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The precautionary post-growth
approach

Executive Summary

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Environmental Research of the
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The precautionary post-growth approach

Executive Summary

Interim Report of the project “Approaches to Resource
Conservation in the Context of Post-Growth Concepts”

by

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Abstract: Social well-being within planetary boundaries: The precautionary post-growth approach

This discussion paper focuses on the role of economic performance and its future development in wealthy countries such as Germany with respect to compliance with planetary boundaries. To improve our understanding of this controversial topic, we introduce the debate in a systematic way, presenting analyses on numerous aspects, pointing out open questions and finally deriving guidelines and options for political action. The presentation, analysis and initial assessment of key arguments and conclusions represent our contribution to making the post-growth discourse – which so far has been conducted primarily in the realms of academia and civil society – accessible to a wider audience.

There are two particularly prominent and clearly antagonistic positions within the discourse whose political consequences are fully contradictory: green growth and degrowth. Our analyses show that both positions are based on core assumptions that cannot be adequately substantiated scientifically and thus cannot claim to serve as the sole strategy for environmental policy action. We therefore propose a third position and put it up for discussion with this paper: *precautionary post-growth*. From our point of view, this approach has the potential to create a new consensus in the sustainability debate. The discussion paper explores the potential for societal orientation and need for knowledge associated with this position.

On the basis of an analysis of the various current positions (chapter 2), this paper presents a detailed overview of the causes of economic growth and identifies those areas of society whose functioning could be dependent on economic growth (chapter 3). We then discuss the possibility that economic systems can be shaped by various reform proposals in such a way that they would be less dependent on permanent economic growth (chapter 4). Finally, we outline the guiding elements of our proposal for such a precautionary post-growth position (chapter 5).

With this discussion paper, we hope to provide an impulse for the societal debate on the design and instrumentation of transformation paths for social well-being within planetary borders. Our aim is to stimulate and structure discussion and research processes. The precautionary post-growth position offers a platform for discussing strategies, whose implementation has yet to be worked out in all details, to meet the challenge of respecting planetary boundaries.

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The UBA publication is available as a download in German here: <http://www.umweltbundesamt.de/publikationen>

Executive Summary

This work¹ focuses on the role of economic performance and its future development in wealthy countries such as Germany with respect to compliance with planetary boundaries.

Our current ways of life and economic activities represent extensive and substantial interventions into various ecosystems. Future generations, including other living creatures, will therefore face drastic and irreversible disadvantages. The increasing concentration of greenhouse gases in the atmosphere is only one, particularly prominent, example of the many anthropogenic interventions in our ecosystems (Bindoff et al. 2013: 869). The status of other fundamental earth system processes has also become critical. The global amounts of phosphorus and nitrogen entering our soils and water bodies, for example, now exceed critical limits, as does the rate at which natural species are becoming extinct (Rockström et al. 2009a/b, Steffen et al. 2015). The early-industrialized and prosperous countries are responsible for a disproportionately large share of these pressures on our natural systems (with regard specifically to greenhouse gas emissions, see Caney 2009: 126).

In Germany, there is a broad scientific and political consensus that our planetary boundaries, whose transgression would possibly have globally serious environmental consequences, must be respected. In the realm of climate policy, policy goals (i.e. the 1.5° and 2° targets) were established at the international level by the Paris Agreement; if these goals are to be taken seriously, substantial adjustments will be necessary within a period of only a few decades. To date, environmental and sustainability policies have not succeeded in achieving a sufficiently strong reduction in such ecological harms.

How exactly the consensual goal of preserving planetary boundaries should be achieved, is a subject of controversial debate in both the scientific and political spheres. Two levels of dissent can be distinguished: There is disagreement on the scope of contributions by individual nation states to reducing global ecological challenges (cf. Enquete Commission 2013: 477-521); there is also disagreement on whether and to what extent the economy of an early-industrialized, prosperous country should be altered to contribute to meeting planetary boundaries and thereby maintaining societal standards of social justice.² The question of how significant economic development and economic growth are for the achievement of environmental policy goals appears to be particularly controversial.

With this work,³ we would like to contribute to an understanding of this controversy, provide a breath of analyses with respect to different aspects, point out open questions and derive guidelines and options for political action. In a first step (chapter 2) we develop a systematization of the positions within this societal discourse. The various terms arising in this debate – *green*

¹ We would like to thank our project advisory board and our clients for many fruitful discussions and feedback on our draft texts. In addition, we would like to thank all colleagues and especially our student employees and interns for their valuable contributions. These include in particular Kirsten Dohmwirth, Lea Kliem, Lisa Storcks, Laura Theuer, Charlotte von Möllendorff (all IÖW) and Evert Reins (RWI).

² In this discussion paper, it is not possible for us to explicitly address questions of which exact concept of social justice should be taken as a basis and which standards of social justice should be observed. The many responses to these questions are highly controversial, and ultimately such questions can only be answered in a process of open discussion and social engagement. At the same time, differences between the individual positions with respect to social justice are not of central importance for the differences between the basic analytical positions of Green Growth, Degrowth and Post-Growth discussed in this text.

At relevant points, however, we assume a minimal conception of social justice that we believe to be relatively uncontroversial as a minimum requirement: Social-ecological transformation should not lead to the weakest members of contemporary society being significantly disadvantaged. Even this minimal demand poses important challenges for the basic positions discussed, as we will demonstrate below.

³ The literature review was completed in May 2017. Since then, several potentially relevant papers have been published which we could not consider in this discussion paper; however, we are not aware of any recent contributions that substantially contradict our analyses.

growth, green economy, a-growth, post-growth, steady-state economy, and degrowth – are often not clearly distinguishable. However, there are two particularly prominent and clearly antagonistic positions within the discourse whose political consequences are fully contradictory: *degrowth* and *green growth*. With this in mind, we consider a third, ideal-typical approach – *precautionary post-growth*, a position which in our view has the potential to create a new consensus in the sustainability debate.

Based on this analysis and development, this paper presents a detailed overview of the causes of economic growth and identifies those areas of society whose functioning could be dependent on economic growth (chapter 3). We examine the literature of the degrowth discourse and draw on insights from mainstream economics. Subsequently, we discuss the possibility of whether economic systems can be shaped by various reform proposals in such a way that they would be less dependent on permanent economic growth (chapter 4).

Regardless of which transformative approach is ultimately adopted, relevant knowledge is needed about how fundamental processes of economic and social change take place and the factors that influence them. Therefore, we also provide an overview of currently discussed heuristics for these processes of change and finally relate them to our proposal for a precautionary post-growth position, whose guiding elements are sketched out at the end (chapter 5).

The paper focuses on the developed post-growth perspective and explores potentials for societal orientation and knowledge requirements associated with these; it introduces the growth debate, highlights its complexity and at the same time tries to do justice to the different analytical and empirical approaches taken.⁴ Our presentation, analysis and initial assessment of key arguments and conclusions is intended as a contribution to making the post-growth discourse – which so far has been conducted primarily in the realms of academia and civil society – accessible to a wider audience. In terms of content, our work ties in with, among other things, the work of the Study Commission (“Enquete-Kommission”) of the German Bundestag on “Growth, Well-being, Quality of Life – Paths to Sustainable Economic Activity and Social Progress in the Social Market Economy” (2010–2013).

We view the precautionary post-growth position as a relevant and important building block of a consistent and global strategy for adherence to planetary borders, SDG's and the promotion of individual quality of life and social well-being, both in conceptual and practical terms.

In this sense, we see this paper as a bridge and platform for discourse involving various social currents and scientific movements. In particular, it is intended to stimulate discussion as to whether and how exactly the normative implication to design public domains such as the social insurance system to be as growth-independent as possible could be implemented and the ecological, economic and social consequences this would have.

Degrowth and green growth positions

Within the degrowth discourse models, political measures and instruments that go hand in hand with (or are meant to lead to) a reduction in economic performance are discussed frequently. Representatives of the green growth approach instead focus on economic policy measures intended to make it possible to combine further economic growth with enhanced environmental protection. In order to understand where these two positions contradict each other, we have reconstructed their respective (deductively valid) arguments with the help of philosophical argumentation theory. This analysis has shown that the degrowth and green growth positions contradict each other in two theses: a descriptive and a normative one. First, they hold differing

⁴ The possibilities available to representatives of the various approaches to underpin those approaches with scientific capacities are also taken into account.

views on how economic performance would develop in an early-industrialized economy (such as Germany) if the country were to make a sufficiently strong contribution to meeting global environmental goals. Second, they contradict each other with regard to their assessments of the relevance of further economic growth for maintaining the quality of life in a society.⁵ Representatives of the **degrowth position** are committed to the following two propositions (e.g. Kallis 2011, Paech 2012, Demaria et al. 2013 or Latouche 2015a/b):

1. Further economic growth in the wealthy countries is not necessary in order for them to maintain their quality of life, which can be secured or even increased, even if aggregate economic output falls.
2. There is sufficient certainty that economic output in wealthy countries will decline if they reduce their levels of ecological harm sufficiently.

In contrast, representatives of the **green growth position** hold the opposing positions (e.g. OECD 2011, World Bank 2012, Jacobs 2013 or Bowen et al. 2014):

1. Further economic growth is still necessary in an early-industrialized, prosperous economy in order to maintain or improve the quality of life in these societies.
2. There is sufficient certainty that with the help of green growth instruments, prosperous countries can sufficiently reduce the ecological damages they cause. Their economic performance – albeit in a qualitatively different form – could continue to grow.

We then examined the extent to which these core theses of the two basic positions can be scientifically justified. There are fundamental objections to the **degrowth propositions**. According to our understandings of quality of life based on the philosophical literature (hedonism, theories of desirability, theories of objective values), the first degrowth thesis does indeed apply. Further economic growth is, in principle, not necessary to maintain the quality of life in a society. However, degrowth representatives do not explain convincingly whether and in particular how this quality of life can be maintained if GDP per capita (very) sharply declines.

The certainty claimed in the second degrowth core thesis about the unavoidable failure of a sufficiently strong decoupling of economic growth and environmental pollution is scientifically untenable. Representatives of the degrowth position usually point out how extensive the ecological challenges are, how short the period for reducing ecological burdens is and how little previous environmental policy efforts have achieved. They also point out that a positive correlation between economic growth and the consumption of natural resources and greenhouse gas emissions has been observable since the 19th century. The parameters relevant to the success of decoupling – decarbonization rates of an economy, development of resource intensities – however, can be influenced politically (e.g. by taxes, incentives, technology promotion, etc.). Thus, forward projections of trends from a past in which political control did not take place or did not take place to a sufficient extent cannot be used to prove that decoupling cannot or will not succeed in the future.

Whether or not the first proposition of the **green growth position** is true crucially depends on one's understanding of social quality of life. Some of the views expressed in philosophical litera-

⁵ Very rarely do representatives of degrowth and green growth explicitly state which quality of life view they ascribe to, i.e. which concept of quality of life should be accepted according to their respective perspectives. Similar, largely abstract terms are commonly used: "welfare" and "well-being" (especially by green growth), "happiness", "a good life" (especially in degrowth). In this paper we describe the concepts of quality of life that are most widespread in philosophical and economic literature and discuss which of these concepts supports the degrowth or green growth proposition on the specific role of economic performance for quality of life.

ture on what constitutes a good life or social quality of life do not support the green growth thesis. Conversely, the core thesis of green growth can be justified particularly well if one uses the concept of quality of life supported by welfare economics: quality of life (“welfare” in the language of economics) is then an aggregate of the extent to which individual preferences are met. However, it is not clear why *this* particular understanding of quality of life, as the fulfilment of individual preferences, should guide political action.

Against the second green growth proposition, it can be argued that the assumed certainty for the success of a sufficiently strong decoupling is not scientifically tenable. Economic-ecological models demonstrate that it is theoretically possible to decouple future economic growth from critical resource consumption and ecological damages. However, model results to date do not demonstrate that this will succeed to a sufficient extent within the available time frame. In addition, the models imply that the technologies required for decoupling will be invented in good time and will assert themselves quickly enough. Scientifically serious statements on this seem hardly possible – in any case, they are fraught with great uncertainty; in addition, rebound effects must be considered.⁶ Last but not least, it is uncertain what the consequences will be for future economic performance, if all ecological damages relevant for compliance with planetary boundaries are reduced simultaneously, as opposed to only a single ecological goal, such as the reduction of GHG emissions.

The precautionary post-growth position

The degrowth and green growth positions are thus based on core assumptions that cannot be adequately justified or substantiated scientifically and thus cannot claim to serve as the sole strategy for environmental policy action. Based on this criticism, we have characterized a third, ideal-typical approach, which we refer to here as the **post-growth position**. In contrast to degrowth and green growth, post-growth is open and unbiased. It contains no strong ex-ante premises regarding either (i) the valuation of future economic growth or possible future contraction, or (ii) the possibility of sufficient decoupling. According to this position, it is uncertain as to how economic performance will develop if the economies of prosperous countries are fundamentally changed in line with global environmental objectives. There is, however, a serious possibility that economic performance would no longer increase or even significantly decrease as a result of this transformation. At the same time, we note that economic performance and the income it generates play an important role because of the current state of the early industrialized, prosperous countries. They are crucial to the functioning of fundamental social institutions that enable components of a good life (e.g. social security systems, expenditures on education, etc.). From this, the aim can be derived to transform these social institutions as a precautionary measure in such a way that they can continue to perform their functions independently of economic output. Greater independence from growth would make it possible to maintain a high level of social quality of life even when economic output stagnates or falls. In a society that is more independent of growth in this sense, there would be fewer conflicting goals between economic and environmental targets. Environmental policy measures would thus be less subject to reservations about possible growth impacts.

We chose the term *post-growth* for this ideally developed third choice between degrowth and green growth. The key political implication for this position – the creation of social institutions that are (more) independent of growth where possible – was, to our knowledge, emphasized for

⁶ Similarly, some of the authors of this paper have clear doubts as to whether it is possible to effectively counteract dysfunctional growth processes based on improved analyses (e.g. through more comprehensive welfare diagnostics) with appropriate instruments. Dysfunctional growth processes are regarded as dynamics that do not increase the quality of life in society, but do have negative ecological and social effects. Some of the authors of this paper are further convinced that it is also highly uncertain whether economic growth can be managed selectively in the sense of a “more qualitative, greener” growth path and whether undesirable “side effects” can be avoided. The optimism about governance associated with this approach must be questioned critically.

the first time in the anthology “Postwachstumsgesellschaft – Konzepte für die Zukunft” (post-growth society – concepts for the future) by Angelika Zahrt and Irmi Seidl (2010).⁷ In addition, there are overlaps in content with the position of authors who advocate the concept of *a-growth* (e.g. van den Bergh 2011) or are close to it content-wise (Jakob and Edenhofer 2014).⁸ From our point of view, the main contribution of these authors to the sustainability debate is the emphasis on the dependence of central societal areas on growth and the discussion of associated implications.

We would like to build on these contributions with our precaution-oriented position on post-growth. In doing so, we would like to add that the involvement of the public and key stakeholders in deliberative processes is central to a post-growth position, and when it comes to developing strategies and instruments, it is in fact dependent on them, for only a deliberative discourse with broad public participation can clarify the level or amount of services that a specific area of society or a specific public institution should provide. In our view, a close iterative exchange between politics, science and the interested public can support such a discourse.

Growth drivers and dependencies

In order to create a basis for the discussion of growth dependencies, we analyze the **status quo of current societies dependent on economic growth** in chapter 3. To explain the current dependence on growth, we address two fundamental questions: the question of causes and triggers of growth dynamics (**growth drivers**, cf. chapter 3.1) and the question of societal necessity for economic growth (**growth-dependent areas**, cf. chapter 3.2).

Analysis of growth drivers

The analysis of growth drivers plays a central role, especially within the degrowth discourse. According to the degrowth position, ecological targets can only be achieved if economic performance declines. For this reason, degrowth advocates believe that it is essential to understand the specific drivers of economic growth in order to be able to initiate appropriate countermeasures. We therefore consider the elements that the degrowth literature characterizes as drivers of economic growth and contrast these with the core statements of various economic theories and related empirical findings. Although degrowth authors often refer implicitly or explicitly to these theoretical foundations, they draw their own analytical and practical conclusions. They also use other terms (e.g. *growth constraint*). Based on these analyses of the literature, we assess the extent to which the candidates for drivers of growth discussed in the degrowth literature can be regarded as such in the light of the broader state of research.

According to the degrowth literature, drivers of growth are those fundamental mechanisms, factors and processes that are responsible for positive trends in economic output measured in terms of gross domestic product (GDP) over time. Empirical studies can generate the knowledge necessary to convincingly identify growth drivers; however, there are several fundamental challenges here. For example, the analytical concept of drivers refers to highly interdependent social and economic mechanisms and systems, which makes it difficult to make isolated statements about the relevance of individual drivers. Furthermore, social and economic constellations are always time-bound: statements about the future relevance of the identified drivers therefore depend on the stability of framework conditions and the reliability of extrapolations. Moreover, the

⁷ We are aware that in the German debate, unlike in the international discourse (a-growth vs. degrowth), there is often no clear distinction between degrowth and post growth. From our point of view, however, it makes analytical sense to make an ideal distinction between the two positions (see **chapter 2** in the discussion paper).

⁸ The positions post-growth and a-growth differ at their core. Thus, in contrast to a-growth, the post-growth position focuses on the importance of a more precautionary or preventive growth independence, as will be explained below.

scientific basis for the formulated assessments is still very limited, especially in the area of empirical literature. In our view, it thus makes sense with respect to the individual drivers to examine their macroeconomic significance more closely from a scientific point of view. Accordingly, we focused on taking systematic stock of the discussions on drivers of growth. With reference to various theoretical approaches in economics as well as available empirical findings, we systematized these drivers and assessed their current and future relevance for early industrialized, prosperous economies. Joint recommendations for action on how to deal with the identified drivers, however, were not developed. Instruments for weakening the drivers of economic growth play a major political role in the degrowth literature. Nevertheless, we did not analyze these instruments explicitly, as we focused on the post-growth perspective developed here and thus on the area of growth dependencies.

Furthermore, the various authors have differing ideas as to whether a targeted weakening of growth drivers is a sensible policy approach at all. Some point out, for example, that a weakening of individual drivers could contribute to reducing resource and environmental consumption without necessarily leading to welfare losses. Other authors argue that a policy focusing on weakening drivers would limit economic dynamics without ensuring the achievement of objectives (compliance with planetary boundaries).

Against the background of these important limitations, chapter 3.1 examines the following drivers in more detail:

- ▶ Corporate goals and behavior
- ▶ Positional and habitual consumption
- ▶ Increases in labor productivity and capital productivity
- ▶ Digitization
- ▶ Access to natural resources
- ▶ Monetary and credit systems

Corporate goals and behavior

In the degrowth literature we reviewed, the behavior of companies plays an important role in explaining overall economic growth. Individual (legal) forms of business, explicit business objectives, and the competitive situation are described as primary reasons why companies pursue growth. From the point of view of the degrowth literature, investment and marketing are the most important instruments for achieving operational growth targets.

We cannot offer a conclusive, scientifically sound assessment of whether **corporate goals and behavior** are relevant drivers of overall economic growth. Nevertheless, we consider the assumption that companies, as economic actors, can drive growth to be plausible. According to the degrowth literature, growth-promoting effects result in particular from the corporate constitution in the legal form of a stock corporation as well as from entrepreneurial objectives aimed at the continuous development of new markets and sales potentials. There is, however, no representative empiricism that would reject or confirm this thesis. Few (and often non-representative) studies indicate a positive connection between shareholder-oriented forms of business and growth at the individual company level. The same applies to the relationship between growth as a corporate objective and real growth of companies. With respect to the proposition that the relative size of companies and thus the intensity of competition correlates positively with growth, the empirical literature is more extensive and therefore more resilient. The positive correlation between the use of marketing instruments to increase consumption and resulting macroeconomic growth, as claimed in degrowth literature, is also supported by several studies. However,

this connection seems to be more valid for advertising than for planned obsolescence and product design, for which corresponding effects cannot be proven.

Positional and habitual consumption

We also regard **positional and habitual consumption** as relevant drivers of economic growth. Two effects can be distinguished between these two types of consumption: The first is their contribution to economic growth, i.e. their role as drivers of growth, and the second is their impact on the quality of life in society. With regard to their contribution to economic growth, we have distinguished two effects within the degrowth literature that can each be interpreted as drivers of growth: positional and hedonistic treadmills. The first treadmill is created as follows: Individuals strive to improve their position relative to their social environment. For this purpose, they consume so-called *positional goods* that fulfil such a benefit. If, however, a sufficient number of individuals in an economy do this, GDP does indeed increase, but the relative position of each individual does not change; thus, individuals continue to consume in order to improve their relative position. This is how the *positional treadmill* is created. The second driver is based on an effect derived from psychological literature, the *hedonistic treadmill*: when an individual's income rises, his or her life satisfaction increases for only a short time due to the psychological habituation effect. At the same time, however, the aspirational level also increases. In order to increase life satisfaction at this higher level of aspiration by the same unit, greater increases in income are required.

The question of whether these treadmills actually exist in the affluent economies and, if so, the strength of their influence, could not be answered comprehensively in the context of this study. Empirical research indicates that the consumption of positional goods is indeed predominantly motivated by relative social environments; it also seems plausible that this consumption is associated with negative external effects, including environmental damage. However, it should be borne in mind that the literature on which this study is based comprises only a few empirical studies and that it therefore appears necessary to investigate the phenomenon of positional consumer goods in further research projects and, in doing so, to consider the extent of its magnitude and macroeconomic relevance.

In the social science literature to date, the phenomena of positional and habitual consumption have not been analyzed with respect to their contributions to economic growth, but rather with regard to their effects on the quality of life. We have summarized this debate separately in an excursus (cf. textbox 3 in chapter 3.1.3.3). Here we have focused on the question of whether positional and habitual consumption can contribute to dysfunctional economic growth, i.e. economic growth that does not lead to an increase in social quality of life. With regard to positional consumption, the relevant literature assumes that it has a negative external effect on the quality of life in society. In contrast, a negative effect is not generally assumed for habitual consumption. However, the strength of the respective influence of positional and habitual consumption has not yet been reliably estimated. In our view, though, the question of dysfunctional growth should be a relevant component of sustainability research and debate.

Innovations, technological developments and increases in labor and capital productivity

We consider the relevance of **innovations and technological developments** as drivers of economic growth to be very high. In the past, technological change has led to considerable increases in **labor and capital productivity** and thus contributed to overall economic growth. With regard to **recent and future technological digital developments**, we consider it plausible that the development of new cross-sectional and basic technologies can lead to further growth spurts. Two opposing views on the relationship between new technologies and economic growth can be identified. The “optimists” (such as Brynjolfsson and McAfee 2014 or Pratt 2015) argue

that considerable productivity and growth leaps can be expected from future technological developments. Authors from the degrowth discourse fear that this would in turn exacerbate ecological challenges (Paech 2017). In contrast, the “pessimists,” scientists such as Gordon (2012) or Cowen (2011), do not expect any significant productivity leaps from digitization.

In recent years, ICT technologies have driven overall economic growth, but to a lesser extent (so far) than previous technological upheavals. In the recent past, data available for the macroeconomic level even point to a slowdown in labor productivity growth. This, however, does not apply to so-called frontier enterprises, which are at the forefront of productivity development in their respective sectors. Various causes have been discussed in the economic literature as triggers for this “productivity paradox”; a consensus has not yet emerged.⁹

Further possible growth drivers

According to our analysis, **access to natural resources** is not a growth driver in the current context of early-industrialized, prosperous industrialized countries. The availability of natural resources is undoubtedly a necessary condition for economic activity. Moreover, the possibility of having access to cheap resources has been highly relevant in various historical phases (of capitalist development). Yet, no convincing argument could be identified that the access to resources still causally and permanently drives economic performance in early-industrialized economies today.

Within degrowth literature there is also a lively debate on the question of whether and how the **monetary and financial system** has a causal effect on economic growth. However, the very far-reaching assertion that there are elements within the monetary system that would virtually force economic growth (growth constraint) has not been substantiated convincingly in the literature we examined. In summary, there is no convincing basis for seeing the monetary system as a causal and long-term effective driver of economic growth. Nevertheless, the fact that size and quality of the monetary and financial system can positively influence dynamics of growth stimulated by other sources is both theoretically and empirically proven in modern development and growth economics. In this sense, a functioning monetary and financial system is undoubtedly an important prerequisite and precondition for economic growth.

Growth-dependent areas

In chapter 3.2 we examine the **areas** of society regarded as **growth-dependent** in the degrowth and post-growth literature.¹⁰ For two areas with a particularly high degree of social relevance, we analyze the reasons for their growth dependence: social security systems – particularly health insurance and pension insurance – and employment.

By growth-dependent areas, we mean those social systems, structures or institutions,

- ▶ that fulfil a socially desirable function or contribute to a socially widely accepted goal and
- ▶ whose socially acceptable functionality or contribution under current framework conditions depends on a continuously growing economy.

⁹ Haldane (2017) provides an overview of the international discussion on the Productivity Puzzle; the *Wirtschaftsdienst* (2017: 83-102) and Weber et al. (2017) present the debate with a focus on Germany.

¹⁰ Social institutions and actors can not only be dependent on growth, but also can actively drive growth processes themselves (see chapter 3.1 in the discussion paper). If a selective steering towards qualitative, green growth were not successful, a further transformation of social institutions would become necessary. This dimension of weakening the growth-driving functions of social institutions was not analyzed due to differing assessments by the various authors of this paper.

Employment

In the field of **employment**, there is a clear positive correlation between the volume of employment and economic growth; however, the causal relationship is by no means trivial. In contributions to degrowth and post-growth literature as well as in many public debates, it is often assumed that the volume of employment in current economies depends on economic growth. This would be the case, for example, if the demand for an industry increased, e.g. through the acquisition of new export markets, leading to additional employment. In the more recent mainstream labor market economy, however, the level of employment is viewed primarily as a result of structural characteristics of an economy, such as the quality of the so-called matching in labor markets. An improved matching process would presumably lead to additional employment and consequently manifest itself, *ceteris paribus*, as macroeconomic growth.

From this point of view, there is no unidirectional causality between employment and economic growth. The given context determines the direction in which this reciprocal interdependence is effective. Nevertheless, it seems meaningful to explicitly analyze the employment sector from the point of view of growth dependence.

Social security systems

The discussion among the project participants in this area has shown that it is crucial to consider how independence from growth is defined. There are different views on this, but with some overlap. In principle, social security systems can be organized independently of growth when it comes to accounting. The decisive factor here is that current and future revenues and payments can be balanced over time (intertemporal budget restriction). This technical requirement can always be met by adjusting contributions and benefits accordingly; however, this is not the understanding of independence from growth that we primarily assume in this paper. Regarding the objective of respecting planetary boundaries while at the same time maintaining social justice, the decisive question is whether social sectors can continue to perform their functions at a **certain socially acceptable level** despite a possible stagnation or decline in economic output. This understanding of **growth dependence** makes it clear that an assessment of whether and when a system is independent of growth is inevitably linked to the question of which future functional or performance capability will (still) be acceptable to society. It also underscores that the question of whether and when an area is independent of growth cannot only be decided scientifically – assumptions as to what constitutes a “socially acceptable level” in each respective area would have to be negotiated in a deliberative public discourse and ultimately decided politically.

As part of our analyses, we considered **social security systems** in terms of their dependence on growth; health insurance and pension insurance were studied in detail, as the insurance branches being most relevant to the study. For the most part, these social security systems are directly linked to wage income (in case of the pay-as-you-go system) or tax revenue (in case of tax-financed systems). Due to demographic change (and, in the health insurance sector, development of medical technology), the volume of benefits will have to be expanded in the coming years and decades to maintain the level of benefits at a socially acceptable level. These two effects make these systems accordingly dependent on growth: In order to maintain their ability to function at a socially acceptable level in the long term, the systems depend on increasing revenues in future years.

Instruments for a more growth-independent society

In chapter 4 we discuss measures and instruments that, from the perspective of the literature reviewed, can contribute to making societies independent of economic growth. Again, we focus

on the two areas of social security systems (pension and health insurance) and employment and consider instruments from the post-growth discourse that aim to make these areas growth-independent. We also look at calls from within the mainstream economy to reform pension and health insurance systems (albeit for reasons other than those in the post-growth discourse). For example, the German Council of Economic Experts found that although growth can facilitate financing of the pension system to some extent, in the face of demographic change, considerable structural adjustments between contributors and beneficiaries will be required. We examine the reform proposals discussed by the German Council of Economic Experts and other actors and consider the extent to which they might contribute to greater independence from growth. In addition to specific reform approaches, i.e. those adjusted to individual social security systems, we also analyze overarching policy proposals (e.g. unconditional basic income and eco-taxes) that may have an impact on both social security systems and the employment sector.

Employment

We analyzed in depth the following measures to weaken growth dependence of employment, all of which have received intensive debate in the post-growth literature:

1. Advancement of the sectoral change towards a more developed service society,
2. Reduction of working hours,
3. Focus of technological change on increasing resource productivity, with less pressure to rationalize labor,
4. Reduction of income dependency on employment.

With regard to the first proposal, our analysis of the literature has shown that the post-growth debate starts at an aggregated macro level: The basic idea is to shift from economic activities with high labor productivity and high resource consumption to activities with low labor productivity and low resource consumption. In the post-growth literature, however, we found no convincing answers to key questions – such as which industries and sectors should be addressed specifically, how such a shift could be implemented in practice, and which empirical studies would support this approach. Furthermore, the fact that activities with lower labor productivity in a market economy generally come with lower wages represents a socio-political challenge that is also not adequately addressed in the corresponding proposals.

With regard to the second measure of reducing working hours, degrowth and post-growth authors distinguish between two impact chains. Some authors argue, first of all, that a sufficiently large reduction in working time can keep the number of employment relationships constant if labor productivity continues to rise as a result of technological change. Representatives of these positions secondly see the reduction of work time in regular markets as a condition for creating available time that individuals would then use for activities outside regular markets (e.g. activities in self-organized repair workshops, in agricultural solidarity groups, voluntary commitments to the elderly and ill, etc.).

With regard to the first impact chain, however, from the point of view of mainstream economics, the assumption of a constant demand for labor is based on a fallacy (the so-called “lump of labor”): a change in the average working time exerts an influence on the price of labor, which in turn changes demand. Empirical analyses of past reductions in working hours do not show a uniform picture here – evidence can be found for neutral, positive and negative employment effects. The precise effect on employment of a reduction in working hours depends on many economic factors.

With regard to the second impact chain, no empirically verified assessment can be made. It remains to be seen how individuals would deal with a reduction in working hours or the extent to which individuals would increasingly pursue self-organized productive activities outside regular markets. From a theoretical perspective, however, the same consideration applies as in the analysis of possible relief effects in health insurance through voluntary or semi-professional support. Ultimately, even if self-organized activities of the same duration are taken up simultaneously, the reduction in working hours would probably amount to foregoing the material gains in prosperity that would otherwise result from specialization in formal labor markets with an (economically) efficient division of labor. This should be considered when weighing the savings effects on energy and resources claimed in post-growth literature as well as the postulated individual and collective welfare gains. A more in-depth analysis of these propositions was not possible within the framework of this research project.

For realization of the third measure, degrowth and post-growth authors propose instruments that are also discussed by green growth representatives: sufficiently strong eco-taxes, subsidy reductions, cap-and-trade systems. Instruments such as a far-reaching eco-tax can be used to provide stronger incentives for technological change, with the primary goal being increased resource productivity. Nevertheless, the realization of a double dividend in the form of simultaneously increased employment is very dependent on a number of prerequisites, including the initial configuration of the tax system.

In connection with the fourth measure, the two concepts of commons-based production by equals and the non-commercial sharing economy are discussed frequently. Both strive to reduce dependence on monetary income. Advocates of this measure assume that formal employment on labor markets will decline and that a high degree of satisfaction of needs can be achieved even with a reduced income. That these approaches may tend to contribute to making satisfaction of needs less dependent on earned income is in our view plausible; however, we consider the extent to which this is realizable to be small, given (consumption) preferences.

With respect to all four measures in the field of employment, an assessment of their effectiveness raises methodological questions; therefore, no reliable quantitative statements can be presented in this study.

Ex-post evaluations of similar instruments used in the past have only limited informative value regarding expected effects on future design and implementation as envisaged by post-growth authors.¹¹ Ex-ante studies based on economic modelling, on the other hand, usually assume that there will be no changes in the model world beyond the instrument used. Any possibly resulting changes in people's preferences or values or other complex system changes are thus not mapped. Therefore, the impact of proposed instruments and possible conditions in a post-growth society can only be estimated to a limited extent with these methods.

An analysis of individual instruments and their potential to weaken growth dependence based on the status quo is nevertheless of great value for political action and policy measures, which must of necessity begin with the "here and now." Our paper therefore focuses on an assessment of the challenges and accompanying effects of a corresponding instrumentation.

The relatively critical assessments of the effectiveness of the individual measures examined do not imply that some objectives from post-growth literature could not be achieved to varying extent in the medium to long term. A prerequisite for their realization and effectiveness, however, is a corresponding change in social preferences and values. Post-growth authors assume that the

¹¹ For example, elasticities determined for marginal changes in a politically defined parameter in empirical studies cannot simply be used as a basis if the effects of significantly larger, i.e. non-marginal, changes are to be estimated.

instruments they propose will trigger far-reaching changes at the individual and institutional level. With this in mind, a number of instruments from the post-growth discourse aim to initiate such individual and collective changes in values (i.e. preference changes) by creating opportunities for testing alternative ways of living and working as well as by removing existing obstacles to corresponding social experiments. A specific example would be the promotion of collaborative production and use of common goods. Corresponding measures could also lead to a change in preferences and values in the long term.

Pension insurance

Post-growth and degrowth literature on restructuring pension insurance systems is very limited. Against this background, the following options for reform were considered:

- ▶ redistribution of the burdens between contributors and beneficiaries (adjustment of working life; funded pension insurance);
- ▶ expansion of the contributor group (“pension for all”, Beveridge system, tax financing);
- ▶ expanded definition of contributions and services (recognition of non-market-mediated activities and time-credit systems).

The analysis of the proposed solutions identified shows that neither an increased working life and higher contributions, nor the “pension for all,” nor an unconditional basic income can comprehensively and permanently dissolve the direct dependence on economic output. In essence, these reform ideas imply, above all, alternatives to the current burden-sharing. Temporary introductory gains, such as those possible in the pension-for-all model, can (at best) be interpreted as a short-term easing of growth dependence. In times of severe demographic imbalances (e.g. retirement of the baby boomer generation), they can thus be considered under certain circumstances.

Approaches from the post-growth literature that aim to expand the pension insurance system by including non-market-mediated, socially valuable activities can at best slightly reduce growth-dependence. The extent to which (and in what form) such services can be provided outside the market and how these services would affect growth dependence of the pension insurance cannot be quantified due to the lack of empirical research results. Theoretical arguments, however, argue against a substantial effect. Systemic obstacles, such as demographic change or efficiency and time budget restrictions on non-market-mediated activities, would persist even after such reforms. Beyond positive, but negligible, effects of activation, we expect small net effects whose direction has not yet been determined.¹²

Health insurance

The post-growth literature also offers only a few elaborated proposals for restructuring health insurance. Overall, there is somewhat greater potential here for a certain reduction in growth dependence, even if complete or extensive independence does not appear realistic. In order to weaken growth dependence, the expenditure side of the system in particular would have to be considered. This could be achieved through the incentivization of health-conscious behavior, implementation of a less expensive range of pharmaceuticals (e.g. through negotiation with payers), or activation of voluntary or semi-professional support options, for example, for fellow senior citizens – if this makes sense from a qualitative point of view. To what extent such measures

¹² In view of a limited individual time budget, it must be assumed that a higher proportion of non-market-mediated activities would lead to a reduction in the volume of market-mediated and thus contributory and taxable activities. Consequently, the financing sum of established social security systems would decrease or increase less than would be possible with a pure extension of working life. As a result, the existing dependence on growth would then even increase or decrease to a lesser extent than possible with a policy approach aimed more strongly at increasing the volume of contributions.

could reduce the dependence of health insurance on growth would have to be further investigated.

System-wide proposals

The concepts discussed so far for an unconditional basic income cannot lead public finances and social security away from the dependence of tax revenues on economic growth. This applies regardless of whether a basic income is financed by an income tax or a consumption tax. Nor will financing public goods through eco-taxes contribute to reducing dependence on growth. With regard to the objective of a resource-light post growth society, an eco-tax nevertheless has various advantages (e.g. financing effect, steering effect). Another policy instrument that could be suitable for increasing tax revenues in the context of a post-growth economy is the so-called Henry George tax on the value of land. Although it could itself trigger growth effects due to induced incentives, it could also nevertheless be an attractive candidate for financing a resource-light (post-growth) society due to the supposed independence of its tax base from growth.

Conclusion of the considerations in chapters 2, 3 and 4

The obligation to respect planetary boundaries, which has already been firmly established in the area of climate protection by the Paris Agreement, is regarded as essential by representatives of the green growth, degrowth and post-growth positions, as well as by the team of authors.

The precautionary post-growth position and societal change

In the discussion on growth, the positions of green growth and degrowth offer divergent perspectives based on shared or diverging central normative considerations and valuation differences. For example, the success of green-growth approaches requires a decoupling of economic growth and environmental pollution through technological innovations to an extent that has not yet been attempted; it also remains unclear whether the necessary decoupling could be achieved quickly enough. Furthermore, the proposition that a forced and far-reaching green-growth strategy (which has not yet been consistently introduced) will not have negative impacts on economic growth in the short and medium term is disputable.

Regarding the degrowth approach, on the other hand, it is uncertain whether the quality of life in society can be maintained by implementing degrowth measures, and the question of which interpretation of quality of life should be sustained remains normatively controversial.

The societal discourse on environmental policy is characterized by a high degree of segmentation and polarization, documented most visibly in the dispute on the issue of growth. In this debate, green growth and degrowth mark the opposite ends of a broad and varied spectrum of individual positions. This situation impedes the productive use and combination of important insights from both strands of the literature. Against the backdrop of the antagonistic positions of green growth and degrowth, which are both strongly reliant on strong assumptions, it seems highly desirable for the development of a consistent sustainability policy to fathom the scope for reciprocal comprehension in the sustainability debate by trying to identify consensual elements that lend themselves to productive application in the policy sphere.

Compliance with our planetary boundaries requires far-reaching and fundamental societal change. As highlighted by the results of chapter 2, there exists no single transformative pathway or single-handed approach of environmental policy-making that should be pursued in isolation, given our state of limited knowledge. Rather, it seems sensible to develop pragmatic strategies for action and respective policy mixes that combine adequate and mutually compatible elements from different approaches and are applicable here and now. The precautionary post-growth approach aims at being such a proposal (cf. chapter 5.2).

Premises and dynamics of societal change processes that are directed at compliance with planetary boundaries

In the relevant scientific discourses, one finds quite different responses to the question as to which factors have an important influence on processes of deep societal change. Approaches on the basis of economic history or institutional economics are increasingly supportive of the hypothesis that **cultural change** might be the root cause for the beginning of dynamic economic growth and the emergence of a growth society.¹³

The previously dominant "culture of growth" is deeply rooted in the formal and informal institutions that control our societies. If they want to contribute to the observance of planetary boundaries, policy approaches - beyond material goals and instruments directly geared to them - must therefore also take cultural change towards a possible *culture of sustainability* into account.

A robust process of change towards a sustainable society that enables social well-being within planetary borders will not be possible without a profound change (as well) in formal and informal institutions (cf. Williamson 2000). The "**multi-level perspective**" (Geels 2011) is currently a frequently used heuristic for complex social change processes. In this perspective, a prevailing, dominant socio-technical system has characteristic features (e.g. a high consumption of resources) and is at the same time characterized by path dependencies. From the perspective of representatives of the multi-level perspective, economic instruments alone are hardly enough to overcome these path dependencies.¹⁴

The "**deep transition**" approach (Schot 2017) ties in with the multi-level perspective. The multi-level perspective and deep transition approaches have in common that they both emphasize the importance of social innovations and do not consider the previous focus on technological innovations as the decisive driver of social change processes an adequate and sufficient explanation. Hence, these perspectives suggest supplementary measures to promote such innovations and to improve the basis for their development in the realm of innovation and research policy.

Against this background, the authors see the necessity for **strengthening transformative elements in innovation policy** that address socio-technical regimes as a whole in accordance with social goals. Such an innovation policy would promote social experiments and societal learning processes, enabling previously unknown paths to sustainable development. Strengthening transformative elements in innovation policy, e.g. in experimental spaces and real-world laboratories at the heart of practice-relevant research and implementation projects, could also pave the way for the participative development of new social goal orientations (preferences, models).

Action-oriented elements of the precautionary post-growth position

In view of path dependencies and uncertainty with regard to the directional security of the strategies pursued, the precautionary post-growth position aims to initiate a design-oriented **search**

¹³ Thus Mokyr (2016) refers to the cultural conditions of social change and focuses in particular on fundamental beliefs. To him, the change in the belief system referred first and foremost to the perception of nature. This, in conjunction with the specific contexts in Europe (competition between smaller states or cities) and the formation of professional networks (e.g. in science and engineering), was ultimately decisive for the industrial revolution. McCloskey (2016) asserts that the available energy resources or innovations of the 19th century or the formation of market institutions were not decisive, since all these factors had already been present in other regions of the world as well. Rather, she claims, it was cultural factors and ideas that were decisive. Denzau and North (1994) also refer to the role of ideas and institutions in social change. Thus, it becomes clear that both economic historians and institutional economists regard the role of ideas and models as essential for economic development. References to the sustainability discussion can be found, for example, in Meyerhoff and Petschow (1996).

¹⁴ This is justified by the fact that the development of the socio-technical system is based, among other things, on various positive feedback mechanisms (economies of scale, cost advantages and increased demand), learning curves and network effects. In addition, (common) interests of the "incumbents" emerge, which would be threatened by a change of path.

process based on guiding principles such as the **precautionary principle**¹⁵ and **social resilience**¹⁶. This participatory, long-term change process, which can only be steered to a limited extent, is intended to open up new options for action and development and must take account of the initial social conditions. For the present society, the focus on growth and strategies for promoting growth is highly characteristic, especially in cultural terms. A process of change towards greater independence from growth must therefore also tackle the deeply rooted social models and develop alternatives to them.

From an **action perspective**, **three elements or requirements** emerge from this approach:

1. A more **effective design of economic framework conditions**, in particular a resolute use of (market-based) **instruments for the internalization of negative environmental externalities** is necessary to comply with the planetary boundaries,
2. Likewise **exploration and development of new paths of societal development** through participatory search processes, experimental spaces, and new approaches in innovation and research policy, and
3. The **identification and realization of potentials** for a more **growth-independent design** of societal institutions.

Effective design of economic framework conditions

The competing concepts of green growth, a-growth, post-growth and degrowth differ in their basic orientation, sometimes considerably, and are sometimes incompatible with regard to central premises. However, with regard to the recommended instruments and reform approaches and concrete paths to be taken, some overlaps, even extensive ones, can be identified. There are **broad similarities, particularly with regard to certain economic instruments**. In addition, most actors that argue on the basis of economic reasoning consider relative prices to be a highly significant determinant for individual behavior, especially with respect to the overuse of natural resources (sources and sinks). Thus, a change in relative prices is regarded across a broad spectrum of views as an important lever to set the course in a sustainable direction. .

To make economic framework conditions more effective with respect to planetary boundaries, the authors argue for an **implementation of market-based, economic instruments** (in particular cap and trade systems or eco-taxes) **to internalize environmentally harmful effects of production and consumption** – to the extent required.¹⁷

¹⁵ The precautionary principle is one of the central principles of German environmental policy and, consequently, of European environmental policy. Precaution plays a role above all under the conditions of uncertainty and ignorance, i.e. when no (quantitative) risk can be derived. In the sense of precaution, it is therefore a matter of dealing with ignorance or uncertainty (cf. v. Gleich and Petschow 2017).

¹⁶ The concept of resilience has different roots and became prominent in the context of Holling's work on the survivability and adaptability of ecosystems (Holling 1973). Today it is used in many disciplines, interpreted differently and underpinned by different indicator systems (on the multidisciplinary perspectives of resilience research, e.g. , see Wink 2016). In addition, the concept of resilience in the political arena has gained in importance, especially in international organizations, especially with regard to economic policy (cf. Brinkmann et al. 2017).

The core of the concept of resilience in terms of content deals with the characteristics of a system or the behavior of a system when it is struck by unknown events with unknown probabilities of occurrence. If the system is able to continue to provide certain system services and, after a shock (following absorption, recovery, restoration or new system state), either to move back to the initial state or to achieve a new (desirable) state (adaptation to the changes), one speaks of resilient systems. The decisive factor here is that a resilient system maintains its system service "no matter what" (cf. Brand and v. Gleich 2017).

¹⁷ With regard to assessment of the importance of non-market-related policy instruments, which are prominently demanded in the degrowth discourse and in parts of the post-growth discourse, no consensus could be reached within the team of authors; for this reason, no other conceivable instruments were listed here; measures in the field of education for sustainable development, however, are undisputed.

It is obvious that compliance with planetary boundaries and the corresponding need for change are associated with considerable **social conflict potential** (such as distribution issues). The representatives of a green growth approach undoubtedly propose suitable instruments from a theoretical perspective, although the political demand for these instruments and their effective implementation in practice has so far been very limited. On the other hand, the ideas and models that have been developed within the ecologically oriented post-growth discourse have so far received only limited acceptance.

Exploration and potential development of new paths of societal development

The second demand to **explore and extend new paths of societal development** is complementary to the first, i.e. the instrumental approach delineated above. In debates on efficiency, consistency and sufficiency,¹⁸ the post-growth discourse has developed both general orientations for a sustainable development as well as strategies for the implementation of specific measures (e.g. regionalization, sharing). Many representatives of a post-growth position regard the necessary cultural change as a precondition for the onset of a transformation towards sustainability, since a correction of market prices alone will not be sufficient. From their point of view, **fundamental changes in the existing economic system** (greater importance of commons, cooperation instead of competition, etc.) would be necessary.

Practical initiatives in this direction are still predominantly niche phenomena for which it must be clarified whether a generalization through appropriate scaling (upscaling) is desirable and possible. The **path dependency of developments** is immense – not only in the technical field, but also in socio-technical contexts. In this respect, the challenge is how new paths of development can be made possible in favor of compliance with planetary limits. Participative social search processes, experimental spaces for new social practices and new approaches in innovation and research policy that stimulate, accompany and support these endeavors are essential for exploring more sustainable options for action.

The approach of exploring new paths of social development inevitably implies that further growth of GDP – being a means but no end in itself – should no longer be regarded as the dominant social target. Instead, more attention should be paid to socially desirable goals (social well-being, good living, etc.). Social change towards a culture of sustainability thus also requires **other indicator systems**.

Political actors can contribute to such search processes by creating suitable and flexible framework conditions as well as funding and accompanying instruments (e.g. transdisciplinary research and consultancy projects) so that social and sustainability-oriented innovations are stimulated more strongly and a broader impact is supported. Such projects should at the same time be scientifically evaluated and accompanied to generate a robust, evidence-based basis of knowledge about the realization potential of a resource-light (post-growth) society and corresponding social innovations.

Identification and development of potentials for a more growth-independent design of societal institutions

From the perspective of the authors of this discussion paper, another important path dependency is the **dependency of important social areas and institutions on growth** (cf. chapter 3.2). From our point of view, emphasizing the growth-dependence of key social sectors and discussing the implications is an essential contribution of authors from the post-growth discourse

¹⁸ For the debate on sufficiency, efficiency and consistency, see e.g. Huber (1994), current references to Schneidewind and Zahrnt (2013), Santarius (2015), Loske (2013 and 2015) or Schneidewind (2018).

to the sustainability debate. Consequently, we see a third element as constitutive for our proposed precaution-oriented post-growth position: the **identification and development of potentials** for a more **growth-independent design** of societal institutions and processes.

From our point of view, this is also essential to increase the resilience of important social systems. Corresponding measures should be implemented if they turn out to be effective and socially acceptable.¹⁹ To this end, appropriate pilot projects should be designed, implemented and evaluated.

If a strategy of greater independence from growth was successful, social acceptance of environmentally motivated policy measures, which may have a negative impact on economic growth, would potentially increase. Such policy measures would then be met with less reservation due to expected negative impacts on economic growth; the **scope for an ambitious environmental and sustainability policy would expand**.

As the explanations in chapter 4.3 show, however, the **existing approaches to achieve greater independence from growth are proving to be marginal in terms of their effectiveness**. Fundamental reform approaches, if any, have so far only been considered in small sections of society and pursued in a series of smaller experiments. Hence, a reliable statement about the generalizability of such approaches and their potential to reduce the existing dependence on growth is hardly possible. However, in view of the uncertainty about the prospects of success of the green-growth strategy to decouple economic growth from negative environmental impacts, which has so far been the dominant approach, it seems necessary to continue working on the conception and testing of models that are less dependent on economic growth. We see a considerable need for research in this area.²⁰

The precautionary post-growth position as a platform for further discourse on social well-being within planetary boundaries

The precaution-oriented post-growth position represents an integrative approach, but at the same time, it provides a comprehensive impulse for further discussion of transformation paths, especially with a view to the economic discourse. The concept of “independence from growth” aims to challenge dominant social models and path dependencies and, in this sense, has the potential to bring about far-reaching change processes. On the other hand, the goal of “social well-being within planetary boundaries” is ultimately to be made concrete in social negotiation processes, and effective narratives are to be developed in a participative manner. In view of the adherence to planetary borders, SDGs and the promotion of individual quality of life and social well-being, we interpret the precautionary post-growth position both conceptually and practically as a relevant and important component of a consistent and global strategy that still has to be worked out in greater detail. From an action perspective, a post-growth position understood in this way can also be regarded as the starting point or as an essential component of an overarching strategy of resilience, motivated by an ethics of responsibility. In view of the uncertainty about future economic and social developments, the implementation of such a strategy could

¹⁹ With reference to various theoretical approaches in economics as well as available empirical findings, the team of authors systematized various growth drivers in Chapter 3.1 and assessed their current and future relevance for early industrialized, prosperous economies. However, joint recommendations for action on how to deal with the identified drivers were not developed, as there were differing ideas amongst the authors on whether a targeted weakening of growth drivers is a sensible policy approach at all. Some of the authors of this discussion paper would point out that a weakening of individual drivers could make a contribution to reducing resource and environmental consumption without necessarily resulting in welfare losses. Others would argue that a policy that focuses on the weakening of drivers would limit economic dynamics without ensuring that this would support the achievement of objectives (to respect planetary boundaries).

²⁰ When evaluating the available analyses and proposals for action as well as the potential of the various transformation discourses with regard to the further increase in knowledge, it must be borne in mind that the protagonists in question in the science system have very different quantitative processing capacities.

contribute to a greater robustness of the transformation process towards a sustainable society within our planetary borders.

With this discussion paper, we offer a contribution to the societal debate on the design and instrumentation of transformation paths for societal well-being within planetary borders. We hope that our impulse stimulates and structures **a new discussion and corresponding research process**. The precautionary post-growth position offers a platform for discussing strategies, whose implementation have yet to be worked out in all details, to meet the challenge of respecting planetary boundaries.