Parliamentary Assembly
Assemblée parlementaire
http://assembly.coe.int

COUNCIL OF EUROPE
CONSEIL DE L'EUROPE

Doc…
Provisional version
20 May 2020

Ethics in science and technology: a new culture of public dialogue

Report[1]
Committee on Culture, Science, Education and Media
Rapporteur: Mr Stefan SCHENNACH, Austria, Socialists, Democrats and Greens

Summary

It is increasingly difficult for lawmakers to match the speed at which science and technologies evolve with the required regulations and standards. The timespan is getting shorter to evaluate risks and determine the medium and long-term consequences on human health and the implications for human rights. It is therefore essential to involve the general public before adopting decisions which highly impact on their lives and entitle them to discuss the direction that research should take to make sure that progress in science and technology corresponds to human progress.

The COVID-19 pandemic, with its deep impact on societies globally, highlights even more the need to strengthen public dialogue, posing new and complex issues which require participatory policy and decision-making processes during and beyond the crisis.

A range of methods for organising public debate exist; they provide for flexible solutions which may be tailored to specificities and historical contexts in each country and could meet different levels of institutional and financial capacity. The report recommends that member States make use of existing tools, such as the Guide to Public Debate on Human Rights and Biomedicine drafted by the Council of Europe Bioethics Committee (DH-BIO) and the toolkit developed by the European Union project Engage2020.

[1] Reference to committee: Doc. 14517, Reference 4383 of 01 June 2018.

A. Draft resolution[2]

1. The Parliamentary Assembly notes that the convergence between nanotechnology, biotechnology, information technology and cognitive sciences, and the speed at which the applications of new technologies are put on the market have consequences not only for individual human rights and the way they can be exercised, but also for the ways risks and benefits are distributed in society. It also notes that, while fundamental scientific research is subject to strict ethical rules and scrutiny, applied research is often subject to competition at global level to bring products quickly onto the market, with less rigorous control and lower standards on the respect of human rights.

2. The developments in science and technology must respect fundamental values and human dignity, and scientific and technological foresight should no longer remain the exclusive remit of researchers and industry. Public authorities have to involve citizens more widely in decision making on science and technology, and policy options should be subject to public debate and scrutiny, to make sure that new advances in these domains sustain human progress. Moreover, the COVID-19 pandemic, with its deep global impact on our societies, has opened a wide spectrum of issues, including the issue of privacy regarding the individual health tracking applications, which require participatory policy and decision-making processes during and well beyond the crisis.

3. The need for public debate and appropriate consultation is clearly stated as a principle in the Council of Europe Convention on Human Rights and Biomedicine (Oviedo Convention, Article 28). The Assembly considers that this principle should be extended to applications of converging technologies outside the biomedical field.

4. Fostering constructive public debate on science and technology advancements is key to ensure democratic and effective governance. A wide range of methods for organising public debate exist; they provide for flexible solutions which may be tailored to country specificities and historical contexts and could meet different levels of institutional and financial capacity.

5. The Assembly therefore calls for the member States of the Council of Europe to develop a new culture of public dialogue, making use of existing tools, such as the Guide to Public Debate on Human Rights and Biomedicine drafted by the Council of Europe Bioethics Committee (DH-BIO) and the toolkit developed by the EU project Engage2020, and in this respect to:

5.1. establish “train-the-trainers” programmes to distribute knowledge and build the capacity of institutions at different levels to organise and facilitate public debate, to create incentives for citizens and other societal actors to participate and to lead effective consultation processes on complex issues ensuring that citizens have access to balanced information and are given sufficient time to deliberate;

5.2. set up intermediary institutions, where relevant, to create the link between science and technology, the relevant public and policy making;

5.3. introduce modules on public debate and societal engagement as part of the academic curriculum in science and technology;

5.4. include debate on scientific and technological developments and ethical considerations in the school curricula, both in terms of regular practice to cultivate dialogue and to develop the ability to understand and analyse complex matters in the domain of science and technology as part of education for democratic citizenship;

5.5. encourage public service broadcasters to strengthen co-operation with practitioners in order to support – not take over – societal engagement processes in public debates;

5.6 encourage the development and use of specialised tools to support fair, open, transparent and un-manipulated online public debate, also seeking to facilitate cross-national and multi-lingual engagement;

[2] Draft resolution adopted unanimously by the committee on 15 May 2020.

6. The Assembly considers that national Parliaments have a key role to play in this process and invite them to:

6.1. make a wider use of public debate as part of the parliamentary decision-making processes, and provide targeted training to their members in this respect;

6.2. explore the cross-political and cross-ideological value of public debate, for example by setting up committees for the future;

6.3. consider setting up parliamentary technology assessment, with a requirement to make use of public debate in assessment procedures;

7. The Assembly invites the European Union to cooperate with the Council of Europe to support a culture of public debate, strengthen democratic governance and encourage citizens' involvement in crucial choices which are required in order to recover from the COVID-19 crisis and to rebuild more resilient and sustainable European societies.

B. Draft recommendation[3]

1. The Parliamentary Assembly, referring to its Resolution …, recalls that democratic governance requires citizen involvement in decisions which have a crucial impact on society and individual lives. In this respect, the need for public debate and appropriate consultation is clearly stated as a principle in the Council of Europe Convention on Human Rights and Biomedicine (Oviedo Convention, Article 28). The Assembly welcomes the adoption by the Council of Europe Bioethics Committee (DH-BIO) of the Guide to Public Debate on Human Rights and Biomedicine and considers that its principles could be extended to applications of converging technologies outside the biomedical field.

2. The COVID-19 pandemic has stressed in a dramatic manner a number of structural weaknesses in our societies. There is a need not only to recover from the crisis, but also to rebuild more resilient and sustainable European societies. The Council of Europe must uphold human rights and democratic values and ensure that the crisis does not become an excuse to threaten them; but it must also assist member States to strengthen the culture of public dialogue and to develop the capacities of young people and the wider public to analyse different options for a sustainable functioning of European societies.

3. Accordingly, the Assembly recommends that the Committee of Ministers, through its relevant committees and group of experts:

3.1. widely promote the Guide to Public Debate on Human Rights and Biomedicine in the member States and, in cooperation with the European Union, seek to assist national authorities, particularly in Central and Eastern Europe, to implement the principles it enshrines;

3.2. as part of education for democratic citizenship, encourage member States to include debate on scientific and technological developments and ethical considerations in the school curricula, both in terms of regular practice to cultivate dialogue and to develop the ability to understand and analyse complex matters;

3.3. in cooperation with the European Union, consider initiating pilot projects on the use of specialised tools for online public debate processes which also have the potential to make cross-national and multi-lingual public debates feasible.

[3] Draft recommendation adopted unanimously by the committee on 15 May 2020.

C. Explanatory memorandum by Mr Schennach, rapporteur

1. Introduction

1. As underlined in Recommendation 2102 (2017) of the Parliamentary Assembly of the Council of Europe on "*Technological convergence, artificial intelligence and human rights* ", developments in science and technology related to the field of genetics and genomics, neurosciences, big data, artificial intelligence and robotics offer many opportunities, but also raise alarming ethical and legal questions.

2. My report will focus on new forms of public debate as an element of enhanced governance for the future. Indeed, "*science and technology cannot contribute to progress unless, at the same time, there is democratic progress*".[4] I am referring to "public dialogue" since this term expresses the political commitment to include the public in the governance process and to take its opinion into account. A constructive dialogue should also build on enhanced "public exchange", i.e. the possibility to confront different arguments and points of view, without necessarily having consensus.

3. The need for public debate and appropriate consultation is clearly stated as a principle in the Council of Europe Convention on Human Rights and Biomedicine (Oviedo Convention, Article 28). However, considering the speed of technological change, this principle ought to be examined carefully in the current context and I believe it should also be extended to applications of converging technologies (NBIC)[5] outside the biomedical field.

4. My report is therefore intended to be complementary to the current work of the Council of Europe Bioethics Committee (DH-BIO) which has prepared a practical guide for initiating public debates in the biomedical field.[6]

5. I wish to thank Mr Lars Klüver, Director of the Danish Board of Technology Foundation who has a long-standing experience in developing methodologies for public debates in the science and technology field and who assisted me with background research. In the committee, we held a hearing with Professor Jean-François Delfraissy, President of the National Ethical Consultative Committee for life sciences and health (CCNE), who presented the public debate on bioethics for which the CCNE had a mandate from the French government to organise in 2018, ahead of the (periodical) review of the French Law on Bioethics in 2020. Moreover, we have gathered information on five other examples of public debates in Ireland, Latvia, the Republic of Moldova, the Netherlands and Poland to illustrate a variety of approaches that reflect different political and cultural contexts and traditions (or lack of) for holding public debates in Europe.

2. The rational for public debate on issues related to science and technology

6. Rapid advancements in science and technology considerably increase the *complexity of the challenges* European societies are facing today. The 17 global Sustainable Development Goals (SDGs)[7] can serve as an example: They consist of 169 partial goals, all of which demand deep analysis, well designed strategies and concerted action at all levels of society, from all sectors, and from a very wide range of expertise.

7. This complexity is emphasised by so-called *wicked problems*, in which there is uncertainty about the problem, the knowledge at hand, and the possible solutions, and which implies that all positions in the debate can be contested. They call for processes of resolution, which inevitably must include a process of negotiation, in which ideally all actors in society have their say, so that the outcome can enjoy their support.

8. The *citizenry has changed*. During the last half century, the level of education has increased dramatically, and media and the internet are providing educational, lexical and contemporary information at an incredible rate. Citizens focus more on the rationales behind and consequences of decisions/developments rather than on following a single party or ideological path.

9. At the same time *new communication channels* have emerged, which on the one hand have increased the intensity of societal debate, but on the other hand have created "echo chambers", generational distances and new options for those who want to manipulate public opinion.

---

[4] PACE Recommendation 2102 (2017) on Technological convergence, artificial intelligence and human rights, and Report of Mr Le Déaut Doc. 14288, http://assembly.coe.int/nw/xml/XRef/Xref-DocDetails-EN.asp?FileID=23531&lang=EN.
[5] NBIC convergence refers to four key sectors: nanotechnology, biotechnology, information technology and cognitive sciences.
[6] https://www.coe.int/en/web/bioethics/public-debate.
[7] https://www.un.org/sustainabledevelopment/sustainable-development-goals/.

10. *Trust in institutions* has decreased. There are many possible explanations. One is that institutions have not sufficiently proved that they are able to avoid crises and solve the big challenges. Another is that only a few institutions have had enough focus on new governance systems in order to be able to face the described new situation. Parliaments are not ahead of the technological development and as a result, legislation becomes reactive instead of anticipating and orientating the S&T developments for the future. This law-lagging introduces a risk of frustration among the public and in the policy-making domain.

3. Overview of existing methodologies and practice

11. The state-of-art of societal engagement (public debate) is quite advanced. For example, the European Commission has recently developed a toolbox that provides tools for most of the needed engagement processes,[8] as well as indications as to how to choose an appropriate tool for a specific situation. However, the next step would be to promote these tools so that they can be used more often and more widely across Europe, and as part of this challenge, to develop competences and capacity among institutions in member States and at European level. Engagement practices need to become an embedded part of institutional procedures – to raise awareness and to facilitate open decision-making processes regarding science and technology and their impacts on society and individual human rights.

3.1. Methodology

12. A very wide range of methods has been developed with close to 60 core methods, with each often having several variants.[9] The origin of methods is diverse. Some are inspired by the judicial process (Irish model of Citizens' Assembly or Danish model of Consensus Conference). Others are adapted forms of processes used for example in innovation and design, organisation development, conflict resolution or opinion analysis. Many have been designed for a specific purpose and afterwards adapted to become more generic.

13. The EC toolbox contains methods for societal engagement for whole systems of use, for example for all phases of the decision-making process: finding visions, needs or concerns; creating solutions and specifying them; filtering solutions with regard to effectiveness and/or acceptability; taking decisions; and finally, implementing those decisions.

14. There are also methods for the four levels of science and technology related activities: S&T policy-making, defining the framework conditions for science and technologies; open research agenda setting, allowing society to suggest S&T activities according to their visions, needs and concerns; S&T steering at institutional and/or project level, providing societal influence on the focus, outcome and impact of S&T (e.g. so-called "Science Shops"); and societal engagement in the science/innovation process, for example by being co-researchers, co-innovators, delivering data or interpreting results.

15. Most societal engagement methods are designed for institutions to be able to invite actors in society to co-produce a result. This is sometimes called "invited" or "top-down" public debate. In contrast to this, "bottom-up" participation, often exemplified with citizen movements and demonstrations, can be seen as an authentic expression of positions among citizens.

16. The challenge for invited participation is, of course, to ensure that the topics taken up and the processes used actually relate to the needs expressed by the public. Content must be relevant and related to the needs and concerns of the citizens, and processes must be open to allow for the participants to express themselves without being restricted. An important challenge for invited participation is, thus, to avoid too tight framing of the issues discussed and restricting the messages from participants.

3.2. Choice of methods for specific purposes

17. The reason that the toolbox is relatively large is that different methods each have their strengths and weaknesses, and their main fields of application. The *methodology*, therefore consists of the toolbox, the ability to pick the right tool, and the ability to use it. There are many parameters to take into account when picking the right tool, such as: to fit with the resources available, e.g. budget, access to needed expertise, staff skills and experience with the method; to fit with the situation, e.g. timing to other processes, expected types of outcome, the freedom of action for the participants (e.g. will the problem be predefined?); legitimacy of the

[8] The EU project Engage2020 identified societal engagement methods globally and analysed them for their specific use areas. An online tool for selection of methods was developed – see www.actioncatalogue.eu.
[9] The EU project Engage2020 made a global scan of societal engagement methods and analysed them for their specific use areas. An online tool for selection of methods was developed – see www.actioncatalogue.eu.

method, i.e. transparency, representativeness, level of information provided to participants, balance in expertise among witnesses, etc; and the desired main roles that the method should play.

18. The parameter on desired roles should be well understood before choosing a method. Figure below shows one approach to this, the so-called TAMI Framework, which characterizes roles according to what should be done? and about what?

	Raising knowledge	**Forming attitudes**	**Initialising action**
Tech/Sci aspects	Scientific assessment • Technical options assessed and made available • Comprehensive overview on consequences given	Agenda setting • Setting the agenda in the political debate • Stimulating public debate • Introducing visions or scenarios	Reframing of the debate • New action plan or initiative to further scrutinise the problem decided • New orientation in policies established
Societal aspects	Social mapping • Structure of conflicts made transparent	Mediation • Self-reflecting among actors • Blockade running • Bridge building	New decision-making processes • New ways of governance introduced • Initiative to intensify public debate taken
Policy aspects	Policy analysis • Policy objectives explored • Existing policies assessed	Re-structuring the policy debate • Comprehensiveness in policies increased • Policies evaluated through debate • Democratic legitimisation perceived	Decision taken • Policy alternatives filtered • Innovations implemented • New legislation is passed

19. With the new forms of public debate, it is imperative to avoid that decisions about methods *jump-to-conclusions*. A very useful process of selecting methods would be to follow a logical exploration of demands:

- *Ensure commitment*. Societal engagement should not become window-dressing. If it is not used by those who can act upon its outcomes, then it is probably not worth the effort.
- *Define the problem and need*. Determining the problem and being clear on how societal engagement can contribute to the search for solutions are important steps towards choosing the right methods.
- *Understand the situation and context*. Timing, overview of points of conflict, windows of opportunity for creating impact are all aspects to consider.
- *Who should be involved*? It is essential to identify: who should have co-ownership of the results; what the geographical reach should be; how the participants should be composed; what are the possible roles for citizens, experts, stakeholders and policy makers in the process and the target groups of the results.

20. The choice of the method demands some pragmatism and weighing these aspects up against each other.

3.3. Key challenges and stumbling blocks

21. The implementation of societal engagement practices brings a range of challenges. Some of these can be solved by increasing the capacity and competence of engagement practitioners, others demand more fundamental changes.

3.3.1. Explaining issues at stake and focusing on the consultation

22. An important quality of the new forms of public debate is that they provide the required information to the participants so that they can provide *reflected answers*, in contrast to opinion polls, that most often look for the reflex opinion based on restricted access to information.

23. The question arises, about how much information the participants need to receive in order to be sufficiently equipped for the debates and reflections they are expected to provide. This of course needs to be decided on a case by case basis and the answer will depend on the complexity of the issue and of the already

existing general level of information among citizens. However, there are some guiding principles that can be of help:

- *The need for technical information is often overestimated*. With most technical developments a very good overview of the technical elements and characteristics makes it possible to take part in the principal discussions on the societal aspects.
- *The need for information about the societal aspects is often underestimated*. Realistic and balanced information about the ethical, social and economic dimensions of the topic, including the potential consequences for human rights, is key to having an informed public debate.
- *Creating well balanced information is a matter of methodology*. With existing co-writing processes and good peer reviewing of the information materials, it is possible to create balanced, comprehensive and condensed information that can be understood by a very large majority of participants.
- *The deliberation adds to the information level*. An important aspect of having time for discussion among the participants is that it provides opportunities for them to mutually increase their understanding of the topic and its implications.
- *Avoid the temptation of too strong framing*. The problem at hand should be well defined, but it should not be over-simplified or too restricted in scope. The reflected deliberation in societal engagement can deliver important results that were not expected, so too strong framing may prove counterproductive.

24. In the Netherlands, for example, eleven organisations took the initiative to organise a series of public dialogues to ascertain the views of Dutch society towards the modification of heritable DNA in the early development of human embryos. The *Rathenau Instituut* provided guidelines and instruments (scenarios) for conducting a national dialogue on the subject.[10] It reviewed what is already known regarding public opinion on the subject and presented an analysis of the reasons for the existing regulations. It has also covered the ethical and social issues that play or could play a role in the dialogue on the question of whether targeted modification of the genome of future persons is acceptable, and if so, for what purposes and under what conditions. In addition, four techno-moral future scenarios or foresight studies were developed. Based on these scenarios, NEMO Kennislink has produced techno-moral vignettes (in this case, animations) to facilitate a discussion on the social implications of the use of germline genome editing. The Dutch Ministry of Health, Welfare and Sport welcomed and financed this project entitled "*A public dialogue on germline genome editing*". The project started in January 2019 and the first public event was held in October 2019. The outcomes of the dialogue will be used as input for political debate on amending the Dutch Embryo Act.

25. Moreover, it may be necessary to establish an independent secretariat to implement a societal engagement process. Independence helps to enable a process that can be accepted by all those involved, making sure that the process is well framed, informed, fair and transparent, especially if the topic is controversial and surrounded by distrust.

26. For example, a public consultation was set up in France in 2018 prior to revising the Framework Law on Bioethics in 2019. This public debate has been organised by and independent organisation - the *Comité Consultatif National d'Ethique (CCNE)* - with a task to steer a genuine exercise in democratic deliberation, inviting citizens, both lay or informed, and experts to express their opinions and discuss them together. At the end of the consultative process, CCNE reported the outcomes to the government in addition to issuing their own opinion on substance. The role of CCNE as a neutral and trustworthy organisation was crucial. The diversity of methods used to collect information has resulted in a considerable diversity of perspectives. The presence of many experts in various disciplines has enabled a real wealth of information. Similarly, the presence of moderators made it possible to conduct the debates in a climate of tolerance and serenity.

3.3.2. Motivating people to participate

27. It is *encouraging for citizens* to sense that policy makers will actually listen, that the outcomes of the activity will be documented and be used in the process of analysis and policy making, and that the process will be fair, open for diversity of people and opinions, and well planned and facilitated. Sensing the opposite will often demotivate people from participating or maybe even motivate them to participate in an unconstructive manner.

28. *Getting influence is motivating*. Managing expectations is therefore essential. The plans on how the results will be used should be spelled out clearly at the outset when inviting citizens to participate. If there are doubts about how to use the outcomes of a public debate then this should be stated clearly. Citizens can accept that policy processes can be quite complicated, but they cannot accept to be ignored.

[10] https://www.rathenau.nl/en/making-perfect-lives/discussing-modification-heritable-dna-embryos.

29. The motivation for citizens to participate in public debates may depend on *history and political culture* in their country/region. Nations that have a history of non-democratic regimes will have to prove their new orientation towards open and new public dialogue, and probably even prove it by establishing new institutions for such dialogue and investing in a certain level of public dialogue activity. There are very convincing examples around the world of the highly motivating effect of such a clear new direction towards open and dialogue-based governance.[11]

3.3.3. The influence of lobbies

30. One important role of dialogue with citizens can be to counteract excess lobbyism by inviting citizens to be independent assessors. In this sense, societal engagement can be seen as a way for policy makers and institutions to make the general public an ally against strong influence from vested interests. This function of public engagement has even been used to counteract corruption by giving groups of independent citizens the power to take economic decisions – for example "participatory budgeting" in some Latin American regions.[12]

31. Given that public debate should ensure that all interests in society have their voices heard, lobbies should not be excluded from public debates. However, this democratic ideal also means that lobbies should not be favoured over citizens or other less resourceful stakeholders. In practice such an ideal can be implemented in several ways, as for example:

- Balanced steering committees for the public debate can be set up, in which lobbies from all interests are represented, so that they are given ownership to the process.
- A balanced panel of lobbies and expertise can be asked to provide their statements towards the participants to ensure that they are heard.
- Participants can be separated into "participants with vested interests" and "participants from the general public". These may have a dialogue together, but when it comes to providing answers/votes in the process, their answers are analysed separately, so that the differences between the answers from the vested interests and the general citizens are made transparent.

32. The open and balanced nature of societal engagement is not necessarily favoured by some vested interests, because they prefer to lobby for their special views and interests rather than having them discussed in the open. In the worst cases, lobbies can seriously undermine an open process, for example by overrunning open meetings or executing pressure on participants, by orchestrating demonstrations against citizen consultations, etc. Lottery and invited participation can be used to avoid meetings being overrun. Clear rules for participation should be stated that provide opportunities for the facilitator to exclude participants that act unacceptably.

33. It is important to avoid giving lobbies excessive power in steering committees, since they can halt the execution of a public dialogue. However, lobbyists can become very constructive actors when there is a clear political commitment to pursue a public debate and listen to the outcomes. Lobbyists are not only serving their specific interest. They can often provide important knowledge and they often weigh this knowledge high in the sense that, if they are invited to provide their expertise, then they very often participate constructively in public debates, not overplaying their interests. Seeing and treating lobbyists as experts can be therefore a fruitful way of integrating them in public debates. However, as with other experts, their possible bias must be balanced out by inviting other experts with different views.

3.3.4. NIMBY topics

34. The NIMBY ("Not-In-My-Back-Yard") problem describes the fact that topics often have a general as well as a local facet to them, especially when it comes to physical planning. Having wind turbines is generally regarded as a good thing, but not when they are built next door. The problem is not specifically linked to societal engagement, but the question arises if societal engagement can provide the needed solutions.

35. Generally, if the process is well-designed to ensure that those affected are listened to and their points

[11] One example is Taiwan. Several civil society and academic organisations have been leading a participatory turn in public debate in Taiwan, which has resulted in very high numbers of engagement activities and in citizen participation. The background for this was the Taiwanese Martial Law, which demands consensus in the Parliament thereby making it easy to block policy changes. Civil society reacted by developing participatory activities that proved the need and wish for change, and this was backed up by some of the parties in the Parliament.

[12] "Participatory budgeting" includes a range of societal engagement methods. In some of them citizens develop ideas for public investments and decide between the ideas through referenda. In countries with challenges of corruption, this makes up a process which cannot be overtaken by economic interests.

seriously considered, and that the final decision is democratic, then the chances of acceptance of the solutions are higher. In practical terms this means that the decision-making process ought to include: a public debate involving those affected; a representative sample of the wider population; a decision-making process in which the opinions of both groups are considered thoroughly. For such a process to be successful it needs to take seriously the needs, concerns and suggestions of those affected. Messages from those affected about how they can be compensated for the burdens they carry on behalf of society should be seriously taken into account in the decisions, because they open up for those affected to accept the process as a fair negotiation.

3.3.5. Reporting on outcomes and explaining final decisions

36. Ensuring commitment from decision makers before initiating public debate is a key step to take: it favours the commitment of all actors involved, including the citizens, and gives a certain guarantee that the outcomes of the process are seriously considered before decisions are made. This ought to be planned before organising public debates in order to manage expectations proactively.

37. Evaluations often indicate that participants do not expect or even want decision makers to make their decisions exactly according to the outcomes of public debates, but they expect decision makers to listen seriously to them, to consider their views and to take them into account in the decision. Decision makers should therefore refer to the public debate process when it has influenced the decision, ensuring transparency and visibility of the role of such engagement activity.

3.3.6. Historic, cultural and institutional barriers

38. Increased use of the new forms of public debate will influence how decisions are taken, thus also influencing power structures in society and in institutions. Change in power structures will unavoidably create resistance, but it is necessary if society is to gain from the positive impacts of societal engagement.

39. Besides the change in power structures, the new forms of debate are newer in some cultures than in others. The change is, for example, bigger in countries that have had authoritarian governance structures recently. However, this challenge from the historical background is not necessarily reflected in the abilities of the populations to manage and take part in the new forms of public debate. Experience relates that societal engagement methods “travel well” and work well in all countries and cultures. Because of the historic and cultural differences, however, they may signal a larger shift in culture of policy debate in some countries than in others.

40. There are several barriers to overcome institutionally in practically all countries. Not all institutions are used to opening up for debates with different actors in society, not all have staff that can ensure proper implementation of methods, and, again, the shift of power structures is an important challenge.

4. Lessons learned to improve public consultation processes

4.1. Raising awareness and capacity of different stakeholders to enter into constructive dialogue/debate

4.1.1. Building a new culture within the policy and decision-making bodies, and namely parliaments

41. Besides the capacity and competences to initiate and organise public debates, there is a need for competence building on the user-side of such processes as well. Decision makers of all kinds need to understand the assets and necessity of public engagement in order to take it seriously and pay attention to the results.

42. This is not an easy task, especially because our democracies are built on the idea of representation, which can be used as an argument against influence from non-elected citizens. However, the idea of a deliberative democracy is not in conflict with the idea of representative democracy. What is new with deliberative democracy is that decision makers listen more profoundly before they decide, and what is not changed is that the elected representatives have the responsibility of taking the decision in the end.

43. Deliberative democracy builds on many strands of democratic thinking, which can converge into a common policy. From the liberal side, societal engagement opens up for listening to the “policy market”. From an enlightened democracy viewpoint, it favours new policy discourse on a higher informed level. And, finally, from a strong democracy point of view, it provides channels of influence from the population directly to the institutions.

44. For example, a Citizens' Assembly was set up in Ireland in 2017-2018 to debate the controversial issue of abortion. The Assembly was composed of 99 randomly selected private citizens. To ensure the quality of the interactions, the experts and the materials given to participants of the Assembly were selected in order to offer the widest possible variety of perspectives. This task was the responsibility of the Expert Advisory Group. Composed of academics and practitioners of various fields of interests (political science, constitutional, medical law, medicine, etc.), it had the mission to construct a fair, balanced and comprehensive work program and to provide background expert advice. The decision-making was deliberately slow, to allow for a debate. The consensus-building techniques facilitated a greater engagement and mutual respect. The information was presented in a very intelligible way. Indeed, this public engagement was a two-way process of communication: the objective was of course to inform the public but also to gather evidence of public views to support decision-making and to involve the public in decision-making.

4.1.2. Training for scientists and technology experts

45. The academic curriculum does not favour societal engagement. Only a very small proportion of scientists understand these sophisticated processes of dialogue. Teaching and advisory resources are available[13] but they are not introduced to a single scientist. Connecting societal engagement to the academic institutions and activities will largely depend on specialised practitioners to regularly collaborate with scientists and their institutions. Moreover, the academic curriculum ought to evolve to resolve this problem in the long-term.

46. Scientists are increasingly aware of the need for improved communication *to* the wider public, but are not yet aware of the need for communication *with* the public. Science communication as a one-way practice is becoming well established, and science centres/museums generally are very competent in providing insights. The pathway of "public understanding of science" is well underway. However, the "scientists' understanding of the public" is much less developed. Consequently, innovations are often made in a scientific echo-chamber, without a deeper understanding of its relation to the needs and concerns of the citizens.

47. The so-called "intermediary institutions" may be an answer to this challenge. Examples of such institutions are Technology Assessment and Foresight institutions that have competences to assess the potential societal impact from new technologies and to set up societal engagement in order to improve the dialogue and to co-create solutions.

4.1.3. Introducing ethical debate in education systems

48. Citizens are generally very capable of taking part in societal engagement processes, when the processes provide the required information, time for deliberation and good facilitation. However, such processes normally only include and consult a small fraction of the population, though often a representative fraction.

49. The education systems (primary, secondary and higher education) make up spaces in which young people ought to be trained to regularly engage in debates on complex issues. This could include training into "discourse ethics", providing insight into the principles of fair deliberations, including an introduction to different societal engagement processes. Such curricula should be built around project-based learning processes on contemporary cases of complex societal issues linked to the developments in science and technology.

4.2. Strengthening the communication flow between stakeholders

50. The new forms of public debate are about establishing "four-way communication" between citizens, experts, stakeholders and decision makers. However, this communication seldom happens with all these actors at the same time. Most often the debate is separated into situations where for example experts and stakeholders give evidence and express their views; situations where citizens deliberate; and situations where decision makers provide insights from their point of view or receive or listen to the outcomes of the debate. The new forms of debate are therefore dependent upon the quality of the information flow and debate between citizens, experts, stakeholders and decision makers.

4.2.1. Experts/stakeholders and decision makers

51. In the new forms of public debate, the role of experts and stakeholders is comparable. Both give evidence about fact, assessments, interests, conflicts, possible solutions etc., and both should be represented

[13] E.g. www.RRI-tools.eu and www.actioncatalogue.eu both providing advice for researchers on how to make use of engagement processes.

in a balanced manner, ensuring that the information and evidence is unbiased. Methods exist to ensure that evidence is given in open processes and deliberated upon. Also, institutions of technology assessment have specialised in assessing such evidence and giving policy options based on well-tested procedures, including expert and stakeholder consultations.

52. The challenge in creating increased value of communication with experts/stakeholders lies in the fact that biases are often well hidden and sometimes not even known by the experts themselves. For example, the disciplinary siloes in the scientific community create risks for blind spots or paradigmatic bias in expert evidence. Comparably, stakeholders may be driven by value systems that they do not themselves question, such as ideological biases. One effective answer to this challenge is to make use of a "*counter-expertise*" principle, making sure that if there are several positions among experts/stakeholders, then all, or at least the most opposing, of them should be heard. This principle is, for example, implemented in the methodology of the Consensus Conference, the Citizen Jury and the Parliamentary Hearing methods.

4.2.2. Experts/stakeholders and citizens

53. As mentioned above, the main challenge in the communication between experts/stakeholders and citizens is the lack of "scientists' understanding of the public". Establishing intermediary institutions could be a way to improve this communication. Moreover, in most countries, science museum/centres and science journalism provide accessible insights to developments in science and technology, and scientists are increasingly aware of the need for better communication towards society. However, the question remains how to establish good dialogue when it comes to controversial issues linked to rapid developments in science and technology. This dialogue is not a matter of high-quality one-way communication to the public. But it is rather a matter of high-quality public debate that can lead to satisfactory solutions or compromises.

54. The development of European GMO policies provides an interesting example. Genetically modified organisms constituted a main societal conflict about governance of new technologies. Several countries initiated societal engagement processes to search for ways to resolve the conflict. One main lesson that came out of these processes, but which could not be seen from traditional opinion polls, was that citizens had a very complex view involving a mix of ethical and practical considerations. For example, it turned out that the magnitude of the "marginal benefit" – meaning the new benefit of a technology minus the perceived set of risks from the technology – was a very determining factor for rejection or acceptance. In practical terms, this meant that a GMO tomato was not accepted, because good tomatoes already were available at a reasonable price, but GMOs used for new medical treatments were accepted because they promised new and affordable cures. These insights influenced the design of the European regulation.

55. Looking ahead into a future where societies need to find compromises and well-balanced solutions to challenges appearing from e.g. Artificial Intelligence, Big Data, new gene editing techniques, climate change mitigation and adaptation, decrease of biodiversity, and other pressing future challenges, such investments in wide and deep deliberative processes between experts/stakeholders and citizens may prove to be the only way forward to make it possible for decision makers to take widely accepted and robust decisions.

4.2.3. Citizens and decision makers

56. Traditional opinion polls are no longer satisfactory as a basis for decision makers' understanding of the public attitude and expectations when it comes to new and rapid developments in science and technology, for several reasons. First, because of the rapid development, the general population will not be sufficiently informed to form a mature opinion, which gives non-sustainable results from polls. An example would be the rapid and wide development in machine learning, which only a small fraction of the population is aware of or well-informed about, especially when it comes to possible options for regulating the development.

57. Second, polls are too framed and restricted in their questioning techniques to be able to uncover alternative visions or needs – the solutions that citizens want, but that are not presented by the S&T development at hand. For example, polls may ask about attitudes towards new, advanced, but expensive medical treatments, and may register positive attitudes. But it is known that if such developments are framed in a perspective of alternative investments in equality in health and in widely distributed illnesses, then these will get more support. Third, often there is a tendency towards "hype" in an early phase of technology development, potentially resulting in overly positive reactions, which may change radically at a later stage when consequences are better known, and the hype turns into realism.

58. In some cases of rapid development in science and technology, there is a need for decision makers to act fast. As seen in retrospect, the appearance of stem-cell technologies was such a case. Decision makers required an indication of a "license to decide" from the public, in order to take decisions that do not provoke a

public outcry. One way to proceed would be to develop projects which co-create policy options with trans-disciplinary groups of experts, and then filter these options in large-scale and representative citizen meetings (e.g. *Citizen Summits*).

4.3. Recognising and enhancing the role of media

59. Media are developing fast with the rise of new social media that bear increasing influence on public opinion. Public broadcasters and common information channels are diminished, given that access to information is available everywhere and at all times. Quick, controversial and sensationalist "news" in social media prevail overusing reliable sources of information and undertaking grounded research and analysis. General media insistence on news criteria that focus on conflict and dissents, therefore tend to oversimplify complex issues by giving preference to controversy and sensationalism over deeper analysis. Such an approach most often leads to very entrenched positions in public opinion that are later difficult to change and hamper a critical, open-minded, and broad analysis of the issues at stake in all their different aspects. It is therefore imperative to explore the options to develop new practices and channels for constructive information exchange and deliberations.

4.3.1. Traditional media and public service broadcasters

60. Traditional media have important roles to play, including public service responsibilities, to support the new forms of public debate. Nonetheless, it would be important to consider if they should be implementing such debates in their own domain. There have been examples of experiments in which media have been hosting societal engagement processes, and they were not convincing.[14] What should have been a societal engagement in order to find a balanced compromise often ends up being a search to identify a winning position of the majority.

61. On the positive side, "constructive journalism" is beginning to appear as a new line of media reporting, which focuses more on possible solutions than on conflicts. The two landscapes are quite different. The fact that opposing views can be identified in a debate does not necessarily reflect the state of discussion on a theme, if these (extreme) opposing views misinterpret the debate as a whole. Therefore, constructive and traditional journalism may supplement each other very well, with a view to supporting the new forms of debate in society. It is necessary to acknowledge that journalism is not in itself societal engagement, however journalism may be a very strong "technique" in the processes of societal engagement.

4.3.2. Social (online) media

62. The influence from social media on societal developments, including on policy and democracy, has been the subject of discussion in recent years. Some characteristics of social media create problems rather than solutions to facilitate public debate. "Echo chambers" of communication in which opinions are being sustained and amplified instead of being challenged and analysed, make up a barrier to mutual understanding across positions. Regrettably, "fake news" and deliberate manipulation in social media distort the communication and turn it away from the important issues that need attention.

63. Social media can of course play a role in making societal engagement visible, to support the recruitment of participants for public debate, and also to give attention to the outcomes. However, as IT infrastructure for societal engagement, the role of social media seems to be very limited.

64. This does not mean that societal engagement cannot make use of online functions. In recent years, several practitioner environments have experimented with specialised tools for online and "blended" engagement, the latter being physical societal engagement meetings supported by ICT tools.[15] New formats of societal engagement become possible when online tools are used as support. For example, the tool EngageSuite makes it possible to set up online facility for small "kitchen table" face-to-face meetings that citizens can arrange themselves. This gives hope for future methods, which make use of a practically unlimited number of widely distributed small meetings, also across languages and geography. This methodology is being experimented with, but still needs to be proven.

65. Recruitment of participants in the online domain is a well described challenge because the fraction of

[14] E.g. different versions of "dilemma games" or "TV trials", in which a problem is treated as in a court room, and the audience votes to create a verdict.

[15] Engagesuite.org is an advanced tool for designing online and blended engagement; opin.org is a tool especially tailored to support youth in participation into democratic discourse. Besides such specialised tools, many standard online programmes can be used in blended engagement, including google.docs, OpenOffice, SurveyMonkey, etc.

people who are active online users is rather small in many countries and not representative with regard to age, gender, education and geography. This means that recruitment of participants has to follow known principles from off-online societal engagement, even if the activity is supported by online mechanisms. In the long term, there is hope that the user base of the specialised tools will increase, so that it will be possible to obtain representativeness in these methods.

66. Online engagement is not yet where it should be, and social media has not proven to be a solution. But tools are being developed which give reasonable hope about new methods that can make use of the geographic scope and universal availability that the online world can provide.

5. Conclusions

67. At political level, we are not sufficiently aware of the growing impact of science and technology on society and on the daily lives of every individual. The challenge is twofold: to better inform both politicians and the general public of rather complex and controversial matters generated by scientific and technological development; and to raise public and policy makers' interest on these questions, the importance of which is shadowed by social and economic concerns.

68. Given the complexities of scientific and technological convergence, scientists and experts must be more involved in an interdisciplinary exchange and be part of new forms of open, informed and adversarial public debate. There is a need to ensure transparency of their position, to unveil any connection to corporate interests of industry, and for them to acquire the ability to communicate their research in a clear and understandable way to a wider public.

69. In terms of governance, it is increasingly difficult for lawmakers to match the speed at which science and technologies evolve with the required regulations and standards. The timespan is getting increasingly shorter to evaluate risks and determine the medium and long-term consequences on human health and the implications for human rights. Parliaments risk finding themselves powerless in the face of the development of new technologies by companies and large groups experienced in the rapid commercialisation of innovations.

70. To reverse this general trend of law-lagging, we need new types of legislation that can be reviewed regularly as is the case in France with the Framework Law on Bioethics which is designed to be reviewed periodically to match the speed of developments.

71. We also need to anticipate and publicly discuss, from the outset of the process, the directions that research should take to make sure that progress in science and technology corresponds to human progress. The scientific and technological foresight should no longer remain the exclusive remit of researchers and industry. We need to re-connect scientific and technological developments with fundamental values.

72. To face these challenges, I would strongly advocate developing a culture of permanent dialogue and working together to prepare younger generations for this. It will no longer be a question of organising a series of "one-off" public consultations which precede legislative changes, but rather maintaining an open dialogue.

73. Informed debate on scientific and technological developments and ethical considerations should be therefore part of the school curricula, both in terms of regular practice to cultivate dialogue and to develop the ability to understand and analyse complex matters in the domain of science and technology.

74. Last, but not least, we need to reinforce the capacity of our parliamentary bodies to be pro-active in this complex decision-making process and ensure that "informed decisions" are the outcome. The development of parliamentary technology assessment institutions, with adequate resources, should be encouraged. I trust that parliaments which do have the support of such institutions can testify to their value and would be ready to share their experiences. The European Parliamentary Technology Assessment (EPTA) network[16] is there also to this aim, and we should make better use of the cumulative expertise this network can and is willing to provide.

75. The COVID-19 pandemic, with its tragic societal and economic consequences across the world, gives us a totally new perspective. It opens a wide spectrum of issues that we need to consider during this crisis and beyond. Today, many issues of concern require our immediate attention, such as: surveillance, tracking and sharing of telecommunications metadata; restrictions on access to information and media freedom; access to healthcare, equal treatment and non-discrimination of all citizens; coordination and synergy in scientific research; equity in use of technology and access to remote education; etc. However, we will also need to

[16] https://eptanetwork.org/.

consider broader issues which will be fundamental for the future. I believe we will need to collectively re-consider the social value attributed to jobs; the value of public services; the social value of “real” economy as opposed to value driven by financial markets; the role of agriculture and local production; energy, water and food supply security; self-reliance and resilience of public health systems; the environmental footprint of our choices and lifestyles; and the need for international cooperation and solidarity.

76. Maintaining an open dialogue on such key issues will be essential to uphold and strengthen our democracies. For this reason, we must consolidate the culture of public dialogue and seek to develop the capacities of young people and the wider public to analyse different options for a sustainable functioning of our societies. Today, this is essential in the context of the COVID-19 crisis: we shall not only recover but seek to rebuild more resilient and sustainable societies, with a more social and greener economy in the future.