



**Knowledge
and science**

**Facts about
alternatives,
not alternative
facts**

Transdisciplinary research
Guest article by Professor Martina Schäfer

A farewell and a fresh start



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As you know, the Oeko-Institut is hardly a newcomer to the field of independent environmental research. We recently celebrated our 40th anniversary, and yet in some ways, we are still regarded as a start-up – a place for thinking about new ideas, with radical yet always well-reasoned proposals for a sustainable future, dynamic and unencumbered by inflexible structures. It helps that we are constantly bringing in new talent to complement the wealth of skills and experience of our existing staff. We have a strong contingent of dedicated young professionals on our team. And of course, there is also the occasional retirement. A major change is afoot at the most senior level of the Oeko-Institut: on 1 July, we will be saying goodbye to Executive Board member Rainer Griesshammer, who has been associated with the Oeko-Institut since the early 1980s and has done so much, over these past decades, to make the Oeko-Institut what it is today. This issue of *eco@work* is therefore dedicated to him. It explores the role of knowledge and science in today's society and, of course, looks back at Rainer's own long career, during which he shaped the Oeko-Institut's positions and helped to set the agenda in the wider sustainability debate. Here at the Oeko-Institut, he will also be remembered for his modesty and for his unfailing courtesy and respect for the entire team. I feel sure that he will not be a stranger to our institute in the years ahead and will continue to work towards our common goal.

At the same time, I am delighted to welcome our new Executive Director Anke Herold. Formerly our research coordinator for international climate policy and on the institute's team for more than twenty years now, she joined the Executive Board on 1 April with special responsibility for research matters.

I send both Rainer and Anke my personal good wishes for the future – at the Oeko-Institut and beyond – and hope all our readers enjoy this issue of *eco@work*.

Yours,

Michael Sailer

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Transdisciplinary research in theory and practice – between a rock and a hard place?

Guest article by Professor Martina Schäfer

In the early 2000s, transdisciplinary research was very much a niche phenomenon and was being trialled solely in fields such as socioecological research. Today, it is increasingly integrated into mainstream research programmes and initiatives; this is clear from many of the funding priorities set by the German Federal Ministry of Education and Research (BMBF) and the international Future Earth initiative. This trend is based on the recognition that solutions to the major challenges facing society, such as climate change, biodiversity loss and the threat to the world's oceans, can only be developed with the involvement of practitioners from a range of sectors (business, civil society, government, politics). This is the only way to analyse the status quo more precisely, identify complex connections (systems knowledge), gain an overview of the diverse normative concepts of how to deal with the problem at hand (target knowledge) and devise appropriate solutions (transformation knowledge).

In the last 15 years, numerous articles have described the challenges facing transdisciplinary research. They identify the problems in establishing this field of scientific inquiry within a research landscape which is largely single-discipline in structure; they also pinpoint the challenges in organising this kind of research process in which the divergent rationales and interests that are characteristic of the science-practice nexus come into play. Publications about transdisciplinary (TD) research

methods, but also conferences and networking activities aimed at building a TD community assist in continuously consolidating the quality of transdisciplinary research. Meta-analyses of the methods used to conduct TD projects, however, show that not enough has been done so far to raise awareness of the state of knowledge in TD, especially among the growing numbers of people for whom this field of research is new territory. These meta-analyses also question whether it is realistic to assume that highly diverse expectations can be met via project-based structures, especially in light of current demands for “scientific excellence”.

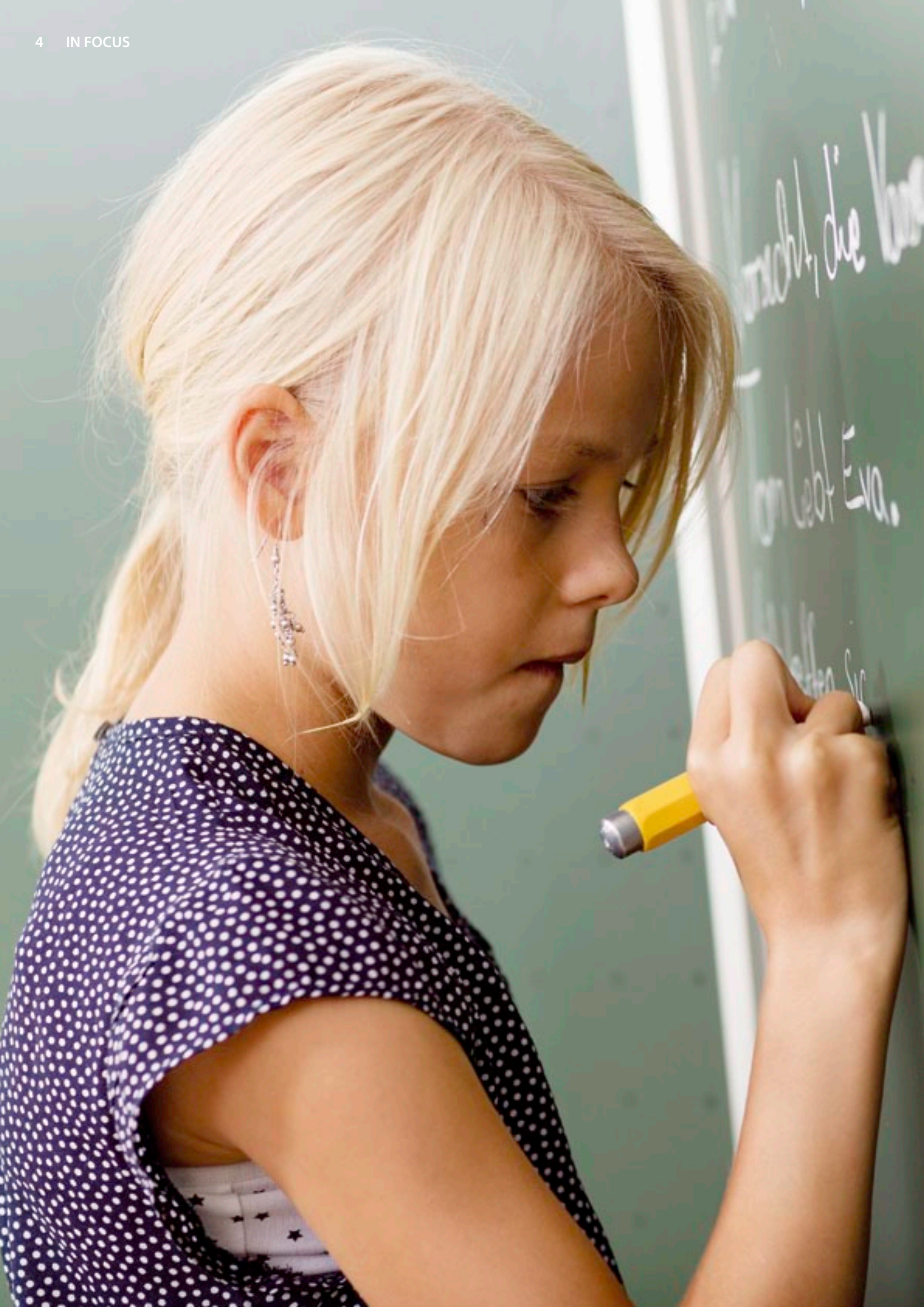
While TD research faces questions from the scientific community about the risks of its being “hijacked” by practical interests and about the scientific soundness of its approach, funding agencies and other stakeholders are increasingly demanding that science make verifiable contributions to solving social problems. In light of this tension, too, the debate about the impacts of TD research has intensified in recent years. An attempt is now being made to clarify definitions of terms such as output, outcome and impact and to differentiate between types of results (e.g. learning process, network building, transformation) to reflect their occurrence in time and space. The TransImpact project, for example, investigates connections between selected processes and methods and their potential impacts (<http://www.td-academy.org>). It is, nonethe-

less, an area beset with major challenges relating, not least, to the attributability of actions and impacts over long periods of time and space, and the influence of other factors.

In sum, then, since its emergence, the growing TD research community has been striving to address critical questions about the robustness of its methodologies, the quality of its approach and its results. However, as is the case in single-discipline research too, it takes time to consolidate standards. Rather than subjecting the TD community to unrealistic expectations that it will produce guaranteed success, a better option would be to support its efforts to foster a constructive dialogue about challenges, methodologies, standards and desired impacts and give it adequate time for reflection – also within the individual project frameworks – along with opportunities for networking and sharing of experience.



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Knowledge and science

Information for a sustainable society

Knowledge is the basis of our work at the Oeko-Institut. Our researchers share their expertise, work on an interdisciplinary and transdisciplinary basis and thus develop knowledge across the traditional divides between research fields. Ensuring that the knowledge gained is of practical relevance to everyday life is also important. The methodological bases and associated

challenges have undoubtedly changed and evolved over the decades. However, there has been one constant ever since the Oeko-Institut was founded: its goal to pool transparent knowledge for sustainable development for the future and make it accessible to society.

“Transitions towards sustainability are taking place at many levels of society,” says Dr Bettina Brohmann from the Oeko-Institut. “For example, we need policies that steer us towards compliance with climate targets, we need technical innovations in the power grid infrastructure, and we also need a shift in social goals and values in response to excessive and often unsustainable consumption.” Scientific knowledge can also support behavioural changes in practical

ways and guide people towards more sustainable choices. In partnership with research institute ISOE and energy companies ENTEGA and Badenova, the Oeko-Institut has therefore been looking at what motivates people to save energy. The Energy Efficiency Classes for Households project – which is funded by the German Federal Ministry of Education and Research (BMBF) – works with interested consumers to field-test some of the key energy saving options

for domestic users. And using other tools developed by the Oeko-Institut, private and commercial consumers can check how to ease the strain on their finances and the environment by buying an electric car or find out whether it is worth installing a battery storage system as well as solar panels, to name just a few examples. All these tools support the transition towards sustainability.

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**SHARED CHALLENGES –
 PRACTICAL SOLUTIONS**

“As we see it, the role of science, in the classic sense, has radically changed in recent decades,” says Bettina Brohmann, Research Coordinator for Transdisciplinary Studies at the Oeko-Institut. “Of course, we still need theoretical bases and methodologies, but it is no longer simply about solving scientific questions in isolation: it is about responding to relevant signals from society.” This must be based on dialogue with stakeholders, interest groups or decision-makers at various practical levels. Concurrently, research institutes such as the Oeko-Institut often act as initiators and idea-makers in their own right. “We want to work together with stake-

holders to identify solutions, not only by integrating their knowledge but also by making the findings more relevant to society and building a sense of ownership.” For example, in order to support sustainable development in a company or region, the Oeko-Institut makes use of local expertise and works with stakeholders to identify appropriate and sustainable solutions.

Cooperation with policy-makers and public authorities is also an important element of a transdisciplinary approach to initiating and managing change. In the Oeko-Institut’s Working Paper Sustainable Consumption – Strategies for Social Transformation, for example, researchers from various divisions of the Oeko-Institut identify six strategic pillars to underpin this process. “It includes setting clear priorities and focusing more

strongly on sufficiency – in other words, on transforming consumption patterns, developing a systemic approach to sustainable consumption policy, and thinking about and integrating social justice,” says Bettina Brohmann. “But promoting social and institutional innovations and involving all the key stakeholders are also important for a successful transition.” The Working Paper thus offers a basis for action at various levels, including local planning and regional funding schemes to support education for sustainable development.

How can the energy transition – Germany’s Energiewende – be managed effectively as a transition process for the whole of society that involves stakeholders from business, politics, civil society and research? This question is currently being investigated as part of Sys-



tem Integration and Interconnection of Energy Supply (ENavi), a Copernicus project supported by the Federal Ministry of Education and Research (BMBF). The project is based around a research consortium with more than 80 partners, including the Oeko-Institut, led by the Institute for Advanced Sustainability Studies (IASS), and focuses on supporting the energy transition as a social transformation process. "We look at technical solutions and new business models and aim to reveal complex connections between the various measures," Bettina Brohmann explains. "The goal is to develop a navigation tool which examines how political, economic, legal, technical and social factors of relevance to the energy transition interact in a systemic context."

A MULTI-STAKEHOLDER APPROACH

For the Oeko-Institut, building knowledge for a sustainable society always involves networking and cooperation, whether in a team, across the Oeko-Institut's divisions or with partners from research, business, politics and civil society. One example is the Systemic Innovation for Sustainable Development – Transfer as a Learning Process at the Regional Level project, whose topic is future-focused urban and regional development. "This project involves collaboration across an extremely diverse set of stakeholders, with regional and urban institutions working alongside policy-makers, civil society and business," Dr Brohmann explains. Funded by Darmstadt University of Applied Sciences as part of the Innovative University initiative, the project aims to cluster the potential for innovation, creativity and policy-making for sustainable development in the Darmstadt region and establish learning systems. "The Oeko-Institut is assisting with process design and providing thematic support. For example, we are working with an automotive supplier on ways of sustainably improving its management of chemicals in leather upholstery production," she explains.

In another project, entitled Transformative Strategies for Integrated Neighbourhood Development (TRASIQ), again funded by the German Federal Ministry of Education and Research (BMBF), the Oeko-Institut adopts a cross-disciplinary approach and draws on practical experience. In cooperation with the Research Institute for Regional and Urban Development (ILS, Dortmund), the German Institute of Urban Affairs (difu) and Darmstadt – City of Science and with support from team ewen and the Schader Foundation, the researchers are developing strategies and policies for neighbourhoods in Darmstadt and Griesheim across the three dimensions of sustainability – economic, social and environmental. "We are engaged in dialogue not only with planners but also with future residents," says Bettina Brohmann. "The project identifies and supports practical action that can be taken in two development areas and produces recommendations for policy-makers."

Dr Brohmann sees collaboration on projects such as these as a fluid process in which continuous dialogue is essential. "We have been working with some of our partners for a very long time, but even these collaborations are changing," she says. "Today, it is important to think more in terms of process design." This need to focus more on process, she believes, stems from the complex challenges associated with the transition to sustainability. "After all, it's about changing lifestyles and entire systems. Everyone has to adapt – consumers just as much as business and politics. And that can only happen through continuous dialogue, review and adjustment."

KNOWLEDGE FOR THE FUTURE

But the Oeko-Institut researchers are not only working on solutions for the present. In many instances, they look several decades into the future. Dr Brohmann again: "What kind of knowledge will we need in future? And how can we make that future more sustainable? One way of answering these ques-

tions is by developing scenarios to test various possible pathways towards an identified outcome. We can prepare the development of these jointly identified outcomes by working in what we call a real-world laboratory – and we can fine-tune the various ideas and measures to meet the practical needs of the future." According to Dr Brohmann, there are specific criteria that must be met by real-world laboratories. "Initiating real-world laboratories has become something of a trend – but many people are using this label even if they have only ever held one consultation with stakeholder groups," she says. "There has to be a measure of quality assurance and compliance with defined standards. And that means working with people to describe problems, prioritising goals, supporting the delivery of solutions and checking again and again that the approach is the right one." This is the only way to ensure that everyone has the kind of information that they genuinely need: sound knowledge for a sustainable future.

Christiane Weihe



Social scientist and regional studies expert Dr Bettina Brohmann has worked for the Oeko-Institut since 1984, becoming Research Coordinator for Transdisciplinary Studies in 2012. In this role, she is engaged in inter-divisional working, focusing on topics such as social aspects of energy and climate policy, consumer and motivation research, and facilitation of decision-making processes.
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Interview with Professor Rainer Griesshammer

He has an insider's knowledge of the Oeko-Institut from his diverse roles in gathering and sharing information – both as an outspoken rebel scientist and as the “go to” person for policy-makers and business. After 37 years with the Oeko-Institut, many of them as a member of the

Executive Board, Professor Rainer Griesshammer will be retiring in summer 2018. He talks to eco@work about past and present challenges facing science, new approaches to generating knowledge, and the Oeko-Institut's role in sharing information.

Alternatives and facts instead of fake news



Professor Griesshammer, how have the Oeko-Institut and science evolved over the years?

The major environmental crisis in the 1970s and 1980s was the moment when conventional science failed. It failed to predict the crisis, and it often defended the use of high-risk technologies and toxic chemicals. The Oeko-Institut was set up in 1977 because the environmental movement needed

independent scientists. This was an affront to the scientific and political establishment and prompted massive criticism of the Oeko-Institut's studies on nuclear power plants and chemicals, for example, with claims that the work was unscientific or even subversive. The situation remained largely unchanged until 1986, the crisis year for advanced technologies with the Chernobyl disaster and the poisoning of the Rhine fol-

lowing the fire at the Sandoz chemical plant in Basel. It made a lot of people stop and think.

What are the signs of this change?

Today, there are environmental scientists working in the universities, in the ministries and public authorities and even in businesses. The Oeko-Institut has become one of the world's leading think tanks. It has built up a very good

working relationship with the universities over many years, as we see from the joint projects, lectures and real-world laboratories, the planned joint professorship with the University of Freiburg and the major collaborative project on systemic innovation with the University of Darmstadt.

The Oeko-Institut aspires to identify environmental and sustainable alternatives. How does it share this message?

It uses a variety of channels. Making our findings publicly available has been part of our mission statement from the start. Nothing should be hidden away in a drawer, as happened so often in academia in the past. We have many ways of raising awareness of our research studies: press releases, our website and social media, policy statements and our work in a wide range of committees. And we also provide advice directly to decision-makers in Parliament, the ministries, NGOs and business.

How difficult is it to disseminate environmental knowledge nowadays?

It depends on the topic. Interestingly, there is more interest in problems than solutions. Acute environmental problems at the local level, such as poor air quality or noise, are better understood than the global challenges – climate change or biodiversity loss, for example – which have a longer latency period. It is more difficult to raise awareness if the environmental impacts are not yet part of people's lived experience.

Another challenge we often face is that we are researching highly complex issues and our findings must be fully substantiated, whereas the media tend to be more interested in brief and succinct messages – sound bites, if you like. It's sometimes difficult to reconcile the two.

The integration of practical experience is becoming increasingly important in knowledge acquisition.

We have involved practitioners from wider society in our work from the outset and always adopted an interdisciplinary approach to problem-solving, focusing on practical action. However, we never really gave much thought to the underlying methodology. Over the past few years, this same methodology has been defined in detail as transdis-

ciplinarity and is now one of the specified criteria that must be met to secure financial support from many of the programmes run by the major funding agencies.

Is citizen participation easy to achieve?

It's not easy but it is essential. At the Oeko-Institut, we have many years of experience in information sharing, communication and participation at various levels: the stakeholder dialogues about Frankfurt Airport, the Ecodesign Directive, power grid expansion and the search for a final storage site for nuclear waste are just a few examples. We recently summarised all these projects and experience in a working paper, describing all the key criteria that should apply to consultation processes, such as a flexible approach to goals and planning, along with transparency and fairness.

Whose side are you on in these processes?

I'm on the side of the environment and sustainability. However, we have seen some green-green conflicts in recent years. People can have wildly opposing views about an individual wind farm or pumped storage power plant, for example, and some citizens' groups are against wind power or grid expansion on principle.

One of the trends we are seeing nowadays is to cast doubt on the opinions of experts or twist what they say – the keyword here is fake news. Is this something that concerns the Oeko-Institut as well?

In principle, it is a good thing to re-examine traditional methods and knowledge and look at alternatives. After all, that's what we do at the Oeko-Institut. But spreading doubt is not enough. The criticisms and the alternatives have to be properly substantiated. They have to be based on real, not "alternative" facts.

What can we do to counter fake news?

We can counter fake news by being both pro-active and reactive on issues which we know are contentious and by publishing position papers or FAQs, for example. That's what we have done with electromobility, for instance. Better still, we can anticipate key debates, gather the data, analyse the various positions and alternatives and thus pre-

pare the ground for decision-making by society. The Power Grid Transparency project is a good example of the role that we can play. The power grid modelling that we undertook successfully within this project framework now enables us to assess plans more accurately and model our own alternatives for grid expansion, as well as those presented by environmental organisations.

You are about to retire from the Executive Board at 65. Which challenges do you see ahead for the Oeko-Institut and your successor?

My successor Anke Herold will, I am sure, promote the Oeko-Institut's international agenda more vigorously than I did, and she may well adopt an even more interdisciplinary approach. A key challenge that I can foresee is that many technologies, products and services are evolving ever more rapidly, making it increasingly difficult to react in time and produce the scientific knowledge and appropriate policy guidance that are required. Digitalisation and genome editing are just two examples. A faster response is needed from legislators here. Overall, however, I have no doubt that the Oeko-Institut is well-placed to analyse and evaluate these new trends.

Thank you for talking to eco@work.

The interviewer was Christiane Weihe.



Professor Rainer Griesshammer has been associated with the Oeko-Institut since 1980, for much of that time as a member of the Executive Board.

*His scientific work focuses mainly on product-related environmental and climate performance and transformations. He played a key role in the development of the PROSA Product Sustainability Assessment methodology and led the initiative to establish ecotopten.de, a product information platform. In 1984, Rainer Griesshammer, who holds a PhD in Chemistry, published the bestselling green guide *Der Öko-Knigge*. From 1992 to 1994, he was a member of the German Bundestag's Enquete Commission on the Protection of Humanity and the Environment.*

The German Federal Foundation for the Environment honoured him with its Environmental Award in 2010.

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