

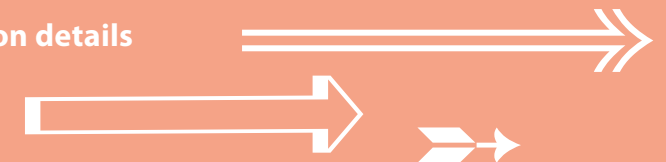
Making transformations equitable

**Annual Report
Oeko-Institut – Institute for
Applied Ecology 2021**

Overview of the 2021 Annual Report

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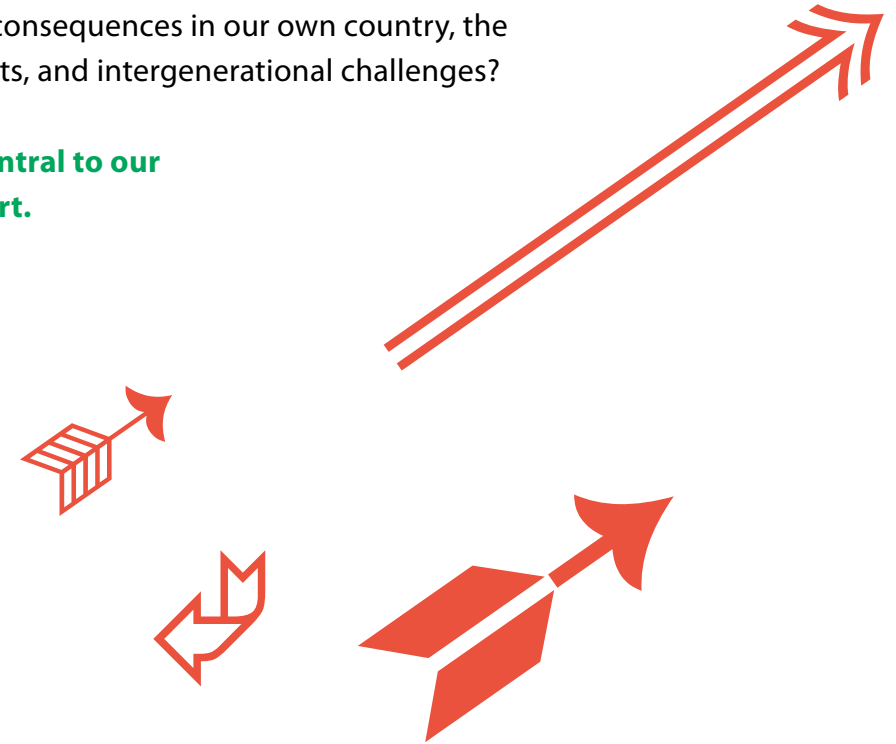
Is that equitable?

Pressing for fair transformation

Our lifestyles and production and consumption patterns urgently need to change – the environment, climate and resources must be protected. But is this being done fairly and equitably? How policy-makers tackle the necessary changes affects people in all kinds of ways. In our own country and globally. Today and in the future. For instance, CO₂ pricing can add to the burdens of low-income households. Resource extraction has environmental and social consequences in other countries. The outcome of the current search for a nuclear waste repository site or failure to take climate action will affect younger people and future generations most of all.

How can we ensure that transformation is equitable – in terms of the social consequences in our own country, the international impacts, and intergenerational challenges?

This question is central to our 2021 Annual Report.



Social justice

in relation to climate-friendly housing

- Even today it is hard for households with low and moderate incomes to find affordable housing, especially in urban centres. Modernisation programmes could make for even higher rents.
- The building modernisation rate is stagnating – currently it is around one per cent. It would need to be around two per cent in order to achieve long-term climate goals.

»With targeted political measures, it is possible to advance climate protection and relieve the financial burden on vulnerable households at the same time.«

oeko.de/jb2021-wohnen1

From: »Distributional effects of selected climate policy measures in the housing sector«, study commissioned by the German Federal Ministry of Labour and Social Affairs

International equity

in sustainable hydrogen production

- The production of green hydrogen in countries of the Global South can lead to coastal water pollution and competing claims on land use.
- The Oeko-Institut estimates that if its energy system is almost greenhouse gas neutral by 2050, Germany will probably need several hundred terawatt hours of electricity-based fuels.

»Ambitious and clearly defined sustainability criteria prevent negative effects of hydrogen production abroad.«

oeko.de/jb2021-wasserstoff1

From: »Sustainability dimensions of imported hydrogen«, working paper on the donation-funded project »Hydrogen? Yes, but only if it's sustainable!«

Intergenerational equity

in the final storage of highly radioactive wastes

- Final storage of highly radioactive wastes in Germany begins in 2050 at the earliest. It therefore affects younger generations most of all.
- Safe longer-term storage of radioactive waste is an absolute necessity – and requires a final repository within deep geological formations.

»In view of the societal relevance, this should be addressed via diverse channels and media platforms, particularly to reach the young generation.«

oeko.de/jb2021-endlagerung1

From: »Public participation in the search for a final repository: Challenges of an intergenerational, self-questioning and learning procedure«, research report commissioned by the German Federal Office for the Safety of Nuclear Waste Management



Editorial

by Jan Peter Schemmel, on the year 2021



Dear readers,

While the war in Ukraine means that we are all currently pre-occupied with questions of security and peace, last year we were immersed in quite different issues: climate protection and social equity – not least during the 2021 Bundestag elections. Stricter climate targets and effective ways to achieve them were just as much in focus as good jobs and decent rates of pay. The topics are closely interlinked. For the sustainability transformations that lie ahead will change the labour market: many new jobs will come into being, while others will disappear. And there must be socially equitable distribution of the benefits and costs of any such transformation.

Of course, equity means far more than ensuring that climate protection measures are socially balanced. An important dimension of equity gained legal traction in the Federal Constitutional Court in April 2021: intergenerational equity. Ruling on constitutional complaints lodged by climate activists, the court found that the existing Climate Change Act has shortcomings and is incompatible with basic rights. Because inadequate action on climate protection today unlawfully limits the freedom of subsequent generations by forcing them

to implement even stricter climate protection measures. The perspective of intergenerational equity is also highly significant in relation to the search for a final repository site, which was debated nationwide last year.

Moreover, equity has an international dimension. This gives further grounds for our commitment to climate protection, because it is societies other than our own that are worst affected by global warming. Yet it is also important to take care not to let our climate protection measures cause social or environmental problems elsewhere, but to ensure that they support sustainable development in other countries. We must be watchful of this when we import resources from them or enter into hydrogen partnerships with them.

Yet the political debate on justice and climate protection is usually dominated by the question of who bears the costs; is climate protection not automatically socially inequitable? No, it is much more a matter of how the relevant measures are designed. Two examples: if the CO₂ price rises, low-income households could be compensated in the form of a citizen rebate. This keeps their costs from rising in direct proportion and sets an incentive for low-CO₂ consumption – an incentive



that is stronger still for those who consume more and do not qualify for a rebate because they can afford to spend more. Or if we introduce a bonus-penalty system for motor cars – that is, a mechanism that makes cars with harmful emissions more expensive and climate-friendly vehicles cheaper – it only affects people who can afford to run a car at all.

And on the subject of cars: climate protection efforts hurt some sectors far worse than others. The (inevitable) end of combustion engines in cars or the phase-out of coal will affect numerous jobs, especially in certain regions. At the same time, many new jobs are being created – because skilled workers are needed for building modernisations, the expansion of renewable energies or the hydrogen industry. Filling the gaps and ensuring smooth transitions in the labour market will be major challenges. In that respect, it is no different from the shift in the labour market resulting from the digital transformation.

When talking about the costs, it must never be forgotten that inaction now will eventually be much more costly for us all, but particularly for the socially disadvantaged. This is shown by price hikes associated with dependence on fossil fuels during security crises such as the war in Ukraine currently. But most of all it is shown by the consequences of climate change. In 2021, floods in this country caused damage amounting to 33 billion euros. Many residents of the Ahr valley lost everything they owned. People who are uninsured – as lower income groups

tend to be – or have no savings are faced with economic ruin. These people must be helped; there is no question about it. But with an eye to the future, it makes far more sense to finance climate protection and adaptation measures, so that extreme weather events do not cause such disasters in the first place. The same applies to countries that are far more affected by the consequences of climate change than we are, yet have contributed far less to causing the climate crisis. I am thinking of sea-level rise and flooding in countries like Bangladesh and Vietnam or droughts in Africa. From my past work in development cooperation, I remember various conversations with people in these countries about this unequal distribution of responsibility and burdens. It is therefore only equitable to press ahead and do more for climate protection.

At the same time, people with low incomes benefit from environmental and climate protection measures not only in the long term but often fairly immediately, even in our own country. For they often live on busy main roads where housing is cheaper and the air quality is poorer. Their flats are smaller, and traffic calmed, car free city centres would provide them with additional recreational and green spaces. We must constantly keep this in mind if we want to take people with us on the path of transformation. We not only have to allay their anxieties but also point out the positive perspectives.



These are the challenges that Germany's federal government, and all of us, must overcome together during the current legislative period. I see it as the Oeko-Institut's task to make analyses and proposals available, as we did last year with especial vigour. As you will read in this annual report, we addressed issues including socially balanced climate protection in housing and transport, and the question of how to ensure the sustainability of hydrogen imports.

The relationship between sustainability transformations and social equity was also to be the focus of our annual conference in 2021. Unfortunately we had to postpone this to the summer of 2022 due to the pandemic. Now as then, we look forward to exchanging ideas on this important issue.

Maybe we will meet there?

With warmest wishes,
Jan Peter Schemmel

Chief Executive Officer of the Oeko-Institut



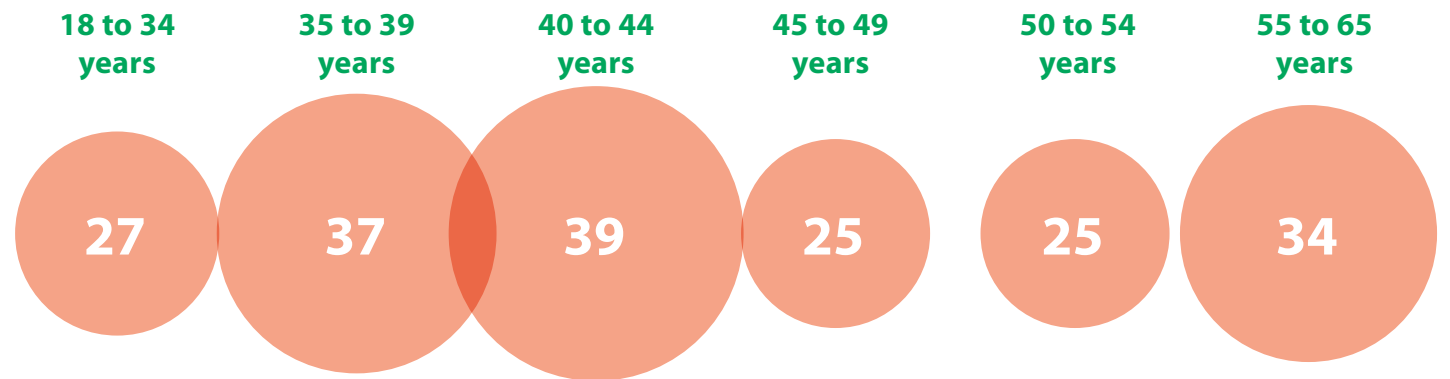
Facts and figures for 2021

Staff members

In 2021 we had 187 members of staff contributing to the success of our work. 130 of them are scientific staff, while 57 people provide support in the finance, IT, human resources, contracts and public relations departments. Almost three quarters of staff members work part-time, with somewhat more than a quarter working full-time.

The distribution of women and men across the staff body is almost half and half, with women slightly outnumbering men – there were 106 women and 81 men working at the Oeko-Institut in 2021. A relatively balanced ratio is found in management functions as well: two women and one man work on the Executive Board; five women and seven men on the Committee. In the research divisions and in central services, seven men and four women are heads of the organisational units. From the age profile of our staff, it is clear that the institute is an attractive employer for both younger and older staff members. This enables us to combine new ideas and youthful perspectives with longstanding experience.

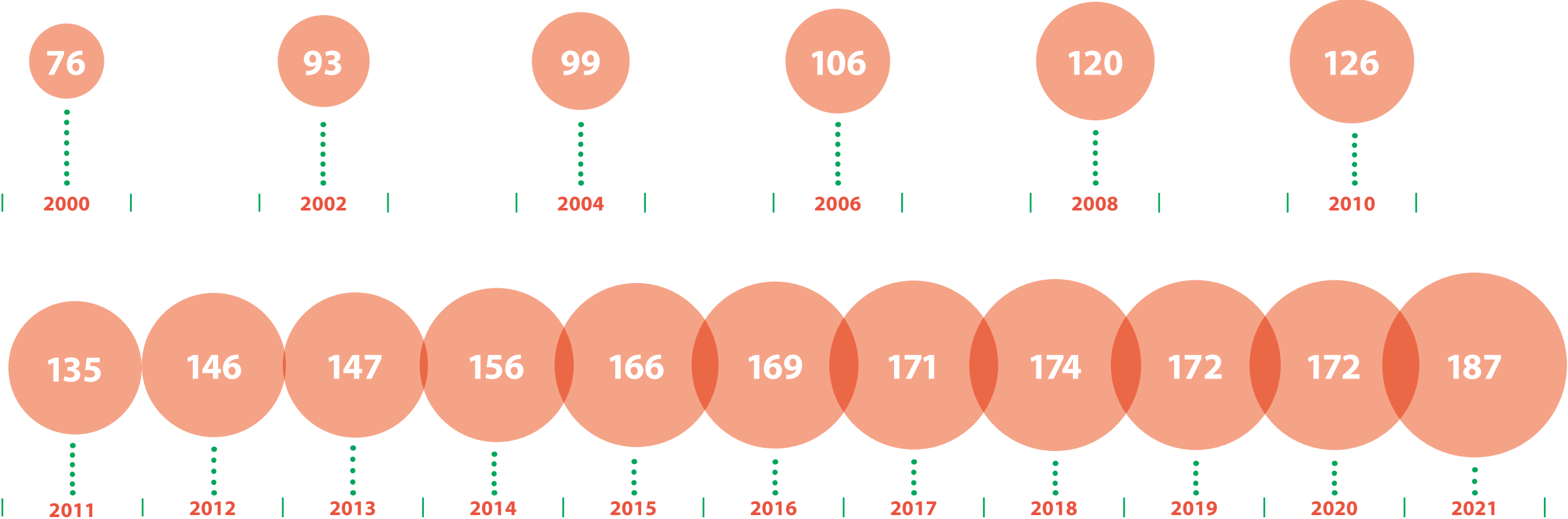
Male and female colleagues are evenly distributed across almost all age groups.



Family friendliness is important to us at the Oeko-Institut. We are therefore very pleased that 14 staff members – five men and nine women – took parental leave in 2021.

Facts and figures for 2021

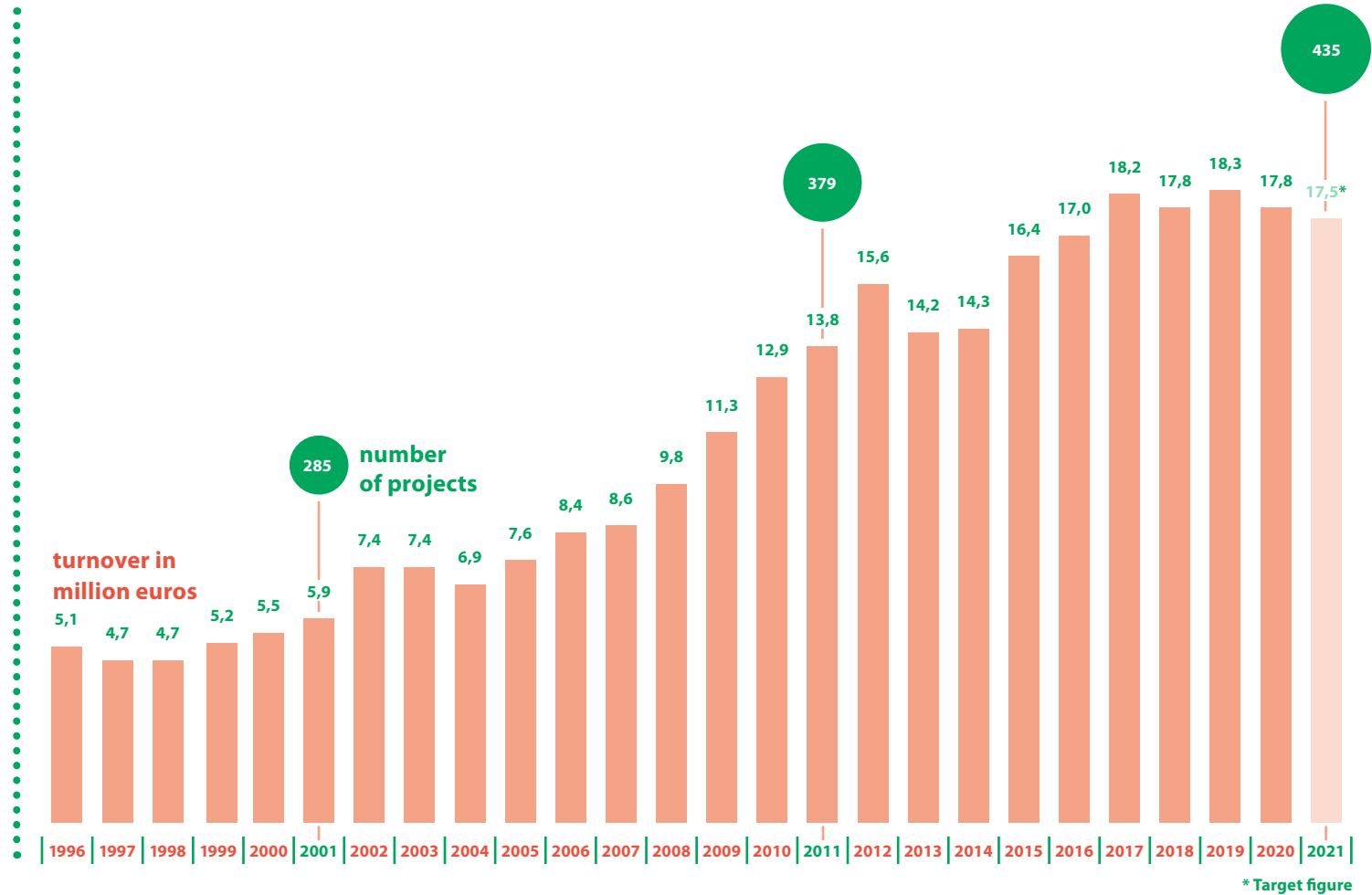
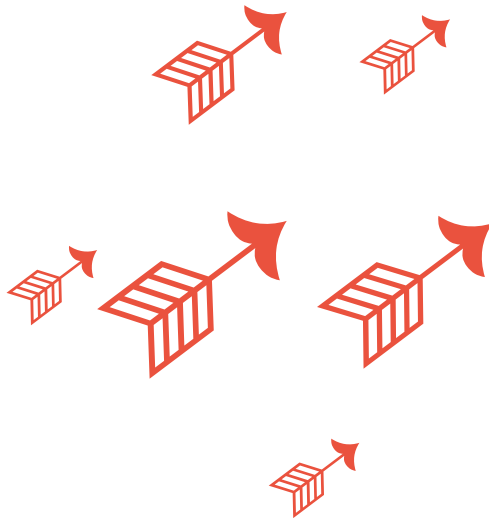
Changing staff numbers over time



Facts and figures for 2021

Projects and turnover

In 2021, we worked on the highest number of projects in our institute's history. Our scientific activities focused on more than 430 projects and research ventures, which accounted for turnover of almost 18 million euros. The above figures are forecasts and will be presented in finalised form at the General Assembly of the Oeko-Institut in September 2022.



Stability and change: Bodies and management

In 2021, the composition of the Oeko-Institut's management bodies remained unchanged. The research divisions were supported by the institute's central services departments. New since 2021 is the People & Development Department, which is the central point of contact for all human resources issues at the institute. Led by Birgit Burgmann, who joined us at the institute in April, the department's staff deal with all aspects of staff administration and staff development. Acknowledging the realities of the prolonged coronavirus pandemic, in 2021 the Oeko-Institut held its first virtual General Assembly. It elected Wolfgang Renneberg as a new Committee member, replacing Prof Dr Gerald Kirchner. The Executive Board and the Committee sincerely thank Gerald Kirchner for his many years of service. Staff in Freiburg and Berlin also voted in Clara Löw and Dr Roman Mendelevitch as their new representatives. Dr Martin Comes took over as the Committee member representing the extended institute management, succeeding Christof Timpe who stood down from the Committee after a long honorary term of office.

The members of the Executive Board



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First Chair of the Committee

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Thomas Rahner

Wolfgang Renneberg

Prof Dr Volrad Wollny

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Project highlights

Introduction

Maintaining the integrity of the environment and climate is a key task for present and future generations. Our lifestyles, consumption and production patterns therefore need to change as a matter of urgency. However, the change that is needed should not focus solely on environmental aspects; it must also consider how the associated actions and developments affect other people, other countries and future generations. In other words, the transformation must be fair and equitable. In the following pages, we showcase 10 projects as examples of the Oeko-Institut's work in 2021. They deal with social justice in the transition towards sustainability, including its international and intergenerational dimensions.

How can Germany achieve climate neutrality by 2045? This question was

explored by researchers in the Energy & Climate Division and the Resources & Transport Division. Together, the two divisions also investigated socially balanced climate policy measures in housing and transport. And as part of the Oeko-Institut's 2020 donation-funded project, the Energy & Climate Division proposed criteria for avoiding the negative impacts of hydrogen imports on producer countries. The Resources & Transport Division also looked at how electric cars compare with combustion engine vehicles when it comes to resource consumption and what sustainable resource management might look like.

The social impacts of environmental policy were the focus of a project conducted by the Sustainable Products & Material Flows, Energy & Climate, and Environmental Law & Governance



Divisions. Experts from the latter also worked with colleagues from the Energy & Climate Division on a project funded by the Institute itself, which explored options for accelerating two pillars of the energy transition – the expansion of wind energy and future transmission grids – without putting opportunities for public participation at risk.

Researchers from the Sustainable Products & Material Flows Division also studied how our consumption is impacting on biodiversity and ecosystem services and what can be done to safeguard them. In addition, they looked at how individual products and services can contribute to the Sustainable Development Goals (SDGs) adopted by the United Nations. And finally, with a focus on the Nuclear Engineering & Facility Safety Division, we turn the spotlight on the [tdAcademy](#),

a research and community platform in which we are involved and which aims to advance transdisciplinary research, with a particular emphasis on the major challenges facing society. Colleagues from this Division are also providing support at various levels for the process to identify a repository site for the storage of high-level radioactive waste.

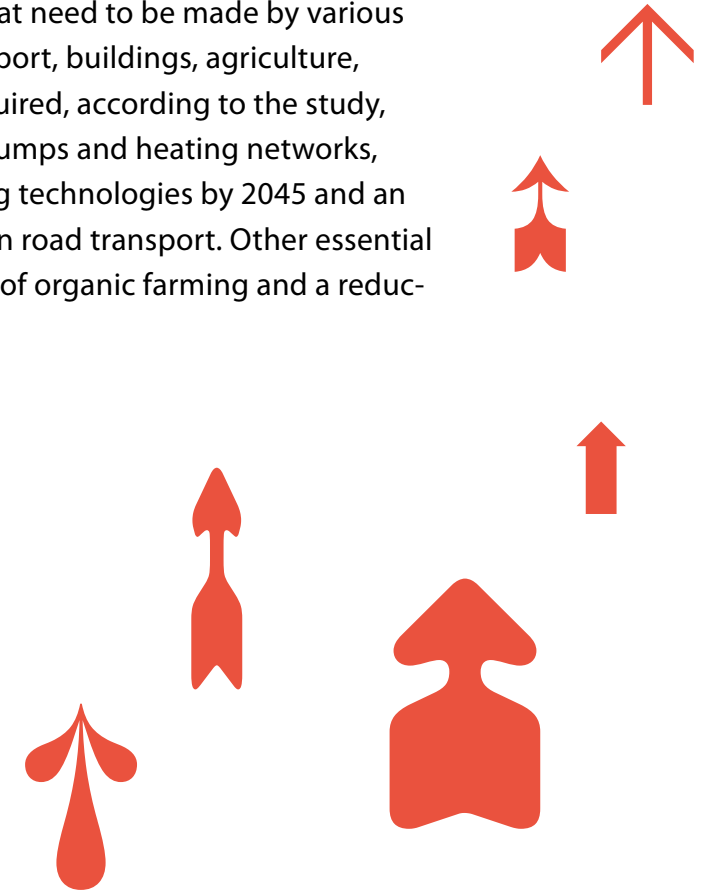
Ambition for justice

Towards a climate-neutral Germany by 2045

In April 2021, Germany's Federal Constitutional Court ruled that the country's climate action to date was unsatisfactory, on the grounds that it did not meet the requirements of intergenerational justice. In response, Germany tightened up its climate targets once again: it must now achieve climate neutrality by 2045, instead of 2050. Is this feasible? And what action is needed? The Oeko-Institut explored these questions on behalf of the Climate Neutrality Foundation (Stiftung Klimaneutralität), Agora Energiewende and Agora Verkehrswende in a continuation of its earlier study »Towards a Climate-Neutral Germany«, which had demonstrated how climate neutrality could be achieved by 2050.

The new study shows that Germany can reach its climate targets as early as 2045. However, this will require accelerated and comprehensive deployment of climate-friendly technologies in combination with a strong climate policy. The researchers identify three key levers for accelerated climate action: more energy efficiency and reduced energy demand; further expansion of renewable power generation and electrification; and increased use of hydrogen.

The project team from Prognos AG, the Oeko-Institut and the Wuppertal Institute for Climate, Environment and Energy also identify specific changes that need to be made by various sectors – energy, industry, transport, buildings, agriculture, land use and waste. Actions required, according to the study, include the expansion of heat pumps and heating networks, the replacement of fossil heating technologies by 2045 and an expedited switch to e-mobility in road transport. Other essential measures are a rapid expansion of organic farming and a reduction of livestock numbers.



- Project title
Towards a climate-neutral Germany by 2045: How Germany can reach its climate targets before 2050
- Clients
Climate Neutrality Foundation (*Stiftung Klimaneutralität*), Agora Energiewende, Agora Verkehrswende
- Project partners
Prognos AG, Wuppertal Institute for Climate, Environment and Energy
- Timescale
March 2020—April 2021
- Further information
oeko.de/jb2021-klimaneutral-2045

»Ambitious measures are imperative for the transport sector. This means that from 2030, registrations of cars with combustion engines will be close to zero, and by 2045, the national vehicle fleet will consist almost exclusively of electric cars. There must be a significant increase in the proportion of electricity-based fuels in aviation and shipping.«



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A complex process

The search for a repository site

With the Repository Site Selection Act (*Standortauswahlgesetz – StandAG*), which came into effect in 2017, Germany gave the go-ahead for a process that is set to preoccupy several generations to come: the search for a repository site for the safe storage of high-level radioactive waste. The search is due to be completed by 2031; the repository will then be constructed, although the final storage of high-level radioactive waste is not scheduled to start until 2050 at the earliest. The Oeko-Institut is following this process at various levels: it monitors the criteria that will inform decision-making on a repository site, supports the public consultation formats and provides advice to affected municipal and district authorities.

An important step in the siting procedure was the publication of the Sub-areas Interim Report in September 2020. It identifies regions which, based on current knowledge, are suitable for consideration as a future repository site – and points out which specific municipalities and districts may be affected. As the geological expertise required to navigate the

report's complexities is rarely available at the local level, the Oeko-Institut provided scientific analyses of its content in various projects in 2021.

Among other things, experts from the Oeko-Institut provided advice to the districts of Rotenburg (Wümme), Wesermarsch and Emsland. In Emsland, for example, the Oeko-Institut assessed whether the salt domes that are identified as possible sub-areas are in fact suitable for consideration based on current knowledge. The researchers concluded that the methodology that led to the selection of the salt domes was transparent, but identified a need for additional information and review on certain points. They also assisted Emsland Rural District to set up its own advisory panel.



- Project title
Supporting the search for a repository site
- Clients
Various clients, plus a self-funded project
- Timescale
Ongoing since August 2020
- Further information
oeko.de/jb2021-endlager-en

»The search for a repository site for high-level radioactive waste is a once-in-a-lifetime project. The procedure being implemented is important, and it is the right way forward. But it is also important to monitor and support this process on a continuous basis, and the Oeko-Institut is committed to that task.«



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Adequate water, additional electricity

Sustainable hydrogen imports

Is an adequate water supply available? How are the electricity inputs generated? Is the local community consulted to a sufficient extent? When it comes to sustainable hydrogen production, there are numerous environmental and socio-economic dimensions to consider. As Germany is likely to have to import substantial quantities of green hydrogen in future in order to meet its climate targets, this applies to hydrogen production in other countries as well. In its 2020 donation-funded project, the Oeko-Institut proposed criteria for avoiding the negative impacts of hydrogen imports on producer countries.

In the study [»Towards a climate-neutral Germany by 2045«](#), the Oeko-Institut predicts that Germany will need to import around 170 terawatt-hours (TWh) of hydrogen annually by 2045. This means that around 50 million cubic metres of water must be provided in the producer countries and around 260 TWh of electricity must be generated from renewable energies. However, the sustainability criteria state, among other things, that the electricity demand must be met from additional renewable energy sources that do not conflict

with countries' decarbonisation strategies and that the water should be supplied by additional seawater desalination plants. Alternatively, hydrogen should be produced in regions with sufficient water supplies. Furthermore, appropriate mechanisms must be put in place in order to prevent human rights violations and rule out the use of sites located in protected areas.

From the project team's perspective, the sustainability criteria not only help to avoid negative effects of hydrogen production. They also provide investment security for companies and are a key basis for recognition of imported hydrogen as a climate protection instrument. Furthermore, the criteria and standards should be defined soon and, if possible, be agreed at the international level so that there is no risk to climate and other sustainability targets in countries of the Global South.



- Project title
Hydrogen? Yes, but it must be sustainable
- Funding
Donation-funded project
- Timescale
October 2020–December 2021
- Further information
→ oeko.de/jb2021-wasserstoff1

»Merely defining sustainability criteria is not enough. In order to ensure that they are genuinely adhered to, a monitoring organisation is needed. And that requires local institutions to introduce certification schemes, for example.«

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Making the energy transition possible

Grid expansion and on-shore wind energy

If grid operators are incentivised to optimise the existing electricity network, grid expansion can be accelerated. And if an on-shore wind energy law is initiated, more wind energy plants can be established more quickly. A self-funded project by the Oeko-Institut shows how this would work. The researchers focused specifically on how two key elements of the energy transition – grid expansion and wind energy – can be accelerated without sacrificing the involvement of citizens.

With regard to grid expansion, grid operators should be more open to all technologies, according to the study. Incentives are needed so that existing and new grids can be managed in a targeted way. This would enable current average capacity utilisation – around 35% – to be substantially increased with no risk to supply security. An important instrument, in this context, is accurate monitoring of transmission lines and local weather conditions. In order to avoid delays caused by legal disputes, there should be more involvement of citizens: among other things, all the relevant decision-makers should be present at information events and consultations

so that issues can be resolved immediately, and the discussions and matters requiring further clarification should be documented.

For wind energy plants, by contrast, uniform regulations are needed at the national level: this has the potential to remove barriers to the construction of new wind power plants. This new federal legislation would specify the minimum area for each regional state (Land) of Germany and provide guidance on standardised interpretation and application of the requirements for nature conservation and species protection. In addition, all project applications should first be received at a central point of contact in the states. These central offices would then forward the applications to authorities or network operators and guide project developers through the entire approval process. Early and open-ended public participation is also required. In this way, the needs of local communities can be considered in land-use and facility planning.



- Project title
Making the energy transition possible
- Funding
Self-funded project
- Timescale
October 2020—January 2022
- Further information
- oeko.de/jb2021-energiewende-netzausbau
- oeko.de/jb2021-energiewende-windenergie

»In order to achieve the expansion of renewable energies, minimum areas for wind energy are required for each state, which should be laid down in a statutory ordinance. State policy is bound by a planning obligation to break down the required areas further to the municipal level. In doing so, it has leeway to rely on cooperation between municipalities.«



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Not on the backs of low earners

Social aspects of environmental policy

Environmental and social policies are interlinked: more affluent households heat larger living spaces, travel more often by air and make a larger contribution to environmental pollution than lower-income households. At the same time, the impacts of the environmental crisis, such as traffic noise or air pollution along major roads, hit already disadvantaged groups particularly hard. These groups are also affected to a disproportionate extent by environmental policy measures such as CO₂ surcharges on fuels for heating and mobility. In other words, both the existence and the absence of environmental policies can have an impact on social justice. A multiannual project commissioned by the German Environment Agency (UBA) investigates the many interactions between environmental and social policy goals.

The project team, which also includes FÖS, ISOE and Zebralog, has developed a conceptual framework in order to identify connections between social and environmental impacts. Status quo analyses in the essential areas of housing, food, mobility, work and leisure offer an overview of current

problems and needs for action. Policy instruments and policy mixes that create synergies between environmental and social goals and reduce conflicts of interests are discussed by the project team in more detail in relation to food and housing.

The experts are also advising the German Environment Ministry on specific short-term needs, such as fair and legally viable distribution of the additional costs of energy upgrading between tenants and landlords, and the new Social Climate Fund (SCF) established as part of the EU's Fit for 55 package. The research process is accompanied by dialogue events and is supported by an advisory board which includes representatives of social and welfare organisations. Effective environmental policy crucially depends on broad public acceptance and therefore also on social justice. The project team is developing further ideas on how this can be achieved.



- Project title
Social aspects of environmental policy
- Clients
German Environment Agency (UBA)
- Project partners
Forum Ökologisch-Soziale Marktwirtschaft (FÖS), Institute for Social-Ecological Research (ISOE), ZebraLog GmbH
- Timescale
September 2020 — August 2023
- Further information
oeko.de/jb2021-umweltpolitik

»We have already studied media and stakeholder discourses. The print media that we analysed touched peripherally at best on the social impacts of environmental policy from 2018 to 2020. This can lead to blind spots in the public debate.«

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Is that fair?

Climate action and social equity in housing and transport

Many policy measures can help to protect the environment and the climate – but are not necessarily fair and equitable. In order to ensure that climate policy in housing and transport is socially balanced, measures must be taken to minimise or redistribute the costs of climate investment and related pressures on low-income households. In two studies commissioned by the German Federal Ministry of Labour and Social Affairs (BMAS), the Oeko-Institut shows how this can be done.

In the housing sector, energy demand must be reduced as a matter of urgency. However, energy upgrading and the associated investment should not result in unacceptably high rent increases, the analysis finds. So it is important to provide adequate government funding for energy retrofitting in rental properties and encourage take-up of the scheme. A climate bonus would also ease the burden on recipients of welfare benefits. As a further measure, the heating cost increases resulting from the carbon levy should be distributed equitably between tenants and landlords. Targeted programmes to support low-income homeowners who carry out retrofitting are also beneficial.

The experts also propose policy measures for the transport sector, where emissions need to be reduced by almost 50 per cent by 2030. Increased taxation of high-emission passenger cars is essential; the income generated from this policy measure can be used to help people on low incomes switch to e-mobility. It is also important to remove environmentally harmful privileges in the taxation of company cars and diesel, for example, and expand eco-friendly alternatives to passenger cars, such as much more affordable local public transport. Another option is to provide free travel or concessionary tickets for lower-income households.



- Project title
Distributional effects of selected climate policies in the housing and mobility sectors
- Supported by the
German Federal Ministry of Labour and Social Affairs (BMAS)
- Timescale
September 2020—April 2021
- Further information
oeko.de/jb2021-verteilungswirkungen

»The housing and transport sectors must increase their climate effort over the next few years – far too little has been done here to date. However, the burden should not be borne by people on lower incomes. Social justice in climate policy is possible.«

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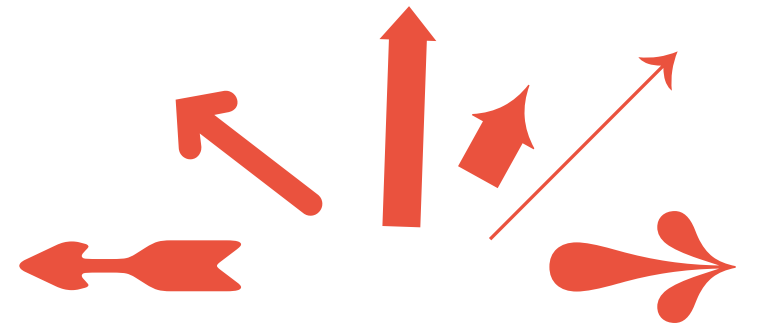
Does my product support the SDGs?

SDG evaluation

The 17 Sustainable Development Goals (SDGs) adopted by the United Nations are intended to guarantee sustainable development in its three dimensions: economic, social and environmental. They cover a range of topics, from food security and gender equality to climate action and responsible production and consumption. These are important but complex goals. How can individual products and services make a contribution here? This question can now be answered using a new method developed by the Oeko-Institut in cooperation with the ZNU Centre for Sustainable Leadership at the University of Witten/Herdecke.

The project team developed an approach for measuring products and services and, indirectly, businesses and product policy against the Sustainable Development Goals (SDGs). A key component of the method, whose development was funded by the German Federal Ministry of Education and Research (BMBF), is a free software package which enables users to find out how products and services measure up against the SDGs and how their performance can be improved.

The basis of the SDG Evaluation of Products (SEP) is the procedure for conducting life cycle assessments. With reference to 45 different indicators, it assesses the contribution made by products and services to the SDGs and identifies dimensions of sustainability where they are already performing well and where there is scope for further action. The indicators cover aspects such as the proportion of women in management positions and social security coverage. In order to complete the evaluation, further indicators can be used to analyse societal benefit. In this way, beyond the core benefit of a product or service, additional benefit aspects can be considered in light of the SDGs.



- Project title
SDG Assessment – Further development of a sustainability assessment method based on the sustainability goals of the United Nations (Agenda 2030)
- Supported by the
Federal Ministry of Education and Research (BMBF)
- Project partners
ZNU – Centre for Sustainable Leadership at the University of Witten/Herdecke
- Timescale
May 2019—October 2020, final report March 2021

Further information
→ prosa.org

»A detailed benefit analysis enables companies to undertake a comprehensive systems review as part of the sustainability assessment. In this way, businesses can pinpoint exactly where they can make positive contributions to the SDGs with their own product innovations.«

MARTIN MÖLLER



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E-mobility vs. the combustion engine

Resource consumption in the passenger vehicle sector

One aspect which is often the focus of attention in assessments of e-vehicles is their demand for resources, such as cobalt and lithium, and the environmental and social impacts associated with extraction. Clearly, the mobility turnaround in Germany cannot take place at the expense of communities in resource-rich regions. Thus far, however, one important question has not been answered: how do electric cars compare with combustion engine vehicles when it comes to resource consumption? In a study for the German Federal Environment Ministry, the Oeko-Institut closed this research gap and compared the consumption of metals and fossil fuels.

The study evaluates the development of Germany's passenger vehicle sector from a resource perspective. It shows that in one scenario, where 100% of new cars are BEVs in 2035, annual crude oil demand is reduced by 56% in the German passenger car sector compared to 2020. This can also help to alleviate the social and environmental problems associated with the extraction and use of oil, such as the contamination of vast land areas in Russia, currently

the main provider of crude oil to Germany. The project team also looked at resource extraction for e-mobility and the associated risks, such as water shortages in South America and chemicals use in Australia. And the study emphasises that metals can be recycled, whereas fossil fuels can only be used once. In the 100% scenario, the peak primary metal consumption for the passenger car sector should be reached around 2035 for lithium, cobalt and copper, with increased use of recycled content making a contribution here. ifeu and Transport & Environment provided project support to the Oeko-Institut by sharing their expertise.

The experts make various recommendations on sustainable resource use, which include establishing a recycling economy for rare earth elements in Europe and introducing ambitious recycling targets for key materials for batteries. Mandatory supply-chain due diligence for crude oil and battery materials is also important, according to the study.



- Project title
Resource consumption of the passenger vehicle sector in Germany until 2035 – the impact of different drive systems
- Clients
German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
- Project partners
ifeu gGmbH, Transport & Environment
- Timescale
May 2020–May 2021
- Further information
oeko.de/jb2021-rohstoffe-verbrenner-e-auto-en

»The extraction, transportation and consumption of crude oil have countless negative impacts — on the environment and climate, as well as on human communities. Take Nigeria: the Niger Delta is already contaminated, and there are frequent accidents and fires caused by oil spills from tapped pipelines.«



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Advancing transdisciplinary research

The tdAcademy

Transdisciplinary research involves stakeholders and topics from civil society, politics, academia and business on an equal basis and thus sets out to utilise as broad a spectrum of knowledge as possible in finding solutions to the major challenges facing society. This aspiration has now taken on tangible form in the tdAcademy, established by the Oeko-Institut, the Institute for Social-Ecological Research (ISOE), Leuphana University Lüneburg and the Center for Technology and Society (ZTG) at Technische Universität Berlin. The aim of this research and community platform is to strengthen the joint production of knowledge and advance transdisciplinary research.

The tdAcademy focuses its research on four topic lines that examine core issues of transdisciplinary research: societal effects; scientific effects; contextual dependencies; and selection of innovative formats and newly tailored methods.

In this project, which is funded by the German Federal Ministry of Education and Research (BMBF) and the Robert Bosch Stiftung, the Oeko-Institut focuses on innovative formats. For example, it aims to bring practitioners and academics

together in real-world labs in order to share and build knowledge. As part of the work on this topic line, interviews will be conducted with experts, and workshops will be held for empirical and academic researchers in order to test and evaluate new formats and methods. Various formats and the development of relevant methodologies have already been discussed at workshops held in 2021. The [first publication by the entire project team](#) highlights the importance of the four topic lines and shows how they are interlinked. The publication's aim is to stimulate discussion and further research.



- Project title
tdAcademy
- Supported by the
Federal Ministry of Education and Research (BMBF), Robert Bosch Stiftung
- Project partners
Institute for Social-Ecological Research (ISOE), Leuphana University Lüneburg, Center for Technology and Society (ZTG) at Technische Universität Berlin
- Timescale
June 2020–May 2023
- Further information
td-academy.org

»With the work in the tdAcademy, we want to contribute to training and networking now and in future. We are currently planning an online seminar on real-world labs, as well as a summer school on formats and methods in transdisciplinary research in conjunction with the University of Freiburg and the European Campus (EUCOR).«



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Global loss

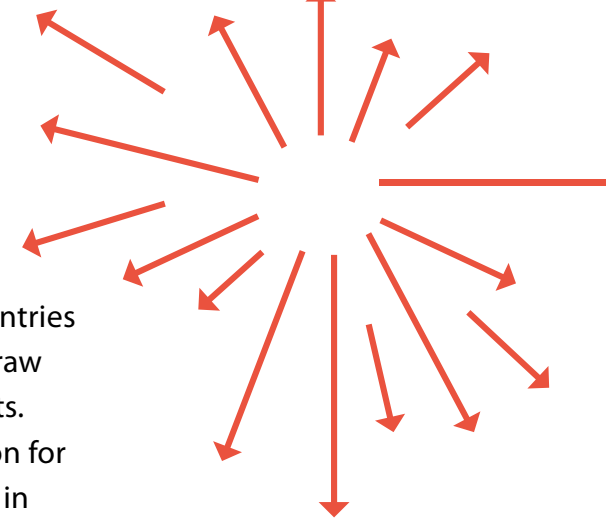
Consumption and biodiversity

The trips abroad, the face cream, even the sausages we have for dinner ... whether it is our tourism, our skincare or the food we eat, our consumption and production patterns have a significant impact on biodiversity. In fact, they are destroying global biodiversity and ecosystem services such as clean air and fertile soil. In collaboration with Adelphi Research, the Oeko-Institut conducted a literature review that explored precisely how our consumption habits are impacting biodiversity and what action should be taken to protect it.

Rising consumption is directly linked to the loss of biodiversity and ecosystem services. The main causes are destruction of habitats, overuse and degradation of ecosystems, land-use change, climate change and invasive species. The cultivation of biotic resources and the extraction of abiotic resources are associated with major losses of biodiversity and ecosystem services, the study found, which was supported by the German Federal Agency for Nature Conservation (BfN) with funds from the German Federal Ministry for the Environment, Nature Conservation and Nuclear

Safety. The impacts are particularly severe in countries of the Global South, as they supply many of our raw materials but are also rich in biodiversity hotspots.

In order to provide more effective protection for biodiversity and ecosystem services, a reduction in consumption levels is required in all sectors, combined with a stronger focus on green and sustainably produced goods. The study shows that food consumption in particular is one of the major causes of biodiversity loss at global level. In addition, the project team identifies good practice examples of communication on sustainable consumption, noting that consumers need much better information: most are unaware of how their individual consumption behaviour impacts on biodiversity and ecosystem services.



- Project title
Sustainable consumption for biodiversity and ecosystem services
- Supported by
the German Federal Agency for Nature Conservation (BfN) with funds from the Federal Environment Ministry (BMU)
- Project partners
Adelphi Research gGmbH
- Timescale
June 2020—November 2022

- Further information
→ oeko.de/jb2021-biodiversitaet-konsum

»In general, biodiversity is not at the forefront of communication on sustainable consumption. The main focus is still on the impacts of climate change. Organic food and fair trade are other topics that are currently given more prominence than biodiversity conservation and ecosystem services in this context.«



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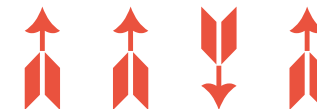
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Funders and clients in 2021

Politics & government

- › Baden-Württemberg Ministry of the Environment, Climate and Energy
- › Berlin Senate
- › Brandenburg Ministry of Rural Development, Environment and Agriculture
- › Bundestechnologiezentrum für Elektro- und Informationstechnik (BfE)
- › City of Hamburg
- › City of Munich
- › Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ)
- › Emsland District Authority
- › European Commission
- › European Environment Agency (EEA)
- › European Parliament
- › German Agency for Nature Conservation (BfN)
- › German Federal Environment Agency (UBA)
- › German Federal Office for the Safety of Nuclear Waste Management (BASE)
- › German Ministry for Economic Affairs and Energy (BMWi)
- › German Ministry for Economic Cooperation and Development (BMZ)
- › German Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU)
- › German Ministry of Education and Research (BMBF)
- › German Ministry of Food and Agriculture (BLE)
- › German Ministry of Labour and Social Affairs (BMAS)
- › Gesellschaft für Anlagen- und Reaktorsicherheit gGmbH (GRS)
- › Karlsruhe District Authority
- › Kreditanstalt für Wiederaufbau (KfW)
- › Leer District Authority
- › Lüchow-Dannenberg District Authority
- › Neckar-Odenwald District Waste Management Company (AWN)
- › North Rhine-Westphalian Ministry of Economic Affairs, Innovation, Digitalisation and Energy
- › Rotenburg District Authority
- › Samtgemeinde Bevensen-Ebstorf
- › Statistical Office of the European Union (Eurostat)
- › United Kingdom Government's Department for Business Energy and Industrial Strategy (BEIS)
- › United Nations Environment Programme (UNEP)
- › Wesermarsch District Authority
- › World Bank Group
- › Zukunft Umwelt Gesellschaft gGmbH (ZUG)



Funders and clients in 2021

Industry

- › Asia Society
- › Bader GmbH & Co. KG
- › BASF SE Ludwigshafen
- › BlueSky Energy Entwicklungs- und Produktions GmbH Österreich
- › Deutsche Amphibolin Werke (DAW SE)
- › EWS Vertriebs GmbH
- › Jokey SE
- › Mehlhart Consulting
- › Miele & Cie. KG
- › Möhler + Partner Ingenieure AG
- › Netze BW GmbH
- › Öko-Recherche GmbH
- › Prognos AG
- › Ramboll Deutschland GmbH
- › Rügenwalder Mühle Carl Müller GmbH & Co.KG

- › Smart Energy for Europe Platform SEFEP gGmbH
- › SQM International N.V.
- › TÜV Süd Energietechnik GmbH
- › Utopia GmbH
- › Volkswagen AG
- › Wacker Chemie AG
- › Werner & Mertz GmbH
- › Wien Energie GmbH

Research and civil society

- › adelphi research gGmbH
- › Agora Energiewende
- › Arbeitskreis Green Shooting
- › Climact
- › Climate Action Network (CAN) Europe
- › Climate Neutrality Foundation

- › European Climate Foundation
- › Forschungsgesellschaft für Energiewirtschaft mbH
- › Freiburg Archdiocese
- › Friedrich Ebert Foundation
- › German Federal Environment Foundation (DBU)
- › German Nature and Biodiversity Conservation Union (NABU)
- › German Olympic Sports Confederation (DOSB)
- › Global Green Growth Institute
- › Green City e.V.
- › Greenhouse Gas Experts Network Inc.
- › Greenpeace Germany
- › Heinrich Böll Foundation
- › HNEE Eberswalde

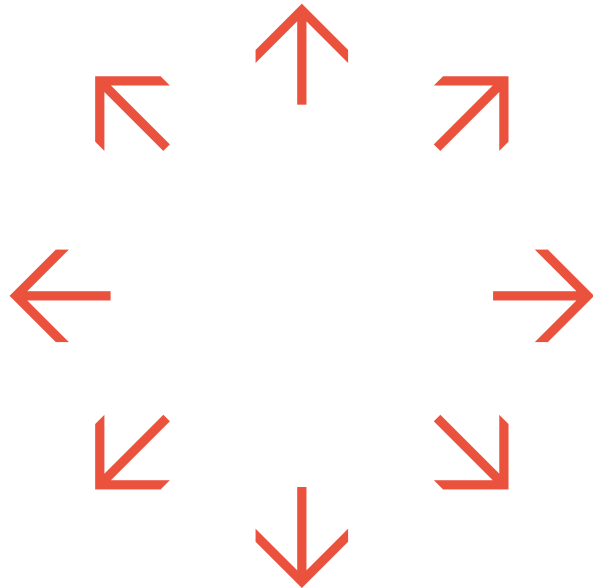
- › IREES GmbH
- › Nürtingen-Geislingen University (NGU)
- › Ostwestfalen-Lippe University of Applied Sciences and Arts
- › Swiss Energy Foundation (SES)
- › Swiss Federal Laboratories for Materials Science and Technology (Empa)
- › The European Campus EVTZ
- › World Economic Forum
- › World Resources Forum
- › WWF Germany / Switzerland / USA

These are some of our funders and clients. A full list of references is available (in German) at oeko.de/referenzen2021



The Oeko-Institut in the media

From classic media work via the website to social media and podcasts: we communicate our research findings to the widest possible public, seeking to gain their support for the necessary changes by using accessible language. We give this work all the more importance since it is enshrined in our statutes.



In 2021 the Public Relations & Communications Department ...

- ... drafted and sent out 34 press releases
→ oeko.de/en/press
- ... authored or editorially supported and published 80 blog posts
→ blog.oeko.de/oeko-institut/english/
- ... wrote 40 website news reports
→ oeko.de/en/press/archive-press-releases
- ... tweeted 818 tweets to 18,460 followers
→ twitter.com/oekoinstitut
- ... produced and distributed the »EcoMail« newsletter 12 times
→ oeko.de/en/press/newsletter
- ... published around 250 Instagram posts and stories for 2,340 followers
→ instagram.com/oekoinstitut
- ... sent 221 updates to 2,777 followers via the LinkedIn profile
→ linkedin.com/company/oeko-institut-e.v.
- ... published the online magazine eco@work 4 times
→ oeko.de/en/e-paper

The Oeko-Institut's new podcast

All change please!

As of 8 April 2021 the Oeko-Institut has been using a new medium to communicate the findings from its scientific research. That date marked the launch of »All change please! The podcast on science and sustainable transformations«. Interested individuals can now listen to complex but comprehensibly explained knowledge on a variety of subjects. Every episode covers a topic from the institute's research and advisory work.

»We want the podcast to go into depth without being too nerdy«, says Mandy Schossig, explaining the new show's approach. Schossig is co-presenter of the podcast and head of the Public Relations & Communications Department at the Oeko-Institut. The first season consists of six episodes, in each of which an expert from the Oeko-Institut is invited to delve into a different topic.

Up to the end of the year, the podcast had received almost 9,000 plays. The episodes are available on all the usual podcast portals – such as Apple Podcasts and Spotify. Each podcast was also promoted with a press release, a blog post and a newsletter article as well as social media activities on Instagram, Twitter and LinkedIn.



Catch up on season 1 (2021):

- Episode 1:
[»Why is hydrogen the champagne of the energy transition?«](#) with Dr Felix Chr. Matthes, released 8 April 2021
- Episode 2:
[»What will become of air travel after the coronavirus?«](#) with Jakob Graichen, released 21 May 2021
- Episode 3:
[»What use is public participation in the search for a final nuclear repository?«](#) with Julia Mareike Neles, released 1 July 2021
- Episode 4:
[»How can we prolong the life of our electrical equipment?«](#) with Siddharth Prakash, released 5 August 2021

- Episode 5:
[»How social can the energy transition be?«](#) with Dr Katja Schumacher, released 23 September 2021
- Episode 6:
[»What use are international climate negotiations?«](#) with Anke Herold, released 28 October 2021

In 2022 we launched the second season with more episodes.
Listen to all episodes of the podcast here: oeko.de/podcast
The Public Relations & Communications Department:
oeko.de/communications

The Oeko-Institut's members

The Oeko-Institut is a non-profit association with around 2,000 members and finances its work mainly through projects funded by third parties. Members' subscriptions enable the institute to address topics for which no external mandate is forthcoming via commissions. These include our annual donation-funded projects, which address the major challenges of our time.

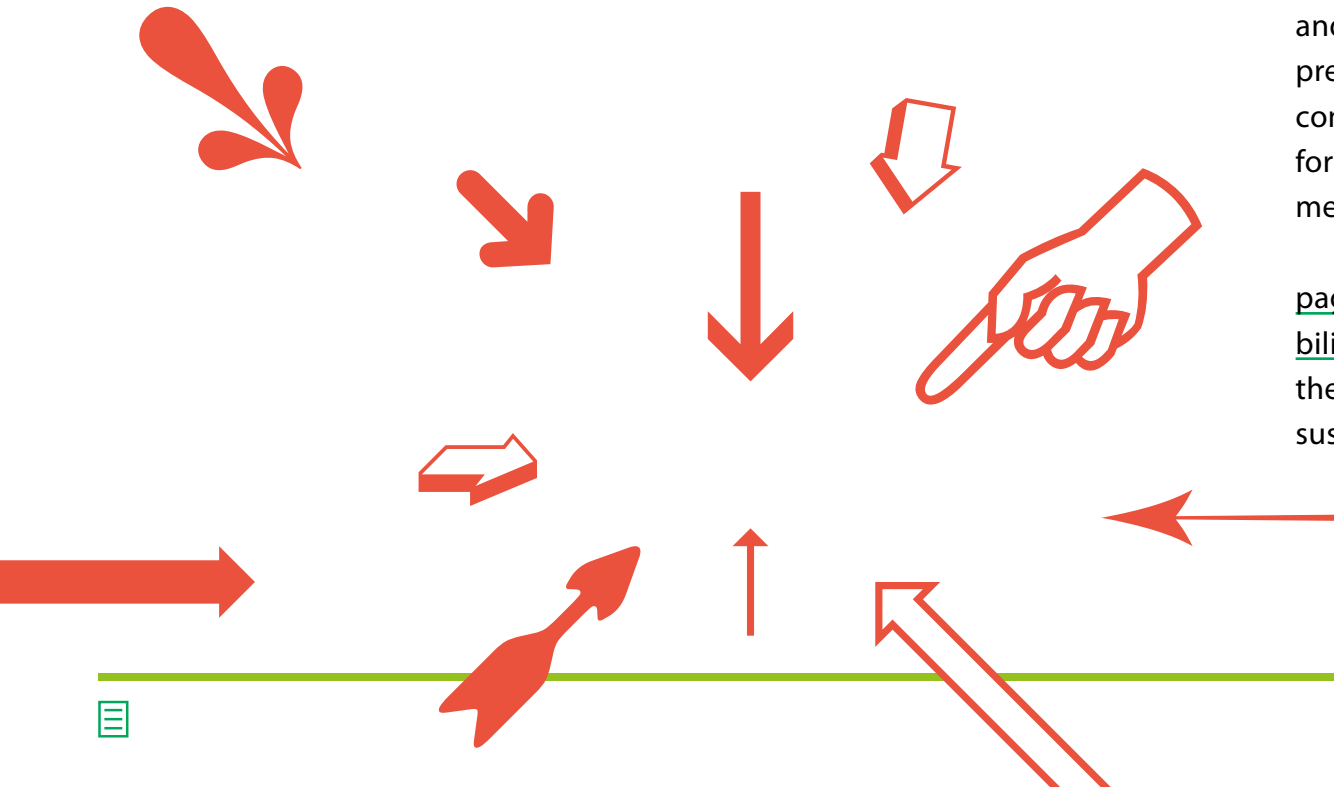
Donation-funded project 2020:

Eight criteria for imported green hydrogen

In order to achieve its goal of climate neutrality by the year 2045, in all probability Germany will have to import large amounts of hydrogen from regions outside the EU.

Scientists from the Oeko-Institut have analysed the likely far-reaching and multi-layered effects on the exporting countries and used this as a basis for developing ambitious and clearly defined sustainability criteria. These are intended to prevent adverse impacts of hydrogen production abroad, give companies a secure basis for investment, and lay foundations for longer-term recognition of imported hydrogen as an instrument for climate protection.

A detailed presentation of the results can be found on [page 18 of this annual report](#). The [working paper »Sustainability dimensions of imported hydrogen«](#) was financed under the donation-funded project: »Hydrogen? Yes, but it must be sustainable!«



New donation-funded project 2021: Circular Economy

To generate new momentum in the direction of circular economy, we need a paradigm shift in Germany. The Oeko-Institut's donation-funded Circular Economy project is investigating the reasons for the failure of a true circular economy to date. Next, the research team will develop solutions and make use of these in policy advisory work.

In a circular economy, the value of products and materials is retained within the cycle for as long as possible. Resource consumption and all kinds of waste are minimised. When a product has reached the end of its service life, it is reused. Products that are not reusable are sent for high-quality recycling.

→ oeko.de/spendenprojekt2021

Sophie Baar takes charge of member services

After 14 years of member liaison duties at the Oeko-Institut, our long-serving colleague Andrea Droste handed over to Sophie Baar at the start of 2021. Her 32-year-old successor moved from the science management staff at the University of Freiburg to join the Oeko-Institut.

»Associations are in my blood«, says Sophie Baar. She has long been – and remains – active in cultural and environmental associations, and particularly appreciates engagement and interaction with the members of our non-profit association. The environmental sciences graduate is well travelled: her studies took her to Turkey and Sweden, followed by a stint on the northern Norwegian coast. She has been working in Freiburg since 2017. In addition to her work for the association and in member services, Sophie Baar supports the Committee and the Executive Board at the Oeko-Institut.



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