

ANNUAL REPORT OF THE OEKO-INSTITUT 2020

KNOWLEDGE **USING**
TO COPE **LEDGE**
WITH
RISIS

Using knowledge to cope with ...



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Crises can have serious consequences – for people, for the economy, for society. We are seeing that right now in the coronavirus pandemic, but risks are also posed by the climate crisis and other critical environmental situations. At the same time, however, there are numerous ways and means of mitigating crises

and tackling them together. Scientific knowhow, technical and social innovations, and the reform of outdated structures can all contribute to this, as can solidarity and commitment. We can use crises in order to learn from them and to create a better, more sustainable future for all.



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Overcoming crises together

Dear readers,

There was the euro crisis that began in 2010, the Fukushima nuclear disaster of 2011, the Ukraine crisis of 2014 and the refugee crisis that lasted from 2015 until 2019. The climate crisis became an increasingly urgent focus of attention, and then came the coronavirus crisis of 2020. It is as if the whole decade, and not just the past year, could be subsumed under the heading of "crisis".

And it is true that we are living at a time of major policy decisions that do not rise to the top of the political agenda until the situation becomes critical. Examples include the creation of preventive, supportive and corrective macroeconomic instruments at EU level in the wake of the euro crisis; the final phasing out of nuclear energy in Germany after the nuclear accident in Japan; widespread sealing off of the EU, agreements with transit countries and a stronger focus on the African continent in development cooperation as a result of the huge increase in the number of refugees; the paradigm shift towards a carbon-neutral economic system as a development objective in the light of the 1.5 °C report of the IPCC and the unprecedented mobilisation of schoolchildren and students under the banner of Fridays for Future.

In crises we stand at a crossroads. Whether the crisis is the peak before the collapse or the turning point that triggers transformation is up to us. Crises usually appear on the horizon before they strike. In the case of those that have been mentioned, it would have been possible to prevent the trend developing, to coun-

teract the critical escalation or to be better prepared. The indications were usually there in the science.

Today, too, there are signals for the future that we should heed. For example, science is warning us about the consequences of exceeding our planetary limits. With regard to biodiversity, the nitrogen and phosphorus cycles and climate change, we have already moved significantly beyond the safe zone. In each case we are at major risk of destabilising the Earth system. This destabilisation would trigger or exacerbate serious critical developments. There is as yet no sign of any moves to change the direction of the disastrous trends in biodiversity, nitrogen and phosphorus, but in relation to action on climate change there is an encouraging paradigm shift towards climate-neutral development. This must now be promptly and rigorously progressed. Every reduction in global warming by one-tenth of a degree counts – because it reduces the stress that we exert on the natural system, and in consequence on economic and social systems, and helps prevent further climate-induced crises in these systems.

From past crises and impending developments we can and must learn lessons for the future. Past events have shown us that science cannot take refuge behind the statement that it published its findings and warnings. The relevant information must also be actively communicated to policy-makers and the general public, in comprehensible form and via suitable channels. During the past year, we at the Oeko-Insti-

**IN CRISES WE STAND AT A CROSSROADS.
WHETHER THE CRISIS IS THE PEAK BEFORE THE
OR THE TURNING POINT THAT TRIGGERS TRANSFORMATION
IS UP TO US.**

tut have therefore concluded an internal project to promote more easily understood professional communication and we have expanded our social media channels.

The crises have taught us that policy-makers need courage to listen to the science, communicate uncomfortable truths and expose myths. In 2020 we shared some ideas on how this can be done – for example with the series in our blog on the scientific investigation of myths relating to the transition to sustainable transport. In our studies of the fuels and resources required for transformation of the energy and transport systems, too, we have repeatedly highlighted opportunities and limits, costs and necessary structural conditions – for example in relation to hydrogen use and car batteries. I found it surprising that media reports frequently mentioned the environmental impacts of resource extraction for car batteries but failed to balance this against the environmental damage caused by the alternative – that is, maintaining the status quo by continuing to extract fossil fuels – which, furthermore, often involves security risks.

The response of most of society during the coronavirus crisis has shown that communicating scientifically based policies to the general public is both possible and worthwhile. Even system capacity limits and the risks and dynamics of exponential trends that call for action when case numbers still appear vanishingly small and the crisis is barely noticeable are now an

automatically accepted part of common knowledge. This is encouraging, because this knowledge is also important for analysing and understanding ecosystems and environmental problems.

We have learned that bold, decisive strategies with a medium- and long-term horizon are needed if we are to emerge from crises stronger than before. These strategies must sit alongside the short-term action plans that often dominate in politics. In 2020, as part of the discussion about an economic stimulus package, we therefore analysed the stimulus measures that were taken in the wake of the financial and economic crisis of 2008/2009 and presented recommendations on actions that would enhance resilience and be economically effective, equitable and ecologically sustainable. With regard to tackling the climate crisis, too, we and our partners set out strategic ideas for a carbon-neutral Germany in 2050.

However, something else that the coronavirus has shown us is that when sweeping measures are put in place in order to achieve an objective, the side effects of these measures must also be considered and mitigated. Otherwise consent and compliance crumble and we run the risk of laying the foundations for another potentially critical development. With this in mind, we also focused in more detail on how measures to tackle the climate crisis – such as carbon pricing – can be designed on an equitable basis. The important question of how we can make the sustainability transformation equitable will also be a key issue at our annual conference in December 2021.

This annual report contains a sprinkling of quotations from great thinkers. I wonder what quotations will occur to you.

Let me know!

Warmest wishes,

Yours,
Jan Peter Schemmel
Chief Executive Officer
of the Oeko-Institut

Facts and figures for 2020

31
MEMBERS OF STAFF
are between
18 and 34 years old

32
MEMBERS OF STAFF
are between
35 and 39 years old

33
MEMBERS OF STAFF
are between
40 and 44 years old

Human resources

In 2020 the Oeko-Institut had more than 177 members of staff (excluding auxiliary personnel and interns) working for the sustainability-oriented transformation of our society.

In terms of gender distribution, in 2020 more posts at the Oeko-Institut were held by women (101) than by men (76). With regard to management functions the ratio is relatively balanced: 42% of management posts are held by women and 58% by men. Overall 25% of the workforce work full time, another 44% work part time of 75% or more and the remaining 31% work part time of less than 75%.

Eighty-seven months of parental leave were taken in 2020, 19 more than in 2019. Sixty of these months – two more than in 2019 – were taken by mothers, of

whom there were eleven, while seven fathers took 27 months' leave. This is 17 months more than the leave taken by fathers in 2019 and is sign of greater equality that we very much welcome.

In terms of the age structure at the institute, we are pleased that we bring together many experienced personnel and an equal number of young people: members of staff are distributed almost evenly across the different age groups.

In 2020 we continued to attach great importance to giving people a voice. Staff members have been involved in twelve staff meetings and three departmental meetings and have elected their four representatives to the Committee.

66%
OF WORKING DAYS
SPENT
working from home

A++
EFFICIENCY STANDARD
of the air conditioning
system in the server room

Office move and day-to-day work

In fitting out our new Berlin office in Pankow, using sustainable, regionally sourced products was a clear priority. For example, we procured compostable acoustic panels made from renewable mushroom mycelium, furniture made from recycled wood, tables and chairs consisting of 90% recycled plastic, linoleum with an excellent lifecycle assessment, energy-efficient LEDs, environmentally friendly paint, and an air-conditioning system in the server room that meets the A++ efficiency standard and uses a coolant with very low global warming potential.

Because of the coronavirus pandemic and to protect people's health, members of staff worked from home

for two-thirds of all working days between April and December 2020; this figure is the average across all sites.

The Oeko-Institut has for many years attached great importance to health and safety at work; this includes a focus on ergonomic workstations. In 2020 health management was restructured and it now includes "active breaks" – 15 minutes of exercises to keep us fit and mobile. Thirty-three such breaks were offered online via an online meeting programme between March and December 2020.

30
MEMBERS OF STAFF
are between
45 and 49 years old

24
MEMBERS OF STAFF
are between
50 and 54 years old

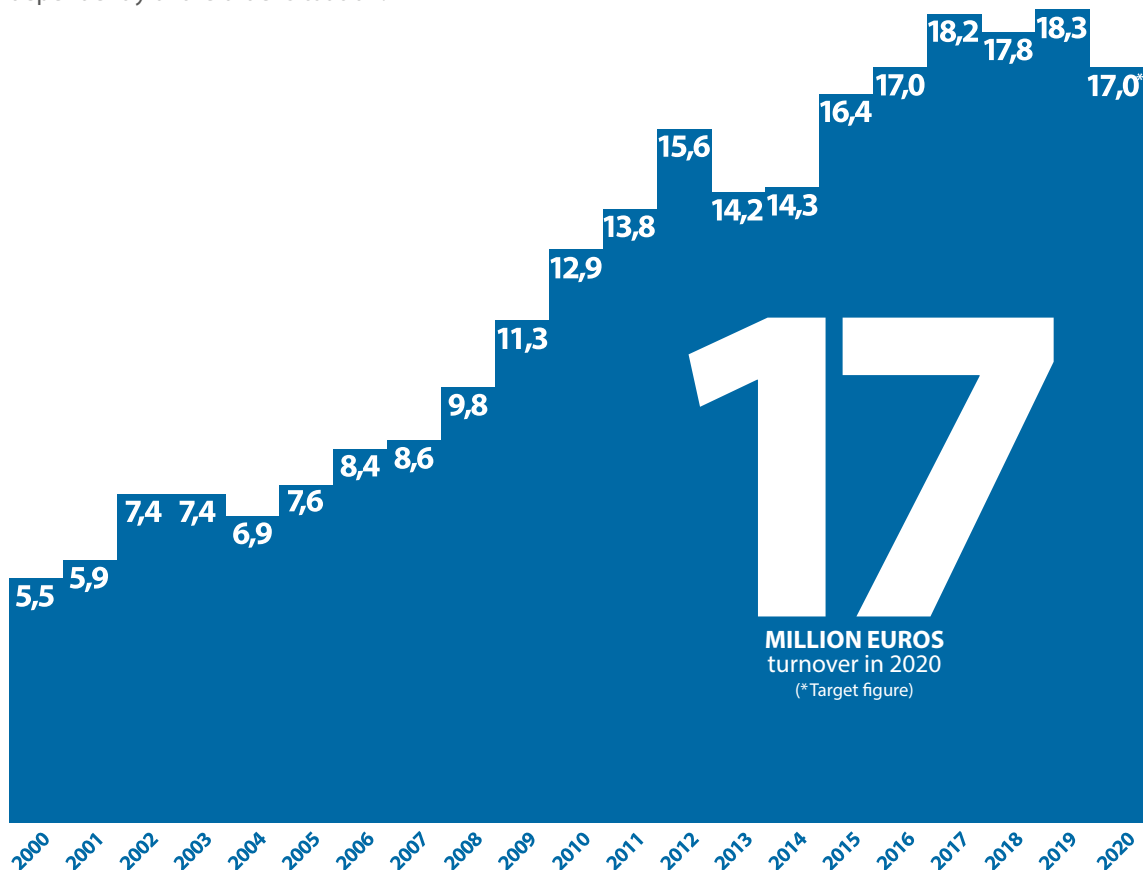
27
MEMBERS OF STAFF
are between
55 and 65 years old

101 | **76**
women | men

Projects and turnover

Last year the institute’s researchers worked on more than 400 projects. These were commissioned by policy-makers, the private sector and civil society. In addition, our researchers initiated projects that were funded by the institute itself. These projects enable important sustainability issues to be addressed independently of the order situation.

In 2020 the Oeko-Institut planned to work to a budget of more than 17 million euros. The actual amount is likely to be higher and will be published with the annual accounts at the forthcoming General Assembly.



Cohesion in a crisis

Stable leadership at the Oeko-Institut

While 2019 saw some staff changes at all management levels, 2020 was a year of stability. The executive board, the heads of the research divisions and those in charge of Central Services continued their work in their established positions. This enabled the institute to handle the coronavirus crisis well and to respond to external adversities by drawing on experience and acting calmly and consistently.

However, there were changes on the Committee: the General Assembly, which was held in Freiburg in June

2020 with appropriate hygiene rules in place, elected two new external Committee members. Sebastian Backhaus and Dr Susanne Dröge took over from Dr Regina Betz and Kathleen Spilok, who were warmly thanked for their long period of voluntary service. There was also a change among the internal Committee members as a new staff representative was elected. In June 2020 Dr Georg Mehlhart was succeeded by Inse Warich, who now represents the interests of our Darmstadt colleagues on the Committee.

Executive Board



JAN PETER SCHEMME

Sprecher der
Chief Executive Officer



ANKE HEROLD



SUSANNE FROSCHL

Committee

External members

Dorothea Michaelsen-Friedlieb
(First Chair of the Committee)
Ulrike Schell
(Second Chair of the Committee)
Sebastian Backhaus
Dr Susanne Dröge
Prof. Dr Gerald Kirchner
Thomas Rahner
Prof. Dr Volrad Wollny

Internal members

Dr Georg Mehlhart (until June 2020)
Inse Warich (from July 2020)
Dr Nele Kampffmeyer
Jan Peter Schemmel
Christof Timpe
Moritz Vogel

Hand in hand: Research Divisions and Central Services



Head of the
Energy & Climate Division
(Freiburg / Darmstadt)



Head of the
Energy & Climate Division
(Berlin)



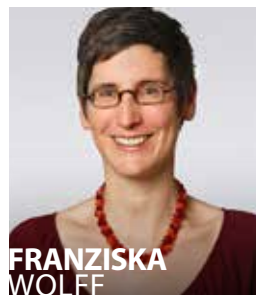
Head of the
Nuclear Engineering &
Facility Safety Division



Head of the
Resources & Transport
Division



Head of the
Sustainable Products &
Material Flows Division



Head of the
Environmental Law &
Governance Division



Head of the
Tenders & Contracts
Department



Head of the
Finance & Accounting
Department



Head of the
IT Department



Head of the
Public Relations &
Communications
Department

Crisis and more

Selected projects from 2020

In 2020 the Covid-19 pandemic – otherwise known as the coronavirus pandemic – seemed to be almost the only topic. It influenced work on the Oeko-Institut's projects, affecting both organisation and content. However, this is not the only crisis that our society must focus on: issues such as tackling the climate crisis also pose major challenges. On the following pages we describe ten projects as examples of the Oeko-Institut's work in 2020. They include projects that deal with critical events and other projects that pave the way for sustainable transformation of our society.

The coronavirus crisis was at the heart of an inter-divisional project: researchers produced proposals for a sustainable economic stimulus package and evaluated the stimulus package that was put in place by the German government during the pandemic. Tackling the climate crisis was the underlying issue in several projects. For example, the Energy & Climate Division looked at the form of the EU's new, more ambitious climate target, and with the Environmental Law & Governance Division it considered how the impact on tenants of carbon pricing of heating fuels can be restricted. The Resources & Transport Division and the Energy & Climate Division worked together

on an analysis of what a climate-neutral Germany might look like in 2050. To illustrate the activities of the Nuclear Engineering & Facility Safety Division, we describe Christian Küppers' work in the German Commission on Radiological Protection and its Emergency Advisory Board set up in 2009.

The Resources & Transport Division also explored the social and environmental challenges associated with the mining of lithium and graphite, which are needed for lithium-ion batteries. Researchers from the Environmental Law & Governance and Sustainable Products & Material Flows Divisions produced a manual for policy-makers and administrative bodies containing recommendations for action on sustainable transformation. The Sustainable Products & Material Flows Division worked on an analysis of the environmental impacts of milk production and the associated environmental costs. Harmful nitrogen surpluses and ways of limiting them were considered by the Energy & Climate Division with colleagues from the Environmental Law & Governance Division. The two divisions also worked together on a study of environmentally induced structural change and the sectors particularly affected by this.

THAT THE WAY I HAVE LEARNED
 SHORT OF PROGRESS IS NEITHER
 NOR EASY.
 MARIE CURIE

Post-crisis sustainability

A viable economic stimulus package

Tackling the coronavirus crisis involves huge tasks for people all over the world. In 2020 the German government produced an economic stimulus package to address the economic crisis. For the Oeko-Institut this was an important opportunity to call for future-oriented structural change. In a project funded partly by the Oeko-Institut itself and partly by the German Federal Environmental Foundation (DBU), the researchers produced proposals for a sustainable economic stimulus package and assessed the German government's own package of measures.

To prevent the economy lurching out of one crisis into another, stimulus packages must consider the need for sustainable structural reform. The stimulus packages in the wake of the financial and economic crisis of 2008/2009 largely failed to do this. The USA provided a rare positive example, giving decisive impetus to domestic manufacture of vehicle batteries and electric cars.

On the basis of lessons learned from previous stimulus programmes and the special features of the coronavirus crisis, the Oeko-Institut recommended measures in six different sectors – including transport, energy, buildings and digitalisation – that are designed not only to reinvigorate the economy but also to have a positive impact on the climate, social equity and future crisis resilience. Among the measures described in the analysis as particularly effective are a five-cent reduction in the Renewable Energy Act (EEG) levy on electricity, an innovation package for urban mobility, building refurbishment programmes and a support programme for small and medium-sized enterprises (SMEs).

“The longer and more expensive the crisis becomes, the more important it is to use the funds sustainably and in a forward-looking way. That is essential if we are to create an economic basis that enables us to reduce the level of debt again, mitigate or prevent other crises – especially environmentally induced ones – and hence reduce the future burden on our young people.”

Jan Peter Schemmel

As soon as the actual stimulus package was published, the Oeko-Institut evaluated it from the sustainability perspective. It found that adequate, targeted support for SMEs is missing from the package, as is the linking of measures to environmental and climate change mitigation criteria. Areas of crucial importance for the future, such as the circular economy and more sustainable agriculture, are not addressed at all. In addition, the extent to which the stimulus package is actually sustainable depends largely on how it is implemented in practice. Boldness, innovation and a focus on the medium- and long-term future are essential if we are to emerge strengthened from the continuing crisis.

Project profile

Project title: Ideas on a sustainable economic stimulus package in the context of the Covid-19 pandemic

Financing: Self-funding and funds from the German Federal Environmental Foundation (DBU)

Timescale: April 2020 – June 2020

Further information:

oeko.de/jb2020-dbu

DON'T BE AFRAID.
BE FOCUSED.
BE DETERMINED.
BE HOPEFUL.
BE EMPOWERED.
MICHELLE OBAMA



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Close to zero

Climate-neutral Germany

Can Germany be climate-neutral by 2050? Reaching this target is feasible: a study for Agora Energiewende, Agora Verkehrswende and Stiftung Klimaneutralität shows that Germany can respond effectively to the climate crisis and achieve a 65 per cent reduction in its greenhouse gas emissions by 2030 – 10 per cent more than currently specified in the Federal Climate Change Act (Bundes-Klimaschutzgesetz). The study models various scenarios to show what this might look like in practice in the energy sector, industry and agriculture, buildings and transport. Developments in land use, land-use change and forestry (LULUCF) and the waste sector are also considered.

Germany can eliminate greenhouse gas emissions completely or almost completely in almost all sectors by 2050. Residual emissions will continue to be produced, mainly in agriculture, but can be

offset by the capture of CO₂ from the atmosphere and its subsequent storage.

The study, conducted together with Prognos and the Wuppertal Institute, shows that emissions reductions will mainly come from action in the ener-

gy sector – through more rapid phasing out of coal and faster expansion of renewable energy generation – and from accelerated transformation in industry.

There is reduction potential in the transport sector as well. The scenario assumes that there will be a clear shift to public transport, walking and cycling. Car-pooling will increase capacity utilisation of private vehicles. Overall, car traffic will decrease by 40 per cent by 2050, accompanied by rapid electrification of private cars and road freight transport. As a result, new internal combustion vehicles will be banned from 2035.

In agriculture, improved nitrogen efficiency in fertiliser use, reduction of livestock and technical measures such as increased fermentation of farm manure will result in lower emissions. Changes in demand for animal products will free up land for the restoration of wetlands that are currently in agricultural use, protecting carbon sinks.

Project profile

Project title: Towards a climate-neutral Germany

Commissioned by: Agora Energiewende, Agora Verkehrswende, Stiftung Klimaneutralität

Project partners: Prognos, Wuppertal Institute for Climate, Environment and Energy

Timescale: Jan. 2020 – Oct. 2020

Further information:

oeko.de/jb2020-klimaneutral

WE CANNOT DIRECT
THE WIND, BUT
WE CAN ADJUST
THE SAILS

ARISTOTLE



**DR WIEBKE
ZIMMER**

Deputy Head of the
Resources & Transport
Division

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“In the study, the Oeko-Institut focused on agriculture, LULUCF and transport. This latter sector can also achieve climate neutrality by 2050, with potential to cut emissions by 74 million tonnes of CO₂e by 2030 compared with 2019. Among other things, that will require us to have 14 million electric cars on German roads within two decades.”

Dr Wiebke Zimmer

A nitrogen law

Protecting the basis of life

Nitrogen surpluses can destroy the natural basis of life: they may suppress plants and animals that have adapted to nutrient-poor conditions. They can also have harmful impacts on soil, groundwater and surface waters and affect air quality and the climate. Nitrogen inputs must therefore be reduced to a level with which the environment can cope. In a study for the state government of Baden-Württemberg the Oeko-Institut recommends a national nitrogen law establishing uniform rules and regulations.

This nitrogen law should require public authorities and government departments at federal and state level to set binding targets for the nitrogen emissions of agriculture, transport and industry and monitor achievement of these targets. Working with the Research Institute of Organic Agriculture (FiBL), the researchers also came up with ideas for other legal instruments and measures that can be used to prevent nitrogen emissions. The study focuses on emissions of ammonia – which contains nitrogen – into the air, because ammonia accounts for almost half of agricultural nitrogen emissions, has particularly high consequential costs for society in terms of health problems and physical and environmental damage and is at present inadequately regulated.

Two-thirds of nitrogen emissions in Germany come from agriculture – from mineral fertilisers as well as from manure and slurry. The Oeko-Institut therefore

recommends reducing the use of manure in agriculture. This means both taking technical steps that can be implemented quickly and – importantly – engaging in long-term actions. For example, the study suggests that mineral fertilisers could be made more expensive by means of a tax on the nitrogen surplus. The experts are also of the view that the statutory upper limit for agricultural nitrogen emissions must be significantly reduced and differentiated according to farm type; corresponding amendments to the Substance Flow Balance Ordinance (StoffBilV) should be addressed.

Project profile

Project title: Instruments and measures to reduce nitrogen surpluses

Client: The Baden-Württemberg state government

Project partners: Research Institute of Organic Agriculture (FiBL)

Timescale: January 2018 – July 2020

Further information:
oeko.de/jb2020-stickstoff

**ACTION IS THE
ANTIDOTE TO
DESPAIR.**
JOAN BAEZ

“We can all do something to protect our livelihood base from dangerous nitrogen surpluses – for example, by looking at the large proportion of animal-based foods in our diet. This is of course a matter for farmers and abattoirs, dairies and the food trade. But also for us consumers.”

Andreas Hermann



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55 per cent by 2030

A more ambitious response to the climate crisis

The message since late 2020 has been clear: the EU is setting itself a more ambitious climate target in order to increase the effectiveness of its response to the climate crisis. It now aims to reduce its harmful greenhouse gas emissions to at least 55 per cent below 1990 levels by 2030, instead of the previous target of 40 per cent. The EU aims to be climate-neutral by 2050. The Oeko-Institut is involved in a wide range of projects which demonstrate how this can be achieved. Its researchers have also produced a policy paper showing that the levels of emission reductions that actually have to be achieved by 2030 will largely depend on precisely what is covered by the new climate target.

target, other sectors will have to achieve additional emissions reductions of a corresponding amount so that the overall target can be reached.

In their study, commissioned by the Environmental Defense Fund, the researchers also show, for example, that with the inclusion of the land-use sector, which is not yet covered by the EU climate target, other sectors could emit an additional 110 million tonnes CO₂e to 2030 – equivalent to roughly two per cent of European greenhouse gas emissions in 1990. The reason is that the quantity of emissions to which the target relates would then be reduced and the relative share of sinks, which capture and store CO₂ from the atmosphere, would increase. The project team is therefore calling for separate targets and incentives for the land-use sector in order to avoid watering down the climate target.

The climate architecture – in other words, the policy measures adopted to achieve climate goals – must now be adapted to the new climate target. The Oeko-Institut therefore recommends continuing to set annual emissions budgets and defining clear emission reduction requirements for all sectors.



For example, one factor determining the scale of emissions reductions is whether and how international aviation, shipping and the land-use sector are included in the new target. Shipping and aviation in particular have seen a significant increase in their emissions since 1990. This means that if they are included in the climate

Project profile

Project title: Wanted: A new climate target for the EU. An analysis of key choices for the ambition and scope of a 2030 target

Commissioned by: Environmental Defense Fund

Timescale: December 2020

Further information:
oeko.de/jb2020-eu-klimaschutz



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“We welcome the EU’s new, more ambitious climate target. It is also a signal to other countries to engage fully in tackling the climate crisis, to take faster and more comprehensive action to protect the climate and to review their own mitigation targets. We need to set a course towards a climate-neutral economy today – that is an important step.”

Sabine Gores

Raw materials for the future

Preventing new environmental and social crises

The transition to sustainable transport inevitably involves electromobility – yet that, too, poses challenges. For example, mining of the lithium and graphite needed for lithium-ion batteries can have damaging impacts on humans and the environment. However, responsible production and high sustainability standards can minimise environmental and social risks in the supply countries. In a study funded by the German Ministry of Education and Research, the Oeko-Institut has outlined the challenges associated with graphite production and lithium mining.

These days graphite comes mainly from China. It can either be mined as natural graphite or produced synthetically – in both cases with potentially serious impacts on the environment and human health. For example, the extraction of natural graphite produces large quantities of dust that can lead to breathing difficulties and reduced lung function in those who come into contact with it. In addition, improper cleaning of graphite with inorganic acids can cause environmental damage. On the other hand, the manufacture of synthetic graphite uses a vast amount of energy, because very high temperatures are needed for the synthesis process.

About one-third of world lithium production comes from salt lake brines in countries such as Chile and Argentina. A key challenge here is the shortage of water in the extraction areas. This may be exacerbated by the extraction process, which involves pumping the lithium brine from underground aquifers to the surface and then concentrating it by means of evaporation. However, the majority of the lithium used worldwide

– around two-thirds of it – comes from Australia, where it is extracted from solid rock. Problems here include the storage in large settlement basins of the residues left when the mineral spodumene that contains the lithium has been processed. Strict safety protocols are needed to ensure that humans and the environment are adequately protected from the release of harmful substances.

Project profile

Project title: Environmental and socio-economic challenges in battery supply chains: graphite and lithium

Funding: German Ministry of Education and Research (as part of the Fab4Lib joint research project)

Timescale: Jan. 2018 – July 2020

Further information:

oeko.de/jb2020-lithium-graphit



“An increase in electromobility will also increase demand for raw materials such as lithium, graphite and cobalt. In past studies we have shown that this demand can be met now and in the future – through additional extraction and through increased recycling of the raw materials.”

Peter Dolega



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The true cost of milk

Hidden costs in agriculture

What does a litre of milk cost? There might seem to be a simple answer to this question, but the reality is more complex. This is because the costs of milk production include not only the amounts that the farmer pays for things such as feed and wages but also the hidden environmental costs – the costs that arise, for example, from greenhouse gas emissions or soil acidification. Working with Infrac and KTBL e.V., the Oeko-Institut has analysed the environmental impacts of milk production and the associated costs.

The results show that in environmental terms organic milk production is superior to conventional production in almost all respects – emissions from feed provision are particularly relevant here. With regard to the economic costs that arise from the environmental impacts of milk production, milk production with access to grazing turns out to have a distinct advantage. The environmental costs attributable to it are up to 24 per cent less than the costs without access to grazing; that is equivalent to up to 6.6 cents per kilo of raw milk. The comparison of the different farming methods and the associated environmental costs shows that, with one exception, organic farming is superior to the conventional approach. The environmental costs of organic milk production are up to 19 per cent less than the corresponding costs of conventional production; that equates to up to five cents per kilo of raw milk. The lowest environmental costs are associated with organic farming methods with access to pasture. Here the environmental costs are up to 24 per cent lower than the costs of the other farming systems.

ALL THE GREAT THINGS
THAT HAVE HAPPENED
IN THE WORLD
HAPPENED FIRST IN
SOMEONE'S IMAGINATION.
ASTRID LINDGREN

On behalf of the German Environment Agency (UBA), the researchers compared different milk

production models – with and without access to grazing, conventional and organic. They calculated not only the environmental footprint of the different production systems but also the environmental costs. They analysed the environmental impacts of the various processes up to the farm gate, including livestock management, the provision of feed and the storage and spreading of farm manure.

Project profile

Project title: Visualisation of hidden environmental costs of agriculture under consideration of different production systems

Client: German Federal Environment Agency

Project partners: INFRAS (Zurich), German Association for Technology and Structures in Agriculture (KTBL e.V.)

Timescale: Jan. 2018 – Dec. 2020

Further information:

oeko.de/jb2020-ernaehrung



**DR JENNY
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“The environmental costs included in the calculation are a low estimate of the damage costs. Some of the (environmental) impacts – such as the ecotoxicological impacts of pesticide use – cannot currently be monetised. The advantage of production systems that manage largely without pesticide inputs cannot be fully depicted by calculating external environmental costs.”

Dr Jenny Teufel

Time for change

Structural change to combat the crisis

Because of the need to protect the climate and the environment, enterprises that do not adapt their outdated business models sufficiently quickly may find themselves in economic difficulties. This applies, for example, to car manufacturers who adhere to the obsolescent model of the combustion engine for too long. Their challenging situation was exacerbated in 2020 by the Covid-19 pandemic, the effects of which included falling sales figures. It is clear that many sectors cannot avoid radical structural change if they want to survive. But if they adopt a forward-looking approach, they will find that the necessary transformation of production and consumption methods also offers economic opportunities. This is one of the findings of an analysis for the German Environment Agency conducted by the Oeko-Institut and Fraunhofer ISI.

The study started by identifying sectors in which long-term environmental objectives or megatrends make change unavoidable. Particular challenges are faced by high-emission and resource-intensive sectors such as vehicle manufacturing, energy, agriculture, and the chemical and pharmaceutical industries. In the automobile industry the pressure to change arises mainly in relation to the product, with attendant impacts on the supply chain, while in other sectors it applies more to resource use or production-related emissions.

The project team also drew up recommendations for action by policy-makers and industrialists to make structural change successful – both generally and specifically in the automobile and chemical industries. Fundamental here is a prompt, proactive and participatory approach that also considers interaction between sectors. In addition, environmentally

“In the face of tighter climate targets, burying your head in the sand and waiting is the worst solution for emission-intensive sectors. For both companies and workers, prompt action and long-term strategies increase the likelihood of transitioning successfully to climate-friendly technologies, business activities and areas of employment.”

Dirk Arne Heyen

friendly structural change must be based on an ambitious environmental policy that sets out clear medium- and long-term targets and thus provides planning and investment security. This needs to be combined with targeted support for businesses, employees and location regions in connection with issues such as sustainable innovation and investment. The example of the automotive industry also highlights the importance of further training for workers to prepare them for new fields of activity that arise as part of the transition to electromobility.

**HARD TIMES
BUILD DETERMINATION
AND
INNER STRENGTH.**
DALAI LAMA

Project profile

Project title:

Strategies for ecological structural change towards a green economy

Client: German

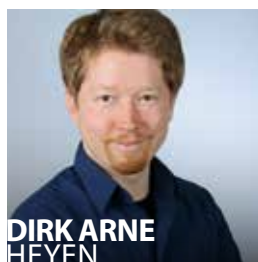
Federal Environment Agency

Project partners: Fraunhofer Institute for Systems and Innovation Research ISI

Timescale: Jan. 2018 – Nov. 2020

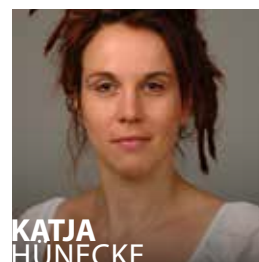
Further information:

oeko.de/jb2020-strukturwandel



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A fair share

Passing on the costs of carbon pricing

I
THAT
THE
BUT

**I LEARNED
THAT COURAGE WAS NOT
THE ABSENCE OF FEAR,
BUT THE TRIUMPH
OVER IT.**

NELSON MANDELA

**In order to in-
centivise the
reduction of
climate-dam-**

aging emissions from buildings and transport, Germany has introduced carbon pricing for fuel emissions from these sectors from 2021. It is essential, however, to build in safeguards against the social hardship that carbon pricing can cause. In rental properties, landlords generally pass on the full costs of heating to their tenants.

However, tenants have no say in the type of heating used in the building or its energy performance, which means that there is no adequate incentive to reduce emissions. In light of this situation, action is needed to prevent the full costs resulting from carbon pricing from being passed on to tenants. In a study for the Federal Environment Ministry, the Oeko-Institut looked at the various options available in law and considered the financial implications for sample households.

There is scope in both constitutional and European law to cap the costs resulting from carbon pricing; in terms of the legal technicalities, too, this would be a viable option that is relatively straightforward to implement, as the short study, conducted in collaboration with Professor Stefan Klinski, shows. Ideally, this should be regulated in the Heating Cost Ordinance (Heizkostenverordnung).

For all the sample households that use heating oil, a 50 per cent cap on the proportion of the carbon price that may be passed on to tenants would result in minimal additional costs to 2025. This is because the decrease in the renewables surcharge, which comes into effect in 2021, offsets these costs. Households using gas-fired heating would actually make savings. However, if carbon prices increase substantially from 2026 onwards, the financial burden on private households would increase as well, unless the renewables surcharge is further reduced or other compensation mechanisms are introduced.

Until 2026, the steering effect of landlords bearing a share of the minimal carbon costs would be too low to incentivise extensive investment in renovation of buildings and installation of new heating systems: with the cap, the additional annual costs per housing unit for landlords would only amount to around 100 euros for heating oil and 70 euros for gas. The steering effect, according to the study, can therefore be expected only when carbon prices rise and are combined with other climate protection mechanisms.

Project profile

Studientitel: Restricting the opportunities to pass on the costs of fuel emissions trading to tenants

Commissioned by: German Environment Ministry BMU

Project partners: Professor Stefan Klinski (Berlin School of Economics and Law)

Timescale: Nov. 2019 – July 2020

Further information:

oeko.de/jb2020-co2preis

“Unless the reduction in the renewables surcharge is factored in, carbon pricing will, of course, create additional costs for the sample households in our study. Depending on the type of household, these costs would amount to between 136 and 253 euros per year to 2025 for heating oil. However, this figure could be halved by capping the costs that can be passed on to tenants.”

Dr Sibylle Braungardt



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Preparing for the worst

The SSK's Emergency Advisory Board

The German Commission on Radiological Protection (SSK) has been sharing its expertise in the field of radiation protection since 1974. Its seven committees deal with topics such as radiological protection in medicine and in nuclear installations, and emergency management. Physicist Christian Küppers, Deputy Head of the Nuclear Engineering & Facility Safety Division at the Oeko-Institut, has been a member of the SSK almost continuously since 1998 and currently chairs its Committee on Applied Radiation Protection and Radiological Protection in Nuclear Installations. He is also a member of the SSK's Emergency Advisory Board, which was set up in 2009. The Board represents the SSK in critical events and incidents and participates in exercises in preparation for such contingencies.

Initially attached to the Federal Ministry of the Interior, the SSK – following the transfer of responsibility in 1986 – now advises the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) on a range of issues: from radiation protection in the workplace to the effects of electromagnetic fields. It also deals with questions such as whether masks should form part of the emergency response and which medical capacities are required to provide care for the public following a reactor accident, for example. This type of issue must be resolved during contingency planning; in other words, before an accident occurs. Similar questions have frequently been discussed in the context of the Covid-19 pandemic as well.

Since it was set up, the SSK's Emergency Advisory Board has only been deployed once in response to a real-life accident: after the Fukushima reactor disaster. In this instance, the Board advised the Federal Environment

“Germany is well-prepared for nuclear emergencies; this was demonstrated most recently when an incident occurred at the Olkiluoto nuclear power plant in Finland in late December 2020. The relevant agencies were informed very quickly through the agreed channels. Had it been necessary, the SSK's Emergency Advisory Board would have been able, at short notice, to propose measures to protect the civilian population in Germany.” Christian Küppers

WHEN WRITTEN IN CHINESE,
THE WORD “CRISIS” IS
COMPOSED OF TWO CHARACTERS.
ONE REPRESENTS DANGER
AND THE OTHER REPRESENTS
OPPORTUNITY.
JOHN F. KENNEDY

Ministry on issues such as the appropriate response by staff at the German Embassy in Tokyo and the handling of freight arriving in Germany from Japan.

The Emergency Advisory Board regularly participates in contingency planning exercises in order to ensure that it is fully prepared to deal with nuclear crises and is able to provide appropriate advice to the Federal Environment Ministry during emergencies, e.g. on whether it is necessary to prohibit the harvesting of crops or to conduct evacuations from affected regions. The exercises themselves focus on scenarios such as major accidents at nuclear power plants or terrorist threats/attacks involving radioactive material.

Project profile

Organisation: German Commission on Radiological Protection (SSK)

Appointed by: Federal Environment Ministry BMU

Timescale: 1998 – 2022 (end of current term)

Further information:
www.ssk.de



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Trafo 3.0

A manual for change

Society is constantly changing. Often because it has no choice. Crises lead to unavoidable upheavals – as is demonstrated both by climate change and by the Covid-19 pandemic. Such changes can and should be

**CRISES CONSTANTLY
GIVE RISE TO
NEW STRENGTHS.**
RITA SÜSSMUTH

shaped in a sustainable manner, so that they are future-proof. Other changes need to be actively initiated in order to drive social and environmental transformation. In the Trafo 3.0 project the Oeko-Institut has explored how this can work in the fields of digitalisation, nutrition and transport. A comprehensive manual now summarises the project's findings for policy-makers and government officials.

The first part of the manual, which was funded by the Federal Ministry of Education and Research, focuses on societal transformation processes and identifies the factors that hinder or promote radical change. The second part deals with the roles that various stakeholders can play in the transformation. The third and final part describes various ways in which policy-makers, public administrators and civil society actors can

initiate and shape change processes. It explains the different steps and illustrates them with practical examples.

For example, the project team recommends delimiting the field in which the change is to occur, analysing it systemically and identifying relevant stakeholders in the change process. As another important step, the general public should be involved in drawing up attractive visions and targets for the future – such as living in a city without the noise and exhaust fumes of combustion engines. Another approach involves identifying trends in society that can impact on sustainability and can then be utilised for one's own change processes. Promoting experiments and social innovations and networking with pioneers of change also makes forward-looking change processes possible.

Project profile

Project title: TTrafo 3.0: Developing a model for socio-ecological transformation processes in practice: Development and trial in three fields of application

Funding: German Ministry of Education and Research

Project partners: Four project partners and twenty practical stakeholders

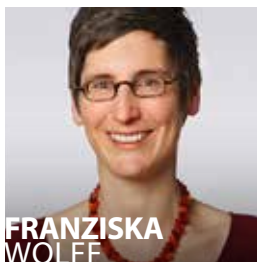
Funding period: April 2015 – Sep. 2018

Editorial revision of the manual:

June 2020 – Dec. 2020

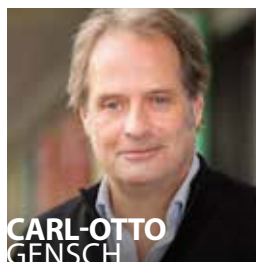
Further information:

<http://trafo-3-0.de>



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“For transformation processes to succeed, it is important for us to be constantly aware that we cannot predict them in detail or plan and manage them completely. But we can influence and encourage them. It is also important that the phasing out of non-sustainable technologies is planned well in advance and communicated across society.” Carl-Otto Gensch

The Oeko-Institut's clients

1. Politics & government

- Baden-Württemberg Ministry of the Environment, Climate and Energy
- Bavarian Environment Agency (LfU)
- Berlin Senate
- Brandenburg Ministry of Rural Development, Environment and Agriculture
- Bundesgesellschaft für Endlagerung mbH (BGE)
- City of Hamburg
- Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ)
- Deutscher Bundestag
- Emsland District Authority
- European Commission
- European Environment Agency (EEA)
- European Parliament
- German Agency for Nature Conservation (BfN)
- German 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 Office for Radiation Protection (BfS)
- Gesellschaft für Anlagen- und Reaktorsicherheit gGmbH (GRS)
- Hessen State Energy Agency
- Karlsruhe District Authority
- Kreditanstalt für Wiederaufbau (KfW)
- Neckar-Odenwald District Waste Management Company (AWN)
- Rhineland-Palatinate Ministry of Environment, Energy, Food and Forestry
- Statistical Office of the European Union (Eurostat)
- The Finnish Innovation Fund Sitra

2. Industry

- Bader GmbH & Co. KG
- BASF SE Ludwigshafen
- Daimler AG
- Deutsche Amphibolin Werke (DAW SE)
- EWS Vertriebs GmbH
- Flughafen Stuttgart GmbH
- Jokey SE
- Krombacher GmbH & Co. KG
- Miele & Cie. KG
- MVV Umwelt Ressourcen GmbH

- Netze BW GmbH
- Rügenwalder Mühle Carl Müller GmbH & Co. KG
- TÜV Süd Energietechnik GmbH
- Wärme Hamburg GmbH
- Werner & Mertz GmbH

3. Research and civil society

- Agora Energiewende
- Baden-Württemberg Energy Research Foundation (SEF)
- Climate Action Network (CAN) Europe
- Climate Neutrality Foundation
- Climate Works Foundation
- European Climate Foundation
- FEMNET e.V.
- Forschungsgesellschaft für Energiewirtschaft mbH
- Friedrich Ebert Foundation
- Friends of the Earth Germany (BUND)
- German Federal Environment Foundation (DBU)
- German Football Association
- German Foundation for Peace Research
- German Olympic Sports Confederation (DOSB)
- Global Green Growth Institute
- Green Budget Germany (FÖS)
- Green City e.V.
- Greenhouse Gas Experts Network Inc.
- Greenpeace Germany
- GRS Batterien
- Heinrich Böll Foundation
- International Carbon Action Partnership (ICAP)
- NABU – Naturschutzbund Deutschland e.V.
- Renewables Grid Initiative
- Stockholm International Water Institute
- Swiss Energy Foundation (SES)
- Swiss Federal Laboratories for Materials Science and Technology (EMPA)
- The European Consumer Organisation (BEUC)
- The Gold Standard Foundation
- Trinomics B.V.
- VDE Verband der Elektrotechnik Elektronik Informationstechnik e.V.
- World Resources Forum
- WWF Deutschland / US

These are some of our funders and clients. A full list of references is available (in German) at www.oeko.de/referenzen2020.

Crisis-proof: Our communication

We communicate our research results via various channels – but always in a way that is easy to un-

derstand and appropriate to the needs of different target groups.

In 2020 the Public Relations & Communications Department ...

- ... produced and distributed **27 press releases** oeko.de/en/press
- ... wrote or provided editorial support for **65 blog posts** and published them blog.oeko.de
- ... composed 26 **website announcements** oeko.de/en/archive/news
- ... published **four issues** of the online magazine **eco@work** oeko.de/en/e-paper
- ... sent **408 tweets** to **16,000 followers** twitter.com/oekoinstitut

In 2020 we also communicated successfully in new channels. We have ...

- ... produced and distributed **9 issues** of the new **newsletter “EcoMail”** oeko.de/newsletter-en
- ... **built up a presence on Instagram**, published **208 posts** and already acquired **1,565 subscribers** instagram.com/oekoinstitut
- ... **created a LinkedIn profile** and used it regularly linkedin.com/company/oeko-institut-e.v.
- ... modernised the **graphics** on the **website**, in the **blog** and in **eco@work**.

IF YOU WANT TO HAVE AN IMPACT
ON OTHER PEOPLE, YOU NEED
TO FIRST SPEAK THEIR LANGUAGE.
KURT TUCHOLSKY

Three new information portals on key issues

In 2020 we created three new information portals on our website to alert our target groups to im-

portant topical issues and the key findings of our research.

1 Information portal on final storage

The search for a final repository for nuclear waste is gathering pace: when Germany's last nuclear power plant goes offline, there will be 17,000 tonnes of spent fuel elements from its nuclear energy installations in interim storage. What should be done with them? The Oeko-Institut provides neutral and independent information on the process of choosing a repository site.

oeko.de/finalstorage

2 Information portal on hydrogen

Sustainable, low-carbon hydrogen is the fourth pillar of the energy transition, after renewable energies, energy efficiency and electrification. The Oeko-Institut is pursuing projects that focus on the production and sustainability of PtX materials; it advises on legislative and regulatory initiatives and analyses and assesses sectors with potential for hydrogen use.

oeko.de/hydrogen

3 Information portal on more climate ambition

The EU aims to be climate-neutral by 2050. In moving towards this goal, the current climate target for 2030 has been increased to at least 55 per cent fewer emissions than in 1990. To contribute to this, the Oeko-Institut produces potential analyses, emissions audits and material flow analyses, emissions inventories and forecasts, and energy and climate protection scenarios.

oeko.de/climateambition

The Public Relations & Communications Department
oeko.de/communications

Coming together: The Oeko-Institut's members

The Oeko-Institut is a non-profit association with around 2,000 members. Its financial resources come mainly from third-party project-based funding. In addition, members' subscriptions and donations provide the basis for independent research.

These contributions enable us to work on issues for which we don't have a mandate via a commission. This includes the annual donation-funded projects and the self-funded projects that address the big challenges of our time.



Donation-funded project 2019:

Aviation and climate action

Air travel is experiencing an unprecedented collapse as a result of the coronavirus pandemic. But until February 2020 there was only one trend in global aviation – upwards. In order to protect the climate, it is clear that aviation must change radically and ultimately become climate-neutral.

More action on climate change requires political regulation, the removal of subsidies, and a focus on technical innovation and alternative drives. For example, flights – unlike car travel and rail journeys – are exempt from energy taxes, and there is no value added tax on international flights. This makes air travel relatively cheap by comparison with other forms of transport – despite its hugely damaging impact on the climate.

If air travel is to become more climate-friendly, it is also important to encourage travellers to change their behaviour and use more environmentally sound alternatives. Offsetting flights – that is, compensating for greenhouse gas emissions by funding climate change mitigation projects – should only be considered as a last resort.

Information, ideas and political solutions: the results of the donation-funded project can be found at www.fliegen-und-klima.de.

Donation-funded project 2020:

Hydrogen? Yes, but only if it's sustainable!

Both industry and government want hydrogen to become a key pillar of Germany's energy transition. But because of the excessively high costs and the limited availability of land, Germany cannot rely on domestic production to satisfy future hydrogen demand. For hydrogen production to be genuinely sustainable and climate-neutral, ambitious criteria for a global hydrogen market will be required.

In its donation-funded project, the Oeko-Institut examines what the sustainability criteria for imported hydrogen might look like. Based on detailed country analyses, the project team will define sustainability criteria that ensure that imported hydrogen contributes to climate change mitigation without adversely affecting other dimensions of sustainability.

oeko.de/spendenprojekt2020

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