



Climate Justice

OPINION



Climate Justice

OPINION

13 March 2024

Published by the German Ethics Council

Jägerstraße 22/23 · D-10117 Berlin

Phone: +49/30/20370-242 · Fax: +49/30/20370-252

Email: kontakt@ethikrat.org

www.ethikrat.org

© 2026 Deutscher Ethikrat, Berlin

Title of the original German edition: Klimagerechtigkeit

All rights reserved.

Permission to reprint is granted upon request.

English translation: Birgit Bayerlein

Layout: Torsten Kulick

Cover illustration: Markus Spiske/Unsplash.com

ACKNOWLEDGEMENTS

The creation of this Opinion has been possible through the support of many people. Angela Kallhoff, Cornelia Betsch, Jörg Tremmel, Dieter Birnbacher, Philipp Staab, Ottmar Edenhofer and Simon Caney were prepared to answer any of the German Ethic Council's questions on 23 February 2023 in a public consultation on justice and responsibility in the face of climate change. On 25 May 2023, Md Shamsuddoha, Sophie Backsen, Diarmid Campbell-Lendrum and Michael Brüggemann contributed various stakeholder perspectives on climate change in the context of another public consultation. Christian Baatz and Johannes Müller-Salo gave helpful feedback on the draft of this Opinion. The German Ethics Council cordially expresses its gratitude to all contributors for their precious input.

CONTENTS

EXECUTIVE SUMMARY	9
1 INTRODUCTION: OBJECTIVES AND DEVELOPMENT OF THIS OPINION	24
2 CURRENT SITUATION	27
2.1 The causes of climate change	27
2.2 The consequences of climate change	29
2.3 Reactions to the challenges of climate change	34
2.4 Overview of climate protection legislation	38
2.5 Attitudes towards climate change	40
2.6 Discourse on climate change	41
2.7 Foundations of climate ethics	43
3 CLIMATE CHANGE AND JUSTICE	47
3.1 Climate change as a justice issue	47
3.2 Foundations of the theory of justice	54
3.3 Dimensions of climate justice	58
3.3.1 Intra-societal justice	58
3.3.2 International justice	60
3.3.3 Intergenerational justice	62
3.4 Just procedures: Fair organisation of political dialogue	65
4 RESPONSIBILITY IN CLIMATE CHANGE	71
4.1 Freedom and responsibility	71
4.2 Multi-actor responsibility in managing climate change	75
4.2.1 The individual level	76
4.2.2 The level of private collectives	79
4.2.3 The political level of public collectives	80
4.3 Consequences for climate-friendly behaviour for different actors	82
4.3.1 Responsibility in the interaction between the actor levels	83
4.3.2 The role of technological development	88
4.3.3 Scope of required action	90

5	CONCLUSIONS AND RECOMMENDATIONS	94
	DISSENTING VOTE	101
	REFERENCES	106
	ABBREVIATIONS	118

EXECUTIVE SUMMARY

Introduction

- 1) Tackling climate change brings up serious questions about justice and responsibility. At the centre of the discussion, there are three intertwined dimensions of climate justice: an intra-societal, an international and an intergenerational dimension. Burdens and responsibilities must be shared in a fair way in these dimensions.
- 2) Beginning with a brief description of the current situation (chapter 2), the German Ethics Council in this Opinion develops a concept of climate justice, which aims to distribute the burdens and responsibilities in all three dimensions in such a way that the minimum requirements for a good, successful life will be fulfilled now and in the future (chapter 3). Based on this concept, the Ethics Council discusses the key issues regarding responsibility in climate change (chapter 4) and formulates recommendations (chapter 5).

Current situation

- 3) Climate is defined as the average of dynamic long-term processes in the earth's atmosphere, determined by means of meteorological methods, and summarises regional and global weather phenomena. There can no longer be any valid doubt that since the beginning of industrialisation, human influence has led to a global climate warming, especially through the combustion of fossil fuels.
- 4) Unabated further global warming would have catastrophic consequences. Even now, extreme weather events like torrential rains, flooding, heat waves and droughts have become increasingly frequent. The destruction of human livelihoods may lead to indirect damages like poverty, hunger and migration. Heat also threatens human health,

as does the spread of pathogens and climate-change related psychological stress.

- 5) Reactions to the challenges of climate change include measures to reduce global warming (mitigation), measures to adjust (adaptation), and technological approaches to change the climate (climate engineering).
- 6) Examples of mitigation measures are the reduction of greenhouse gas emissions in power generation, food production, the heating of buildings, traffic, industrial manufacturing and private consumption.
- 7) Adaptation strategies to climate change include changes in agriculture, robust infrastructures like dams and storm-proof power lines, or the preparation of the health system for the consequences of global warming.
- 8) Climate engineering comprises technical measures to remove CO₂ from the atmosphere in a targeted manner, and other interventions in the climate system, like the reduction of solar radiation by depositing large amounts of sulphur dioxide in the stratosphere.
- 9) Among the population, the attitudes towards measures to combat climate change are varied, and are influenced by the discourse in the media. It is the task of climate ethics to show the possibilities of responsible political and individual action in managing climate change, to work out and justify morally acceptable options for action, and thereby reduce uncertainties.

Climate change and justice

- 10) Both the causal responsibility for climate change and the dangers, damages and losses caused by it, as well as the means to cope with it, are unequally distributed. Such inequalities raise questions of justice.
- 11) Justice determines in a reasoned manner what is appropriate for individuals and groups. The central ethical problem of climate change concerns the appropriate distribution of the associated burdens and responsibilities.

- 12) The concept of climate justice advocated in this Opinion incorporates egalitarian, sufficientarian and prioritarian considerations. At the core of egalitarian theories lies the principle of equal treatment. Sufficientarian concepts focus on the minimum requirements for a good, successful life. Prioritarian approaches advocate that the most disadvantaged people should be given preference.
- 13) The German Ethics Council combines these three perspectives in the framework of a human rights approach to a *sufficientarian threshold concept of climate justice*. This means firstly that, as a principle, all human beings should have equal opportunities to lead a good, successful life (egalitarian). Secondly, nobody should fall below certain threshold values for essential basic goods or abilities, like health, food, water, safety or mobility, which must be defined as a minimum requirement for such a life (sufficientarian). Thirdly, climate protection measures should be designed in such a way that those who are most affected by climate change can reach the relevant thresholds (prioritarian).
- 14) Since tackling climate change is commanded by ethical considerations of justice and requires a comprehensive transformation at both individual and social levels, ideas of a good, successful life will in many respects not be feasible in the form of current Western consumption behaviours. At the same time, such a transformation opens up new opportunities.
- 15) The concept of climate justice introduced above leads to ethical consequences in at least three dimensions: in view of different population groups within a society, of people in different countries and world regions, and of current and future generations.
- 16) Within society, different groups of people suffer more or less severely from the damages and burdens due to climate change and the measures to contain it, also in Germany. Especially people with limited financial means

are hit particularly hard. This is why it is necessary to prevent an aggravation of social disruptions and conflicts, and to distribute burdens in such a way that the requirements for a good, successful life are fulfilled for everyone. As a consequence, climate protection measures must be examined in particular with regard to their reasonableness for those who are not so well-off, and effective compensatory as well as support measures are required to ensure that relevant threshold values can be met.

- 17) At an international level, the long history of colonialism and industrialisation must be taken into account, as well as ongoing neo-colonial dependencies. Contributions to global warming, climate damages and the possibilities to protect oneself from them are geographically unevenly distributed. Therefore, a distinction must be made between growth in countries of the Global South that are catching up on development, and further growth of consumption and resource use in industrialised countries, and appropriate compensatory payments must be negotiated. People from all countries deserve equal opportunities to lead a good, successful life, and must be able to achieve corresponding threshold values. Again, those who are furthest away from achieving this should be favoured first.
- 18) From an intergenerational perspective, young people and people who are not yet born will have to bear the major burdens of a changed world climate and the measures required to deal with it. Therefore, it is imperative to take all necessary and reasonable measures today in order to prevent that future generations can no longer achieve the minimum requirements for a good, successful life. At the same time, all solutions under consideration must leave future generations sufficient scope for decisions and actions, and must not impose lasting disproportionate burdens on them.

- 19) With regard to all three dimensions, the path to more climate justice is characterised by considerable conflicts. This is why procedurally just dialogue processes are indispensable.
- 20) Within our society, the established normative principles and procedures of the liberal-democratic order apply. They require an open and equitable agreement between all those affected and all those in charge. Suitable institutions and procedures must be (further) developed. This presupposes fair access and participation opportunities to the public political discourse on climate justice, and a transparent comparison of different arguments and options for action.
- 21) Internationally, a procedurally just debate on issues of climate justice requires better dialogue and closer cooperation. Sustainable political decisions may only be negotiated in fair, multilateral processes and must be laid down in contractual agreements. In the longer term, the establishment and extension of international institutions ensuring fair political decision-making procedures in climate issues seems indispensable in order to consolidate such communication processes.
- 22) With regard to the intergenerational dimension, it is necessary to appropriately take into account the interests of younger and future generations. In this context, ideas under discussion are a stronger involvement of young people in political processes, and ways to represent and advocate for future generations in today's negotiation processes.

Responsibility in climate change

- 23) Responsibility presupposes freedom, and freedom includes responsibility. This principle also applies for climate change; it is crucial for our free and democratic society and safeguarded and guaranteed by law. Social coexistence requires mutual restrictions of freedom, in order to provide equitable freedom for all.

- 24) The inner and rationally guided realisation of the necessity for action leads to self-commitment as an expression of one's individual freedom. This may imply that people question their former lifestyle or adapt their behaviour, for example by voluntarily abandoning certain vacation, consumption or mobility practices.
- 25) On grounds of justice, it can be morally required to contribute to measures to tackle climate change. If one's own exercise of freedom interferes in an unjust manner with the freedom and welfare of others or of future generations, for example through consumption that is harmful to the climate, the state may intervene with restrictions of freedom. As long as there is no regulatory obligation, it is left up to the individual to accept a moral obligation to cooperate.
- 26) Responsibilities and obligations to cooperate are inter-linked on different stakeholder levels that comprise actors with different structures and specific roles. The fulfilment of individual moral obligations to cooperate, such as the change in individual mobility behaviour, is facilitated and, in some cases, only made possible by conductive framework conditions. Creating such conditions is largely subject of state regulation, but also requires private organisations such as companies to assume responsibility. In order to avoid a diffusion of responsibility, it is necessary to clearly attribute responsibilities in a well-founded concept of multi-actor responsibility.
- 27) Individual responsibility is often at the centre of the climate debate. However, it would be inappropriate to expect that climate change could be tackled by the efforts of individuals alone. The state cannot oblige people to lifestyle and consumption behaviours causing lower emissions unless the economic and social order provides suitable conditions for it.
- 28) Nevertheless, it is true that the responsibility to protect the climate partly lies with individuals and their

consumption decisions, at least within the scope of individual levels of freedom and the availability of reasonable lower-emission alternatives. Individual contributions may be small, but they remain morally relevant. Insofar as they become a habit and routine in the behaviour of many individuals, they promote the emergence and development of a culture of assumed responsibility. Individual responsibility can also be assumed by contributing to democratic decision-making and opinion-forming.

- 29) At the level of non-governmental or private organisations, companies in particular have a moral responsibility to enable individuals to develop climate-friendly consumption behaviours. According to the ability-to-pay principle, especially large multinationals are obliged to contribute. The companies' moral obligation to cooperate must not burden them excessively. Rules of competition and framework conditions for economic activities should be designed in a way to promote, and not impede, climate justice, at least at the national level.
- 30) At the political level, the task is to provide the social conditions and the legal framework so that behaviours that cause lower emissions are possible without unreasonable personal or entrepreneurial encumbrances, and so that burdens are distributed fairly. Measures must be effective, necessary and proportionate, and be democratically legitimised. Moreover, they should be structured in a foresightful manner, so that individuals and private organisations can brace themselves for them, and planning security for companies is ensured, for example.
- 31) Given the global dimension of climate change, an effective global strategy that goes beyond existing international agreements is urgently needed. Germany must, via supranational agreements, integrate as many countries as possible into the efforts for climate protection, and must let itself be integrated, too. The state has a significant responsibility to foster global agreement on more climate justice

and to achieve binding global conventions with effective reduction targets, which will in fact be implemented.

- 32) There are currently considerable obstacles at all levels to the equitable fulfilment of climate responsibility. In view of the considerable risks posed by climate change, the German Ethics Council considers it the duty of state actors to make vigorous efforts, even if it is uncertain whether ambitious targets to limit global warming can actually be achieved. Considering the extremely serious consequences of unabated global warming, it would be downright irresponsible to refrain from taking national and European climate protection measures simply because a worldwide implementation of such measures does not yet seem to be guaranteed. Moreover, efforts to reach more effective international climate protection agreements would not be politically credible without making efforts at the national or European level at the same time.
- 33) Germany can assume international responsibility particularly in the field of technological development, both at state and business level. In doing so, the mitigation of greenhouse gases and a more precautionary approach regarding adaptation to climate change must be at the core of long-term climate-friendly and just development. At the same time, the development of technologies to achieve “negative emissions” must be fostered, among them techniques for carbon capture and storage. However, such technologies may not be misused to relax emission reduction efforts, since otherwise a vicious circle of increasing emissions and increased need for carbon capture would be triggered.
- 34) From the considerations detailed above ensues the responsibility to scrutinise climate-relevant framework conditions for politics, business and technology – both nationally and globally – from an ethical justice perspective, and to develop alternatives. With regard to the current economic system based on competition

and quantitative growth, industrialised countries are faced with far-reaching questions about a fundamental transformation.

- 35) An open debate in society is necessary in order to discuss the required balancing of interests, and to make the purpose of corresponding measures clear and transparent. Actors at all levels jointly bear the responsibility to make such a transformation towards a sustainable and climate-neutral society a key issue, and to develop alternatives for a good, successful life without further growth in consumption and exhaustion of resources.
- 36) When it comes to reaching agreement on political measures, communication across society is particularly important, especially in the media and in politics. All actors with communicative reach in society bear responsibility for factual and transparent reporting and a differentiated presentation of different positions.
- 37) Demands to suspend democratic freedoms and processes in order to impose the measures required for lower-emission activities in a technocratic or ecoauthoritarian manner must be firmly rejected. Nevertheless, on all levels mentioned above, the responsibility arises to reflect on the further development of current institutions and processes of democratic opinion-forming, given the challenges of climate change.

Conclusions and recommendations

- 38) Responses to the challenges posed by climate change must adequately take into account the interests, concerns and abilities of all human beings living today, as well as of future generations. This is why in this Opinion, the German Ethics Council has developed a concept of climate justice, which aims to distribute burdens and duties in such a way that the minimum requirements for a good, successful life can be achieved for all human beings now and in the future.

39) On the basis of the considerations detailed above, the German Ethics Council recommends:

1. The challenges and opportunities of the socio-ecological transformation that is required to tackle climate change should be discussed more clearly in public, in politics and across society. In these discussions, climate justice and responsibility should take centre stage. Political parties, civil society, media and science should consider and develop perspectives for a good, successful life in a sustainable and climate-neutral society without further growth of consumption and exhaustion of resources.
2. Material and immaterial costs to implement climate protection measures should be defined as precisely as possible, communicated in a transparent manner and distributed equitably and responsibly, within society as well as internationally and intergenerationally. This process should be guided by threshold values for important basic goods and capabilities as minimum requirements for a good, successful life, and prioritise the needs of people whose provision does not reach certain threshold levels.
3. Climate protection measures should be interconnected in an overall political concept which includes changes in the energy sector, the promotion of low-emission technologies, the reduction of climate-damaging subsidies, regulations to reduce emissions and corresponding economic incentives, far-sighted measures to adapt to the inevitable consequences of climate change and the development and testing of technologies to capture carbon from the earth's atmosphere. For every decision on technical measures, possible new path dependencies at

the expense of future generations must be avoided, for example if they are burdened with maintaining a global economy for carbon capture in the long term.

4. At a national level, care must be taken to quickly and effectively fulfil the commitments undertaken by Germany in the Paris Agreement. This can best be done by expanding and intensifying carbon pricing on products and services. In doing so, justice within society must be ensured, e.g. by means of the compensatory effect of a general per-capita refund from carbon pricing to all residents. Moreover, it must be ensured that attractive climate-friendly alternatives are available. In addition, regulatory instruments like disproportionately high pricing on particularly climate-damaging products or services must be considered in order to make these less attractive for wealthy persons, too.
5. The fair distribution of responsibilities for these and other climate protection measures is mainly a task for the state. In order to fulfil this task, companies and other private organisations must be more strongly obliged, too, and be supported through appropriate framework conditions. The widespread focus to date on the personal responsibility of individual persons does not do justice to the problem. Individual freedom of choice is always influenced by the collective action of many, and strongly determined by political framework conditions. This is why clear legal regulations are required to make it easier for individuals to behave in a climate-friendly way. It is inappropriate for state actors to expect climate-friendly consumption from individuals as long as the conditions for such behaviour are largely unfulfilled or even thwarted within the economic

and social order desired and supported by the same state, so that lower-emission choices still require a kind of “moral heroism” in many respects. Moral criticism of private lifestyle and consumption decisions is no substitute for necessary political measures.

6. The legitimate expectation of policymakers to create more effective framework conditions for climate protection does not, however, release individuals from their personal moral obligation to cooperate. Everyone has a moral responsibility to contribute to the fulfilment of social responsibilities. This includes a reconsideration of one’s personal conduct, way of life, and civic engagement with regard to the challenges of climate change and the ways to deal with it, and to change them accordingly, as far as possible and reasonable – irrespective of regulatory standards.
7. The debate on fair ways to deal with climate change and its consequences must be pursued in a framework of open societal discourses. In this process, fair access and participation opportunities must be ensured, as well as transparent consideration of different pieces of information, arguments and options for action. Taking binding decisions must be reserved for the democratically legitimised bodies intended for this purpose, especially the parliaments. Scientific expert committees and extra-parliamentary civic engagement are part of the public discourse in a liberal parliamentary democracy; however, they cannot replace democratic decision-making. A potential destabilisation of democracy must be counteracted at all levels. Individual commitment and protests must abide by democratic rules, too.

8. Media and politics bear a particular responsibility to facilitate and lead a constructive, solution-oriented discourse on climate change. A credible discussion about realistic solutions to climate change requires fact-based reporting that neither glosses over nor exaggerates problems, and offers appropriate space for the range of positions found in society and science. Doubts that are barely substantiated by facts, evasive strategies or pseudo-solutions should not receive too much attention. Exaggerated alarmism or a one-sided focus on problems should both be avoided. In view of the great challenges of a socio-ecological transformation, the expected positive aspects should also be sufficiently highlighted.
9. Given the various health hazards of climate change that can be observed even today – also in Germany – and which are expected to increase, the health sector has a particular responsibility to respond to these challenges and to implement protective measures. Legislators should change the rules and distribution of resources in the healthcare system in such a way that special attention is paid to climate adaptation issues in the regulation, control and organisation of the healthcare system.
10. Climate change and its consequences cannot be tackled at the national level alone. Especially at an international level, global warming must be addressed more effectively. Decisions on an internationally just distribution of burdens arising from climate change and the measures to deal with it require an intensification of intergovernmental understanding and cooperation. Therefore, Germany should give high priority to further increasing its current efforts in order to achieve effective global agreements to limit global

warming and to set binding reduction targets whose implementation is guaranteed by the nation states. In order to achieve this, all diplomatic possibilities must be deployed and agreements made within alliances of states like the EU and G20, as well as other multi-national agreements as intermediate steps. Particular emphasis should be given to mechanisms for the effective implementation of the adopted measures.

11. Wealthy industrial states must support countries of the Global South in financing the necessary investments to reduce emissions and adapt to climate change. The support payments that have already been promised must be actually paid, used for efficient measures in the recipient countries, supported by transfer of technologies and through fair trade relations, and their climate-protecting effect independently verified.
12. It is to be expected that some states will try to refrain from making their own contribution to climate protection for as long as possible, in order to benefit from the efforts of others. This free rider problem should be countered by broad international cooperation involving as many countries as possible, in order to keep the costs and risks for all participants within reasonable limits, even if not all actors are prepared to make their contribution right from the start.
13. For reasons of intergenerational justice, the necessary steps to contain climate change and to adapt to its consequences must be taken as soon as possible. Given the serious effects on the livelihoods of younger and future generations, there is no ethical justification for waiting, stalling or delaying. The perspectives and interests of young people and future

generations should be given more weight in political opinion-forming and decision-making on measures to tackle climate change. Appropriate instruments that politically implement and institutionalise the consideration of these perspectives and interests must be developed and expanded further.

1 INTRODUCTION: OBJECTIVES AND DEVELOPMENT OF THIS OPINION

Tackling climate change and its consequences is one of the greatest tasks for humankind, now and in the future. It is not only linked to enormous scientific, technological, social and political challenges, but also to difficult ethical problems, especially questions of justice and responsibility. The German Ethics Council intends to contribute to this debate for several reasons.

Pursuant to Article 2 paragraph 2 of the Paris Agreement on Climate Change of 2015, the agreed arrangements for a global reaction on climate change “reflect equity and the principle of common but differentiated responsibilities and respective capabilities, in the light of different national circumstances”.¹ However, it is difficult to implement this principle of justice, and many people are disappointed by the results that have been achieved so far. Among other things, this is due to different views – often unvoiced – on the ethical principles underlying various options in climate policy. These principles require explicit consideration.

The urgency of questions of climate justice has become clear to the German Ethics Council through its exchanges with other European Ethics Councils² and on the occasion of its autumn conference with school pupils in September 2022, where the latter emphatically requested the Ethics Council to deal with the issue.³ The decision by the German Federal Constitutional Court of 24 March 2021 on climate protection⁴ also underlines the necessity to provide an ethical basis for just climate policy. According to this decision, climate protection

1 Official German translation: BGBl. II 2016, p. 1082 (1085).

2 Cf. Österreichische Bioethikkommission (2022); Swedish National Council on Medical Ethics (2023); Nuffield Council on Bioethics (2023).

3 Further information at <https://www.ethikrat.org/weitere-veranstaltungen/triff-den-ethikrat-unser-leben-in-der-pandemie> [2024-01-16].

4 Decision by the First Senate of 24 March 2021 - 1 BvR 2656/18 (BVerfGE 157, 30).

measures must be reasonably distributed with regard to future generations. The Federal Constitutional Court defines minimum requirements for the political implementation without prescribing in detail the legislator's tasks. Particularly, it does not specifically lay down how the burdens between current and future generations must be balanced. This leaves scope for ethically deliberated political decisions which also take into account the socio-political challenges of climate protection.⁵

In its considerations on the topic of climate justice and the results of two public hearings⁶, the German Ethics Council identifies three central dimensions: firstly, justice between social groups within a society (intra-societal), secondly justice between countries (international), and thirdly justice between generations (intergenerational). Dealing with the challenges of climate change in a fair manner means striving to distribute the burdens and responsibilities in all three intertwined dimensions as justly as possible. To this purpose, the German Ethics Council develops proposals in this Opinion that take into account different understandings of justice and climate ethical arguments, as well as existing inequalities, injustices and responsibilities with regard to the most important implementation issues. These proposals are not intended to pre-empt specific decisions and measures in climate policy, but first and foremost to contribute to clarifying their normative foundations.

In chapter 2, this Opinion summarises relevant factual foundations of the debate on climate change, including scientific facts, attitudes among the population, problems of the public discourse, approaches and topics in climate ethics, as well as relevant legal framework conditions. In chapter 3,

⁵ Cf. Bohnenberger (2022); Rixen and Welskop-Deffaa (2023); Rixen (2023).

⁶ In February and in May 2023, the members of the German Ethics Council discussed questions of justice and responsibility when tackling climate change with experts from the normative and social sciences, as well as with people representing various stakeholder perspectives. Further information at <https://www.ethikrat.org/themen/aktuelle-ethikratthemen/klimaethik> [2024-01-16].

central issues of justice in the three dimensions mentioned above are considered and a concept of climate justice is developed which aims to distribute burdens and duties in such a way that the minimum requirements for a good, successful life can be achieved for all human beings now and in the future. Taking up these issues, key questions of responsibility in the context of climate change are discussed in chapter 4. On this basis, recommendations are formulated in chapter 5.

The German Ethics Council presupposes two basic ethical convictions. Firstly, it assumes an enlightened anthropocentrism, that recognises people as responsible for the prudent use of natural resources and living conditions.⁷ Such treatment and use is motivated by a well-understood interest in a sustainable development and future of humankind, but acknowledges the interconnectedness of human and planetary well-being. Secondly, the German Ethics Council is convinced that even crisis management must always respect the forms and use the means of parliamentary democracy. It highlights the necessity to strengthen democratic negotiation processes in a crisis, and to find ways to communicate constructively about the challenges of dealing with climate change.

It is generally known and has been illustrated many times how the sometimes bleak scenarios of a climate crisis could be averted. According to general appraisal, this requires a social-ecological transformation, which also opens up new opportunities for a good, fulfilling life.⁸ However, such a transformation can only be achieved if the corresponding measures are socially accepted. This will not be possible unless the burdens and responsibilities are more justly distributed. To this purpose, questions of intra-societal, international and intergenerational climate justice must be considered more systematically in the future, including their interconnectedness.

7 Cf. Grunwald and Kopfmüller (2022).

8 Cf. WBGU (2018); Sachverständigenrat für Umweltfragen (2021); IPCC (2022b).

2 CURRENT SITUATION

2.1 The causes of climate change

Climate is defined as the average of dynamic long-term processes in the earth's atmosphere, determined by means of meteorological methods. It comprises weather phenomena on a regional and global scale. The resulting temperature is based on the interaction of a large number of diverse factors: The sun's rays hit the earth's surface and warm up the soil, which then emits thermal radiation. The earth's atmosphere does not only consist of nitrogen and oxygen, but also contains trace gases like water vapour, carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O), which reflect this thermal radiation like a greenhouse film, in spite of their very low concentrations. These so-called greenhouse gases contribute to the global average temperature of approx. +15 °C (degrees centigrade) and thus make life on earth possible – without the earth's atmosphere, the average temperature would reach -19 °C. This is referred to as the natural greenhouse effect.

For roughly the last 10,000 years the CO₂ concentration in the earth's atmosphere lay almost consistently at 280 ppm⁹. Through the combustion of fossil fuels and the destruction of forests and moors, among other factors, it has increased by 50 percent since the beginning of industrialisation (about 1750) to 421 ppm in December 2023.¹⁰ The increase in the CO₂ concentration to levels, that have not been reached for at least two million years is leading to a global warming called anthropogenic climate change, which will affect the earth for thousands of years.¹¹ Warnings of this global warming as a consequence of

9 280 ppm (parts per million) means 280 CO₂ molecules in one million air molecules, i.e. a molar concentration of 0.028 percent.

10 Cf. Siegert et al. (2020); IPCC (2021) 4 (A.1.1). For current figures, go to <https://gml.noaa.gov/ccgg/trends/global.html> [2024-01-11].

11 Cf. Gammon et al. (1985) 27 f. (fig. 3.1); IPCC (2021) 8 (A.2.1), 21 (B.5).

burning coal were already voiced more than 100 years ago.¹² It has been scientifically proved that the increase in the CO₂ concentration in the earth's atmosphere is for the most part due to the combustion of fossil fuels. The drastic thinning of the radioactive isotope of carbon ¹⁴C in the earth's atmosphere can only be explained by the accumulation of atmospheric carbon through the combustion of coal, oil and gas, whose ¹⁴C isotopes have mainly decayed during the long-term underground storage (so-called Suess effect).¹³ In addition, the concentration of other greenhouse gases in the earth's atmosphere is also increasing. The concentration of methane, for example, has increased to 2.6 times the levels of the pre-industrial era, and continues to accelerate. Main drivers for this development are the natural gas industry and cattle farming.¹⁴

Calculations of the Intergovernmental Panel on Climate Change (IPCC), which serves as the scientific reference committee, have shown an increase of +1.07 °C (range: 0.8 °C to 1.3 °C) in the anthropogenic global warming since 1850.¹⁵ In contrast, the change of the global surface temperature caused by natural factors only figures between -0.1 °C and +0.1 °C.¹⁶ According to current scientific knowledge, there can therefore be no reasonable doubt that today's global warming is almost exclusively man-made.¹⁷

Global annual greenhouse gas emissions continue to rise and amounted to over 37 billion tons of CO₂ annually in 2022.

12 "The furnaces of the world are now burning about 2,000,000,000 tons of coal a year. When this is burned, uniting with oxygen, it adds about 7,000,000,000 tons of carbon dioxide to the atmosphere yearly. This tends to make the air a more effective blanket for the earth and to raise its temperature. The effect may be considerable in a few centuries." Initially published in *The Rodney & Otamatea Times, Waitemata & Kaipara Gazette*, of 14 August 1912, p. 7.

13 Cf. Graven et al. (2020).

14 Cf. NOAA (2022); Scholtz et al. (2020).

15 Apart from global warming caused by the additional greenhouse gases in the earth's atmosphere, also cooling effects, mainly due to man-made aerosols and chlorofluorocarbons (CFCs), have been taken into account in the calculation.

16 Cf. IPCC (2021) 5 (A.1.3).

17 Cf. Rahmstorf and Schellnhuber (2019).

77 percent of these can be attributed to the G20 states, and 8 percent to the EU states. Currently, German emissions amount to 650 million tons of CO₂ per year, corresponding to approx. eight tons of CO₂ per person. Due to the decline of emissions in Germany and the simultaneous increase in other parts of the world, Germany has a share of 1.8 percent in global emissions (down from 17 percent around 1900).¹⁸ With emissions of approx. 94 billion tons of CO₂ due to its industrialisation from around 1750, Germany has contributed substantially to total global CO₂ emissions up until today, i.e. 5.3 percent. From a historical perspective, Germany is therefore the fourth largest emitter of CO₂ after the United States, China and Russia in view of the absolute amount of emissions caused since 1750, in spite of its comparatively small population.¹⁹ The EU's share in global CO₂ emissions amounted to 22 percent until 2020 – almost the same amount as all of Africa, Latin America and East Asia (except China) together, accounting for 25 percent.²⁰ In addition, emissions for the production and transport of imported and exported goods must be taken into account. Since many goods that are in demand in industrialised countries are produced in other regions of the world, emissions are “outsourced”. In China, for example, roughly one third of CO₂ emissions can be attributed to the production of export goods.²¹

2.2 The consequences of climate change

Since it is difficult to forecast climatic developments, the IPCC has developed various scenarios which are the result of different assumptions regarding the future progression of global greenhouse gas emissions. All scenarios depict an increase of

18 Cf. Global Carbon Budget (2023a).

19 Cf. Global Carbon Budget (2023b).

20 Cf. Chancel et al. (2021) 117 (fig. 6.2).

21 Cf. Weber et al. (2008).

the average global temperature for the year 2100 compared to pre-industrial times.

This increase is caused by the increased greenhouse effect as well as by further, non-linear consequences. The rise in temperature that is forecast for the years 2081 to 2100, compared to 1850 to 1900, ranges from +1.4 °C if net zero emissions can be achieved by 2050, to +4.4 °C if emissions continue to increase in the long term.²² There has been no comparably fast increase in the past 10,000 years.²³

In addition, the risk of possible sudden climatic changes through non-linear processes (including tipping points) must be considered, the specific probability of occurrence and consequences of which are subject to a variety of interactions and feedback loops due to the complexity of the climate system and are therefore difficult to determine precisely.²⁴ Even at current levels of global warming it seems possible that tipping points will be reached in the subpolar circulation of the northern Atlantic (Gulf Stream)²⁵, for the thawing of permafrost soils where large amounts of methane are released, and in the shrinkage of the Greenland and West Antarctic ice sheets. With further warming, more systems could tip and mutually destabilise each other, thus making tipping cascades a possibility.²⁶

The specific consequences for people can vary considerably, depending on the region, the social situation and the incidental exposure to extreme events. Although the rise in temperature in comparison to pre-industrial times is “only” approx. 1.1 °C so far, sometimes catastrophic consequences are perceptible even now, and will become more intense by the

22 Cf. IPCC (2021) 14 (B.1.1, Tab. SPM.1). In the period from 2011 to 2020, the global surface temperature was already 1.09 [0.95–1.20] °C higher than in the period from 1850 to 1900, with the increase being more distinct over land (1.59 [1.34–1.83] °C) than over the oceans (0.88 [0.68–1.01] °C). Cf. IPCC (2021) 5 (A.1.2).

23 Cf. Umweltbundesamt (2013).

24 Cf. IPCC (2021); Umweltbundesamt (2008).

25 Cf. Piecuch and Beal (2023).

26 Cf. Lenton, Armstrong McKay, et al. (2023).

year 2100, even assuming a fictitious immediate halt to emissions²⁷: Extreme weather events like torrential rain, flooding and heat waves, but also droughts, aridification, water shortages and ensuing crop failures and forest fires are more and more frequent, also in Germany, and lead to ever larger landscape changes, losses and damages.²⁸ The extinction of many animal and plant species due to land use changes, environmental pollution, hunting and overfishing will be accelerated through climate change, because it destroys their living conditions and favours the introduction and expansion of invasive species.²⁹ For example, it is feared that through climate change, the red fire ant will quickly spread all over Europe and cause crop failures, with damages amounting to billions.³⁰

The harm done to human livelihoods through climate change may result in further indirect damages. These might range from malnutrition to hindrance of school education.³¹ The increasing number of natural disasters and crop failures as a consequence of global warming will probably drive many millions of people into poverty or force them to flee.³² Although the long-term well-being of humanity depends on numerous factors and risks, and although the total number of people living in poverty might possibly even decline due to overall increasing incomes³³, the *additional* risks of poverty and refugee movements caused by climate change as calculated by the IPCC³⁴ should not be neglected.

27 This is due to the rapid degradation and thereby cooling effect of combustion aerosols, which will be rapidly washed out by the rain in case of a fictive halt to combustion, whereas the emitted CO₂ remains in the earth's atmosphere for many decades and "captures" the sun's heat. Cf. Dvorak et al. (2022).

28 Cf. IPCC (2023) 46 ff.; (2019); Rahmstorf and Schellnhuber (2019); Otto (2019).

29 Cf. IPBES (2023) XVIII (KM-B3).

30 Cf. Menchetti et al. (2023).

31 Cf. Shamsuddoha and Javed (2022).

32 Cf. Piguet et al. (2011); Llain Arenilla and Hawkins Rada (2020).

33 Cf. O'Neill 2023.

34 Cf. IPCC (2018) chap. 3; (2022a).

Climate change involves dramatic consequences for human health, too, and increases multiple vulnerabilities.³⁵ Risks arise primarily from heat, whereby heat regulation of living beings (e.g. through sweating and breathing) not only depends on the temperature, but also on humidity, solar radiation and wind speed. The so-called wet-bulb temperature is the lowest temperature that can be achieved through direct evaporative cooling in a given environment. If this temperature exceeds 35 °C for extended periods of time, mammals are no longer able to regulate their core body temperature, which can then rise to dangerous levels and lead to heat death. In the long term, unabated global warming might lead to survival in some regions of the earth only being possible with artificial air-conditioning.³⁶ Apart from the heat, there are other health hazards due to climate change, like carriers of tropical diseases spreading in Europe and Germany, for example.³⁷

In addition, climate change has short-term and long-term effects on mental health. These might appear directly as stress disorders after extreme weather events, for example, or indirectly as a consequence of the impairment of economic or social activities. Moreover, even the mere awareness of the threat posed by climate change can cause psychological stress. The health of people with pre-existing mental illnesses and of members of specific demographic groups like migrants, refugees, children and adolescents, for example, are affected particularly severely. Measurable consequences range from intensified anxiety, grief or anger, to an increase of depression and suicidal tendencies.³⁸ As a consequence, increased burdens for health systems will arise, too.³⁹

In the climate debate, the irretrievable loss of livelihoods, cultural artefacts or biological species is distinguished from

35 Cf. Bolte et al. (2023).

36 Cf. Sherwood and Huber (2010).

37 Cf. Watts et al. (2019).

38 Cf. Doherty and Clayton (2011).

39 Cf. Kahlenborn et al. (2021); Adrian et al. (2023).

damages that are theoretically reversible and remediable (e.g. with money). The extent of such losses and damages depends on the amount of future greenhouse gas emissions. The higher the rise in temperature, the more intense and frequent will be the occurrence of extreme heat, torrential rains and droughts, and the greater will be the ensuing losses and damages.

Extremes in temperature, for example, that occurred on average once in fifty years in a climate without human influence, will occur 8.6 times in fifty years with an intensity increased by 2 °C if global warming increases by 1.5 °C, and even 39.2 times in fifty years with an intensity increased by 5.3 °C if global warming increases by 4 °C.⁴⁰ Worldwide, people are exposed to extreme heat on twice as many days today than in the period from 1986 until 2005.⁴¹ The number of heat-related deaths of persons over 65 years of age was 85 percent higher in 2022 compared to the period from 1991 to 2000.⁴² A one-day heavy rainfall event that occurred statistically once in ten years in a climate without human influence, will probably occur 1.5 times in ten years with a 10.5 percent higher precipitation amount if global warming increases by 1.5 °C, and probably 2.7 times and with a 30.2 percent higher precipitation amount if global warming increases by 4 °C. An aggravation of droughts is also to be expected.⁴³

Many changes caused by greenhouse gas emissions are irreversible for centuries or millennia. This applies to changes in the oceans, the ice sheets and the global sea level.⁴⁴ All over the world, people currently live almost exclusively in annual average temperatures ranging from 0 °C to 29 °C – a temperature range referred to as human climate niche. In the year 1980, only 0.3 percent of the world population lived in areas of extreme heat, i.e. an annual average temperature of over 29 °C.

40 Cf. IPCC (2021) 15 (B.2.2), 18 (fig. SPM.6).

41 Cf. Romanello et al. (2023) 2358.

42 Cf. Romanello et al. (2023) 2360.

43 Cf. IPCC (2021) 15 (B.2.2), 18 (fig. SPM.6).

44 Cf. IPCC (2021) 21 (B.5).

Global warming and demographic development so far have led to the situation that today 9 percent of the global population have to live in areas with such extreme heat. For the scenario of temperatures approx. 2.7 °C higher compared to pre-industrial levels, calculations predict that by the year 2100 one in three people would have to live in a place with extreme heat, which would increase migration and refugee movements.⁴⁵

2.3 Reactions to the challenges of climate change

In the year 2015, 195 countries and the EU adopted the Paris Agreement. It intends to reduce global emissions to the extent that global warming will be restricted to less than +2 °C or even less than +1.5 °C, if possible (Article 2 (1) (a)).⁴⁶ In order to achieve this target, global CO₂ emissions would need to be reduced to net zero by the year 2040.⁴⁷

For the effect of future emissions, the following rules apply: Every additional ton of greenhouse gas emissions causes a slight additional global warming. Since also the expected negative consequences and the ensuing financial losses and damages caused by climate change will increase with every rise in global warming,⁴⁸ the latter may be quantified in proportion to every additional ton of CO₂ emitted. However, such an estimate depends on a large number of conditions. Provided that the consequences for current and future generations are given

45 Such a scenario is not considered improbable, unless the climate protection measures agreed so far will be significantly reinforced. Cf. Lenton, Xu, et al. (2023).

46 This strategy was recommended as early as 2003 by the German Federal Government's Advisory Council on Global Change (Wissenschaftlicher Beirat der Bundesregierung Globale Umweltveränderungen). Cf. WBGU (2003).

47 Only if emissions of other greenhouse gases are roughly halved at the same time, will the date for net-zero CO₂ emissions required for a probable achievement of the 1.5 °C target be postponed to 2055. Cf. IPCC (2018) 6 (fig. SPM.1).

48 Cf. IPCC (2023) 14 (B.2).

equal weight, the Federal Environment Office (Umweltbundesamt) assessed the losses and damages in the year 2020 at 680 euro per ton of CO₂.⁴⁹ More recent studies additionally take into account interactions between the economy and extreme climate, and therefore estimate the costs resulting from one additional ton of CO₂ at over 3,000 US dollar. They fear that as a consequence of the damages due to climate-induced natural disasters, the global gross national product may shrink by a third on average by the end of the century.⁵⁰ As a conclusion from the projected losses and damages, the IPCC deems a rapid limitation of greenhouse gas emissions necessary. The question of which global warming scenario with its respective losses and damages will occur will depend on the pace of the reduction to net zero emissions.

When reacting to the challenges of climate change it is necessary to distinguish between measures to reduce global warming (mitigation) and measures to adjust to climate change (adaptation). Examples of mitigation measures are the reduction of greenhouse gas emissions in power generation, food production, the heating of buildings, traffic and industrial manufacturing. People with the average German consumption pattern could reduce their personal emissions roughly by half through behaviour modification.⁵¹ Further great potential for savings exist in industry and infrastructure, e.g. by investing in more climate-friendly processes or products in the construction sector, in traffic etc. However, these cannot be implemented through individual decisions, or only in a very restricted manner. This is why, apart from voluntary contributions, especially technical changes (e.g. more renewable energy production with more efficient installations for the storage and transport of electricity, e-mobility, heat pumps

49 Cf. Matthey and Bünger (2020).

50 Cf. Kikstra et al. (2021).

51 Cf. the seven “Big Points” of the Competence Centre for Sustainable Consumption (Kompetenzzentrum Nachhaltiger Konsum) at <https://nachhaltigerkonsum.info/service/bigpoints> [2024-01-16], for example.

etc.), positive incentives (reduction of VAT on climate-neutral products, low-priced public transport, subsidies), negative incentives (e.g. taxes, charges and reduction of subsidies for climate-damaging procedures) and further regulatory measures like a speed limit are being discussed.

Carbon pricing on products and services which is calculated by including it in or pegging it to emissions trading with CO₂ certificates (with maximum or minimum limits for better planning, if necessary) may lead to an effective reduction of greenhouse gas emissions.⁵² However, undifferentiated carbon pricing can cause social tensions, because although wealthy people with generally higher emissions will pay higher levies overall, their greater financial leeway means they will be less compelled to change their lifestyle than less well-off people.⁵³ In order to prevent this, carbon prices per ton could increase exponentially with the amount of personal emissions, for example. Alternatively, carbon pricing might be coupled to a per-capita-refund, which will be paid in equal shares to all inhabitants (including children). Such a design would also give people more freedom of choice than subsidising specific technologies. For example, people who do not want to own a car do not benefit from subsidies for electric cars.

Additional regulatory instruments are under consideration, because the steering effect of carbon pricing is limited for people who can afford even considerable surcharges for very high emissions. These include strict maximum limits for emissions, or a ban on particularly climate-damaging products or services. Limiting extremely high carbon emissions by people with high energy consumption and high household income in these ways could make it easier to fulfil the basic needs of the most disadvantaged people in society in spite of strict

52 Cf. Green (2021).

53 Cf. Tank (2020).

reduction targets. Moreover, such a limitation could increase public acceptance for carbon pricing overall.⁵⁴

At the same time, given the global warming that has already occurred and that must further be expected even under optimistic scenarios, adaptation to climate change in order to strengthen resilience against the consequences of climate change becomes increasingly urgent. However, adaptation strategies for endangered regions, population groups and economic sectors differ considerably. They include, for example, the modification of agricultural practices (choice of crop species, irrigation, cultivation systems) in order to withstand altered climatic conditions, the expansion of robust infrastructures like dams, dykes or storm-proof power lines, the implementation of early warning systems for severe weather, as well as the preparation of the public health system for the various consequences of climate change on human health. An example are the maps on torrential rain threats which have recently been established by local authorities to develop efficient urban planning precautions against extraordinary rainfall events.

Besides mitigation and adaptation, climate engineering⁵⁵ has been attracting increasing attention for around 15 years. It deals with technical measures to remove CO₂ from the atmosphere in a targeted manner, and other technical interventions in the climate system. These include the charring of biomass⁵⁶, ocean-based methods⁵⁷ and the technical capture of CO₂ from the air and its long-term storage (CCS: carbon capture and storage, CDR: carbon dioxide removal). Further geoengineering or climate engineering are also being discussed, e.g. the reduction of solar radiation (solar radiation management) by depositing large amounts of sulphur dioxide in the

54 Cf. Büchs et al. (2023).

55 Cf. Caviezel and Revermann (2014).

56 Charring biomass from water hyacinths of African lakes, for example, is one of the cheapest methods to reduce greenhouse gas emissions. Further information at <https://char2cool.org> [2024-01-11].

57 Cf. Kim et al. (2023).

stratosphere by means of airplanes.⁵⁸ This would lead to the creation of stratospheric clouds of sulfate aerosols that reflect incident sunlight, like after the eruption of a volcano.

2.4 Overview of climate protection legislation

Currently, regulations are in place at different levels to deal with the challenges of climate change. The fulfilment of the obligations under the Paris Agreement is regulated in the EU Climate Protection Regulation of 2018⁵⁹ by means of binding national annual targets for reducing European greenhouse gas emissions in the time from 2021 until 2030. The German Federal Climate Change Act (Bundes-Klimaschutzgesetz) of 2019⁶⁰ set out corresponding annual national reduction targets and defines guidelines for action in case these targets are not met.

In 2021, the Federal Constitutional Court⁶¹ ruled that this Act did not meet the constitutional requirements because no annual reduction targets were specified for the period of time after 2031. The Court explains that German Basic Law, in the sense of an “intertemporal guarantee of freedom”, protects against a one-sided shift of the burden of greenhouse gas reduction imposed by Article 20a GG into the future (guiding principle 4, para. 183). As a consequence, the freedom granted by Basic Law may be restricted through measures to limit climate change, taken as early as possible, and through adaptation

⁵⁸ Cf. IPCC (2021) 624 ff.

⁵⁹ Regulation (EU) 2018/842 of the European Parliament and of the Council of 30 May 2018 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No 525/2013 (OJ L 156 of 19 June 2018, p. 26).

⁶⁰ German Federal Climate Change Act of 12 December 2019 (BGBl. I, p. 2513), last amended by Article 1 of the Act of 18 August 2021 (BGBl. I, p. 3905).

⁶¹ Decision by the First Senate of 24 March 2021 - 1 BvR 2656/18 (BVerfGE 157, 30).

measures mitigating its impact (guiding principle 4, para. 183). Such restrictions must be proportionate, i.e. suitable, necessary and appropriate (para. 192). This is the case if they effectively link restriction and adaptation measures, and neither come one-sidedly at the expense of future generations (para. 131) nor put an excessive burden on people who are living today and will probably not live to see the measures required in the future. For the implementation of Article 20a GG, the court leaves “considerable scope for action” to the legislator (para. 207), and points out that in cases of conflict, a balance needs to be struck with other constitutionally protected rights and constitutional principles (para. 198).

In order to meet the requirements of the Federal Constitutional Court, the national climate protection targets of the Federal Climate Change Act were modified (reduction of national greenhouse gas emissions by 65 percent compared to 1990 levels by 2030, by 88 percent by 2040 and to net zero by 2045) and corresponding annual emission amounts laid down for the years 2023 until 2040.⁶² In addition, the Federal Government has proposed a second amendment to the Act in 2023⁶³, in order to enable cross-sector and far-sighted overall assessments if reduction targets are not met. Moreover, in order to implement the European “Green Deal”, there is a whole range of current EU legislative projects, some of which have already been adopted.⁶⁴

62 Cf. First Act to amend the Federal Climate Change Act of 18 August 2021 (BGBl. I, p. 3905).

63 Cf. Proposal for a Second Act to amend the Federal Climate Change Act of 11 September 2023 (BT-Drs. 20/8290).

64 Enumerating all of these legislative procedures would go beyond the scope of this Opinion. Further information at https://germany.representation.ec.europa.eu/news/europaischer-green-deal-eu-staaten-bringen-entscheidende-klimagesetzgebung-auf-den-weg-2023-04-25_de [2024-01-16].

2.5 Attitudes towards climate change

The measures to deal with climate change discussed in section 2.3 have wide-ranging impacts on the population. The willingness to accept these impacts depends on one's personal attitude towards climate change, among other aspects. In psychological and social research, different attitude patterns are identified, such as alarmed active, convinced, cautious, disengaged or dismissive in Germany, for example. The respective groups of persons are distinct from one another in aspects like convictions and certainty with regard to climate change, commitment for the issue, concerns and risk awareness and perception of one's self-efficacy.⁶⁵ Research also increasingly takes into account the importance of emotions like shame or fear.⁶⁶

According to several studies, a majority of the respondents in all age brackets in Germany consider climate change to be a serious problem for humankind, and show a distinct awareness for the necessity of climate protection measures.⁶⁷ There are only weak correlations between people's attitudes and demographic characteristics like age, sex, education and place of residence.⁶⁸ The readiness to act tends to be slightly higher in persons who are older or female, had longer schooling or live in larger cities.⁶⁹ However, such demographic differences become less important when psychological factors like knowledge about climate change, trust in government bodies and assessments of the effectiveness of measures and one's own self-efficacy are taken into account.⁷⁰

65 Cf. Klinger et al. (2022). This study as well as studies in other countries follow the methodology of the Yale Program on Climate Change Communication, thereby making international comparisons possible. Further information at <https://climatecommunication.yale.edu/about/projects/global-warmings-six-americas> [2024-01-16].

66 Cf. Pihkala (2022).

67 Cf. Stieß et al. (2022).

68 Cf. Wolf (2021).

69 Cf. PACE (2023); Lehrer et al. (2023) 45 f.

70 Cf. PACE (2023).

However, a high awareness of the problem does not necessarily lead to environmentally friendly or climate-friendly behaviour. People with a higher income tend to have a stronger ecological awareness, but generally also generate considerably more CO₂ emissions than people with a lower income, because they heat a larger living space, are more mobile and spend more on consumption, amongst other things.⁷¹ There is barely a difference in problem awareness between different age groups, although over the past years, it has risen most strongly in people under 35 years of age. In fact, especially in younger people worries about the consequences of climate change have been found to increase, which can also result in a psychological strain referred to as climate anxiety.⁷² In a study published in 2022, 37 percent of adolescents said they were “very afraid” of climate change, 27 percent said “rather afraid”.⁷³

2.6 Discourse on climate change

Attitudes towards climate change and possible solution approaches are also influenced by the media. However, communication science studies of media offerings show that certain media patterns and mechanisms can be rather a hindrance for a constructive public discourse on the issue.

Firstly, compared to other issues, climate issues continue to receive little attention in the media. Even if discussion of the topic has increased over the last years, it only accounts for a small part of reporting.⁷⁴ The question of how much significance climate change should be given in public discourse in

71 Cf. BMUV and Umweltbundesamt (2023) 58.

72 Cf. S. Clayton (2020).

73 Cf. Möller-Slawinski (2022) 80.

74 Cf. Tschötschel et al. (2022) with regard to public service television in Germany; Brüggemann and Sadikni (2024) with regard to online media; Hase et al. (2021) with regard to newspapers.

comparison to other themes is itself the subject of controversial debate.⁷⁵

Secondly, discussions about climate change are often unilaterally focussed on problems and conflicts, while less reporting on solutions and constructive efforts is given.⁷⁶ Illustrations of disasters or reports on particularly provocative protests service the usual news values in journalism, such as conflict, damage or controversy, but they can also stir up fears and contribute to “cognitive dissonance” – a psychological discomfort that arises through the confrontation with gloomy pictures combined with a lack of perspectives for a solution. This of leads to repression or polarisation, which makes it harder to pursue a constructive discourse on how to deal with climate change.⁷⁷ However, by now there are also indications for a change in reporting, away from purely negative representations towards more constructive messages and a stronger focus on proposals for solutions.⁷⁸

A third factor is the way we deal with voices calling into doubt that climate change is anthropogenic, or trivialising it. If such statements are receiving as much space as those that reflect the by far greater consensus among scientists that climate change is caused by humans, it can suggest a “false balance” where both sides appear to be similarly plausible.⁷⁹ However, such representations have become rarer by now. Instead, many media outlets have come to attribute more weight to scientific evidence, and, correspondingly, discuss positions voicing scepticism with regard to anthropogenic climate change critically.⁸⁰

A fourth challenge in the discourse is the strategic exploitation of critical objections to climate protection measures. Such

75 Cf. Lawrence et al. (2024).

76 Cf. Guenther et al. (2023).

77 Cf. Guenther et al. (2023); Guenther and Brüggemann (2023); Hiss (2021).

78 Cf. Guenther et al. (2022).

79 Cf. Boykoff and Boykoff (2004).

80 Cf. Brüggemann and Engesser (2017).

objections must, of course, be examined for their justification. Nevertheless, they may also result from strategies of relativisation and delay, and be intended to cast doubt on measures, e.g. to protect minority business interests.⁸¹ For example, such strategies highlight third party responsibility, advertise technical solutions that promise less drastic cuts but yet need to be developed, focus on negative consequences of climate protection measures, or call upon people to simply accept climate change and focus primarily on adaptation measures.⁸² The challenge consists in distinguishing serious and possibly justified arguments from those that are purely strategically motivated. The latter should be assessed critically, without placing concerns against climate protection measures under general suspicion, as this would narrow public discourse on the issue.⁸³

2.7 Foundations of climate ethics

In this Opinion, the German Ethics Council aims to provide an orientating analysis of the normative foundations of positions and arguments on dealing with climate change. This requires taking a short look at the objectives and positions of climate ethics.⁸⁴ It is concerned with the question of which approach to deal with the challenges of climate change is morally correct under which conditions and assumptions. Since climate is a global common good, everybody is involved as a contributor to the causes of climate change and is affected by its consequences, even if the contributions to the causes and the degree of concern vary. The aim of climate ethics is to provide normative guidance for both individual and collective action⁸⁵ to protect this global common good.

81 Cf. Painter et al. (2023).

82 Cf. Lamb et al. (2020).

83 Cf. Bojanowski (2019).

84 Cf. Ott (2021).

85 Cf. Kallhoff (2021).

In view of the spatial and temporal extent of climate change, climate ethics is faced with special challenges and trade-offs, which are further exacerbated by the interrelatedness of the topic with many other large fields such as economy, health, migration and social or political stability. Spatially, the entire earth's atmosphere and therefore the entire planet is concerned, independent of the question in which states or regions of the world or by what economic sectors or in which consumption processes emissions are caused.

With regard to time, a great challenge is that damages and losses through the emissions of past and current generations can be felt now, but will have even much more severe effects on future generations. From the perspective of many people living today, there are therefore no strong incentives to take immediate countermeasures (preference for the present).⁸⁶ The time dimension also involves specific epistemic difficulties, since appraisals of the effectiveness of individual climate protection measures are subject to uncertainties that increase with the length of the periods of time considered, for example.

The collective nature of both the causes and the tackling of climate change becomes particularly challenging when concrete responsibility must be assumed. In the context of climate responsibility, people are quick to point a finger at others who might make greater contributions. The fact that others might take little or no action is often used to exonerate oneself from one's responsibility, so that in the end nobody takes action. Moreover, the so-called free-riding problem has been observed, which means that certain actors try to refrain from making their own contribution for as long as possible, in order to benefit from the efforts of others.

The core of the subject area of climate ethics therefore consists of the analysis and normative assessment of current as

86 Climate ethicist Stephen M. Gardiner perceives here a "tyranny of the contemporary", the clinging to the current lifestyle as an unreasonable burden for all future generations. Cf. Gardiner (2021) 203.

well as long-term problems of distribution and responsibility with regard to climate protection measures, under conditions of epistemic uncertainty and under consideration of multiple interrelations with other societal challenges.

Tackling climate change is an formative task for society. On the basis of today's data, appraisals and normative considerations, orientation for action must be gained. The temporal dimension of this task requires foresightful, provident and impact-based thinking, because today's actions or omissions have consequences on future generations. Such consequentialist approaches must be distinguished from deontological positions. For example, utilitarian contributions are guided by the expected maximum benefit of measures in the struggle against the consequences of climate change. Human rights approaches, on the other hand, refer to normative principles that limit benefit based considerations.⁸⁷

The frequently necessary consideration of trade-offs requires the introduction and establishment of mid-level principles that are based on general normative postulates, but can also do justice to the specific, highly complex practical interconnections of the climate problem.⁸⁸ Among these principles are:

- » the *equality principle*: Every human being, living today or in the future, in principle has the same basic rights, for example to life, free self-realisation and the resources necessary for this.
- » the *polluter-pays principle*: Those individuals or groups who contribute more to climate change must make proportionately greater efforts to tackle it, e.g. assume a larger part of the costs.
- » the *beneficiary-pays principle*: Whoever has the greater benefit from past or current damages to the climate through

87 Cf. Gardiner et al. (2010).

88 Cf. Birnbacher (2022) chap. 5.

emissions is also more strongly obliged to compensate for the damage done, and to provide for a better future.

- » the *ability-to-pay principle*: Those who can make greater contributions because they are economically or technically better able to do so, for example, should actually make these contributions.

The ranking of these principles has far-reaching consequences for the appraisal of approaches to climate change, e.g. with regard to mitigation or adaptation strategies and possible climate engineering.⁸⁹

In view of the ever more noticeable impacts and deteriorating forecasts, climate policy is under pressure to curb climate change and tackle its effects. However, in many respects it remains unclear what successful political steps towards this might look like. It is the task of climate ethics to show the possibilities of responsible political and individual action in responding to climate change, to work out and justify morally acceptable options for action, and thereby reduce uncertainties.⁹⁰

89 Cf. Baatz and Ott (2015) on the ethical discussion of these three fields of action.

90 Cf. Düwell (2017).

3 CLIMATE CHANGE AND JUSTICE

3.1 Climate change as a justice issue

Both the causal responsibility for climate change and the dangers, damages and losses caused by it, as well as the means to cope with it, are unequally distributed. Inequalities may be unjust in various respects. An ethical analysis and reflection is necessary to identify such injustices and develop well-founded paths to cope with them constructively.

The emission of greenhouse gases in amounts that affect the global climate soared with the industrialisation of the countries of the Global North and the spread of the prosperity levels generated by it. On the other side, the negative consequences of climate change particularly affect three groups: socially disadvantaged people within societies, people in the Global South and the younger as well as future generations. Not only do they have in common that their contribution to past and current emissions is comparatively small, but also that they often have less capacities and resources to cope with climate change than many major emitting actors. A closer look at these three constellations of inequality already points out the justice problems involved.

An example of *intra-societal inequality* is the burden caused by extreme heat, as has already been observed in Germany. The elderly, children, people whose health is particularly affected by heat, and members of specific professional groups are exposed to an unduly heavier burden and threat in severe heat than other people. People working outdoors in the building sector, agriculture, gastronomy, waste disposal and similar employment cannot escape the heat. People who do not have access to air-conditioning because of limited financial resources, or who live in cramped or precarious living conditions, suffer particularly hard from heat waves and related health risks. At the same time, especially lower-income persons contribute

►

Figure 1: Intra-societal inequality

The figure shows the per-capita emissions and the share of emissions per income group in Germany in 2019. The top 1 percent emit twenty times as much per person as the bottom 50 percent. This is why they account for more than 10 percent of German emissions. Under the Paris Agreement, Germany has committed to reducing its per-capita emissions by 55 percent compared to 1990 levels until 2030, i.e. to 6.5 tons of CO₂ per person. The lower half of the population in terms of income already complies with this value.

Source: World Inequality Report 2022

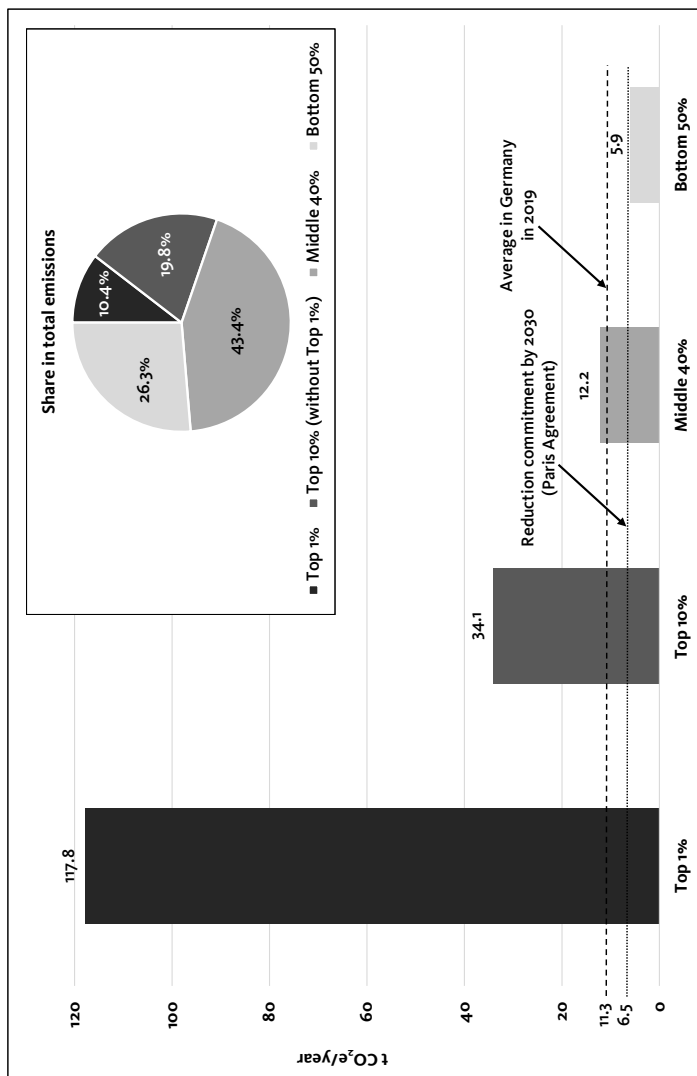
comparatively little to CO₂ emissions, since they can afford less consumption than those with a higher income (figure 1). Other transformations associated with climate change also affect different areas and groups within society to a varying degree. For example, because they rely on cars more than the urban population, some measures to reduce emissions may disproportionately restrict the mobility and leisure behaviour of the population in rural areas.

Extreme inequality and climate change mutually reinforce each other if very rich people massively contribute to climate change through frequent flights, larger living spaces and higher consumption altogether (especially if they own private jets, yachts and villas), but also through climate-damaging investments and political lobbying. In 2019, for example, the richest 1 percent of the world population accounted for 16 percent of global CO₂ emissions, which corresponds to the total emissions of the poorer two thirds of the world population, i.e. of about five billion people.⁹¹

The *international inequality* is manifested in the fact that Germany as a country with comparatively high per-capita

⁹¹ Cf. Kowalzig et al. (2023) 4.

Greenhouse gas footprint, depending on income



Data: World Inequality Report 2022

►

Figure 2: Inequality between countries

The figure shows countries as points, with their historical CO₂ emissions on the abscissa (i.e. their cumulative carbon emissions since 1750 divided by the number of people living in the respective country today) and their vulnerability or adaptability to climate change on the ordinate. The statistic is based on 45 indicators that have been summarised and published by the US university of Notre Dame as the ND-GAIN index.

Source: <https://gain.nd.edu/our-work/country-index/download-data>, the CO₂ emission and population figures have been extracted from <https://ourworldindata.org/co2-emissions>

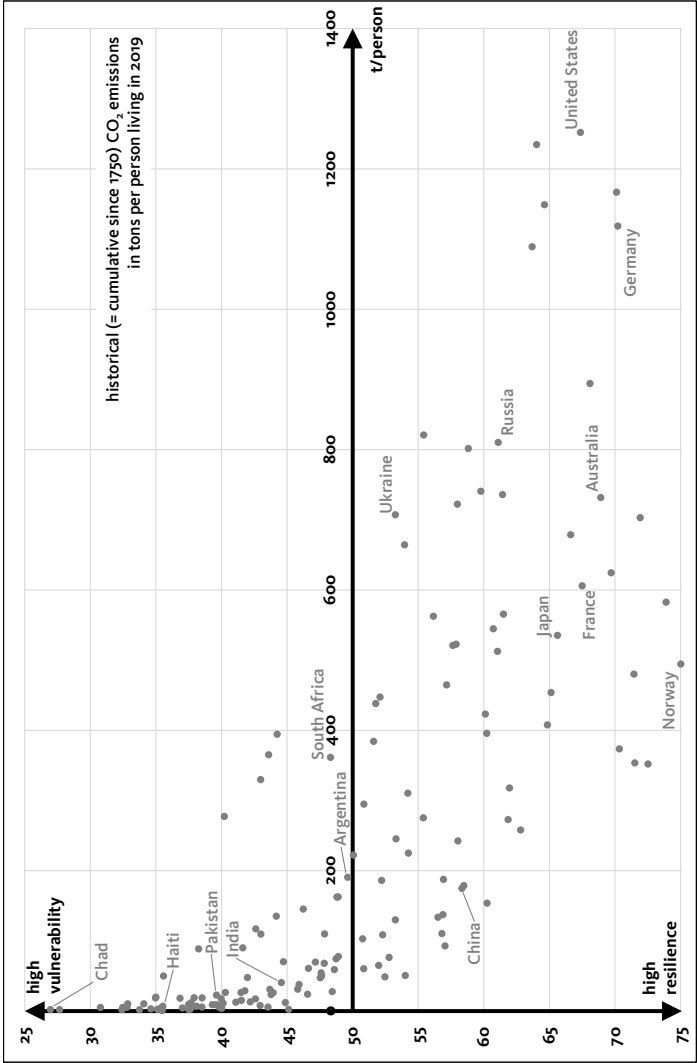
emissions is less severely affected by climate change than other countries (figure 2). In Pakistan, for example, 33 million people were hit by an extreme flooding disaster in the summer of 2022, destroying 1.5 million houses and more than 2000 kilometres of roads. It was caused by record monsoon rainfall after an extreme heat wave that led to extraordinary glacier melting in the Himalaya region. Although Pakistan emits less than 1 percent of global greenhouse gases, it is among the ten Asian countries that suffer most from climate change.⁹² However, the impact of climate change becomes increasingly noticeable in the Global North, too, as was dramatically obvious in the inundation of the Ahr valley in the year 2021.⁹³ At the global level, such changes moreover trigger considerable migration movements, which can result in a destabilisation of the countries of origin, considerable danger for the “climate refugees” concerned, and social tensions as well as political conflicts in the destination countries.⁹⁴

⁹² Cf. Shehzad (2023).

⁹³ Cf. Tradowsky et al. (2023).

⁹⁴ Cf. Sachverständigenrat für Integration und Migration (2023).

Inequality
between countries:
vulnerability in
relation to historical
CO₂ emissions



Data: ND-GAIN, Our World in Data

Figure 3: Intergenerational inequality

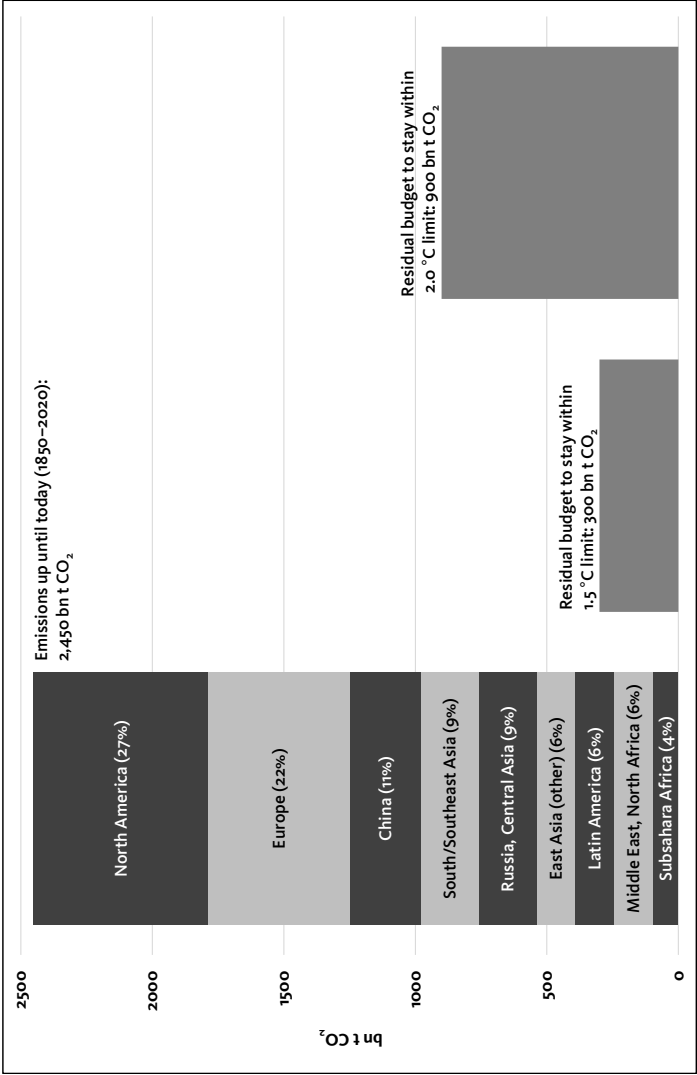
Of the altogether 2,450 billion tons of CO₂ that have been emitted since 1850, 22 percent are attributed to the EU. The figure compares historical emissions with the residual CO₂ budgets that will be available in the future if climate change is to be curbed. According to the latest IPCC report, another 300 billion tons of CO₂ may be emitted at most in order to limit global warming to less than 1.5 °C with a probability of 83 percent, or 900 billion tons of CO₂ to limit global warming to less than 2 °C with the same probability. In view of the global emission rates for 2020, the 1.5 °C budget will be exploited within six years, and the 2 °C budget in 18 years.

Source: World Inequality Report 2022, fig. 6.2 (budgets according to IPCC report AR6 2021)

The *intergenerational inequality* may be illustrated in an exemplary manner by comparing historical emissions with the “residual budgets” in greenhouse gases that remain today for limiting climate change (figure 3). A theoretical model in which every generation opts for the path that is easiest for them even though it comes at a high cost and great damages for future generations, leads to unbearable burdens after several generations because the effects add up. Today’s lack in climate protection will have much stronger negative effects on future generations.

From an ethical point of view, the inequalities outlined above raise questions of justice. In this context, justice must first of all be understood as a general normative principle which determines in a rationally justifiable and comprehensible manner what is appropriate for specific individuals and groups. Correspondingly, the core problem of climate change in terms of ethical justice is the adequate distribution of burdens and responsibilities that result either directly or indirectly from climate change itself on the one hand, or from reactions to climate change (mitigation, adaptation etc.) on the other hand.

Intergenerational inequality: historical CO₂ emissions vs residual budget



Data: World Inequality Report 2022

3.2 Foundations of the theory of justice

Questions with regard to a just distribution must be considered against the background of fundamental considerations of justice theory.⁹⁵ In this process, the distinction between justice as a (personal) virtue and justice as a structural feature of social systems and conditions is of crucial importance.⁹⁶ In addition, there are different, sometimes even competing positions that determine and highlight various aspects, dimensions and “currencies” of justice, like basic goods or capabilities (options for one’s conduct of life).

In this Opinion, the German Ethics Council focuses especially on the structural justice of social systems and conditions. It is true that virtue ethics aspects that are concerned with the just behaviour of individuals are relevant for issues of climate justice, too. Individually just behaviour is guided by options that seem to be ethically justified, e.g. in the sense of universalistic ethics of responsibility⁹⁷. However, focussing on the virtue-ethical dimension of justice might give rise to the misconception that emissions-reducing individual behaviour alone could overcome the climate-damaging consequences of today’s lifestyles. This view falls short of the mark. Structural justice, on the other side, does not expressly exclude personal behaviour, but it perceives individuals mainly as members of a politically constituted community.

The crucial ethical question of a just distribution of the burdens and responsibilities resulting from climate change may be answered in different ways.⁹⁸ The concept of climate justice advocated in this Opinion incorporates egalitarian, sufficientarian and prioritarian considerations. Egalitarian

95 The German Ethics Council has already written extensively about the various dimensions of the concept of justice in its earlier Opinions. Cf. especially *Deutscher Ethikrat* (2017) 219–26; (2022) 192–203.

96 Cf. Aristoteles (1985) book V; Rawls (1975) 19.

97 Cf. Jonas (2020).

98 Cf. Bartmann et al. (2023).

theories place the equal status of all people at the centre, from which derives the necessity of equal treatment. According to sufficientarian concepts, justice requires a political practice which guarantees the minimum requirements for a good, successful life. Finally, prioritarian approaches advocate that the most disadvantaged people should be given preference.⁹⁹ In all three theoretical models human rights considerations play a role, even if the details of their formulation may differ considerably. Although each model in its pure form has received considerable criticism¹⁰⁰, these three concepts can be combined to form a more balanced view overall. The decisive aspect for a just distribution of the burdens and benefits resulting from climate change and its management consists in enabling a good, successful life for all people.

Based on human rights principles, egalitarianism demands that every person is respected and everybody's interests are equally considered. With regard to issues of distributing goods and burdens it may be concluded that all people have the same right to an equal measure of resources and emissions. However, such a purely synchronous-egalitarian distribution pattern would fall short of the challenges of climate change because it does not take into account the relevant historical and geographic inequalities of the initial situation. It might likewise lead to a general expansion of emissions that is incompatible with the aims of climate protection, or to a radical decrease of emission levels, with severe social and economic consequences.~

This is why it is necessary in this context to also consider sufficientarian perspectives, which require that a sufficient measure of basic goods or capabilities¹⁰¹ is guaranteed, and that this measure is further determined by formulating corresponding threshold values. This by no means implies that

99 Cf. Konrad-Adenauer-Stiftung (2023).

100 Cf. Roser and Seidel (2013).

101 Cf. Nussbaum (2011).

generally binding maximum limits are laid down that may not be exceeded, as is the case with threshold values for CO₂ emissions, for example. Rather the contrary is true. Sufficierarian threshold values indicate basic requirements for a good, successful life. Reaching these thresholds must be a minimum guarantee on grounds of justice ethics.¹⁰² An exact distinction between objective basic needs and individual desires is not easy and therefore contested.¹⁰³ Nevertheless, it seems reasonable to set as a target the guaranteed availability of the goods and capabilities that are essential for a good, successful life. This requires an agreement within society on the respective threshold values for specific areas.¹⁰⁴ In this context, new forms of civil society participation must be examined in the process of defining the threshold values.¹⁰⁵

Finally, a prioritarian perspective must also be taken into account, which asserts the principle of prioritising the less advantaged.¹⁰⁶ It is based on an ethical argument that categorises an increase in benefit as morally more valuable if it benefits those who are particularly in need or disadvantaged.¹⁰⁷ Accordingly, in the concrete assessment of both reasonable burden and necessary support, the current situation (geographical

¹⁰² The drinking water supply may serve as an example for such a sufficientarian argumentation. Through aridity, falling groundwater levels, torrential rains and flooding, climate change has severe impacts on the availability of water. However, supplying all people with a daily water ration above the required threshold value is a minimum requirement for a good, successful life. In order to guarantee that future generations also achieve this threshold value for the basic need of water, the corresponding necessary conditions for dealing with water must be defined today. Under the National Water Strategy, numerous measures are requested to this end, e.g. incentives to use rainwater for gardening, the rewetting of fens, higher charges for water withdrawal or a ban on the privatisation of drinking water. Cf. BMUV (2023).

¹⁰³ Cf. Shue (1996); (2014).

¹⁰⁴ Cf. Nussbaum (2000); Kistler (2018).

¹⁰⁵ Cf. Oels et al. (2020).

¹⁰⁶ Cf. Temkin (2000).

¹⁰⁷ Cf. Birnbacher (2022) 63. Historically known variants of this intuition can be found in the so-called principle of difference by Rawls (1975) 104; with reference to a religious tradition in the so-called "Option for the poor" at Franziskus (2015); Bedford-Strohm (2018).

location, social situation, cultural specifics) and performance (economic prosperity, political framework conditions, scientific and technological development) must be taken into account. People who have to lead a life below the threshold values for a good, successful life must be given preferential consideration and support.

These considerations result in a *sufficientarian threshold concept of climate justice*, where all three perspectives are combined in the framework of a human rights approach. This means firstly that, as a principle, all human beings should have equal opportunities to lead a good, successful life (egalitarian). Secondly, nobody should fall below certain threshold values for essential basic goods or abilities, like health, food, water, safety or mobility, which must be defined as a minimum requirement for such a life (sufficientarian). Thirdly, climate protection measures should be designed in such a way that those who are most affected by climate change can reach the relevant thresholds (prioritarian).

From the perspective of justice theory outlined above, it is clear that the debate on climate justice touches on broader questions about a good, successful life. In ethics, the relationship between the just and the good has always been controversial. On the one hand, the question of a good, successful life appears to be fundamental, as it determines what can be understood as basic goods or capabilities relevant to distribution.¹⁰⁸ On the other, the general rights and duties derived from considerations of justice ethics set definitive limits to efforts to lead a good life.¹⁰⁹ Since tackling climate change is commanded by ethical considerations of justice and requires a comprehensive transformation at both the individual and the social level, ideas of a good, successful life will in many respects not be feasible in the form of current Western consumption behaviours (for example in terms of mobility, energy

108 Cf. Nussbaum (2000).

109 Cf. Schockenhoff (2014) 530.

and resource consumption). At the same time, a just and comprehensive socio-ecological transformation will open up new opportunities for a good and fulfilling life, and not only for those who are currently disadvantaged (cf. chapter 4).

3.3 Dimensions of climate justice

The sufficientarian threshold concept of climate justice presented in section 3.2 has important ethical consequences with regard to the inequalities associated with climate change. In line with the types of inequality already mentioned, three dimensions must be taken into account that form a coordinate system of climate justice: intra-societal, international and intergenerational justice. These three dimensions overlap and must therefore always be considered in conjunction with each other. They also touch on other topics such as gender justice and ecological justice, which are not considered in more detail here.

3.3.1 Intra-societal justice

Germany is already experiencing damage and burdens as a result of climate change and the measures to tackle it. However, these vary in severity between different social groups, sub-sectors and regions. This applies, for example, to secondary health problems¹¹⁰, which disproportionately affect the elderly population,¹¹¹ to extreme weather events, which have a particularly serious impact on agriculture, and to financial burdens caused by mitigation and adaptation measures, which can hit people

¹¹⁰ Cf. Traidl-Hofmann and Orasche (2023).

¹¹¹ Cf. WBGU (2023); Sachverständigenrat für Umweltfragen (2023); Sachverständigenrat zur Begutachtung der Entwicklung im Gesundheitswesen (2023); Robert Koch-Institut (2023).

with limited financial resources particularly hard. There is a risk here of exacerbating social upheavals and conflicts.

Already from an egalitarian point of view, it is an imperative of climate justice within society to counteract social divisions due to different burdens. It is not only the immediate consequences of climate change that are important here, such as direct damage to life, health and property as a result of heat or more frequent extreme weather events. Rather, indirect and longer-term effects must also be taken into account, for example in the areas of family, work, mobility or leisure activities.

From the point of view of sufficiency, the burdens caused by climate change and the necessary adaptation or mitigation measures must be distributed in such a way that the minimum requirements for a good, successful life for all people are met. In the case of both any restrictions and any compensatory allowances, the reasonableness of the burdens for the socio-economically disadvantaged must also be examined from a prioritarian perspective.¹¹²

If necessary, compensatory and support payments may be required to guarantee the relevant threshold levels, which could also be granted in the form of per capita reimbursement from carbon pricing to all residents (climate allowance) (see section 2.3).¹¹³ As less affluent people typically cause less CO₂ emissions, they would receive more money back than they have paid in the form of carbon pricing. High taxation of particularly emission-intensive behaviour and, as a last resort, even banning such behaviours should also be considered if this is the only way to keep the burden for all people within reasonable limits.

¹¹² Cf. Baatz and Voget-Kleschin (2019).

¹¹³ Cf. Kruij (2023).

3.3.2 International justice

At an international level, unevenly distributed contributions to global warming, profits derived from colonialist exploitation and different geographical impacts of climate damage must be taken into account in terms of justice ethics.¹¹⁴ Industrialisation and the associated gains in prosperity in one part of the world cannot be considered in isolation from the associated events in other parts of the world. The history of the Global North is inextricably interwoven with the imperialist colonisation, oppression and exploitation of the Global South, some of which continues to this day. These processes gave the colonial powers numerous advantages and – with a time lag – contributed significantly to climate change and its associated damages. This has been and continues to be at the expense of countries that have not benefited to the same extent from this industrialisation, whose self-determined development has been massively hindered by exploitation and oppression, and which are hit particularly hard by climate change today. At the same time, they are inadequately prepared for climate change and have fewer options to protect themselves from its consequences.¹¹⁵

A purely egalitarian allocation of equal carbon budgets, against this background, is not acceptable. Even if obligations for the present cannot easily be derived from misdemeanours of the past, some of which occurred a long time ago, it is necessary to assume moral responsibility because people living today benefit from the actions of previous generations. Correspondingly, a distinction must be made between growth in countries of the Global South that are catching up on development, and further growth of consumption and resource use in industrialised countries.¹¹⁶

114 Cf. Caney (2021).

115 Cf. Leichenko and O'Brien (2008).

116 Cf. Franziskus (2015) 53 ff. (no. 48–51).

This is already reflected in the current political discourse: Countries of the Global South, who are often hit particularly hard by the consequences of climate change, are not able to finance the necessary investments to reduce emissions and adapt to climate change. Against this backdrop, the high cumulative emissions of wealthy industrialised countries compared to the rest of the world are also seen as a form of illegitimate appropriation of atmospheric common goods. At the UN climate summit in 2009 (COP 15), the industrialised nations therefore promised to make support payments to finance mitigation and adaptation in the amount of USD 100 billion annually to the countries of the Global South.¹¹⁷ Even though official reports have recently listed over USD 80 billion in annual support paid, this figure is actually lower, because the donor countries often only grant loans.¹¹⁸ The fund for losses and damages envisaged and agreed at previous meetings was further specified at the 28th World Climate Conference (COP 28) in Dubai at the end of 2023¹¹⁹, but payment and disbursement modalities have not been regulated to the satisfaction of the countries of the Global South. Furthermore, they consider far higher compensation payments from countries with high emissions to countries of the Global South to be necessary in order to achieve international climate justice.¹²⁰

The three principles underlying the sufficientarian threshold concept also guide the international dimension of climate justice. Firstly, according to the egalitarian idea of equal opportunities, people in all countries should basically have the same opportunities to lead a good, successful life. Secondly, it must be ensured that everyone can reach the threshold values to be determined according to the sufficientarian principle. Thirdly, according to the prioritarian principle, those countries and populations that are furthest away from reaching

117 Decision 2/CP.15 (UN Doc. FCCC/CP/2009/11/Add.1).

118 Cf. Zagema et al. (2023).

119 Decision 1/CP.28 5/CMA.5 (advance unedited version).

120 Cf. Fanning and Hickel (2023).

these threshold levels should be favoured first. At the same time, former colonialist dependencies must not be allowed to continue unchecked. The issue of climate justice must therefore always be considered within the concepts of development ethics.¹²¹

3.3.3 Intergenerational justice

Also in regards to time, the historical responsibilities for past greenhouse gas emissions, their negative consequences and the different resources and capacities for mitigating or tackling climate change are important from an ethical justice perspective. The ethical debate about a fair distribution of the relevant damage and burdens must therefore not only take into account age groups living today,¹²² but also and in particular future generations.¹²³ According to all projections, their members – who have not yet been born – will have to bear the main burdens of a changed global climate and the measures required to deal with it (cf. section 2.1). The fact that their very existence depends on our decisions today (*non-identity problem*¹²⁴) does not release people living now from moral and political obligations with regard to their well-being.¹²⁵

In view of the egalitarian principle that no one should be subject to heavier burdens or more far-reaching restrictions than anyone else without a factual reason, the problem of intergenerational justice is particularly acute.¹²⁶ This is all the more true as, depending on the predicted scenario, the burdens in question could assume a scale that would no longer

121 Cf. Moellendorf (2018). See in this context also the “Greenhouse Development Rights Framework”. Cf. Baer et al. (2008).

122 Cf. Müller-Salo (2022).

123 Cf. L. H. Meyer and Roser (2007).

124 Cf. Parfit (1984) chap. 16.

125 Cf. L. H. Meyer and Roser (2009); L. Meyer (2021).

126 See also the decision 1 BvR 2656/18 by the Federal Constitutional Court of 24 March 2021.

be easily compatible with guaranteeing minimum conditions for a good, successful life. Climate change and the problems associated with it, for example for the health of the population, economic prosperity or ecological balance, threaten to have an existential impact on the living conditions of future generations. From the point of view of the prioritarian principle of precedence, future generations therefore deserve special attention. On average, they will probably be worse off than people living now because climatic conditions will deteriorate in most regions of the world.

Against this backdrop, it is not just an expression of high-minded benevolence, but a strict duty based on the grounds of ethical justice to take all necessary and reasonable measures today to prevent future generations from not being able to achieve the minimum requirements for a good, successful life. This concerns first of all the necessary steps to mitigate climate change and adapt to its consequences. Time is a decisive factor here, so waiting, stalling and delaying are morally reprehensible.¹²⁷ At the same time, all technological solutions under consideration must also leave future generations sufficient scope for decisions and actions, and must not impose disproportionate long-term burdens on them. With this in mind, the requirements of carbon management by means of carbon capture and storage (CCS) technologies that would need to be maintained for thousands of years must be critically examined (see section 4.3.2). After all, the same sufficientarian standard that applies to people living today must also be applied to future generations.

In all of this, however, ethical considerations of justice with a view to future generations face particular challenges. In this context, too, the overlap between the various dimensions of climate justice must be considered. The members of future generations cannot be summarised as a homogeneous group. Depending on their social affiliation and geographical

127 Cf. WBGU (2023) 251 ff.

distribution, the extent to which they are affected by the negative consequences of climate change is likely to vary considerably, especially as climate change tends to exacerbate existing inequalities.¹²⁸ Climate adaptation measures in favour of a good life in the future, such as climate-resilient building technology or urban greening, can be implemented more quickly and comprehensively in countries with a strong economic performance.

Moreover, in view of the long-term nature of climate change, the question also arises as to the temporal scope and possibly the gradation of ethical obligations towards the future.¹²⁹ The debate centres on how far into the future and for how many generations we are obliged to take precautions and to what extent. With reference to welfare economics approaches, it is sometimes argued in this context that less moral weight should be given to the welfare of generations further in the future than to the welfare of those living now or in the near future (future discounting). However, it seems questionable, or at least requiring justification, why the contingent circumstance of being born at a later moment in time should diminish the moral significance and the inherently justified claims of future persons.¹³⁰ The feeling of being morally overburdened in view of the temporal scope of ethical obligations of justice, and the epistemic uncertainties regarding the cultural, technological, political and religious situation and priorities of future generations are not sufficient as a justification here. In view of the urgency of tackling climate change with regard to generations living today and in the near future, the practical significance of the question of temporal discounting with a view to the more distant future is admittedly of secondary importance. In the case of basic goods or capabilities that are protected by human rights, it can moreover be assumed with a high

128 Cf. Caney (2019).

129 Cf. Roemer (2011); L. Meyer (2021).

130 Cf. Caney (2014).

degree of probability that they will also be important for future generations. These include, for example, food and health, but also social relationships and scope for decent individual development.¹³¹

3.4 Just procedures: Fair organisation of political dialogue

With regard to the three considered dimensions of climate justice, the question arises as to how political decisions on dealing with climate change should be made in a just manner. It should be noted in particular that the path to greater climate justice is characterised by considerable conflicts in view of the systemic interdependencies of this issue and historical path dependencies. They are rooted, for example, in trade-offs and different weightings between inter- and intragenerational justice and in divergent weightings of historical responsibility. It can therefore not be assumed that, as in an ideal world, all dimensions of justice can be satisfied equally and adequately. Rather, priorities must be set, conflicts of interest regulated and weightings negotiated. Instead of striving for the fulfilment of ideal solutions that are desirable in terms of justice theory, in the reality of a “non-ideal” world¹³² compromises must be made on the path to ever better solutions.

Without losing sight of the ideals of justice theory, action in favour of greater climate justice requires targeted, ethically justified and procedurally just steps along this way.¹³³ It is about the principles and procedures of political opinion-forming and decision-making with regard to the fair distribution of the burdens of climate change and its management. This aspect of procedural justice¹³⁴ runs, as it were, parallel to the

131 Cf. Roser and Seidel (2013) 55 f.; Gosseries and Meyer (2009).

132 Cf. Heyward and Roser (2016).

133 Cf. the debate in Broome (2016).

134 Cf. Forst (2022) 14.

three dimensions of justice discussed here, but must be applied to all three of them.

As has been shown, the problem of dealing with climate change in a just manner touches on essential aspects of a good, successful life. It therefore concerns fundamental questions about how individuals and societies want to live and what they need for this (cf. section 3.2). Different areas of social life and objectives (individual freedom, economic prosperity, international security) are affected and must be included in the balancing processes. Approaches that refer to practical constraints, self-preservation imperatives or emergency situations in order to recommend an expertocratic or technocratic crackdown fall short here.¹³⁵ Rather, the established normative principles and procedures of the liberal-democratic order must form the unassailable basis for the necessary political decisions. They require an open and equal dialogue between all those affected and responsible, particularly with regard to the articulation of their own needs and interests as well as an agreement on appropriate perspectives for action.

However, a procedurally fair dialogue on climate justice issues poses specific challenges for the principles and procedures of political opinion-forming and decision-making. Those who are particularly affected by climate change and its management are often disadvantaged, marginalised or even generally excluded from existing political communication and decision-making processes. This applies to disadvantaged people within the German population as well as to people in the Global South and members of future generations. Accordingly, suitable political principles and procedures must be (further) developed with regard to all three dimensions – intra-societal, international and intergenerational – in order to enable procedurally fair political consideration of the perspectives and concerns of all those affected. This applies in particular where the dialogue on climate change and its management touches

¹³⁵ Cf. Staab (2022).

on questions of the restriction of individual freedoms and the distribution of burdens. The concept of climate justice advocated in this Opinion should therefore be expanded to include the principle of fair democratic participation and involvement.

In a liberal democracy, this means strengthening and expanding political participation with regard to *the dimension of justice within society*. If decisions are to be made on the appropriate distribution of the burdens of climate change and its management within the framework of liberal democratic principles and procedures, broad and sustainable social majorities must be won for corresponding proposals. Arguments based on the ethics of justice, which are able to convince all those involved and concerned of the appropriateness and reasonableness of a certain distribution, can play a crucial role here. In any case, the impression must be avoided that the debate on climate justice results in sacrifices for the majority of people dictated by a small elite. It is therefore necessary to include all those affected in the discussion.

This presupposes fair access and participation opportunities to the public political discourse on climate justice, and a transparent comparison of different arguments and options for action. It also urgently requires comprehensive and reliable information about the respective opportunities and follow-up costs for individuals and society. However, it must be borne in mind that even good participation processes cannot always overcome all objections and must not result in projects that are in the public interest (e.g. the construction of wind turbines or flood protection dams) being prevented by objections that are irrational or primarily driven by the personal interests of individual people.¹³⁶

With regard to the *international dimension*, a procedurally just debate on issues of climate justice requires intensified international dialogue and closer international cooperation. In the absence of appropriate international institutions with

¹³⁶ Cf. Braun (2023).

executive power, viable political decisions regarding the global common good of the climate can only be effectively achieved through voluntary commitments by sovereign states, negotiated in fair multilateral processes and formalised in contractual agreements.¹³⁷ However, the problem of historically grown imbalances and asymmetrical power and dependency relationships between states, which are particularly pronounced between the countries of the Global North and the Global South, must be taken into account. For example, fair inclusion into the international dialogue on climate justice of the countries of the Global South most affected by climate change and of the population groups most affected there must be ensured. In the longer term, the establishment and expansion of international institutions appears to be necessary in order to stabilise corresponding fair dialogue processes.

With regard to the *intergenerational dimension*, a procedurally fair dialogue on climate justice requires to appropriately take into account the interests of younger and future generations. This poses challenges to conventional principles and procedures of liberal-democratic opinion-forming and decision-making, because according to these, state action is legitimised by the electorate, i.e. the citizens who are currently entitled to vote.¹³⁸ It is true that young people who have not yet reached voting age already know how to make their voices heard in the public debate on climate change. However, they could be involved more intensively in political decision-making processes by making appropriate changes to existing institutions and procedures.¹³⁹ Discussions in this regard include their involvement in relevant decision-making bodies, the formation of youth advisory councils or a general lowering of the voting age.

137 Cf. United Nations (2021).

138 Cf. Schaible (2023).

139 Cf. Müller-Salo (2022).

For future generations on the other hand, who are likely to be particularly affected, there are fundamental and far-reaching epistemic difficulties as well as problems from the perspective of political and democratic theory. This applies not only to forecasts becoming increasingly uncertain the further the respective period of time lies in the future, but also and above all to the adequate representation of people not yet born today in present-day social and political communication processes that are relevant for their future survival.¹⁴⁰ In principle, the interests of future generations must already be taken into account today. This has already been prominently expressed in the Federal Constitutional Court's ruling of 2021. As a result, the court has become an advocate for those who are not yet able to speak out for themselves and assert their interests politically or legally today. This corresponds to the basic intention of an advocacy ethic that has been discussed for some time.¹⁴¹ With a view to future generations, it is inevitable that their interests should be recognised in today's negotiation processes.¹⁴²

The instruments that have been set up for this purpose so far provide important approaches, but – as the Federal Constitutional Court has explained – are probably not yet sufficient. In addition to the general awareness raising for long-term challenges posed by climate change, various proposals are being discussed to take better account of the perspectives and interests of future generations in parliamentary democracy.¹⁴³ For example, intergenerational justice could be enshrined in the constitution to oblige parliaments to consider the impact of their decisions on future generations, or governments could be urged to systematically assess the long-term effects of political measures and include them in their decision-making processes, as well as to develop long-term budget plans that,

140 Cf. Abate (2019).

141 Cf. Apel (1988) 204 ff.; Brumlik (2017).

142 Cf. Gonzalez-Ricoy and Rey (2019).

143 Cf. Tremmel (2014); Stein (1998); Rose and Hoffmann (2020).

for example, define climate protection investments over longer periods of time.

4 RESPONSIBILITY IN CLIMATE CHANGE

Considering issues of justice in all dimensions when combating climate change is a moral obligation. On the one hand, this raises the question of *who* is responsible for fulfilling such obligations – individuals or social, economic and state collectives. On the other hand, it must be clarified how the respective responsibilities should be distributed – e.g. in the relationship between the individual and the collective or between different collectives, such as states of the Global South and of the Global North.

4.1 Freedom and responsibility

The debate on climate responsibility and its fair distribution has been taking place intensively for a long time in many industrialised countries, including Germany (cf. section 2.3). However, it often seems unclear, polarised and gridlocked. It fluctuates between a focus on the individual responsibility of people who “fuel” climate change through their consumption, one-sided attributions of responsibility to the economy and references to the structural responsibility of national and international politics, which set the essential framework conditions for production and consumption. In the public debate, restrictions on existing freedoms and opportunities and their justification play a central, often conflict-generating role when weighing them up against other individual and social aims. At the same time, the familiarity of the concept of responsibility in everyday life repeatedly leads to premature simplifications and one-sided attributions of responsibility.

Responsibility presupposes freedom, and freedom includes responsibility. Human freedom, as manifested, for example, in the setting of goals, acting intentionally and weighing up

different options for action with reasons, is inextricably linked to responsibility. Social coexistence requires mutual restrictions of freedom, in order to provide equitable freedom for all in the first place. In addition, the realisation and safeguarding of individual freedom presuppose that advance efforts are made collectively. This interplay of enabling and restricting freedoms is central to liberal and democratic communities and is secured by law. It is well established and accepted in practically all fields of activity, right down to daily routines, such as in road traffic and traffic regulations.

New challenges or social change can lead to this interplay having to be rebalanced. Most notably, comprehensive transformations such as the development towards greater sustainability and climate justice are associated with conflicts in pluralistic societies, especially if previous freedoms and vested interests are called into question. They result in part from the fact that, for reasons of climate justice, areas previously left entirely or largely to private action (e.g. mobility, food or heating) also become politically regulated. The debate on climate change and climate responsibility to date shows that it is precisely in such situations that there are sometimes fierce defensive reactions.¹⁴⁴

As a moral and legal principle, responsibility is relevant to the normative relationship between actors, their actions and the authorities to whom they are accountable for their behaviour. Responsibility presupposes a subject, an object to be held responsible for, and an authority to which the subject bears responsibility. Responsibility is always based on norms, with justice norms receiving particular attention in the context of this Opinion (cf. chapter 3). Finally, a distinction must be made between retrospective responsibility in the sense of being the cause of or being at fault for past actions, and prospective responsibility in the sense of being in charge of future actions.

144 Cf. Stein (2014) 55–57.

Possible subjects of climate responsibility can be identified at different levels, from individuals in different roles, via civil society groups and private companies to states and communities of states.¹⁴⁵ Their responsibilities for climate justice are interlinked and must therefore be combined in an overall concept of multi-actor responsibility (cf. section 4.2).

Objects of responsibility for climate justice are actions and decisions that are relevant to the climate and climate impacts. Due to complex causal chains, it is often difficult to assess and evaluate the consequences of today's actions for the future. In order to assess the burden of responsibility in favour of greater climate justice, unreflected and interest-driven distortions must be avoided. Both the degree of precautionary measures demanded for present and future generations and the emphasis on uncertainties around long-term consequences can be excessive and then place a one-sided burden on the decisions to be made.

Responsibility can lead to obligations when actors commit themselves or when obligations or specific restrictions are imposed on them by others. Inner and rationally guided understanding leads to self-commitment as an expression of one's individual freedom – and not as an external restriction of freedom. At an individual level, this can mean questioning previous lifestyles or changing behaviours, for example by voluntarily changing holiday, consumption or mobility behaviours – completely or at least largely irrespective of whether this is socially expected, whether it makes a relevant contribution or whether other people also make a commitment.¹⁴⁶

A moral *obligation* to cooperate with measures to tackle climate change exists under certain conditions. The diagnosis of the problem must be robust and moral norms such as those of justice must make a certain behaviour appear to be morally imperative. In the case of climate change, this means

¹⁴⁵ Cf. Braun and Baatz (2017).

¹⁴⁶ Cf. Lob-Hüdepohl (2020).

upholding standards justified by sufficientarian principles to safeguard freedom and the possibilities of a good life for all people, for example (cf. section 3.2). As long as there is no regulatory obligation, it is up to individual freedom to accept this moral obligation to participate. If one's own exercise of freedom interferes unjustly with the freedom and well-being of others, state intervention is required. Not only people living today are relevant here, but also the opportunities for life and freedom of future generations, as the Federal Constitutional Court recently stated (cf. section 2.6). State intervention can range from appeals and incentives to legal obligations and prohibitions. Restrictions on freedom must be democratically legitimised, effective, necessary and proportionate, and distribute the burdens in a fair manner.

The central criterion for the attribution and effective distribution of individual and collective climate responsibility as well as the obligations to cooperate follows from the concept of climate justice developed in chapter 3. Based on egalitarian, sufficientarian and prioritarian considerations, this concept focuses on ensuring minimum requirements for a good, successful life. The concept is based on a close interweaving of the polluter-pays principle, the ability-to-pay principle and the beneficiary-pays principle (cf. section 2.7). The fulfilment of individual moral obligations to cooperate is facilitated by social and political framework conditions and, in some cases, is only made possible by these in the first place. Their creation is largely the responsibility of state regulation, but also requires the assumption of responsibility by private collectives such as companies. The various responsibilities and obligations to cooperate are therefore interlinked.

4.2 Multi-actor responsibility in managing climate change

In order to structure the field of climate-responsible actors and bundle them in a concept of multi-actor responsibility, three levels of actors can be distinguished: the individual level, the level of private collectives and the political level of public collectives. These actor levels are characterised by different levels of reach of their actions. At the individual level, individuals organise their personal lives within their capabilities according to their preferences, lifestyles, political attitudes and values. At the level of private collectives, supra-individual associations such as clubs, citizens' initiatives, civil society organisations, religious communities or commercial enterprises act according to their respective goals and opportunities. At the political level, public collectives ranging from municipalities and states to communities of states such as the EU bindingly regulate the possibilities and limits of action of actors at the individual and private collective levels.

The responsibility for greater climate justice is specifically distributed across these three levels due to their differences in influence, dependencies and responsibilities. For example, production and consumption are influenced and shaped by factors such as lifestyles, behaviour patterns and consumer preferences on the one hand (individual level) and social and political framework conditions on the other (public collective level). In addition, responsibility at all levels increases with the capabilities of the actors.

Distributed responsibility, however, is subject to the danger of being passed back and forth between actors, of one's own contributions being considered as marginal, and of fingers being pointed at others who should do something first. This creates a diffusion of responsibility. As a result, the temptation may increase to succumb to an interest-led preference for the present, to the desire to secure one's own vested interests or to the inertia of ingrained habits – instead of taking drastic

measures (including lifestyle measures), for which there may be abstract approval but no serious willingness to act. This can be countered by clear attributions of responsibility in a well-founded concept of multi-actor responsibility. Such a concept differentiates role-specific responsibilities and areas of responsibility in order to specify who should take responsibility for what, at what level and in what chronological order, so that the burdens of climate change and its management are distributed in a fair manner. In order to develop this concept, it makes sense to first take a closer look at the three actor levels.

4.2.1 The individual level

For a long time, the debate on climate responsibility, particularly in the public sphere and mass media, has focussed on the level of individual action, especially with regard to individual consumption.¹⁴⁷ This approach is based solely on the polluter-pays principle. Without doubt, practically every aspect of personal life and consumption leads to energy and resource use, emissions and waste. As part of humanity, every person contributes to climate change as a polluter. Even if each individual contribution may seem small, the consequences add up when looking at entire societies. This implies a moral obligation for individuals to change their personal behaviour, especially if it generates comparatively high emissions. According to widespread assumption, recognising this responsibility will ultimately solve the problem if everyone increasingly not only adopts lower-emission behaviours, but by doing so also motivates the economy to make more climate-friendly offers. It is assumed that overall, there is a good chance of overcoming the climate problem in this way.

¹⁴⁷ Cf. Scherhorn and Weber (2002); Grunwald (2010); Heidbrink et al. (2011); Fragnière (2016).

Upon closer examination, however, this line of argument is not valid. Three counter-arguments in particular can be put forward:

(1) Individual behaviour does not take place in abstract freedom, but is integrated into its social environment. It is often entrenched by framework conditions and incentive structures, e.g. through gainful employment with the associated need for mobility. It is inappropriate for the state to expect a lower-emission lifestyle and consumption from people as long as the conditions for such behaviour are not met within the economic and social order desired and supported by the same state. In many areas, lower-emission behaviour still requires the acceptance of sacrifices, disadvantages and possibly even “moral heroism”, especially on the part of the financially disadvantaged. This is not only unfair, but also not a reliable basis for a comprehensive transformation towards climate neutrality.

However, individual responsibility in consumption is by no means obsolete or even ineffective. In many areas today, there is considerable freedom in the way people organise their personal life and consumption. For example, no one is subject to social coercion to take a flight or even a long-distance flight for holiday purposes. It should be noted, however, that potentials for living and consuming with lower emissions is unevenly distributed, for example between social classes, between urban and rural areas and between different areas of life. It depends on the availability of reasonable climate-friendly alternatives, e.g. a good public transport system or lower-emission and affordable heating systems. Individuals in their role as consumers are not responsible for the availability of these alternatives.

(2) Climate justice concerns the collective in society and the state, both nationally and globally, and relates to humanity as a whole as well as to nature. The goal of limiting climate change has been legitimised nationally and under international law in Article 2 of the United Nations Framework Convention on Climate Change since 1992. Expecting private individuals to

achieve it would mean privatising the implementation of a political objective and would ignore the social division of labour between public tasks and private freedoms. Moral criticism of individual decisions in personal life and private consumption is no substitute for political measures.

Of course, in a liberal democracy, these require political legitimisation by parliament and ultimately by the voters. This refers to another form of individual responsibility, namely political responsibility. Individuals do not just passively face the state as people affected by state measures, but actively shape climate policy as citizens of this state (cf. section 4.2.3). This involvement encompasses a broad spectrum of different activities, ranging from exercising the right to vote and standing for election to participating in public opinion-formation and civil society commitment.¹⁴⁸

(3) The third argument relates to the lack of success of the approach of achieving greater climate justice through individual lifestyle choices. Despite many efforts over the decades, successes remain modest and are often cancelled out by increased consumption.¹⁴⁹ There is no sign of a global movement towards a more climate-friendly lifestyle. Hopes of a breakthrough towards lower-emission consumption with the help of gentle “nudging”¹⁵⁰ have also diminished. The (at least) significantly increased awareness of the problem of climate change continues to be reflected only slightly in changes in consumption. Although there are certainly many reasons for this, the lack of effectiveness of individual measures, which seems plausible to many, represents a significant barrier.¹⁵¹

Against this backdrop, it does not seem realistic to expect that a comprehensive turnaround can be achieved simply by

¹⁴⁸ Cf. Cripps (2013) 133–43.

¹⁴⁹ Cf. Sorrell (2007).

¹⁵⁰ Cf. Thaler and Sunstein (2009).

¹⁵¹ Cf. Sinnott-Armstrong (2005). There are different ways to respond to this perceived lack of self-efficacy. Cf. Schwenkenbecher (2014); Knights (2019); Sandler (2010).

intensifying environmental education or climate education, let alone by exerting moral pressure. It is true that people share responsibility for the way they shape their personal lives and are subject to a moral obligation to contribute to making their behaviour more climate-friendly within the scope of their respective possibilities. However, the one-sided or even exclusive attribution of climate responsibility to individuals is objectively inappropriate and unacceptable. The responsibility of collectives such as companies and especially states and, in view of limited national room for manoeuvre, international bodies must not be overlooked. All in all, calling for the assumption of individual responsibility only seems appropriate as part of a more comprehensive multi-actor responsibility.

4.2.2 The level of private collectives

For the private-collective level, which includes non-governmental organisations such as companies, churches or associations, the line of argument is analogous. In the case of climate change, companies, for example, have a moral responsibility to enable climate-friendly consumer behaviour with their products and services. Furthermore,, companies are in principle morally responsible for switching to lower-emission production, logistics and product ranges. In accordance with the ability-to-pay principle, large, global companies have a particular obligation. This applies all the more to the handful of companies (“Carbon Majors”) to which alone two thirds of global industrial greenhouse gas emissions can be attributed.¹⁵²

It is within the power of companies to offer climate-friendly alternative products that are not necessarily more expensive or worse than conventional products. Of course, the moral obligation to cooperate is contingent on it remaining compatible with the rules of competition in the economic system and

¹⁵² Cf. Grasso and Vladimirova (2020).

not placing an undue burden on companies. Beyond reasonable would be, for example, a demonstrable (and not merely claimed by lobbyist) threat to the company's own economic basis or competitiveness due to its commitment to reducing emissions. Under no circumstances should a merely alleged threat to the economic basis be misused for campaigns against effective climate policy. Competition rules and framework conditions for economic activity, which are decisive for what is economically reasonable, can also be shaped politically – at least within the national and European framework. This in turn points to climate responsibility in the political sphere (cf. section 4.2.3) and the interconnectedness of the levels in terms of a more comprehensive socio-ecological transformation.

4.2.3 The political level of public collectives

National and supranational institutions with a political mandate, such as governments and corresponding supranational bodies, represent the political level of public collectives. This is where framework conditions are established that strongly influence the ability of individuals and private collectives to participate in tackling climate change. The social conditions and legal framework must be restructured in such a way that lower-emission behaviour is possible without unreasonable or unjust personal or entrepreneurial burdens. Examples include the removal of subsidies that hinder climate neutrality, tax legislation that favours climate neutrality, an international tax on aviation fuel, expansion of the public transport system, promotion of climate-friendly agriculture and food, and the purposeful continuation of the energy transition.

Political measures in this regard are of course subject to constitutional requirements. These measures must be suitable, necessary and proportionate. Proportionality also requires a fair and reasonable distribution of burdens. For this reason, it is also constitutionally necessary to avoid unfair impacts

of climate-related measures, for example for socially weaker population groups. It should also be borne in mind that political measures must not merely lead to the emigration of emissions-intensive industries to other countries, as this would ultimately thwart the intended climate effects. It is therefore necessary to think on a larger, ultimately global scale.

Political measures for more climate justice have differing effects on people's freedom. They can enable, secure or restrict freedom. Legal provisions can collectively bind the members of a society to certain patterns of behaviour by means of rules and prohibitions and therefore be more effective than the moral obligation to cooperate based on insight and voluntariness. They can also, for example, eliminate the free-rider problem and the injustices involved. Of course, this does not give governments a free ticket to pass any measure to implement climate protection targets that have an unreasonable impact on the freedom of individuals.

Ultimately, both individual states and supranational players have a responsibility at the political level to work towards an effective global strategy for dealing with climate change that goes beyond existing international agreements. This is urgently needed, as the free-rider problem also plays a role internationally when countries place their own national interests first. Policies that aim to maximise the interests of a single country at the expense of other countries cannot solve the global problem of global warming.¹⁵³

Thinking in terms of national borders does not do justice to the global common good that is the climate. In this respect, parallels can be drawn with the equitable distribution of water and the protection of international waters.¹⁵⁴ Here,

¹⁵³ Cf. Nordhaus (2019).

¹⁵⁴ Cf. Grunwald (2016).

for example, international water protection conventions¹⁵⁵ are based on the idea that internationally important waters are a common good that cannot only be managed nationally. States are not allowed to do as they please in such waters on their respective territories, but have a shared responsibility to maintain the integrity of the waters in the long term. Some states even consider granting rivers, some of which supply entire regions of the world with water, a legal status of their own.¹⁵⁶ Just like protecting water, protecting the climate is an international task that states must fulfil as a shared responsibility. Tackling climate change can be seen as a cooperative endeavour to improve the well-being of nations if countries move away from nationalist policies and take cooperative action. There is a significant governmental responsibility to make a massive international commitment in favour of such a strategy.

4.3 Consequences for climate-friendly behaviour for different actors

In order for multi-actor responsibility for fair climate protection to be successful, it is necessary to take a closer look at the options for action of and the interactions between the actor levels described. In doing so, the role of expected technological developments should be taken into account and, on this basis, the scopes should be identified in which specific responsibilities should be allocated according to ethical considerations of justice.

¹⁵⁵ Convention on the Protection and Use of Transboundary Watercourses and International Lakes (UNECE Water Convention) of 17 March 1992; Convention on the Law of the Non-Navigational Uses of International Watercourses (UN Watercourses Convention) of 21 May 1997.

¹⁵⁶ Cf. Iorns Magallanes (2019); Page and Pelizzon (2022); Hansche and Meisch (2021).

4.3.1 Responsibility in the interaction between the actor levels

At an *individual level*, responsibility exists in two respects. On the one hand, it refers to *private consumption*. Even after the relativisations explained above, part of the responsibility to protect the climate remains with consumers within the scope of their levels of freedom and the availability of reasonable lower-emission alternatives. Even if climatic consequences are usually remote in time and space from individual actions and are thus anonymised, they are morally relevant.¹⁵⁷ Individual contributions to climate justice may be extremely small, and those taking action may feel that they are ineffective, but this does not mean that they are morally irrelevant.¹⁵⁸ Efforts to reduce climate damage through personal, family and community climate protection measures is first of all a decision of individual conscience tailored to the problem of climate change. Insofar as such decisions become habitual and routine in the behaviour of many individuals,¹⁵⁹ they promote the emergence and development of a culture of assumed responsibility.¹⁶⁰ This can significantly help to trigger the necessary transformation processes, even if the *individual* contributions do not directly lead to relevant effects in quantitative terms.

On the other hand, individual responsibility also refers to *political participation* in the democratic opinion-forming process for a climate-friendly future.¹⁶¹ This can take place through direct participation within representative democracy, for example through elections or party political involvement, but also through active participation in democratic opinion-forming in many other places in society, e.g. in political parties or in the (social) media. In addition, committed citizens can and

157 Cf. Broome (2019); Kagan (2011).

158 Cf. Baatz (2014).

159 Cf. Lawford-Smith (2015).

160 Cf. Hourdequin (2010); Hedberg (2018); Knights (2019).

161 Cf. Sandberg (2011).

should pool their interests in greater climate justice in local initiatives, supra-regional environmental organisations or social movements in order to trigger or reinforce political dynamics for climate protection and socio-ecological transformations in civil society. Procedural justice (cf. section 3.4) and compliance with the principles of the rule of law and democratic rules are essential for participation in all these forms.

At the *political level* of multi-actor responsibility, state bodies take regulatory and administrative action. In this way, they essentially shape the possibilities and conditions for climate protection-promoting action by individuals and private collectives that produce climate-relevant goods and services. Government action in all its forms (legislative and administrative) must itself be *sustainable*, i.e. viable, reliable and predictable in the long term, particularly in view of the upcoming socio-ecological transformations, so that it can fulfil its orientational function for personal lifestyles as well as for the production and trade of goods and services. Burdens must be distributed in a socially equitable manner (cf. section 3.3.1), and more disadvantaged people must be favoured in accordance with prioritarian principles.

More climate justice must not be bought at the price of injustice elsewhere. An open social debate is necessary in order to make the necessary deliberations and to communicate the intention of corresponding measures in a clear and transparent manner. One example of this is the Scottish concept of an independent “Just Transition Commission”, which examines and evaluates regulatory plans for the transition to a low-carbon economy with regard to aspects of justice.¹⁶²

Given the global dimension of climate change, every state must use supranational agreements to involve as many other countries as possible in climate protection efforts, and must also allow itself to be involved. This applies specifically to Germany, which in 2022 contributed only 1.8 percent to global

¹⁶² See <https://www.justtransition.scot> [2024-01-18].

CO₂ emissions whilst being of the largest economies in the world.¹⁶³ In terms of the ability-to-pay principle, this situation is both an opportunity and an obligation to initiate and implement international agreements for greater climate justice today and in the future.

Nevertheless the problem remains that there are still considerable obstacles at all levels to the equitable fulfilment of climate responsibility. In the face of the substantial risks posed by climate change, the German Ethics Council considers it the duty of state actors to make vigorous efforts to promote *global* harmonisation processes for greater climate justice and to achieve binding global agreements with effective reduction targets. In view of the free-rider problem mentioned above, the harmonisation processes must also include an effective concept to guarantee the implementation of agreed targets by the states. To this end, diplomatic options and regional alliances must be used to take meaningful steps towards the goal.

Although the existing international climate protection agreements provide considerable support for the global implementation of necessary measures to limit global warming, they are not yet sufficiently guaranteed. For this reason, it is currently uncertain whether the target of limiting global warming can actually be achieved, even if Germany and Europe make their contribution. Dealing with this uncertainty is of crucial importance for the legitimisation of intra-societally fair climate protection concepts at a national and European level, and is the subject of controversial debate in social discourse. Some argue that the burdens associated with national and European climate protection measures should only be imposed on the population once the global implementation of the necessary measures to limit global warming has been fully secured by means of international climate protection agreements.

However, this view does not do justice to the importance and urgency of the problem. It disregards the fact that in

¹⁶³ Cf. Global Carbon Budget (2023a).

situations in which there is no way of averting a danger with certainty, it may be necessary to resort to defence measures with uncertain success. In this case, the required prospective level of success is primarily determined by the extent of the damage that may occur if the danger materialises. The more serious these damages are, the more likely it is that measures to avert them are required that at least offer a chance of preventing the onset of the danger in question or of reducing its extent. Considering the extremely serious consequences of unabated global warming, it would therefore be downright irresponsible to refrain from taking national and European climate protection measures simply because the worldwide implementation of corresponding measures to limit global warming does not yet seem to be guaranteed.

This is all the more true since efforts to reach more effective international climate protection agreements would not be politically credible without simultaneous efforts at the national or European level. Up until 2020, the EU was responsible for 22 percent of the CO₂ emissions generated since the beginning of industrialisation¹⁶⁴ and, given its technical and financial capabilities, has a responsibility to take a lead in the necessary socio-ecological transformations and to promote the innovations required for this. It is therefore essential to take national and European climate protection measures now, in parallel with the negotiation of better global agreements, so that the emission reduction targets guaranteed in the Paris Agreement on Climate Change are achieved as far as possible and the necessary measures to achieve climate neutrality are reasonably distributed over time in a far-sighted overall concept. It is not simply a question of whether a target such as limiting global warming to 1.5 °C is achieved or missed, but rather of making significant progress towards greater climate justice. If the individual burdens necessary to fulfil this collective obligation are distributed in a socially fair manner, people can be expected to

¹⁶⁴ Cf. Chancel et al. (2021) 117 (fig. 6.2).

accept these burdens, because without such a parallel approach there is no longer a realistic chance of limiting global warming to a tolerable level.

Determining the extent of national measures is the task of political opinion-formation and state institutions. It must aim to ensure that justice is maintained or increased in all dimensions. Moreover, it should be carried out in such a way that restrictions of freedom and burdens are structured with foresight, so that individuals and private organisations can brace themselves for them, and planning security for companies is ensured, for example. This is in line with the decision of the German Federal Constitutional Court, which concludes from the principle of proportionality that the reductions in CO₂ emissions necessary to achieve climate neutrality and thus protect future generations should be distributed over time in a forward-looking manner that protects fundamental rights.¹⁶⁵

According to the polluter-pays-principle, Germany is one in a number of industrialised countries that contribute far disproportionately to climate change. The special responsibility from a justice ethics perspective resulting from this fact is intensified when the historical dimension of the causes for climate change is taken into account (cf. section 3.3.2). With its industrialisation through coal and steel, Germany was one of the pioneers in the use of fossil fuels. Since Germany, like other countries in the Global North, still benefits from these developments today, justice demands that it assumes special responsibility. This applies not only to the future mitigation of its own contributions to climate change, for example through an energy transition, but also, in the spirit of international climate justice, to supporting the countries of the Global South that are severely affected by the consequences of climate change. Here, it is important to overcome the historical injustices between the causation of climate change and the massive impacts of its consequences.

¹⁶⁵ BVerfGE 157, 30 (para. 243).

4.3.2 The role of technological development

Technological development is a field in which Germany can assume its international responsibility due to its technological capabilities and potential export opportunities for corresponding technologies and its business models. In the view of the German Ethics Council, the mitigation of greenhouse gases must remain the key concern of a long-term climate-friendly development, which requires, for example, further increases in efficiency and the fastest possible phase-out of fossil fuels.

At the same time, a more preventative approach regarding adaptation to climate change must be part of climate-responsible action. The state and society, including private collectives such as companies, have a responsibility – within the scope of their possibilities – to recognise problems at an early stage and take preventative measures, if possible before further climate-related catastrophic damages occur, such as severe floods or droughts. The German Ethics Council also considers it necessary to develop technologies that could contribute to achieving “negative emissions” (Negative Emissions Technology, NET), including techniques for carbon capture and storage, but also for binding other greenhouse gases such as methane (cf. section 2.3). Promoting the development of such technologies should generally be seen as positive, since experience in recent decades has shown that emission reduction measures will not lead to sufficient success quickly enough. Moreover, even in the event of far-reaching emission reductions, a CO₂ base will remain that would have to be reduced in order to limit global warming to a tolerable levels.¹⁶⁶

However, such technologies must not be misused to slow the reduction of emissions. This would trigger a vicious circle of increasing emissions and simultaneously increasing needs for carbon capture, thereby placing an undue burden on future generations. Global development with only slow progress

¹⁶⁶ Cf. Smith et al. (2023).

in reducing emissions but rapid implementation of NET technologies would impose the burden of having to operate the corresponding global large-scale infrastructure on future generations for an indefinite period of time, at a minimum for centuries¹⁶⁷. This would create considerable practical constraints that include risks, and would thus restrict freedoms and be an unfair burden on future generations. When utilising technological progress to mitigate climate change and deal fairly with its consequences, however, the civil liberties of those affected in the longer term must also be normatively taken into account (cf. section 3.3.3). This consideration therefore argues in favour of continuing to give higher priority to reducing emissions. Without such reductions, the spiral of technical upgrading to contain the climate problem while emissions increase will never end.

Responsibility for more climate justice to ensure minimum requirements for a good life also means realistically assessing the role of technology in tackling climate change and its consequences. This also applies to efficiency-enhancing technologies, for example in energy supply and mobility. Although efficiency is a key to greater climate justice, increases in efficiency are not per se beneficial to the climate, for instance if they are offset by other effects such as economic growth and increasing consumption (rebound effects). For example, progress in digitalisation and artificial intelligence is always expected to contribute to climate protection and sustainability. In fact, the opposite has usually happened so far, e.g. due to the high energy consumption of IT systems worldwide and the demand for rare metals associated with their use. Even considerable advances in efficiency do not release human action from responsibility. Technology must always be seen in its social context, for example regarding consumption and regulation. When assessing new technologies, it is also not enough to be satisfied with their positive *potential* for greater climate justice.

¹⁶⁷ Cf. Kalkuhl et al. (2022).

Rather, strategies must be developed to effectively implement this potential both nationally and internationally, including an examination of the effects of these strategies in terms of proportionality and justice.

The German Ethics Council considers it irresponsible to expect that individual future technologies such as nuclear fusion or artificial intelligence could - figuratively speaking - turn the tide on climate change so that we could manage without additional burdens or changes to current global economic and living conditions. The risks associated with climate change are so serious that waiting for this chance” or relying on a single solution would, in our view, be irresponsible, especially towards future generations.¹⁶⁸

4.3.3 Scope of required action

From the considerations detailed above arises the responsibility to scrutinise climate-relevant framework conditions for politics, business and technology – both nationally and globally – from an ethical justice perspective, and to develop alternatives. Firstly, this relates to questions of international governance and their bundling in the United Nations. The renaissance of geopolitical superpower aspirations with a corresponding bloc mentality as well as national egoisms and nationalisms jeopardises the necessary fair global cooperation in dealing with climate change.

Secondly, far-reaching questions arise with regard to the current economic order, which is orientated towards competition and quantitative growth. Growth in consumption and production often cancels out the sometimes considerable technical progress that has been made in terms of efficiency and greater resource productivity, as well as behavioural changes in parts of the population. In terms of justice, a distinction must

¹⁶⁸ Cf. Jonas (2020).

be made between growth in countries of the Global South that are catching up to achieve the minimum requirements for a good, successful life, and further growth of consumption and resource use in industrialised countries. While catch-up growth in countries of the Global South is a matter of making development particularly low-emission, e.g. through efficient technologies, industrialised countries are faced with more far-reaching questions about a fundamental socio-ecological transformation, i.e. an end to the focus on quantitative growth.

In Germany, political parties, civil society and science jointly bear the responsibility to make the comprehensive transformation towards a sustainable and climate-neutral society a key issue, and to develop alternatives for a good, successful life without further quantitative growth in consumption and exhaustion of resources. This will require changes in our private lifestyles as well as in society. It has become clear by now how strongly life as a consumer in a capitalist society in countries of the Global North affects the well-being and freedoms of future generations as well as those living today in other countries and in Germany. In this context, politically defined framework conditions have an impact on the individual and private-collective level. Politicians are challenged to reshape the framework conditions for the actions of individuals and organisations, e.g. companies, in such a way that reaching threshold values for a good, successful life is promoted for everyone. Individuals should have as much freedom as possible in the practical realisation of their responsibility, i.e. choices between several options for achieving the goals of climate justice.

For exploring and defining accepted, solution-oriented political measures, communication across society is particularly important, especially in the media and in politics (cf. chapter 2). Democratic opinion-formation requires informed and reflective communication in order to enable a constructive discourse with comprehensible and transparent considerations and prioritisations, which is essential for a sufficiently large social consensus. From this constellation arises a particular

responsibility for all actors with communicative reach in society for objective and transparent reporting and a differentiated presentation of normatively differing positions.

All of this, especially the need for a comprehensive transformation, represents a considerable challenge for democracy. Assuming climate responsibility at the political level has a considerable impact on habits and vested interests at the individual level, and therefore leads to a considerable need for explanation and, in some cases, is met with resistance. For this reason, greater consideration of criteria of procedural justice (cf. section 3.4) is also of great importance here.

The challenges for political and communicative processes described above, but also the short-term nature of democratic decisions due to four- to five-year parliamentary terms, have repeatedly led to calls to temporarily suspend democratic freedoms and processes by means of a kind of emergency argument in order to be able to enforce the measures required for lower-emission behaviour in a technocratic or even ecoauthoritarian manner.¹⁶⁹ There are two reasons why such proposals should be firmly rejected. The first reason is of a normative nature and is linked to the commitment to the democratic principle that all citizens have the right, as affected parties, to have a say in defining the norms of their social (co-)existence.¹⁷⁰ The other reason is that, unlike technocratic regimes, democracy also offers a wealth of functional opportunities for deliberation and participation (for example, in the context of many civil society climate protection movements that have been active in democracies for decades), which ultimately enables good and argument-based decisions. Of course, this does not mean that current forms of democracy already offer the best solutions for dealing with climate change. As a consequence, on all levels mentioned above, the responsibility arises to reflect on the further development of current institutions and processes of

169 Cf. Staab (2022).

170 Cf. Habermas (1992).

democratic opinion-forming, given the challenges of climate change.¹⁷¹

¹⁷¹ Cf. Kersten (2022).

5 CONCLUSIONS AND RECOMMENDATIONS

The search for ways to limit climate change and global warming and to cope with their consequences is one of the major challenges facing humanity both now and in the future, and raises a variety of questions of justice. Possible solutions in the interests of the health and life opportunities of present and future generations concern both emission reduction measures (mitigation) and adaptations to current and future consequences of climate change (adaptation), such as protection against heat, floods, drought and forest fires. In addition, technologies need to be developed for the targeted reduction of greenhouse gas concentrations. However, the fulfilment of these tasks not only involves immense scientific, technological, social and political challenges, but also the resolution of difficult ethical problems.

Losses, damages and burdens resulting from climate change and its management often lead to simultaneous injustices in at least three overlapping dimensions – between different social groups within a society (intra-societal), between states (international) and between people of different generations (intergenerational). Responses to the challenges associated with climate change must take appropriate account of the interests, concerns and abilities of all people living today, as well as of future generations. In this Opinion, the German Ethics Council therefore presents a concept of climate justice which aims to distribute burdens and duties in such a way that minimum requirements for a good, successful life are guaranteed for all. For important basic goods and capabilities such as health, food, security or mobility, corresponding threshold values are to be determined that must not be undershot for a good, successful life and from which different distribution rules result. Agreeing on such threshold levels and finding ways to adequately respect them in political decisions is no easy task. Fulfilling this task requires efforts at all social and political levels and

by all stakeholders, as well as adherence to the principles of procedural justice.

In view of the problem, an effective and efficient approach is a fundamental requirement of justice. Tackling climate change requires a socio-ecological transformation, which is associated with high investment, material and immaterial costs. However, unabated global warming would entail even greater follow-up costs and problems of justice than the transformation itself. The necessary endeavours require confidence as a basic attitude and determination in political action. This is sometimes impeded by the fact that the discussion about climate change is increasingly characterised by hopelessness, fatalism and concerns, e.g. regarding undesirable sacrifices, unreasonable prohibitions or even a comprehensive deindustrialisation of the country. However, the conclusions derived from the considerations presented here can also be associated with positive visions of life and attractive prospects of the transformation. It is possible to soundly justify climate protection ethically and to design measures that are fair, socially acceptable and democratically legitimised. At the same time, major opportunities for development open up in many areas – in addition to positive effects on the quality of life of many people, not least for employment-creating innovations in industry, transport and the energy sector.

With this Opinion, the German Ethics Council offers ethically well-founded answers to the fundamental question of how the interests of all people in a good, successful life can be taken into account and how responsibilities and burdens in dealing with climate change can be clearly defined and fairly distributed.

The German Ethics Council recommends:

1. The challenges and opportunities of the socio-ecological transformation that is required to tackle climate change should be discussed more clearly in public, in politics and

across society. In these discussions, climate justice and responsibility should take centre stage. Political parties, civil society, media and science should consider and develop perspectives for a good, successful life in a sustainable and climate-neutral society without further growth of consumption and exhaustion of resources.

2. Material and immaterial costs to implement climate protection measures should be defined as precisely as possible, communicated in a transparent manner and distributed equitably and responsibly, within society as well as internationally and intergenerationally. This process should be guided by threshold values for important basic goods and capabilities as minimum requirements for a good, successful life, and prioritise the needs of people whose provision does not reach certain threshold levels.
3. Climate protection measures should be interconnected in an overall political concept which includes changes in the energy sector, the promotion of low-emission technologies, the reduction of climate-damaging subsidies, regulations to reduce emissions and corresponding economic incentives, far-sighted measures to adapt to the inevitable consequences of climate change and the development and testing of technologies to capture carbon from the earth's atmosphere. For every decision on technical measures, possible new path dependencies at the expense of future generations must be avoided, for example if they are burdened with maintaining a global economy for carbon capture in the long term.
4. At a national level, care must be taken to quickly and effectively fulfil the commitments undertaken by Germany in the Paris Agreement. This can best be done by expanding and intensifying carbon pricing on products and services. In doing so, justice within society must be ensured, e.g. by

means of the compensatory effect of a general per-capita refund from carbon pricing to all residents. Moreover, it must be ensured that attractive climate-friendly alternatives are available. In addition, regulatory instruments like disproportionately high pricing on particularly climate-damaging products or services must be considered in order to make these less attractive for wealthy persons, too.

5. The fair distribution of responsibilities for these and other climate protection measures is mainly a task for the state. In order to fulfil this task, companies and other private organisations must be more strongly obliged, too, and be supported through appropriate framework conditions. The widespread focus to date on the personal responsibility of individual persons does not do justice to the problem. Individual freedom of choice is always influenced by the collective action of many, and strongly determined by political framework conditions. This is why clear legal regulations are required to make it easier for individuals to behave in a climate-friendly way. It is inappropriate for state actors to expect climate-friendly consumption from individuals as long as the conditions for such behaviour are largely unfulfilled or even thwarted within the economic and social order desired and supported by the same state, so that lower-emission choices still require a kind of “moral heroism” in many respects. Moral criticism of private lifestyle and consumption decisions is no substitute for necessary political measures.
6. The legitimate expectation of policymakers to create more effective framework conditions for climate protection does not, however, release individuals from their personal moral obligation to cooperate. Everyone has a moral responsibility to contribute to the fulfilment of social responsibilities. This includes a reconsideration of one’s personal conduct, way of life, and civic engagement with regard to

the challenges of climate change and the ways to deal with it, and to change them accordingly, as far as possible and reasonable – irrespective of regulatory standards.

7. The debate on fair ways to deal with climate change and its consequences must be pursued in a framework of open societal discourses. In this process, fair access and participation opportunities must be ensured, as well as transparent consideration of different pieces of information, arguments and options for action. Taking binding decisions must be reserved for the democratically legitimised bodies intended for this purpose, especially the parliaments. Scientific expert committees and extra-parliamentary civic engagement are part of the public discourse in a liberal parliamentary democracy; however, they cannot replace democratic decision-making. A potential destabilisation of democracy must be counteracted at all levels. Individual commitment and protests must abide by democratic rules, too.
8. Media and politics bear a particular responsibility to facilitate and lead a constructive, solution-oriented discourse on climate change. A credible discussion about realistic solutions to climate change requires fact-based reporting that neither glosses over nor exaggerates problems, and offers appropriate space for the range of positions found in society and science. Doubts that are barely substantiated by facts, evasive strategies or pseudo-solutions should not receive too much attention. Exaggerated alarmism or a one-sided focus on problems should both be avoided. In view of the great challenges of a socio-ecological transformation, the expected positive aspects should also be sufficiently highlighted.
9. Given the various health hazards of climate change that can be observed even today – also in Germany – and which are expected to increase, the health sector has a particular

responsibility to respond to these challenges and to implement protective measures. Legislators should change the rules and distribution of resources in the healthcare system in such a way that special attention is paid to climate adaptation issues in the regulation, control and organisation of the healthcare system.

10. Climate change and its consequences cannot be tackled at the national level alone. Especially at an international level, global warming must be addressed more effectively. Decisions on an internationally just distribution of burdens arising from climate change and the measures to deal with it require an intensification of intergovernmental understanding and cooperation. Therefore, Germany should give high priority to further increasing its current efforts in order to achieve effective global agreements to limit global warming and to set binding reduction targets whose implementation is guaranteed by the nation states. In order to achieve this, all diplomatic possibilities must be deployed and agreements made within alliances of states like the EU and G20, as well as other multinational agreements as intermediate steps. Particular emphasis should be given to mechanisms for the effective implementation of the adopted measures.
11. Wealthy industrial states must support countries of the Global South in financing the necessary investments to reduce emissions and adapt to climate change. The support payments that have already been promised must be actually paid, used for efficient measures in the recipient countries, supported by transfer of technologies and through fair trade relations, and their climate-protecting effect independently verified.
12. It is to be expected that some states will try to refrain from making their own contribution to climate protection for as

long as possible, in order to benefit from the efforts of others. This free rider problem should be countered by broad international cooperation involving as many countries as possible, in order to keep the costs and risks for all participants within reasonable limits, even if not all actors are prepared to make their contribution right from the start.

13. For reasons of intergenerational justice, the necessary steps to contain climate change and to adapt to its consequences must be taken as soon as possible. Given the serious effects on the livelihoods of younger and future generations, there is no ethical justification for waiting, stalling or delaying. The perspectives and interests of young people and future generations should be given more weight in political opinion-forming and decision-making on measures to tackle climate change. Appropriate instruments that politically implement and institutionalise the consideration of these perspectives and interests must be developed and expanded further.

DISSENTING VOTE

We share the view of the majority vote that tackling climate change and its consequences is one of the greatest tasks facing humankind, now and in the future, and that in this context, fundamental questions of justice need to be addressed. We also agree that, in view of the German Ethics Council's competences, its contribution can only lie in providing reliable ethical guidance for the necessary balancing decisions. Regrettably, however, the majority vote falls short of this self-defined goal in its deliberations in several respects. The approach outlined in the Opinion has a number of serious argumentative problems and normative gaps. In addition, although it does address questions of individual and collective responsibility in the context of climate change, the answers to these questions are themselves met with criticism.

I. On questions of justice

The central topos of climate justice remains surprisingly underdetermined. Firstly, there is no discussion of how the efforts for "climate justice" relate to other "great human tasks" – such as the fight against hunger – or specifically why they should be given top priority. Comprehensible criteria for this are not named, let alone explained in more detail. The same applies to the question of risk assessment (for example in comparison to the peaceful use of nuclear power), just as innovation aspects only are mentioned in passing. Nor is the relationship between mitigation and adaptation, which raise very different problems of justice, sufficiently elaborated.

Secondly, the majority vote attempts to combine egalitarian, sufficientarian and prioritarian considerations into a "*sufficientarian threshold concept of climate justice*" (section 3.2, paragraph 7) that is "expanded to include the principle of fair democratic participation and involvement" (section 3.4, paragraph 4). However, the Opinion does not provide a

comprehensible explanation that goes beyond academic jargon. In particular, it remains completely unclear how the distribution-relevant threshold values for the individual goods, which are elementary for the proposed concept of justice, are to be determined in each specific case. Since the importance and practical (benefit) value of individual goods vary greatly due to the extremely different circumstances and living conditions in the various regions of the world, but also within a national area, the recent debate on justice does not consider the goods as such to be decisive, but their contribution to the development of certain capabilities. However, it is not only a question of the semantic currency in which the distribution discourse itself should be conducted, but also of its normative point of reference. Depending on whether the basic concept of 'dignity', the - in their extent notoriously controversial - 'human rights' or even the culturally conditioned notions of a 'good life' are used, very different distribution arrangements arise. In order to be able to appropriately moderate the political conflicts of objectives in the three central areas of intra-societal, international and intergenerational justice, a much more differentiated normative set of criteria is required, beyond the always necessary safeguarding of a minimum subsistence level for all those involved, in order to be able to evaluate alternative strategies for action and to organise the temporally extended transformation processes accordingly. As is conceded in the Opinion itself, the theoretical models of egalitarianism, sufficientarianism and prioritarianism used here as reference points take "different, occasionally even competing positions" (section 3.2, paragraph 1) with regard to the definition and emphasis of the different aspects and dimensions of justice, it is not sufficient to simply mention the various possibilities of weighting the equality principle, polluter-pays principle, beneficiary-pays principle and ability-to-pay principle (cf. section 2.7) and then refer in recommendation no. 12 to the general free-rider problem to which all these theoretical models are naturally exposed.

Thirdly, a direct consequence of the lack of a convincing set of criteria for making well-founded decisions when weighing up competing strategies for action is the purely *appellative* nature of the statements, particularly on international and intergenerational justice. The call to intensify efforts to conclude global agreements to limit global warming is as general as it is cheap, as long as it is not at all clear whether the largest CO₂ emitters can be integrated into such agreements. The same applies to the statement that the wealthy industrialised nations must provide to the countries of the Global South “support in financing the necessary investments to reduce emissions and adapt to climate change” (recommendation no. 11). Here, too, we would like to see more concrete details on what such support should look like in view of the very different national strategies, for example with regard to the compensation fund for damages and losses set up at the last COP 28 World Climate Conference. The reflections on intergenerational justice are also largely limited to a few references to improving the political representation of younger people or people not yet born, without answering the ethically relevant questions of a fair distribution of various adaptation measures over a longer sequence of generations for even a single area of action. This is aggravated by the extensive lack of coherent structural considerations as to how the different approaches to the theory of justice and the respective legal interests concerned could be placed in a procedurally and materially convincing relationship. Apart from the fact that the epistemic status of climate science forecasts that differ regarding how far they extend into the future is not adequately taken into account, there are no further considerations on the relationship between scientific and political rationality. Furthermore, the question of how probability aspects can influence the weight of certain justice considerations remains completely unanswered – although this is obviously of utmost importance for the deontic qualification (permissibility or necessity) of a measure. The same applies to the insufficient differentiation with regard to the

various relevant (legal) normative levels, for example the relationship between international and constitutional law.

Fourthly, the Opinion fails to recognise that the advocated climate protection policy has clearly unequal effects in social terms. Instead, the Opinion answers questions of justice within society from a one-sided, elitist perspective. The freedom of choice mentioned in section 2.3 with regard to more or less carbon intensive lifestyles does not exist for most people in Germany due to their personal and economic circumstances, even if they are provided with financial assistance. To give just one example, this cannot compensate for people who are dependent on private cars due to illness, age or housing situation. It is simply inadequate to respond to an expected lack of freedom and inequality by simply proposing monetary compensation, especially as this is unlikely to compensate for all losses, nor is it more specifically defined in its distribution logic. Furthermore, the extensive carbon pricing as set out in recommendation no. 4 threatens to establish a particularly intrusive instrument for the comprehensive control and monitoring of private lifestyles – a danger that is not mentioned at all in the Opinion.

II. On dealing with responsibility

The complex dimensions of individual and collective responsibility in connection with the challenges caused by climate change are also insufficiently addressed in the Opinion. Firstly, this concerns the normative containment of the finding that even particularly extensive national efforts to improve one's own carbon footprint have a very small impact on global CO₂ emissions (and are also very likely to be [over]compensated elsewhere because fossil fuels, for example, do not simply disappear). Interference with the individual freedom of citizens can hardly be legitimised on this basis; they are simply not proportionate in the absence of suitability for achieving the declared goal of climate protection. Contrary to what is said in the Opinion (section 4.3.1, paragraph 8), the “urgency” of the

problem does not change this: Time pressure does not turn an ineffective measure into an effective one. The hope that Germany could assume a global pioneering role through its national climate policy, which would motivate in particular those countries that currently contribute massively to global carbon emissions to follow suit, proves to be epistemically highly uncertain and therefore cannot justify massive interventions in the freedom of its own citizens.

The Opinion's appellative tone turns into an exaggerated and almost illiberal moralism at the point where it imposes a moral obligation to cooperate on individual citizens, according to which they "can and should pool their interests in greater climate justice in local initiatives, supra-regional environmental organisations or social movements in order to trigger or reinforce political dynamics for climate protection and socio-ecological transformations in civil society" (section 4.3.1, paragraph 2), that is taken up in recommendation no. 6. In view of the many normative gaps, not only do the outlines of the climate policy deemed here as absolutely worthy of support remain unclear, but the question also arises as to why it should not be left to the responsible citizens themselves to autonomously determine the goals of their respective political commitment. With this rhetoric, the Opinion also disavows the concern, which we expressly support, that the issue of climate protection should not lead to an erosion or questioning of democratic institutions.

Steffen Augsberg, Franz-Josef Bormann, Frauke Rostalski

REFERENCES

- Abate, Randall S. (2019): *Climate Change and the Voiceless. Protecting Future Generations, Wildlife, and Natural Resources*. Cambridge: Cambridge University Press.
- Adrian, Gerhard; Dietrich, Martin; Esser, Birgit; Hensel, Andreas; Isermeyer, Folkhard; Messner, Dirk; Mettenleiter, Thomas C.; et al. (2023): Gemeinsam können wir den Auswirkungen des Klimawandels begegnen. In: *Journal of Health Monitoring*, 8 (S3), 3–6. DOI: <https://doi.org/10.25646/11390>.
- Apel, Karl-Otto (1988): Verantwortung heute – nur noch Prinzip der Bewahrung und Selbstbeschränkung oder immer noch der Befreiung und Verwirklichung von Humanität? In: *Diskurs und Verantwortung. Das Problem des Übergangs zur postkonventionellen Moral*, by Karl-Otto Apel, 179–216. Frankfurt am Main: Suhrkamp.
- Aristoteles (1985): *Nikomachische Ethik*. Edited by Günther Bien. 4th ed. Hamburg: Meiner (Philosophische Bibliothek: 5).
- Baatz, Christian (2014): Climate change and individual duties to reduce GHG emissions. In: *Ethics, Policy & Environment*, 17 (1), 1–19. DOI: <https://doi.org/10.1080/21550085.2014.885406>.
- Baatz, Christian; Ott, Konrad (2015): Klimaethik: Mitigation, Adaptation und Climate Engineering. In: *Klimagerechtigkeit und Klimaethik*, ed. by Angela Kallhoff, 181–98. Berlin: De Gruyter (Wiener Reihe: 18).
- Baatz, Christian; Voget-Kleschin, Lieske (2019): Individuals' contributions to harmful climate change: The fair share argument restated. In: *Journal of Agricultural and Environmental Ethics*, 32 (4), 569–90. DOI: <https://doi.org/10.1007/s10806-019-09791-2>.
- Baer, Paul; Athanasiou, Tom; Kartha, Sivan; Kemp-Benedict, Eric (2008): *The Greenhouse Development Rights Framework. The Right to Development in a Climate Constrained World*. 2nd ed. Berlin: Heinrich-Böll-Stiftung (Publication Series on Ecology: 1).
- Bartmann, Marius; Halsband, Aurélie; Schapper, Andrea (2023): *Climate Justice. Ethical Aspects and Policy Aspects*. Baden-Baden: Verlag Karl Alber (Ethik in den Biowissenschaften: 26).
- Bedford-Strohm, Heinrich (2018): *Vorrang für die Armen. Auf dem Weg zu einer theologischen Theorie der Gerechtigkeit*. 2nd ed. Leipzig: Evangelische Verlagsanstalt (Öffentliche Theologie: 4).
- Birnbacher, Dieter (2022): *Klimaethik. Eine Einführung*. Ditzingen: Reclam (Reclams Universal-Bibliothek: 14267).
- BMUV (2023): *Nationale Wasserstrategie. Kabinettsbeschluss vom 15. März 2023*. Available at https://www.bmu.de/fileadmin/Daten_BMU/Download_PDF/Binnengewasser/BMUV_Wasserstrategie_bf.pdf, accessed on 16.01.2024.
- BMUV; Umweltbundesamt (2023): *Umweltbewusstsein in Deutschland 2022. Ergebnisse einer repräsentativen Bevölkerungsumfrage*. Available at https://www.bmu.de/fileadmin/Daten_BMU/Pool/Broschueren/umweltbewusstsein_2022_bf.pdf, accessed on 14.02.2024.

- Bohnenberger, Katharina (2022): Klimasozialpolitik. Ein Forschungsstandbericht zur Verbindung von Klimapolitik und Sozialpolitik. Available at <https://difis.org/f/7f9566f4c3.pdf>, accessed on 18.10.2023.
- Bojanowski, Axel (2019): Journalisten im Klimakrieg. In: *Aus Politik und Zeitgeschichte*, 69 (47–48), 35–38.
- Bolte, Gabriele; Dandolo, Lisa; Gepp, Sophie; Hornberg, Claudia; Lopez Lumbi, Susanne (2023): Klimawandel und gesundheitliche Chancengerechtigkeit: Eine Public-Health-Perspektive auf Klimagerechtigkeit. In: *Journal of Health Monitoring*, 8 (S6), 3–38. DOI: <https://doi.org/10.25646/11769>.
- Boykoff, Maxwell T.; Boykoff, Jules M. (2004): Balance as bias: global warming and the US prestige press. In: *Global Environmental Change*, 14 (2), 125–36. DOI: <https://doi.org/10.1016/j.gloenvcha.2003.10.001>.
- Braun, Florian (2023): Klimaverantwortung und Energiekonflikte. Eine Argumentationsanalyse von Abwägungen zu Windkraftanlagen. 1st ed. Baden-Baden: Nomos (Wissenschafts- und Technikforschung; 23).
- Braun, Florian; Baatz, Christian (2017): Klimaverantwortung. In: *Handbuch Verantwortung*, ed. by Ludger Heidbrink, Claus Langbehn and Janina Loh, 855–86. Wiesbaden: Springer VS.
- Broome, John (2016): Do not ask for morality. In: *The Ethical Underpinnings of Climate Economics*, ed. by Adrian Walsh, Sæde Hormio and Duncan Purves, 9–21. London: Routledge.
- Broome, John (2019): Against denialism. In: *The Monist*, 102 (1), 110–29. DOI: <https://doi.org/10.1093/monist/ony024>.
- Brüggemann, Michael; Engesser, Sven (2017): Beyond false balance: How interpretive journalism shapes media coverage of climate change. In: *Global Environmental Change*, 42 (1), 58–67. DOI: <https://doi.org/10.1016/j.gloenvcha.2016.11.004>.
- Brüggemann, Michael; Sadikni, Remon (2024): Online Media Monitor - Analyse der weltweiten Online Klimaberichterstattung von Nachrichtenseiten. Available at <https://www.cen.uni-hamburg.de/icdc/data/society/omm-mediaanalysis.html>, accessed on 14.02.2024.
- Brumlik, Micha (2017): Advokatorische Ethik. Zur Legitimation pädagogischer Eingriffe. 3rd ed. Hamburg: CEP Europäische Verlagsanstalt.
- Büchs, Milena; Cass, Noel; Mullen, Caroline; Lucas, Karen; Ivanova, Diana (2023): Emissions savings from equitable energy demand reduction. In: *Nature Energy*, 8 (7), 758–69. DOI: <https://doi.org/10.1038/s41560-023-01283-y>.
- Caney, Simon (2014): Climate change, intergenerational equity and the social discount rate. In: *Politics, Philosophy & Economics*, 13 (4), 320–42. DOI: <https://doi.org/10.1177/1470594X14542566>.
- Caney, Simon (2019): Justice and posterity. In: *Climate Justice. Integrating Economics and Philosophy*, ed. by Ravi Kanbur and Henry Shue, 157–74. Oxford: Oxford University Press.
- Caney, Simon (2021): Climate justice. *The Stanford Encyclopedia of Philosophy (Winter 2021 Edition)*. Available at <https://plato.stanford.edu/entries/justice-climate>, accessed on 16.01.2024.
- Caviezel, Claudio; Revermann, Christoph (2014): Climate Engineering. Endbericht zum TA-Projekt „Geoengineering“. Berlin: TAB.

- Chancel, Lucas; Piketty, Thomas; Saez, Emmanuel; Zucman, Gabriel (2021): World Inequality Report 2022. *World Inequality Database*. Available at <https://wir2022.wid.world>, accessed on 18.10.2023.
- Clayton, Susan (2020): Climate anxiety: Psychological responses to climate change. In: *Journal of Anxiety Disorders*, 74, 102263. DOI: <https://doi.org/10.1016/j.janxdis.2020.102263>.
- Cripps, Elizabeth (2013): *Climate Change and the Moral Agent. Individual Duties in an Interdependent World*. Oxford: Oxford University Press.
- Deutscher Ethikrat (2017): *Big Data und Gesundheit – Datensouveränität als informationelle Freiheitsgestaltung*. Berlin.
- Deutscher Ethikrat (2022): *Vulnerabilität und Resilienz in der Krise – Ethische Kriterien für Entscheidungen in einer Pandemie*. Berlin.
- Doherty, Thomas J.; Clayton, Susan (2011): The psychological impacts of global climate change. In: *American Psychologist*, 66 (4), 265–76. DOI: <https://doi.org/10.1037/a0023141>.
- Düwell, Marcus (2017): Zur Zukunft der Klimaethik. In: *Jahrbuch für Wissenschaft und Ethik*. Band 21, ed. by Dieter Sturma, Bert Heinrichs and Ludger Honnefelder, 115–20. Berlin: De Gruyter. DOI: <https://doi.org/10.1515/jwiet-2017-0108>.
- Dvorak, Michelle T.; Armour, Kyle C.; Frierson, Dargan M. W.; Proistosescu, Cristian; Baker, Marcia B.; Smith, Christopher J. (2022): Estimating the timing of geophysical commitment to 1.5 and 2.0 °C of global warming. In: *Nature Climate Change*, 12 (6), 547–52. DOI: <https://doi.org/10.1038/s41558-022-01372-y>.
- Fanning, Andrew L.; Hickel, Jason (2023): Compensation for atmospheric appropriation. In: *Nature Sustainability*, 6 (9), 1077–86. DOI: <https://doi.org/10.1038/s41893-023-01130-8>.
- Forst, Rainer (2022): *Das Recht auf Rechtfertigung. Elemente einer konstruktivistischen Theorie der Gerechtigkeit*. 4th ed. Frankfurt am Main: Suhrkamp (Suhrkamp-Taschenbuch Wissenschaft: 1762).
- Fragnière, Augustin (2016): Climate change and individual duties. In: *WIREs Climate Change*, 7 (6), 798–814. DOI: <https://doi.org/10.1002/wcc.422>.
- Franziskus (2015): *Laudato si'. Über die Sorge für das gemeinsame Haus*. Stuttgart: kbw Bibelwerk.
- Gammon, Richard H.; Sundquist, Eric T.; Fraser, Paul J. (1985): History of carbon dioxide in the atmosphere. In: *Atmospheric Carbon Dioxide and the Global Carbon Cycle*, ed. by John R. Trabalka, 25–62. Washington, D.C.: United States Department of Energy. Available at <https://www.osti.gov/servlets/purl/6048470>, accessed on 08.02.2024.
- Gardiner, Stephen M. (2021): Future ethics. In: *Handbuch Technikethik*, ed. by Armin Grunwald and Rafaela Hillerbrand, 2nd ed., 203–7. Berlin: J.B. Metzler.
- Gardiner, Stephen M.; Caney, Simon; Jamieson, Dale; Shue, Henry (Hrsg.) (2010): *Climate Ethics. Essential Readings*. Oxford: Oxford University Press.
- Global Carbon Budget (2023a): Annual CO₂ emissions – GCB. *Our World in Data*. Available at <https://ourworldindata.org/grapher/annual-co2-emissions-per-country>, accessed on 13.02.2024.
- Global Carbon Budget (2023b): Cumulative CO₂ emissions – GCB. *Our World in Data*. Available at <https://ourworldindata.org/grapher/cumulative-co-emissions>, accessed on 13.02.2024.

Gonzalez-Ricoy, Inigo; Rey, Felipe (2019): Enfranchising the future: Climate justice and the representation of future generations. In: *WIREs Climate Change*, 10 (5), e598. DOI: <https://doi.org/10.1002/wcc.598>.

Gosseries, Axel; Meyer, Lukas H. (Hrsg.) (2009): *Intergenerational Justice*. Oxford: Oxford University Press.

Grasso, Marco; Vladimirova, Katia (2020): A moral analysis of carbon majors' role in climate change. In: *Environmental Values*, 29 (2), 175–95. DOI: <https://doi.org/10.3197/o96327119X15579936382626>.

Graven, Heather; Keeling, Ralph F.; Rogelj, Joeri (2020): Changes to carbon isotopes in atmospheric CO₂ over the industrial era and into the future. In: *Global Biogeochemical Cycles*, 34 (11), e2019GB006170. DOI: <https://doi.org/10.1029/2019GB006170>.

Green, Jessica F. (2021): Does carbon pricing reduce emissions? A review of ex-post analyses. In: *Environmental Research Letters*, 16 (4), 043004. DOI: <https://doi.org/10.1088/1748-9326/abdae9>.

Grunwald, Armin (2010): Wider die Privatisierung der Nachhaltigkeit. Warum ökologisch korrekter Konsum die Umwelt nicht retten kann. In: *GAIA*, 19 (3), 178–82. DOI: <https://doi.org/10.14512/gaia.19.3.6>.

Grunwald, Armin (2016): Water ethics – orientation for water conflicts as part of inter- and transdisciplinary deliberation. In: *Society - Water - Technology. A Critical Appraisal of Major Water Engineering Projects*, ed. by Reinhard F. Hüttel, Oliver Bens, Christine Bismuth and Sebastian Hoechstetter, 11–29. Cham: Springer. DOI: https://doi.org/10.1007/978-3-319-18971-0_2.

Grunwald, Armin; Kopfmüller, Jürgen (2022): *Nachhaltigkeit*. 3rd ed. Frankfurt am Main: Campus (Campus Studium).

Guenther, Lars; Brüggemann, Michael (2023): Not here, not now, not me: how distant are climate futures represented in journalistic reporting across four countries? In: *Journal of Science Communication*, 22 (5), A01. DOI: <https://doi.org/10.22323/2.22050201>.

Guenther, Lars; Brüggemann, Michael; Elkobros, Shorouk (2022): From global doom to sustainable solutions: International news magazines' multimodal framing of our future with climate change. In: *Journalism Studies*, 23 (1), 131–48. DOI: <https://doi.org/10.1080/1461670X.2021.2007162>.

Guenther, Lars; Meyer, Hendrik; Kleinen-von Königsłow, Katharina; Brüggemann, Michael (2023): A distant threat? The framing of climate futures across four countries. In: *Environmental Communication*, 17 (7), 775–93. DOI: <https://doi.org/10.1080/17524032.2023.2253500>.

Habermas, Jürgen (1992): *Faktizität und Geltung. Beiträge zur Diskurstheorie des Rechts und des demokratischen Rechtsstaats*. 1st ed. Frankfurt am Main: Suhrkamp.

Hansche, Maximilian; Meisch, Simon (2021): Rights for rivers. In: *Justice and Food Security in a Changing Climate*, ed. by Hanna Schübel and Ivo Wallimann-Helmer, 356–61. Wageningen: Wageningen Academic Publishers.

Hase, Valerie; Mahl, Daniela; Schäfer, Mike S.; Keller, Tobias R. (2021): Climate change in news media across the globe: An automated analysis of issue attention and themes in climate change coverage in 10 countries (2006–2018). In: *Global Environmental Change*, 70, 102327. DOI: <https://doi.org/10.1016/j.gloenvcha.2021.102327>.

Hedberg, Trevor (2018): Climate change, moral integrity, and obligations to reduce individual greenhouse gas emissions. In: *Ethics, Policy & Environment*, 21 (1), 64–80. DOI: <https://doi.org/10.1080/21550085.2018.1448039>.

Heidbrink, Ludger; Schmidt, Imke; Ahaus, Björn (Hrsg.) (2011): Die Verantwortung des Konsumenten. Über das Verhältnis von Markt, Moral und Konsum. Frankfurt am Main: Campus.

Heyward, Jennifer C.; Roser, Dominic (Hrsg.) (2016): Climate Justice in a Non-Ideal World. Oxford: Oxford University Press.

Hiss, David (2021): Hitze, Extremwetter und kognitive Dissonanz. Warum die kognitive Dissonanz in der Klimakrise allgegenwärtig ist und was das für die Klimakommunikation bedeutet. In: *Climate Action – Psychologie der Klimakrise. Handlungshemmnisse und Handlungsmöglichkeiten*, ed. by Lea Dohm, Felix Peter and Katharina van Bronswijk, 141–58. Gießen: Psychosozial-Verlag.

Hourdequin, Marion (2010): Climate, collective action and individual ethical obligations. In: *Environmental Values*, 19 (4), 443–64. DOI: <https://doi.org/10.3197/o96327110X531552>.

Iorns Magallanes, Catherine (2019): From rights to responsibilities using legal personhood and guardianship for rivers. In: *ResponsAbility. Law and Governance for Living Well With the Earth*, ed. by Betsan Martin, Linda Te Aho and Maria Humphries-Kil, 216–39. London: Routledge.

IPBES (2023): The Thematic Assessment Report on Invasive Alien Species and their Control. Available at <https://www.ipbes.net/ias>, accessed on 23.02.2024.

IPCC (2018): Global Warming of 1.5 °C. Available at <https://www.ipcc.ch/sr15>, accessed on 11.01.2024.

IPCC (2019): Climate Change and Land. Available at <https://www.ipcc.ch/srccl>, accessed on 11.01.2024.

IPCC (2021): Climate Change 2021: The Physical Science Basis. Available at <https://www.ipcc.ch/report/ar6/wg1>, accessed on 11.01.2024.

IPCC (2022a): Climate Change 2022: Impacts, Adaptation and Vulnerability. Available at <https://www.ipcc.ch/report/ar6/wg2>, accessed on 11.01.2024.

IPCC (2022b): Climate Change 2022: Mitigation of Climate Change. Available at <https://www.ipcc.ch/report/ar6/wg3>, accessed on 11.01.2024.

IPCC (2023): Climate Change 2023: Synthesis Report. Available at <https://www.ipcc.ch/report/ar6/syr>, accessed on 11.01.2024.

Jonas, Hans (2020): Das Prinzip Verantwortung. Versuch einer Ethik für die technologische Zivilisation. 1st ed. Berlin: Suhrkamp.

Kagan, Shelly (2011): Do I make a difference? In: *Philosophy & Public Affairs*, 39 (2), 105–41. DOI: <https://doi.org/10.1111/j.1088-4963.2011.01203.x>.

Kahlenborn, Walter; Porst, Luise; Voß, Maïke; Fritsch, Ute; Renner, Kathrin; Zebisch, Marc; Wolf, Mareike; Schönthaler, Konstanze; Schauser, Inke (2021): Klimawirkungs- und Risikoanalyse 2021 für Deutschland (Kurzfassung). Available at https://www.umweltbundesamt.de/sites/default/files/medien/5750/publikationen/2021-06-10_cc_26-2021_kwra2021_kurzfassung.pdf, accessed on 13.02.2024.

Kalkuhl, Matthias; Franks, Max; Gruner, Friedemann; Lessmann, Kai; Edenhofer, Ottmar (2022): Pigou's Advice and Sisyphus' Warning: Carbon Pricing with Non-Permanent Carbon-Dioxide Removal (CESifo Working Paper: 10169). Available at <https://ssrn.com/abstract=4315996>, accessed on 14.02.2024.

Kallhoff, Angela (2021): Climate Justice and Collective Action. London: Routledge.

Kersten, Jens (2022): Das ökologische Grundgesetz. München: C.H. Beck.

Kikstra, Jarmo S.; Waidelich, Paul; Rising, James; Yumashev, Dmitry; Hope, Chris; Brierley, Chris M. (2021): The social cost of carbon dioxide under climate-economy feedbacks and temperature variability. In: *Environmental Research Letters*, 16 (9), 094037. DOI: <https://doi.org/10.1088/1748-9326/ac1dob>.

Kim, Seoni; Nitzsche, Michael P.; Rufer, Simon B.; Lake, Jack R.; Varanasi, Kripa K.; Hatton, T. Alan (2023): Asymmetric chloride-mediated electrochemical process for CO₂ removal from oceanwater. In: *Energy & Environmental Science*, 16 (5), 2030–44. DOI: <https://doi.org/10.1039/D2EE03804H>.

Kistler, Sebastian (2018): Wie viel Gleichheit ist gerecht? Sozialethische Untersuchungen zu einem nachhaltigen und gerechten Klimaschutz. Marburg: Metropolis-Verlag (Beiträge zur sozialwissenschaftlichen Nachhaltigkeitsforschung: 23).

Klinger, Kira; Metag, Julia; Schäfer, Mike S. (2022): Global warming's five germanys – revisited and framed in an international context. In: *Environmental Communication*, 16 (8), 1108–26. DOI: <https://doi.org/10.1080/17524032.2022.2153897>.

Knights, Paul (2019): Inconsequential contributions to global environmental problems: A virtue ethics account. In: *Journal of Agricultural and Environmental Ethics*, 32 (4), 527–45. DOI: <https://doi.org/10.1007/s10806-019-09796-x>.

Konrad-Adenauer-Stiftung (2023): Klimaschutz global gerecht gestalten. Available at <https://www.kas.de/documents/d/guest/sozialethik-konkret-klimaschutz-global-gerecht-gestalten>, accessed on 16.01.2024.

Kowalzig, Jan; Brückner, Mara; Schmitt, Manuel (2023): Klima der Ungleichheit. Wie extremer Reichtum weltweit die Klimakrise, Armut und Ungleichheit verschärft. Available at <https://www.oxfam.de/system/files/documents/20231120-oxfam-klima-ungleichheit.pdf>, accessed on 11.01.2024.

Kruip, Gerhard (2023): Die Soziale Frage in der globalen Klimaschutzpolitik. In: *Klimaschutz global gerecht gestalten*, ed. by Konrad-Adenauer-Stiftung, 59–76. Available at <https://www.kas.de/documents/d/guest/sozialethik-konkret-klimaschutz-global-gerecht-gestalten>, accessed on 16.01.2024.

Lamb, William F.; Mattioli, Giulio; Levi, Sebastian; Roberts, J. Timmons; Capstick, Stuart; Creutzig, Felix; Minx, Jan C.; Müller-Hansen, Finn; Culhane, Trevor; Steinberger, Julia K. (2020): Discourses of climate delay. In: *Global Sustainability*, 3, e17. DOI: <https://doi.org/10.1017/sus.2020.13>.

Lawford-Smith, Holly (2015): Unethical consumption and obligations to signal. In: *Ethics & International Affairs*, 29 (3), 315–30. DOI: <https://doi.org/10.1017/S089267941500026X>.

Lawrence, Michael; Homer-Dixon, Thomas; Janzwood, Scott; Rockstöm, Johan; Renn, Ortwin; Donges, Jonathan F. (2024): Global polycrisis: the causal mechanisms of crisis entanglement. In: *Global Sustainability*, 7, e6. DOI: <https://doi.org/10.1017/sus.2024.1>.

Lehrer, Lena; Hellmann, Lennart; Temme, Hellen; Otten, Leonie; Hübenthal, Johanna; Geiger, Mattis; Jenny, Mirjam A.; Betsch, Cornelia (2023): Kommunikation zu Klimawandel und Gesundheit für spezifische Zielgruppen. In: *Journal of Health Monitoring*, 8 (S6), 39–60. DOI: <https://doi.org/10.25646/11770>.

- Leichenko, Robin M.; O'Brien, Karen L. (2008): *Environmental Change and Globalization. Double Exposures*. Oxford: Oxford University Press.
- Lenton, Timothy M.; Armstrong McKay, David I.; Loriani, Sina; Abrams, Jesse F.; Lade, Steven J.; Donges, Jonathan F.; Buxton, Joshua E.; et al. (2023): *The Global Tipping Points Report 2023*. Available at <https://global-tipping-points.org/download/4608>, accessed on 13.02.2024.
- Lenton, Timothy M.; Xu, Chi; Abrams, Jesse F.; Ghadiali, Ashish; Loriani, Sina; Sakschewski, Boris; Zimm, Caroline; et al. (2023): Quantifying the human cost of global warming. In: *Nature Sustainability*, 6 (10), 1237–47. DOI: <https://doi.org/10.1038/s41893-023-01132-6>.
- Llain Arenilla, Shirley; Hawkins Rada, Cindy (2020): Climate change and forced migration. In: *Migraciones Internacionales*, 11, 6. DOI: <https://doi.org/10.33679/rmi.vii.1846>.
- Lob-Hüdepohl, Andreas (2020): „Nachhaltige Lebensstile“. Ethische Anmerkungen zu einem moralischen „Hochwertopos“. In: *Theologie der Gegenwart*, 63 (2), 117–29.
- Matthey, Astrid; Bünger, Björn (2020): Methodenkonvention 3.1 zur Ermittlung von Umweltkosten (Kostensätze). Available at https://www.umweltbundesamt.de/sites/default/files/medien/1410/publikationen/2020-12-21_methodenkonvention_3_1_kostensaetze.pdf, accessed on 16.01.2024.
- Menchetti, Mattia; Schifani, Enrico; Alicata, Antonio; Cardador, Laura; Sbrega, Elisabetta; Toro-Delgado, Eric; Vila, Roger (2023): The invasive ant *Solenopsis invicta* is established in Europe. In: *Current Biology*, 33 (17), R896–97. DOI: <https://doi.org/10.1016/j.cub.2023.07.036>.
- Meyer, Lukas (2021): Intergenerational justice. *The Stanford Encyclopedia of Philosophy (Winter 2021 Edition)*. Available at <https://plato.stanford.edu/entries/justice-intergenerational>, accessed on 16.01.2024.
- Meyer, Lukas H.; Roser, Dominic (2007): Intergenerationelle Gerechtigkeit. Die Bedeutung von zukünftigen Klimaschäden für die heutige Klimapolitik. Available at https://ub-swsearch.ub.unibas.ch/de/detail/swsearch_9955886560105504, accessed on 14.02.2024.
- Meyer, Lukas H.; Roser, Dominic (2009): Enough for the future. In: *Intergenerational Justice*, ed. by Axel Gosseries and Lukas H. Meyer, 219–48. Oxford: Oxford University Press.
- Moellendorf, Darrel (2018): Development and climate ethics. In: *The Routledge Handbook of Ethics and Public Policy*, ed. by Annabelle Lever and Andrei Poama, 487–500. London: Routledge.
- Möller-Slawinski, Heide (2022): Ergebnisse einer Repräsentativ-Umfrage unter Jugendlichen 2022/2023. Available at <https://www.sinus-institut.de/media-center/studien/barmer-jugendstudie-2022-23>, accessed on 11.10.2023.
- Müller-Salo, Johannes (2022): Offene Rechnungen. Der kalte Konflikt der Generationen. Ditzingen: Reclam (Reclam Denkraum).
- NOAA (2022): Increase in atmospheric methane set another record during 2021. Available at <https://www.noaa.gov/news-release/increase-in-atmospheric-methane-set-another-record-during-2021>, accessed on 18.10.2023.
- Nordhaus, William (2019): Climate change: The ultimate challenge for economics. In: *American Economic Review*, 109 (6), 1991–2014. DOI: <https://doi.org/10.1257/aer.109.6.1991>.

Nuffield Council on Bioethics (2023): Health, Climate Change and Ethics – An Overview. Available at <https://www.nuffieldbioethics.org/assets/pdfs/Health-climate-and-ethics-paper-FINAL-12.10.23.pdf>, accessed on 16.01.2024.

Nussbaum, Martha C. (2000): Women and Human Development. The Capabilities Approach. New York: Cambridge University Press.

Nussbaum, Martha C. (2011): Creating Capabilities. The Human Development Approach. Cambridge, MA: Harvard University Press.

Oels, Angela; Pfeiffer, Fabian; Sämann, Sofie (2020): Was können wir aus der politischen Steuerung der Coronakrise für die Klimawandelanpassung lernen? Available at https://www.umweltbundesamt.de/sites/default/files/medien/656/dokumente/uba-dialog_aus_coronakrise_fuer_klimawandelanpassung_lernen_ergebnispapier.pdf, accessed on 14.02.2024.

O'Neill, Brian C. (2023): Envisioning a future with climate change. In: *Nature Climate Change*, 13 (9), 874–76. DOI: <https://doi.org/10.1038/s41558-023-01784-4>.

Österreichische Bioethikkommission (2022): Die Klimakrise als ethische Herausforderung. Available at https://www.bundeskanzleramt.gv.at/dam/jcr:doe336aa-db97-4833-b0a5-e2d51eeca7d/klimakrise_ethische_herausforderung.pdf, accessed on 11.01.2024.

Ott, Konrad (2021): Domänen der Klimaethik, ein neuer Blick – Domains of Climate Ethics Revisited. In: *Ethik in den Ingenieurwissenschaften. Eine Annäherung*, ed. by Uta Breuer and Dieter D. Genske, 379–418. Wiesbaden: Springer.

Otto, Friederike (2019): Wütendes Wetter. Auf der Suche nach den Schuldigen für Hitzewellen, Hochwasser und Stürme. Berlin: Ullstein.

PACE (2023): Handlungsbereitschaft im Überblick. *Planetary Health Action Survey*. Available at <https://projekte.uni-erfurt.de/pace/topic/output/10-readiness>, accessed on 11.01.2024.

Page, John; Pelizzon, Alessandro (2022): Of rivers, law and justice in the Anthropocene. In: *The Geographical Journal* (Online). DOI: <https://doi.org/10.1111/geoj.12442>.

Painter, James; Ettinger, Joshua; Holmes, David; Loy, Loredana; Pinto, Janaina; Richardson, Lucy; Thomas-Walters, Laura; Vowles, Kjell; Wetts, Rachel (2023): Climate delay discourses present in global mainstream television coverage of the IPCC's 2021 report. In: *Communications Earth & Environment*, 4, 118. DOI: <https://doi.org/10.1038/s43247-023-00760-2>.

Parfit, Derek (1984): Reasons and Persons. Oxford: Oxford University Press.

Piecuch, Christopher G.; Beal, Lisa M. (2023): Robust weakening of the Gulf Stream during the past four decades observed in the Florida Straits. In: *Geophysical Research Letters*, 50 (18), e2023GL105170. DOI: <https://doi.org/10.1029/2023GL105170>.

Piguet, Etienne; Pécoud, Antoine; Guchteneire, Paul de (2011): Migration and climate change: an overview. In: *Refugee Survey Quarterly*, 30 (3), 1–23. DOI: <https://doi.org/10.1093/rsq/hdroo6>.

Pihkala, Panu (2022): Toward a taxonomy of climate emotions. In: *Frontiers in Climate*, 3, 738154. DOI: <https://doi.org/10.3389/fclim.2021.738154>.

Rahmstorf, Stefan; Schellnhuber, Hans Joachim (2019): Der Klimawandel. Diagnose, Prognose, Therapie. 9th ed. München: C.H. Beck (C.H. Beck Wissen: 2366).

- Rawls, John (1975): Eine Theorie der Gerechtigkeit. 1st ed. Frankfurt am Main: Suhrkamp.
- Rixen, Stephan (2023): Ist sozial gerechter Klimaschutz möglich? *sozialpolitikblog*. Available at <https://difis.org/blog/?blog=78>, accessed on 11.01.2024.
- Rixen, Stephan; Welskop-Deffaa, Eva M. (Hrsg.) (2023): Klimasozialpolitik. Der Klimaschutz-Beschluss des Bundesverfassungsgerichts und seine Folgen. Freiburg im Breisgau: Lambertus.
- Robert Koch-Institut (2023): Sachstandsbericht Klimawandel und Gesundheit. Available at https://www.rki.de/DE/Content/GesundAZ/K/Klimawandel_Gesundheit/KlimGesundAkt.html, accessed on 11.01.2024.
- Roemer, John E. (2011): The ethics of intertemporal distribution in a warming planet. In: *Environmental & Resource Economics*, 48 (3), 363–90. DOI: <https://doi.org/10.1007/s10640-010-9414-1>.
- Romanello, Marina; Napoli, Claudia Di; Green, Carole; Kennard, Harry; Lampard, Pete; Scamman, Daniel; Walawender, Maria; et al. (2023): The 2023 report of the Lancet Countdown on health and climate change: the imperative for a health-centred response in a world facing irreversible harms. In: *The Lancet*, 402 (10419), 2346–94. DOI: [https://doi.org/10.1016/S0140-6736\(23\)01859-7](https://doi.org/10.1016/S0140-6736(23)01859-7).
- Rose, Michael; Hoffmann, Jonathan M. (2020): Sieben Bausteine für eine zukunftsgerechtere Demokratie. SRzG-Positionspapier. Available at https://generationengerechtigkeit.info/wp-content/uploads/2020/06/PP_7-Bausteine-fuer-eine-zukunftsgerechte-Demokratie.pdf, accessed on 18.01.2024.
- Roser, Dominic; Seidel, Christian (2013): Ethik des Klimawandels. Eine Einführung. Darmstadt: WBG.
- Sachverständigenrat für Integration und Migration (2023): Klimawandel und Migration: was wir über den Zusammenhang wissen und welche Handlungsoptionen es gibt. Available at https://www.svr-migration.de/wp-content/uploads/2023/06/SVR-Jahresgutachten_2023_barrierefrei.pdf, accessed on 16.01.2024.
- Sachverständigenrat für Umweltfragen (2021): Was jetzt zu tun ist: Empfehlungen für eine ökologische Transformation. Available at https://www.umweltrat.de/SharedDocs/Downloads/DE/04_Stellungnahmen/2020_2024/2021_10_impulspapier_koav.pdf?__blob=publicationFile, accessed on 13.02.2024.
- Sachverständigenrat für Umweltfragen (2023): Umwelt und Gesundheit konsequent zusammendenken. Available at https://www.umweltrat.de/SharedDocs/Downloads/DE/02_Sondergutachten/2020_2024/2023_06_SG_Umwelt_und_Gesundheit_zusammendenken.pdf?__blob=publicationFile, accessed on 13.02.2024.
- Sachverständigenrat zur Begutachtung der Entwicklung im Gesundheitswesen (2023): Resilienz im Gesundheitswesen. Wege zur Bewältigung künftiger Krisen. Berlin: Medizinisch Wissenschaftliche Verlagsgesellschaft.
- Sandberg, Joakim (2011): “My emissions make no difference”: Climate change and the argument from inconsequentialism. In: *Environmental Ethics*, 33 (3), 229–48. DOI: <https://doi.org/10.5840/enviroethics201133326>.

Sandler, Ronald (2010): Ethical theory and the problem of inconsequentialism: Why environmental ethicists should be virtue-oriented ethicists. In: *Journal of Agricultural and Environmental Ethics*, 23 (1–2), 167–83. DOI: <https://doi.org/10.1007/s10806-009-9203-4>.

Schaible, Jonas (2023): Demokratie im Feuer Warum wir die Freiheit nur bewahren, wenn wir das Klima retten – und umgekehrt. 1st ed. München: Deutsche Verlags-Anstalt.

Scherhorn, Gerhard; Weber, Christoph (Hrsg.) (2002): Nachhaltiger Konsum. Auf dem Weg zur gesellschaftlichen Verankerung. 2nd ed. München: Ökom-Verlag.

Schockenhoff, Eberhard (2014): Grundlegung der Ethik. Ein theologischer Entwurf. 2nd ed. Freiburg im Breisgau: Herder (Grundlagen Theologie).

Scholtz, Michiel M.; Neser, Frederick W.C.; Makgahlela, Mahlako L. (2020): A balanced perspective on the importance of extensive ruminant production for human nutrition and livelihoods and its contribution to greenhouse gas emissions. In: *South African Journal of Science*, 116 (9/10), 8192. DOI: <https://doi.org/10.17159/sajs.2020/8192>.

Schwenkenbecher, Anne (2014): Is there an obligation to reduce one's individual carbon footprint? In: *Critical Review of International Social and Political Philosophy*, 17 (2), 168–88. DOI: <https://doi.org/10.1080/13698230.2012.692984>.

Shamsuddoha, Md; Jabed, Akib (2022): Locally-Led Adaptation Planning: Communicating Ground Realities to Bangladesh's Nap Process. Available at <https://cprdbd.org/wp-content/uploads/2022/04/Locally-Led-Adaptation-Planning.pdf>, accessed on 16.01.2024.

Shehzad, Khurram (2023): Extreme flood in Pakistan: Is Pakistan paying the cost of climate change? A short communication. In: *Science of the Total Environment*, 880, 162973. DOI: <https://doi.org/10.1016/j.scitotenv.2023.162973>.

Sherwood, Steven C.; Huber, Matthew (2010): An adaptability limit to climate change due to heat stress. In: *Proceedings of the National Academy of Sciences*, 107 (21), 9552–55. DOI: <https://doi.org/10.1073/pnas.0913352107>.

Shue, Henry (1996): Basic Rights. Subsistence, Affluence, and U.S. Foreign Policy. 2nd ed. Princeton: Princeton University Press.

Shue, Henry (2014): Climate Justice. Vulnerability and Protection. Oxford: Oxford University Press.

Siegert, Martin; Haywood, Alan; unt, Dan; Flierdt, Tina van de; Francis, Jane (2020): What ancient climates tell us about high carbon dioxide concentrations in Earth's atmosphere. Imperial College London (Grantham Institute Briefing Note: 13). DOI: <https://doi.org/10.25561/79292>.

Sinnott-Armstrong, Walter (2005): It's not my fault: Global warming and individual moral obligations. In: *Perspectives on Climate Change: Science, Economics, Politics, Ethics*, ed. by Walter Sinnott-Armstrong and Richard B. Howarth, 293–315. Bingley: Emerald (Advances in the Economics of Environmental Resources: 5).

Smith, Stephen M.; Geden, Oliver; Minx, Jan C.; Nemet, Gregory F. (2023): The State of Carbon Dioxide Removal – 1st Edition. Available at <https://www.stateofcdr.org>, accessed on 11.01.2024.

Sorrell, Steve (2007): *The Rebound Effect: An Assessment of the Evidence for Economy-wide Energy Savings from Improved Energy Efficiency*. London: UK Energy Research Centre.

Staab, Philipp (2022): *Anpassung. Leitmotiv der nächsten Gesellschaft*. 1st ed. Berlin: Suhrkamp (edition suhrkamp: 2779).

Stein, Tine (1998): *Demokratie und Verfassung an den Grenzen des Wachstums. Zur ökologischen Kritik und Reform des demokratischen Verfassungsstaates*. Opladen: Westdeutscher Verlag.

Stein, Tine (2014): Zum Problem der Zukunftsfähigkeit der Demokratie. In: *Kann Demokratie Nachhaltigkeit?*, ed. by Bernhard Gesang, 47–63. Wiesbaden: Springer VS.

Stieß, Immanuel; Sunderer, Georg; Raschewski, Luca; Stein, Melina; Götz, Konrad; Belz, Janina; Follmer, Robert; Hölscher, Jana; Birzle-Harder, Barbara (2022): *Repräsentativumfrage zum Umweltbewusstsein und Umweltverhalten im Jahr 2020. Klimaschutz und sozial-ökologische Transformation (Abschlussbericht)*. Available at https://www.umweltbundesamt.de/sites/default/files/medien/479/publikationen/texte_20-2022_repraesentativumfrage_zum_umweltbewusstsein_und_umweltverhalten_im_jahr_2020.pdf, accessed on 14.02.2024.

Swedish National Council on Medical Ethics (2023): *Climate Change, Healthcare and Ethics*. Available at <https://smer.se/wp-content/uploads/2023/11/opinion-climate-change-healthcare-and-ethics.pdf>, accessed on 16.01.2024.

Tank, Lukas (2020): The unfair burdens argument against carbon pricing. In: *Journal of Applied Philosophy*, 37 (4), 612–27. DOI: <https://doi.org/10.1111/japp.12429>.

Temkin, Larry (2000): Equality, priority, and the levelling down objection. In: *The Ideal of Equality*, ed. by Matthew Clayton and Andrew Williams, 126–61. Basingstoke: Macmillan.

Thaler, Richard H.; Sunstein, Cass R. (2009): *Nudge. Wie man kluge Entscheidungen anstößt*. Berlin: Econ.

Tradowsky, Jordis S.; Philip, Sjoukje Y.; Kreienkamp, Frank; Kew, Sarah F.; Lorenz, Philip; Arrighi, Julie; Bettmann, Thomas; et al. (2023): Attribution of the heavy rainfall events leading to severe flooding in Western Europe during July 2021. In: *Climatic Change*, 176 (7), 90. DOI: <https://doi.org/10.1007/s10584-023-03502-7>.

Traidl-Hofmann, Claudia; Orasche, Jürgen (2023): Die Auswirkungen des Klimawandels auf unsere Gesundheit und was uns erwartet. In: *Zeitschrift für medizinische Ethik*, 69 (4), 548–67. DOI: <https://doi.org/10.30965/29498570-20230051>.

Tremmel, Jörg (2014): Parlamente und künftige Generationen – das 4-Gewalten-Modell. In: *Aus Politik und Zeitgeschichte*, 64 (38–39), 38–45.

Tschötschel, Robin; Schumann, Norman; Roloff, Rahel; Brüggemann, Michael (2022): Der Klimawandel im öffentlich-rechtlichen Fernsehen. In: *Media Perspektiven* (12), 574–81.

Umweltbundesamt (2008): *Kipp-Punkte im Klimasystem. Welche Gefahren drohen?* Available at <https://www.umweltbundesamt.de/sites/default/files/medien/publikation/long/3283.pdf>, accessed on 13.02.2024.

Umweltbundesamt (2013): Zu erwartende Klimaänderungen bis 2100. Available at <https://www.umweltbundesamt.de/themen/klima-energie/klimawandel/zu-erwartende-klimaaenderungen-bis-2100>, accessed on 18.10.2023.

United Nations (2021): Our Common Agenda. Report of the Secretary-General. Available at https://www.un.org/en/content/common-agenda-report/assets/pdf/Common_Agenda_Report_English.pdf, accessed on 18.01.2024.

Watts, Nick; Amann, Markus; Arnell, Nigel; Ayeb-Karlsson, Sonja; Belesova, Kristine; Boykoff, Maxwell; Byass, Peter; et al. (2019): The 2019 report of The Lancet Countdown on health and climate change: ensuring that the health of a child born today is not defined by a changing climate. In: *The Lancet*, 394 (10211), 1836–78. DOI: [https://doi.org/10.1016/S0140-6736\(19\)32596-6](https://doi.org/10.1016/S0140-6736(19)32596-6).

WBGU (2003): Über Kioto hinaus denken – Klimaschutzstrategien für das 21. Jahrhundert. Berlin: Wissenschaftlicher Beirat der Bundesregierung Globale Umweltveränderungen.

WBGU (2018): Welt im Wandel – Gesellschaftsvertrag für eine Große Transformation. 2nd ed. Berlin: Wissenschaftlicher Beirat der Bundesregierung Globale Umweltveränderungen.

WBGU (2023): Gesund leben auf einer gesunden Erde. Berlin: Wissenschaftlicher Beirat der Bundesregierung Globale Umweltveränderungen.

Weber, Christopher L.; Peters, Glen P.; Guan, Dabo; Hubacek, Klaus (2008): The contribution of Chinese exports to climate change. In: *Energy Policy*, 36 (9), 3572–77. DOI: <https://doi.org/10.1016/j.enpol.2008.06.009>.

Wolf, Ingo (2021): Akzeptanz für Klimapolitik. In: *Informationen zur politischen Bildung*, 347, 54–57.

Zagema, Bertram; Kowalzig, Jan; Walsh, Lyndsay; Hattle, Andrew; Roy, Christopher; Dejgaard, Hans P. (2023): Climate Finance Shadow Report 2023. Assessing the delivery of the \$100 billion commitment. Available at <http://hdl.handle.net/10546/621500>, accessed on 16.01.2024.

ABBREVIATIONS

BGBI.	Bundesgesetzblatt (Federal Law Gazette)
BMUV	Bundesministerium für Umwelt, Naturschutz, nukleare Sicherheit und Verbraucherschutz (Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection)
BT-Drs.	Bundestagsdrucksache (Bundestag printed paper)
BVerfGE	Entscheidungen des Bundesverfassungsgerichts (Decisions of the Federal Constitutional Court)
CCS	carbon capture and storage
CDR	carbon dioxide removal
CO₂	carbon dioxide
CO₂e	CO ₂ equivalent
COP	Conference of the Parties
et al.	and others (lat.: et alii)
EU	European Union
f.	following [page]
ff.	following [pages]
G20	Group of Twenty
GG	Grundgesetz (Basic Law)
IPBES	Intergovernmental Platform on Biodiversity and Ecosystem Services
IPCC	Intergovernmental Panel on Climate Change
NET	Negative Emissions Technology
NOAA	National Oceanic and Atmospheric Administration
OJ	Official Journal
p.	page
PACE	Planetary Health Action Survey
para.	paragraph [number]
ppm	parts per million
UN	United Nations
UN Doc.	UN document
WBGU	Wissenschaftlicher Beirat der Bundesregierung Globale Umweltveränderungen (German Advisory Council on Global Change)

Members of the German Ethics Council

Prof. Dr. med. Alena Buyx (Chair)
Prof. Dr. iur. Dr. h. c. Volker Lipp (Vice-Chair)
Prof. Dr. phil. Dr. h. c. Julian Nida-Rümelin (Vice-Chair)
Prof. Dr. rer. nat. Susanne Schreiber (Vice-Chair)

Prof. Dr. iur. Steffen Augsberg
Regional Bishop Dr. phil. Petra Bahr
Prof. Dr. theol. Franz-Josef Bormann
Prof. Dr. rer. nat. Hans-Ulrich Demuth
Prof. Dr. iur. Helmut Frister
Prof. Dr. theol. Elisabeth Gräb-Schmidt
Prof. Dr. rer. nat. Dr. phil. Sigrid Graumann
Prof. Dr. rer. nat. Armin Grunwald
Prof. Dr. med. Wolfram Henn
Prof. Dr. rer. nat. Ursula Klingmüller
Stephan Kruip
Prof. Dr. theol. Andreas Lob-Hüdepohl
Prof. Dr. phil. habil. Annette Riedel
Prof. Dr. iur. Stephan Rixen
Prof. Dr. iur. Dr. phil. Frauke Rostalski
Prof. Dr. theol. Kerstin Schlögl-Flierl
Dr. med. Josef Schuster
Prof. Dr. phil. Mark Schweda
Prof. Dr. phil. Judith Simon
Prof. Dr. phil. Muna Tatari