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DISCUSSION PAPER

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Groundwork for Social-Ecological Transformations: The Social Contract, Global Governance and the Meaning of Time.

Constructive Criticism of the WBGU Report World in Transition – a Social Contract for a Great Transformation

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Groundwork for Social-Ecological Transformations: the Social Contract, Global Governance and the Meaning of Time. Constructive Criticism of the WBGU Report *World in Transition – a Social Contract for a Great Transformation*[1]

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Summary

A decade ago, the German Advisory Council to the Federal Government on Global Environmental Change (*Wissenschaftlichen Beirats der Bundesregierung für Globale Umweltveränderungen* – WBGU) published its main report. This attempt to take stock in 2011 made an impact and provided orientation on both a national and international scale. The WBGU report did not hold back: It aimed to show the urgent need for change in terms of sustainable development through the interplay of politics, economy, society and nature. The central message was: We need a "social contract for a Great Transformation", and it must be implemented by 2021. How is the report to be assessed today? We will summarise the positions of the WGBU report, cite its merits, and comment on them critically and constructively.

Our approach examines the five main themes of the report: the global social contract; global governance using the example of the Paris Climate Agreement; acceptance by those involved and affected; the urgency of economic, political and social action; and the concept of the Great Transformation. In our critique, we suggest ways to constructively elaborate on the ideas laid out in the WBGU report, ideas that were not thought through to the end. Our focus lies particularly on how to deal with time and the concept of the Great Transformation. In doing so, we will also address the significance of technical advances, innovation and our own ignorance.

The title of the report uses the term "Great Transformation" which acts as a leitmotif throughout. Put forth by Karl Polanyi (1941/44), this term, as used in the WBGU's parlance, is intended to address the far-reaching changes that a regulatory state would have to undertake, along with the participation of the global citizenry, in order to overcome the ecological crisis of the coming decades. In our conclusion, we argue that the idea of a uniformly planned and comprehensively attainable transformation of the current situation is inadequate. Instead, we have observed that different actors in different places have worked at different speeds not on a Great Transformation but on a multitude of *social-ecological transformation processes.* The effectiveness of such movements – which often emerge spontaneously – has grown to the present day. This gives us hope.

Key Words: Great Transformation, social-ecological transformation, global social contract, consensus, global governance, top-down/bottom-up approach, ignorance, temporal structures, technical progress, international climate policy, WBGU, Fridays for Future

JEL Classification: A00, A12, B12, B59, F64, H19, N50, O39, Q01, Q50, Q59

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[1] This paper is a translated version of our German paper „Grundlagen sozial-ökologischer Transformationen: Gesellschaftsvertrag, Global Governance und die Bedeutung der Zeit“ published 2021 as ZEW Discussion Paper No. 21-034 (https://ftp.zew.de/pub/zew-docs/dp/dp21034.pdf).

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1. Introduction[6]

On 7 April 2011, almost exactly a decade ago, the German Advisory Council to the Federal Government on Global Environmental Change (WBGU) published its main report *World in Transition: A Social Contract for a Great Transformation*.[7] This report attracted a lot of attention at the time and still provides impetus and orientation for many people committed to climate protection. Prominent experts like Maja Göpel and Uwe Schneidewind take this report as the starting point for their reflections in books such as *The Great Mindshift* (Göpel, 2016) and *Die große Transformation* (Schneidewind, 2019). Indeed, the report's propositions have also been taken up internationally,[8] in particular by the so-called *Stockholm Memorandum* which was signed by numerous Nobel Laureates at the third Nobel Laureate Forum in May 2011 (cf. The Stockholm Memorandum 2011).[9] This article is devoted to the question of how the WBGU report is to be assessed on the basis of today's level of knowledge.

From the perspective of 2011, the report contains a good summary of the environmental and social data available at the time, elucidates the important discussions and addresses the challenges and options arising from the expected global environmental changes. As far as the tasks of politics are concerned, the WBGU report does not content itself with aspects, it goes all out. It aims to paint a clear picture of the opportunities as well as the urgency for transformation, targeting sustainable development through the interplay of politics, economy, society and nature. The authors see their central message in the project of a "social contract for a great transformation", which, starting in 2011, must be created and implemented within 10 years. In those 10 years, the Paris Climate Agreement was adopted, and Greta Thunberg along with the "Fridays for Future" movement found broad support in many communities across the globe. In addition to the Paris Climate Agreement, the so-called Sustainable Development Goals (SDGs) were adopted, Pope Francis published his encyclical "Laudato Si" (2015), the German government passed a climate protection law, and the European Green Deal was launched at the European Union level. The USA, after an interim withdrawal, rejoined the Paris Climate Agreement in 2021, and China committed to the goal of achieving carbon neutrality[10] by 2060. Thus, with regard to climate policy challenges, quite a few things have moved in a positive direction. Was all this brought about by the WBGU's idea of a "social contract for the Great Transformation"? Can such a social contract make a significant contribution to successful, long-term climate policy? Is a *Great Transformation* necessary? What factors provided the impetus for these changes to come about? These are the kinds of questions we want to address in the following when we present and critically examine the positions of the WGBU report. While we are convinced that the WBGU report has overlooked essential aspects of social-ecological change, to its credit it has provided a strong catalyst for the debate on milestones and implementable opportunities to achieve comprehensive climate and environmental policy. In the following, we will explore the strengths of the report. In addition, we will present facets of a fundamental consideration of the economy as it interacts with

[6] The authors would like to thank Carlo Gallier, Oliver Geden, Martin Kesternich, Monika Kloth-Manstetten, Brigitte Knopf, Marco Rudolf, Florian Strack and the participants of the lunch seminar at ZEW Leibniz Centre for European Economic Research for their valuable comments. Responsibility for any errors lies with the authors. We are grateful to Suzanne von Engelhardt for translating the German version of this paper into English.

[7] WBGU ain report from 2011, see https://bit.ly/2ZircyZ. Comic version of the WBGU main report, see https://bit.ly/3pideIc

[8] In the run-up to publication, e.g. by Schellnhuber et al. 2010.

[9] Carl Christian von Weizsäcker published an article in the Frankfurter Allgemeine newspaper on 30 September 2011 (FAZ Nr. 228) under the title “Die Große Transformation: ein Luftballon” in reaction to the publication of the WBGU report. We would like to thank Achim Wambach for drawing out attention to the article.

[10] For a differentiation between carbon neutrality, tri-building gas neutrality and climate neutrality, see https://www.dena.de/fileadmin/dena/Publikationen/PDFs/2020/dena_BR_Analyse-Klimaneutralita__t_WEB.pdf.

the environment and society. Our approach examines the five main themes of the WBGU report. First, we present the key theses. From the subsequent critique, we develop our own suggestions for constructively elaborating on what is laid out in the WBGU report but has not been thought through to the end. We focus particularly on the use of *time* and the concept of the *Great Transformation*.

2. Five topics of the WGBU report

The five key topics of the WGBU report are:

1. *A Global Social Contract.* The WGBU report envisages a new social contract as the institutional foundation for a Great Transformation. This social contract must be recognised globally as valid. It would create legally binding obligations for all people, especially for business enterprises, public authorities, political institutions and the media, as well as for religious, cultural, sporting and other social institutions. Environmentally compatible production processes, behaviours and consumption patterns must be established and practised; environmentally harmful production processes, behaviours and consumption patterns must be stopped or eliminated.

2. *Global governance*. Since Thomas Hobbes' classical formulation, we know that every social contract requires an authority endowed with power and a monopoly on the use of force as a sovereign to ensure compliance. The modern state, for instance in its form as a democratic constitutional state, can be understood as such an authority. If a social contract is to be effective globally, it would require institutions of global governance, institutions capable of translating the globally applicable social contract into supranational and state law and creating executive bodies to ensure the implementation of the respective provisions (see WBGU report 2011, 236-239).

3. *Acceptance by the parties involved and affected.* Classical contract theories envisage that in principle all stakeholders can agree to the stipulations of the social contract. The WGBU notes in its report that people must have the will to make the far-reaching changes proposed. In real life, of course, one cannot expect a consensus that is supported by all. If a global social contract in the sense of the WBGU report is to succeed, it would require the consent of a large number of the people now living on earth. Yet that would mean the vast majority of the earth's inhabitants would have to be prepared to radically change their lifestyles and consumption habits.

4. *Urgency for far-reaching economic, political and social action.* In 2011, the WGBU report stated that the course for the necessary changes must be set within the next ten years, meaning by 2021 (WBGU 2011, 29, 285),[11] otherwise it would be too late. In other words, for the authors of the WGBU report, humanity's clock had reached the eleventh hour in 2011 (Faber et al. 2020 and 2021).[12]

[11] "A decisive course must be set for the Transformation within the coming decade if the reconstruction is to succeed over the next 30 years" (WBGU 2011, 285).

[12] Marlon Barbehön (2020) draws attention to the fact that the perception that democratic politics is becoming disconnected from the urgencies of an increasingly fast-paced world is not a new phenomenon. Indeed, it is "to a certain extent constitutive" for modern democracy's form of rule. The thesis that the acceleration of the world leads to democratic decisions lagging behind the world to a certain extent (e.g. Rosa 2005) is problematic for two reasons. On the one hand, it evaluates democracy primarily on the basis of its ability to make and implement decisions within an (increasingly tight) time budget and diagnoses that the speed of democracy will at some point lag behind the speed of the world (Barbehön 2020). On the other hand, the thesis fails to recognise that the "relationship between measurable and perceived speed depends on the historical moment" (ibid., 507). This becomes clear when Barbehön references historical experiences of acceleration through telecommunication, production and transportation technologies. For example,

5. *Great Transformation.* Anyone who experienced the student revolution in the sixties and seventies would say that the WGBU report is calling for nothing less than a revolution under the banner of a Great Transformation; for the authors of the report want a radical shift in structures and ways of life. This demand results from the realisation that should the current structures, ways of life and behaviour be maintained in the future, they will lead to an ecological crisis with unforeseeable economic and social consequences, which will include civil wars and wars over resources and environmental goods. For the WBGU report, the term "*Great Transformation*" is therefore shorthand for the opportunity to mitigate or even avoid the consequences of this ecological crisis by undertaking radical change and through economic, political, and social action which we have never seen before. In the long term, foundations are to be laid for society, foundations that enable conservation and sustainable use of the natural basis for life.

In the following, we will examine each of these five topics in detail. We will demonstrate that the original report, at times, did not refer to the prevailing reality at the outset of the 21st century. However, we wish to emphasise that we see an understanding for certain real problems at work behind these ideas, an understanding capable of revealing perspectives for the future that should be taken seriously. Despite our criticism, our aim is to elaborate on these perspectives.

3. Dimensions of the WBGU report's concept of holistic transformation

3.1 A Global Social Contract

The WGBU report calls for a global social contract for all of humanity. In the classical political philosophy of Hobbes (1588-1679), Locke (1632-1704) and Rousseau (1712-1778), a social contract is a binding agreement between all citizens of a state to secure peace and security (Hobbes) as well as property and individual freedom (Locke) in addition, and to establish a basis for a good, collective life (Rousseau).

According to Thomas Hobbes' theory, a social contract is limited to guaranteeing the contractual parties, i.e. all citizens, peace (in the sense of the absence of violence and war) and security. This theory imagines the citizens as a kind of *homo economicus*: They agree to the treaty because when it comes into force, they can pursue their own personal interests better than before. Jean-Jacques Rousseau, on the other hand, expects from a social contract that citizens, by entering into the contract, completely abandon all personal interests (volonté particulière) that cannot be reconciled with the common good (volonté générale). The social contract in the WBGU report seems to be conceived along the lines of Rousseau, a contract in which all people on Earth commit themselves, both through their actions and avoidance of environmentally harmful behaviour, to contributing to the long-term preservation of the natural foundations of human life, to ensuring that biodiversity is not endangered and, in particular, to reducing climate change to a level tolerable for humankind. In this regard, the WBGU report explicitly speaks of a global citizenry that would have to agree to these far-reaching restrictions on its actions (cf. WBGU report 2011, p. 8; Manstetten 2018, Chapter 13).

What classical political philosophy theoretically conceived as a social contract has taken the form of a constitution in modern democracies governed by the rule of law. Ideally the constitution expresses certain general rules to which all concrete laws, administrative acts and acts of government as well as the entire administration of justice are subject. These rules gain legitimacy

today we no longer perceive the railway's establishment as a means of transport as excessive acceleration because we have different experiences of speed and a different *inventory of knowledge*.

from the fact that ideally all citizens of the state agree to them. In the WBGU report's social contract, this idea of a constitution extends beyond individual statehood to a global society.

As Buchanan and Tullock (1962) have argued, the social contract of a state should ideally be accepted unanimously, which requires consensus on a constitutional level. This line of argumentation, in turn, also holds true for a global social contract, as the WBGU report implies. In reality, however, establishing such a consensus is not feasible. Instead it has to be replaced by something like a two-thirds majority as is the case for changes to the German constitution or certain votes in the United States Senate. In the following, we wish to elucidate the problem of feasibility in greater detail. What are the prospects for realising the idea of a global social contract to combat climate change?

1. Unlike classical political philosophy, it is impossible to see why the ambitious goals set out in the WBGU report should be in the self-interest of every global citizen. When Immanuel Kant stated that even a nation of devils would have to agree to a wisely tailored republican constitution (for the sake of sheer survival and maximisation of their own utility), the same cannot be said for the WBGU report's environmental policy goals, for one can well imagine individual people living a good life, according to their own personal interest, without participating in the WBGU's ambitious goals. In the case of the WBGU report, the decisive prerequisite for a social contract – that it is in principle supported by all – would only be met if one imagined all members of a global citizenry as altruists who cared so much about the well-being of future generations, and the well-being of non-human living beings, that they would forego opportunities in life they consider positive on a large scale.
2. We live in a time when billions of people live under dictatorial regimes. As pleasing as the election of Joe Biden as President of the USA may seem with regard to climate policy, in the last election in 2020 slightly less than half the electorate in one of the world's largest democracies voted for Donald Trump, a president who denied climate change. At present it is not foreseeable that the world citizenry as a social group would subject itself to certain rules along the lines of the principles of a world constitution.

3.2 Global Governance

Every social contract must have binding force if it is to be valid. Every social contract therefore needs a sovereign, an authority or a combination of authorities to enforce the rules laid out in the contract. In the classical social contract, it is the state that casts the social contract in a legal form and sanctions violations of the law through its monopoly on the use of force. In a liberal democracy organised on the basis of separation of powers, this state is divided into three bodies: executive, legislative and judicial power, i.e. government and administration, parliament and the judiciary. We do not exclude the possibility of individuals or groups breaking the rules of the social contract, but every violation is prosecuted by law. Indeed in this instance, the WBGU report speaks of the "regulatory state" which ensures its legislation and measures bear responsibility for the future.

A global social contract, however, necessarily includes an enforcement body beyond the current 195 states recognised by the UN; ideally, this body would have to be a *world state* or a regulator with the power of a world state. In the environmental policy debate, the idea of a *world shogun*[13] was in fact developed in the 1980s, a power endowed with dictatorial powers that could enforce reasonable environmental policy goals, by drastic means if necessary (cf. Hannon 1985). Such an authority, however, cannot be reconciled with our classical understanding of democracy or the rule of law. Moreover, it seems unrealistic that anything resembling the regulatory state called for

[13] "Shogun" is the term for the commander-in-chief of the Japanese Emperor's troops. The shoguns represented the entire power of government in their ranks. Using the metaphor of a "world shogun", Bruce Hannon recommended in 1985 that sustainability policy should be directed with all possible force to implement experts' proposals (cf. Manstetten 2018, 253).

by the WBGU report could be set up on a global level in the next few years or decades. The United Nations, the only authority to remotely reflect such a body, is currently marked by its weakness in dealing with international crises.

Perhaps such an interpretation does an injustice to the intentions of the WBGU report. The idea of a global social contract is an attempt to respond to a real problem, supranational in nature: the ecological crisis in its various manifestations does not remain within political boundaries. Thus, there are different political communities with long-term interests that make supranational agreements with binding effect seem urgently necessary.

The climate problem is a particularly striking example of this. It requires a globally managed political effort. Such efforts beyond the framework of individual states have existed for some time. But how binding have their rules been? To answer this question, let's look at the so-called Kyoto Protocol of 1997 and the Paris Climate Agreement of 2015. With the help of a *top-down approach* (Gallier et al. 2019) and the threat of sanctions against nations in breach of the agreement, the Kyoto Protocol attempted to place the global common good above the individual interests of the participating states. Specifically, states that failed to achieve the agreed reduction in emissions should be subject to drastically higher reductions as a consequence. However, this approach, which comes very close to the idea of global governance, failed precisely because of these stipulated sanctions: Firstly, the threat of sanctions was an obstacle for some states to join the treaty in the first place; secondly, the attempt to create a powerful institution necessary to enforce sanctions failed.

The Kyoto Protocol, which despite its ratification by 141 countries ultimately proved ineffective, was replaced by the Paris Climate Agreement. This represents a paradigm shift in many respects. Instead of extending the Kyoto Protocol and equipping it with an aggregate, global mitigation target for greenhouse gas emissions, the 2015 Paris Climate Conference chose a very different approach (see Green et al. 2014 and Gallier et al. 2019). The sovereignty problem was addressed by starting from an overall top-down target, then relying on specific national targets set by the states themselves (so-called "nationally determined contributions", NDCs). Thus, it is not decided at the top which national goals are to be set. Instead a *bottom-up approach* is applied (Gallier et al. 2019). This change also represents a decisive paradigm shift at the level of targets because it means that attention no longer focuses on what is ecologically desirable, but instead on what is politically feasible (cf. Geden 2016). Just as targets are dynamically shaped over time, the design of the pathways for achieving them is also left to the individual states (Gallier et al. 2019).

The pragmatic approach of the Paris Agreement hence moves away from the idea of a central authority that disciplines recalcitrant individuals, companies, associations, authorities and states through sanctions. Oliver Geden makes it clear that the design of the Paris Agreement is a mixture of top-down and bottom-up approaches, which does not actually abandon the idea of a top-down goal in the form of the 2°C target, but replaces this top-down approach with a bottom-up approach when it comes to designing the mechanisms to meet the target (Geden 2016).[14] At the present time we are unable to conclusively assess the paradigm shift's chances of success in the Paris Agreement. The NDCs submitted in the run-up to the UN Climate Change Conference (COP26) in Glasgow indicated once again that the current growth in ambition will not be sufficient to achieve the 2°C target (see UNFCC Synthesis Report by the Secretariat 2021). The challenge is to inspire

[14] The tension engendered by these two approaches can be addressed with the so-called ratchet mechanism which obliges states to gradually tighten their self-imposed targets. Whether this will succeed in the final analysis is disputed. Some have criticised the fact that central aspects of the Paris Agreement do not adequately address the free-rider incentives (Cooper et al. 2017) and that the dynamic incentives might even be counterproductive (Gallier et al. 2019 and Gallier, Sturm 2020).

ambitious climate targets while adequately resolving the social dilemmas through incentives that work.

While the Paris Agreement is top-down in nature, unlike a classic social contract, it has the advantage that it leaves room at the bottom to manoeuvre, allowing individual societies and economic stakeholders to bring in different ideas and innovations which ultimately strengthen acceptance and participation and make the goals achievable. In contrast to a clearly defined social contract, the Paris Agreement contains provisions that appear vague, in need of interpretation and are flexible yet are tantamount to a framework that allows different societies to pursue a binding climate policy according to their organisation, scope for action and fundamental convictions.

In conclusion, the development from the Kyoto Protocol to the Paris Agreement can be summarised as follows: The Kyoto Protocol attempted to create a central, international institution to enforce effective climate protection globally by virtue of its treaties and sanction mechanisms, protections regulated in detail by the treaty. This idea failed for various reasons: In practical terms, it proved impossible to create such an institution because it quickly became clear that the treaty lacked the power to enforce sanctions. States were clearly not prepared to accept the loss of sovereignty such an institution would have demanded of them. For the same reason, a similar attempt would most likely fail again today. There are many reasons why far-reaching, ecologically desirable changes in human behaviour cannot be implemented top-down in the medium or long term.

3.3 Acceptance by those involved and affected

The global social contract envisaged by the WBGU report "combines responsibility for the future with democratic participation" (WBGU 2011, 2). According to the report, a consensus among global citizenry is what would ensure the legitimacy of far-reaching ecological action. In reality, the success of ambitious environmental policy depends crucially on a vast majority of people wanting the changes that experts believe must take place. Thus, the WBGU report counts on the participation of independent, enlightened and committed citizens so that people voluntarily accept what the scientific experts demand of them in terms of additional effort and foregoing activities in life they value. However, this leads to two problems:

1. From today's perspective, we can hardly say a consensus of global citizenry is in sight in the long term which would legitimise far-reaching measures. (Manstetten 2018, 251f.). A citizenry presupposes that the persons belonging to a state are granted individual civil rights, including the right to freedom of expression and political participation. At present, the anti-democratic and illiberal structures and arbitrary measures of many states, some of which are populous and powerful, prevent a citizenry from coming together for this purpose. Hence it is unrealistic to imagine that even half of the soon-to-be eight billion people will commit to a global social contract in the near future.
2. The WBGU report addresses the problem of dissenters who either do not agree to the social contract or who will work against it after it has been adopted. This problem is addressed under the heading of *veto players* (cf. in particular WBGU 2011, Chapter 5.3). The term suggests that the group is in the minority. Veto players are all people who cannot be dissuaded from lifestyles that damage the environment and climate because they care little about the future or well-being of future generations. The veto players also include companies and organisations that profit from the environmentally harmful status quo. Such actors could make up a large part of humanity existing today. They also include powerful interest groups as well as influential, wealthy and powerful individuals whose influence is difficult to overcome. Against this background, the public involvement envisaged in the WBGU report is a double-edged sword. When accompanied by certain media campaigns, institutionalised public participation can even undermine or

significantly delay ecologically sensible projects. Protests against the track construction for power grids and the associated delay as well as debates surrounding the designation of areas to expand wind energy create considerable obstacles to achieving climate targets in time.

This all shows that we would be forced to take a very pessimistic view of the future if the success of environmental and climate policy necessarily had to depend on a global social contract legitimised by a world citizenry. Resignation would practically be the inevitable consequence.

In our view, the inadequacy of the WBGU report lies in an overly unified picture of all people living on Earth today. Instead of imagining a global citizenry of environmentally aware citizens, it is best to think of global humanity today as a large mosaic. It includes various individuals, e.g. climate activists, climate change deniers and those who are indifferent; it includes diverse groups of stakeholders with heterogeneous interests, different cultural backgrounds and different sets of values. It also includes business enterprises, interest groups, NGOs, educational, academic and research institutions, governmental bodies and supranational organisations, etc. All of these individuals, groups and structures act in a partly regulated, partly unregulated co-existence, and also, not infrequently, in opposition to each other. Such a mosaic will hardly form a unified body of political action. Yet what may well happen within this chaotic field is that somewhere certain activities will emerge, gain popularity and momentum, and trigger economic or social dynamics which gradually exert a decisive pull in a certain direction. And if, on top of that, the reasoning of experts demonstrates that a certain course makes sense, namely a social-ecological transformation of our modes of production and forms of consumption, then there is certainly hope that the actions of individual groups will disseminate, inspire others, thereby becoming the engine of larger changes.

In the following we present an example from the recent past. While a survey in the mid-1980s showed that over 80% of West Germans saw the environment as the most important issue,[15] it lost much of its importance after the fall of the Berlin Wall in the 1990s. The environment was pushed aside by the problem of unemployment which quickly came to dominate the agenda. While the issue of the environment was brought up time and again with varying degrees of importance over the next three decades, the overall mood among climate activists was one of disappointment until 2015 because so little seemed to have been achieved compared to their expectations. Their mood began to change when the UN Climate Change Conference in Paris announced its goal to limit global warming to well below 2°C.[16] The Sustainable Development Goals (SDGs) adopted by the UN a few months earlier, which covered a much broader range of general environmental issues, also led to a new discursive and political dynamic. The SDGs placed environmental goals in a broad context that also described the framework required to achieve climate and environmental goals: the absence of disease, poverty, social and political instability, and war. In the run-up to the Paris conference, Pope Francis, in his encyclical *Laudato Si. On Care for the Common Home* (Pope Francis, 2015), had drawn on Catholic Social Doctrine to show how urgently people needed to focus on, consider and act on ecology and why ecology and social issues had to be addressed jointly. According to Francis, caring for people and protecting ecosystems were different aspects of one and the same task (cf. Overbeck 2020).[17] Francis thus drew attention to a central challenge in designing the necessary changes, both theoretically and practically: addressing ecological problems creates interactions with social issues. Likewise, social problems such as poverty and inequality and how they are fought have an impact on the ecological equilibrium. Accordingly,

[15]See https://www.bpb.de/izpb/8971/umweltbewusstsein-und-umweltverhalten?p=0
[16]See: https://unfccc.int/sites/default/files/english_paris_agreement.pdf Article 2
[17]Comparable issues are also addressed in other religions: See, for instance, Franz Alt, Dalai Lama, (2020) The Dalai Lama's climate appeal to the world: Our only home: A climate appeal to the world, Bloomsbury Sigma, London.

these interactions between the social and ecological dimensions of our co-existence must not be secondary considerations, but instead be included at the outset of the search for adequate solutions (cf. e.g. Faber, Petersen 2012).

During the years following the ratification of the Paris Agreement, pessimistic voices quickly grew until something happened in 2018 that no one expected: a 15-year-old schoolgirl started a school strike outside the Swedish Parliament. Out of Greta Thunberg's solitary strike, a global youth movement emerged which mobilised people in over 150 countries to strike on a regular basis, especially in 2019, exerted pressure on national politics, and spoke out publically calling on businesses to stop production methods damaging to the climate. On 20 September 2019, the Fridays for Future movement managed to mobilise several million people across the world to join their Global Strike Day. In Germany alone an estimated 1.4 million people took to the streets.[18]

The impact and insistence of these protests led environmental and climate protection to dominate politics in many countries, gaining momentum. In Germany, the climate policy goals that had been set long before (55% reduction of greenhouse gases compared to 1990 by 2030, cf. BMU 2016) were tackled with significantly greater commitment and tightened up considerably with a view to the period after 2020. As a result of this development, climate policy received the attention needed to make it one of the central arenas for political debate.

- In 2019 the so-called Climate Cabinet (official name: "Cabinet Committee on Climate Protection") was formed within the German government to implement the Climate Protection Plan 2050 which had been adopted in 2016 and already provided for concrete targets in specific sectors and a reduction target of approximately 55% by 2030. Under great public pressure, the federal government negotiated the Climate Protection Act within the Climate Cabinet, establishing a fixed set of rules to achieve the sector-specific climate protection targets as well as CO_2 pricing for heating and transport.
- In December 2019, the newly appointed EU Commission President von der Leyen introduced the European Green Deal which aims to make Europe the first climate-neutral continent.
- In the German government's economic stimulus package (2020) to overcome the economic consequences of the Corona pandemic, ecological aspects have been taken into account to a much greater extent than in comparable packages of the past (dena/navigant 2020).[19]
- In the USA as well as China, Japan and South Korea, governments have committed to more decisive action in the fight against climate change and set concrete time targets for achieving similarly ambitious goals as in the EU Green Deal.

This all shows that the acceptance of far-reaching changes like those needed for climate protection is dynamic in nature. Yet the indicators for this acceptance exist on a different level than the WBGU report of 2011 appears to assume. Acceptance grows over long periods of time, often in the background; it depends particularly on the socially balanced design of climate policy measures: Potentially regressive distributional effects must be taken into account and unequal impacts on different social groups compensated (Poterba, 1991; Metcalf, 1999, Rausch et al. 2011). Moreover, acceptance grows by creating opportunities for people to participate in the decision-making process for adequate climate policy measures, especially at the local level. Involving citizens –

[18] See: https://www.handelsblatt.com/politik/international/klimabewegung-global-climate-strike-sostreikt-die-welt-fuer-den-klimaschutz/25036370.html?ticket=ST-9574154-ZNLNFnZ31poMRP1ZQtFUap6

[19] https://www.dena.de/fileadmin/dena/Publikationen/PDFs/2020/Synergien_nutzen_-_Impulse_fuer_die_weitere_Ausgestaltung_des_Konjunkturprogramms_der_Bundesregierung.pdf

informed, responsible citizens – and recognising them as relevant actors, empowers them to actively advocate for their own concerns (Löschel et al. 2020). By repeatedly offering opportunities to become involved and involving people at an early stage in concrete local decisions that affect them directly, people gain confidence that effective, efficient and socially just climate policy measures can be found and implemented through democratic processes (Frick et al. 2021).

At the time the WBGU report was written, public perception might have assumed that "political standstill" had taken hold of environmental and climate policy between 1990 and 2011. In reality, however, many small steps were taken during these years to promote decisive changes, the first results of which have only recently become visible. Many people in NGOs, the media, politics, administration, business and science prepared pivotal developments that sowed the seeds for the Paris Climate Agreement and the emergence of social movements such as the "Fridays for Future" in the following years. Many thought that time had stood still with regard to climate protection. In reality, successful action for the environment requires patience and a long-term timescale (Klauer et. al. 2017). When Greta Thunberg sat outside the Swedish Parliament at the beginning of the climate movement with the climate catastrophe in mind, she did not start from scratch, for what made her action seem so outstanding was that she stood, so to speak, on the shoulders of a multitude of actors. Without knowing it, scientists, government administrators and engaged citizens had worked over several decades to open the doors for her and her movement to the important interlocutors in politics, society and business. The fact that these doors opened so quickly was only possible because an awareness of the need to take climate change seriously had already grown in the minds of many decision-makers in companies and authorities. Greta Thunberg and the climate movement have now provided a strong impetus to translate this awareness into action.

Having examined the topic of acceptance from the perspective of institutions and actors in this chapter, we now change our dimension of observation and turn to the meaning of *time*.

3.4 Urgency for economic, political and social action – the problem of time

To ensure it is not too late to save humanity from the climate crisis (see Manstetten 2018, Chapter 13), the WBGU report makes demands on people living today, asking them to make considerable efforts for future generations and fulfil these efforts within the short period of ten years. Measured against the literal fulfilment of its temporal milestones, the WBGU report would have to be judged as an outright failure in 2021. Such targets are presumably set in a political communication process aimed at shaking up stakeholders through threatening messages, therefore the timeframe targeted in 2011 should not be taken too seriously. Yet the deeper problem remains that the WBGU report offers a truncated understanding of time, so that neither possibilities for action nor constraints on action can be realistically assessed within the dynamics of nature, economy, politics and society. We will demonstrate this in the following.

The WBGU report imagines all of humanity as a group of travellers on foot who have to be at the station at a certain time so as not to miss the train that will take them from their present location, where their lives are in danger, to a place of safe refuge. The departure time of humankind's rescue train, according to the WBGU report, is more or less fixed, and if it is missed (for instance because certain climate-relevant tipping points are reached due to a failure to reduce the increase in temperature), it is definitely too late. The train that humanity should have caught to save itself from climate catastrophe has irreversibly departed. If we stay with the metaphor, we must call on the passengers to undertake tremendous effort. Everything they can do they must do to get to the station on time. A leisurely pace, breaks or back roads seem to be prohibited, and to go in another direction is even more prohibited. Yet justified as it is, this image reveals a problem: If the

pedestrians are told they have to keep to the departure time at all costs, even if they have to fly to do so, although at best they can only walk, the instruction becomes an excessive demand that could lead them to tire out and resign. The threat of missing the train will paralyse them.

The WBGU report knows only *one* homogeneous time which it applies equally to nature and all societies. This time, which the ancient Greeks called *chronos*, appears as a linear, uniformly unfolding, irreversible sequence of minutes, hours, days and years. With a glance at the clock or the calendar, one thinks one knows whether one "still has time", whether one is acting just in time or whether one is already "too late". This image of time is appropriate for the tightly timed appointment system of many professions in modern societies with a global division of labour. However, when climate policy stakeholders apply this image to the global action of humanity, they come across as rushed climate managers who do not want to be late at any cost (see Klauer et al. 2017, especially chapter 8).

An example of this was the discussion in 2018 when the IPCC (Intergovernmental Panel on Climate Change) presented its specially commissioned report 1.5°C in the run-up to the international climate conference in Katowice (COP24). Although the report itself did not stipulate an explicit time limit for action, it led a large number of stakeholders to warn that there were only 12 or perhaps even only 10 years left to undertake the necessary measures. For instance *The Guardian* ran the headline on 8 October 2018: "We have 12 years to limit climate change catastrophe, says UN."[20]

When it comes to globally effective measures that humanity has to take, such a standpoint is misleading. If at first it manifests itself in overloaded rhetoric and hectic activity, sooner or later it will lead to utter resignation because one cannot shake off the feeling of being too late. One objection to such a view is that all should not be lost just because the "blossom dreams"[21] dreamt by the WBGU report and similar bodies have not ripened into fruit by the deadlines they set for them.

One homogeneous time for everyone and everything only exists in the abstract, similar to the *one* humanity assumed by the WBGU report as the subject of global action, which is also an abstraction. To be precise, there are many time structures that, in reality, overlap. Every single thing has its time, as it is stated in the Bible: a house may take a few years from initial planning to completion, even in a modern society an energy system takes decades; think of the expansion of power lines in Germany or even the development of hydrogen technology and infrastructure. Innovations that make an important contribution to achieving climate goals today or in the future have their own time structure, from their conception to their effect, which cannot be sped up as one wishes. Currently, we see this in the example of the vaccination campaign against the Covid 19 virus. As early as spring 2020, most people worldwide would have liked to have had a vaccine available with which they could have been immediately vaccinated. But time passes from the first signs of a promising vaccine in cutting-edge research, through testing, approval and mass production, to the moment when everyone who wants to be is vaccinated.

Indeed institutional regulations, such as those called for by the WBGU report, also have their own time structure: Changing the rules of the game in a society, like a new social contract that is tantamount to a constitutional amendment, can take at least a few years, but may well take

[20] See: https://www.theguardian.com/environment/2018/oct/08/global-warming-must-not-exceed-15c-warns-landmark-un-report#:~:text=The%20world%27s%20leading%20climate%20scientists,hundreds%20of%20millions%20of%20people.

[21] This expression is taken from Goethe's hymn, Prometheus (Goethe 1966).

decades. Another time structure that is hardly considered in most climate scenarios is the planning time authorities need to construct infrastructures.

"If one actually sees in climate change something like an existential threat, then it can be used to demonstrate that modern society is precisely not capable of reacting in unison with one strategy, in one concerted action, as it were. As with all other subjects, the safeguards of civilisation are at work here as well, preventing the whole system from reacting in a uniform, centralised manner" (Armin Nassehi in: *Die ZEIT*, 27/10/2019).[22] Nassehi draws attention to "reaction modes, immunisation strategies and social inertias" that might seem like mere delays to undertaking necessary action considering the WBGU report's urgent demands. Yet "civilisational safeguards" can certainly be recognised in them, without which the coexistence of free people would not be possible (cf. also Klauer et al. 2017, Chapter 5).

Good political action may not be able to take on board this sheer infinite abundance of time structures, but it does acknowledge that they exist and how they interact with each other, while also recognising the situations in which windows of opportunity suddenly open up for interventions that can be successful and pioneering. The ancient Greeks coined the term *kairos* for such a window of opportunity. *Kairos* means the moment or the period of time in which something can succeed. The *kairos* is the moment when what might have seemed impossible over years and decades can suddenly happen – if, and only if, someone seizes that moment. To perceive *kairos* is sometimes a matter of luck, but it is often what is called the luck of the brave or capable.[23] It means waiting patiently until an opportunity to act presents itself and then seizing the opportunity decisively. Greta Thunberg, for example, was intuitively able to seize the right moment for her highly symbolic protest. Because she *had caught* that moment, the *kairos*, she was able to garner a great deal of attention for her cause, in a way that came as a complete surprise for many politicians and activists. No one expected a protest linked to the name of a single 15-year-old schoolgirl would have such an impact.

An aspect of time neglected by the WBGU report is ignorance of the future and its various aspects (Faber et al. 1992/1996). Ignorance initially means nothing more than the banal fact that one does not know something and consequently cannot predict anything. What is by no means banal, however, is the task of taking this fact duly into account, i.e. to realise that factors and developments that may be of decisive importance for our understanding of climate change and climate policy lie outside the scope of predictions offered by the current state of knowledge in any given area. Such factors can influence developments in both positive and negative directions. A striking positive example is the unexpected emergence of the Fridays for Future movement. Beforehand, no one could have reckoned that decisive changes would be initiated by the actions of a single person.

One aspect of ignorance that is important for the relationship between the economy and the environment, and which cannot be determined more precisely in advance, is the factor of novelty. Inventions and their resulting innovations are a decisive engine for change. Political and economic frameworks can promote such innovations, but novelty, by its very nature, is unpredictable. It can be said with certainty that humanity's potential for innovation, which can be used effectively for climate protection, is great: just think how energy efficiency has been improved through the use

[22] Original quote: "Sieht man im Klimawandel tatsächlich so etwas wie eine existenzielle Bedrohung, dann lässt sich daran durchdeklinieren, dass die moderne Gesellschaft gerade nicht in der Lage ist, darauf wie aus einem Guss, mit einer Strategie, gewissermaßen in einer konzertierten Aktion zu reagieren. Wie bei allen anderen Themen wirken auch hier jene zivilisatorischen Sicherungen, die das Gesamtsystem an einer einheitlichen, zentralisierten Reaktion hindern" (Armin Nassehi: Alles sofort? Das geht nicht. Warum es für eine moderne Gesellschaft so schwierig ist, die Klimakrise zu bekämpfen, *Die Zeit*, 27/10/2019).

[23] In political philosophy, that which enables the brave or capable person to have luck is termed the power of judgement (cf. Klauer et al. 2017, Chapter 7).

of artificial intelligence. We can even say that there is currently far more innovation potential than the public is aware of. Yet how this potential will specifically be used is unpredictable. When thinking about time and change, one must emphatically take into account this ignorance and the possibility of novelty, i.e. the inherently unpredictable.[24]

Let us return to our image at the beginning of this section, the story of a group of travellers on foot who have to be at the station at a certain time so they do not miss the train. It is not wrong to warn humanity or point out that one day it might be too late. These warnings are intended to ensure that the calamity does not happen. Yet we do not know precisely if or when it will be too late, nor do we know what will happen when it is too late. Nevertheless, the fact that the train might sooner or later have irreversibly left the station is cause for justified concern. To that extent we agree with the WBGU report. Yet when calling humanity to action, we must not overlook the many time structures, different in both qualitative and quantitative terms, that have to be taken into account; we must not forget that there is much we don't know, and at the same time we must be alert and open to *kairos*, the right moment to act – which is likely to be a rather long-term process. Moreover, one must have a feeling for novelty, how new things emerge and interact. All of this should therefore also be part of the future-oriented decision-maker's portfolio. Perhaps technical, economic and political innovations or far-reaching, unexpected behavioural changes will speed up the travellers' path to the station that will save them, but there might also be delays and obstacles that no one could have expected or imagined. There is no absolute certainty in such cases. One can often only determine years later whether or not the *kairos* was perceived in taking action for climate protection. But such a perspective on time gives us room for hope (Klauer et al. 2017: especially chapters 7 and 8).

3.5 On the concept of the Great Transformation

The title of the WBGU report uses the term "Great Transformation" which acts as a leitmotif throughout. In the WBGU's parlance, this term is intended to address the far-reaching changes that a regulatory state would have to undertake, along with the participation of the global citizenry, in order to overcome the ecological crisis in the coming decades. However, the term Great Transformation seems misleading to us in this context for two reasons.

The first reason comes from the history of ideas: The WBGU report takes its guiding concept from the groundbreaking treatise *The Great Transformation* by Karl Polanyi (1944/2019). Polanyi explored the questions of how the catastrophe of the century, two world wars and the rise of National Socialism, could come about. In his search for causes, Polanyi focused on a transformation that seemed to him to be of central historical significance: the political implementation of the idea of self-regulating markets in the course of the Industrial Revolution. Polanyi's thesis is that transforming human labour and natural resources into a commodity[25] led to constant social and ecological tensions, ruptures even in the social fabric, which ultimately discharged in the most horrific way: in the "catastrophe of the century". After Karl Marx, Polanyi is perhaps the most influential critic of the free-market system. Like Marx, he points out inherent contradictions in the central position of the market (Petersen, Faber 2018). Yet, it is also true that his argumentation has been countered on numerous occasions.[26] Regardless of the criticism of

[24] In reference to Barbehön (2020), we emphasise that the reference to the urgency of climate policy action does not itself constitute a political solution. Rather, opportunities must be opened up for novelty to emerge. This is inconceivable if the claim from the outset is to "enforce a comprehensive plan or to want to prevent all risks" (Barbehön 2020, 518). Barbehön pleads for a willingness to experiment, which is not an expression of deficient policy but part of making solutions possible.

[25] Polanyi speaks here of the "commodification" of labour and natural resources.

[26] Above all, his historical localisation of the emergence of social frictions has led to doubts regarding the viability of his empirical analysis and its ability to be transposed to a general critique of the market system

Karl Polanyi, it should be noted that his concept of transformation, in contrast to the WBGU report's use of the term, by no means points primarily to a success story. The aspect of "where the transformation will lead" is unspecified; it may even lead to disaster, as the rise of National Socialism clearly shows in Polanyi's analysis. Moreover, the Great Transformation is about a change that can be traced back to a specific initial moment. Polanyi writes: "But the source and matrix of the system was the self-regulating market, that innovation which provided the impetus for the emergence of a specific civilisation" (Polanyi 2019, 19). Transferring the concept of the Great Transformation to the political measures necessary to combat climate change and other environmental problems carries with it, *nolens volens,* connotations from an epoch often referred to as capitalism, which are ill-suited to the intentions of the WBGU report.

The second reason is that today the term *Great Transformation* hardly captures the real processes of change that are needed, if only because the processes may not look as big as the term suggests. The term *Great Transformation* almost inevitably conjures up the image of a unified movement shaped by politics, science and citizenry, whose individual parts are carried by a grand plan, by a comprehensive overall concept. That is not what Polanyi calls the Great Transformation, and it is not what humanity needs for the foreseeable future or in the coming decades. We agree with the authors of the WBGU report insofar as we also consider political decisions at international and national levels to be indispensable. But they are at best a necessary and by no means a sufficient condition for the changes that lie ahead in the coming decades.

4. Conclusion: The perspective of social-ecological transformations

It is clear from our exposition thus far that we do not consider the term *Great Transformation* to be appropriate for the decades ahead. Instead, we propose to speak of *social-ecological transformations* in the plural. Social-ecological transformations, in contrast to the one *Great Transformation,* are developments that are initiated at different times due to very different motivations. Books like "Silent Spring", political demands like Willy Brandt's for a "blue sky over the Ruhr Valley", the emergence of the anti-nuclear power and peace movement from the 1970s onwards as well as the environmental and climate movement in the 1980s, which ultimately led to the first global Earth Summit in Rio de Janeiro in 1992, out of which grew a multitude of social and political activities all over the world – these examples show that different stakeholders are working on social-ecological transformations in different locations at different speeds. The effectiveness of these movements has grown until today and is even accelerating, with no end in sight.

Even though the future is unknown and unpredictable, there is reason for hope. Innovations are particularly worth mentioning here. Innovations cannot be predicted, but one can very well specify conditions that are favourable for the development of innovations. Smart policies can also contribute to such conditions. In climate protection, significant regulatory and economic innovations have already begun. They include, in particular, the CO_2 price for heating and transport that has now been introduced in Germany. Such institutional innovations can, in turn, considerably expedite the interaction of innovative technologies from different sectors. As far as these innovative technologies are concerned, significant changes can be expected in the coming years and decades that could substantially advance climate protection. The interplay of digitalisation and networks with decentralised forms of energy generation, for example, could contribute significantly to a cross-sectoral energy revolution. Advancements in this field can clearly be seen today, whereas ten years ago no one even reckoned with such progress. This gives

(see e.g. Braudel 1979). Objections have also arisen over the years from a theoretical perspective (see e.g. Harvey and Metcalf 2004 and Halperin 2004).

us hope. Hope gives us the strength and staying power to do everything we can. Whether that ultimately will be enough is not in the hands of humankind.

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