Öko-Institut e.V.
Institut für angewandte Ökologie
Institute for Applied Ecology

HEAD-WINDs

Annual Report Oeko-Institut **2024**

CONTENTS

THE EYE OF THE *HURRICANE*

Since its founding in 1977, the Oeko-Institut's researchers have often been caught up in major storms. In those days, our experts were dubbed "scientific rebels" because they introduced new perspectives into public debates – and were not afraid to face some strong headwinds. But in the eye of the hurricane, it is calm – and that's how they defended their positions, explained their studies and convinced others with their expertise.

Opposition to nuclear power I Energy turnaround study

Amateurs? Us??

At the time of its founding, many people were reluctant to take the Oeko-Institut seriously. Publications by its researchers that criticised nuclear power were dismissed as an "uprising of amateurs".

The energy turnaround study

In this 1980 study, the Oeko-Institut shows that there is an alternative to oil and uranium. There is a future with renewable energies. They are a long time coming, but decades later, the nuclear phase-out and the energy turnaround come true – in 2011.

Breast milk study

Nothing but scaremongering?

A study in 1981 investigates the contamination of breast milk by toxic substances in the environment. It is criticised by the Federal Health Ministry and is even described as "scaremongering" by the Society of Paediatrics.

The breast milk study

The facts speak for themselves: the causes can be found in the increasing levels of chemical residues in the environment. And the Oeko-Institut sends a clear message: rapid action by the government and tougher environmental standards are required.

The Nitrogen Association scopes out the Oeko-Institut I Drinking water study

Barefoot and in shorts

Quite chaotic, somewhat unkempt, and very much an alternative scene: this is how the Oeko-Institut is described by a representative of the Nitrogen Industry Association who calls in – incognito – to check us out in 1981.

The drinking water study

The "visit" is prompted by the drinking water study, in which the Oeko-Institut draws attention to the numerous exceedances of maximum nitrate limits in drinking water – sparking concerns at the Association about its turnover.

A government change and public contracts

Too close to the government?

During the change of government in 1982, numerous conservative politicians are keen to halt the granting of public research funding to the Oeko-Institut. A number of parliamentary questions in the Bundestag also aim to discredit the Institute.

Agencies and ministries

Today, our researchers still work on behalf of numerous public-sector bodies, including the German Environment Agency (UBA), the Federal Office for the Safety of Nuclear Waste Management (BASE), the Federal Environment Ministry and the Federal Ministry of Agriculture.

The Castor controversy

Ship it abroad

In 1996, Michael Sailer, the Oeko-Institut's CEO, criticises protests and blockades of transports of Castor flasks containing nuclear waste. In his view, it is a fallacy to assume that this will put the brakes on the nuclear industry, which would then increasingly rely on reprocessing abroad.

Interim storage instead of transports

In 2000, the "nuclear consensus" between the Federal Government and energy suppliers – intended to usher in the nuclear phase-out – includes Michael Sailer's proposal to set up interim storage facilities at nuclear power plant sites.

Sustainable Höchst

Yellow foam

The Oeko-Institut repeatedly criticised Höchst AG, which attracted publicity in the early 1990s with a series of shocking accidents in which harmful and potentially carcinogenic chemicals were r eleased, with these incidents downplayed in the company's crisis communications.

The other side

Hostility evolves into critical partnership: in 1995, Höchst AG commissions the Oeko-Institut to develop a management tool for a corporate sustainability strategy – although the cooperation is highly controversial within both organisations. The project generates international publicity for the PROSA sustainability assessment tool.

An overview of our Institute's history can be found here: https://zeitreise.oeko.de (in German)

Although the wind sometimes blows more fiercely today and will in future, we stand firm – with our scientific expertise, unbiased knowledge and critical appraisals. You can depend on that.

DEAR READERS,

In 2024, we witnessed numerous upheavals. Power generation from renewable energies continued along its rapid growth trajectory: installed renewable power capacity in Germany increased by 12% and the renewables share of public power generation reached 59%. This positive trend can be observed worldwide as well. According to forecasts by the International Energy Agency (IEA), renewables are set to overtake coal in global power generation in 2025 and will provide more than 17,000 terawatt-hours (TWh) by 2030 – a rise of almost 90% from 2023. Exponential growth can be observed not only in the global renewable energy market, but also in the market for electric vehicles. Here, global sales rose by a further 25% in 2024. Meanwhile, the much-heralded renaissance of nuclear power is not going as well as expected in some quarters: nuclear generated just 9% of the world's electricity in 2023, with its share steadily declining since it peaked at 17% in 1996. By contrast, the renewables share in global power generation reached 30% and is still on a sharp upward trajectory.

These are probably not the upheavals you expected, are they? Because last year, of course, there were other major events which gave much less cause for optimism – to put it mildly. Trump's election victory, the collapse of Germany's traffic light coalition and the rise of far-right parties in Europe, including at the federal level in this country, greatly concern us. Populism, particularly on the far right, is becoming more entrenched instead of subsiding. I am writing this text before the Bundestag elections, but the expected shift to the right here in Germany too is already worrying many people, who are taking to the streets to protect our democracy.

At the same time, I am firmly convinced that so many positive dynamics are now under way that even those who deny that climate change is happening are powerless to halt them. As a rule, renewable energies are now the most economically viable solution, and many individuals, businesses and, fortunately, governments too have understood that their expansion is the right approach and that there is no alternative to climate action. To cite one well-known example: after the Trump Administration announced that the US would be withdrawing – again – from the Paris Agreement, the former Mayor of New York City, Michael Bloomberg, stated that he and other climate funders would ensure that the US would still meet its commitments to tackle the climate crisis – among other things, by providing funding for the UNFCCC Secretariat. Bloomberg had previously donated millions of dollars for this purpose during Trump's first term in office. And in Germany, many companies and industry associations are engaging for the further transformation of the energy sector. They include the President of the German Association of the Automotive Industry (VDA), Hildegard Mueller, who observed ahead of the Bundestag elections: "Anyone who denies climate change and fails to see the future as an opportunity sets the seal on long-term economic decline."

When I look back on 2024, I see many things that we at the Oeko-Institut can be proud of. One is the Science Forum on the Circular Economy, whose various event formats were attended by almost 500 people. The circular economy was also a key theme in our communications last year. You can find information on this topic in this Annual Report as well – and, of course, on many other future-

focused issues that our researchers are addressing. Our first alumni meeting was another special event: it was attended by many of our former staff members, who are able to offer us additional perspectives from their vantage point outside the Institute. I'm particularly gratified to see a network emerging here, giving further impetus to our joint engagement to protect the environment and climate.

Another exciting network of diverse stakeholders arose as a result of an open letter which, as part of an alliance from research and industry, we sent to the Federal Government in early 2024. It was prompted by plans for massive cuts and, indeed, the later cancellation of funding for the further development of electromobility. From our perspective, this was a fatal decision, for the German automotive industry is in a critical phase in the transition to e-mobility, requiring application-oriented research. This was a highly diverse multi-stakeholder alliance comprising automotive and energy companies, associations and research institutes. As this shows, many people are pulling together here, and this inspires me with optimism.

I also see it as our task at the Oeko-Institut to develop and share positive visions for the future. For many people, protecting the environment and climate mainly means restrictions or even self-denial – sacrificing travel, certain foods or home comforts, for example. And yet our strategies have so many positive impacts. Slowing climate change is an important one, but of course, it is not felt quite so immediately in daily life. But the benefits of liveable cities with less noise and lower emissions can certainly be felt. The same applies to improved safety on our roads, or the benefits of a healthy, plant-based diet. It is important that we focus again on the positive developments and visions instead of only considering the potential disadvantages – even though we must of course take them seriously and address justified concerns.

The title that we chose for this Annual Report is "Headwinds". For us at the Oeko-Institut, this kind of weather is by no means unfamiliar – we have faced it ever since the Institute was established. And of course, there are still strong headwinds today – mainly from those who deny climate change and reject the transformation of our society. In almost 50 years of our existence, we have learned how to take the wind out of the critics' sails: with sound research and a clear position.

So that this text ends as positively as it began: deforestation in the Amazon decreased by 30% in 2024 compared to 2023, reaching the lowest level in nine years – a major success for the new Brazilian government. In Bangladesh, one of the countries most severely impacted by climate change, an early warning system and better-organised disaster risk management are now saving tens, if not hundreds, of thousands of lives.

These are also developments that give me courage.
I hope they do the same for you.

Warmest wishes, yours, Anke Herold
Acting CEO of the Oeko-Institut

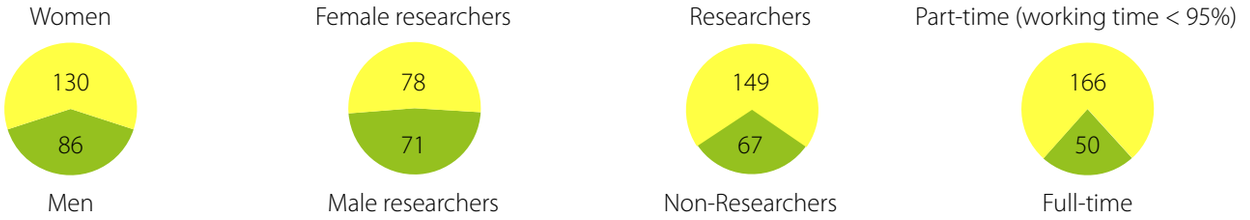
2024: OUR YEAR *IN FIGURES*

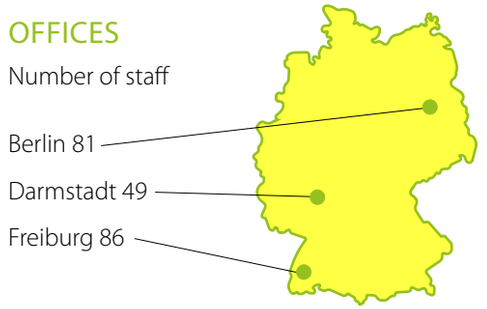
Staff, project numbers, turnover – the Oeko-Institut saw further growth across the board in 2024. Always with an eye on the goal, we are continuously expanding our knowledge and expertise in order to drive the transition to sustainability.

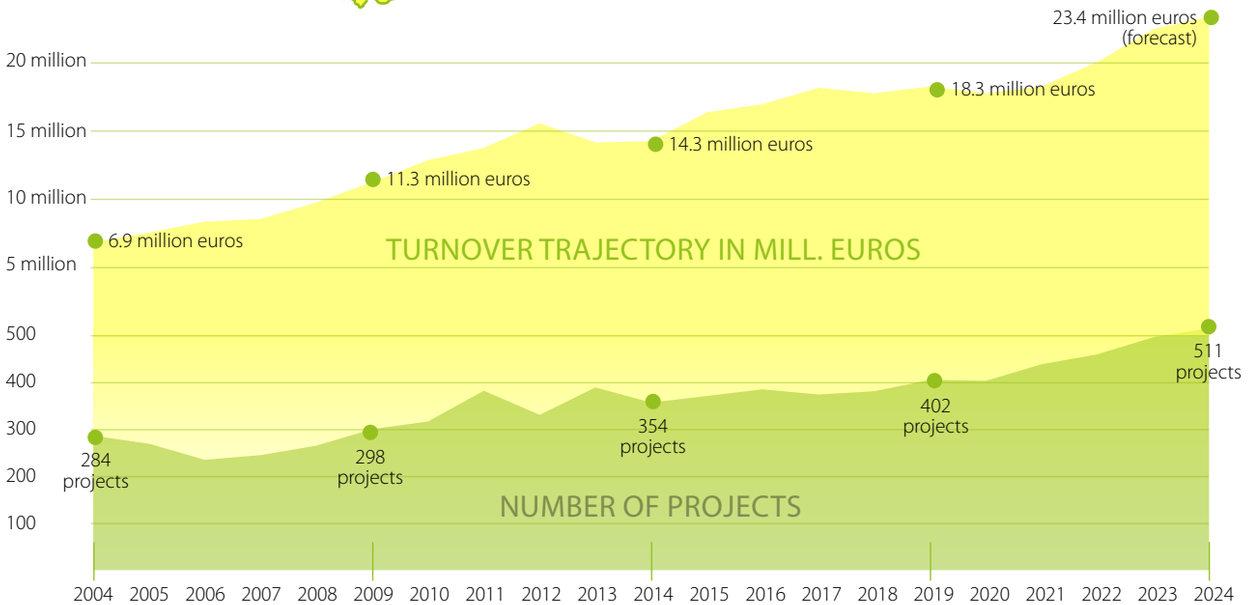
In 2024, **216 dedicated staff** in our Freiburg, Darmstadt and Berlin offices contributed to the Oeko-Institut's success. Of this figure, **149 were engaged in research**, while **67 staff** working for Central Services ensured that the Institute's internal procedures ran smoothly.

The Oeko-Institut achieved a new record, with **more than 500 projects** delivered over the year – a historic milestone for our Institute.

It also maintained its financial stability, achieving a turnover of **around 23.4 million euros** (forecast) – a figure that underscores the success of our work and the trust in our expertise.







STABILITY IN A HEADWIND

Stability and flexibility – two strategies for withstanding turbulence and opposition.

Stability and flexibility – two strategies for withstanding turbulence and opposition. Stability guarantees continuity and dependability based on proven structures and processes. With it, we set the direction and create certainty and trust – both internally and externally. With our experienced Executive Board and a Committee that has evolved over many years, we can rely on a consistent set of values, experience and skills, especially in times of change.

Flexibility enables us to adapt swiftly and effectively in dynamic periods so that we are prepared for unexpected challenges and can respond appropriately. We are open to new ideas, are agile in shaping processes, and promote innovation. The appointment of a new second head of the Resources and Transport Division and new faces on the Committee are two examples.

The Executive Board in 2024

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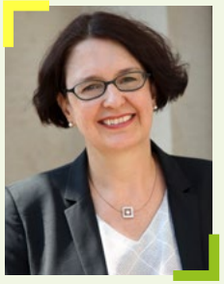

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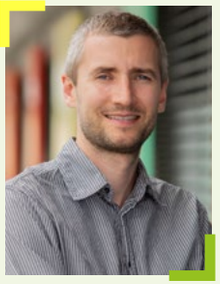

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The Committee

External members of the Committee

Dorothea Michaelsen-Friedlieb First Chair of the Committee
Ulrike Schell Second Chair of the Committee
Professor Lorenz Hilty
Bettina Lorz
Helmfried Meinel
Wolfgang Renneberg
Professor Thomas Schomerus

Internal members of the Committee

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Carl-Otto Gensch
Jonathan Schreiber
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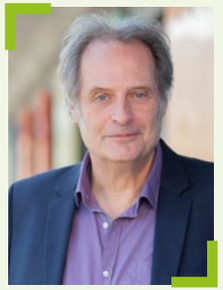

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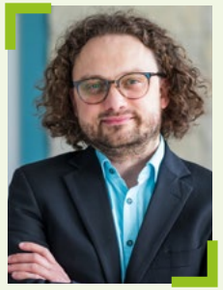

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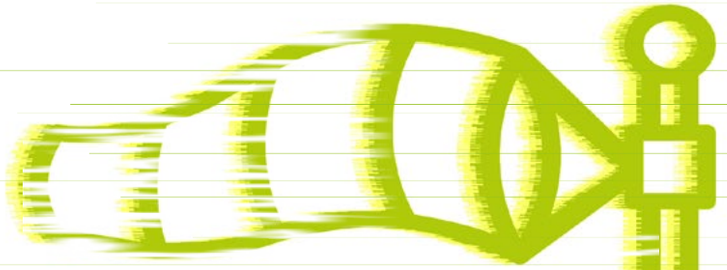
WIND SPEED 6



These are stormy times. And those who advocate for climate action are facing particularly strong headwinds right now – from those who deny that climate change is happening, but also from those who refuse to accept that investment is necessary here or who have no desire to give up habits that they have come to enjoy. At the Oeko-Institut, our experts stay on course even when the wind is strong and are not afraid of storms. They trust in the independence of their research, the integrity of their analyses and the reliability of their arguments. This also applies to the 10 projects that we showcase here as examples.

In the Energy and Climate Division, our researchers investigated how the renewables expansion can be accelerated with stakeholder involvement. They also looked at the heat transition and explored how increased acceptance of a grid-based heat supply and expansion of energy-efficient building management can be achieved. Climate change mitigation and the task of mobilising more support for relevant policy measures was a focus of the Environmental Law and Governance Division. The experts also analysed how many local residents near airports make use of legal options to claim reimbursement of expenditure on structural noise abatement. They were further involved in a joint project with researchers in the Nuclear Engineering and Facility Safety Division, in which they answered the question of when the search for a repository site for high-level radioactive waste is likely to be completed. Safe disposal of these waste streams was the focus of another project in this Division as well. The aim was to build a bridge between science and civil society and thus identify viable solutions.

Meanwhile, in the Sustainable Products and Material Flows Division, our experts explored the topic of the circular economy. They provided scientific support for the development of the National Circular Economy Strategy and supported the strategic process at political level. They also analysed how textile recycling can be improved and promoted by policy-makers. And together with colleagues from the Resources and Transport Division, they developed a climate tool which cultural institutions can use to identify their climate change mitigation potential and access information about relevant measures. This Division also showed that there is potential to rapidly close the emissions gap in the transport sector and that positive economic development is indeed possible in this context.

A CIRCULAR FUTURE

Less resource consumption, lower emissions, more security of supply – the circular economy offers many benefits. And it has a vital role to play if we want to stay within planetary boundaries. At the same time, the circular economy affects all sectors and requires technical solutions and reliable infrastructures, as well as economic incentives, adequate financing and public acceptance. The Federal Cabinet therefore adopted the National Circular Economy Strategy at the end of 2024. The Oeko-Institut provided expert support for its development in two projects: in accompanying scientific research, and in supporting the stakeholder process.

In the accompanying research, the researchers first prioritised fields of action by identifying sectors which have particularly high environmental impacts, such as buildings, vehicles and batteries, plastics, textiles, information and communication technologies, electronics and renewable energy systems. Cross-cutting issues such as public procurement and digitalisation were also integrated into a corresponding strategy. The project team then defined targets, indicators and instruments, both overarching and specific to the fields of action. They include accelerated investment in the circular economy, as well as economic instruments, promotion of repair, reuse and high-quality recycling, and the legal embedding of circularity in public procurement.

In the stakeholder process, the researchers acted in a supportive capacity in various formats – in round tables and dialogue workshops, in the online public consultation, and during the evaluation of statements by stakeholders from business, civil society and research and by the federal states.

PROJEKTTITEL:

Stakeholder project[A]:
Steering of the stakeholder process and support in the development and implementation of a national circular economy strategy
Accompanying research[B]:
Scientific support to the development of the National Circular Economy Strategy

CLIENT:

[A] German Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV)
[B] German Environment Agency (UBA)

PROJECT PARTNERS:

[A] Ifok GmbH, Wuppertal Institute
[B] Wuppertal Institute, Ecologic Institute, HafenCity University Hamburg, SystemIQ, Institute for Energy and Environmental Research (ifeu), Oekopol, Darmstadt University of Applied Sciences

TIMESCALE:

[A] February ´23 – December ´26
[B] February ´23 – November ´25

FURTHER INFORMATION:

www.kreislaufwirtschaft-deutschland.de (in German)

“Key factors for the transition to a circular economy are funding, support through labour market policy measures, and a positive vision for the future. The adoption of the National Circular Economy Strategy was a genuine feat of strength, and its implementation now requires strong political commitment.”
– Siddharth Prakash

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TRANSPARENT AND SOCIALLY JUST

Most people in Germany are still very worried about climate change and support climate action. When it comes to relevant policy measures, however, a more nuanced picture emerges: there is sometimes a lack of acceptance here. There are various reasons for this, including what are perceived to be restrictive changes in everyday life, as well as concerns about the resulting costs. A Policy Brief by the Oeko-Institut considers which politically influenceable factors have an impact on acceptance and provides practical recommendations for stakeholders involved in developing climate policy instruments.

In essence, policy-makers and administration have three points of leverage, starting with the development and combination of the measures themselves. Here, it is important to facilitate environment- and climate-friendly behaviour: for example, if car use is restricted or becomes more expensive, timely action is needed to make local public transport a more attractive option.

It is also crucial to ensure that the measures are socially just and that all demographic groups can benefit from low-carbon technologies and consumption options. For example, rising energy costs have an above-average impact on lower-income groups, who lack the financial resources to undertake energy upgrading of their homes or to replace the heating system, or are dependent on their landlords' decisions on these issues. Support schemes that are aligned with social justice principles are needed here.

A second point of leverage is the accompanying communication. Providing timely, clear and practical information about relevant aspects such as costs, savings potential and other benefits can help to secure support and lessen the impact of disinformation. The third entry point is the approach taken to develop and implement climate policy measures. This includes involving citizens and key social stakeholders appropriately in decision-making processes.

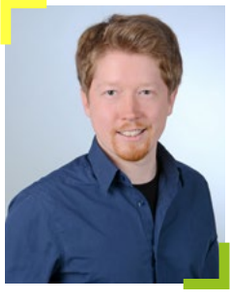
PROJECT TITLE:
Scientific Support Climate Monitoring, Climate Policy and Climate Sciences

CLIENT:
German Federal Ministry for Economic Affairs and Climate Action (BMWK)

TIMESCALE:
October 2021 – November 2024

FURTHER INFORMATION:
www.oeko.de/ar2024-acceptance-climate-policy

“Above all, when it comes to regulatory provisions and price-based instruments such as carbon pricing, their design, social support measures and communication must be considered in detail to ensure that they gain acceptance. We are looking at this in our new donation-funded project.“ – Dirk Arne Heyen



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OPEN-ENDED WITH A CLEAR GOAL

Establishing a repository for high-level radioactive waste is highly complex. Merely identifying a site involves a multitude of tasks. Can it be accomplished by 2031? Researchers at the Oeko-Institut analysed the workflows stipulated in Germany's Repository Site Selection Act (StandAG) and the associated time requirement. They show that based on current knowledge, the existing target date for identifying a site cannot be met; the search is unlikely to be completed until 2074.

According to the project team, the delay is partly due to the new procedure. All areas with crystalline rock, clay stone and salt formations will undergo open-ended evaluation, with a focus not only on the best possible safety, but also on extensive public participation. Furthermore, the search for a repository site is conducted in three phases that build on each other and involve multiple work steps, allowing for an evolving process – and this takes time. For example, decision-making should always be transparent, the implementation of process steps needs to be evaluated, and the current state of technology should be considered at every stage.

To complete the process within a realistic timeframe, what is needed, from the project team's perspective, is a shared vision for the site selection procedure among all the stakeholders involved in the process, as well as a joint communications strategy and mutual support. This would help to ensure that the numerous and sometimes conflicting requirements are dealt with as openly as possible, for the site selection procedure should not only be participatory and transparent, but also science-based, self-questioning and learning while leading in a timely manner to the goal.

Above all, the large number of potential siting regions will have a significant impact on the timescale due to the considerable effort involved in carrying out detailed exploration and assessment of each of these sites. The project team therefore recommends setting a maximum limit on numbers and only focusing on areas with sufficient potential.

PROJECT TITLE:
Support of BASE in the process analysis of the site selection procedure (PaSta)

CLIENT:
German Federal Office for the Safety of Nuclear Waste Management (BASE)

PROJECT PARTNER:
Becker Buettner Held (bbh)

TIMESCALE:
June 2020 – January 2021, March 2023 – February 2024

FURTHER INFORMATION
www.oeko.de/jb2024-pasta (in German)

"According to the Repository Site Selection Act, the selection process is to be self-questioning. We should see this as an opportunity. The fact is that mistakes and how they are handled can improve the outcome, and so can transparent discussions and continuous integration of findings from science and technology."
– Judith Krohn

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PEOPLE AND TECHNOLOGY

By 2045, our apartments, buildings and offices should be climate-neutral. This heat transition requires the right technology, as well as stakeholders who are willing to support it and drive it forward. For example, more acceptance of a grid-based heat supply – in other words, heating networks that are powered by waste heat or renewable energies – is required, along with far more energy-efficient building management. Technical innovations, appropriate policy frameworks and social and organisational measures are important here, according to a recent study.

Financing and organising participation processes is a key factor in increasing acceptance. The project team provides practical support for local authorities in this context: a manual shows how they can involve citizens in heat planning and delivery – for example, with the concept of the customer journey, which guides tenants and building owners step by step through the switch to a climate-neutral heat supply and thus helps to counter uncertainties.

In addition, new approaches may be useful in establishing energy management systems, especially in public institutions and small and medium-sized enterprises (SMEs). These systems make it possible to measure energy consumption and leverage savings potential. Together with stakeholder practitioners from sectors such as education and tourism, the researchers developed solutions and tested them during two heating periods. Various obstacles were identified, including lack of knowledge, lack of motivation and lack of resources, as well as technical challenges. They can be overcome by practical strategies, according to the project team: examples are financial support and external advice for SMEs, non-profit organisations and public institutions.

PROJECT TITLE:
Scientific Support Climate Monitoring, Climate Policy and Climate Sciences

CLIENT:
German Environment Agency (UBA)

PROJECT PARTNER:
Fraunhofer Institute for Solar Energy Systems (ISE)

TIMESCALE:
July 2021 – October 2024

FURTHER INFORMATION:
www.oeko.de/ar2024-energy-efficiency-improvement

“If the heat transition is to succeed, it needs more support from society. This can be achieved through participation and transparency on issues such as costs or heating products, but also through systematic learning: local authorities should share their experience and knowledge with other municipalities, for example.“ – Benjamin Koehler

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RAPID IMPACT

Can the emissions gap in the transport sector be closed fast? It is possible. There is scope to reduce Germany's emissions to 80-85 million tonnes CO_2 equivalents (Mt CO_{2e}) by 2030 – the current figure is above 145 Mt CO_{2e}. As the prerequisite, investment in transport and the associated tax system needs to be aligned with climate goals. Positive economic development would then be feasible as well, as a recent study shows. It presents two scenarios which describe the consequences of immediate action on the one hand and delayed action on the other.

In particular, electrification and the shift to public transport can accelerate the transport transition. They are supported by measures such as higher investment in low-carbon modes of transport, a sufficiently high CO_2 price and adjustments to the tax system. According to the study, vehicle tax payable for new car registrations should be based to a greater extent on CO_2 emissions, e.g. via a penalty system. In the experts' view, it would also make sense to introduce a mileage-based car toll in future to reduce mileage and offset falling revenues from the energy tax.

Immediate action would also allow for longer introduction phases for policy instruments, avoiding abrupt price rises in the transport sector. According to the economic analysis by INFRAS, both scenarios have positive effects on value creation and employment. A share of the revenue could also be used to ease the burden on vulnerable households. For higher earners can invest more easily in electric cars, while lower-income groups are generally more financially impacted by climate protection measures. Here, the Oeko-Institut recommends rapid development of strategies that support these groups' switch to low-carbon mobility.

PROJECT TITLE:
Getting the transport sector on track: Scenarios for greenhouse gas neutrality in 2045

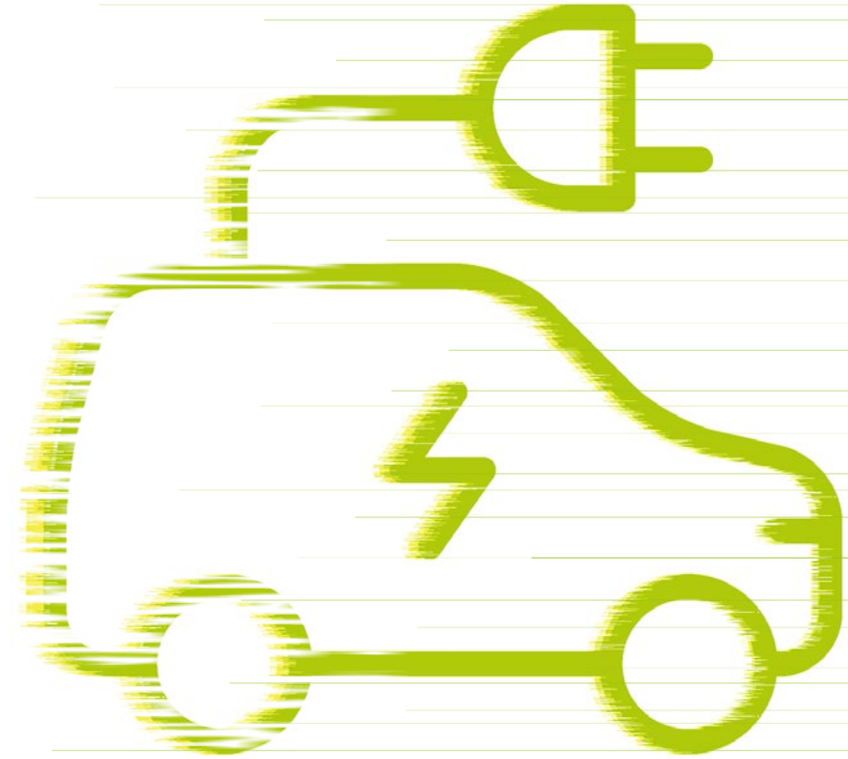
CLIENT:
German Environment Agency (UBA)

PROJECT PARTNER:
INFRAS

TIMESCALE:
January 2020 – December 2023

FURTHER INFORMATION:
www.oeko.de/jb2024-verkehrswende (in German)

"Unfortunately, the new Climate Change Act adopted in 2024 absolves the transport sector of specific responsibility and reduces the incentives to cut its emissions. Unless policy-makers take action here, we will have to spend billions, in double figures, on purchasing additional emission allowances until 2030." – Peter Kasten



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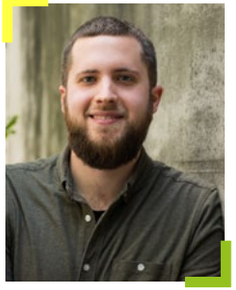

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CLIMATE ACTION TAKES CENTRE STAGE

How audiences travel to a concert and what kind of heating energy is used to ensure that they don't start to freeze in the middle of the second song have a major impact on cultural institutions' carbon footprint. A new climate tool shows exactly where they have potential for climate action and which measures they can apply to leverage it to best effect. The tool was developed by the Oeko-Institut and its project partners as part of the nationwide Culture4Climate initiative. It promotes more climate action in the cultural sector – through emissions reductions in all segments and by promoting sustainability on a broad scale through cultural practice.

With the climate tool, cultural institutions can easily and effectively identify potential for climate action in the fields of mobility, energy, food/catering and procurement of materials and resources; they can also access information about relevant measures. The tool, which is free of charge, not only shows where there is potential to make savings, but also how long their impact lasts, how much they cost and how much staffing input they require. Users can also compare selected measures and draw up an individual action plan – regardless of which cultural segment they come from.

The climate tool contains 18 potential measures in total, including energy upgrading and more eco-friendly heating practices, the adoption of guidelines on company vehicles, and introduction of multi-use systems. It also shows which instruments are particularly effective and disregards those with a low mitigation impact. Motivating key figures to take action is the goal, so guidance on implementation is provided as well. A crucial element of climate action in the cultural sector, from the project team's perspective, is embedding it in management and communications. The management level has a key role to play in setting clear goals and actively progressing relevant measures.

PROJECT TITLE:
Culture4Climate: Climate tool for cultural institutions

FUNDED BY:
German Federal Ministry for Economic Affairs and Climate Action (BMWK)

PROJECT PARTNERS:
Network for Sustainability in Art and Culture (2N2K), Kulturpolitische Gesellschaft e.V. (KuPoGe)

TIMESCALE:
November 2021 – October 2024

FURTHER INFORMATION:
www.culture4climate.de/klimatool (in German)

“Mobility and energy are the largest drivers of emissions in the cultural sector. So there is very high savings potential in the public’s travel behaviour, for example. And measures relating to food and catering can often be implemented at low cost with a short lead time.“ – Juergen Sutter

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SHUT THE WINDOW!?

Whether they live near Frankfurt Airport or Düsseldorf Airport, in the area surrounding civilian and military airports in Germany, local residents may apply to be reimbursed for structural noise protection – mainly installation of soundproof windows and insulation of roller shutter boxes or roofs. This is regulated under the German Act for Protection against Aircraft Noise and the Second Aircraft Noise Abatement Ordinance. They specify the conditions which must be met to be eligible for refunds. But how do these regulations work? And how many people actually make use of these opportunities?

The Oeko-Institut has investigated how many measures were implemented, and identified the resulting costs in order to facilitate more accurate assessment of whether the Act and the Ordinance are successfully mitigating noise impact through passive noise abatement. Provisions of planning approval decisions and voluntary programmes for structural noise abatement, which exist at some airports, were also considered.

With the exception of Frankfurt, no airport in Germany has achieved the projected figures for refunds relating to noise abatement measures, according to a key finding of the study. The number of applications and the costs were much lower than expected. Only in Frankfurt were applications for refunds submitted by around half of the dwellings that were entitled to claim for noise abatement, followed by Hamburg, which lagged behind on around 17%. A total of around 32 million euros was disbursed for structural noise abatement measures near civilian airports under the regulations; of this figure, around 26 million euros related to the expansion of Frankfurt Airport. According to the study, one of the main reasons for the low number of applications and approvals relates to the numerous exemptions confronting prospective claimants, such as the more comprehensive refunds granted under previous voluntary programmes, or soundproofing measures already being in place.

PROJECT TITLE:
Analysis of the state of implementation of the 2nd Aircraft Noise Abatement Ordinance

CLIENT:
German Environment Agency (UBA)

TIMESCALE:
April 2022 – January 2024

FURTHER INFORMATION:
www.oeko.de/ar2024-aircraft-noise-protection

“The German Act for Protection against Aircraft Noise is intended to protect local residents from aircraft noise by means of passive noise abatement, among other things. Due to the numerous exemptions in the Second Aircraft Noise Abatement Ordinance, however, passive noise abatement has not been rolled out across the board. This must be taken into account in the still pending review of the Act.”
– Silvia Schuette

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FROM JACKET TO TROUSERS

Millions of pairs of trousers, sweaters, T-shirts: in 2018 alone, the volume of used textiles collected in Germany was estimated at around one million tonnes, which corresponds to a collection rate of 64-74%. However, a substantial proportion is exported to countries outside the EU, where the textiles are landfilled or burned to generate energy. Only around 26% of used textiles was recycled, and recycled fibres are very rarely made into new garments. Why is there no closed loop? And how can textile recycling be promoted at the political level? Researchers at the Oeko-Institut are seeking answers to these questions.

The researchers investigated existing recycling technologies as well as their strengths and weaknesses. With a share of 65-87%, mechanical recycling clearly predominates. It has a lower environmental impact than other techniques, but reduces the quality of fibres. Thermochemical recycling techniques such as gasification break down the fibre structure completely, but their products are more likely to end up in the general chemical industry than in fibre manufacturing. Depolymerisation, in which the fibres are transformed back into their original components, is a promising solution. It requires far less energy, but is still under development. From the Oeko-Institut's perspective, it should be developed further as a matter of urgency as it enables fibres to be used again by the textile industry.

To ensure that more recycled fibres are woven into new textiles, stronger incentives are also needed for manufacturers, such as binding requirements for recycled content and recyclability of textile products. According to the study, manufacturers should also be obliged to take responsibility for the textiles they place on the market (extended producer responsibility). Legal provisions are also being discussed, e.g. under the EU Ecodesign Regulation and Waste Framework Directive.

PROJECT TITLE:
Textile recycling – status quo and current developments

CLIENT:
German Nature and Biodiversity Conservation Union (NABU)

TIMESCALE:
December 2023 – October 2024

FURTHER INFORMATION:
www.oeko.de/jb2024-textilrecycling-nabu (in German)

“Clear legal provisions, economic incentives and better technologies can greatly improve textile recycling, whose potential is not being utilised at present. The textile sector must move towards a closed-loop economy and lawmakers should set ambitious targets to help it along the way.“
– Clara Loew

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BUILDING BRIDGES

Geologists were involved, and so were radiation protection specialists. Workplace safety experts participated, along with social scientists. And not least: citizens played a key role in this transdisciplinary project. As part of research on the safe disposal of high-level radioactive waste, TRANSENS's objective was to build a bridge between science and society and thus identify viable solutions. The Oeko-Institut's researchers looked at how a repository will affect the potential site and its public image, and how this can be taken into account in decision-making processes.

The project team conducted interviews, held workshops and carried out surveys to find out how citizens feel connected to their region, what characterises this connection, and to what extent this influences their expectations of their involvement in planning infrastructure projects. One of the workshops also discussed a model, developed by TU Braunschweig, of the surface facilities at a repository that is embedded in the landscape in various ways. It became apparent that attitudes towards spatial modifications vary considerably. In rural regions where tourism or agricultural plays a major role, scepticism tends to prevail. In cities and high-density regions that are accustomed to more pronounced and continuous changes, people more often identify with their social relationships than with the landscape. Even so, for these people too, natural and cultural landscapes are still important.

The TRANSENS project aimed to generate knowledge on safety, justice and process-related issues together with practitioners. In this context, the Oeko-Institut's researchers also explored issues around interim storage and its extension, safety management and the design of transdisciplinary research.

PROJECT TITLE:
Transdisciplinary Research on High-Level Radioactive Waste Management in Germany (TRANSENS)

FUNDED BY:
Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV), Volkswagen Foundation, Lower Saxony Ministry for Science and Culture

PROJECT PARTNERS:
A total of 16 research institutes from Germany and Switzerland, and numerous practitioner and civil society partners

TIMESCALE:
October 2019 – March 2025

FURTHER INFORMATION:
www.transens.de
(in German)

"In the repository process, space-sensitive long-term governance creates flexibility and the capacity to act. This means that diverse perspectives are considered in policy decisions. Future developments can thus be anticipated at an early stage." – Dr Melanie Mbah

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FAIR AND RENEWABLE

Land is a valuable asset. We need it for housing and recreation, as well as for agriculture and an undisturbed natural environment. The expansion of solar and wind energy also relies on land – but it faces major challenges relating to land competition and regional impacts. How can the local level make a fair contribution here? And how can all stakeholders be integrated effectively into this process? These questions were explored by researchers in a transdisciplinary consortium.

In order to ensure that the expansion of renewable energies is as equitable as possible, it is essential to close the gap between the abstract national requirement for additional capacity and local realities. In the "Power" sub-project, the Oeko-Institut allocated national target amounts for wind and photovoltaics expansion on a regional basis. Regionalised electricity market scenarios were developed, which included expansion targets, the required reductions of CO_2, and the associated overall system costs.

The aim was to develop allocation mechanisms that take site-specific technical and economic issues into account while also ensuring that impacts are distributed fairly across regions. Recommendations for the expansion of capacity on a regional basis were produced, which were then illustrated and discussed with reference to a model region. Various conceptions of justice were applied in the allocation process, such as equitable distribution of regional impacts based on local electricity consumption, or population-based expansion to protect recreation areas. Simultaneously, the researchers discussed the results of the allocations with planning associations and identified regional scope for negotiation. From the researchers' perspective, however, a solution that is perfectly aligned with all the various interests does not exist. They therefore recommend consensus-based solutions, which involves identifying those sites that match several justice criteria and can thus be regarded as fair.

PROJECT TITLE:
EmPowerPlan: Regional planning of the energy transition – participation and justice on site and the big picture in mind

FUNDED BY:
German Federal Ministry for Economic Affairs and Climate Action (BMWK)

PROJECT PARTNERS:
Institute for Futures Studies and Technology Assessment (IZT), Reiner Lemoine Institute (RLI), team ewen

TIMESCALE:
August 2022 – January 2025

FURTHER INFORMATION:
www.oeko.de/ar2024-energy-transition-participation

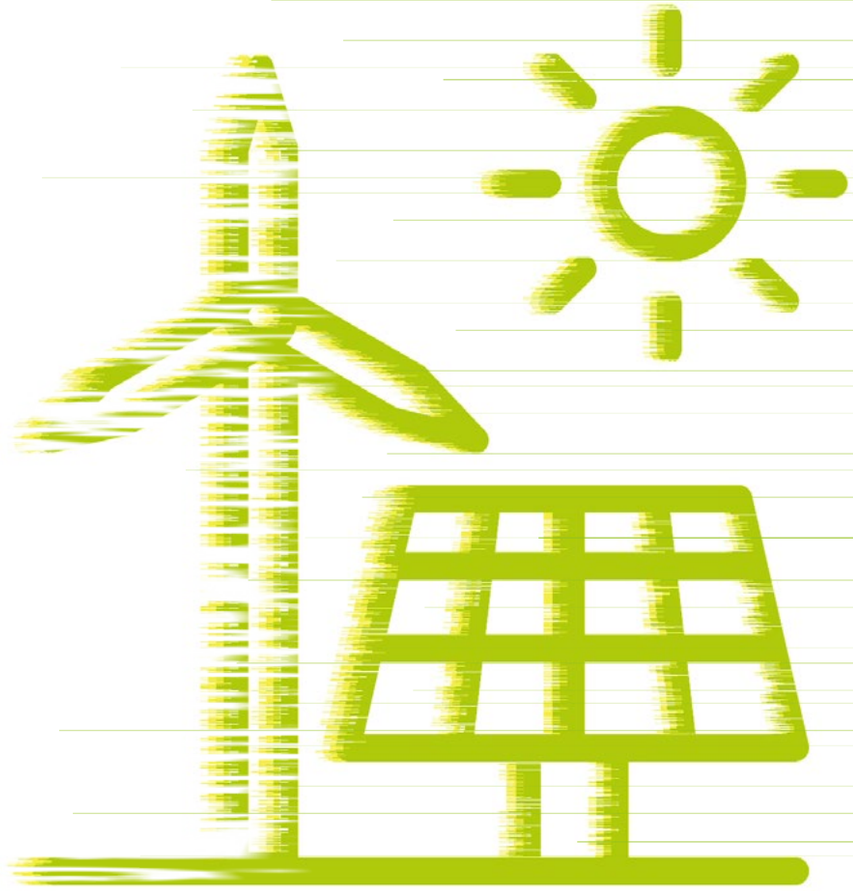
Responsibility for the content of this publication lies with the author.

Supported by:

Federal Ministry for Economic Affairs and Climate Action

on the basis of a decision by the German Bundestag

"All regions should, as far as possible, contribute equally to a just expansion of renewable energies. Consensus-based solutions help to ensure that the diversity of opinion is considered to the greatest possible extent. We therefore need to identify sites at local level that match various conceptions of justice." – Dr Marion Wingenbach



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FUNDERS AND CLIENTS IN 2024

1. Politics & government

- Austrian Agency for Health and Food Safety (AGES)
- Austrian Ministry for Climate Action (BMK)
- Baden-Württemberg Ministry of the Environment, Climate Protection and the Energy Sector
- Brandenburg Ministry of Agriculture, Environment and Climate Protection
- Bundesgesellschaft für Endlagerung (BGE, Germany's federal company for radioactive waste disposal)
- City of Munich
- Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ)
- District authorities of Alzey, Cuxhaven and Karlsruhe
- European Commission
- European Education and Culture Executive Agency (EACEA)
- European Environment Agency (EEA)
- European Union
- Food and Agriculture Organization of the United Nations (FAO)
- German Federal Agency for Nature Conservation (BfN)
- German Federal Environment Agency (UBA)
- German Federal Foreign Office
- German Federal Highway Research Institute (BASt)
- German Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR)
- German Federal Ministry for Economic Affairs and Climate Action (BMWK)
- German Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV)
- German Federal Ministry of Education and Research (BMBF)
- German Federal Ministry of Food and Agriculture (BMEL)
- German Federal Office for Radiation Protection (BfS)
- German Federal Office for the Safety of Nuclear Waste Management (BASE)
- German Federal Office of Administration (BVA)
- Gesellschaft für Anlagen- und Reaktorsicherheit gGmbH (GRS)
- Statistical Office of the European Union (Eurostat)
- Swiss Federal Office of Justice (FOJ)
- United Nations Office for Project Services (UNOPS)
- Zukunft Umwelt Gesellschaft gGmbH (ZUG, Germany's federally owned project management agency)

FUNDERS AND CLIENTS IN 2024

2. Private sector

- 50Hertz Transmission GmbH
- Abfallwirtschaftsgesellschaft des Neckar-Odenwald-Kreises mbH
- Apple Inc.
- Carbon Limits AS
- Currenta GmbH & Co. KG
- Deutsche Energie-Agentur (dena GmbH)
- Deutsche Sport Marketing GmbH (DSM)
- Duesenfeld GmbH
- EWS Vertriebs GmbH
- Ramboll Deutschland GmbH
- Ricardo Energy & Environment
- Würth Elektronik GmbH & Co. KG

3. Academia, stakeholder groups and civil society

- Agora Energiewende
- Carbon Market Watch (CMW)
- Eberswalde University for Sustainable Development
- European Climate Foundation (ECF)
- Foundation Development and Climate Alliance
- Fraunhofer-Gesellschaft
- Freiburg Archdiocese
- German Federal Environment Foundation (DBU)
- German Informatics Society (GI)
- German Olympic Sports Confederation (DOSB)
- Heinrich Böll Foundation
- Institut Feuerverzinken GmbH
- Institute for Resource Efficiency and Energy Strategies (IREES)
- Integrity Council for the Voluntary Carbon Market (ICVCM)
- Nürtingen-Geislingen University (NGU)
- Ökopol – Institute for Environmental Strategies
- Perspectives Climate Group GmbH
- Smart Energy for Europe Platform (SEEP) gGmbH
- Stiftung Zukunftserbe
- Swiss Federal Laboratories for Materials Science and Technology (Empa)
- Umwelthaus gGmbH

These are some of our funding providers and clients. A full list of references is available (in German) on our website
www.oeko.de/referenzen2024

CIRCULAR ECONOMY: WHAT'S NEXT?

In 2024, we restructured our Annual Meeting, previously held every two years, in order to create an event – the Oeko-Institut's new Science Forum – that offers our attendees flexibility in terms of location and timing. In three online forums and a half-day in-person session, we offered more than 400 stakeholders from politics, business, science and civil society diverse formats for knowledge-sharing and networking. The key topic of the events was "Circular Economy – What's Next?" In late September, we explored various aspects of the circular economy in online discussions. We organised the digital forum on circular economy solutions for plastics in cooperation with WWF Germany, on urban mining together with the Institute for Energy and Environmental Research (ifeu) in Heidelberg and K1-MET, and on a circular textile industry in collaboration with the Ellen MacArthur Foundation.

At the closing event at the dbb forum in Berlin on 5 November, the focus was on sharing positive visions for the future and on the frameworks needed to implement a circular economy. After a keynote by Dr Susanne Lottermoser from the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection, our experts Siddarth Prakash, Clara Loew and Dr Johannes Klinge provided an introduction to the topic. This was followed by two deep dives for more detailed discussion, focusing on the economic incentives for a circular economy and on acceptance and justice on the path towards an absolute reduction of resource consumption. As part of the process, we welcomed the adoption of the National Circular Economy Strategy on 4 December 2024, whose development benefited from scientific support from the Oeko-Institut.

THE OEKO-INSTITUT IN THE MEDIA

The "All change please!" podcast – knowledge to listen to

In 2024, we produced a total of **12 episodes of our "All change please!" podcast.** They include three special episodes with recordings from the online forums at the Science Forum and a special podcast on the electricity situation to mark the first anniversary of Germany's nuclear power plant closures.

In the podcast episodes, we generally chat to our researchers about the status quo and opportunities and challenges on the path towards more protection of the environment, climate and resources.

We cover a diverse range of topics, as the Top 3 most listened-to episodes show:

Mehr Tempo bei der Energiewende (14.3.2024) /
Speeding up the energy transition
Spezial: Genug Strom trotz Atomausstieg? (11.4.2024) /
Special: Enough power despite the nuclear phase-out?
Wie gewinnen wir die Gesellschaft für Klimapolitik? (28.11.2024) /
How do we gain society's support for climate policy?

In 2024, we also shared our research findings with specific targets groups via our other communication and social media channels.

- Our team sent out **42 press releases** oeko.de/en/news/press-releases
- published **29 news items and 51 blog articles** oeko.de/en/news
- shared **535 Instagram posts and stories** with 4,345 subscribers, reaching 35,116 (individual) profiles instagram.com/oekoinstitut
- published **206 posts via LinkedIn** for, currently, 9,887 followers and reached 4,888 subscribers via the LinkedIn Newsletter, achieving 177,073 impressions linkedin.com/company/oeko-institut-e.v.
- reached **747 followers via Bluesky** bsky.app/profile/oekoinstitut.bsky.social
- reached **438 followers on Mastodon** mastodon.social/@oekoinstitut
- posted **633 tweets and reached 18,271 followers,** achieving 156,248 impressions
- sent out **12 issues of the EcoMail Newsletter** oeko.de/en/newsletter/
- published **4 issues of our eco@work magazine** in online and analog versions on
- the following topics: "Not without trees – Natural carbon sinks for climate change mitigation", "A good balance? Voluntary climate action", "Urban Mining" and "The power of consumers" oeko.de/magazin

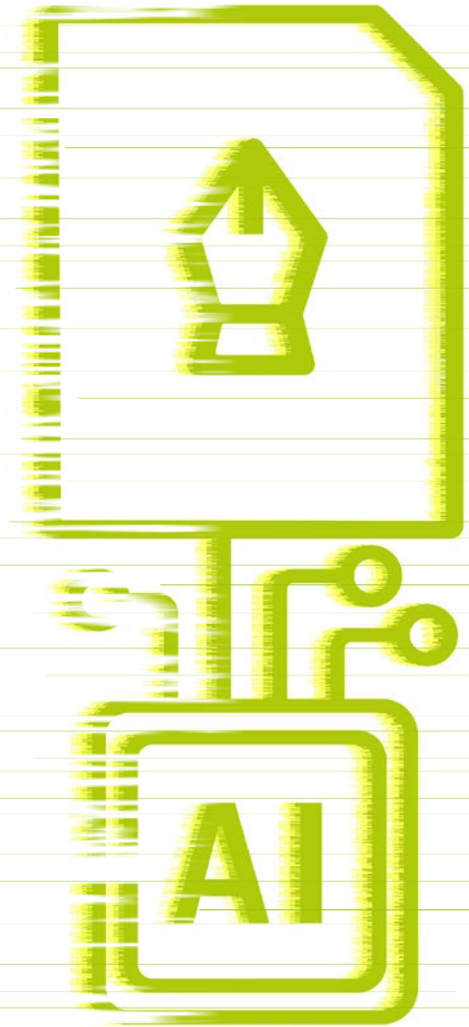
TOGETHER AGAINST THE HEADWINDS

Since 1977, the Oeko-Institut has been organised largely as a non-profit association with 2,000 members, including more than 20 local authorities. It relies mainly on third-party project funding, which we use on a project-specific basis. Every year, however, we also work on research ideas for which no external funding is forthcoming. This non-commissioned research is made possible thanks to our many donors and our members' subscriptions.

Results of the donation-funded project "AI-generated Content"

In our study "AI-generated Content – Fact or Fiction?", we investigated the risks and opportunities associated with AI-based large language models (LLMs) to find out how easy it is for users to access reliable information on environmental and climate-related issues. We tested four widely used AI models – ChatGPT 4o, Claude 3.5 Sonnet, Gemini Pro/Gemini Advanced and Phind-70B – to check their factual accuracy and source references in four selected topic areas: renewable energies and power grids; new nuclear reactor concepts; dietary habits; and carbon capture and storage (CCS). It was found that in the survey conducted in September and October 2024, factual accuracy had increased compared to the preliminary test in March. The quality of the answers is continuously improving and the language models continue to undergo dynamic development. However, the availability and quality of the source referencing vary between the models. The recommended approach is to input the query ("prompt") into several language models and then compare the answers and sources. Appropriate regulation is therefore especially important in this area, for without it, users lack a frame of reference for rating the supposedly trustworthy answers. Our policy recommendations for a regulatory framework conclude the donation-funded project and will be available on our website www.oeko.de.

www.oeko.de/blog/fakt-ist-sprachliche-unsicherheiten-der-kuenstlichen-intelligenz (in German)



TOGETHER AGAINST THE HEADWINDS

Current donation-funded project: "Components of motivating and socially just climate policy"
In our latest donation-funded project, we talk to citizens about their motivation and conceptions of fairness in relation to the energy transition and climate action in the light of growing concerns as to whether climate measures are fair and affordable. Without broad social support, the necessary transformation of our energy system and mobility cannot succeed. We are therefore investigating how to develop equitable policy instruments and devising a "fairness check" – an online tool which is intended to help policy-makers systematically consider the social impacts of their proposed measures. We will then summarise our findings specifically for ministries and public authorities. The project was launched in late 2024 and is due to present its findings at the end of 2025.

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