

**Innovation, Climate, and the Future:
How to accelerate the contribution of new technologies to tackle
climate change**

Brussels, 9 December 2019

EVENT MINUTES

“L’avenir n’est jamais que du présent à mettre en ordre. Tu n’as pas à le prévoir, mais à le permettre.”

“As for the future, your task is not to foresee it, but to enable it.”

- *Antoine de Saint Exupéry (1900-1944)*

On the 9th of December 2019, the European Risk Forum and Re-Imagine Europa organised a joint event on [“Innovation Climate and the Future: how to accelerate the contribution of new technologies to tackle climate”](#).

With the intention to introduce a European Green Deal within her first hundred days in office, European Commission President-Elect Ursula von der Leyen has placed addressing climate change at the forefront of the EU’s upcoming political agenda.

For Europe to meet its ambitious objective to become the world’s first carbon-neutral continent and reduce CO₂ emission by at least 50 per cent by 2030, the EU will have to establish a policy and regulatory environment that encourages the creation and innovation of new technologies critical to meeting this important challenge.

Although progress has been made in this regard over the last few years - through for example the sustained emphasis on the circular economy, or, more broadly, the introduction of the Better Regulation Guidelines - still more can and should be done to harness the EU’s capacity to innovate and embrace the future.

The aim of the conference was to bring together key representatives from academia, industry, NGOs, media, policymakers and other stakeholders in a high-level debate to explore the possibilities that technology offers in pursuing the ambitious objectives connected with the European Green Deal, including the reduction of CO2 emission by at least 50 per cent by 2030.

The importance of this issue has in fact prompted the European Risk Forum and Re-Imagine Europa to join forces to build on the expertise of ERF on the topics of innovation, new technologies and the regulatory and policy perspectives and Re-Imagine Europa's focus on the need to build new narratives and develop concrete and pragmatic new ideas on a vision of Europe for the 21st century. As pointed out by Professor Manuel Castells: "Europe is in danger because of a lack of new ideas".

Opening Remarks

Professor Mark Ferguson, Director General of the Science Foundation Ireland and Chief Scientific Adviser to the Government of Ireland, who chaired the conference, gave the welcome speech. "As Europeans, we have the duty to take the lead of people addressing problems such as climate change since we have both scientific and ethical capabilities that are needed" said Prof. Ferguson, who then added: "Mitigation strategies are not going to work alone. We have to lead on both innovations and the necessary smart regulations to encourage those innovations". Prof. Ferguson highlighted an example of European innovation engineering a new strain of bacterium that feeds on carbon dioxide instead of sugars or other organic molecules¹.



Prof. Ferguson also underlined the relevance of the debate around the role of innovation and new technologies in achieving the ambitious goals set by European Commission President Ursula von der Leyen and the European Green Deal. Whilst climate change has been reported for over fifty years, the real existential question that climate change poses has only recently been brought to the fore of the political agenda. With the European Commission having set this as its top priority for this mandate, it will be more important than ever to develop possible innovative solutions and sustainable business

opportunities. In this context, Prof. Ferguson stressed the need to respect both the Innovation Principle and the Precautionary Principle.



"We have this really clear vision to be a climate-neutral continent by 2050, so we have to work hard to ensure not only that innovative technologies are developed but also that the whole process is managed in the most appropriate way to reach this ambitious objective" explained Daria Tataj, Former Chair of High-Level Advisors to European Commissioner for Research, Science and Innovation and Member of the Advisory Board of Re-Imagine Europa. "It is

almost always the foresight of governments to create the conditions that stimulate the potential needed to create innovative ecosystems” concluded Dr Tataj.

You can find a link to the presentation of Dr Tataj [here](#).

Session 1 - An improved policy framework to foster innovation for climate change

To address the challenge of climate change, society will need an effective policy framework to manage scarce resources, support sustainable innovation and employ new technologies that can help reverse and mitigate increasing climate volatility as well as advance sustainable production and consumption.

The first session of the conference was entitled “An improved policy framework to foster innovation for climate change” and was chaired by Robert Madelin, Chairman of FIPRA International and former Director-General of DG CONNECT. He introduced the three panellists pointing out that science and innovation will allow us to tackle climate change only if they are widely adopted by society. Policymakers are therefore responsible to design the rules in order to encourage changes to take place in the right way at the right time.



The first speaker of the panel was Alexandre Affre, Director for Industrial Affairs & Entrepreneurship at BusinessEurope. He underlined that competition for investments in research and innovation is on the rise and companies are increasingly willing to invest outside of the European Union. For these reasons, the main requirements to stimulate an environment suitable for innovation are professional skills of workers, a collaborative atmosphere, adequate funding and a regulatory framework suitable for the development of innovation. (see Figure 1). He concluded that the development of policy tools such as sandboxes and the Innovation Principle and public funding via Horizon Europe would be important.

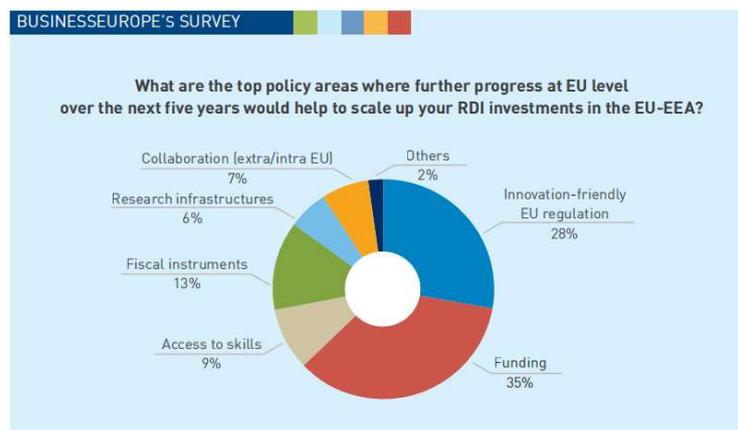


Figure 1

Felice Simonelli, Senior Research Fellow at the Centre for European Policy Studies (CEPS), focused during his presentation on the relationship between policymaking and innovation and stressed the importance of calibrating regulations to foster the innovative potential of research (you can find the full presentation of Dr Simonelli here). The central point of his remarks was that the Innovation Principle is a tool suited to help achieve EU policy objectives by ensuring that legislation is designed in a way that creates the best possible conditions for innovation to flourish. He also discussed the ways in which the Innovation Principle can be applied in a complementary way, alongside the Precautionary Principle (see Figure 2).

Components of the innovation principle

"... whenever policy is developed, the impact on innovation is fully assessed ..." (EPSC, 2016)

- 1. Foresight and Horizon Scanning**
 - Detecting early signs of potentially important developments through a systematic examination of threats and opportunities, with emphasis on new technology
- 2. Research and Innovation Tool (Tool #21)**
 - Broadening stakeholder consultation to capture the R&I angle of EU initiatives
 - Assessing the potential impacts of EU initiatives on R&I
 - Considering the impacts of the legislative design on R&I
 - Improving the design of EU initiatives to make them more innovation friendly
- 3. Innovation deals**
 - Non-legislative tool
 - Cooperation among the European Commission, Member State authorities and businesses to: identify regulatory obstacles hindering innovation; and find solutions to remove such obstacles, while complying with EU and national law

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Figure 2

Dr Tataj, the third speaker on the panel, explained that the methods of application at the national and regional level of the policies that are designed by the European Commission are at least as important as their overall effectiveness in encouraging innovation. She then highlighted the fact that a real change in perspective is mandatory and a participatory approach involving all the different stakeholders is absolutely needed to disrupt the complex system that drives climate change, since climate change and environmental problems in general are now a real emergency (see figure 3).

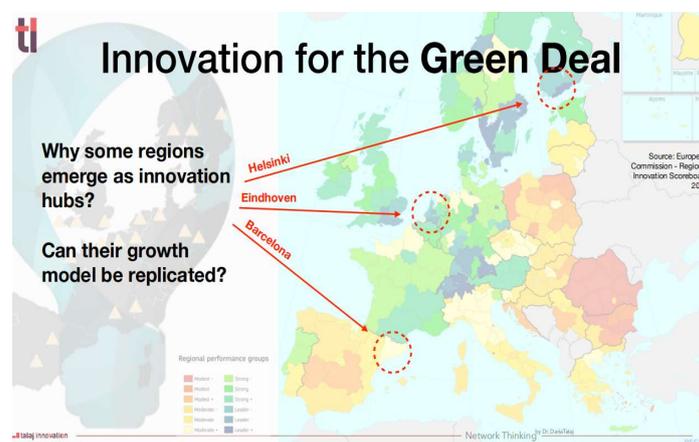


Figure 3

Session 2 - The role of science in developing solutions to tackle climate change

Science plays a key role in informing policy decisions, particularly in the area of climate change, where the generation and interpretation of evidence is essential for developing effective instruments and policies. However, in an age where facts are often contested or falsified, society needs an effective system of scientific advice, high-quality data generation and a credible institutional framework that does not tolerate misinformation.

The second session was chaired by Keith Sequeira, Head of Unit EIC Governance & Coordination at DG Research and Innovation. Mr Sequeira talked about the importance of scientific advice in policy-making, referring also to the establishment of the Scientific Advice Mechanism (SAM), an independent and permanent committee that has the task of supporting the legislative work of the European Commission through scientific evidence.

Steffi Ober, Team Leader for Economics and Research Policy at Naturschutzbund Deutschland (NABU), then explained that the current pace of change is far too slow to stop climate change (you can find the full presentation of Dr Ober [here](#)). Dr Ober provided some examples of successful transdisciplinary dialogue based on her experience in Germany. She pointed out that better results can be achieved by bringing together all the actors involved: only through cooperation is it possible to combine technological innovation with the necessary change from the bottom up in terms of living standards and habits. She then suggested that Europe is suffering from a lack of incentives for a more holistic (or systemic) innovation approach, fostering as well technological, cultural, institutional and economical changes.

The second speaker on the panel was Richard Meads, the Rapporteur for the European Risk Forum (ERF), you can find the link to the full presentation of Mr Meads [here](#)). He focused on the importance of applying the highest standards of scientific evidence, integrity and the need to address risk-risk trade-offs in risk management decision making to tackle climate change. Also making reference to a recent ERF publication (see the excerpt in Figure 4), he explained that the quality of the scientific evidence used in any decision-making process has an impact on the legitimacy and transparency of decisions and therefore on the support of citizens to the legislative measures that may result. Using the best evidence also allows us to better understand both the relationship between costs and benefits of the decisions that are taken and to minimize the possibility that there are risks that are not identified *a priori*.

7.5. European Commission – Guidance

7.5.1. Scientific Integrity Standards

Recommendation 13: Working under direction of the central oversight body (as referred to in Recommendation 6 above), independent committees of eminent scientists should draw up all significant technical guidelines required to support the Commission-wide policies for the quality of scientific evidence and risk analysis, and to ensure that scientific integrity is respected. This process should ensure that guidelines are independent of political considerations, that they are based on cutting-edge science; that they reflect lessons learned from retrospective evaluation of scientific evidence; and that they embed the expertise of the scientific community.

Figure 4

Luca De Biase, Editor of Nòva24 – Il Sole 24 Ore spoke next and stated that as science is really understood only by a minority of the population, narratives that explain scientific evidence are always approximations of more complex problems. However, if presented in the right way, narratives can be helpful to achieve a broad understanding of real problems. For this reason, we should concentrate on finding narratives capable of making the problem clearer in the public debate and thus create consensus towards solutions which should help to address climate change.



Session 3 - Technology Area 1 – Digitalization & Climate Change

Digital tools and new sources of data can help scientists, policymakers, manufacturers, farmers, and other citizens improve their understanding of the dynamic relationship between land, life, water and climate and act accordingly. This session discussed some of those tools and their potential impact.

After lunch, the third session (“Digitalization & Climate Change”) started, chaired by Bernd Halling, Head of Corporate Strategy and Advocacy at Bayer. While introducing the speakers, Mr Halling spoke about the importance of using digital technologies such as AI and big data both to better understand the societal implications of climate change and its impact and to engage people in collaborative problem-solving.

The first speaker of the session was Sam Baker, Strategy/Purpose/Innovation Partner of Monitor Deloitte who concentrated on the role of emotional engagement as the real gamechanger in getting people to embrace a new vision of the future (you can find the full presentation of Mr Baker [here](#)). Mr Baker explained that the role of the younger generation in keeping climate change and other important issues at the centre of attention is crucial and introduced some insights from a report of Monitor Deloitte (see an excerpt in Figure 5) that explored the impact of new technologies on achievement of the Sustainable Development Goals (SDGs).

Key Messages



Urgent intervention is required

- Our biosphere is under threat from rising carbon emissions
- Our economy continues to drive unsustainable consumption
- > 30% of sampled indicators actually deteriorating, all could be undermined by climate change



Digital technologies are having a powerful impact

- Powerful impact on 103 targets through the four impact functions
- Deployment of existing technologies will, on average, accelerate progress by 22% and mitigate downwards trends by 23%
- Abatement of 1.34 Gt in 2030, 7x growth of ICT sector emissions available



Digital technologies can and need to contribute more

- Identified upsides need locking in
- Negative externalities need better understanding and mitigation
- Upside emissions scenario needs to be pursued
- The €3 trillion of ICT R&D needs an Impact focus

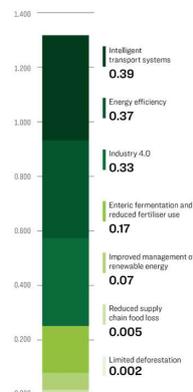


Figure 5

Stephanie Hampton, Director of the Division of Environmental Biology at the US National Science Foundation (NSF) then spoke. Prof. Hampton presented the National Ecological Observatory Network (NEON) project, funded by NSF to make publicly available in near real time all data taken from 81 collection centres in the US on soil, water, fauna and other conditions (see excerpt in Figure 6). She explained that research on these issues must be more collaborative both from an interdisciplinary and international perspective, in order to have a large-scale impact such as that needed to address environmental issues with a global dimension.

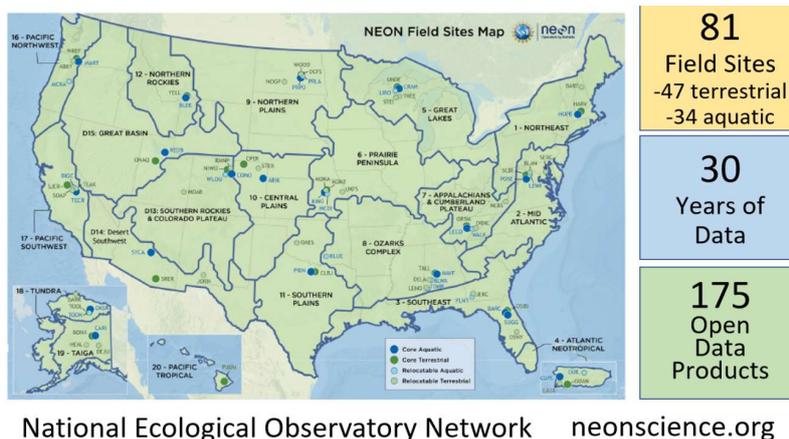


Figure 6

The session concluded with the presentation of Susanna Mäkelä, Senior Director of Government Affairs at Microsoft's EU office, who underlined the possibilities that AI could offer in fighting climate change. Ms Mäkelä explained that a lot of data exists on human behaviour and characteristics, the same cannot be said for the environment and that, as pointed out by other speakers, improvement is needed from this

point of view. Finally, she presented the “AI for Earth” grant program that Microsoft offers to innovators in the environmental sector (see Figure 7).

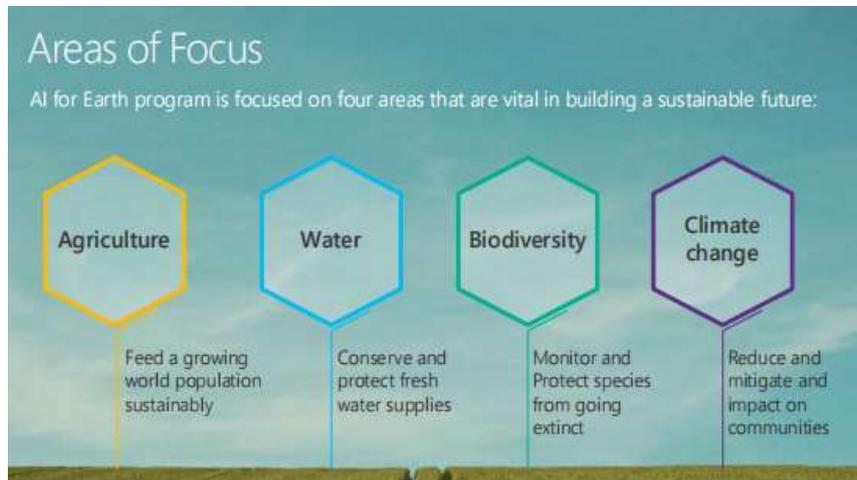


Figure 7

Session 4 - Technology Area 2 – Life Sciences & Climate Change

The life sciences already affect our daily lives, from the medicines we take to the food we eat and the ways that they are produced. This session looked at some of the latest developments in this field and their current and future contributions to tackling climate change.

The fourth and final session, entitled “Life Sciences & Climate Change”, was chaired by Angela Karp, Director for Science Innovation, Engagement and Partnerships at Rothamsted Research. After the introduction of the speakers, Prof. Karp expressed the wish that agriculture should be part of the solution to climate change and explained how Rothamsted has developed an innovative programme to encourage and support entrepreneurs to develop solutions which increase environmental sustainability of agriculture, an area in which there are currently too few incentives (you can find the full presentation of Prof. Karp [here](#)).



Julia Harnal, Vice President for Global Sustainability & Governmental Affairs at BASF, then spoke. Ms Harnal emphasized the innovative potential that can be achieved through knowledge sharing and open

research and the importance of preserving the earth's limited environmental resources for future generations. A collaborative approach to these issues could enable resource-effective practices, i.e. more sustainable food production and climate change mitigation through the development of new agricultural technologies.

Dirk Inzé, Science Director of the VIB-UGent Center for Plant Systems Biology, was the second panellist. Prof. Inzé's presentation highlighted the importance of more progressive regulation on genome editing to the development of high yielding, climate-resilient crops that could help in solving some of the problems connected with extreme climate conditions such as drought. He explained that engineered plants could be very effective in capturing greenhouse gases so that a carbon-negative society might even be possible. In addition, the use of high productivity agricultural products developed with the new breeding techniques could free up land and water resources which could be used to grow forests that would increase biodiversity.

Tobias Erb, Director at the Max Planck Institute for Terrestrial Microbiology, gave the last presentation of the session. He focused on the possibility of developing a more efficient photosynthesis process using synthetic biology. This could also produce food, biochemicals and biofuels more efficiently, helping in optimizing the use of limited resources. However, this will require a smart regulatory framework to not only guarantee safety but also to facilitate the rapid transfer of these technologies to production.

Closing Remarks

Ms Mariya Gabriel, European Commissioner for Research, Innovation, Education, Culture & Youth and former Commissioner for the Digital Economy and Society delivered the closing remarks of the conference. "We're no more talking about the distant menace of global warming. Climate change is a concrete existential threat for our planet, as President Ursula von der Leyen underlined marking the European Green Deal as the top priority for the European Commission in coming years. Climate Change is not just about the environment, and it's evidently affecting our social foundations: the climate crisis threatens the most vulnerable parts of our populations, and it's up to us to take this responsibility also towards future generations" stated Commissioner Gabriel in her address. She then endorsed the need to work together to make Europe the first mover on these issues and lead a smart transition to become climate neutral by 2050 (see Figure 8).



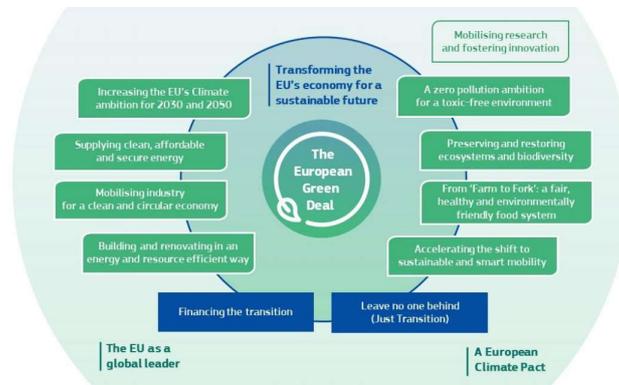


Figure 8

“We need holistic, transdisciplinary solutions and close cooperation between scientists and practitioners. And we have to keep in our minds that any solution to these issues is not just a matter of technology: to get the work done. It’s also necessary to build frameworks that can change the behaviour of markets and of people” stated Ms Gabriel, who then continued: “It’s therefore of vital importance to align the interests of all with the need to invest in such profound changes as they will necessarily have an impact on industrial, financial and social policies. It is essential to deeply transform our lifestyle and in doing this it is necessary to keep in mind social fairness to prevent the burden of change from having an impact on the less affluent”.

Conclusions and Next Steps

“We do not inherit the Earth from our ancestors; we borrow it from our children”.

- *Native American proverb*

In launching the Green Deal, the European Commission opened the way to a new, sustainable model of growth for Europe, with the aim of being the first mover towards a fair and prosperous society that responds to the challenges posed by climate change and environmental degradation, improving the quality of life of current and future generations. The involvement and commitment of the public and of all stakeholders is crucial: science and innovation must have a driving role both in accelerating the contribution of new technologies to tackle these issues and in guiding the public discourse in favour of more sustainable lifestyles and businesses.

As Erika Widegren (Chief Executive of Re-Imagine Europa) concluded, this event was a starting conversation for the years to come. The importance and the timeliness of the issue will require more

cross-sectoral and interdisciplinary dialogue to foster and nurture new ideas on how Europe can lead the race to become the first carbon-neutral continent in the world.

ⁱResearchers have created a strain of the lab workhorse bacterium — full name *Escherichia coli* — that grows by consuming carbon dioxide instead of sugars or other organic molecules. The achievement is a milestone, say scientists, because it drastically alters the inner workings of one of biology's most popular model organisms. And in the future, CO₂-eating *E. coli* could be used to make organic carbon molecules that could be used as biofuels or to produce food. Products made in this way would have lower emissions compared with conventional production methods, and could potentially remove the gas from the air. The work was published in *Cell* on 27 November, 2019. "It's like a metabolic heart transplantation," says Tobias Erb, a biochemist and synthetic biologist at the Max Planck Institute for Terrestrial Microbiology in Marburg, Germany, who wasn't involved in the study.

See: <https://www.nature.com/articles/d41586-019-03679-x>