

Interview with Robert-Jan Smits

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[H2020 Robert-Jan Smits](#)

A sit down with Robert-Jan Smits one of the architects of the European research area and a firm supporter of scientific knowledge and technology as means to address today's greatest challenges.



We discuss with Robert-Jan Smits, former Director General of DG Research and Innovation and currently Senior Adviser for Open Access and Innovation of the European Commission on the challenges and opportunities lying ahead for the European Research area.

Smits, is one of the architects of the European research area and a firm supporter of scientific knowledge and technology as means to address current challenges. He was one of the founders and key negotiators of H2020, the world's largest investment programme in science and innovation thus securing European competitiveness in today's complicated world.

Further to his work in H2020, Smits has been instrumental in the development of several policy initiatives in the field of European science and innovation policy such as the European Research Council (ERC), the European Roadmap for large-scale research infrastructures and the Innovation Council. In this interview, he reflects on the factors that led to the successes of H2020 and on some of the biggest rewards throughout his career. Finally, we asked him about the lessons that can be carried forward in the preparation of the new, post-H2020 research and innovation framework for Europe.



Which are the main novelties of Horizon 2020, currently the world's largest investment programme in science and innovation?

Horizon 2020 marks a big change compared to the previous EU framework programmes. It has three clear objectives, reflected in the structure of the programme (the 3 pillars) aimed at boosting excellence science, strengthening industrial leadership and addressing the grand societal challenges. To underline this "break with the past", we decided to give it a special name instead of simply following the numbering sequence of its predecessors (i.e. FP6, FP7, etc.).

With Horizon 2020 we brought together in one programme, science and innovation and introduced a paradigm shift through a radical simplification of rules and procedures, notably to attract a greater pool of talent from all over Europe.

The three-pillar structure works as follows. The first pillar is about "Excellent Science" and provides support to individual researches. This is mainly done through the European Research Council (ERC) and the Marie Skłodowska Curie Actions (MSCA). At the same time, under this pillar, investments are made to network, upgrade and build new research infrastructures. The second pillar refers to "Industrial Leadership"; it focuses on strengthening the competitiveness of Europe's industry through technological R&D and provide financial support to help companies bring their innovations to the market. Finally, there is the "Societal Challenges" pillar in which research is funded on some of the biggest challenges of our time, like the ageing population, increased pollution in urban environments, infectious diseases, natural hazards, to name but a few.

As regards the simplification of rules and procedures, we introduced a single funding rate for all types of participants and reduced the "time to grant" substantially. To achieve that, we re-engineered the complete process, established an electronic workflow — including an electronic signature — and developed a user-friendly participant portal. The radical simplification measures are one of the main reasons for the success of Horizon 2020.

All in all, Horizon 2020 has a robust peer-review process whereby the selection of proposals is based on excellence (no geographical criteria). I believe that the success and popularity of Horizon 2020 is confirmed by the results of the latest interim evaluation. The programme attracted more than 100,000 applications, representing a 65% increase in the annual number of applications compared to its predecessor, the 7th Framework Programme. Finally, another encouraging fact is that more than half (52%) of the participants are newcomers, including research institutes but also SMEs.

Horizon 2020 took shape during a financial turmoil for Europe but you successfully secured an increased budget. What were the main success factors?

We were indeed successful to increase the budget of Horizon 2020 by almost 50%, from 50 to 80 billion euros, and that during a period of major economic crisis. I think there are three main reasons for this success. First, we submitted a strong and well-founded proposal.

Secondly, we were able to convince the finance ministers about the positive impact that science and innovation has on the economy. We collaborated with think tanks and the OECD to highlight with evidence the impact of S&I on growth, jobs and prosperity. We went beyond simply praising scientific work and publish "success stories".

Finally, a third success factor is the trust and support we had of the European Parliament and the Council. What helped of course as well was that various scientific bodies across Europe spoke out and underlined the need of further support for science and innovation at European level.

In short, there were three main factors: a) a well-grounded proposal, b) a clear demonstration of the benefits for economy and job creation and c) building on political trust and support.

What lessons can be derived from this experience in the preparation of the new framework programme, "Horizon Europe"?

One of the main lessons is to speak up and to speak out in favour of EU Science and innovation. This means that scientists should not only do top quality research but also talk about it. They need to communicate and indicate what science brings to citizens, to society and the economy as a whole. In my view, it is no longer enough just to ask for funding for your research project without explaining the rewards for society and without thinking how more people can benefit from your work and results.

In this respect, I believe that CERN's communication team is doing an excellent job. Although high-energy physics is an extremely complex field, CERN has always been able to create a lot of excitement all over Europe and across the world.

How important is international collaboration in science? Was this one of the main goals of Horizon 2020?

Increasingly, we need to think and act globally and therefore boosting international collaboration is a key objective of Horizon Europe. This is important for two reasons: first, Europe generates 1/3 of the world's knowledge while it only has 7% of the world's population. This is an amazing fact! However, this percentage will decrease over the next two decades and that is why we need to tap into and attract to Europe the best brains wherever these are located. As such, we can avoid a dramatic shrinkage of knowledge production in Europe.

There is a second important reason why we need to do more at global level that has to do with the big societal challenges we are facing: whether it is climate change, energy resources or big natural disasters. These are global challenges and to address them effectively we need more global collaboration. For example, pollution in urban environments or achieving a sustainable economy are not only European issues. Global challenges necessitate closer and stronger global collaboration.

However, with Horizon 2020 we did not get the result we were hoping. The percentage of third country participation is too low. This is mainly due to a change of rules regarding the funding of third-country participants. Under Horizon 2020, the participation costs of these participants will no longer be reimbursed if they are coming from the BRIC countries. The reason was this change was that many of these countries have developed substantially and could financially support the participation of their researchers in Horizon 2020. However as many of them did not yet have for this their own dedicated funding mechanisms in place, there was a significant drop in participation from these countries. Nevertheless, we are trying to compensate this situation through different tools. Therefore, intensifying global scientific collaboration and reaching a greater pool of talent and knowledge remains one of the biggest challenges for Horizon's 2020 successor.

Europe innovates but probably not enough compared to other countries. What, in your view are the main obstacles?

Indeed, Europe has been very good in transforming euros into knowledge but not always that good in transforming knowledge back into euros. In other words, we do not harvest enough from our investments in science and research, especially compared to other countries like the US, China or Korea.

Europe does not have the number of high tech unicorns that we see in other countries. We have not succeeded in embedding digital technologies sufficiently in our manufacturing, health, education systems. We also suffer from a lack of effective knowledge transfer mechanisms from academia to the industry.

This result is an “innovation deficit” and the cure is not only to invest more money but also to build more structural cooperation mechanisms between universities and industry. Today, many European universities remain disconnected from the industry and the local economy, instead of being sources of know-how, addressing societal problems and stimulating innovation and job creation. Recently, President Macron referred to this issue during his annual speech in Sorbonne University and called for “European Entrepreneurial Universities” that will help address this deficit.

We also need to rethink the European venture capital system as today the VC funds remain scattered and are too small. Therefore, we are setting up a "Fund of Funds" to create a robust venture capital scheme.

From your experience, do think that the concept of “innovation” is embedded in our universities?

As we all know, an academic career is determined by the so-called Journal Impact Factor, these are the number your publications in peer-reviewed academic journals. Researchers are not rewarded for transferring knowledge to the local economy, for the quality of their teaching and the extent to which they inspire students and future researchers, for their efforts to engage citizens or advice policy makers in a fruitful dialogue about future challenges. As long as this culture continues to exist, I see a problem with the embedding of innovation inside our academic system.

Horizon 2020 offered many opportunities for young researchers to train and mature in the excellent academic environment offered by research institutes and universities around Europe. However, I am wondering, how many of them could further pursue a scientific career? Did Horizon 2020 succeed in creating more science jobs?

When designing Horizon 2020 we did an excellent impact assessment to understand the impact that investing 80 billion Euros in science would have for the GDP and job creation. One can find online that data from the detailed analysis on how Horizon 2020 would affect GDP increase, financial growth and job creation. These are quite staggering and impressive figures!

If you look to the ERC and the MCSA programmes, they not only fund thousands of researchers but enable them to hire more staff to work with them. Therefore, the impact of employment for scientists has been enormous.

To which extend the European industry is involved, of even more invest in R&D today? Do you believe that the current situation can be further improved?

Today, the level of R&D investment from private companies is one of the biggest challenges for Europe. Unlike, Korea, China and the U.S where the private sector is a key player, in Europe it plays a much smaller role. As you know, member states committed themselves to spend 3% of their GDP on science and innovation, one third of which comes from public investments and two-thirds from the private sector.

However, this is the case for few countries like Germany and Sweden. In most European countries, the contribution of the private sector remains significantly lower. So why does the private sector hesitate to invest in science and innovation?

One could argue the talent is not there and this is why the industry is not motivated to invest more but I do not think this is convincing, judging from the high number of university graduates and our skilful researchers that thrive in almost every area of science. A second possible explanation is the level of complexity in our legislative and regulatory system. I find this argument more relevant. Finally, as we discussed earlier, there is a stumbling block in the level of knowledge transfer between academia and industry.

Is there space in a post-H2020 programme for blue-sky research?

Absolutely! I think that we should invest much more in fundamental research than we did before. That is why in Horizon 2020 but also in the Horizon Europe there is a separate pillar aimed at boosting excellent Science of which the prestigious ERC is part.

Investing in frontier research, as I prefer to call it, is essential to expand the boundaries of knowledge. In our research ecosystem, we need this.

However, I think there is still value to assess the impact of frontier research once selected projects are finished to examine if there is any potential to transfer generated knowledge to society.



In the CMS cavern, during the visit of the President of the European Commission J.M. Barroso in 2011 (Credits: CERN)

Horizon 2020 placed strong emphasis on communication. Why this was so important and how satisfied are you with the results?

We can never communicate enough about the results of EU funded research. Communicating research results has therefore been one of the priorities of Horizon 2020. However, this is complex task.

If we walk around in Brussels and ask people about Horizon 2020 most of them will stare at us. If we ask them “Do you know that the EU played a crucial role in developing a vaccine for Ebola?” or “Do you know that the EU played a key role in developing the next generation of batteries for energy storage”, most of them would not know this. In other words, we are not yet reaching the citizen despite our enormous communication efforts and budgets. i think this is one of the biggest frustrations of the Commission research staff . However, I have always said that the ones that should talk about the impact of EU research is not the Commission but the researchers themselves. They are best suited to explain how their research has or will contribute to improve the life of European citizens.

The thousands of researchers across Europe that get support from European taxpayers and profit from European collaboration are therefore the best ambassadors of Horizon 2020.

Failure to communicate science could turn as a boomerang because if society does not appreciate where taxpayers’ money is invested and how it improves the citizens’ daily lives, it could pull the break and reduce the funding for science.

Being EC's DG for Research and Innovation is a very demanding role, thus I am wondering what has been the most rewarding thing from that time?

Definitely the people that I met during my career. People that helped me discover and learn new things, my colleagues in DG research and innovation and the young scientists from all over Europe who developed their careers through Horizon 2020. I would like to add a special note on the long-lasting collaboration that I was lucky to have with your former Director General, Rolf Heuer, which now continues with Fabiola Giannotti.

Finally, I would like to ask you about the collaboration between CERN and the EC?

When I was the Research DG at the European Commission, we signed an MoU with CERN that shaped our cooperation in numerous fields: from the development of the European Open Science Cloud to research infrastructures and knowledge transfer. in defining some key scientific priorities. In addition, CERN is the home to many ERC and MSCA grants offering an attractive and inspiring environment for your talents. Amongst the many projects on which we worked together, I want to mention SESAME, the light-source facility in the Middle East and future accelerator projects like the ILC in Japan or CLIC and, more recently, the Future Circular Collider study for a post-LHC circular machine.

The cooperation between the European Commission and CERN has been an enormous

success thanks to the people involved and the understanding that by joining forces we can achieve so much more.