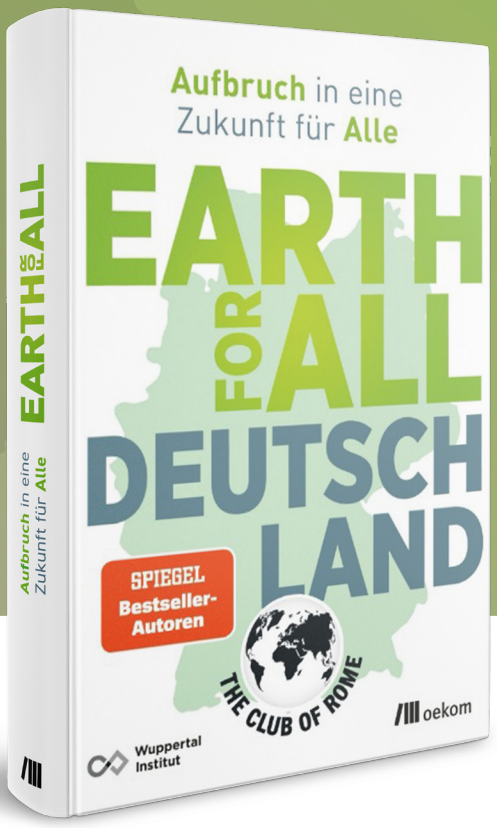
Earth 4All

Earth4All: **Germany**

Towards a future for all

OCTOBER 2024



THE CLUB OF ROME

Wuppertal Institut

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Earth4All

Earth4All is an international initiative that explores how wellbeing for all can be achieved within the planetary boundaries this century. It was launched in 2020 by The Club of Rome, the Norwegian Business School, the Stockholm Resilience Centre and the Potsdam Institute for Climate Impact Research.

The long-term goal of Earth4All is a new economic paradigm that enables prosperity for all people within planetary boundaries. To this end, Earth4All produces analyses that consistently link the economy, environment and society. These enable the identification of policy measures that have the potential to simultaneously address the polycrises of our time and develop synergies through integrative approaches. To ensure that these findings are participatory, the Earth4All team has an international structure and works with citizen participation, campaigns and broad communication. After all, social transformation can only succeed if the public is involved in shaping our common future.

Earth4All is based on system dynamics models and a Transformational Economics Commission made up of economic experts from around the world. Its members include Kate Raworth, Jayati Ghosh and Ernst Ulrich von Weizsäcker.

In September 2022 - 50 years after the publication of *The Limits to Growth*, Earth4All published the book *Earth for All: A Survival Guide for Humanity*, which makes key research findings accessible to the general public. The book presents a realistic path for systemic change by outlining five extraordinary turnarounds and corresponding policy measures:

1. **Eliminate poverty** by growing the economies of the poorest countries through green investment and cancelling their debts to high-income countries.
2. **Reduce inequality** by increasing taxes on the top 10%, strengthening workers' rights and introducing citizens' funds to give everyone access to a nation's wealth.
3. **Empower women** by increasing access to education, putting them in leadership positions and equalising pensions.
4. **Transform food systems** by cutting waste and stopping the conversion of wild landscapes to farmland.
5. **Transform energy use** by immediately phasing out fossil fuels, electrifying everything and seriously investing in renewables and energy efficiency.

Earth4All is actively committed to implementing the political solutions identified. This includes global cooperation with international organisations such as the United Nations, the involvement of citizens worldwide through youth forums or assemblies, the implementation of surveys to determine attitudes towards change in the economic system and the adaptation of Earth4All initiatives to local conditions. In addition to Germany, Earth4All has national engagement activities in Austria, Kenya and Argentina; further countries are planned.

Earth4All Germany

The Wuppertal Institute is the scientific partner and coordinator of the Earth4All national engagement strategy in Germany. The program of work takes the ideas behind the global initiative and applies it to the specific challenges in Germany. This includes the discussion of Germany's responsibility in the world as well as the exploration of the consequences of a transformation process in Germany. The key findings will be published on 14 October 2024 in the book *Earth for All Germany: Towards a Future for All*.

The book uses the five turnarounds to analyse how a profound social transformation can succeed in Germany. A key finding is that such a leap is only possible through the interaction of all the turnarounds, which must be supported by an ambitious political and economic framework.

As in the global analysis, a distinction is made between two future scenarios for Germany:

Too Little Too Late:

In this scenario, the current path of economic development, which is based on unsustainable production structures and consumption patterns, is continued. The analysis shows that such a "business as usual" approach reinforces inequalities and cannot counteract the climate crisis sufficiently to prevent its dramatic consequences.

Giant Leap:

In this scenario, society, politics and business make bold decisions and investments that strengthen social cohesion, build trust, reduce poverty nationally and globally, transform food and energy systems sustainably and establish an economic system that aims for the wellbeing of all on a finite planet.

In order to realise the positive vision of a Giant Leap, several political strategies must be well coordinated and implemented simultaneously. This is anything but easy, but it is worth it. In Germany, this also requires the five turnarounds mentioned above.

Due to the special framework conditions in a resource-intensive industrialised country like Germany, these five turnarounds must be combined with a focus on the use of resources. Germany's ecological footprint in the world can be significantly reduced through circular economy strategies, which would also make it easier to achieve ambitious climate protection targets.

The book is not intended as an all-encompassing guide to action, but rather shows possible paths for a socio-ecological transformation that can count on broad social acceptance. It is an invitation to a social dialogue about the future of Germany. The book thus represents the prelude to discussions with citizens and stakeholders, which are planned in a follow-up phase. This further phase aims to reach more people and promote inclusive dialogues to ensure that everyone can be part of developing a shared vision for the future.

Key messages

1. **A rapid change for the better is possible.** The authors' analyses show that the fossil and resource-consuming structures established over 150 years of industrial history in Germany can be transformed into a climate-neutral society based largely on a circular economy within the next 25 years.

2. **Unlimited economic growth on a finite planet is impossible - and therefore not a benchmark for quality of life and a good life.** Instead, social wellbeing for all within planetary boundaries is the central goal.

3. **Transforming different areas at the same time is easier than transforming each one individually:** all five turnarounds influence each other. It is easier, more effective, cheaper and more beneficial to implement them together and quickly rather than one after the other. This requires policy integration instead of isolated measures by individual departments, as well as cooperation instead of compartmentalisation - this is the only way to leverage synergy effects.

4. **An ecological transformation without a reduction in social inequality will fail.** Climate policy cannot replace social policy. However, climate policy must be designed in such a way that it does not exacerbate social inequality, otherwise there is a risk that the ecological transition will be blocked. The protection of the climate and ecosystems can only be achieved with a simultaneous significant reduction in inequality and the fight against poverty. The basic prerequisite for all turnarounds is therefore a fairer tax and social policy.

5. **Technology alone is not the solution to all challenges.** Efficiency and renewable energies are key strategies that need to be implemented at a much faster pace. However, they are also associated with challenges such as land consumption. Accordingly, moderate lifestyles (sufficiency), a limitation of luxury consumption and a fundamental paradigm shift towards the economical use of resources and energy are also required. This is not about a general restriction of needs, but about responsibility and a fairer distribution of available resources - and therefore a better life for everyone. Such changes are acceptable to the majority. However, sustainable behaviour must be made possible for everyone - which requires an enabling culture.

6. **The necessary transformation processes can only be realised together and with the support of everyone.** Democracy must be strengthened and negotiation processes enabled. This requires an increase in empowerment, especially for women and young people, whose rights and needs are still not sufficiently heard. A transformation with many losers jeopardises democracy. Broad participation, future dialogues at all levels, citizens' assemblies and a more democratised economy can help to close social divides.

7. **Bold investments in the future are definitely affordable.** An integrative, holistic transformation approach requires considerable investment in the future. A consistent reduction in climate-damaging subsidies, a progressive financial contribution from the rich and reforms to public finances such as the adjustment of the debt brake will free up funds for this, are socially just and at the same time avert exorbitant future damage and adaptation costs.

8. **Germany must take on more responsibility.** As a leading industrialised nation, Germany has a special responsibility. By taking bold steps, Germany can strengthen existing starting points for positive global change and play a pioneering role. At the same time, Germany must learn to better understand the global implications of its own transformation actions and mitigate negative consequences. This will create the basis for a global wellbeing society.

Five turnarounds for Germany

Our way of doing business has undoubtedly led to an increased level of prosperity in Germany in recent decades, but also to a more unequal distribution of wealth and a high consumption of resources. “Business as usual" is reaching its natural and social limits. Fundamental changes are therefore needed.

Our economic system has led to public infrastructure being neglected and social cohesion increasingly disintegrating. The ecological challenges have been partially addressed in the past and real successes have been celebrated. Nevertheless, we are still living far beyond our means in terms of planetary boundaries. There can therefore be no more "business as usual".

The aim of good politics and good economics must be to ensure that there is enough clean water to drink, clean air to breathe, a sustainable climate and food for a healthy diet in the future. If we manage to preserve our natural resources, everyone will benefit. Exploitation, on the other hand, benefits a few in the short term and no one in the long term.

In addition to the ecological issue, we need to focus more than ever on the social impact. Access to the basic necessities of human existence must not depend on households' wallets but must be guaranteed for all people. In the political arena, complex issues are sometimes answered with simple solutions. Simplification offers many people security, which is unfortunately all too often abused by organised misinformation. We therefore want to take a clear, but scientifically sound stand against such misinformation and make it clear what is at stake: we are concerned with the preservation of our common livelihoods and a move towards securing our social coexistence. It is about the health and wellbeing of us all. All of this is at stake if we continue as before or even turn back the clock to the fossil fuel age. A Giant Leap, on the other hand, can prevent the current polycrisis from escalating further. It is possible to make Germany fit for the future and worth living in.

We therefore do not want to paint an apocalyptic picture of a doomsday society. Rather, the authors' analyses prove that it is worthwhile to radically change course. A profound social transformation is not only necessary for Germany to make a substantial contribution against the multitude of global crises. Transformation is much more an opportunity than a duty: it enables us to secure wellbeing, health, security and democracy for current and future generations in Germany. With a consolidated and strong civil society, with trade unions that can powerfully represent the rights of employees, with entrepreneurs who assume social responsibility and with politicians who want to courageously shape a good future.

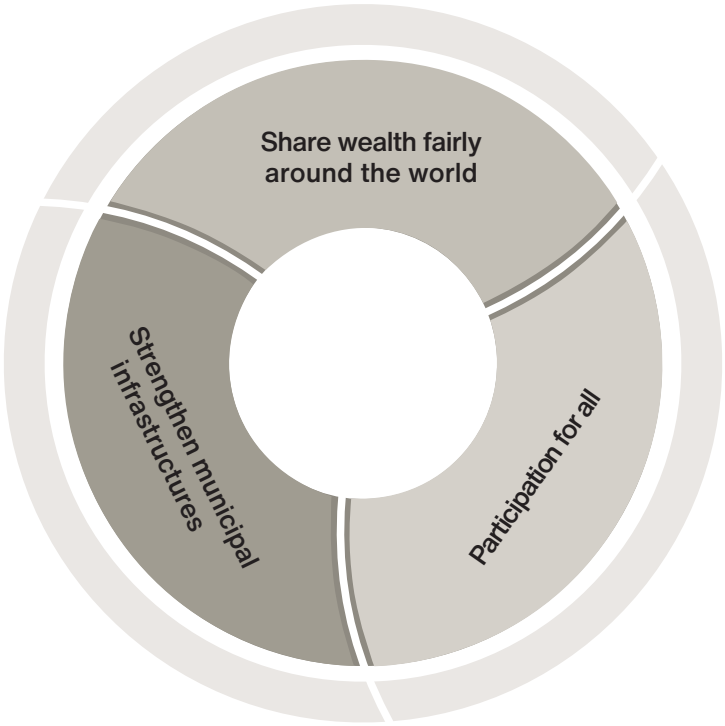
With their book *Earth for All Germany*, the team of authors want to encourage people to - in the words of Bertolt Brecht - "finally trust our strength and build a better life".

Poverty

For good reason, the first of the 17 Sustainable Development Goals is: "end poverty in all its forms everywhere". The absence of poverty is the fundamental prerequisite for achieving other key sustainability goals. Although extreme poverty has fallen significantly worldwide over the past fifty years, it has risen again in recent years as a result of overlapping global crises. Around 700 million people currently live in extreme poverty, i.e. they live on less than USD 2.15 per day.

Rapid economic growth in low-income countries, which is sustainable and fair, does make it possible to overcome poverty. However, it requires a new economic model and other forms of international cooperation. The current international structures severely restrict the political options of low-income countries. This must change.

However, poverty and fears of social decline also exist in Germany. Although these are less existential, addressing them is essential to achieving a fairer society. Around one in five people in Germany is affected by poverty and associated social exclusion - and the trend is rising. This is a situation that we as a high-income industrialised country cannot accept, not least because it significantly jeopardises the social acceptance of necessary transformation processes.



Share wealth fairly around the world

One of the biggest challenges for countries in low-income countries is that they have too little financial room for manoeuvre. Many low-income countries are suffering from a massive debt burden. Officially promised development aid and transfer payments such as international climate financing are not forthcoming. Instead, loans are granted that only postpone growing interest and repayment burdens into the future. Many low-income countries have to choose between combatting poverty and climate protection - even though they themselves have contributed little to the global ecological crisis and suffer more from it than others.

Germany should therefore advocate political changes to international financial and trade regulations that expand the financial room for manoeuvre for low-income countries. This includes actively supporting debt relief for poor countries, expanding financial room for manoeuvre through the International Monetary Fund's Special Drawing Rights and advocating for fair international trade rules.

Participation for all

Central basic needs for a dignified life in a developed society are often not met in Germany. Access to affordable, climate-friendly electricity, heating and mobility services as well as healthy food must become a core element of the national fight against poverty.

This requires targeted support programmes for low-income households and considerable government investment in improving public infrastructure. There is therefore an urgent need to restructure the tax and subsidy regime.

There must be a social review for transformation measures that examines the necessary bans, subsidies or taxes in terms of their distributional effects. Needs-based and socially differentiated support can be financed by scrutinising climate-damaging subsidies for the rich in particular.

Visible and tangible improvements for the general public are supported by prioritising socially oriented investments in public energy and mobility infrastructures as well as in the health sector, instead of exclusive funding programmes that are only accessible to a few.

Strengthen municipal infrastructures

In particular, municipalities with a high poverty rate do not have the financial means to provide technically well-equipped, climate-friendly public buildings with high efficiency standards or high-quality lunches in schools and canteens. They can no longer afford public swimming pools and are increasingly having to cut back on financing local public transport, which is essential in terms of social and climate policy. Although local authorities are the key players in the fight against poverty, they are often poor themselves. A reform of local authority finances is urgently needed here.

The state must ensure that its own institutions are the model and guiding principle of social transformation processes. A fund for upgrading municipal infrastructure enables local authorities to finance key anti-poverty projects that benefit everyone - for example, good, efficient and convenient public transport, attractive cycle paths and footpaths or high-quality food in school canteens.

Focusing more strongly on public services again creates broad acceptance for all challenging transformation processes. This also includes investments in municipal heating networks, which could be used to supply at least some of those households with climate-friendly heat that are unable to fulfil the requirements of the Building Energy Act themselves due to insufficient income and a lack of capital.

Inequality

Germany is an unequal country. While the richest 10% own over 60% of the wealth, the bottom 40% have virtually none at all. In many cases, greater wealth also means greater opportunities to influence politics, the economy and society. As a result, the power to make social or political changes is distributed extremely unequally across the country. A high level of inequality contributes to dysfunctionalities and the rise of populist movements. In addition, the wealthy also have a disproportionate responsibility for greenhouse gas emissions and resource use due to higher consumption. Conversely, this means that if everyone is to have a good life within planetary boundaries, resources, income and wealth must be distributed more fairly.

Studies show that not only the poor benefit from greater equality, but also the economy and the rich themselves. After all, wealth is based not least on a stable society, well-trained skilled workers, good healthcare and an attractive public transport infrastructure.

Rather than strengthening mechanisms for fairer distribution, recent decades have seen efforts to reduce them: A wealth tax is no longer levied, redistribution via income taxes has been reduced, capital income is taxed at only 25% (and is therefore clearly better off than income from work). In addition, the wealthy in particular benefit from numerous exemptions from inheritance tax. The current policy in Germany does not show any consistent efforts to reduce inequality.

A change of direction in this area is also crucial because the financing of all turnarounds is only possible if the wealthy with their large fortunes make an appropriate contribution to the necessary investments in the future.

Tax the rich

Although Germany is a high-tax country in terms of income, it is a low-tax country in terms of wealth - which reproduces and exacerbates wealth concentration and inequality. The exact design of a fairer tax system is a matter for political decision and needs to be carefully considered. Various options are on the table: the reintroduction of wealth tax, the removal of exemptions from inheritance tax and a financial transaction tax. The options also include a one-off substantial wealth levy as a fast-acting burden equalisation measure. This would do justice to the urgency of the situation, as the money could be used to set up a special fund for climate protection and transformation. It is equally important to close the many legal and semi-legal tax loopholes - regardless of whether this involves exemptions from inheritance tax or opaque corporate structures as a basis for tax evasion abroad.

Fee and dividend plus

It is essential not to place an even greater burden on financially disadvantaged people in particular as a result of climate-relevant restructuring - a "fee and dividend plus" to compensate for the regressive burden of CO2 pricing offers one way of doing this. The internalisation of externally caused environmental costs through emissions trading can have beneficial effects not only in terms of making environmentally harmful products more expensive, but can also have a positive distributional effect if properly designed.

However, a lump-sum distribution per capita can only compensate for part of the financial burden caused by the transformation. New (disruptive) policy approaches are needed, especially for those households that are particularly affected and cannot adapt on their own. This is because neither climate money nor the provision of subsidies alone are sufficient; holistic support packages are required.

Economic models that promote equality

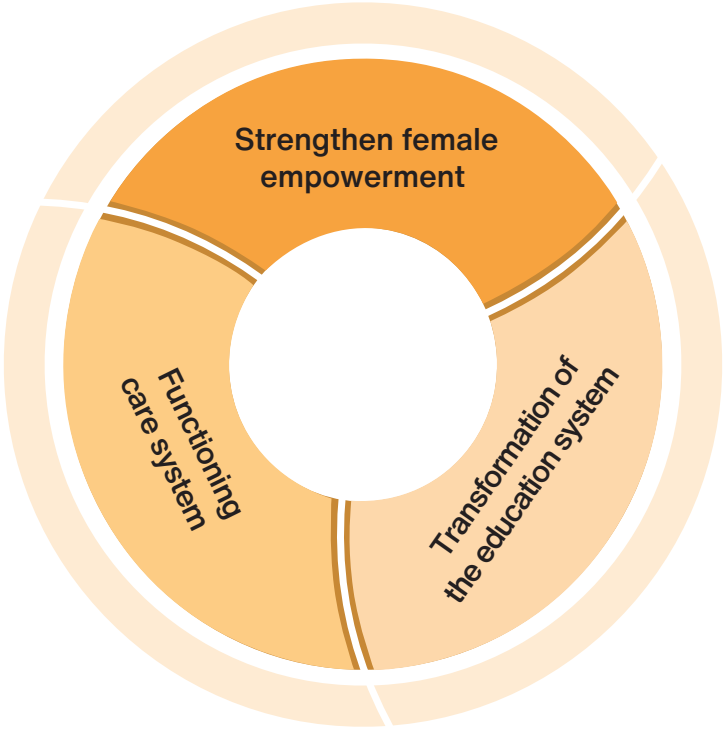
Inequality can also be reduced by strengthening a fairer economy. The redistributive tendencies of largely unregulated capitalism from the bottom to the top must be restricted. This is possible, for example, by promoting social enterprises that focus on social goals rather than profit and other legal forms that prioritise responsible ownership over maximising profits, or by strengthening the sharing economy in a socio-ecological way. Trade unions play a central role in shaping this.

Empowerment

We can only achieve a sustainable "Earth for all" if everyone can really play a part in shaping it. Empowerment means strengthening the self-efficacy of all people in a society - here (as in the global Earth4All initiative) especially the empowerment of women. Despite all the undeniable progress, gender equality has not yet been achieved in Germany. But it is indispensable for the world of tomorrow. This is because women are often promoters of social change whose potential is needed in all areas in order to achieve the transformation towards a safe and just world.

In order for this potential to be utilised, framework conditions must be created that make this possible. Key areas of action in Germany include ending violence and sexism and overcoming structures that have become entrenched over decades and still restrict the equal development of women today. These include, for example, unequal pay and the associated inadequate financial security in working life and old age, insufficient representation in political offices and leadership positions, as well as unequal opportunities for

individual time management and a lack of fair distribution of care work. Many of the existing problem areas are due to structural inequalities that are mutually dependent and reinforce each other. An extraordinary turnaround in empowerment is therefore needed to break down these connections and create gender-equitable social structures.



Strengthen female empowerment

Germany needs a consistent improvement in the framework conditions for women in all areas of society. This requires strengthening women in political offices and in management positions in companies and administrations. In addition, violence against women must be reduced by expanding prevention measures and consistently enforcing a zero-tolerance policy.

Functioning care system

Structural inequalities are reduced by easing the burden on families and the equal distribution of care work. This requires reliable and seamless childcare services as well as men taking on more care work. One possible supportive measure here is the reduction of working hours for all: flexible working conditions and working time models would give everyone in Germany more time for themselves and others and could contribute to the wellbeing of society as a whole. Responsible use of digitalisation can help pave the way for this.

Transformation of the education system

Daycare centres, schools and training and further education institutions shape the societies of tomorrow and, as institutions, are always role models. Through their teaching expertise, employees can lay the foundations for a new understanding of inclusion and diversity and convey empowerment, democracy, responsibility and respect. This must be supported by a variety of measures: from personalised learning plans and the targeted promotion of talent and creativity to new learning formats. Involving pupils in a

participatory way and giving them a holistic and interdisciplinary approach to the topic of sustainability creates the basis for imparting knowledge about the future.

In addition, it is important to develop completely new, courageous visions of the future that extend the pursuit of equal opportunities and empowerment to all disadvantaged people, because diversity harbours a great opportunity for society.

Food

Our current food system is neither good for the planet nor for our health. Intensive agricultural production has a massive impact on our immediate environment and that of other regions of the world. Around a third of global greenhouse gas emissions are caused by the food system. However, our food is not only a driver of climate change, it is also particularly affected by its consequences: extreme weather events such as storms, floods and persistent droughts are already reducing crop yields and jeopardising food security.

At the same time, today's predominant so-called Western diet - characterised by high levels of fat and sugar, highly processed foods and lots of meat - is leading to more and more diet-related diseases. For people living in poverty in particular, it is far more difficult to eat a healthy diet than it is to resort to unhealthy options. As a result, around three million people in Germany are affected by food poverty.

Sustainable cultivation systems

Sustainable agriculture must function in cycles instead of depleting soils and resources. To achieve this, the proportion of regenerative agriculture, which aims to protect and conserve soil, water and biodiversity, must be increased. At the same time, more intensive forms of agriculture must become more sustainable. Reducing the use of fertilisers and pesticides, for example through the use of modern agricultural technology methods - such as agricultural robotics, which enables more precise and environmentally friendly cultivation of fields - is key here.

To date, farmers have received too little remuneration for environmentally friendly farming practices, which means that these methods are often not profitable enough. The funding conditions under the European Common Agricultural Policy (CAP) must therefore be fundamentally revised. Public funds should be made available specifically for the protection of public goods and services, in particular for the protection of soil, water and biodiversity.

Efficient land utilisation

The amount of land available for agricultural use is limited and competition for it is increasing due to the growing demand for settlement areas, biomass cultivation and nature conservation. In Germany, agricultural land is already insufficient to meet the domestic demand for food.

A growing world population can only be fed if the available land is utilised more efficiently. We must therefore utilise our agricultural land more sustainably, efficiently and sensibly. 60% of arable land in Germany is currently used to grow animal feed. This proportion must be reduced. In addition, technological measures such as vertical farming can ensure more efficient use of increasingly scarce land. At the same time, land and resources are being used unnecessarily due to the current excessive waste of food. Another important measure is therefore the reduction of food waste along the entire value chain.

Sustainable food culture

Research is unanimous: diets with a high proportion of plant-based foods such as pulses, fruit, vegetables and wholemeal products and a lower proportion of animal products are not only good for the environment, they are also healthier. A trend in this direction is now clearly recognisable. Nevertheless, it is still too difficult for consumers to change their eating habits in everyday life. There are many reasons for this: unhealthy, industrially highly processed products are often over-represented through advertising, marketing and packaging. Sustainable purchasing decisions at the supermarket shelf are often more complicated and time-consuming at first glance due to the variety of information available. Healthy food is also usually more expensive. However, healthy eating should not depend on education or income.

The framework conditions should be designed in such a way that they automatically support a sustainable eating style. There are numerous levers for this: revising the VAT system by lowering the tax on plant-based products or improving the visualisation of sustainable products instead of the current jungle of labels. As more and more people are no longer preparing and eating their meals at home, a key lever is out-of-home catering and communal catering. Cafeterias and canteens in particular can promote sustainable eating habits by offering appropriate options. Free, high-quality school meals can also contribute to more equal opportunities for children.

Energy

A future in which energy is more risk-free, intergenerational, reliable, affordable and almost completely CO_2-free for everyone is possible. This does not require deindustrialisation, because today we know very well how the central industrial processes can be made climate-friendly.

However, the transformation of the energy system has always been accompanied by myths. One persistent myth is that the supply of electricity must be provided by large centralised power plants to ensure security of supply. National and global analyses show the opposite. In many municipalities and regions, a different

type of energy supply has long been established practice. The expansion of renewable energies, the intelligent information technology linking of generation points and the provision of flexibility options such as storage and load management are crucial for this. The expansion of local community energy must also be supported in order to strengthen acceptance and accelerate capacity expansion.

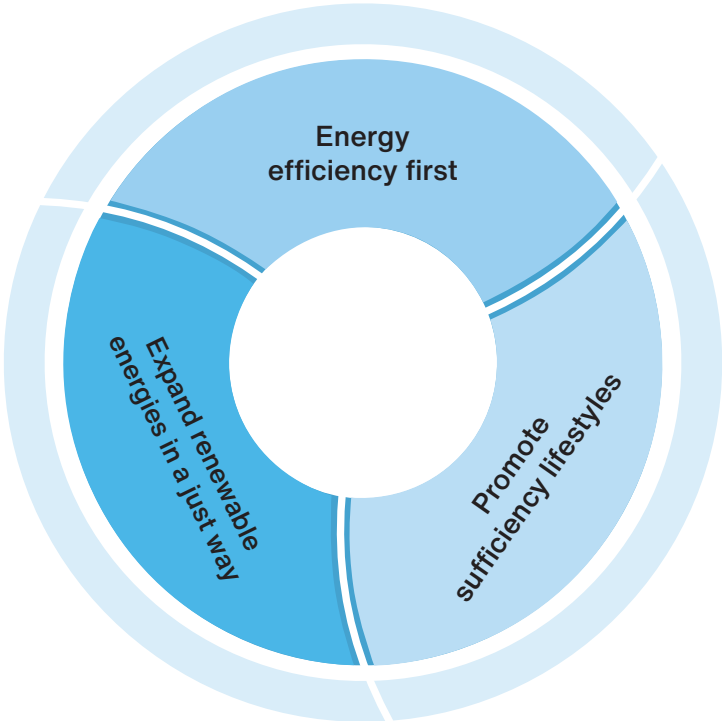
In addition, there must be a much more consistent avoidance of unnecessary energy consumption through efficiency and sufficiency measures. If energy efficiency is given a higher priority, the transition will be easier.

Such an energy system may still sound utopian today, but it is possible and economically attractive. The foundations for this were laid a long time ago: the nuclear phase-out, the decision to end coal subsidies early and the target of greenhouse gas neutrality by 2045 enshrined in the Climate Protection Act are milestones in the energy transition as well as a mandate and legacy for the future. Today, there is a consensus among energy scientists that Germany can manage without nuclear energy, coal, oil and, to a large extent, natural gas in 2045.

The decisive factor is this: we need to speed up the implementation of key strategies. Although greenhouse gas emissions in Germany were reduced by around 46% between 1990 and 2023, which is an international record, the rate of reduction is clearly too slow for Germany's goal of becoming greenhouse gas neutral by 2045.

Without a bold policy mix with a steering effect and social support, the structural change towards climate neutrality in the energy system will not be possible. Consistent action against resistance is also needed where traditional privileges and environmentally harmful subsidies need to be dismantled. Finally, we need a policy that creates planning security through continuity, which is particularly important in the energy sector.

A strategic mix of efficiency, sufficiency and consistency (renewable energies) is necessary for a successful energy transition.



Energy efficiency first

The internationally recognised principle of "energy efficiency first" means prioritising the avoidance of energy consumption over more energy supply - wherever this is possible and advantageous. Applied consistently, this can achieve a decoupling of economic growth and energy demand. The more energy and materials that are saved without compromising on quality of life, the faster, more cost-effective, more environmentally friendly and more socially acceptable a 100% supply of renewable energy can be achieved.

Energy efficiency is important in all sectors, especially in relation to electricity consumption, which will increase in the coming years due to the switch from fossil fuels to electricity. There are numerous concepts and proposals on how to increase energy efficiency. In the case of household appliances, electricity consumption can be reduced through consumption standards - such as those stipulated in Europe by the Ecodesign Directive. On the heating side, for example, savings can be achieved if the annual energy refurbishment rate in existing buildings can be increased from less than 1% today to 2-3%, especially in public buildings. Switching to industrial waste heat or promoting minimum energy standards for buildings will bring additional benefits. Advice and support from a single source through so-called one-stop shops can make energy-efficient refurbishment, planning, the process and implementation much easier.

Expand renewable energies in a just way

The rate of expansion of renewable energies, especially electricity generation from wind and solar, must be significantly increased by 2030: the newly installed annual capacity of renewable electricity generation must at least triple compared to the expansion rates at the beginning of the decade and the expansion must continue at this level until 2045. In addition, investments must be made in the infrastructure of grids, storage facilities and other flexibility options.

This expansion will require an enormous financial effort. It will only succeed with the help of private capital mobilisation, but must be supported with public funds. This will only succeed if people feel involved in the development. The energy transition therefore requires not only technical solutions, but also a convincing narrative for the future and social support. Accompanying communication campaigns must create transparency as to why certain measures are unavoidable. The energy transition is entering a new phase with the heating and transport transition, in which millions of households are much more directly affected than with the electricity transition. Experience with the Building Energy Act has shown where the pitfalls lie. The mistakes made there must not be repeated: the political guideline for the future must be to first explain the meaning and benefits in detail and then implement regulatory requirements in conjunction with a socially responsible subsidy system.

Promote sufficiency lifestyles

Studies show that rebound effects cancel out efficiency increases if no countermeasures are taken, which is why the technology-orientated efficiency and consistency strategies need a third pillar, the sufficiency strategy. Policymakers must use appropriate instruments to promote energy-saving behaviour and limit energy waste. This has long been recognised in the transport transition: traffic avoidance and modal shift are part of the sufficiency strategies, even if they are not yet implemented with the necessary breadth.

Sufficiency policy is about much more than appeals for individual behavioural changes. Political framework conditions must enable and encourage unsustainable production and lifestyles to change within society.

Moderation needs to be encouraged and excess discouraged, for example, by making parking in city centres less attractive, but instead ensuring the expansion of attractive public transport and giving people the opportunity to leave their cars at home. Only then will people's mobility behaviour change and more sustainable patterns of behaviour and new eco-routines become established. Trying to achieve individual behavioural changes through government or moral pressure without real alternatives that everyone can afford is clearly unfair and will therefore fail.

Economic system change

The economy is not an end in itself. The purpose of economic activity should be the creation of wellbeing and social development. To achieve this, production and consumption structures must be organised in such a way that there is enough for everyone - and within planetary boundaries.

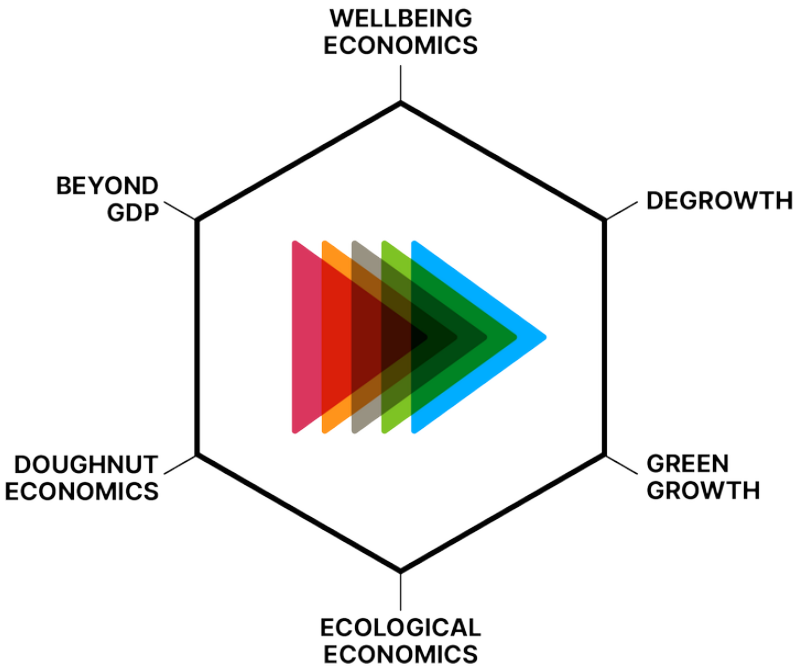
Natural resources are central to our lives. Without natural resources and services provided by nature, human life, a modern economy and social activity are inconceivable. Raw materials are a central basis for this. However, the extraction and use of raw materials is sometimes associated with considerable environmental pollution. Sustainable economic activity therefore requires a particularly sparing use of natural resources.

Promoting the efficient use of raw materials was and is a key approach to preventing an unlimited increase in raw material consumption and the associated environmental impact, while at the same time strengthening international competitiveness. But this approach of increasing efficiency alone is not enough. We need a fundamentally different, more systemic and circular management of material flows.

We need to get away from the disposable and throwaway society, the "linear economy": take from nature, process, use and then throw back into nature. The counter-model to this "throw-away society" is a circular economy. Its central principle is to use as few raw materials as possible and to keep these raw materials in use for as long as possible ("keeping them in circulation") so that fewer new raw materials have to be extracted from nature. This can be achieved with many strategies that are already being utilised today - including reusing, sharing, repairing or recycling and living in moderation.

To achieve this, we need an economy that overcomes the narrow limits of individual and short-term profit maximisation and serves the wellbeing of all people and nature. The essential characteristics of this form of economic activity are that it is collaborative, cross-company and aims to achieve fair prosperity. We must turn away from the antiquated form of "rentier capitalism". This is an economic system in which particularly resource-rich and powerful actors defend their privileges at the expense of other economic actors and the general public, privately appropriating natural resources and deriving benefits from them, while the general public bears a large part of the burden.

The transition to a circular economy needs the right economic incentives: environmental costs must be fully internalised in order to eliminate the separation between benefits and burdens. Higher taxes on primary raw materials, priority and higher standards for environmental protection could be combined with a limit on extraction, making secondary raw materials and products more competitive. Products must be designed in such a way that they can be repaired and recycled and as many (particularly scarce) raw materials as possible can be recovered and further processed through mechanical or chemical recycling. It must once again be worthwhile to act for the common good rather than just for profit.



We must not lose sight of the fact that not only Germany, but all countries must maintain or achieve a secure level of prosperity to ensure peace and cohesion in the global community. This means that at least basic needs must be met, a life in dignity must be possible for all and the excessive consumption of resources, especially in wealthy countries, must be reduced. Targets such as halving the consumption of primary raw materials without sacrificing quality of life can provide guidance on what consumption would be tolerable for the environment and society in the long term - and what implementation is possible with the measures outlined. This does not mean that all people must halve their consumption, but that a minority of humanity must reduce their excessively high consumption so that a life in dignity can be ensured for the vast majority of people. Enabling sufficient or moderate lifestyles is just as central to this as a fair distribution of the burdens and benefits of the necessary transformation processes.

Methodology and modelling

A large number of climate protection scenarios are available for Germany for the period up to 2045/2050 with a differentiated breakdown of subsectors and technological strategies within the energy system. The main purpose of these scenarios is to advise the Federal Government on climate policy targets with regard to available and corresponding technology options and, in principle, on the energy policy mix required to achieve these targets. Only a few of these scenarios contain differentiated economic cost-benefit analyses. They also focus on climate protection and the energy transition. Interactions with issues relating to inequality, poverty, food, empowerment and resources cannot be captured by most modelling approaches. One exception is the Federal Environment Agency's RESCUE scenarios, which have at least analysed the interactions between the energy transition and resource issues in more detail.

In addition to these scenarios, the *Earth for All Germany* study takes a close look at trade-offs, conflicting objectives, interactions and synergies. The iSDG model is used, which enables a holistic mapping of the five turnarounds. In terms of the energy sector, the iSDG model is not as detailed as the German energy

and climate protection scenarios. Nor does the model go into every detail with regard to each of the other turnarounds. However, it provides a comprehensive overview of the effects and interactions of a socio-ecological transformation by modelling the combined implementation of all five turnarounds. Even if numerous scientific research questions still need to be developed when comparing iSDG and German modelling, the results are exciting and provide a clear direction.

The Millennium Institute's iSDG model integrates 30 sectors: 10 environmental, 10 social and 10 economic. These include the dynamics within each sector and between the sectors. They are recorded in over 3,000 variables and equations. As a result, the model covers a large number of indicators that are relevant for the assessment of sustainable future scenarios.

The baseline scenario already available from the project *Consideration of SDG interactions in transformation pathways*, adapted to Germany, describes how Germany will change if no ambitious measures are taken in environmental and social policy, but only hesitant and unambitious steps. This is the "Too Little Too Late" scenario. Two further scenarios were calculated using the iSDG model as part of this book. One scenario, which is used in the chapter on the energy transition, takes current climate policy into account and incorporates the government's existing plans as far as possible ("Existing Plans"). The third scenario, the "Giant Leap", analyses the effects if further ambitious measures are simultaneously taken in the areas of poverty, inequality, empowerment, food and energy. This results in the overall picture of a highly ambitious climate and sustainability policy in Germany.

In addition, the model was used to calculate the turnarounds individually so that we can observe what happens if only the measures in the respective sector are tackled and nothing happens in the other sectors.

Why did we choose these scenarios? The consequences of climate change are described very impressively in many books. In recent years, a large number of measures have already been introduced to combat climate change, which - if implemented - can make a major contribution to mitigating climate change. However, this can only be part of the solution. It is essential that they are dovetailed with financial and social policy from the outset. Unfortunately, this has so far happened too little in reality. Very often, climate and social policy are even played off against each other - we therefore wanted to know to what extent the two policy areas favour or, if necessary, hinder each other. For this reason, in the "Existing Plans" scenario we only calculated with the currently planned climate protection measures and flanked them in the more ambitious "Giant Leap" scenario with many other measures, primarily from the financial and social sectors. The results are clear and show how essential it is to combine ecological and social measures.

For further details on the Earth4All modeling work, please reach out to us at info@earth4all.life, and we will supply you with the corresponding technical information.

Further information on the Club of Rome and the Wuppertal Institute

The Club of Rome is a platform of diverse thought leaders who identify holistic approaches to complex global issues and promote policy initiatives and transformative action to enable humanity to emerge from multiple planetary emergencies. The organisation has prioritised five key areas of impact: Emerging New Civilisations; Planetary Emergency; Reframing Economics; Rethinking Finance; and Youth Leadership and Intergenerational Dialogues.

The **Wuppertal Institute** is an implementation-orientated research institute for sustainability and transformation research. Founded in 1991, the Wuppertal Institute's core mission is to contribute to the achievement of global sustainability goals on the basis of scientific findings. A particular focus is on transformation pathways towards a climate-friendly and resource-conserving future. To this end, the scientists develop system, target and transformation knowledge and research practical models and strategies for politics, business and society - at local level, in Germany, in Europe and around the world.

For more information see earth4all.life/germany

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Earth 4All

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Earth4All is an international initiative to accelerate the systems changes we need for an equitable future on a finite planet. Combining the best available science with new economic thinking, Earth4All was designed to identify the transformations we need to create prosperity for all. Earth4All was initiated by The Club of Rome, the Potsdam Institute for Climate Impact Research, the Stockholm Resilience Centre and the Norwegian Business School. It builds on the legacies of *The Limits to Growth* and the planetary boundaries frameworks.