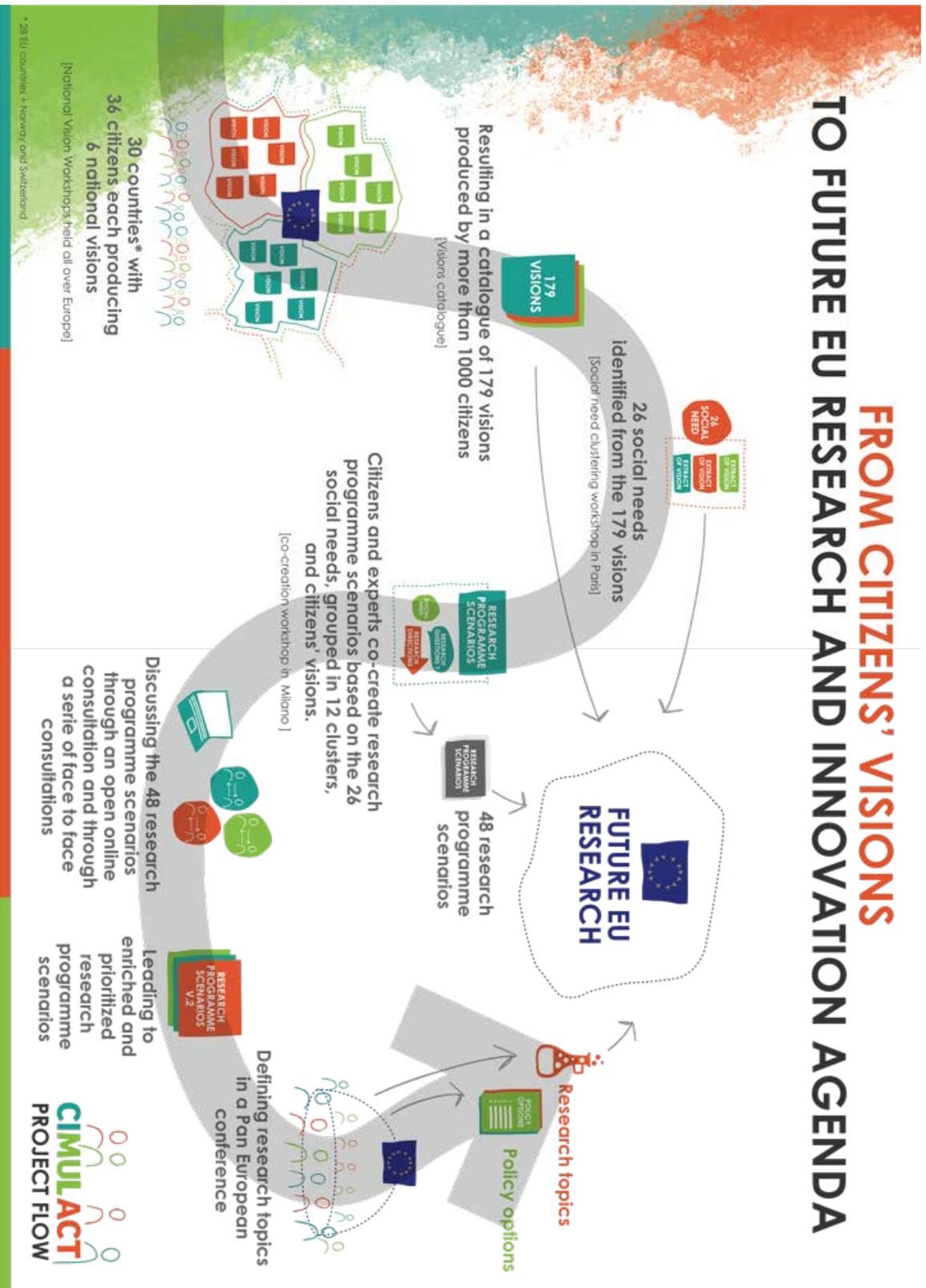
2. Methodology

The report is divided into two parts. The first part assesses the impact of CIMULACT results on the H2020 Work Programme 2018 – 2020. The second part investigates internal processes of the project, and how CIMULACT methodologies and results affected the consortium partners.

<u>The main aim of the first part of the report is to assess the impact of CIMULACT results on the H2020 WP 2018 – 2020</u>. From the general introduction of the H2020 WP 2018 – 2020 it is already known that CIMULACT was used as one of the inputs in the preparation of this programme[15]. Our objective, however, is to get more specific insights into how this input was processed and to what extent it was utilized. First, we assess the correspondence of CIMULACT research topics with the final version of H2020 WP 2018-2020. Second, we investigate the actual use of the CIMULACT outcomes in the formulation of the programme.

For the assessment of the correspondence of the CIMULACT research topics, we compared the final 23 research topics[16] of CIMULACT and the H2020 WP 2018 – 2020 specification in terms of thematic similarity (Annex I). It is principally a qualitative assessment which was later presented also in quantitative terms – how many citizen-driven topics occur in the programmes and topics in the H2020 WP 2018 – 2020. This assessment was done in three steps:

1. Selection of distinctive keywords (key statements) for each of the final 23 CIMULACT research topics.
2. Reading through the texts of the H2020 WP 2018 – 2020 topics, we looked for the occurrence of keywords and key statements identified in the CIMULACT research topics. This identified potential topics and calls of the Work Programme where a thematic similarity with the CIMULAC topics might exist.
3. Afterwards the contexts of the keywords in the identified topics in both documents were compared to assess the thematic similarity (alignment).

The thematic comparison resulted in three outcome configurations:

i)   CIMULACT research topic covered by H2020 WP 2018-2020
ii)   CIMULACT research topic not covered by H2020 WP 2018-2020
iii)   Societal challenge or research theme of H2020 WP 2018-2020 not covered by CIMULACT research topics

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[15] General introduction of the Horizon 2020 Work Programme 2018 – 2020. Available at: http://ec.europa.eu/research/participants/data/ref/h2020/wp/2018-2020/main/h2020-wp1820-intro_en.pdf

[16] In this report we worked with the final 23 research topics that were elaborated at the Pan-European conference which was the final phase of the CIMULACT process

Outcomes ii) and iii) call for further investigations if, for example, earlier visions or research programme scenarios have been pursued in the later steps or have been lost because of their minor position / low priority.

Obviously, thematic similarity indicates overlap of the final 23 CIMULACT citizen-based research topics with the H2020 WPs; however, it does not imply that the CIMULACT outcomes were actually used in the formulation of the H2020 Work Programme. Using the examples of four pairs of similar topics we illustrate the extent and the nature of the thematic overlap.

We asked three independent experts to review texts of four cases of the overlap between H2020 Work Programme for 2018-2020 (WP) and CIMULACT 23 topics. This was done in three steps:

1. Revision of common keywords. These keywords are not necessarily exact wordings in the both texts; but it is important that they represent a common content of the WP a CIMULACT topics.
2. Stating the rate of the overlap (similarity) in each of the three chapters of the topics, the experts express their judgements as percentages of the complete overlap. The judgements are justified by a couple of clearly formulated statements on the similarity and the difference between WP and CILULACT topics. Experts are asked to address concrete features and to avoid common statements.
3. Stating the overall rate of the similarity.

Table 2: Criteria for the assessment of the thematic overlap of research topics

Thematic Similarity Assessment	*Similarity rates as percentages of the complete overlap*
Challenge	Compare the list of main challenges in both texts.
Scope	Compare: • The extent of the subject (the number of issues) to be studied; • The research perspectives (dimension of investigation).
Expected Impact	Areas of impact (society, communities, employees, individuals), the nature of impact (on science, on industry, on people)
Overall	Justify the final rate; give the relation between WP and CIMULACT topics - see the chart below

Table 2 contains the criteria and requirements for experts' assessment listed by topic chapters (challenges, scope and impact), providing some guidelines for the assessment in

Step 2. We initially required a qualitative assessment expressed in terms of rates relative to the complete overlap of the selected pairs of topics. Besides the overlap rating, we asked experts to state the relation between the topics in the pair only in reference to the overall assessment. The meaning and expression of the "relation" is illustrated in Figure 2.

Figure 2: Relations of the topics to be stated by experts
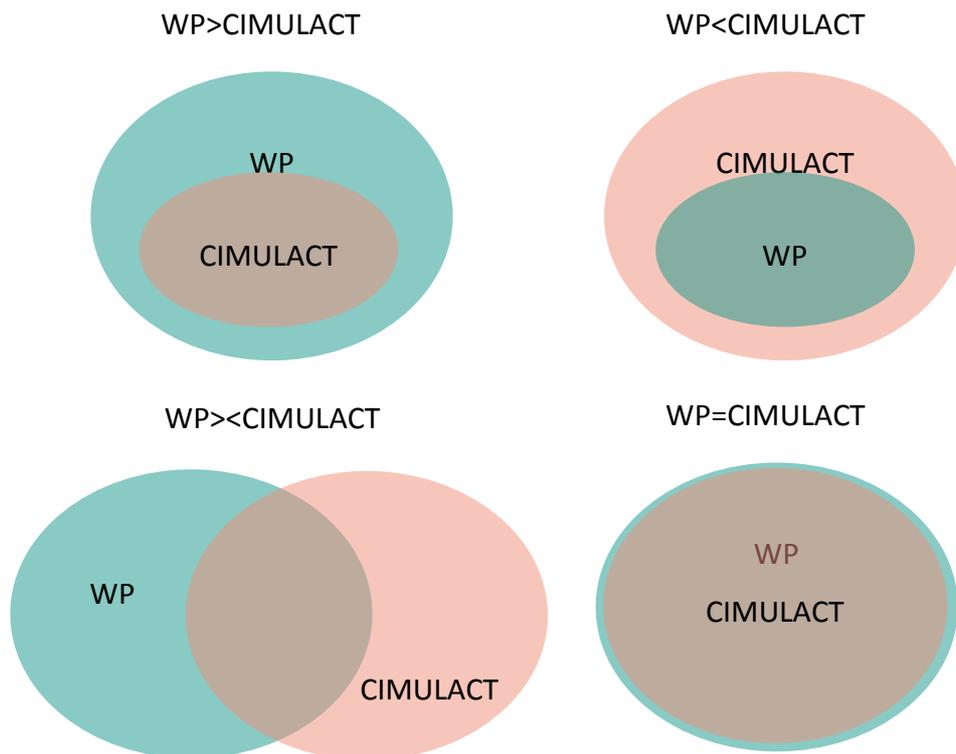
For the investigation of the actual use of CIMULACT outcomes in the preparation of the H2020 WP 2018 – 2020, we carried out an online survey among policy officers of the Commission services (DGs), and four interviews with 5 EC policy officers who either managed the formation of some sub-programme of the H2020 WP 2018 – 2020 or coordinated the overall formulation of it.

The questions in both the survey, and the interviews, aimed at obtaining more precise and extensive feedback on the usefulness of the CIMULACT results as well as their opinions on the CIMULACT approach and how to generally improve participatory/public engagement approaches. The questionnaires are attached to this report in the Annex II and III.

The online survey was designed and conducted in cooperation with the project officer from the Commission. The online survey contains mainly multiple-choice questions with the

possibility to add comments, one open question, and few screening questions at the end[17].

The link to the online survey was distributed to 215 policy officers by DG Research. After a week the project officer sent a reminder to all earlier approached potential respondents and a week later we closed the survey. We gathered 43 responses (20%) of which 20 (47%) were incomplete. Finally, we analysed 23 complete responses (11%).

In depth Interviews with five EC policy officers were conducted by phone and we had two face-to-face meetings with three policy officers in Brussels. Three out of the five interviewed policy officers had participated in the Pan-European conference organized by the CIMULACT consortium a year before (December 2016).

The objective of the second part of the report is to learn if internal processes functioned well resulting in impacts on CIMULACT consortium partners. The aim is to assess the methodology and approaches of co-creation and public engagement in other working activities as well as dissemination of results at the national level.

The assessment is based on the feedback obtained from questionnaire surveys and webinars, which were organised after each major phase of the project. The pool of feedback from the National Citizen Vision Workshops and Clustering workshop was reviewed, classified, and analysed. The pool of feedback from the Co-Creation workshop, as well as National Research and Policy Workshops and Online Research & Policy Consultations, was reviewed, classified, and analysed by the Technology Centre CAS.

To complete the picture of the impact on partners, we approached the consortium partners with additional "impact targeted" open questions regarding the use of methods concerning co-creation and participatory processes as well as their experience with stakeholders' familiarization with the methods and results. Both sets of feedback were analysed by standard descriptive methods. The questionnaires are attached to the report in the Annex IV and V.

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[17] This design of the questionnaire with multiple choice and a minimum of open questions was chosen to increase the chance of being filled by policy officers.

The Impact of CIMULACT on the H2020 Work Programme 2018 – 2020

H2020 Work Programmes 2018 – 2020

Horizon 2020 is one of the largest research and innovation programmes in the world. The investigated Work Programme 2018 – 2020 (WP) was published on October 27, 2017, ten months after publishing the final 23 CIMULACT research topics. The objective of H2020 is to support EU competitiveness, to develop technology and processes, and to provide innovative solutions for society's challenges.

The Horizon 2020 WP 2018 – 2020 follows five priority areas: 1) Increased investment in sustainable development, and climate-related research and innovation; 2) Integrating digitisation of all industrial technologies and societal challenges; 3) Strengthening international research and innovation cooperation; 4) Societal resilience and 5) Market creating innovation.

The first priority focuses on areas related to sustainable development and climate resilience.   Namely R&I actions' emphasis on the implementation of the Energy Union, reducing the environmental impact through the use of renewable energy sources, decarbonisation of the energy system, and the impact of climate change. Besides that, this priority also deals with clean energy innovation (including renewables, energy storage solutions, energy efficient architecture, and transport mobility) and circular economy.

The emphasis on the integration of "digital" in all its forms, cybersecurity, and the societal impact of the digital transformation is integrated into the second priority. The third priority deals with international cooperation as a means for EU's scientific leadership.

The main topics of the priority Societal Resilience are security (e.g. in respect to terrorism, cyberattacks) and migration. The last priority concerns market-creating innovation since innovations and new business models offer opportunities for economic growth and job creation.

The preparation of the H2020 WP 2018 – 2020 was supported by foresight which stressed eight issues with an expected impact on society in the future: 1) Hyper-connectivity and big data driving change and innovation; 2) Falling cost of energy fostering innovation; 3) Migration and demographic dynamics challenging European societies; 4) Pressure on health systems and inequalities; 5) Climate change, oceans and space; 6) Primary sector innovation being key for sustainability and well-being; 7) Biotechnology as the next wave of disrupting technologies and 8) Increasing instability as a new reality for societies.

Together with foresight studies, the preparation of the H2020 WP 2018 – 2020 was supported by stakeholder consultations and advisory groups. The stakeholder consultations include thematic groups and networks (e.g. European Technology platforms, European Innovation Partnerships) as well as specific expert groups and results of Framework Programme (FP) projects where CIMULACT was highlighted as the only example of the FP projects that enabled direct interactions with citizens.

Horizon 2020 consists of seven individual Work Programmes which relate to Societal Challenges. Each individual Work Programme includes several priority areas in which Calls for proposals were announced with the issue of the H2020 WP 2018 – 2020 in October 2017.[18]

Work Programme: Health, demographic change and wellbeing

The Programme refers to four challenges concerning healthcare: 1) Rising and unsustainable health and care costs; 2) External environmental factors influencing health; 3) Threats of infectious diseases and 4) Health inequalities and access to healthcare. The research shall take into account effective integration of personalized medicine as well as needs of vulnerable groups of citizens; it is also important to understand the role of the environment and support digitization in healthcare.

The Work Programme consists of the following Calls: 1) Better health and care, economic growth and sustainable health systems; 2) Digital transformation in health and care and 3) trusted digital solutions and cybersecurity in health and care.[19]

Work Programme: Food security, sustainable agriculture and forestry, marine, maritime and inland water research and the bioeconomy

The Work Programme reacts to challenges such as mitigating climate change, food security, securing natural resources, promoting alternatives to fossil-based economies, and sustainable use of marine resources. Supporting sustainable food systems and healthy life styles, and making the transition towards a circular economy are two of the solutions to these challenges.

The Work Programme includes these calls 1) Sustainable food security, 2) Blue growth, and 3) Rural renaissance.[20]

Work Programme: Secure, clean and efficient energy

The Work Programme supports actions concerning renewable energy, smart energy systems, energy efficiency, and carbon capture utilization and storage. The main emphasis is put on priorities like decarbonising the EU building stock; EU leadership on renewables, and affordable and integrated energy storage solutions.

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[18] General introduction of the Horizon 2020 Work Programme 2018 – 2020. Available at: http://ec.europa.eu/research/participants/data/ref/h2020/wp/2018-2020/main/h2020-wp1820-intro_en.pdf

[19] Horizon 2020 Work Programme 2018 – 2020: Health, demographic change and wellbeing. Available at: http://ec.europa.eu/research/participants/data/ref/h2020/wp/2018-2020/main/h2020-wp1820-health_en.pdf

[20] Horizon 2020 Work Programme 2018 – 2020: Food security, sustainable agriculture and forestry, marine, maritime and inland water research and the bioeconomy. Available at: http://ec.europa.eu/research/participants/data/ref/h2020/wp/2018-2020/main/h2020-wp1820-food_en.pdf

It incorporates one call: Building a low-carbon, climate resilient future: secure, clean, and efficient energy.[21]

Work Programme: Smart, green and integrated transport

The aim of this Work Programme is to achieve a resilient, resource-efficient, climate and environmentally friendly, safe and seamless European transport system. Additionally, the programme works towards resource efficient transport with the respect to the environment; better mobility, less congestion, more safety, and security, global leadership for the European transport industry, socio-economic and behavioural research, and forward-looking activities for policy making.

The Work Programme consists of 3 calls: 1) Mobility for Growth, 2) Digitising and Transforming European Industry and Services: Automated Road Transport, and 3) Building a low-carbon, climate resilient future: Green Vehicles[22].

Explicitly within the first call "Mobility for Growth", a number of topics for research and innovation priorities proceeded from citizens' visions of the future identified as part of the CIMULACT project[23].

Work Programme: Climate action, environment, resource efficiency and raw materials

The Work Programme is mainly devoted to sustainable development. Based on that, the programme defines six priorities: Climate action (in support of the Paris agreement); circular economy; raw materials; water for our environment, economy, and society; innovating cities for sustainability and resilience and protecting and leveraging the value of our natural and cultural assets.

Part of the Work Programme are two calls: 1) Building a low-carbon, climate resilient future: climate action in support of the Paris Agreement, and 2) Greening the economy in line with the Sustainable Development Goals (SDGs).[24]

Work Programme: Europe in changing world – Inclusive, innovative and reflective societies

The Work Programme aims at fostering understanding of Europe and providing and supporting inclusive, innovative, and reflective European societies. It emphasises the future

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[21] Horizon 2020 Work Programme 2018 – 2020: Secure, clean and efficient energy. Available at: http://ec.europa.eu/research/participants/data/ref/h2020/wp/2018-2020/main/h2020-wp1820-energy_en.pdf

[22] Horizon 2020 Work Programme 2018 – 2020: Smart, green and integrated transport. Available at: http://ec.europa.eu/research/participants/data/ref/h2020/wp/2018-2020/main/h2020-wp1820-transport_en.pdf

[23] Horizon 2020 Work Programme 2018 – 2020: Smart, green and integrated transport, p.11. Available at: http://ec.europa.eu/research/participants/data/ref/h2020/wp/2018-2020/main/h2020-wp1820-transport_en.pdf

[24] Horizon 2020 Work Programme 2018 – 2020: Climate action, environment, resource efficiency and raw materials. Available at: http://ec.europa.eu/research/participants/data/ref/h2020/wp/2018-2020/main/h2020-wp1820-climate_en.pdf

of work with a focus on technological transformations and the knowledge and digital-driven economy.

The Work Programme contains three main calls: 1) Migration, 2) Socioeconomic and cultural transformations in the context of the fourth industrial revolution, and 3) Governance for the future.[25]

Work Programme: Secure societies – Protecting freedom and security of Europe and its citizens

The main aim for the Work Programme, to develop new technologies and working methods for solutions to emerging security threats, is divided into three calls: 1) Protecting the infrastructure of Europe and the people in the European smart cities, 2) Security, and 3) Digital security.[26]

The topics (calls) established the basis for the investigation of the thematic relevance of the CIMULACT project for the H2020 WP 2018 – 2020.

The comparison of the CIMULACT citizen-based topics with H2020 WP 2018 – 2020

The focus of this chapter is on comparing CIMULACT research topics with H2020 WP 2018 – 2020 and the identification of thematic overlap. Twenty-three research topics (see Figure 2) were presented to the Commission as the final outcome of the CIMULACT project. These research topics, based on citizens' visions, were developed from the "Research programme scenarios", enriched at National Research and Policy Workshops and the Online Research & Policy Consultations. Finally, enriched suggestions of research topics were revised at the Pan-European conference with the participation of EC policy officers.

For the distribution of the final 23 CIMULACT research topics we have used data presented in Deliverable 2.2 (Figure 3)[27] where each of the research topics was assigned to one or more Societal Challenges. It is evident that the most CIMULACT research topics refer to

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[25] Horizon 2020 Work Programme 2018 – 2020: Europe in changing world – Inclusive, innovative and reflective societies. Available at: http://ec.europa.eu/research/participants/data/ref/h2020/wp/2018-2020/main/h2020-wp1820-societies_en.pdf

[26] Horizon 2020 Work Programme 2018 – 2020: Secure societies – Protecting freedom and security of Europe and its citizens. Available at: http://ec.europa.eu/research/participants/data/ref/h2020/wp/2018-2020/main/h2020-wp1820-security_en.pdf

[27] CIMULACT Deliverable 2.2: Social needs based research programme scenarios including 10 to 15 simulated calls for H2020. Available at: http://www.cimulact.eu/wp-content/uploads/2017/03/CIMULACT-Deliverable-2.2-2017_low_res.pdf

Challenge 6 (18 research topics). The second most important is Challenge 1, within which 11 research topics are grouped.

Figure 3: CIMULACT research topics[28]

CIMULACT Research topics
1. Access to equal and holistic health services and resources for all
2. At one with nature
3. Balanced work-life model
4. Consume smarter, increase well-being
5. Debating alternative economic models
6. Design thinking and doing and life skills for all
7. Dissemination and continuous exploitation of research and innovation in the healthcare system
8. Educational ecosystem as a driver of social innovation and local development
9. Empowered citizens
10. Empowering diversity in communities
11. Evidence-based community building
12. Evidence-based personalized healthcare
13. Evolving food culture in growing cities
14. Fostering equal opportunities in the digital era
15. Good quality food for all
16. I am empowered to lead my changes
17. Learning for society
18. Making dense and growing urban areas more sustainable and liveable
19. Meaningful research for community
20. Smart energy governance
21. Sustainable transport solutions that enable us to live where we choose
22. Technology as a means of well-being

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[28] CIMULACT 23 citizen-based topics for future EU research. http://www.cimulact.eu/wp-content/uploads/2018/02/CIMULACT-Booklet-Final-compressed.pdf

23.	Urban-rural Symbiosis

The least number of research topics can be found within Challenge 2 (3 research topics) and 3 (2 research topics). Societal challenge 7 (Secure societies – protecting freedom) was not explicitly covered by the 23 citizen-driven research topics, however the research team considered some implicit (expected) relevance of 7 topics to this challenge (ref. Deliverable 2.2). For this reason, the respective column in Figure 3 is displayed in a different pattern than the others.

This distribution (Figure 3) of research topics across the Societal Challenges provided the initial guidance for the assessment of the correspondence of the final 23 citizen-based research topics with the H2020 WP 2018 – 2020 topics.

Figure 4: The distribution of the CIMULACT research topics across Societal Challenges based on Deliverable 2.2[29]
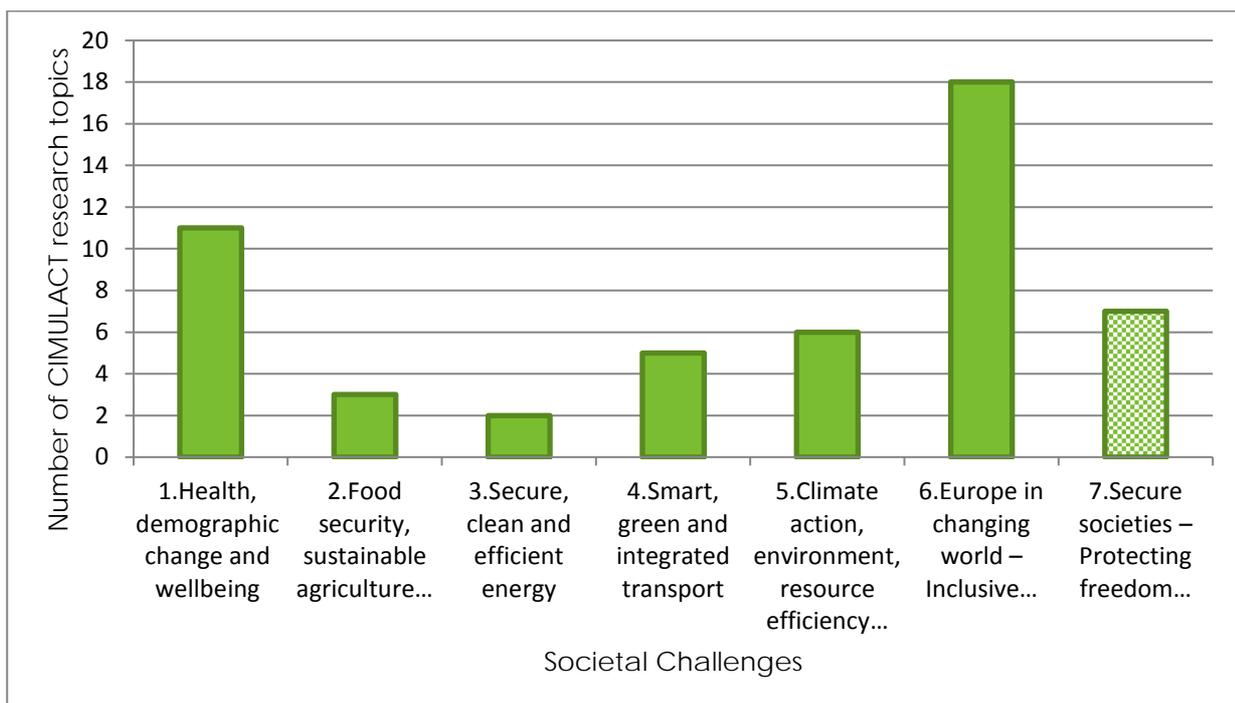
Fifteen of the final 23 CIMULACT research topics found their clear reflection in 22 topics in the H2020 WP 2018 – 2020 (Table 2). This correspondence between CIMULACT and the

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[29] CIMULACT Deliverable 2.2: Social needs based research programme scenarios including 10 to 15 simulated calls for H2020. Available at: http://www.cimulact.eu/wp-content/uploads/2017/03/CIMULACT-Deliverable-2.2-2017_low_res.pdf

Work Programme given by the co-occurrence of keywords, while taking into consideration their contexts, suggests thematic overlap on this aggregation level. It is, however, important to note that 9 out of 15 CIMULACT research topics are relevant for more than one H2020 WP 2018 – 2020 topic, while for 8 out of the 23 final CIMULACT research topics we lack evidence that there is any correspondence with the H2020 WP 2018 – 2020.

Table 4: Reflection of the CIMULACT research topics in the H2020 WP 2018 – 2020 (thematic overlap)

Work Programme	H2020 topic	CIMULACT topics[30]
1. Health, demographic change and well-being	Exploiting research outcomes and application potential of the human microbiome for personalised prediction, prevention and treatment of disease (page 12)	Evidence-based personalized healthcare (page 14)
	Rare Disease European Joint Programme Cofund (page 13)	Dissemination and continuous exploitation of research and innovation in the healthcare system (page 13)
	Actions in support of the International Consortium for Personalised Medicine (page 18)	Access to equal and holistic health services and resources for all citizens (page 15)
	Demonstration pilots for implementation of personalised medicine in health care (page 55)	Evidence-based personalized healthcare (page 14) Access to equal and holistic health services and resources for all citizens (page 15)

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[30] http://www.cimulact.eu/wp-content/uploads/2018/02/CIMULACT-Booklet-Final-compressed.pdf

	Prototyping a European interoperable Electronic Health Record (EHR) exchange (page 80)	Evidence-based personalized healthcare (page 14)
2. Food security, sustainable agriculture and forestry, marine and maritime and inland water research and the bioeconomy	Personalized Nutrition (page 28)	Good quality food for all (page 18) Evolving food culture in growing cities (page 19)
	Towards healthier and sustainable food (page 31)	Evolving food culture in growing cities (page 19) Good quality food for all (page 18)
	Innovative and citizen-driven food system approaches in cities (page 40)	Good quality food for all (page 18) Urban-rural symbiosis (page 25)
	Realising the potential of regional and local bio-based economies (page 108)	Evolving food culture in growing cities (page 19)
3. Secure, clean and efficient energy	Enabling next-generation of smart energy services valorising energy efficiency and flexibility at demand-side as energy resource (page 36)	Smart energy governance (page 20)
	Market Uptake support (page 70)	Smart energy governance (page 20)
	Mitigating household energy poverty (page 75)	Smart energy governance (page 20)
4. Smart, green and integrated transport	Sustainable multi-modal inter-urban transport, regional mobility and spatial planning (page 17)	Sustainable transport solution that enable us to live where we choose (page 22) Urban-rural symbiosis (page 25)

	Harnessing and understanding the impacts of change in urban mobility on policy making by city-led innovation for sustainable urban mobility (page 19)	Sustainable transport solution that enable us to live where we choose (page 22)
	An inclusive digitally interconnected transport system meeting citizens' needs (page 65)	I'm empowered to lead my changes (page 12) Fostering equal opportunities in the digital era (page 32)
5. Climate action, environment, resource efficiency and raw materials	Demonstrating systemic urban development for circular and regenerative cities (page 33)	Urban-rural symbiosis (page 25) Making dense and growing urban areas more sustainable and liveable (page 26) Consume smarter, increase well-being (page 24)
	Strengthening international cooperation on sustainable urbanisation: nature-based solutions for restoration and rehabilitation of urban ecosystems (page 58)	Making dense and growing urban areas more sustainable and liveable (page 26) At one with nature (page 23)
	Visionary and integrated solutions to improve well-being and health in cities (page 60)	Making dense and growing urban areas more sustainable and liveable (page 26)
6. Europe in a changing world - inclusive, innovative and reflective societies	Research for inclusive growth: addressing the socioeconomic effects of technological transformations (page 18)	I'm empowered to lead my changes (page 12)
	Innovative solutions for inclusive and sustainable urban environments (page 20)	Urban-rural Symbiosis (page 25)

	New forms of delivering public goods and inclusive public services (page 41)	Empowered citizens (page 29)
	Pilot on using the European cloud infrastructure for public administrations (page 48)	Evidence-based community building (page 28)

Note: the co-occurrence of keywords method; the Work Programme 7 (Secure societies) is not included because it has no explicit correspondence in the 23 final CIMULACT research topics (see Figure 4).

Source of Table 2: own assessment

Figure 4 shows the number of CIMULACT research topics explicitly corresponding to the topics of H2020 WP 2018 – 2020. The majority of CIMULACT research topics can be assigned to the Work Programme 1 (5 topics), 2 and 6 (both 4 topics). Three research topics relate to the Work Programme 3, 4 and 5. On the other hand, the Work Programme concerning "Secure Societies" is not represented by any of the CIMULACT research topics.

From this overview it is evident that more than half of the CIMULACT research topics are covered by the topics of H2020 WP 2018 – 2020. Though this does not prove that CIMULACT research topics were actually used for developing the H2020 WP 2018 – 2020, the identification of common themes between CIMULACT research topics and H2020 WP 2018 – 2020 confirmed that social needs and wishes of citizens about desirable European future were included in H2020 WP 2018 – 2020 in a substantial extent (15 of 23 citizen-based topics have some correspondence in the H2020 WP 2018 – 2020, 9 calls[31] refer to a citizen-based topic).

The results of the comparison with foresight studies (Deliverable 5.2[32]) also showed that elements of the CIMULACT topics were well represented within expert foresight studies (10 out of 16 studies include one or more references to research topics identified in CIMULACT), though often with distinct differences in focus.

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[31] 1) Better Health and care, economic growth and sustainable health systems; 2) Digital transformation in Health and Care; 3) Sustainable Food Security; 4) Rural Renaissance; 5) Building low-carbon, climate resilient future: secure, clean and efficient energy; 6) Mobility for Growth; 7) Greening the economy in line with the Sustainable Development Goals (SDGs); 8) Socioeconomic and cultural transformations in the context of the fourth industrial revolution; 9) Governance for the future

[32] Deliverable 5.2: Report on comparison of research topics from CIMULACT with those from expert oriented foresight studies. Available at: http://www.cimulact.eu/wp-content/uploads/2018/04/D5.2_Report-on-comparison-expert-oriented-foresight-studies-compressed.pdf

The following analysis of the individual Work Programmes and their overlap with the CIMULACT topics is based on the analysis of identified key words – for more details on the results and topics see Table 3 above.

Work Programme: Health, demographic change and well-being

The thematic overlap between CIMULACT research topics and the topics from the WP "Health, demographic change and well-being" corresponds to the priorities of personalized medicine, innovation health and care systems and its digital transformation. The overlap is not total, though, since the WP includes themes of the health and care industry, infectious diseases, or the role of environment and climate change for health that are not, at least not explicitly, identified among the 23 CIMULACT research topics.

In both CIMULACT research topics and topics of this WP, the stress on healthcare systems is based on the personalized approach that brings benefits to citizens as well as to the system performance. This approach takes into account citizens' needs and enhances the sustainability of healthcare systems. The personalized approach assumes that new care models, innovation, and valuable clinical tools, aimed at the single person, are needed in order to provide better access to healthcare as well as to secure better prediction and prevention of diseases. Moreover, the close link to research should secure the use of research results and strengthen innovation leading to a positive impact for patients.

The issue of digitization, the use and production of data that associate with such new healthcare systems and services, are covered by both CIMULACT research topics and WP topics. For the efficient reuse of data that provides people with empowering and improving healthcare, suitable conditions must be established in terms of e.g. data security, privacy or storage.

As we might see from Table 3, based on the key words analytical comparisons, there is a significant thematic focus overlap of H2020 and 3 CIMULACT out of the 23 topics: 1) Evidence-based personalized healthcare (holistic approach, develop user lifestyle methods and technology), 2) Access to equal and holistic health services and resources for all citizens (patient-centred health care or effective use of data), and 3) Dissemination and continuous exploitation of research and innovation in the healthcare system (strengthening public engagement).

Work Programme: Food security, sustainable agriculture and forestry, marine and maritime and inland water research, and the bioeconomy

Three CIMULACT research topics are relevant to the WP "Food security, sustainable agriculture and forestry, marine and maritime and inland water research, and the bioeconomy". The priorities of these topics are related to the relationship between food production and ecosystem functions, food quality and consumer health. Moreover, the emphasis is placed on changing environmental conditions and the development of innovative and sustainable food and non-food chains and services, as well as the optimal use of resources to support the diverse needs of communities and businesses. The content

of the Call "The Blue Growth (e.g. sustainable harvesting the resources from seas, sustainable growth in the maritime sector or protecting biodiversity)" is not explicitly covered by CIMULACT research topics.

Specifically, one of the thematic overlaps between CIMULACT research topics and WP topics concerns personalized nutrition and healthy food. Personalized nutrition can lead to empowering individuals and groups of people while changing their consumer behaviour towards healthier and more sustainable lifestyles. Consequently, sustainable production and processing methods are needed, which require research and the active engagement of different actors, such as civil society, stakeholders, policymakers, etc.

Both CIMULACT topics and topics from WP also cover the issue of the health of European citizens; these were influenced by the approach of cities and regions to sustainable food environment. It relates to the pressing issue of sustainable food security in terms of its affordability, safety, and nutritious value. Additionally, with growing demand for regional and locally produced food, there will be a need to increase awareness and engage local and regional stakeholders, through participative and co-creation processes, to develop strategies for local food production reflecting the existing conditions at the local and regional level.

Work Programme: Secure, clean and efficient energy

Although there is only one CIMULACT research topic (20. Smart energy governance) corresponding to WP Secure, clean and efficient energy, we can identify 3 priority areas this topic relates to: energy efficiency, smart and clean energy for consumers, and the effort to be a global leader in renewables.

The thematic overlap between topic "Smart energy governance" and WP topics addresses energy efficiency that directly influences energy costs for customers, energy independence, energy poverty, and building smart and sustainable infrastructure. The future trend lies within the decentralization and decarbonisation of the energy systems of buildings, digital smart technologies and an emphasis on new business opportunities (e.g. innovative energy, flexible consumption). The focus is also on renewable energy solutions and their implementations at consumer scale, as well as the changing role of consumers that should be more active and empowered in energy markets and services.

Moreover, topics are built on the assumption that energy efficiency measures, and the increased use of renewables, will help to handle energy poverty. The aim is to empower individuals and communities to participate in the transition to renewables that could result in improving living conditions and the greater accessibility of energy for end users. The specific CIMULACT topic focused on empowering citizens in order to gain influence on management of smart energy systems and price mechanisms so that smart energy doesn't eventually become a new way of increasing profitability of energy suppliers at the cost of consumers. This focus can be found embedded implicitly in the WP topics of relevance.

Work Programme: Smart, green and integrated transport

The thematic overlap between the WP "Smart, green and integrated transport" and CIMULACT research topics concern transport transformation towards zero-emissions and socio-economic and regulatory aspects (i.e. sustainable spatial planning integrating innovative transport solutions, increasing public awareness). Emphasis is also placed on the digitization of transport systems.

In particular, the thematic overlap addresses new forms of mobility of people with the potential consequences for spatial organization of cities and their surroundings, and transport in general. Thus, a multidimensional approach is needed in order to assess e.g. the impact of transport, infrastructure, environmental, and quality-life issues. It is also necessary to understand the impact of new urban mobility solutions on policy making, as well as the needs of various groups of citizens, accounting for specificities of local conditions. The new forms of mobility solutions (including digitization) offer great opportunities for participants to be active in digital travel ecosystems but, at the same time, they need to acquire new skills to do so.

Work Programme: Climate action, environment, resource efficiency and raw materials

CIMULACT research topics corresponding to the topics in the WP "Climate action, environment, resource efficiency and raw materials" point to the transition to a circular economy in order to maintain the value and utility of products, materials, and resources – especially regarding the altered value chain and urban consumption patterns in cities. Here the essential role relates to cities as the hubs of technological and social innovation. In particular, circular economy is needed to increase the connectivity between existing and new ecosystems (including their renewal) in urban-rural areas, and to design and manage public spaces, for increased sustainability and equitability, resulting in healthier and better-quality life.

Work Programme: Europe in a changing world - inclusive, innovative and reflective societies

Within the WP "Europe in a changing world - inclusive, innovative and reflective societies", two areas have thematic overlaps with CIMULACT research topics: 1) Socioeconomic and cultural transformations in the context of Industry 4.0 and 2) Governance for the future. The WP area of governing the migration from third countries and the integration of migrants was not taken up by CIMULACT research topics.

The thematic overlap between CIMULACT research topics and WP topics for the first area – socioeconomic and cultural transformation – relates to changes within the working environment (i.e. automation, digitization) with its challenges, opportunities, and risks. Another theme with thematic overlap is the identification of the main drivers of inequality between urban and peripheral environment and the identification of the best practice to overcome this condition.

In the second area – governance for the future – CIMULACT research topics, as well as WP topics, focus on the transformation of governance by new approaches for delivering

better public services, and on developing and enhancing evidence-based policies that can lead to higher trust in authorities.

Work Programme: Secure societies – Protecting freedom and security of Europe and its citizens

The research priorities for the WP "Secure societies – Protecting freedom and security of Europe and its citizens" cover issues like the protection of the infrastructure in European cities, security against disasters (both natural and man-made), border security and fighting against terrorism, and cybersecurity and data protection that are not explicitly included in the 23 CIMULACT research topics.

Figure 6: Number of CIMULACT research topics across H2020 WPs 2018–20
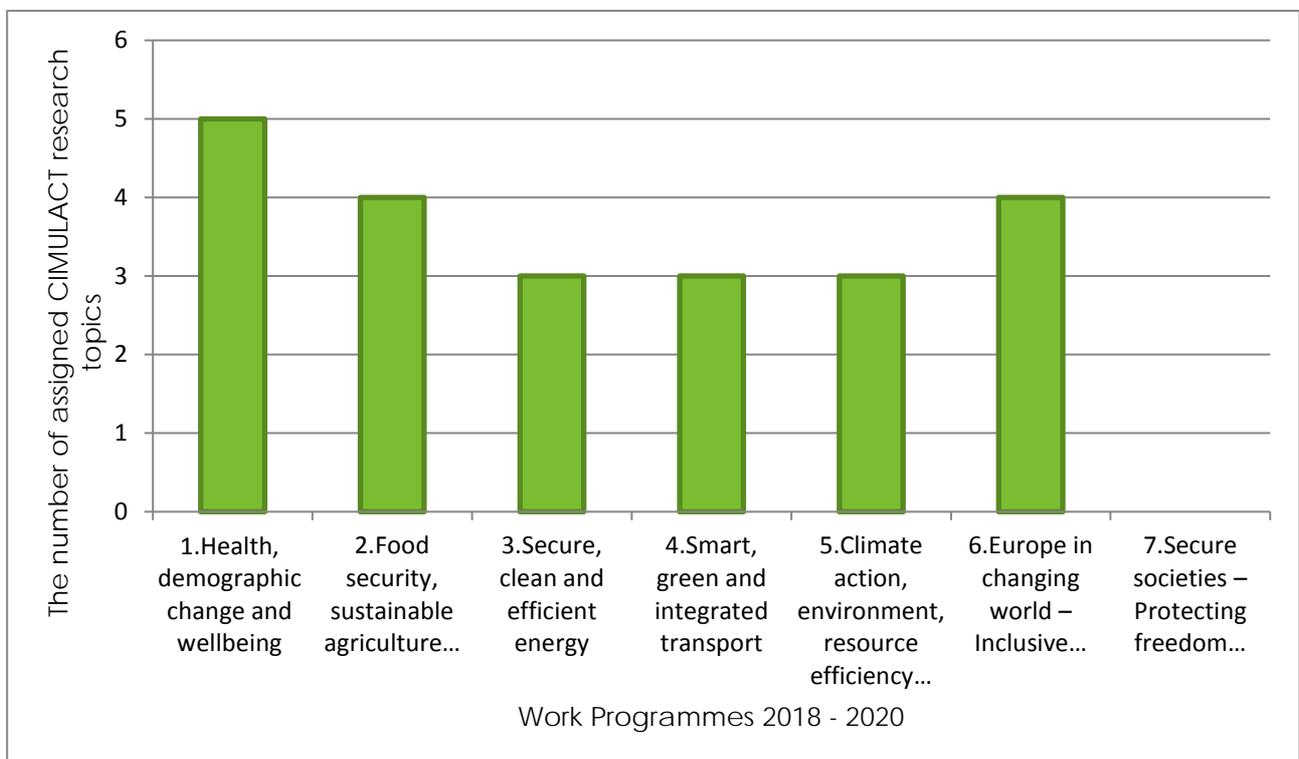
There were 8 citizen-based research topics provided by the CIMULACT project which were not reflected in the recent H2020 WP 2018–20. This is to be expected (see also chapter 1.4).

- The CIMULACT project was challenged by very tight deadlines vis-a-vis the production of content in WP 2018-20, even though there was very good communication between Commission services officers of the programmes and the

consortium. The final 23 research topics [33] were made available for the Commission after many WP topics had already been elaborated, and the CIMULACT outcomes could, thus, only be expected to be incorporated to a certain extent.

- The CIMULACT report was one of many sources of ideas for research. Moreover, according to the interviewed policy officers, the Commission did not look for elaborated topics. Rather, the Commission wanted to learn about research directions the citizens considered important.

We selected four examples of good overlap between the CIMULACT 23 research topics and the H2020 WP-2018-2020. The cases presented with topic headings are showed in Table 3.

Table 5: Select pairs of topics for further investigation

#	Topic H2020 WP 2018-2020	CIMULACT topic (of final 23)	Common keywords	ACRONYM
1	Demonstration pilots for implementation of personalised medicine in healthcare	Evidence-based personalized healthcare + Access to equal and holistic health services and resources for all citizens	Personalised medicine (PM), big data, improvement of the health care system	Personalised medicine
2	Sustainable multi-modal inter-urban transport, regional mobility and spatial planning	Sustainable transport solution that enable us to live where we choose + Urban-rural symbiosis	Sustainable transport model, metropolitan area, new transport technologies, business model	Sustainable transport
3	Visionary and integrated solutions to improve well-being and health in cities	Making dense and growing urban areas more sustainable and liveable	Green areas, urban fabric, urban sustainability	Liveable cities
4	Research for inclusive growth: addressing the socioeconomic effects of technological transformations	I'm empowered to lead my changes	Technological transformation, skill acquirement, education, flexible labour market	People and technology

We stated common keywords for each H2020 WP 2018-2020 and CIMULACT pair. These are keywords in the sense that they represent categories of subjects and ideas presented in both topics, but it does not mean that they are words of the investigated texts. The common keywords give an early indication of the areas of the overlap between the

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[33] CIMULACT Deliverable 2.2: Social needs based research programme scenarios including 10 to 15 simulated calls for H2020. Available at: http://www.cimulact.eu/wp-content/uploads/2017/03/CIMULACT-Deliverable-2.2-2017_low_res.pdf

topics. For further presentation we introduced short names of the cases (called ACRONYMs in Table 3) and their representative colours.

Table 5 summarises the results of the expert judgement about the similarity (overlap of topics). Cases 3 and 4 show a very high rate of overlap of the WP and CIMULACT topics. In these cases, H2020-WP-2018-2020 is fully in line with the wishes of citizens identified in the CIMULACT project. In the first case, WP covers only part of the citizen-driven research topic or direction. Clearly, CIMULACT raised attention to a set of issues concerning personalised medicine (citizens´ demand for them) which will likely be examined in the future. Case 2 represents another typical situation in the comparison of topics. While WP clearly addresses common European transport priorities, citizens are more interested in the local issues. Citizens claim more attention should be paid to transport as a means of deeper integration of urban and rural areas. Again, there is great opportunity for the Commission and MS to utilise CIMULACT results to design research programmes in the near future. The emphasis on "local" might suggest using a framework of greater participation between the European and national programmes (e.g. in Joint Programming Initiatives).

Table 6: Results on the overlap assessment of the selected four cases

Case	Rate of the overlap	Relation of the topics	Comment
1. Personalised medicine	48%	WP<CIMULACT	CIMULACT has overall wider scope than H2020-WP 2018-2020. This is because CIMULACT puts PM into a broader framework of holistic medicine, whereas the WP emphasizes scientific and technical approach towards a PM-based model
2. Sustainable transport	58%	WP><CIMULACT	The focus on local transport surrounding urban centres is common. Nevertheless, WP exceeds CIMULACT in its territorial scope, while CIMULACT is broader in the thematic scope.
3. Liveable cities	91%	WP = CIMULACT	Almost a complete overlap in all dimensions, there are just some minor additions to both topics which extend them in different directions.
4. People and technology	81%	WP>CIMULACT	From the perspective of future strategy or policy, H2020-WP-2018-2020 is thematically broader than CIMULACT

The overlap is further illustrated in the charts below (Figure 6). Since we selected typical cases of the intersection between CIMULACT and H2020-WP-2018-2020, this visualisation shows the capacity (either realised or potential) of the CIMULACT project outcomes and the underlying methodology of citizen consultation and co-creation to feed European research strategies and programmes.

We used averages in summarising expert opinion. These are well justifiable since there is a great level of agreement among the experts' judgements. The differences in the judgements on the overall overlap of the topics are less than 13 percentage points. Also, the expert assessments of the similarity of the individual chapters of the topics do not exceed 10 percentage points in most cases. More details on the assessment of the overlap between H2020-WP-2018-2020 and CIMULACT topics are provided in Annex V.

Figure 5: Graphical Illustration of the overlap of selected H2020-WP-2018-2020 and CIMULACT topics
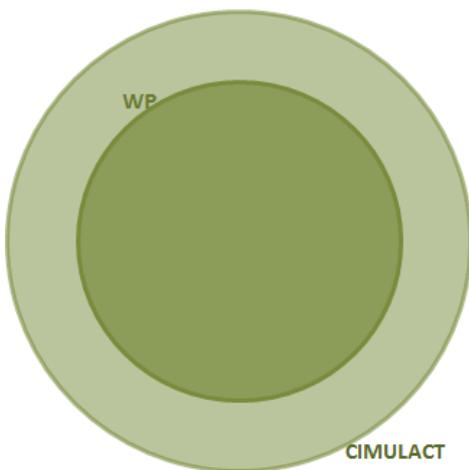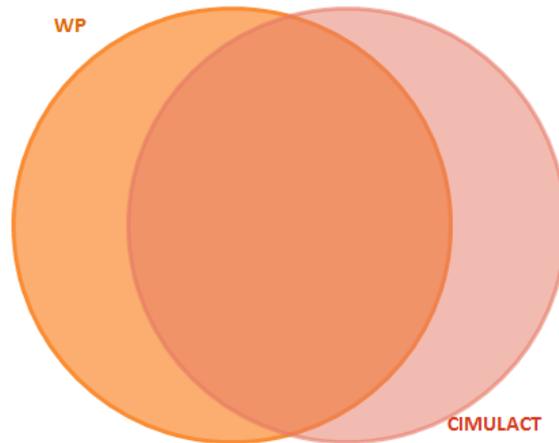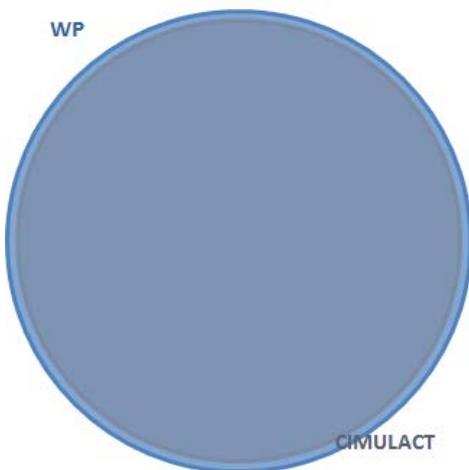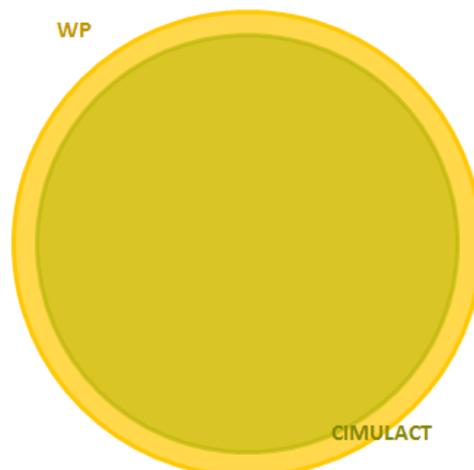
CIMULACT Citizens visions

In the early stage of the CIMULACT project, specifically at the National Citizens Vision Workshops, citizens formulated 179 citizens' visions for a desirable and sustainable future. This was the basis for further steps in formulating the citizen-based research topics. These visions expressed the diverse needs and ideas of citizens using the various levels of their elaboration and detail, from generic to more specific. In this section, we map the citizens' visions on seven Societal Challenges with the aim to understand if all citizens' visions were identified in the Societal Challenges and with which weight. In particular, we analyse if Societal Challenge 7 "Secure societies – Protecting freedom and security of Europe and its citizens" was addressed by citizens invited to the vision workshops; in other words, if the security related challenge was already absent at the beginning of the construction of citizen induced research directions. The range of visions is wide and many of the visions are holistic, embracing a multitude of perspectives. We have, therefore, chosen to compare them with the challenge descriptions rather than with the WP topics.

The produced visions are built on solidarity, community, and cooperation. They are also typically positive/constructive visions, because the vision building procedure advised citizens to see a vision as a way forward to improve their quality of life. The visions comprised citizens' wishes related to themes like health, education, tolerance, sustainability, urban structure, community housing, and work-life balance. The participating citizens emphasised family values, greening energy production, sustainability of transport, and environmental sustainability (e.g. sustainability agriculture, green urban spaces or harmony with nature). A large percentage of the visions also concerned participatory and deliberative democracy, "e-democracy" or higher degree of involvement in decisions regarding citizens' everyday lives.

Afterwards, the visions were assigned to the seven Societal Challenges by the CIMULACT research team as showed in Figure 5. It follows from this exercise that on average each vision addresses four of the seven Societal Challenges and each of the seven Societal Challenges are represented in at least 9% of the visions.[34]

Most of the visions are assigned to Societal Challenges 1 and 6, because they often address issues concerning health, demographic change, wellbeing, and inclusive, innovative, and reflective societies. In contrast, Societal Challenges 3, 4 and 7 have the least assigned visions. This is because citizens expressed concerns regarding secure, clean, and efficient energy, smart, green, and integrated transport, and protection of the freedom and security of Europe and its citizens less frequently. It is worth emphasizing that frequencies do not necessarily represent the importance of the issues and topics. All collected visions received high priorities, because only those regarded as important were selected by the participants of the workshops to be handed over to the further treatment in the CIMULACT process.

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[34] CIMULACT Deliverable 1.3: Vision Catalogue – Encompassing the visions from all 30 countries. Available at: http://wwwcimulact.eu/wp-content/uploads/2016/06/D1.3final.pdf

The comparison of the correspondence between citizens' visions and Societal Challenges (Figure 5) and the correspondence of CIMULACT research topics with H2020 WP 2018–20 topics (Figure 4) indicate the transition and transmission of ideas in the course of the CIMULACT project. In both comparisons, most visions/topics relating to WP 1 (Health) and 6 (European Societies), as well as the higher numbers of visions/topics, also associate with food issues. The reason the most visions are related to these issues may be that they concern everyday life problems of citizens, and are highly relevant from a demand-side perspective.

On the other hand, an explanation can also be that more specific issues typically require a higher level of knowledge of sectors and were created less frequently. This was indicated in the later online consultation on research programme scenarios with citizens and experts[35].

Later, in the CIMULACT process, visions were merged into more aggregated blocks of needs. In effect, citizens' needs and ideas concerning security appeared here and there in the other topics covering the 6 Societal Challenges. For more information see the Figure 5 below.

Figure 6: Correspondence between Citizens' visions and Societal Challenges based on Deliverable 1.3[36]
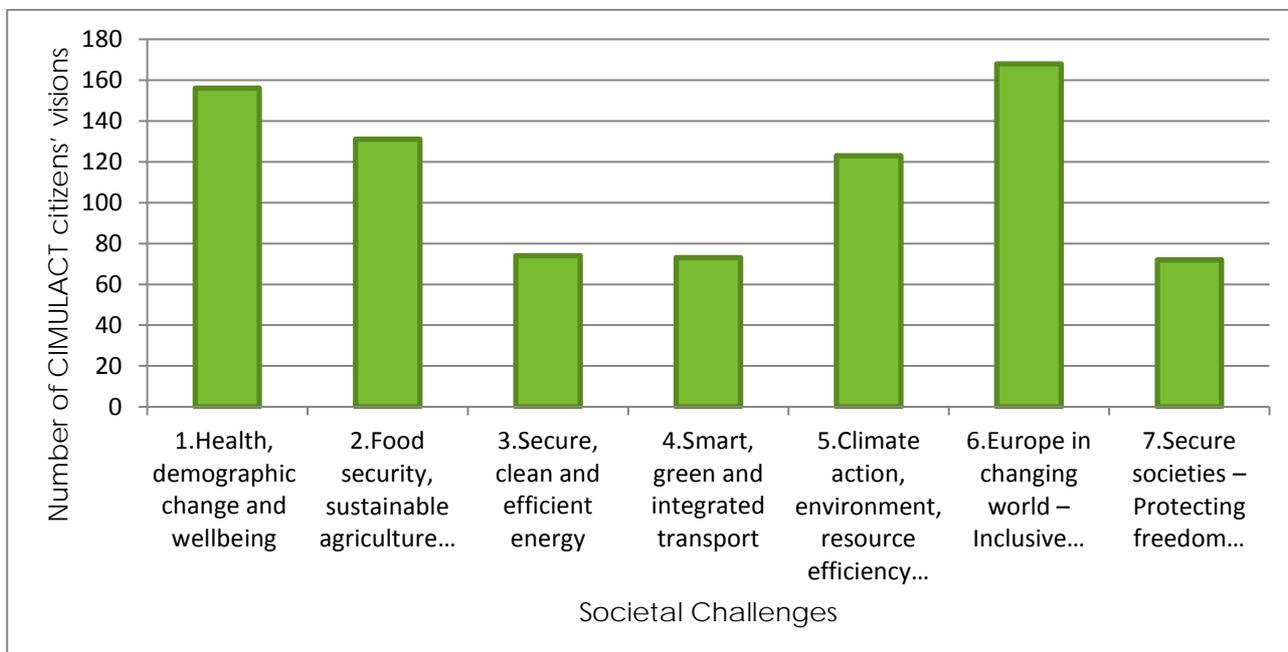
Impact of CIMULACT Research topics on Horizon 2020 WP 2018–20 based on Online Survey and Interviews with EC officers

The results of the online survey with policy officers

In this part of the research, we focused on the actual use of CIMULACT outcomes in the preparation of the H2020 WP 2018–20. First, we carried out an online survey among policy officers of the Commission services (DGs) who managed the formation of the given sub-programme of the H2020 WP 2018–20. We then conducted interviews with a selection of them. The questions posed in the survey and interviews aimed at giving us more precise and extensive feedback on the usefulness and impact of the CIMULACT results and the CIMULACT approach.

With the support of DG Research and Innovation, the online survey was distributed to 215 policy officers. The questions concentrated on EC policy officers' familiarity with the CIMULACT project and its results, the application of the CIMULACT results for formulating the Horizon 2020 WP 2018–20, and opinions on how to achieve a greater impact of participatory/public engagement on EU research and innovation agenda. Among the 43 gathered responses, 20 were incomplete with no valuable information (e.g. most of the respondents did not even fill the first question). Consequently, 23 completed responses are analysed in this chapter. Eighteen respondents were directly involved in both the preparation of H2020 WPs and the Ninth Framework Programme.

The first question[37] relates to the interest of policy officers in "what citizens think of research and innovations" (Figure 6). The major interest refers to citizens' wishes and needs (16 responses). The second rating choice for officers are concerns and fears of citizens. Values as well as knowledge of citizens were chosen by seven policy officers.

Concerning the familiarity of policy officers to the CIMULACT project and its results (Figure 7), seven policy officers followed the CIMULACT project closely, out of which two used its results/topics for formulating their H2020 WP 2018–20 contributions. One respondent used the results, although he/she did not follow the project. The indicated reason for not following the project was "lack of time to check the results"; nevertheless, colleagues of this respondent reviewed some relevant input provided by CIMULACT.

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[37] „What seems the most interesting for you when it comes to what citizens think of research and innovation?"

Figure 7: The most interesting aspects for Policy officers out of what citizens think of research and innovation
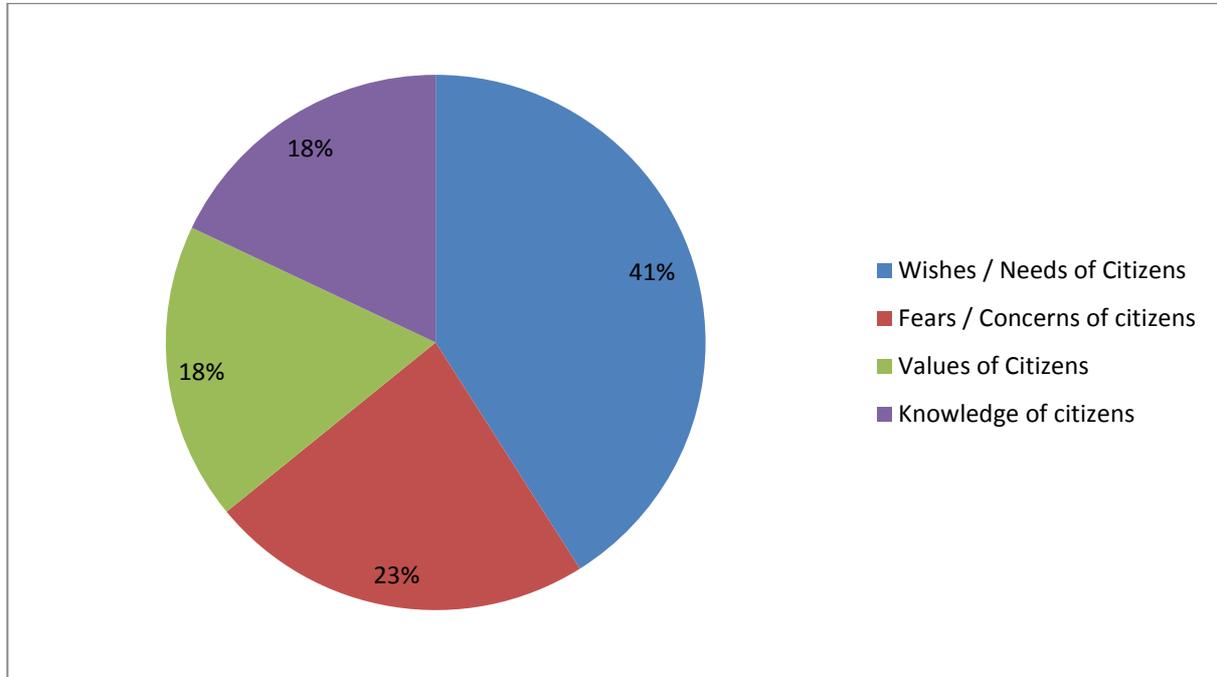
Three respondents used CIMULACT results partly, two as an inspiration for their work on the Work Programme, and one used some concrete parts of the project for formulating WP 2018–20 contributions. In one case the results or topics served as a justification of current or already defined topics. These three respondents appreciated the extent of the coverage of issues/needs of the final CIMULACT research topics. In two cases they welcomed the novelty of topics as well as the compatibility to other sources. Two of them indicated that some of the CIMULACT topics led to a concrete Work Programme 2018-20 call, or specific parts of the call. One policy officer stated that "*One of my topics is the result of three research topics identified by CIMULACT - and merged together to reach the required level of broadness*".

Although 16 respondents answered that they did not follow the project closely (i.e. they were not aware of the CIMULACT outputs delivering 23 final research topics, 48 research programme scenarios or 179 citizens' visions), four of them expressed an interest in checking the outcomes. The main reason not to follow the project was a weak awareness of the existence of the CIMULACT project outputs.

Finally, 20 policy officers did not use the results for formulating H2020 WP 2018–20. Two responses pointed out that CIMULACT results came at the late stage of the elaboration of the research agenda (this is true for the 23 topics, but not for the visions, the needs, and the research agendas). In one case the results were not used because the relevant

topics/ideas were already present in the draft WP. According to this policy officer, it nevertheless confirmed harmony between CIMULACT results and other sources used in the preparation of the WP.

Figure 8: Familiarity with and use of the CIMULACT outcomes

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                        Overall 23 respondents

   7 respondents                    16 respondents did not
   followed CIMULACT                  follow CIMULACT

          2                               1

        3 respondents used CIMULACT              4 respondents
        results for formulating H2020         expressed additional
              WP 2018 - 2020                  interest in CIMULACT


   The use of CIMULACT results:          Interesting aspects:

     • For inspiration (2x)                • Coverage of needs/issues (3x)
     • For justification (1x)              • Novelty (2x)
     • Concrete parts of                   • Compatibility to other sources
       CIMULACT topic (1x)                   (2x)
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In terms of project methodology, 13 respondents considered citizens' engagement adequate for providing trustworthy outputs. The rest of respondents were reluctant to assess the project methodology as they were not familiar with it. One respondent commented that societal engagement is necessary and although the genuine consultation process needs time and resources, it is more meaningful than online consultation. Furthermore, it needs to be done in a serious manner, i.e. everyone should be equipped with the necessary knowledge and be able to go beyond his/her day-to-day thinking. Another respondent suggested improvements, including raising awareness on how EC produces the research work programmes and defines calls and topics as well as "training" of citizens in this field, could be useful as well.

In the final questions, we investigated opinions on how participatory/public engagement approaches, similar to CIMULACT, could have a greater impact on the EU research and innovation agenda. The responses to this question mostly concerned intensive dissemination of project outcomes within the Commission to the relevant POs across the relevant DGs. Increased visibility, having a profound dissemination strategy, and communicating the results to the involved stakeholders, as well as to all directorates in DG RTD, seem to be crucial actions to increase the chance to have impact on the EU research and innovation agenda. Also, the PO of the project and associated POs need to be willing to put an effort into this task, because the project partners only have access to the EC POs through their own PO.

More future projects should be based on a methodology that incorporates the views of citizens, which will allow for increased identification of societal needs. A greater impact can be also achieved by increasing the number and volume of public engagement processes while at the same time demonstrating that resulting research and innovation reflects citizens' needs and concerns. This response connects with another one: that project outcomes (concrete ideas) should be tested with more end users and consumers. In result, it can facilitate the utilization of the research results and their transformation into new products reflecting the needs of citizens.

In addition, one respondent argued that greater public engagement could also be achieved through an introduction of citizen science and knowledge sharing at schools and universities.

Another answer argued that, to have a greater impact on EU research and innovation, projects based on co-creation/public engagement processes "*need to be institutionalized and systematically built in as part of the co-creation process of strategic and operational programming… At this moment it is used 'ad-hoc' depending on the knowledge, interest and personal motivation of individual colleagues…Directors need to understand the added-value this can bring and ensure their units follow through in a systematic way*". More systematic approach can increase the quality of these processes, but as a downside, participatory processes may slow down the agenda setting process and bring additional costs.

The results of the interviews with policy officers

We conducted two interviews with policy officers by phone and we had two face-to-face meetings with three policy officers in Brussels. Only one of these interviewed officers was slightly familiar with the CIMULACT project. The other four were not only well informed, but had in some way used the results in their work. One respondent reported CIMULACT results to the foresight group of DG RTD. The conducted interviews provided more details to the online survey outputs on the impact, because there was enough space given to identify possible bottlenecks in the exploitation of the CIMULACT results too.

All interviewees agreed that citizens are competent to suggest directions for research topics. In particular, citizens are aware of what solutions they expect and what they want to be done. Thus, they are able to indicate societal needs of relevance to the R&I agenda setting. The policy officers did not expect that citizens would understand all of the research areas but agreed that citizens can play a key role in some research areas.

CIMULACT addressed the whole area of citizens' interests and concerns based on citizens' visions for a desirable and sustainable future. In response, the policy officers did not expect that citizens identify how to solve some issues, but they expect citizens to help them to identify areas that are important to them. For instance, citizens are able to prioritize between different options in the areas of health or food. A co-creation project like CIMULACT, with the genuine process of consultations and simultaneous use of the bottom-up approach, can bring solutions to societal issues. The conclusion is that the project has proved to be a highly positive public engagement process with clear relevance to the agenda setting process.

Moreover, the respondents with knowledge of the project methodology consider the project to be the right instrument for the engagement of citizens. Nevertheless, they stated that a prerequisite for success is, researchers/project teams that are well trained for genuine citizen consultations, asking appropriate questions, while reserving enough time to establish trustful relationships with participants (citizens, experts, stakeholders, policy makers) and develop meaningful research topics.

Views differ regarding the quality of research topics. Most of the interviewees consider them sufficiently elaborated and interesting. On the other hand, one interviewee considers CIMULACT research topics sufficient for the justification of the WP but would need more details to make a clear statement. The results bring the research closer to citizens, and policy officers can use it for the establishment and comparison of research priorities. Besides, research topics based on needs and expectations of citizens can help distinguish between political pressure and real citizens' problems.

Interviewees believe that the use of CIMULACT outcomes in the preparation of FP9, are relevant. CIMULACT results can influence the level of priorities and the project experience should lead to methodological recommendations for FP9. At minimum the CIMULACT outcomes can bring "food for thought": e.g. how the research programme contributes to addressing citizens' needs and expectations and the impact research can have on citizens. Generally, if it turns out that the new FP supports public engagement in R&I, projects like CIMULACT should be fully utilised in its formulation.

All interviewees agreed that a positive way of presenting citizens' visions might lead to new ideas or perspectives. Historically, citizens' voices in the R&I domain have referred to fears about the impacts of technologies, which led policy officers to hold the view that citizens should be aware of risks as well as benefits, e.g. especially if it concerns specific or "sensitive" topics (e.g. automation, the future of work). If citizens are not familiar with the issue, it can cause fears which could prevent them to look for more information. Hence, the approach adopted in CIMULACT (transforming fears into requirements and

expectations) was appreciated. Input from citizens is only one of many sources for formulating research work programmes; however, the officers agreed that the Commission should not neglect citizens' expectations and fears either in the process or in the final document.

Finally, we discussed with policy officers how to better deliver the results of projects like CIMULACT to those who might want to use them – In other words, how to be more visible among the Commission services. While the whole process depends on knowledge sharing and knowledge management it seems that the Commission has reserves in this respect. Thus, some important sources might be omitted or simply unrecognized. The solution could be the creation of a "virtual" space/information repository with summary information that could be taken into account for formulating WPs. Publishing project results only on the website, without receiving any internal notice (e.g. from DG RTD), may reduce the policy officers' chance of using project results and potential inputs.

Organizing small events or seminars during lunch breaks for policy officers to present project results is one of the traditional methods used to increase the project's impact in the EC itself. For instance, in the case of the CIMULACT project, all relevant policy officers were invited to the CIMULACT presentation in early 2016. While the research units of the Commission services were continuously informed on the CIMULACT reports, individual officers lacked awareness of the relevance of these outputs to their work. While the above suggested targeting might considerably reduce this gap, one should not ignore the need for policy officers to make a personal effort to actively seek information on new issues of reporting from projects like CIMULACT, read reports, and apply the important results. If future projects are to have greater impact, it is important that the dissemination (including awareness raising) procedures within the European Commission are set-up jointly by the desk officer and the project coordinator at the early stage of the project.

4. Main findings

The first part of the report focused on the assessment of the impact of the CIMULACT results on the H2020 WP 2018–20 in terms of which way and to what extent they were utilised. We assessed the relevance of CIMULACT research topics toward the final version of H2020 WP 2018-20 through mutual comparison based on thematic similarity. Furthermore, we investigated the actual use of the CIMULACT outcomes in the formulation of the programme through the online survey with policy officers as well as interviews.

The result of the comparison showed clear correspondence between 15 CIMULACT research topics and 22 H2020 WP 2018–20 topics in terms of thematic overlaps. Most CIMULACT research topics referred to the Societal Challenge 1, 2 and 6 of the H2020 WP 2018-20. On the other hand, no CIMULACT research topics corresponded explicitly to Societal Challenge 7. For 8 CIMULACT research topics, we did not find any correspondence with H2020 WP 2018–20.

Although CIMULACT is one of many inputs in the research agenda, according to the approached policy officers the exceptional position of the CIMULACT results was that they contributed new topics, and aspects to topics, and confirmed the relevance of topics already in the pipeline for the WP. This contribution was also acknowledged in the Interim Evaluation of Horizon 2020 where CIMULACT is mentioned as having produced significant input into Horizon 2020.[38]

Furthermore, policy officers who participated in the online survey and interviews believe that citizens are capable of suggesting directions for research. Citizens should have a say, and the Commission would like to understand what citizens consider the most important areas to be investigated for the benefit of society.

The actual use of CIMULACT research topics for the formulation of research programmes was gathered by the online survey and interviews with policy officers. The 23 completed responses indicated that a vision-based approach to gathering and prioritizing citizens' wishes and needs was highly appreciated. The information about citizens' fears and concerns, values, and knowledge are also valuable and should not be neglected.

Views on the quality of topics differed. Policy officers took CIMULACT results as an inspiration and justification of current topics. In the case of one of the interviewees, specific parts were used for formulating WP 2018–20. They appreciated the coverage of needs/issues, novelty of topics and compatibility with other sources.

The interviewed policy officers stated that CIMULACT results were fully sufficient for adding important aspects to topics, and for the justification of the H2020 WP 2018–20, but they would need to be more detailed for defining WPs research topics. Nevertheless, they stated that CIMULACT outcomes (taken as research directions) confirmed that the themes

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[38] Interim Evaluation of Horizon 2020 Annex 2. Available at:
https://ec.europa.eu/research/evaluations/pdf/archive/h2020_evaluations/swd(2017)221-annex-2-interim_evaluation-h2020.pdf#view=fit&pagemode=none

of the research agenda of the EU is primarily in accordance with citizens' interests and needs.

Interviews also revealed that a focused effort on dissemination of results among policy officers is necessary to increase the impact of such projects. Although the information on the CIMULACT project and its outcomes was disseminated among the Commission services, and events were organized by the desk officer and CIMULACT partners, the awareness of the final 23 CIMULACT research topics among the research policy officers was limited due to lack of understanding of their high relevance to the prepared research agenda.

In terms of CIMULACT methodology, 13 respondents[39] considered it adequate for trustworthy outputs and appreciated the benefits of a genuine consultation process. Moreover, it seemed that there is even high demand of policy officers for more projects that gather the views of citizens and build on public engagement processes. Thus, if FP9 pursues the emphasis on public engagement, there will be a large potential for projects like CIMULACT to impact the formulation of research priorities.

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[39] 13 respondents considered methodology adequate for trustworthy outputs although only 7 respondents stated that followed CIMULACT project closely.

5. Lessons Learned from the CIMULACT Process

In this part of the report we briefly assess the whole CIMULACT process, concentrating on the potential impacts of the project on CIMULACT consortium partners regarding methodology, as well as co-creation and public engagement applications.

The assessment of "lessons learned" is built on data from two sources:

i)   The feedback obtained from questionnaires and webinars, which were organized after each major phase of the project. It serves as a source of demonstrating the project´s impact on the consortium partners and their capacity building and knowledge sharing.

ii)   Surveys among consortium partners and WP leaders carried out in January 2018.

The impact assessment on partners' practice can only register short-term impacts. We may deduce, however, that some of the impacts will persist and evolve in long-term, supported by the future oriented questions in the surveys in January 2018.

It is also important to consider the rapid pace of project tasks required during the first year of CIMULACT in order to deliver results (23 citizen-based research topics) to the Commission on time so they could be utilised in the preparation of the H2020 WP 2018–20.

Formulating citizens' visions of desirable and sustainable future

Vision building workshops[40] focused on generating visions of desirable and sustainable European future through face-to-face citizen consultations. These visions served as the basis for the rest of the project.

Vision building workshops (national citizens' consultations) were held from November 2015 to January 2016 in 30 European countries (i.e. the 28 EU member states plus Switzerland and Norway). Vision building workshops had the same format in all countries in order to comply with the unified approach. Each workshop consisted of groups of about 36 citizens. The composition of the citizens' group followed predefined criteria with respect to age, gender, educational attainment, and professional as well as regional background. During these workshops citizens generated 6 national visions; in total, 1088 citizens from 30 European countries generated 179 visions[41].

The first training on methodology adhered to the project kick-off meeting in Copenhagen. A number of webinars providing further details followed afterwards. Almost all partners considered the training manual for the workshop and other informational material as sufficient and comprehensive.

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[40] CIMULACT Deliverable 1.3: Vision Catalogue – Encompassing the visions from all 30 countries. Available at: http://www.cimulact.eu/wp-content/uploads/2016/06/D1.3final.pdf

[41] one vision less made from the workshop in Ireland

In the internal evaluation there were stories of the impact of the national vision workshops on citizens. In some countries, participants stayed after the workshop talking among themselves or with organizers on the issues that emerged during the sessions. Some even planned to meet for a similar event or debate in the future. For some participants it was a great opportunity to share their views for the benefit of the society, others found themselves thinking in terms of communities or civil society for the first time.

The WP1 leader found the preparation of methodology and the trainings for 30 partners to be an exceptional experience. For him it was a great challenge which required a revision and recursive improvements of the process.

Taking into account the challenges, such as the time pressure and the number and diversity of consortium partners who had to conduct 30 workshops across Europe, the workshops were carried out successfully and the methodology allowed for the delivery of unique citizens' visions. It was a good experience for the organisers (the CIMULACT team) to see citizens motivated to express and share their wishes and fears associated with science and providing valuable (relevant and consistent) inputs in further steps of the project. It showed them that citizens had many different thoughts and extraordinary ideas and knowledge concerning technological advantages and disadvantages in relation to sustainability and future living.

From citizens' visions to Research Programme Scenarios

The next phase of the CIMULACT project involved two activities carried out upon the gathered citizens' visions: i) identification of European common social needs underlying the visions, and ii) construction of research programme scenarios.

The first activity took place during an interactive clustering workshop in Paris (February 2016), where the 179 generated visions were reviewed, and the underlying needs of citizens' visions were extracted. Twenty-six CIMULACT core partners and 11 external "challengers" participated in this workshop. Twenty-six social needs were identified and merged into 12 social needs clusters.

The process was considered time-condensed but effective, and the table facilitator role was especially appreciated. No partners report specific impact on their practices from these two phases.

On the way from Research Programme Scenarios to Research topics

The results from the co-creation process (the 48 research programme scenarios) were further consulted with citizens, stakeholders and experts in two parallel ways: a) the

national and policy consultations[42] and b) the online research & policy consultations [43]. Both tasks were carried out in each of the 30 European countries separately.

The aim of the workshops was to review and enrich at least four research programme scenarios. The consortium partners could indicate their thematic preferences for the national and policy consultations. On this basis, the coordinator of the task distributed the research programme scenarios across countries, taking into account that each scenario received more or less the same attention. In addition, the workshop organisers (partners) could choose between three suggested methods or develop their own method. In total, 11 methods were applied. Thus, this approach allowed partners to experiment with methods and to include different target groups (including experts, stakeholders, citizens, and policy makers). It was also possible to divide the multi-actor consultation into two or more events. Overall, 50 national research and policy consultations took place from 2nd September to 8th October 2016 with a total of 977 participants including citizens, experts, stakeholders, and policy makers.

These 11 newly developed or adjusted methods are undoubtedly one of the products of the above step in the project. The majority of them were integrated into the CIMULACT Inspiration catalogue[44]. The most innovative and promising methods are integrated into the online Engage2020 Action Catalogue[45]. Some of the new methods, developed by partners with less experience with participatory approaches, with support from more experienced partners, are regarded as a benefit to the project (creative spread of public engagement approaches), and had an important capacity-building effect on these partners.

Although CIMULACT partners gained some skills and gathered experience from the organization of the Visions workshops, the preparation of the national research and policy workshops (particularly the recruitment/invitation of participants) was challenging because of limited time (because of need to speed up the delivery of citizens induced research topics to the Commission). The time constraint was also exacerbated by the summer break. In spite of stressful preparation, the workshops produced highly relevant outcomes and their content was rich and of high quality, both were appreciated by the consortium members. Once again it was proved that citizens and stakeholders of various

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[42] CIMULACT Deliverable 3.2: Programmes and concepts for all citizen and multi-actor consultations. Available at: http://www.cimulact.eu/wp-content/uploads/2017/09/D3.2-Programmes-and-concepts_compressed.pdf

[43] CIMULACT Deliverable 4.2 – European Report on Online Consultation Results. Available at: http://www.cimulact.eu/wp-content/uploads/2017/04/Report-online-consultation.pdf

[44] Deliverable 5.1: Inspiration catalogue. Available at: http://www.cimulact.eu/wp-content/uploads/2018/04/D5.1_Inspiration-Catalogue-for-consulting-different-groups-compressed.pdf

[45] http://actioncatalogue.eu/ An online tool for selection of engagement methods for participatory activities in research and innovation

backgrounds have the capacity to cooperate and to provide relevant and useful contributions to research programme proposals.

In general, all participants exhibited great interest in research policy development and in the possibility to influence it, even though they might have been sceptical at the beginning. It is reasonable to assume that the multi-actor, face-to-face consultations have changed the perception of the participants on decision making at the European level, and that they will distribute this view among their social networks.

The second parallel activity – online consultation[46] – involved citizens as well as experts. The aim of the exercise was to assess the relevance of suggested research programme scenarios. In total, 3,458 people participated in the survey. Based on the results from the questionnaires, it was possible to identify opportunities for the improvement of the formulation of research topics as well as success factors.

Regarding the participation in the online consultation, some consortium partners found it difficult to reach respondents. The limited participation in the online consultation was probably based on the timing (the summer when most people have holidays) which resulted from the need to deliver final research topics to the Commission in December 2016 (similar problem to the National research and policy consultations).

The tool for the online consultation (Dynamic Argumentative Delphi) was considered relevant, with a good design and a user-friendly translation tool for the platform content. According to the majority of partners, the results of the online consultation and their analysis were of high quality. Although the process could have been simplified and the content made more comprehensible for citizens, the online consultation was another opportunity to bring science and society together, and showed itself to be an interesting tool for use in the participatory processes – to attract more people to participate. Moreover, this experience can serve as a lesson on how to consult different groups online.

Finalisation of research topics

Before the Pan-European conference, a meeting of the core partners took place in Paris (3rd – 4th of November). At this meeting the results from the national research and policy workshops, and the online consultation, were integrated into 48 suggestions for research topics, including the descriptions of challenges, the scope, and expected impacts.

These 48 research topic suggestions were the main input in the final Pan-European conference that took place on the 1st December in Brussels. The aim of this conference was to finalise the citizen-based research topics for the H2020 WP 2018–20. Additionally, 46

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[46] CIMULACT Deliverable 4.2 – European Report on Online Consultation Results. Available at: http://www.cimulact.eu/wp-content/uploads/2017/04/Report-online-consultation.pdf

CIMULACT researchers, 11 experts, 2 advisors and 16 European Commission officers[47] were invited to the Pan European conference. The conference transformed the 48 research scenarios into research topics that resulted in the final 23 citizen-based research topics and about 40 policy recommendations.

The co-creation between consortium and Project Officers of the Commission during the conference included a discussion of the underlying citizens visions and tensions between different research scenarios. This made up an important learning process for the Project Officers. It was presumably the main reason for the high impact of the project on Commission future use of open research agenda setting. For some of the partners it was a unique learning exercise with regard to the participatory transformation of background information and scenarios into a format fitting the Horizon 2020 WP 2018-20 profile.

General impact of dissemination

Dissemination began with the first results of the national citizens' consultations of the project. The main objective of the dissemination has been to spread partial and final results among the scientific community, policy makers, and general public to maximize the impact of the project. Project Officers at the Commission services have been a specific target group for communication and dissemination.

For this reason, the project has used several instruments such as a project website, newsletters (8x), policy briefs (4x), videos (including 3x official videos, 2x teaser videos and 25x partners videos), and social media. The two main channels of dissemination have been the project website, and social media. The Twitter account has had 476[48] followers and the Facebook has been followed by 414 users[49].

The project events involving people outside the project team (citizens', multi-actor and online consultations) had a significant disseminating effect too. Moreover, four reviewed scientific publications and around 126 presentations at workshops and conferences related to the CIMULACT project have been registered so far[50]. CIMULACT was chosen by the OECD as a good practice case for engagement of citizens in science agenda setting[51]. The Commission has selected CIMULACT to be profiled as a successful project of

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[47] Three of them were interviewed in investigating of the actual use of CIMULACT outcomes in the preparation of the H2020 WP 2018 – 2020

[48] Accessed on 05.04.2018

[49] Accessed on 05.04.2018

[50] Accessed on 16.04.2018

[51] OECD Science, Technology and Innovation Policy Papers. No. 50. December 2017. Available at: https://www.oecd-ilibrary.org/docserver/74edb6a8-

Horizon 2020. The dissemination was supported by the Advisory Board that provided inspiration, feedback on activities and helped to improve the dissemination strategy (particularly by highlighting success stories or by providing ideas to increase people's interest). So far, the consortium partners have conducted more than 902 disseminating activities[52].

Yet, there is still space for improvements, such as better mapping of stakeholders to get more detailed overview of the target groups for the newsletters and policy briefs, more user-oriented information material (highlighting, in particular success stories), and creation of more (story-telling) videos or capacity-building at the national level with universities, research foundations etc.

In general, the growing interest in the CIMULACT methodology among relevant policy makers and stakeholders, both at the EU and the national level, can be considered important impact and a success. Furthermore, consortium partners gained new dissemination skills and tested diverse communication tools in order to increase the outreach of the future projects (e.g. creating videos or establishing policy dialogues and making presentations to politicians/policy-makers). The dissemination process also proved to partners that networking and continuous involvement of stakeholders and policy makers are essential to get the most impact out of a project.

Impact of CIMULACT on consortium partners

To discover and measure the impact of the CIMULACT project on CIMULACT consortium partners, we asked them questions regarding methods, co-creation and participatory processes, as well as stakeholders' feedback. We collected the opinions in the questionnaire (annex III) that had been distributed to all consortium partners by e-mail. Overall, we received 27 out of 28 possible responses; these are analysed in this chapter.

The first question[53] focused on applied methods since there were several methods substantially modified or newly developed. We wanted to find out how the CIMULACT project inspired partners to use these methods in their further activities (Figure 8). Based on the answers, it is possible to distinguish three groups: partners that have been inspired and already used at least some of the methods (15 responses), partners that have been inspired but have only been looking for the opportunity to use them and the experience gained (9), partners (3) that have not been inspired at the moment (however this does not exclude returning to them in the future).

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en.pdf?expires=1522742677&id=id&accname=guest&checksum=EEE39CAC6D6E363C36C104B2DA 16741F

[52] Accessed on 16.04.2018

[53] "Has CIMULACT process inspired you to use the tested/developed methods (or some of their aspects) in other contexts/activities? If yes, please specify. "

Generally, the CIMULACT project has proven to be a good example of an RRI process that can be used for engaging citizens in setting the research agenda at the national level (e.g. universities working with the principle of RRI or collaboration with ministries), or for municipalities to be more citizen oriented. Furthermore, the project has shown the importance of public engagement in giving opportunities to citizens to shape future policy and express individual and societal needs. In two cases, the inspiration by single methods or the whole CIMULACT methodology has also led to developing project proposals by project partners.

CIMULACT has provided tools and methods for the engagement of citizens and multiple stakeholders that has been developed and tested. As an example, the imaginary journey or the CIMULACT picture set from the National Citizens' Vision workshops that have already been used by at least 2 partners within different scenarios workshops can be re-used in participatory foresight activities, as they have proved to be effective and interactive tools.[54] In many cases, these tools have become a part of partners' portfolios.

The inspiration as well as the application of the CIMULACT process can be documented in concrete examples. In Ireland, the CIMULACT methods have been applied to a project in the healthcare sector in order to approach and engage different stakeholders. The Belgian partner SDS has developed the method "Belgian CIMULACT Caravan" that has enabled the reaching and hearing of participants in their social environment. This method has already been reused for the purpose of the Wallonia Regional administration. In addition, for the Lithuanian project partner, aspects of the Caravan method have also served as an inspiration for a project proposal.

The co-creation process has been used in Italy to redesign the guide of a big park in Milan with the engagement of e.g. farmers and policy makers. In another case in Italy, the "World café" format has been adopted and used for demonstration of expert knowledge to participants and getting feedback from them. In Sweden, a workshop has been run using the CIMULACT visioning exercise (the approach applied in the first citizen consultation) in order to develop visions of desirable and sustainable coastal management.

The nine project partners who have been inspired but have not yet applied the gained experience see an opportunity in adjusting their own methods in order to improve the engagement of stakeholders in decision making. For instance, in Hungary the partners see the potential of using the developed methods in local consultations related to sustainable local development, organising activities for stakeholders (that e.g. working in environmental or social sustainability) to exchange and harmonize their future plans or methodology training. As one partner has mentioned, the project had also led to the recognition of the need to strengthen EU citizenship, as citizens feel alienated.

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[54] Deliverable 5.1: Inspiration catalogue. Available at: http://www.cimulact.eu/wp-content/uploads/2018/04/D5.1_Inspiration-Catalogue-for-consulting-different-groups-compressed.pdf

Figure 9: The use of CIMULACT methods by partners in their further activities
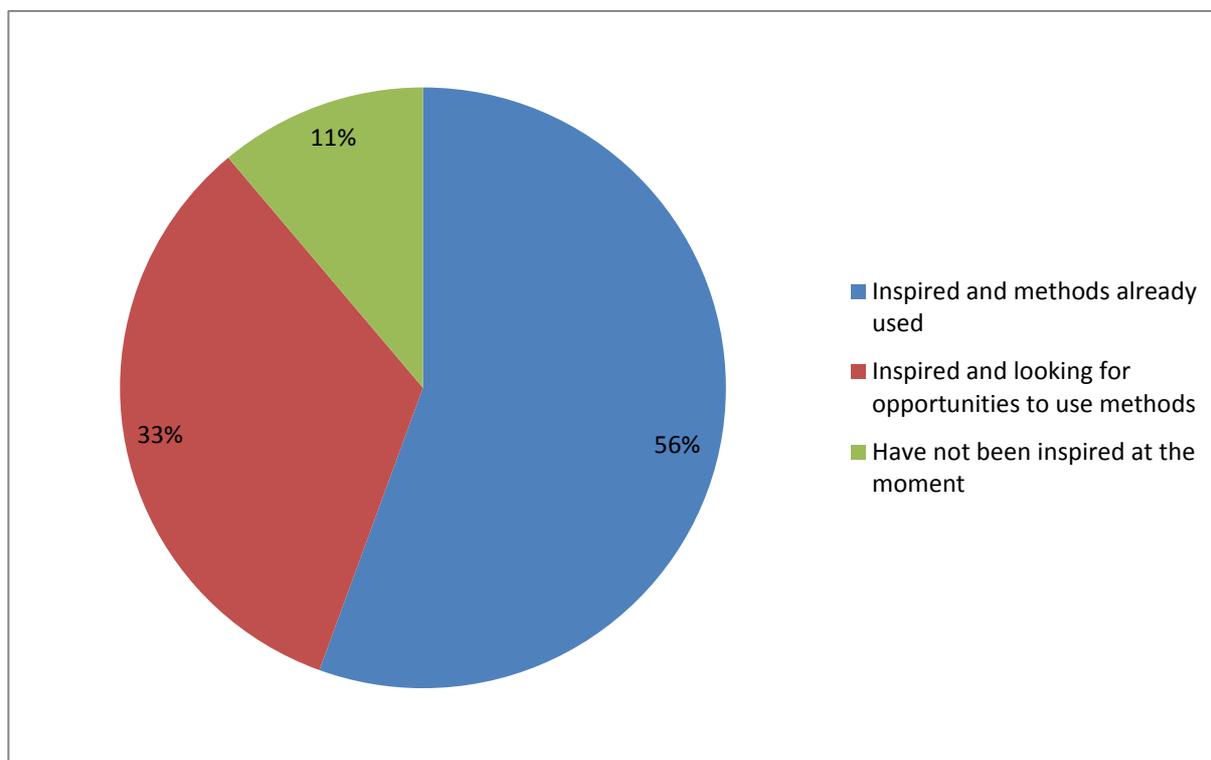
The second question[55] looked into the benefits of experience with the co-creation processes and public engagement, i.e. whether partners have started to be more active in this area. Again, three groups can be identified (see Figure 9). First, many partners (15) have already been active in co-creation and public engagement activities in their work. These partners have obtained new insights and thoughts that have led to more co-creation driven processes in their work. The effect of CIMULACT has also been realized in the wider involvement of target groups (e.g. citizens or experts/stakeholders) and in the research of at least two project partners, as these partners concentrated specifically on experts and stakeholders or especially on citizens in the consultations. Besides, six partners stated they have started to more actively use co-creation processes or its elements in their work. The project provided them with an in-depth understanding of the potential of citizen engagement in the research, and has enabled them to compare the used methodologies and the achieved outcomes with other projects. Furthermore, according to one partner, the project strengthened partners' confidence that public engagement into research provides added legitimacy to outcomes. The project also demonstrates how local level consultations can be up-scaled to European level conclusions.

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[55] "Based on the CIMULACT project experience, have you started to be more active in co-creation and public engagement? Or do you consider to be more active in engaging citizens/experts/stakeholders in the near future? If yes, please, specify. "

For instance, in Croatia, the project partner has started to pursue the co-creation approach, and public engagement among stakeholders from public and civil sector, in order to disseminate and transfer the knowledge about methods as well as helping them to conduct such processes.

Thanks to the CIMULACT experience, nine other partners have started to be more active in co-creation and public engagement. The reason behind this is a better understanding of the need for public engagement using the co-creation and public engagement tools. In one case, thanks to the CIMULACT project, one partner has become more active, promoting public engagement through social media.

Another example is the Irish project partner, which, through this experience has developed strong skills in engaging citizens, experts, and stakeholders that has led to the solidification of their expertise in co-creation and public engagement. They are now recognized as national experts in this area. Another example, based on the CIMULACT experience, can be seen in Greece where the project partner has started to be more involved in public engagement projects, e.g. promoting the underwater cultural and natural heritage by involving local and regional stakeholders.

Finally, the last group includes partners (3), which are not as active in co-creation and public engagement. Despite this, they still consider being more active in the future and utilize the experience if they have an opportunity.

Figure 10: The activity of project partners in co-creation and public engagement processes
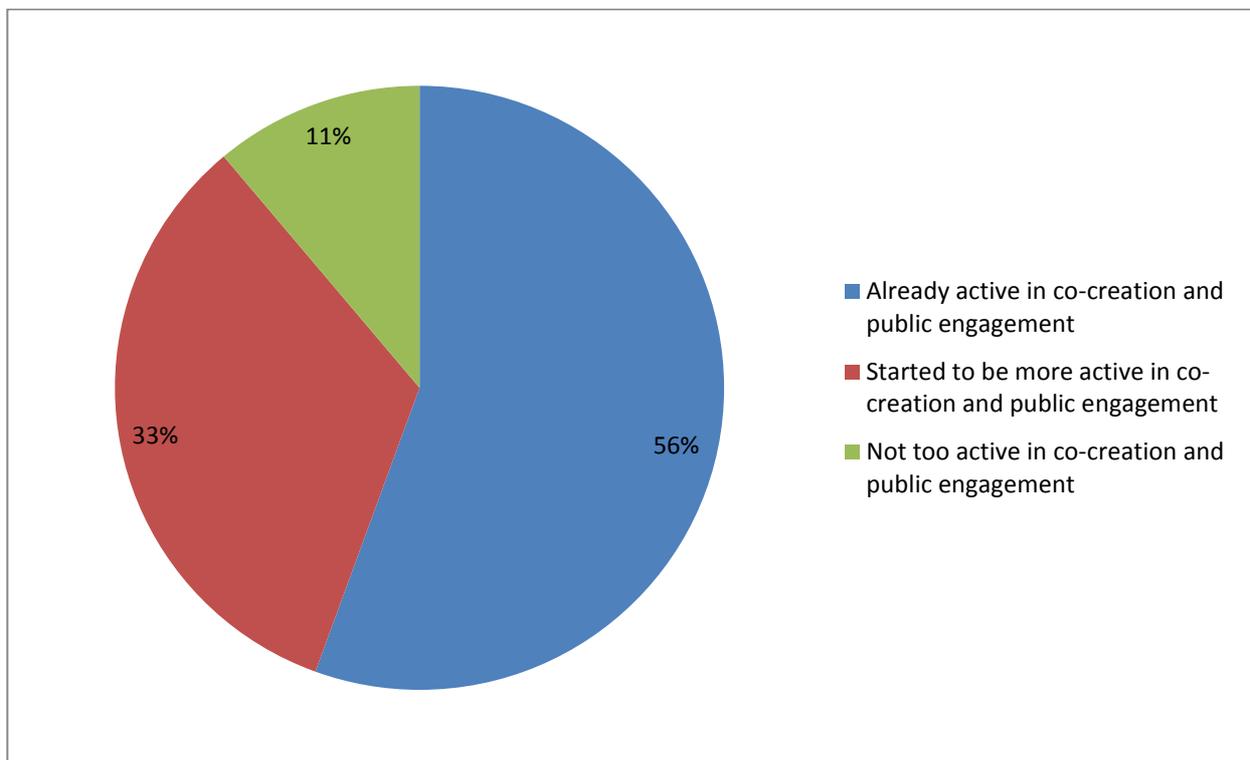
The third question[56] relates to the individual and institutional benefits, or new skills acquired during participation in the CIMULACT project that can be divided into several thematic clusters (Figure 10): the need of citizens and stakeholders' involvement, methodological and participatory skills, dissemination, recruitment, networking, and facilitation.

The CIMULACT project increased the awareness that involving multi-actors at all levels of the research process strengthens its social impact in the case of 25 project partners. It includes the conviction that contributions to complex issues (even high-level topics) involving citizens in policy making is possible. The process showed that citizens appreciate the opportunity to share their different opinions and suggestions, and their contributions enrich the research. Moreover, there is confidence that public engagement and co-creation strengthen the democratic process and can reinstate trust in institutions in the decision-making sphere. The precondition for this process is actual consideration of citizens' viewpoints and provision of information about the results of such participatory processes. On the other hand, this has not been shared by all partners as two of the partners expressed doubts and scepticism about the benefits of the citizen involvement in the setting of research agenda and policy making.

The second cluster, with a high number of answers (20), concerns methodological and participatory skills. The project's multi-actor approach has built confidence in the ability to produce relevant knowledge for developing a research agenda. Through the experience with participatory tools, project partners have become more confident in using and testing such methods. The project has also contributed to developing new participatory methods.

Moreover, these participatory methods, if the process is well elaborated, have the potential to bring together citizens' and experts' knowledge. The process has also led to better understanding of creativity and idea generating processes, as well as to higher awareness that the right method encourages answers on a broad number of issues and topics.

In terms of dissemination, 11 project partners have improved their methodological and analytical skills, including strategies and techniques (both advantages and disadvantages) to better communicate with policy makers and stakeholders. One of the important factors for building relationships with citizens and stakeholders is the need to keep them informed about the results and progress. Based on the experience of one partner, it has also turned out that, for some national policy makers, the international reference project can better illustrate the importance and value of co-creation and public engagement. The project itself is the reference that can be used for reaching a new audience.

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[56] „What benefits have your participation in the CIMULACT project brought you? What have you learned (institutionally/individually)?

Moreover, eight project partners stated that the effect of close collaboration and dissemination activities have led to the creation of the network of organizations that can also be engaged in future co-creation projects and collaborations. The project has showed the value of collaboration with stakeholders as well as with the CIMULACT consortium. For instance, at least five project partners have already developed activities of co-creation and public engagement independent from the CIMULACT project, but, at the same time, in the collaboration with CIMULACT partners.

The last mentioned areas are recruitment and facilitation. Concerning the first, six partners have developed or improved skills which concern the strategies to recruit citizens and specific groups. In addition, they have become more aware that the quality of recruitment has an impact on the consultation phase. Concerning the latter, five partners have acquired new skills in facilitation and have gained self-confidence in the interaction with groups or individuals of various backgrounds.

Figure 11: Benefits of partners' participation in the CIMULACT project
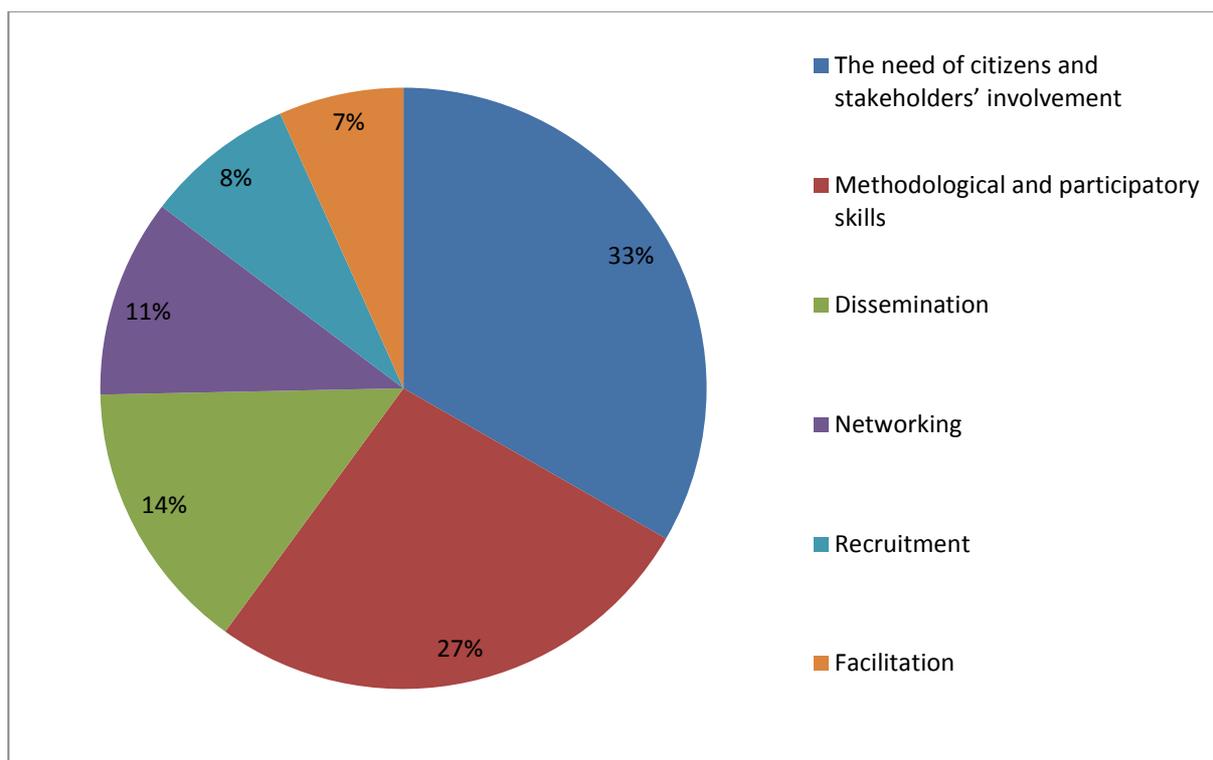
In the last question[57], we investigated the feedback partners got from stakeholders and policy makers to whom they had disseminated the project outcomes. The findings from

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[57] „Have you got any feedback from policy makers or key stakeholders whom you have disseminated CIMULACT project/results to? If yes, please, specify."

questionnaires showed that 19 partners received feedback from these target groups that were very positive overall.

The CIMULACT partners have mainly disseminated information about interesting results and the methodology. The target groups were particularly policy makers, academics, researchers, students, and stakeholders who have been involved in the project. The responses showed that while these target groups were most interested in the methods and their applications for research, they showed interest in the whole process of the co-creation and project results in many cases.

Thanks to the partners' efforts, the outreach of the project has been large. The French Ministry of Culture in France, the Norwegian Research Council and the Ministry of Research in Norway, the Ministry of Science, Technology and Higher Education in Portugal, the Ministry of Higher Education and Science in Denmark, and the Ministry of Education, Science, Research and Sport in Slovakia followed the results of the CIMULACT project. Furthermore, the CIMULACT project was presented at several important events. First, the OECD workshop in Seoul on Open Science, where one presentation concerned methods and experience with Open Agenda Setting and the second presentation specifically focused on the CIMULACT project (June 2017). Second, at the STOA Panel of the European Parliament, CIMULACT was presented within an intro session on The Future of Science through Citizens Engagement (March 2017). Third, CIMULACT was presented within session on Responsible Research Agendas at, The 3rd European Technology Assessment Conference in Cork (May 2017).

Here we present several examples of the impact at the national level. In Croatia, the procedures and methods of the CIMULACT project were presented to policy makers through the organizing interactive event. For these policy makers it was a new experience, as they had never been involved in such a process. In Hungary, a political party expressed an interest in the CIMULACT methodology because it had been successfully applied across Member States for the European policy. In Ireland, the partner received positive feedback from eHealth Ireland and National Contact Points for H2020 where the CIMULACT was described as a best practice in co-creation and represented a model they hoped to follow. In the Czech Republic, the close collaboration between TC CAS and the Technology Agency of the Czech Republic led to the incorporation of co-creation and participatory approaches into the recent technology agency research programmes. In Slovenia, the partner successfully contacted national institutions (the University of Ljubljana, the Ministry of Education, Science and Sports, and other significant institutions in Slovenia) and presented the project together with DG RTD; additionally, they used the conference related to H2020 & FP9 and showed the methods and outcomes of the CIMULACT project there. The feedback was positive, expressing the wish of the participants to get more involved in such projects in the future. Particularly, Slovenian stakeholders were interested in topics that their citizens expressed.

Main findings

In the second part of the assessment of the CIMULACT project impacts we focused on the procedures which were implemented in order to achieve project objectives. Additionally, we dealt with the use of the co-creation and participatory approaches and other methods adopted, modified, or developed in the course of the project and obtained stakeholders' knowledge by consortium partners. The gathered experience from the implementation of the project methodology was summarised in lessons learned and recommendations.

It must be noted that CIMULACT results, and consequently their impacts, were influenced by the stress on the project because of the acceleration of the process to deliver the project key results (23 citizen-based research topics) to the Commission at the time to be considered in the formulation of the WP 2018–20. Despite this fact, all project steps and partial results were successfully completed and delivered to the Commission.

In general, CIMULACT supported the multi-actor engagement in R&I. The whole process consisted of these main steps: national citizen vision workshops, cluster workshops, co-creation workshops, national research and policy workshops and online consultation, and Pan-European conference. More than 5000 participants were engaged in the CIMULACT project, actively participating in shaping R&I topics. Moreover, the CIMULACT experience proved that engagement of citizens is highly-valuable as they are able to provide important and unique inputs and a diversity of ideas.

Moreover, workshops and other consultations allowed partners to gain new valuable experience in co-creation and public engagement, and to test various methods in this field. Based on the feedback from consortium partners, it was evident that CIMULACT had a significant impact in terms of the application of CIMULACT methods as well as the increase in activities in the field of co-creation and public engagement. Within the CIMULACT process, 11 methods for engagement of citizens and stakeholders were developed and tested. The result of these methods was the CIMULACT inspiration catalogue. These methods serve as an inspiration and as practical tools for researchers and other institutions interested in the practice of co-creation and public engagement.

Thanks to this experience, more than half of the consortium partners have been inspired by these methods and have already used them (or parts) in their work. Other partners seek opportunities for using this new knowledge and experience in the future. CIMULACT has helped partners work on their approaches involving stakeholders as well as citizens in decision making.

Participation in the CIMULACT project allowed project partners to acquire and improve techniques and strategies for convincing and recruiting participants. The project also showed how important it is to disseminate project information as well as results to both citizens and stakeholders. It creates mutual trust and a working relationship. Finally, the project encouraged the development of - skills in facilitation with which not all partners had prior experience.

Among other benefits that the project brought to consortium, partners increased methodological knowledge, dissemination, networking, recruitment, and facilitation abilities. Furthermore, the methodology allowed the bringing together of citizens and experts. In addition, a close collaboration has been established between project partners, resulting in new working opportunities, as well as cooperation with various stakeholders, thanks to proper dissemination activities.

The outcomes of the project were extensively disseminated outside of the project consortium. The CIMULACT project was presented during many events and conferences and established many working relationship and future opportunities. Based on feedback, the results, co-creation, and methodology (including its application) were the most interesting aspects for stakeholders and policy makers. Dissemination activities to citizens, stakeholders, and policy makers created high commitment and could change the perception of decision making at the European level. CIMULACT partners also established new cooperation between themselves as well as institutions at the national and regional level.

6. Conclusions

The general aim of the CIMULACT project was to engage citizens, along with a wide range of other actors, in the co-creation of themes and topics for the European Research and Innovation agenda. Unlike most other projects, CIMULACT had an exceptional opportunity to have its results utilised by policy makers during the course of the project. The final set of 23 citizen-based research topics was delivered to the Commission in time to enter the process of formulation of the H2020 Work Programme for the period 2018 – 20120. It happened on 12th December 2016, 15 months before the end of the project. The H2020 Work Programme 2018–20 was consequently published in October 2017. This enabled the project team to look deeper into the adoption process of CIMULACT results within the Commission. Similarly, the CIMULACT results as well as the methods of public engagement in the formulation of policy agenda were made available to Member States at the early stage of the debate on the R&I agenda for the next programming period.

Combining three sources of evidence (explicit declaration in the General introduction of the Horizon 2020, screening texts for thematic similarity, and survey/interview of the Commission officers) we could show that CIMULACT supported the preparation of the recent Work Programme of European research (H2020):

1) There was overlap between 15 final CIMULACT research topics and 22 topics from the H2020 WP 2018–20
2) Nine H2020 calls[58] refer to a citizen-based topic of CIMULACT.

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[58] 1) Better Health and care, economic growth and sustainable health systems; 2) Digital transformation in Health and Care; 3) Sustainable Food Security; 4) Rural Renaissance; 5) Building low-carbon, climate resilient future: secure, clean and efficient energy; 6) Mobility for Growth; 7)

3) The online survey and interviews with policy officers provided us with information that CIMULACT research topics served as an inspiration, or as a validation, of existing ideas for topics, and in some cases CIMULACT research topics influenced concrete WP 2018–20 calls or topics.

4) CIMULACT has served as a reference for the Commission in its efforts to increase societal influence on the European research agenda, resulting in mentioning of CIMULACT in several central policy papers.

The CIMULACT results provided support to the principle that citizens should have a say in the research and innovation agenda as they are capable of suggesting unique and relevant directions for research and innovation. They have a reasonable claim for R&I to deliver solutions to their visions, problems, and concerns, and they are end-users and tax-paying financers of the research and innovation activities in society.

The finding that the CIMULACT citizen-based topics provided unique results is supported by this impact study, but also by the comparison between foresight studies and CIMULACT outcomes (Deliverable 5.2[59]). Elements of the CIMULACT topics were well represented within expert foresight studies (10 out of 16 studies include one or more references to research topics identified in CIMULACT), but the citizen-based CIMULACT topics provide unique perspectives – for example on improving democracy and local organisation, and ensuring quality of life – which are often lacking in foresight studies.

CIMULACT was acknowledged by the approached policy officers as a good example of multi-actor co-creation based on public engagement with trustworthy methodology. CIMULACT was also chosen by OECD as a good practice case for the engagement of citizens in Open Research Agenda Setting. [60] Also with the view of FP9, the potential of using projects with methodology like CIMULACT, based on co-creation/public engagement taking into account views of citizens, is quite large. The assessment disclosed some bottlenecks in the dissemination of results and their use in the Commission work which are partly systematic and partly on the personal level of the officers. In any case, more targeted dissemination can certainly help cure both imperfections.

Greening the economy in line with the Sustainable Development Goals (SDGs); 8) Socioeconomic and cultural transformations in the context of the fourth industrial revolution; 9) Governance for the future

[59] Deliverable 5.2: Report on comparison of research topics from CIMULACT with those from expert oriented foresight studies. Available at: http://www.cimulact.eu/wp-content/uploads/2018/04/D5.2_Report-on-comparison-expert-oriented-foresight-studies-compressed.pdf

[60] OECD Science, Technology and Innovation Policy Papers. No. 50. December 2017. Available at: https://www.oecd-ilibrary.org/docserver/74edb6a8-en.pdf?expires=1522742677&id=id&accname=guest&checksum=EEE39CAC6D6E363C36C104B2DA16741F

Gathering feedback throughout the project course, and a brief survey among the partners at the end of the project, showed that CIMULACT had significant positive impact on the spread of public engagement and co-creation methods within the consortium and associated partner networks.

Project partners gained further confidence that citizens can provide valuable and plausible ideas on research needs. Moreover, CIMULACT developed 11 new or adjusted participatory methods that were tested during the project and summarized in the CIMULACT Inspiration catalogue. At least half of the project partners adopted these methods and some of the partners have already used the whole methods or their aspects in their working activities. Furthermore, the assessment of the responses on the CIMULACT process exposed options for refinement and improvement of the methodology.

Finally, the project paid substantial attention to dissemination with the effort to promote the utilization of results. The overall range of dissemination activities was large, and through the activities of consortium partners, information about the CIMULACT project was presented in many events at the regional, national, and European level (e.g. an OECD workshop, STOA Panel of the European Parliament or The 3rd European Technology Assessment Conference). Thus, these activities helped to share knowledge gained about the methodology and co-creation/public engagement and encouraged the establishment of new networks that can serve as the basis for future co-creation/public engagement activities.

Table 7: Selection of the achievements of the CIMULACT project

The reference to CIMULACT in the General introduction of the Horizon 2020 Work Programme 2018–20 as an input to the H2020 WP 2018–20 and as an example of FP project enabling direct interactions with citizens
CIMULACT presented in the Interim Evaluation of Horizon 2020 as a project that had already produced significant input into Horizon 2020
Fifteen of 23 research topics with thematic overlap in 22 topics of the H2020 WP 2018–20
The CIMULACT project affected the H2020 WP 2018–20 and in some cases CIMULACT research topics led to a concrete WP 2018–20 call or specific parts of the call (findings based on interviews with policy officers)
CIMULACT has added important aspects to the EU research agenda by providing new future-oriented perspectives to themes under the Grand Challenges
The CIMULACT citizen-based topics had unique qualities as compared to expert foresight studies (findings from Deliverable 5.2).

CIMULACT was chosen by OECD as one of a good practice case for engagement of citizens in Open Research Agenda Setting

CIMULACT outcomes remain relevant for the preparation of Framework Programme 9

CIMULACT developed 11 new or adjusted participatory methods (summarized in the Inspiration catalogue)

Most of the CIMULACT Consortium partners already adopted new/adjusted participatory methods in their working activities

Consortium partners gained or improved skills in areas of methodological knowledge, acquirement of new recruitment approaches and facilitation

New (working) networks within the consortium and between individual partners and national institutions, stakeholders were established

Large overall outreach of the CIMULACT project:

- Around 902 dissemination activities of consortium partners
- Four reviewed scientific publications
- Ca 126 presentations at workshops and conferences

Two presentations at an OECD workshop on Open Science (June 2017, Seoul): 1) methods and experience with Open Agenda Setting; 2) the CIMULACT project

CIMULACT presented within intro to the session on The Future of Science through Citizens Engagement at the STOA Panel of the European Parliament (March 2017, Brussels)

CIMULACT presented within session on Responsible Research Agendas at The 3rd European Technology Assessment Conference (May 2017, Cork)

CIMULACT presented at a conference on the Future of the Research System to 450 Norwegian research administrators, politicians and university representatives (March 2017, Oslo)

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CIMULACT Deliverable 5.1: Inspiration catalogue

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Online survey with the Commission policy officers

Questionnaires: Questions for Impact assessment report – Consortium partners

Questionnaires: Questions for Impact Assessment Report – WP leaders

WP1 National citizen consultations (Questionnaire and webinar#1 Feedback on WP1 - Synthesis)

WP2 Paris cluster workshop (questionnaire)

WP2 Milano consortium meeting, training and workshop (questionnaire)

WP3 Research and policy toolkit and methods training (questionnaire)

WP3 Analysis grid with used methods

WP3 Face-to-face consultations (participants' evaluation)

WP4 Online consultations (questionnaire)

Vision Matrix

8. List of Annexes

1. Annex I QUESTIONNAIRE FOR IMPACT ASSESSMENT REPORT – POLICY OFFICERS
2. Annex II QUESTIONS FOR IMPACT ASSESSMENT REPORT – INTERVIEWS WITH POLICY OFFICERS
3. Annex III QUESTIONNAIRE FOR IMPACT ASSESSMENT REPORT – CONSORTIUM PARTNERS
4. Annex IV QUESTIONNAIRE FOR IMPACT ASSESSMENT REPORT – WP LEADERS
5. Annex V COMPARISON OF CIMULACT AND H2020 TOPICS
6. Annex VI EXAMPLE OF THE SELECTED CIMULACT TOPICS OVERLAP WITH H2020-WP-2018-2020

ANNEX I QuestionNAIRE for Impact assessment report – Policy officers

Welcome to the CIMULACT project survey for members of the European Commission!

Thank you for agreeing to take part in this important survey helping to assess the impact of a European project called „Citizens and Multi-Actor Consultation on Horizon 2020" (CIMULACT).

CIMULACT has as a main objective to engage citizens and stakeholders in the co-creation of European research agendas based on real, validated and shared citizens´ visions, needs and demands.

We will be gaining your thoughts and opinions in order to better serve you in the future. This survey should only take you 10-15 minutes to complete.

Be assured that all answers you provide will be kept in the strictest confidentiality. Please click on the NEXT button to begin.

Section A:

A1.   1. What seems the most interesting for you when it comes to what citizens think of research and innovation?

Wishes / Needs of citizens ☐

Values of citizens ☐

Fears / Concerns of citizens ☐

Knowledge of citizens ☐

Other ▼

Other

[_____]

A2.   2. Have you followed the CIMULACT project closely (e.g. are you aware of the final 23 research topics, 48 scenarios, 26 social needs or even 179 citizens' visions)?

Yes ☐

No ☐

A3.   **3. Did you use the CIMULACT results / topics for formulating the Horizon 2020 Work Programme 2018-2020?**

Yes ☐

No ☐

A4.   **3a. How did you mostly use CIMULACT results / research topics?**

For inspiration ☐

For justification of current topics / calls developed by experts (fitting to citizens visions and needs) ☐

Some concrete parts of the CIMULACT topics were used ☐

(Almost) the whole description of the CIMULACT topic was adopted ☐

Other ▼

Other

_____

A5.   **3a. Why you did not use the CIMULACT results / topics for formulating the Horizon 2020 Work Programme 2018-2020?**

Low coverage of issues / needs ☐

Insufficient novelty of the topics ☐

Incompatibility with other sources ☐

Low quality of description ☐

I have not been familiar with the CIMULACT project outputs ☐

Other ▼

Other

_____

A6. **3b. What aspects of CIMULACT topics are you interested in?**

Coverage of issues / needs ☐

Novelty of topics ☐

The topic is compatible to other sources ☐

Quality of description (particularly, the level of details) ☐

Other ▼

Other

A7. **3c. Have some of the CIMULACT topics led to a concrete Work Programme 2018-2020 call or specific parts of the call?**

Yes ☐

No ☐

A8. **4. Do you consider the project methodology adequate for providing trustworthy inputs?**

Yes ☐

No ☐

A9. **5. How could participatory / public engagement projects like CIMULACT have a greater impact on EU research and innovation agendas (FP9) in the future?**

A10.   6. Which of the European Commission DGs do you work for?

RTD ☐

GROW ☐

AGRI ☐

ENV ☐

MOVE ☐

CONNECT ☐

SANTE ☐

Other ▼

Other

☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

A11.   7. Are you directly involveld in the preparation of H2020 WPs / FP9?

Yes ☐

No ☐

A12.   8. We plan to carry out a few more detailed interviews after assessing the results of this survey. In case you are interested in the follow-up of this survey and/or in taking part in the interview, please, enter your e-mail address in the box below.

☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Thank you for sharing your thoughts which we shall use as an input to the CIMULACT project impact assessment report!

Technology Centre of the Czech Academy of Sciences

On behalf of the CIMULACT project consortium

ANNEX II Questions for Impact assessment report – INTERVIEWS WITH Policy officers

1. Do you think that ordinary citizens are competent to suggest directions of research/ research topics?

2. According to your knowledge has the project CIMULACT confirmed their competence?

3. Have you find the 23 CIMULACT research topics elaborated in the sufficient detail?

4. The 23 CIMULACT research topics were published in January 2017, i.e. 10 months before the H2020 Research Programme 2018-2020 was issued. Some respondents complained that it was a bit too late to reflect CIMULACT in this WP. What would be the right period for delivering citizens' opinions?

5. Will you use CIMULACT results in the preparation of FP-9?

6. The project obviously transmits what citizens want from research - in which areas research is desirable (48 scenarios 23 topics). It does not imply that citizens do not want the other themes to be investigated. There are definitely research areas of which citizens know too little to give them priority (in their wishes). Nevertheless, there might be also research areas/directions (e.g. cloning) some people think that should not be investigated. Do you think that a project like CIMULACT should identify them?

7. It came out of the survey that more than half of the respondents were not aware of the CIMULACT results. How actually the project outcomes were distributed among the relevant research officers?

ANNEX III QuestionNAIRE for Impact assessment report – Consortium partners

We would like to ask you to answer the following questions in order to use it as one of the inputs for the Impact Assessment Report (D5.3). It could help us to have a better understanding of the project impact on consortium partners (individuals as well as institutions) – content wise, methodology wise, management wise etc.

CIMULACT partner institution:

Country:

1) Has CIMULACT process inspired you to use the tested / developed methods (or some of their aspects) in other contexts / activities? If yes, please, specify.

2) Based on the CIMULACT project experience, have you started to be more active in co-creation and public engagement? Or do you consider to be more active in engaging citizens / experts / stakeholders in the near future? If yes, please, specify.

3) What benefits have your participation in the CIMULACT project brought you? What have you learned (institutionally / individually)?
    a. confidence in the involvement of citizens in the complex issues of policy making
    b. confidence in that research should provide account to citizens
    c. …

4) Have you got any feedback from policy makers or key stakeholders whom you have disseminated CIMULACT project / results to? If yes, please, specify.

Thank you for your time and cooperation.

The CZ team – TC CAS

ANNEX IV Questionnaire for Impact Assessment Report – WP leaders

As a WP leader you have been responsible for coordinating the work, implementing decisions, reporting of the respective WP etc. Therefore we would like to ask you for your assessment of the WP you have led. This information will be used as one of the inputs for the D5.3 Impact Assessment report.

CIMULACT partner institution:

Country:

1) Can you highlight the outstanding features of the process of the WP you led (e.g. results, effects, feedbacks, participants)?

2) What did go surprisingly well?

3) What did fail (where were critical imperfections)? What improvements are necessary?

4) Have you benefited from taking the leadership of the given WP (institutionally / individually)?

5) Are you planning to use the newly acquired experiences in the near future? How? In European projects only or on the national level, too?

Thank you for your time and cooperation.

The CZ team – TC CAS

Annex V Comparison of CIMULACT and H2020 Topics

Challenge 1: Health, demographic change and well-being

Call	Priorities	Title of H2020 topic	Key Words H2020 topic	CIMULACT topic	Key Words CIMULACT topic
Better Health and care, economic growth and sustainable health systems	Personalized medicine	Understanding causative mechanisms in co- and multimorbidities		x	
		Systems approaches for the discovery of combinatorial therapies for complex disorders		x	
		Exploiting research outcomes and application potential of the human microbiome for personalised prediction, prevention and treatment of disease	Personalized healthcare; holistic approach; valuable clinical tools; effective using of data	Evidence-based personalized healthcare	Personalized healthcare; holistic approach; develop user lifestyle methods and technology; effective using of data
		Rare Disease European Joint Programme Cofund	exploit research results in the healthcare system; research results dissemination; engagement stakeholders including patient organisations	Dissemination and continuous exploitation of research and innovation in the healthcare system	exploit research results in the healthcare system; research results dissemination; engagement people/stakeholders
		International flagship collaboration with Canada for human data storage, integration and sharing to enable personalised medicine approaches		x	
		Actions in support of the International Consortium for Personalised Medicine	patient-centred healthcare; effective using of data; public health strategies; equity and access to health services	Access to equal and holistic health services and resources for all citizens	patient-centred healthcare; effective using of data; public health strategies; equity and access to health services
		Data integration and data-driven in-silico models for enabling personalised medicine - a European standardization framework		x	
		ERA-NET to support the Joint Programming in Neurodegenerative Diseases strategic plan (JPND)		x	
	Innovative health and care industry	Regenerative medicine: from new insights to new applications		x	
		Innovation platforms for advanced therapies of the future		x	
		Innovation Procurement: Next generation sequencing (NGS) for routine diagnosis		x	
		Strengthening regulatory sciences and supporting regulatory scientific advice		x	
	Infectious diseases and improving global health	Mining big data for early detection of infectious disease threats driven by climate change and other factors		x	
		Stratified host-directed approaches to improve prevention, treatment and/or cure of infectious diseases		x	
		New anti-infective agents for prevention and/or treatment of neglected infectious diseases (NID)		x	
		Global Alliance for Chronic Diseases (GACD) - Scaling-up of evidence-based health interventions at population level for the prevention and management of hypertension and/or diabetes		x	
		Translational collaborative cancer research between Europe and the Community of Latin American and Caribbean States (CELAC)		x	
		Implementation research for maternal and child health		x	
		Research on HIV, tuberculosis (TB) and/or hepatitis C (HCV) in patients with mono-, co-infections and/or comorbidities in the context of fostering collaboration with the Russian Federation		x	
		Establishment of an International Network of Social Sciences Research Centres to help address governance and other challenges in the preparedness for and the response to infectious threats		x	
		Creation of a European wide sustainable clinical research network for infectious diseases		x	
		Building international efforts on population and patient cohorts		x	
		Coordinating European brain research and developing global initiatives		x	
		Strategic collaboration in healthcare research and innovation between EU and China		x	
	Innovative health and care systems - Integration of care	Mental health in the workplace		x	
		Novel patient-centred approaches for survivorship, palliation and/or end-of-life care		x	
		Demonstration pilots for implementation of personalised medicine in health care	Personalized healthcare; Research of the conditions for personalized medicine; prevention and treatment solutions; effective using of data; economic viability and impact	Evidence-based personalized healthcare; Access to equal and holistic health services and resources for all citizens	Personalized healthcare; Research of the conditions for personalized medicine; prevention and treatment solutions; effective using of data; economic viability and impact
		HTA research to support evidence-based healthcare		x	
		Innovation in healthcare - a CSA towards using pre-commercial procurement and public procurement of innovative solutions in healthcare systems		x	
	Decoding the role of the environment, including climate change, for health and wellbeing	New testing and screening methods to identify endocrine disrupting chemicals		x	
		The Human Exposome Project: a toolbox for assessing and addressing the impact of environment on health		x	
		Setting the priorities for a European environment, climate and health research agenda		x	

Call	Priorities	Title of H2020 topic	Key Words H2020 topic	CIMULACT topic	Key Words CIMULACT topic
Digital transformation in Health and Care	Digital transformation in Health and Care (eHealth; mobile health (mHealth); Information and Communication Technologies (ICT) for Active and Healthy Ageing)	Big data and Artificial Intelligence for monitoring health status and quality of life after the cancer treatment		x	
		Adaptive smart working and living environments supporting active and healthy ageing		x	
		Large scale implementation of digital innovation for health and care in an ageing society		x	
		Exploiting the full potential of in-silico medicine research for personalised diagnostics and therapies in cloud-based environments		x	
		Prototyping a European interoperable Electronic Health Record (EHR) exchange	eHEALTH; health data security; improving quality and resources efficiency; more efficient using of data	Evidence-based personalized healthcare	eHEALTH; health data security; improving quality and resources efficiency; more efficient using of data
		Scaling up the univocal Identification of Medicinal Products		x	
		Digital health and care services		x	
		Large Scale pilots of personalised & outcome based integrated care		x	
		Supporting investment in smart living environments for ageing well through certification		x	
		Support for the large scale uptake of open service platforms in the Active and Healthy Ageing domain		x	
		Support to further development of international cooperation in digital transformation of health and care		x	
		Digital health and care services – support for strategy and (early) adoption		x	
		Support to a Digital Health and Care Innovation initiative in the context of Digital Single Market strategy		x	

Call	Priorities	Title of H2020 topic	Key Words H2020 topic	CIMULACT topic	Key Words CIMULACT topic
Trusted digital solutions and Cybersecurity in Health and Care	Focus Area on Digitising and transforming European industry and services	Smart and healthy living at home		x	
	Focus Area on Boosting the effectiveness of the Security Union	Toolkit for assessing and reducing cyber risks in hospitals and care centres to protect privacy/data/infrastructures		x	
		Raising awareness and developing training schemes on cybersecurity in hospitals		x	

Challenge 2: Food security, sustainable agriculture and forestry, marine, maritime and inland water

Call	Priorities	Title of H2020 topic	Key Words H2020 topic	CIMULACT topic	Key Words CIMULACT topic
Sustainable Food Security	From functional ecosystems to healthy food	Biodiversity in action: across farmland and the value chain		x	
		Microbiome applications for sustainable food systems		x	
		Integrated health approaches and alternatives to pesticide use		x	
		New and emerging risks in plant health		x	
		Stepping up integrated pest management		x	
		Making European beekeeping healthy and sustainable		x	
		Improving animal welfare		x	
		Anti-microbials and animal production		x	
		A vaccine against African Swine Fever		x	
		Personalized Nutrition	personalized nutrition; food supply chain; personalized nuttrition advice/support; food behaviour	1) Good quality food for all; 2) Evolving food culture in growing cities	personalized food diets/sustainable nutrition (e.g. quality, health); food supply issues/impact; educational programmes (healthy food habits); food behaviour
		Future proofing our plants		x	
		Towards healthier and sustainable food	healthy and sustainable food; consumer practices; locally produced/supplied food; processing methods (food waste/losses)	1) Evolving food culture in growing cities ; 2) Good quality food for all	sustainable food (production); research on food practice/habits; local food production; food waste
	Environment and climate-smart food production and consumption	Alternative proteins for food and feed		x	
		Climate-smart and resilient farming		x	
		European Joint Programme on agricultural soil management		x	
		Forest soils Research and Innovation Action		x	
		Integrated water management in small agriculture catchment		x	
		Innovative and citizen-driven food system approaches in cities	urba-rural cohesion/symbiosis; quality life for citizens; safe and sustainable nutrition food; citizen/stakeholder engagement	1) Good quality food for all; 2) Urban-rural symbiosis	urba-rural cohesion/symbiosis; quality life for citizens; safe and sustainable nutrition food; citizen/stakeholder engagement
		Integrated system innovation in valorising urban biowaste		x	
	Building capacities	Food Cloud demonstrators		x	
		Monitoring food R&I investments and impacts		x	
		Genetic Resources and Pre-breeding communities		x	
		Innovations in plant variety testing		x	
		Agri-Aqua Labs		x	
		ERANETs in agri-food		x	
	Targeted international cooperation	Supporting Microbiome Coordination and the International Bioeconomy Forum		x	
		Support to the implementation of EU-Africa Research and Innovation Partnership on Food and Nutrition Security & Sustainable Agriculture (FNSSA)		x	
		Food Systems Africa		x	
		Sustainable Intensification in Africa		x	
		Integrated approaches to food safety controls across the food chain		x	
		Highly efficient management of soil quality and land resources		x	
		High-quality organic fertilisers from biogas digestate		x	

Call		Title of H2020 topic	Key Words H2020 topic	CIMULACT topic	Key Words CIMULACT topic
Blue Growth	Blue Growth	Towards a Baltic and North Sea research and innovation programme		x	
		Blue Bioeconomy Public-Public Partnership		x	
		Sustainable harvesting of marine biological resources		x	
		Sustainable EU aquaculture 2.0: Nutrition and Breeding		x	
		Multi-use of the marine space, offshore and near-shore: pilot demonstrators		x	
		Sustainable solutions for bio-based plastics on land and sea		x	
		The Future of Seas and Oceans Flagship Initiative		x	
		All Atlantic Ocean Research Alliance Flagship		x	
		Coordination of marine and maritime research and innovation in the Black Sea		x	

Call		Title of H2020 topic	Key Words H2020 topic	CIMULACT topic	Key Words CIMULACT topic
Rural Renaissance	From farm to society: understanding dynamics and modernising policies	Building modern rural policies on long-term visions and societal engagement		x	
		Socio-economic impacts of digitisation of agriculture and rural areas		x	
		Contracts for effective and lasting delivery of agri-environmental public goods		x	
		Analytical tools and models to support policies related to agricultural and food		x	
	Organising sustainable food and non-food value chains under changing conditions	Closing nutrient cycles		x	
		Realising the potential of regional and local bio-based economies	Food supply chain; Involvement and cooperation with stakeholders/citizens; Scenarios and strategies for local food production and increasing capacities for different cities with different conditions	Evolving food culture in growing cities	Food supply chain; Involvement and cooperation with stakeholders/citizens; Scenarios and strategies for local food production and increasing capacities different cities with different conditions
		Circular bio-based business models for rural communities		x	
		Sustainable wood value chains		x	
	Taking advantage of the digital revolution	ICT Innovation for agriculture – Digital Innovation Hubs for Agriculture		x	
		Enabling the farm advisor community to prepare farmers for the digital age		x	
		Digital solutions and e-tools to modernise the CAP		x	
	Boosting innovation and enhancing the human and social capital in rural areas	Thematic networks compiling knowledge ready for practice		x	
		Fuelling the potential of advisors for innovation		x	

Call	Priorities	Title of H2020 topic	Key Words H2020 topic	CIMULACT topic	Key Words CIMULACT topic
Challenge 3: Clean, secure and efficient energy / Building low-carbon, climate resilient future: secure, clean and efficient energy	Energy efficiency	Decarbonisation of the EU building stock: innovative approaches and affordable solutions changing the market for buildings renovation		x	
		Integrated home renovation services		x	
		Stimulating demand for sustainable energy skills in the construction sector		x	
		Upgrading smartness of existing buildings through innovations for legacy equipment		x	
		Next-generation of Energy Performance Assessment and Certification		x	
		Business case for industrial waste heat/cold recovery		x	
		Capacity building programmes to support implementation of energy audits		x	
		Innovative financing for energy efficiency investments		x	
		Mainstreaming energy efficiency finance		x	
		Aggregation - Project Development Assistance		x	
		Enabling next-generation of smart energy services valorising energy efficiency and flexibility at demand-side as energy resource	energy efficiency; individualised energy; innovative energy services/business models	Smart energy governance	energy efficiency; individualised energy; innovative governance/business models
		Socio-economic research conceptualising and modelling energy efficiency and energy demand		x	
		New energy label driving and boosting innovation in products energy efficiency		x	
		Supporting public authorities to implement the Energy Union		x	
		European City facility - European Cities as key innovation hubs to unlock finance for energy efficiency		x	
	Global leadership in renewables	**Title of H2020 topic**	**Key Words H2020 topic**	**CIMULACT topic**	**Key Words CIMULACT topic**
		Developing the next generation of renewable energy technologies		x	
		Disruptive innovation in clean energy technologies		x	
		Renewable energy system integrated at the building scale		x	
		Increased performance of technologies for local heating and cooling solutions		x	
		Demonstrate significant cost reduction for Building Integrated PV (BIPV) solutions		x	
		Solar Energy in Industrial Processes		x	
		Combining Renewable Technologies for a Renewable District Heating and/or Cooling System		x	
		Developing solutions to reduce the cost and increase performance of renewable technologies		x	
		Demonstrate highly performant renewable technologies for combined heat and power (CHP) generation and their integration in the EU's energy system		x	
		Demonstrate solutions that significantly reduce the cost of renewable power generation		x	
		Optimising manufacturing and system operation		x	
		Increase the competitiveness of the EU PV manufacturing industry		x	
		Development of solutions based on renewable sources that provide flexibility to the energy system		x	
		Demonstration of solutions based on renewable sources that provide flexibility to the energy system		x	
		Development of next generation biofuels and alternative renewable fuel technologies for road transport		x	
		Demonstration of cost effective advanced biofuel pathways in retrofitted existing industrial installations		x	
		Development of next generation biofuel and alternative renewable fuel technologies for aviation and shipping		x	
		Boosting pre-commercial production of advanced aviation biofuels		x	
		Market Uptake support	empower individuals; renewable energy; innovative business model	Smart energy governance	individualised energy production (prosumers); renewable energy; innovative business model
	Smart and clean energy for consumers	**Title of H2020 topic**	**Key Words H2020 topic**	**CIMULACT topic**	**Key Words CIMULACT topic**
		The role of consumers in changing the market through informed decision and collective actions		x	
		Mitigating household energy poverty	energy poverty; renewable energy; energy efficiency	Smart energy governance	energy poverty; renewable energy; energy efficiency
		Consumer engagement and demand response		x	
	Smart citizen-centred energy system	**Title of H2020 topic**	**Key Words H2020 topic**	**CIMULACT topic**	**Key Words CIMULACT topic**
		Flexibility and retail market options for the distribution grid		x	
		Solutions for increased regional cross-border cooperation in the transmission grid		x	
		Integrated local energy systems (Energy islands)		x	
		Decarbonising energy systems of geographical Islands		x	
		TSO – DSO – Consumer: Large-scale demonstrations of innovative grid services through demand response, storage and small-scale (RES) generation		x	
		Research on advanced tools and technological development		x	
		Pan-European Forum for R&I on Smart Grids, Flexibility and Local Energy Networks		x	
		European Islands Facility - Unlock financing for energy transitions and supporting islands to develop investment concepts		x	
	Smart Cities and Communities	**Title of H2020 topic**	**Key Words H2020 topic**	**CIMULACT topic**	**Key Words CIMULACT topic**
		Smart Cities and Communities		x	
	Enabling near-zero CO2 emissions from fossil fuel power plants and carbon intensive industries	**Title of H2020 topic**	**Key Words H2020 topic**	**CIMULACT topic**	**Key Words CIMULACT topic**
		Advanced CO2 capture technologies		x	
		Conversion of captured CO2		x	
		Strategic planning for CCUS development		x	
		Integrated solutions for flexible operation of fossil fuel power plants through power-to-X-to-power and/or energy storage		x	
		Low carbon industrial production using CCUS		x	
		Geological Storage Pilots		x	
	Joint Actions between countries	**Title of H2020 topic**	**Key Words H2020 topic**	**CIMULACT topic**	**Key Words CIMULACT topic**
		Joint programming actions to foster innovative energy solutions		x	
		Support to the realisation of the Implementation Plans of the SET Plan		x	
		European Pre-Commercial Procurement Programme for Wave Energy Research &Development		x	
		Support action in preparation of a Joint Programming activity		x	
		Joint Programming with EU and African partners for a R&I actions in the area of renewable energy		x	
	Cross-cutting issues	**Title of H2020 topic**	**Key Words H2020 topic**	**CIMULACT topic**	
		Social Sciences and Humanities (SSH) aspects of the Clean-Energy Transition		x	
		Modelling in support to the transition to a Low-Carbon Energy System in Europe		x	
		Support for the opening of low-carbon energy research databases in Europe		x	
		Support to sectorial fora		x	
		Research, innovation and educational capacities for energy transition		x	
		Transition in coal intensive regions		x	

Challenge 4: Smart, green and integrated transport

Call	Priorities	Title of H2020 topic	Key Words H2020 topic	CIMULACT topic	Key Words CIMULACT topic
Mobility for Growth (CIMULACT directly mentioned, particularly the priority "Accounting for the people")	Building a low-carbon, climate resilient future: low-carbon and sustainable transport	Advancements in aerodynamics and innovative propulsion systems for quieter and greener aircrafts		x	
		Aviation operations impact on climate change (InCo flagship)		x	
		Future propulsion and integration: towards a hybrid/electric aircraft (InCo flagship)		x	
		InCo flagship on reduction of transport impact on air quality		x	
		Retrofit Solutions and Next Generation Propulsion for Waterbone Transport		x	
		Sustainable multi-modal inter-urban transport, regional mobility and spatial planning	urban-surrounding territories transport infrastructure; innovative transport solutions; spatial planning; quality of life (including environment)	1) Sustainable transport solution that enable us to live where we choose, 2) Urban-rural symbiosis	urban-surrounding territories transport infrastructure; innovative transport solutions; spatial planning; quality of life (including environment)
		Harnessing and understanding the impacts of change in urban mobility on policy making by city-led innovation for sustainable urban mobility	New transport/mobility solutions; identification of transport solutions (current, future - including their impact); new business model and tools	Sustainable transport solution that enable us to live where we choose	New transport/mobility solutions; identification of transport solutions (current, future - including their impact); new business model and tools
		Upgrading transport infrastructure in order to monitor noise and emissions.		x	
		Hardening vehicle environmental protection systems against tampering		x	
		Logistics solutions that deal with requirements of the 'on demand economy' and for shared-connected and low-emission logistics operations		x	
	Safe, integrated and resilient transport systems	Human Factors in Transport Safety		x	
		Marine Accident Response		x	
		Airworthiness of mass-market drones		x	
		Coordinating national efforts in modernizing transport infrastructure and provide innovative mobility services		x	
		Innovative technologies for improving aviation safety and certification in icing conditions (InCo flagship)		x	
		Moving freight by Water: Sustainable Infrastructure and Innovative Vessels		x	
		Safety in an evolving road and mobility environment		x	
		Innovative applications of drones for ensuring safety in transport		x	
		InCo Flagship on Integrated multimodal, low-emission freight transport systems and logistics		x	
	Global leadership and competitiveness	Multidisciplinary and collaborative aircraft design tools and processes		x	
		The Autonomous Ship		x	
		"Driver" behaviour and acceptance of connected, cooperative and automated transport		x	
	Accounting for the people	An inclusive digitally interconnected transport system meeting citizens' needs	empowering citizens; skills development; digital technology and its literacy	1) I'm empowered to lead my changes, 2) Fostering equal opportunities in the digital era	empowering citizens; skills development; digital technology and its literacy
		New regulatory frameworks to enable effective deployment of emerging technologies and business/operating models for all transport modes		x	
		Building Open Science platforms in transport research		x	
		Demographic change and participation women in transport		x	
		Support for dissemination events in the field of Transport Research		x	
		Supporting Joint Actions on sustainable urban accessibility and connectivity (*The topic will be further defined with the update of the work programme 2019*)		x	
	Blue growth	Unmanned and autonomous survey activities at sea		x	
		Ship emission control scenarios, marine environmental impact and mitigation		x	
Call	**Priorities**	**Title of H2020 topic**	**Key Words H2020 topic**	**CIMULACT topic**	**Key Words CIMULACT topic**
Digitising and Transforming European Industry and Services: Automated Road Transport	Digitising and Transforming European Industry and Services: Automated Road Transport	Testing, validation and certification procedures for highly automated driving functions under various traffic scenarios based on pilot test data		x	
		Support for networking activities and impact assessment for road automation		x	
		Human centred design for the new driver role in highly automated vehicles		x	
		Developing and testing shared, connected and cooperative automated vehicle fleets in urban areas for the mobility of all		x	
		Efficient and safe connected and automated heavy-duty vehicles in real logistics operations		x	
		Large-scale, cross-border demonstration of highly automated driving functions for passenger cars		x	
Call	**Priorities**	**Title of H2020 topic**	**Key Words H2020 topic**	**CIMULACT topic**	**Key Words CIMULACT topic**
Building a low-carbon, climate resilient future: Green Vehicles	Building a low-carbon, climate resilient future: Green Vehicles	Integrated, brand-independent architectures, components and systems for next generation electrified vehicles optimised for the infrastructure		x	
		Virtual product development and production of all types of electrified vehicles and components.		x	
		Low- emissions propulsion for long-distance trucks and coaches		x	
		User centric charging infrastructure		x	
		InCo flagship on "Urban mobility and sustainable electrification in large urban areas in developing and emerging economies"		x	

Challenge 5: Climate action, environment, resource efficiency and raw materials

Call	Priorities	Title of H2020 topic	Key Words H2020 topic	CIMULACT topic	Key Words CIMULACT topic
Building a low-carbon, climate resilient future: climate action in support of the Paris Agreement	Decarbonisation	Supporting the development of climate policies to deliver on the Paris Agreement, through Integrated Assessment Models (IAMs)		x	
		Negative emissions and land-use based mitigation assessment		x	
	Climate adaptation, impacts and services	Climate change impacts in Europe		x	
		Resilience and sustainable reconstruction of historic areas to cope with climate change and hazard events		x	
		Human dynamics of climate change		x	
	Inter-relations between climate change, biodiversity and ecosystem services	Inter-relations between climate change, biodiversity and ecosystem services		x	
	The Cryosphere	The changing cryosphere: uncertainties, risks and opportunities		x	
	Knowledge gaps	Addressing knowledge gaps in climate science, in support of IPCC reports		x	
Call		**Title of H2020 topic**	**Key Words H2020 topic**	**CIMULACT topic**	**Key Words CIMULACT topic**
Greening the economy in line with the Sustainable Development Goals (SDGs)	Connecting economic and environmental gains - the circular economy	Methods to remove hazardous substances and contaminants from secondary raw materials		x	
		Independent testing programme on premature obsolescence		x	
		Demonstrating systemic urban development for circular and regenerative cities	Circular economy; spatial/urban planning; sustainable development (urban-rural); participatory governance	1) Urban-rural symbiosis, 2) Making dense and growing urban areas more sustainable and liveable, 3) Consume smarter, increase well being	Circular economy; spatial/urban planning; sustainable development (urban-rural); participatory governance
		Building a water-smart economy and society		x	
		Coordinated approaches to funding and promotion of research and innovation for circular economy		x	
	Raw materials	New technologies for the enhanced recovery of by-products		x	
		Raw materials innovation for the circular economy: sustainable processing, reuse, recycling and recovery schemes		x	
		Raw materials policy support actions for the circular economy		x	
		New solutions for sustainable production of raw materials		x	
		Raw materials innovation actions: exploration and Earth observation in support of sustainable mining		x	
	Water for our environment, economy and society	Digital solutions for water: linking the physical and digital world for water solutions		x	
		EU-India water co-operation		x	
	Innovating cities for sustainability and resilience	Strengthening international cooperation on sustainable urbanisation: nature-based solutions for restoration and rehabilitation of urban ecosystems	Environmental sustainable development; sustainable development of cities; urban ecosystem; foster social, economic and cultural well-being	1) Making dense and growing urban areas more sustainable and liveable, 2) At one with nature	Environmental sustainable development; sustainable development of cities; urban ecosystem; foster social, economic and cultural well-being
		Visionary and integrated solutions to improve well-being and health in cities	Functional urban area; sustainable development of cities; improving personal well-being	Making dense and growing urban areas more sustainable and liveable	Functional urban area; sustainable development of cities; improving personal well-being
	Protecting and leveraging the value of our natural and cultural assets: Earth observation	Strengthening the benefits for Europe of the Global Earth Observation System of Systems (GEOSS) - establishing 'EuroGEOSS'		x	
		Development of commercial activities and services through the use of GEOSS and Copernicus data		x	
	Protecting and leveraging the value of our natural and cultural assets: Nature-based solutions, disaster risk reduction and natural capital accounting	Towards operational forecasting of earthquakes and early warning capacity for more resilient cities		x	
		Valuing nature: mainstreaming natural capital in policies and in business decision-making		x	
	Protecting and leveraging the value of our natural and cultural assets: Heritage alive	International network to promote cultural heritage innovation and diplomacy		x	
		Transforming historic urban areas and/or cultural landscapes into hubs of entrepreneurship and social and cultural integration		x	
		ERA-NET Cofund action(s) for climate action, environment, resource efficiency and raw materials		x	

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

Call		Title of H2020 topic	Key Words H2020 topic	CIMULACT topic	Key Words CIMULACT topic
Migration	Migration	Understanding migration and mobility patterns: elaborating mid and long-term migration scenarios		x	
		Towards a forward-looking migration governance: addressing the challenges, assessing capacities and designing future strategies		x	
		Social and economic effects of migration in Europe and integration policies		x	
		Mapping and overcoming integration challenges for migrant children		x	
		Addressing the challenge of migrant integration through ICT-enabled solutions		x	
		International protection of refugees in a comparative perspective		x	
		Addressing the challenge of forced displacement		x	

Call		Title of H2020 topic	Key Words H2020 topic	CIMULACT topic	Key Words CIMULACT topic
Socioeconomic and cultural transformations in the context of the fourth industrial revolution	Socioeconomic and cultural transformations in the context of the fourth industrial revolution	Research for inclusive growth: addressing the socioeconomic effects of technological transformations	Competitivness in the labour market (changing environment); skills development; Empowering practices	I am empowered to lead my changes	Competitivness in the labour market (changing environment); skills development; Empowering practices
		Transformative impact of disruptive technologies in public services		x	
		Innovative solutions for inclusive and sustainable urban environments	Urban-rural development (inequalities); Case studies/good practices of urban-rural symbiosis; participatory models	Urban-rural Symbiosis	Urban-rural development (inequalities); Case studies/good practices of urban-rural symbiosis; participatory models
		Innovative approaches to urban and regional development through cultural tourism		x	
		Cities as a platform for citizen-driven innovation		x	
		Inclusive and sustainable growth through cultural and creative industries and the arts		x	
		The impact of technological transformations on children and youth		x	
		The societal value of culture and the impact of cultural policies in Europe		x	
		Social platform on endangered cultural heritage and on illicit trafficking of cultural goods		x	
		Collaborative approaches to cultural heritage for social cohesion		x	
		Curation of digital assets and advanced digitisation		x	
		Using big data approaches in research and innovation policy making		x	
		Supply and demand-oriented economic policies to boost robust growth in Europe – Addressing the social and economic challenges in Europe		x	

Call		Title of H2020 topic	Key Words H2020 topic	CIMULACT topic	Key Words CIMULACT topic
Governance for the future	Governance for the future	Trust in governance		x	
		Past, present and future of differentiation in European governance		x	
		Addressing populism and boosting civic and democratic engagement		x	
		Enhancing social rights and EU citizenship		x	
		New forms of delivering public goods and inclusive public service	Improving public services/democratic processes; citizens participation; secure access and use of services; empowerment	Empowered citizens	Improving public services/democratic processes; citizens participation; secure access and use of services; empowerment
		Trends and forward-looking scenarios in global governance		x	
		Partnering for viability assessments of innovative solutions for markets outside Europe		x	
		Drivers and contexts of violent extremism in the broader MENA region and the Balkans		x	
		Extreme ideologies and polarisation		x	
		Pilot on using the European cloud infrastructure for public administrations	Tools and models for evidence based policy; Citizens/stakeholders participation; trust in the authorities, institutions and the policies	Evidence-based community building	Tools and models for evidence based policy; Citizens/stakeholders participation; trust in the authorities, institutions and the policies
		Digitisation, Digital Single Market and European culture: new challenges for creativity, intellectual property rights and copyright		x	
		ERA-Net Co-fund - Renegotiating democratic governance in times of disruptions		x	
		Taking lessons from the practices of interdisciplinarity in Europe		x	

	Call	Priorities	Title of H2020 topic	Key Words H2020 topic	CIMULACT topic	Key Words CIMULACT topic
Challenge 7: Secure societies - Protecting freedom Europe and its citizens	Protecting the infrastructure of Europe and the people in the European smart cities	Protecting the infrastructure of Europe and the people in the European smart cities	Prevention, detection, response and mitigation of combined physical and cyber threats to critical infrastructure in Europe		x	
			Security for smart and safe cities, including for public spaces		x	
	Call		**Title of H2020 topic**	**Key Words H2020 topic**	**CIMULACT topic**	**Key Words CIMULACT topic**
	Security	Disaster-Resilient Societies	Human factors, and social, societal, and organisational aspects for disaster-resilient societies		x	
			Technologies for first responders		x	
			Pre-normative research and demonstration for disasterresilient societies		x	
			Chemical, biological, radiological and nuclear (CBRN) cluster		x	
			Demonstration of novel concepts for the management of pandemic crises		x	
		Fight against Crime and Terrorism	Human factors, and social, societal, and organisational aspects to solve issues in fighting against crime and terrorism		x	
			Technologies to enhance the fight against crime and terrorism		x	
			Information and data stream management to fight against (cyber)crime and terrorism		x	
			Explosives: detection, intelligence, forensics		x	
		Border and External Security	Human factors, and social, societal, and organisational aspects of border and external security		x	
			Technologies to enhance border and external security		x	
			Demonstration of applied solutions to enhance border and external security		x	
		General Matters	Pan-European networks of practitioners and other actors in the field of security		x	
			Strategic pre-commercial procurements of innovative, advanced systems to support security		x	
			Pre-commercial procurements of innovative solutions to enhance security		x	
	Call		**Title of H2020 topic**	**Key Words H2020 topic**	**CIMULACT topic**	**Key Words CIMULACT topic**
	Digital Security	Cybersecurity, Digital Privacy and data protection	Cybersecurity preparedness - cyber range, simulation and economics		x	
			Management of cyber-attacks and other risks		x	
			Digital Security and privacy for citizens and Small and Medium Enterprises and Micro Enterprises		x	
			Cybersecurity in the Electrical Power and Energy System (EPES): an armour against cyber and privacy attacks and data breaches		x	
			Digital security, privacy, data protection and accountability in critical sectors		x	

CIMULACT topic	Key words
Access to equal and holistic health services and resources for all citizens	access to health services; prevention and awareness of health; patien-centred healthcare; compare healthcare systems (differencies/approaches); economic viability and impact; prevention and treatment solutiions; public health strategies; equity and access to health services
At one with nature	psychological and physical well-being; environmental sustainability; consumer habits; affordable and accessible sustainable life style
Balanced work-life model	work flexibility (paid x unpaid work); productivity and efficiency; healthy life style
Consume smarter, increase well being	responsible consumerism; consumer behaviour; healthy well-being; market and behaviour research; circular economy
Debating alternative economic models	experience with alternative econom. Models; social cohesion; common knowledge base about alt. econom. models
Design thinking and doing and life skills for all	design thinking and life skills fostering; focus on process instead of results; reflect current curricula; develop creativity (good practices and models)
Dissemination and continuous exploitation of research and innovation in the healthcare system	research results for service provider; exploit research results in the healthcare systems; engagement citizens in research discussion; research results dissemination; engagement people/stakeholders
Educational ecosystem as a driver of social innovation and local development	develop creative thinking; personalized approches (empowering); new ways of learning (sharing knowledge among generations); learning agents cooperation; cohesion + inclusion
Empowered citizens	securing information, access and using of services; citizen participation; empowerment; inclusive society; improving public services and democratic processes
Empowering diversity in communities	equality; diversity as a potential; new models and approaches for social inclusion; models of conflict resolution
Evidence-based community building	access to data and evidence; infomed mindsets (citizen, policy makers); reducing prejudice; models of participation; tools and models for evidence based policy; trust in the authorities, institutions and policies; citizens/stakeholders participation
Evidence-based personalized healthcare	personalized healthcare; E-health - improving quality and resources efficiency; holistic approach; educational/skill training (health, digital literacy); develop user lifestyle methods and technology; research of the conditions for personalized medicine; prevention and treatment solutions; effective using of data; health data security
Evolving food culture in growing cities	diversity of food culture in communities; food as enabler for social inclusion/cohesion; food behaviour (impact on environment); food supply chain; educational programmes (healthy food habits); research on food practice/habits; Involvement and cooperation with stakeholders/citizens; Scenarios and strategies for local food production and increasing capacities in different local condition/cities
Fostering equal opportunities in the digital era	safe digitalizaton; equal access to digital infrastructure; digital era (internet of things, virtual reality); opportunities for everyone = digital producers; digital technology and its literacy
Good quality food for all	access to food (+ impact on rural/urban areas); food poverty; food waste; food equality - social cohesion; personalized food diets/safe and sustainable nutrition (e.g. quality, health); local food production; sustainable food (production)
I am empowered to lead my changes	flexibility on labor market; empowering practices and tools; skills development (technical, social, individual); empowering citizens; competitivness in the labour market (changing environment)
Learning for society	harmonize common and individual good; lifelong education; building collective framework/intelligence; social cohesion (diversity)
Making dense and growing urban areas more sustainable and liveable	cities sustainable development; fucntional urban area; citizen participation; urban structure/urban transport/good practice; improving personal well-being (social, economical, cultural); urban ecosystem
Meaningful research for community	application of research (impact on community); rsearch funding; transaprent research process; access to information
Smart energy governance	decentralize and individualize energy production (prosumers); renewable energy; socially and economic fairness; new/innovative governance/business model; energy poverty; energy efficiency
Sustainable transport solutions that enable us to live where we choose	new/innovative sustainable transport/mobility solutions (current, future - including their impact); transport infrastructure + innovative business model and tools; sustainable life style; access to services and its location; urban-rural transport connections
Technology as a means of well being	access to technology; ethical using of technology; citizen participation in the development of technology
Urban-rural Symbiosis	urban-rural sustainable development + symbiosis; quality life for citizens (including environment); spatial planning (social + econom. + ecolog. sustainability); participatory governance; citizen/stakeholder engagement; functional urban area; urban-surrounding territories transport infrastructure; good practices (case studies) of urban-rural symbiosis

ANNEX VI Example of the selected CIMULACT topics overlap with H2020-WP-2018-2020

Table 3 Assessment of the overlap of the topics on Personalised medicine

Thematic Similarity Assessment	Rating	Explanation
Challenge	50%	CIMULACT provides more details on health services and resources. CIMULACT includes also issues of holistic medicine, e-health and social aspects of the personalized healthcare such as equal access. In contrast WP ask for a pilot project concentrated more on the personal health care provision.
Scope	53%	WP topic is presented at very general level, CIMULACT is more detailed and broader, e.g. in terms of holistic medicine and individual responsibilities (these are missing in WP. CIMULACT includes PM into a broader framework of holistic medicine, whereas the WP restricts its focus on evidence-based path towards a PM model.
Expected Impact	43%	WP as a pilot study has limited impacts, CIMULACT topics promises actual implementations of results with impact on the science, the health care system and people. CIMULACT claim beside the personal level impacts also a wider range of "soft" effects.
Overall	48%	CIMULACT has overall wider scope than H2020-WP 2018-2020. It is because CIMULACT puts PM into a broader framework of holistic medicine, whereas the WP emphasizes scientific and technical approach towards a PM-based model. WP< CIMULACT

Table 4 Assessment of the overlap of the topics on Sustainable transport

Thematic Similarity Assessment	Rating	Explanation
Challenge	60%	CIMULACT stress out the balance of rural and urban areas, while urban rural symbiosis is not explicitly addressed in WP. WP focuses on new transport models within the metropolitan areas, whereas CIMULACT is broader – it considers the sustainability of territorial organization as a whole
Scope	53%	WP aims more at technologies and technical solutions, while CIMULACT aim at organisation and socioeconomic aspects;. Both texts strive for sustainability; CIMULACT is somewhat broader in terms of incorporation aspects of social psychology, identity and culture. Urban rural symbiosis is not explicitly addressed in WP
Expected Impact	67%	WP aims more on infrastructural, technical and system solutions of mobility, while CIMULACT deals more with socioeconomic aspects of transportation and mobility. Urban rural integration is not explicitly addressed in WP; on the other hand the improvements of Trans-European transport corridors or inter-cities transport are not explicitly considered in CIMULACT
Overall	58%	The focus on local transport surrounding urban centres is common.. However WP exceeds CIMULACT in its territorial scope, while CIMULACT is broader in the thematic scope. WP>< CIMULACT

Table 5 Assessment of the overlap of the topics on Liveable cities

Thematic Similarity Assessment	Rating	Explanation
Challenge	100%	The both topic descriptions refer to the same challenges just using different words.
Scope	85%	WP has a slightly broader (e.g. gender dynamics and diversity). WP gets more precise and specific
Expected Impact	87%	Very similar in terms of sustainability with slight differences: WP stresses out the impacts on the international level and monitoring system, while CIMULACT aims at empowering an individual.
Overall	91%	Great level of overlap in all chapters. WP = CIMULACT

Table 6 Assessment of the overlap of the topics on People and technology

Thematic Similarity Assessment	Rating	Explanation
Challenge	97%	Both refer to very similar challenges including same possible threats.
Scope	73%	WP has a broader scope of understanding the process and path dependent patterns in society with a great emphasis on social inclusion. WP is future oriented, whereas CIMULACT aims at proactive steps.
Expected Impact	73%	WP aims at delivering overall strategy for cohesion and inclusion in the society while CIMULACT concentrates more on empowerment of an individual.
Overall	81%	From the perspective of future strategies or policies: WP>CIMULACT