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Bridging the gap between climate science and policy

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About this report:

To curb climate change, European policymakers need access to the best and most up-to-date scientific information and data. How can the research community ensure that happens? This paper summarises the discussions and key recommendations arising from a virtual roundtable of experts in climate and energy research, politics and industry, hosted by Science|Business, with the support of scientific publisher and analytics company Elsevier, on 29 June 2021. This report is ultimately a product of Science|Business. As such, the views expressed herein do not necessarily reflect those of individual members of its Network.

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Recommendations

Publish synoptic science.

The standard form of scientific reports is designed to keep the methodology and reasoning transparent, not to offer a concise summary for policymakers with limited time. Scientific knowledge is also typically the product of not one paper, but many, over a long period of time. Scientific organisations should therefore provide easy-to-read synoptic reports that quickly summarise the most relevant and up-to-date findings.

Establish regular dialogue between policymakers and multidisciplinary scientists and industrialists.

Synoptic reports won't be enough because producing them will take time, and because scientists don't always agree. Achieving net-zero carbon emissions will require new approaches to energy, transport, and the economy at large, all of which are complex domains in their own right. Therefore, policymakers should establish regular dialogue with scientists from a variety of fields, in order to get deeper insight into on-going research or new findings, better understand different perspectives and articulate their own knowledge needs. Industrialists should also be included in discussions, since they will have practical perspectives on reducing carbon emissions in their sectors.

Distinguish scientific advice from policy advice.

The role of scientists is to improve our understanding of the world, while politicians are elected by a community to make decisions—often difficult and unpleasant ones—on how that community will manage itself. Blurring this distinction weakens public accountability by allowing politicians to hide behind scientific authority, and by transferring power to unelected experts.

Therefore, if the bridge between science and policy is to be strengthened, it's vital that both parties understand the limitations of their different roles. Scientists should present the evidence they have as clearly as they can, without making political value judgements. Politicians should keep that evidence in mind alongside other factors—such as public opinion—when exercising judgement, and should not pretend the decisions they take are simply apolitical prescriptions of science.

Be honest with the public about the trade-offs of pursuing net-zero.

Just as it's tempting to present unpleasant political decisions as pure science, politicians also face obvious incentives to pretend their decisions are wholly positive and have no drawbacks, even though that's almost never true. When severe trade-offs are involved, failing to be honest with the public is a breach of their trust that can undermine confidence in future decisions. At the same time, policymakers should also be sure to highlight all the benefits, including the potentially positive impact on human health, of policies designed to deliver net zero.

Scientists and other experts therefore need to give politicians clear and unvarnished advice about precisely what's involved in the pursuit of net-zero. Politicians, in turn, have to be frank with the public about the trade-offs. This challenge reinforces the need for multidisciplinary scientific advice: the expertise needed for a full understanding of the coal industry's climactic impact is very different from that necessary to understand the economic and social impact of pit closures.

Promote basic scientific literacy.

Policy debates on pursuing net-zero and the trade-offs involved could be improved if policymakers and the public at large had a firmer grasp of basic scientific concepts, such as what scientists mean, statistically, when they present a finding that is subject to some degree of uncertainty. Politicians and the public should also understand that scientific findings are not divine revelations. Science is the method by which our understanding of the universe evolves, and seemingly concrete findings can quickly be superseded by new evidence. This is not a prescription for advanced data skills and climatology to be taught to schoolchildren. Rather, basic information about the significance of different types of scientific and statistical observations should be made more visible, not just to policymakers, but to the public at large, if necessary as part of government public relations efforts.

The virtual roundtable

Context

In 2019, the European Union set itself the ambitious goal of achieving net-zero carbon emissions by 2050 to help curb climate change. This goal is to be pursued on a continent with a highly developed and energy-intensive economy, but also with huge national and regional variation in wealth and the sources of wealth—from the digital start-ups of Berlin to the coalfields of Upper Silesia.

The challenge is even greater than it appears at first glance: the European Commission says that to achieve net-zero by 2050, there are only five years left to put the key building blocks in place, such as infrastructure, technology, and investment. That doesn't leave room for mistakes—especially given that the measures will need the support of national politicians who have to answer to the public, including those whose livelihoods depend on carbon-based industries.

To make the right decisions, European policymakers need access to the best and most up-todate information, much of which will have to come from myriad fields of the scientific community. That raises some important questions: What obstacles are there between the world of science and the world of policy, how can they be removed, and how can scientists give better advice to policymakers? To discuss the answers, Science|Business, with the support of scientific publisher and analytics company Elsevier, convened a virtual roundtable of participants from the worlds of climate and energy research, politics and industry. This paper provides a summary of the discussion.

So much science, too little time

For policymakers, finding time for a close reading of a scientific paper is hard, while digesting enough papers to give a well-rounded view of the field and all its contrasting perspectives is close to impossible.

Vincent Berrutto, head of research and innovation at the European Commission's energy department, said the challenge becomes immediately obvious to anyone moving from academia to the world of policy. "Being a researcher at the start of my career and being now more involved in policymaking, I can see that these are two different worlds," he said. "Rarely do policymakers have time to read the scientific literature," so they often have to rely on others, such as experts from the European Commission Joint Research Centre, to do part of the work.

As Berrutto suggested, policymakers often rely on secondary sources for scientific information. Mari Sundli Tveit, chief executive of the Research Council of Norway (RCN), said the RCN-funded Oslo Institute for Research on the Impact of Science (OSIRIS) surveyed Norwegian policymakers on how they go about gathering information. The results show that "very few use first-hand sources, such as research articles or direct contact with researchers," said Tveit. "Most of them rely on secondary sources, with internet searches as the most common tool."

Jytte Guteland, Member of the European Parliament





Mari Sundli Tveit, Chief Executive of the Research Council of Norway



Figure 1: The research papers relating to energy & the climate published between 2016 and 2020

Source: Elsevier

For example, the Norwegian government recently published a white paper on energy policy. "It's the most important policy document for energy and climate policy for years, and will be for years to come," she said. The largest share of the report's references was to agencies of the Norwegian government, followed by consultancies, international organisations and industry—academia came last.

While the thought of politicians and their advisors frantically searching the internet for information may sound like a scene from Armando lannucci's political satire The Thick of It, Tveit argued that the survey findings don't necessarily point to an underutilisation of science in policy. Rather, she said they highlight an opportunity for intermediaries to improve the translation of science for a policy audience.

The need for synoptic science

What's needed is a more systematic way for policymakers to access and consume the flood of information coming out of academia, said Jytte Guteland, a Swedish member of the European Parliament (MEP), where she brokered a common position on the EU's forthcoming Climate Law. "We need to find ways to organise ourselves so we get relevant information," and so that it's more than mere coincidence if a particular report gains traction in the European Parliament. She also argued that the "impact assessments" that accompany Commission legal proposals could give more information than they currently do.

Alan Thomson, global energy business leader at engineering firm Arup, said policymakers need "synoptic" information that delivers the most salient points first. "They're going to secondary sources not because they're better, not, possibly, because they can't get hold of the primary sources, but mainly because they give a synopsis," Thomson said. He added that sharing detailed information even within governments is a problem: departments circulate 50-page documents of closely written text, "and you need to read all 50 pages to find the salient points: what we need to do is get down to the three or four salient points for each of the documents, we need to share those, I believe, in a synoptic fashion." Then, at least, "people are aware that they exist."

But scientific papers don't always arrive at the same conclusions and future discoveries can disprove

prior assumptions. Policymakers therefore also need to know what's contentious and what isn't. "Many times, science doesn't get it right the first time or the second or the third: science is much more of an error-correcting machine than a 'do it right the first time' machine," said Carlos Henrique de Brito Cruz, senior vice president of research networks at Elsevier. Moreover, individual scientists tend to be experts in narrow fields, so are not best placed to explain everything that's relevant. That creates a need for science-based "organisations that will look into all those details and extract some consensus," allowing policymakers quick access to the latest developments, he said.

Hanne Bach, director of the Danish Centre for Environment and Energy at Aarhus University, suggested that asking policymakers to read reports—no matter how carefully edited—may not be the best way to get them up-to-date information. "I'm afraid that these 'synthesis reports' will be prepared, they will be very good, they will be outdated quickly and then they'll be on the bookshelf." Instead, she argues there should be regular dialogue between scientists and policymakers, where "the scientists provide what they know, the facts, and the policymakers take what they need." If that can be put in place, "you will find out what direction the policymakers are going and the policymakers will understand more what they can actually get from the science."

How about we forget writing and try talking?, Meet with policymakers, listen to them and tell them what they need to know. Follow up with detail and data later if needed.

Patricia Thornley

Patricia Thornley, director of energy and bioproducts research at Aston University in England, agreed. "How about we forget writing and try talking?," she said. "Meet with policymakers, listen to them and tell them what they need to know. Follow up with detail and data later if needed."

Given industry is one of the biggest emitting sectors in Europe, industry representatives should also be part of the discussions on policy options to reach net-zero and tackle the specific challenges to be overcome in "hard-to-abate" sectors, said Timothy Suljada, acting head of climate, energy and society at the Stockholm Environment Institute.

Who's in charge here?

Assuming the main obstacle—time—can be overcome in the ways participants suggested, the next challenge is deciding what exactly politicians need scientists to tell them, and where the responsibilities of a scientist end and those of a politician begin. While scientists study specific aspects of nature, politicians are charged with making decisions on behalf of everyone and have to consider a wide array of different factors, including the wishes of the public to whom they are answerable.

Because of their different roles, "the scientist will never exactly deliver what the policymaker needs," said Alexandru Marchis, secretary general of the Universities Informal Liaison Offices Network. He argued that policymakers need "boiled-down' solutions, and in the process of boiling down the

Patricia Thornley, Director of Energy and Bioproducts research at Aston University

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Carlos Henrique de Brito Cruz, Senior Vice President of Research Networks at Elsevier

Hanne Bach, Director of the Danish Centre for Environment and Energy at Aarhus University



Gerard Govers, Vice Rector of Science, Engineering and Technology at KU Leuven

complexity of the data that are managed by the scientists, you need to take certain decisions," and those decisions are for policymakers, not scientists, Marchis said. "The scientist can come and put forward the facts, and then it is the elected policymaker that needs to make the decision on behalf of the society."

But at the same time, Marchis is sceptical of the notion that the gap can be filled by intermediaries, such as consultants. "When you're increasing the complexity of a chain of information, the big risk is that certain things are getting lost in translation." Instead, he argued that scientists and policymakers need to get better at talking to each other directly, while keeping to their separate domains of expertise and responsibility.

Blurring that distinction can lead to scientific authority being misused, argued Carlos Härtel, chief technology officer at Climeworks, a Swiss carbon capture firm. You have scientists who are principled and others who are opportunistic, he said. "For every politically expedient position, you will find a scientist who takes that position and is going to defend it in public." That gives politicians cover to dodge responsibility for unpopular decisions or find excuses for bad ones, Härtel said. He added that politicians also deliberately over-complicate relatively simple policy questions in order to shift responsibility for them onto the scientific community.

Likewise, there are also perverse incentives for scientists: by exaggerating the degree of uncertainty and the need for further research, "we are partly serving ourselves as a scientific community, we are giving ourselves a business," argued Gerard Govers, vice rector of science, engineering and technology at the Catholic University of Leuven.

As a scientist or scientific advisor, you are supposed to understand and contextualize the science, but not to prescribe policy, said Brito Cruz. For example, a major source of information for policymakers is the Intergovernmental Panel on Climate Change (IPCC), which is "forbidden from prescribing policy," Brito Cruz said. Instead, the IPCC's job is to summarise the latest scientific understanding of climate change.

Being honest with the public

Politicians also have to worry about a force to which scientists can be happily oblivious: public opinion. While there is the cynical caricature of the craven politician whose every move is calculated to secure re-election, the whole point of representative democracy is that the political class is answerable to the public and must respect its concerns. Net-zero can't be achieved by 2050 if the politicians who support it cannot maintain the public's trust.

Although the International Renewable Energy Agency (IRENA) has published research claiming that global energy-related carbon dioxide (CO_2) emissions can be reduced by 70% by 2050 and completely phased-out by 2060 with a net positive economic outlook, many experts believe the pursuit of net zero will compromise economic growth.

Economic matters that are important to the public, such as the affordability and availability of energy, could be affected by carbon-reduction strategies. "It's inevitable that there will be trade-offs," said Thornley. "I think we have to understand and to communicate clearly to the public that you cannot have a single agenda focus. You cannot build a magic widget that will sort climate and be neutral to everything else," she said. "There will be counter-impacts that are negative, there will always be trade-offs, and I don't think people understand that anywhere near enough."

The need to be honest with the public broadens the problem of dealing with uncertainty and dissenting scientific opinion in the advice given to policymakers. "Scientists know what they mean by uncertainty and I think it gets massively misinterpreted by the general public, and policymakers as well," said Thornley.

Uncertainty and doubt are the default position of the scientific method, even when the evidence is overwhelming. Indubitable theorems are extremely rare and tend to be found in mathematics and physics; they don't exist when it comes to observations of systems as complex as Earth's climate. But a layperson unfamiliar with basic scientific concepts might be forgiven for thinking that scientific uncertainty is an admission that a theory is little more than conjecture. That's why "statistical literacy is really important," said Thornley.

"It is absolutely normal that scientists in the very acute phase of a sanitary crisis would have diverging views...We need to be able to connect the dots,"

Nathalie Berger

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While politicians generally accept the need for net-zero emissions, there is much less of a consensus on how to achieve that target. Scientific opinion is very often too fragmented, too diverse and even contradictory, one participant noted, adding that scientists need to ask themselves: "What are the key ideas that we want the politicians to incorporate and to accept and to work with?"

Adel El Gammal, secretary general of the European Energy Research Alliance, took a different view. He argued that "the facts are extremely clear," and called for a "global narrative" to invite electorates everywhere to accept the trade-offs—including a complete change in their way of life.

No politician wants to address the real problems, which imply impact on employment (notably changes required in locations, profiles and/or qualifications) and on economic growth (in the way it is currently defined, i.e. with a strong link to material manufactured goods), he said. Economic growth and wealth have (in their current definition) hitherto been "core values," he added, but "I believe that we need to break the status quo." In El Gammal's view, "the only way you can sell that politically" is you need people to endorse and adhere to a global transition narrative in which they can project themselves. "We're not asking people to go to hell," but endorse a transformative process that will change radically the way they are living and the values according to which they are measuring themselves, he added.

But maintaining the public's trust is a challenge, said Nathalie Berger, head of a new European Commission department for supporting member states' structural reforms. Berger said that in her native France, there was a range of conflicting expert opinions on how to deal with COVID-19, and the public lost trust in the government's response. "It is absolutely normal that scientists in the very acute phase of a sanitary crisis would have diverging views," she said. "We need to be able to connect the dots," such as by instituting diverse and multidisciplinary scientific advice that gives politicians a broader perspective.

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