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The Limits to Environmental Economics

… Wilke-Volltext …

Summary

By examining the problem of climate change this paper develops (a) a substantial critique of the background assumptions that not only the formulation of economic theories but, in parts, also that of sociological/ political theories base on and (b) an approach to what should be understood by the term "ethics" as used in the fifth IPCC-Report. However, this approach does not "supplement" to efficiency considerations" which up to now dominate the practical results of the IPCC; it rather supersedes them. It will be demonstrated that the supposed rationality behind the cost-benefit analysis used by economists and the IPCC – in correspondence to neo-classical economic theory – in order to more or less calculate mathematically the ideal climate policy is only vaguely visible and often not honored as both incorrect and incomplete normative and descriptive assumptions are incorporated into the calculation of what is supposed to be "efficient" climate policy. Accordingly, keywords are: predated and too optimistic climate data; problematic use of prognosis uncertainty; missing injury factors of global warming such as wars over resources; the limits of growth are not taken into account; improper quantification of what cannot be quantified; incorrect discounting of future events; ethical and democratic deficiencies of "preference theory" (to be clear, the problem lies within normative preference theory itself and not within the descriptive anthropology of the so called "homo oeconomicus" which is often criticized in a rather misleading manner). The critique not only points at neoclassical environmental economics, Nicholas Stern, the IPPC, and, what is more, their "skeptical" critics but also to some extent even alternative economists. This paper also outlines an alternative to "efficiency thinking" which is not to be associated with "Rousseauian" or "Marxist" theories focusing on basic human needs or capabilities and Rawls´ critique of utilitarianism. It therefore goes beyond the prevalent critique of the neo-classical approach to economics. A possibly more moderate but, therefore, from a methodological standpoint, more coherent climate economics could be the objective that rather merges into a more general "climate social science" (Klimasozialwissenschaft) and a general balancing theory instead of only focusing on technicalities and natural sciences. The idea behind terminologies like "ethics" and "theory of justice" that most social scientists have adopted will be corrected in the process of this review. Neither are these ideas "vague", when it comes to their justification/ explanation, nor do they solely correspond to the "democratic will of the majority". They are not even something completely different from preference theories which have to be qualified as (less convincing) ethics themselves.

1. Introduction and problem specification

Science is the methodical and rational search for truth and/ or justice – in the end, for its own sake. In case "facts" are to be found objectively we are talking about "truth" and in case

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"norms" are to be substantiated objectively we are contemplating "justice". Climate economics have played a more and more prominent role within the debate about both "facts" and "norms" that the appropriate climate policy should be based on. Especially the economical ideas of Nicholas Stern and IPCC have been very important and helpful for the climate debate during the last years. Even though there is more than one scientific approach to climate economics, all of them, at least if they can be assigned to the neoclassical approach to economics, are subject to more or less substantial and often simply over-looked criticism. [2] This critique will be presented here in order to establish comprehensive climate sociology with a much broader view on the problem at hand that, on one side, is not constricted by economics but that, on the other side, is also faithful to a refined climate economics.[3]

Climate economics deals with the calculation of the most cost-efficient climate policy. This idea also underlies the economical parts in the IPCC-Reports. In practice, damages caused by climate change and the more general advantages and disadvantages that arise from certain climate policies and can be translated into monetary value are netted and put into proportion, thus leading to the "optimal" path to save our climate. [4] "Efficiency" is key and focal point in this context. However, this traditional cost-benefit analysis has a fundamental problem. "Lucid facts and clear-cut figures" within the IPCC-Report and in climate economics in general might appeal to politicians as well as the media. They, nevertheless, far too often conceal the scientific and normative assumptions that, while being compiled, were made in the background. If these assumptions prove false or if they are "uncertain", so are the figures (and facts) they are based on and, ultimately, the suggested objectivity, which is actually hardly redeemable/ achievable – even if figures appeal to scientists and politicians alike (and all the more so to the media).[5] Along the way this paper, thus, criticizes the restriction of the term "science", which is very common among natural scientists and economists, to (a) descriptive statements and especially (b) quantifiable information.

2. Realistic climate data, economic damages and uncertainties

The first problem climate economists face is that they tend to be rather optimistic about the human impact on the climate and, thus, underestimate the caused damages. Climate change probably poses problems that, regarding their dimensions, throughout human history have never occurred before. However complex the science behind our changing climate may be, the core concern of climate protection is a rather simple matter[6] which is to cut down on the output of "Green House Gases" (GHGs) by reducing the amount of oil, coal and gas we consume. What we need in order to achieve this objective are strict GHG-reduction goals, higher energy efficiency, much more renewable energy resources – which, theoretically, are almost free of GHG´s – and maybe even a certain quantum of sufficiency, i.e. a more frugal way of life, abstaining from the unnecessary and not a globalization of the non-sustainable (western) way of life. What we eventually have to discuss is our model of civilization that over the past 200 years was mainly based on a high level of fossil fuel consumption. Fossil fuels are om-

[2] An alternative model to the neo-classical approach to economics would be ecological economics; see Daly 1996; Rogall 2009, p. 157 et seq. However, some of the following critique is also valid for such an alternative concept.
[3] What is meant here is the underlying economics of climate protection and not economy as such.
[4] See, e.g., Lüdemann/ Magen 2008, p. 5; Posner 1986, p. 85 et seq.; Nordhaus, 2008, p. 5.
[5] Critical (however, only with regards to factual uncertainties) also Stehr/ von Storch 2008, p. 19 et seq.
[6] This formulation goes back to Hänggi 2008, p. 7.

nipresent in modern society. They are not only powering our cars but also providing a basis for our heat-energy, our fertilizer, our synthetic material. They are contained in almost every kind of product and in their transport. Because of the climate change our high level of meat consumption, private car rides and oversea holidays, well heated apartments, consumer electronics and so on – today regarded normality – will become points of discussion.

If we continue living under the current paradigm projections agree that until the year 2100 there will be a global warming of about 3-6 degree Celsius. Considering, that countries like China and India adapt increasingly to the western way of life the global warming may even exceed this number. So, without a much more decisive climate protection severe economic disasters and a disruption of the policy of peace that are likely to result in a major loss of human life are imminent. Not to mention that there is a flagrant global and inter-generational conflict, as well[7]. And, despite the often stressed role of Germany and Europe as the pioneers in climate protection a German still emits three times as many GHG´s as a Chinese and about twenty times the amount of an African[8]; at the same time, southern countries – and future generations – are much more likely to be affected by climate change.[9] They will have to deal with the majority of the approaching problems without having caused them. All in all, there has been a worldwide increase of emissions since 1990 of about 40 %. In western countries emission have in general (only) remained stable, and even this "success" is mainly due to the collapse of Eastern Europe industry at the beginnings of the 90´s and the – unintended – transfer of production plants to emerging countries that, statistically, have entered in the books as "successful local climate policy".

There is an often recalled mantra in science and politics: We have to limit global warming to a maximum of 2 degrees Celsius. Therefore, we would have to reduce our worldwide GHG output to 40-50 % (60-80 % in the industrialized countries) relative to the output of 1990 until 2050. However, worldwide climatologic research, regularly compiled in the IPCC-Reports, calls for much more decisive steps towards drastic changes especially if we take the really disastrous events into account and – to the extent possible – want to prevent them. In its 2007 report the IPCC argues for worldwide (!) reduction goals somewhere around 50-85 % in between the years 2000 and 2050 if we want to limit global warming to 2-2,4 degree Celsius and even calls these goals modest (as they do not include negative feedback effects within the climate system).[10] If global population rising from 6,6 billion to about 9 billion people and a global average CO_2 emission of about 4,6 ton – in Germany today it is approximately 11 ton – per year and person (i.e. without deforestation) was taken into account this would all add up to reducing CO_2 emissions to about 0,5-1 ton (per year and person). [11] Consequently, the industrialized countries would have to reduce their emissions by more than 90 % until 2050. We have to remind ourselves that (1) negative feedbacks within the climate system have not been included and (2) a global warming of about 2-2,4 degree Celsius implies drastic global threat scenarios. Furthermore (3), latest research linked to the IPCC shows that reality has already

[7] On the concept of sustainability (which means „more intergenerational and global justice") see Ekardt 2010c; Ott/ Döring 2004.
[8] Cf. Baumert/ Herzog/ Pershing 2005, p. 22.
[9] Böhringer/ Welsch 2008, p. 265; Nordhaus 2008, p. 6, is rejecting any kind of consequences – in contrast to Stern 2009, p. 13.
[10] On the following see IPCC 2007, p. 15, table SPM.5.
[11] See Hänggi 2008, p. 31, who calculates that according to the data of the IPCC in 2007 and in case world population rises to 9 billion by 2050 the per head out-put of CO2-aquivalents should be around 1,3-0,4 t even without taking rebound-effects into account.

surpassed[12] the IPCC´s predictions of the climatic changes in 2007. So, the climatologic perspective dictates that the occident will have to establish a zero emission society if catastrophic damages are supposed to be prevented.[13] As emissions caused by human land use can never really drop to zero, the energy sector might even have to reach negative emissions (i.e. the recuperation of GHGs out of the atmosphere).[14] As climate change is a prolonged phenomenon these arguments are often overlooked; GHGs stay in our atmosphere for hundreds of years.

As far as possible, restraining feedback effects have been included into the climate models that climate prognoses are based on. In contrast, reinforcing feedback effects that could change the outcome of climate prognoses dramatically have hardly been taken into account in their underlying theoretical frameworks, e.g. melting sheets of ice decreasingly reflect sunlight; the accumulation of water vapor within the atmosphere due to rising heat; the changed influence of cloud formation; the role of the oceans and marine life; the release of GHGs relating to the melting of permafrost soil; the changed human land use caused by climate change. Uncertainties also appear in calculations concerning the production of nitrous oxide and methane in farming and especially concerning deforestation that accounts for about 20 % of climate change. So, (1) not only is the IPCC rather cautious and so-called climate skeptics, that hardly ever are climatologists by profession, tend to overlook this fact but they also exaggerate the level of uncertainty within climate models and understate projected damages.[15] Furthermore, on a regular basis they avoid seeing that (2), even if less dramatic climate prognoses turn out to be true, there is reason enough to act only because fossil fuels are already diminishing and will eventually run out. In addition, climate skeptics (3) often understate the precautionary principle: If we assumed that drastic threats to interests worthy of protection are *possible* and if we also knew that at the time they materialize remedial action will probably be too late the obvious conclusion would be to act now. Underlying this last argument, however, is a normative thought. This assumption presupposes (correctly, as will be shown later on – see chapter 4.) that there are normative interests worthy of protection.

This scientific foundation has not or only in parts been taken up by climate economics. The IPCC data of 2007 is used (at best). Nevertheless, due to working methods it only reflects the level of knowledge of 2004 and is most of the times based on rather restrained (cautious) climate models. In the summer of 2009 even Nicholas Stern, who, as the probably most influential of all climate economists, is often cited as an example and who in many ways goes beyond other climate economists, has still (only) talked about a global reduction goal of 50 % until 2050 and does not seem to take the Copenhagen Synthesis into account; on the other hand, if we take a look at the Stern-Review from 2006 we will find lots of evidence indicating that the numbers are probably too low. Then, however, problematic assumptions of facts which tend to underestimate possible damages caused by climate change have been reflected

[12] Cf. the Copenhagen Synthesis from the beginning of 2009 (available at: http://climatecongress.ku.dk/pdf/synthesisreport); see also Hansen 2007 with regards to research conducted by NASA.

[13] See the conclusion of EU's Council of Ministers (Environment) on the 2nd of March, 2009 (available at: http://register.consilium.europa.eu/pdf/de/09/st07/st07128.de09.pdf) and the resolution of several managers of energy companies from April 2009, cited in TAZ on April 10th, 2009.

[14] It could, e.g., be feasible to combine bioenergy with CCS; cf. Ekardt 2009b, chapter 15-16.

[15] As an example for the following see only Lomborg 2007. Climate skeptics are ignoring that some negative developments will occur with a delay of (at least) several decades as some GHGs will stay in the atmosphere for a long time. Furthermore, because of the physical limits to growth the world will probably not for all time become richer and, therefore, we cannot assume that potential climate damages will simply be compensated by growing wealth. And, climate protection policy costs (in parts only alleged costs) are not better spend on the fight against Aids or malaria; we should better do both, not only because climate change threatens to become the worst catastrophe developing countries have ever faced.

in climate economical calculation. All the more so, in case even Stern´s assumptions are dismissed as exaggerations, which is the standpoint of many of his critics – like William Nordhaus who is also the main example in this paper for a rather "skeptical" position.[16]

This way the focus does not lie on the argument that the total cost of drought failures, floods (and other natural disasters), water shortages, widespread famine, the possibility that swathes of land and maybe even whole countries become uninhabitable and, last but not least, unmanageable migratory movements will probably be much higher than the total cost of an effective climate protection policy; the Stern-Report of 2007 has stressed this argument against a significant body of opinion held by economists[17], according to the latest calculations it, nevertheless, proved too cautious.[18] Stern on his part criticizes many economists for their disregard of the economic benefits climate protection policy and strict reduction goals have. Not only will an increased efficiency, an increased use of renewable energies and more sufficiency in the light of diminishing resources (especially fossil fuels) and the political instability of many countries providing them[19] lead to a lasting and affordable supply of warmth, energy and fuels. In fact, in the short run it will also save energy costs (for example, through more efficient thermal insulation of buildings) and may result in new jobs and new markets due to the use of new technologies.[20] Apart from the problem of outdated climate, data Stern, the IPCC and others omit another important economical factor: it may appear rather cynical, but, the presumably biggest cost factor in the future could be the damage caused by military conflicts for oil, water and other resources. All this classifies the economical calculations as too conservative and, thereby, documents how problematic – even in economical terms – the latest discussion about "less climate protection policy because of the current financial crisis" actually is.[21]

There is reason enough to "update" all climate economical calculations which on the other hand will not call the theoretical background to climate economics into question. A structural and therefore unsolvable problem stirs up principle doubts about climate economics. Climate change is, considering the concrete course it takes today and its economic consequences, a very complex problem and can, thus, never be prognosticated "exactly". To sum it up, it is characterized by a high level of uncertainty. It is impossible to include uncertain, future events and developments "precisely" into cost calculations. If future events do not have assignable occurrence probabilities (risk) but instead this probability is unclear (uncertainty) they per se cannot be quantified. Then, however, it cannot be argued to include an impending damage that may – if it actually occurs –cost 10 billion Euros and has an occurrence probability of 10 % as "1 billion Euros" into a climate economical cost-benefit analysis; as far as can be seen, Stern does not address this problem either. In view of this problem, Stern´s critics, however, conclude that damage prognoses have to be conservative.[22] A different interpretation, nevertheless, seems to be the more convincing one and goes hand in hand with the basic hypothesis of this paper: cost-benefit analysis as the background of climate economics suggests a false impression of precision and its critical examination is, therefore, unavoidable.

[16] Cf. Nordhaus 2008, p. 5 et seq., but especially p. 123 et seq.
[17] Stern 2006 (available at: http://www.hm-treasury.gov.uk/stern_review_report.htm); Welzer 2008; Ekardt 2010, § 1; Kemfert 2008, p. 63 et seq. (for an overview of pandemic events that are likely to happen see p. 54 et seq.).
[18] Parry et al 2009 speak of 500 billion Euro total costs per year instead of only about 100 billion Euro.
[19] Cf. Stern 2009, p. 39 and passim.
[20] Cf. Kemfert 2008, p. 135 et seq.
[21] Thus, amiss Knopp/ Piroch 2009, p. 409 et seq. and Frenz 2009, § 1 no. 1 et seq. and passim; for a correct analysis see Wustlich 2009, p. 515 et seq.
[22] On the following, in more detail, see Byatt et al. 2006, p. 199 et seq.

Actually, these problems are not new – apart from the outdated climate data some are, in fact, rather old hats like those surrounding the economical calculation of damages and how uncertainty is dealt with. Below, the focus lies therefore on hardly ever addressed problems climate economics also have. They concern Stern as much as the IPCC and its critics. First and foremost, an often overlooked, factual assumption comes to mind – and, then, a whole bunch of normative assumptions without which it would not be possible at all to discuss in which case prognosticated climate data and the events they will most likely cause (e.g. higher oil prices or more hurricanes) have to be classified as "benefit" or "cost".

3. The limits to growth

Climate economical calculations of the "ideal climate protection policy" rely heavily on the problematic assumption of "unlimited and perpetual growth" – that is also why the Working Group III of the IPCC is mainly focused on finding *technological* solutions to reduce emissions. Damages due to climate change might – in calculations based on this assumption – cause dips in growth (maybe even significant ones). The idea that functioning, long-term (!) climate protection policy, instead of hoping for an economic revival through the promotion of new technologies and after a (much needed) fight against poverty in parts of the world, should much rather critically revise the "idea of growth" is hardly ever topic in climate economical discussions. That applies to Stern, too.[23] Worse still is Stern´s and probably the IPCC´s standpoint that climate change is only a "market failure" (and, therefore, – within the logic of current approaches to economics – an economical problem that is solvable with the usual steps and measures like any other economical problem).[24] Some commentators even fall short to Stern´s uncritical view on the limits to growth.[25]

What causes climate change is, very briefly, the wealth of the industrialized world. In case we strive for further growth energy consumption and, in consequence, the consumption of fossil fuels will rise, at least in short- to mid-term. The central idea of sensible climate protection, however, is to decrease the use of oil, gas and coal drastically in order to reduce the amount of GHG´s that are blown into the atmosphere. One could say: We could switch from fossil fuels to renewable energies, which produce much less GHG´s, and we could in general use energy in much more efficient ways.[26] These are in a nutshell some of the essential strategies to combat climate change. This way energy consumption, wealth and economics seem to go on growing and, at the same time, emissions of GHG´s will go back. Climate protection policy is indeed a chance to make short term profits. There are, however, three arguments relating to climate change why the paradigm of "unlimited growth" as such sooner or later will have to be revised:

1. As it seems, emissions that are saved due to the application of feasible new technologies will be eaten up, in case there is unlimited economic growth, by the increase in wealth (so called "rebound effects").[27] Metaphorically speaking, if cars on the one hand continue to be more and more energy efficient, but, on the other hand more and

[23] E.g. Stern 2009, p. 11 or p. 92; cf. also Weimann 2009, p. 26.
[24] Cf. Stern 2009, p. 11 et seq.
[25] Cf. Nordhaus 2008, p. 32 et seq. and passim.
[26] E.g. Stern 2009, p. 111 et seq.
[27] The German Federal Environmental Agency found this effect to be true with regard to private energy consumption (cf. the underlying study available at: http://www.umweltdaten.de/publikationen/fpdf-l/3544.pdf.); even more pessimistic in this respect is the, albeit controversial, analysis by Garret 2009.

more people drive cars (and some might even want to drive bigger cars) then nothing much is won with regard to global GHG reduction goals. This is exactly what is happening today and also explains why, for example, the emissions of the industrialized countries since the 1990ies remain static even though there have been many political programs to reduce the emission of GHG´s.

2. If climate change is supposed to be limited to a non-catastrophic level drastic GHG reduction goals are obligatory. We have to bear in mind that climate protection policy is not about increasing global wealth and not about keeping emissions at a constant level through advancements in efficiency and so on; it is rather about reducing them globally (!) to up to about 80 %. This goal and the scale of the challenge force us to go beyond phrases like "more energy efficiency is needed" and to rethink the unlimited growth paradigm. Because in the end a, to some extent, stable climate is the foundation of human existence.

3. And even apart from these arguments there is the trivial but nevertheless fundamental truth that in a finite world growth will eventually reach its natural, physical limitations (unless we talk about growth in knowledge and skills – like playing the piano – and the like). It is impossible to make sure that the whole world – all Chinese, Indians and Indonesians who slowly but surely adapt to the occidental way of life and, consequently, the paradigm of unlimited growth it is based on – will for all time become richer and richer. Even if mankind is able to switch from fossil fuels to solar energy, other resources remain limited. Wind mills, solar collectors and electric cars are made of resources, as well. We can hope that "new ideas" are limitless and will despite physical limitations guarantee "unlimited growth" without any kind of resource consumption. This, however, seems undecided so that it is at least open to question to base one's climate policy advice on such an assumption.[28] In general, new ideas tend to only produce new ways for the consumption of physical resources: In the beginning the internet seemed to be an immaterial idea. Personal computers and servers, however, consume electricity and need, when being built, lots of rare resources for their infrastructure and the diverse equipment that goes along with them.

These problems are all of fundamental nature. They cannot be dismissed by saying that we today know of more oil reserves than were prognosticated 30 years ago; they can at best (if at all) be postponed. The problem of the physical limitations inherent to our planet shows another important aspect: Even if there was no climate change at all this common perspective on growth needs to be questioned.[29] And there are even more arguments to support this point of view. Global rates of growth do not provide us with any information about how wealth is distributed: Some may get richer and richer while those who would need growth much more urgently still become poorer and poorer – a phenomenon we experience today, in Europe and worldwide. Furthermore, the term "growth" conceals many aspects that should be thought of, that should be appreciated – this, however, is a well known and on-going debate. Private so-

[28] Hans Nutzinger, e.g., one of the creators of the German "eco tax" seems to believe in this assumption – even as an alternative economist. Still, it could be argued that it would be unwise to base our future society on a rather vague hope. This question is currently the focal point of a controversial discussion in the newly founded international (at the moment mainly middle-European) network for sustainably economy (Netzwerk Nachhaltige Ökonomie – www.nachhaltige-oekonomie.de). Even the Austrian government has spurred a discourse about the paradigm of unlimited growth (www.wachstumimwandel.at).

[29] Cf., on the following, the contributions by Schmidt 2005, Behrens/ Giljum 2005, and Löhr 2005; Ekardt 2009d, p. 223 et seq.; Daly 1996; Wuppertal-Institut, 2008.

cial work and private child care, for example; and the ecological damages in the wake of our "path of growth" (Wachstumspfad), which we believe to have no alternative to. What is more, there is no empirical data showing a clear connection between growth and happiness.[30]

If the debate about our climate thus leads to a debate about growth we also face another serious problem. Even though it is still regarded a controversy[31], according to the common view on economics capitalism and the social welfare state need some kind of growth. The idea that in case we let go of the "paradigm of unlimited growth" an adequate way of life would no longer be possible is doubtful, at least historically. Human history up to the 18th century in general only knew of static economies.[32] A society based on growth, it could be argued, is, therefore, an historical exception linked to the appearance of fossil fuels. Besides, humanity has developed technological knowledge to such an extent that it should be possible to preserve the essential achievements of this time, nonetheless.[33] However one may decide in this matter: the scale of the problems that arise with climate change, the "rebound-effect" and the physical limits our world has could make any debate about it superfluous. To accept this, would on the other hand put an end to only push the development of "new technologies" forward, like the IPCC and, along with it, huge parts of the research have in mind. The industrialized countries would instead have to look for where sufficiency is an adequate answer to today´s problems. Moreover, it could be useful to think about the consequences and implications that an end of the "idea of unlimited growth" might have in the long run.

Now, we might wonder whether this discussion is at all worthwhile for climate-economists. Who says that facts and prognoses about future events like the oil-price, hurricanes etc. should be of any interest to us? Why don´t we let consumers decide (by their factual preferences)? This paper wants to confront this point of view which eventually leads to a review and a critique of preference based decision theory typically used in economics – and which was also adopted by Working Group III of the IPCC with its main focus on engineering and economics. This critique, however, does not only revolve around the above mentioned problems of how to discount properly and how to "quantify" aspects of reality that cannot be quantified (see chapter 5).

4. Climate Protection and Justice: Why not only natural science and preference based decision theory can be labeled „objective" – and what "ethics within IPCC-Reports" would mean

4.1 Assumptions surrounding the core of liberal democratic and sustainable ethics

So, the way is now paved not for pondering natural-scientific but normative questions, i.e. questions of evaluation and why certain things should be done and others should not: to what extent should certain negative and irreversible effects (we are, furthermore, unsure of and that might be drastic, too) be averted or be accepted, if necessary, after carefully considering, weighing and balancing them with the interests society has today. We cannot deduct "value"

[30] Psychological research, however, implies the opposite; cf. Wuppertal-Institut 2008, p. 282 et seq.
[31] Rogall 2009, p. 157 et seq., tries to find an unbiased and balanced answer.
[32] Cf. Daly 1996, passim. This alone hints at the fact that the idea of growth has a cultural background – which is not only rooted in classical liberalism alone, but also (already) in Calvinistic Protestantism; cf., with additional references, Ekardt 2009b, chapter II.
[33] The classic national „policy for growth and jobs" is further pressured by Globalization and, accordingly, makes regulatory efforts even more difficult; see Ekardt/ Meyer-Mews/ Schmeichel/ Steffenhagen 2009e, chapter 1 and 3.

(whether something is to be appreciated or whether it is to be criticized) from the observation of nature or a natural phenomenon itself; this basic consideration is not discussed in economic or natural scientific debates to the extent necessary.[34] This way we enter into the realm of ethics and theory of justice (these terms will be used as synonyms).[35] Below, it will be demonstrated that there are not only descriptive assumptions (see above) but also rejectable normative, ethical assumptions within climate-economic models. Nevertheless, many economists would completely dismiss the idea that cost-benefit analysis or the calculation of the preferable climate protection policy has anything to do with ethics.[36] As we will see below, this should be incorrect.

For the sake of the argument, we need to return to a more general level. Let us suppose that a society is "just" if it provides room for everybody within it and everywhere else to lead life the way they please – in other words, if everybody has an equal (!) right to freedom (understood in the way just described). Conflicts between different "spheres" of rights to freedom are solved in a democratic manner following the rules deducted from the division of powers. Then, living together could be called just if an optimum degree of human rights to freedom including the elementary preconditions of freedom (Freiheitsvoraussetzungen) and other arrangements that support the right to freedom (weitere Freiheitsvoraussetzungen) are realized. This includes the constant need to weighing and balancing the colliding spheres. The following thoughts will try to demonstrate briefly that this is the only necessary and possible criterion to justice, if only interpreted in the right way. We do not want to get deeper into the idea that, in case of a correct (re-)interpretation of liberal-democratic legal systems, there is a correspondence between the genuinely ethical and legal perspective in all of the following statements, since human rights are the subject of international treaties and national constitutions.[37] The right to freedom is often called "a human right" while it could also be split into the freedom of action, the freedom of occupation, the freedom of assembly, the freedom of property, the freedom of religion, freedom of opinion etc.[38] The protection of the elementary prerequisites to freedom, like on the one hand life, health and subsistence level (and therewith, for example, a basal access to energy supply but also a, to some extent, stable global climate[39]) and on the other hand granting these freedoms to coming generations and human beings in other parts of the world, is considered only marginally in the liberal-democratic tradition. There is, nevertheless, a strong argument in favor of regarding the protection of the elementary prerequisites to freedom as logically implied in the term "freedom" itself. Simply put, there can never be any freedom without these prerequisites. Another argument for extending the right to freedom inter-generationally and globally will be discussed in chapter 4.5. More detailed ethical and legal arguments supporting this "re-interpretation" have been examined elsewhere and will not be recapitulated here.[40]

[34] Stern 2009, p. 86 et seq. only hints at that problem and immediately forgets about it again.

[35] With regards to some of the possible misunderstandings that can arise in the context of the following chapter see the controversy between Dilger 2006, p. 383 et seq. and Ekardt 2006b, p. 399 et seq. (triggered by Ekardt 2004).

[36] See, e.g., Wink 2002; Nordhaus 2008, p. 175 et seq.; Böhringer/ Welsch 2009, p. 261 et seq.

[37] Ethics is not only developing the principles of liberal democracies parallel to the law. In the following, it will be shown that it is also justifying them and, thereby, providing an ultimate basis for law; on the relation of law and ethics, see Ekardt 2010b, § 1 A. (Law always combines normative and instrumental rationality).

[38] As regards content, there is no further significance for this differentiation – apart from the idea that the constitutional lawmaker has in parts (pre-)structured the balancing of colliding freedoms (see chapter 5.) by deciding about their weight within the catalogue of fundamental rights.

[39] For the reasons to even include threatening damages (precaution) that are not certain, see chapter 2 above.

[40] For a detailed analysis of the theory of justice underlying chapter 4 and with additional references, see Ekardt 2010c, § 3-7; Ekardt 2009b, Chapter 4-6; Ekardt 2010a; focusing on the intergenerational dimension is Unner-

4.2 An essential differentiation: Anthropology (homo oeconomicus) versus normative preference theory/ efficiency theory

It is important to notice that all these aspects lie within the scope of *theory of justice*. In contrast, *action theory* merely describes the factual behavior of human beings, whereas a normative, theory of justice oriented (morally or legally) approach is about the behavior of human beings and societies, particularly how they *should* behave/ organize themselves. Instead of action theory we could also use the terms "anthropology" or "conception of man" (and it is part of our confused discourse that many people hold the erroneous assumption of the conception of man being something normative, an image of "how man is supposed to be" or how society should be organized, thus, mixing anthropology and theory of justice[41]). The idea of man as an egoistic being is very common amongst economists. Its oversimplifications have been realized by many people in recent years even though many economists still have problems accepting that. A theoretical foundation that says "*man is in fact (almost only) egoistic by nature*", which is an idea that goes back to Thomas Hobbes doctrine of the homo oeconomicus, might be the main point of disagreement in many of economics' controversies. Due to this idea economists purport to be able to *explain and prognosticate* factual events and developments, but it will not be investigated here. It was already analyzed elsewhere how companies, voters/ consumers and politicians are often linked in vicious circles – and how factors like conformity, emotional difficulties to perceive spatiotemporal long-term consequences, self-interest, traditional (false) values, economic-technical path dependencies and the structure of collective goods have hindered really incising climate protection policies.[42] Economic anthropologies hardly ever achieve this necessary differentiation. By pointing out that human beings tend towards self-interest they do, however, stress a very important point (whereas the idea of the homo oeconomicus has been modified in many ways in recent years and should come close to what was just laid out).

The actual problem is then not the *descriptive anthropology* of a rather self-interested humanity – which empirically, as shown above, is only in parts correct – that left-wing critics of common economical approaches like to target. It is not even any kind of *theory that addresses a so-called happy life*. As there is no standard for testing such a theory according to the principle of freedom, such a theory cannot exist. This is why on a theoretical level debates about whether the pursuit of financial profit – as most economists would agree – or whether living the "need for some kind of true solidarity" or the like – as might be the goal of critics inspired by Marx´ theories – actually have no point at all. Hereto, a liberal-democratic framework does not give any kind of instructions; still, an idea of happiness less focused on consuming resources would be helpful to realize that one´s own freedom has to be limited for the sake of intergenerational and global freedom.

However, the problem rather lies in the theory of justice underlying (not only climate-) economics, i.e. efficiency theory or normative preference theory (as efficiency theory was called

stall 1999.

[41] This is very unfortunate as it causes a tendency to see facts in a somewhat screwed, desired way and as it, then, builds the basis for certain "do's and don'ts" – or, in contrast, as it prohibits to get through to the question whether solely normative statements can be justified at all. That is why, e.g., Heinig 2008, p. 330 et seq. is missing the point.

[42] For references, see supra note 41. A slightly unsystematic list offers Rogall 2009, p. 63 et seq. – who incorrectly assumes that sufficiency (i.e. "doing without" certain things and aspects of life) per se is voluntary, while instead it is much more often caused by (high) prices (see chapter 6.).

here most of the times). Thus, the problem is not mainly descriptive anthropology but the normative theory of how human beings and societies *should* be.

4.3 Why economic efficiency theory (normative preference theory) is ethics itself – at the same time: remarks on the terms objectivity and rationality

If we want to elaborate on the possibility of an objective theory of justice and its above shown content – and if we also want to show that efficiency theory or normative preference theory base on a different kind of, but incorrect, theory of justice – we have to pose the following question that is closely tied to the remarks on freedom made above: Is there a secure basis to prove that the principle of freedom and its consequences (maybe, for example, "one person, one emission right" on a global scale) are objective? Here, justice is supposed to mean that a certain societal order is the correct one to achieve certain goals. Then, justice is not an extra that can be formulated subsequent to the desire of "wealth" or the like. Every concept of how a society should be (even a simple "a society should be as rich as possible, and the distribution of wealth does not matter" or just "right is whatever the sum of the empirical preferences is") is a priori – may it be correct or incorrect – a concept of what is "just", it is a theory of justice. Doctrines of a successful society – devised by moral philosophy, law, normative political science or moral theology – a priori deal with justice. Just like physics, biology or sociology a priori deal with the (descriptive) truth – even if some results of our scientific research eventually prove wrong, thus, missing this demand). The foundation of neo-classical (climate) economists, that wealth – goods expressed in monetary values – has to be maximized, is, therefore, neither trivial nor to be called "empirical" at all. Its core is a normative idea – an (efficiency-) ethic[43] that like the homo oeconomicus goes back to Thomas Hobbes. It is not – unlike the corresponding anthropology – supposed to explain or prognosticate but to propose correct decisions. This results in:

- It is incorrect to counterpart „efficiency versus justice" or „efficiency versus ethics" as economists like Nordhaus and Stern or left-wing critics do.[44] From a scientific point of view only the debate about whether an efficiency-ethic is convincing or not is worthwhile. In contrast, it does not make any sense conceptually that the IPCC wants to "include" ethics or theory of justice (these terms are, as is well-known, synonymous) in its fifth status report "in addition to" an efficiency analysis. Again, this would fall for the false idea that ethics (or justice) may be a diffuse extract from questions about societal orders, questions that somehow seem to be "more important" than others or may even have a religious tendency. For this, Stern is a good example.[45]
- Moreover, the controversy „ethics versus efficiency" rather revolves around the question how better distributive justice of certain goods can be achieved (in the sense of intensified re-distribution). This is a special and, what is more, a scientifically not really conducive question as it is only partially decidable.[46]

[43] A from an economic perspective striking analysis provides Gawel 2001, p. 9 et seq. and p. 43 et seq.
[44] That is why Nutzinger 2003, p. 77 et seq. and Grzeszick 2003, p. 647 et seq. are, in our opinion, slightly misleading; see also Mathis 2009.
[45] Unfortunately, the day-to-day and often even the scientific (if not philosophical) usage of the word "ethics" is rather arbitrarily. It does not make any sense, however, to classify medically assisted suicide or the protection of embryonic stem cells as "ethical problems" and to leave out other societal questions that are normative as well (e.g. the scope of economic freedom).
[46] We will come back to this question briefly later on in note 75.

But, is there an objective ethic? Can there be objective and generally accepted standards in our post-metaphysical, global and multi-cultural world (called "ethical" or "efficient" all the same)? The principle of freedom would suggest that, for example, dictatorships are unjust – but is it possible to substantiate that principle in an objective manner? That statements of fact, like those referring to anthropology or climate data, may be uncertain or may be difficult to prove, but can be *true* or *false* in an objective manner and, therefore, be rational is hardly ever questioned. It is much more problematic to make a similar statement about moral or legal norms. Can they be *correct*/ *incorrect* or objective/ rational? Most economists, Stern as well, imply that only economics or natural science can be objective. It shall now, therefore, be outlined very briefly that there are indeed rational and, thus, objective norms with freedom as their foundation and main principle.[47] In advance, we have to be clear about the terms we use:

- „Objective" means „not subjective"; i.e. not contingent on perspective, cultural background or attitude – so, universal and applicable everywhere.
- Reason or rationality, respectively, means being able to make decisions based on arguments and, therefore, in an objective manner. Whenever we talk about the applicability of moral/ legal principles of justice – here freedom and, subsequently, its rules that structure the weighing of colliding interests – we are discussing normative rationality. In contrast, instrumental and theoretical rationality both deal with facts. Instrumental rationality asks which way would be the most efficient to achieve a norm that was found to be "correct" like a certain GHG reduction goal (or maybe even a very selfish goal like theft) – for example, by implementing emission trading. Theoretical rationality on the other hand tells us how facts are to be found that do not have a practical background right away like, for example, climate data according to natural sciences. Such facts are the basis for the weighing of colliding interests (according to normative rationality). Economists, however, do not see the whole picture that is "normative rationality". They are only interested in the concept of weighing and balancing interests. Their objects of consideration are the preferences that can be expressed in monetary values. Not a really convincing approach, as we will see in the following.

Whether there are norms and facts that can be substantiated objectively (verifiable according to the requirements of rationality) has nothing to do with the – correct – observation that again and again human being`s subjectivity gets in their way when they try to find facts and norms. People normally have a tendency to see the world "through their eyes". This, however, is not an absolute argument against the possibility of objectivity – for example, after a thorough examination and the discourse with other.[48] To illustrate that with an example: It may be true that there are natural scientists who comment on a climate change caused by man – positively or negatively – following certain financial incentives. Their findings could then not be regarded objective as they are biased to some extent. Accepting that, nevertheless, does not prove the absolute impossibility to gather objective and unbiased climate data. The observance of "subjectivity" – however often it may occur does not matter – logically implies that

[47] There are justification models that are (in parts) similar to the one we will develop here – yet, without the link to the questions of sustainability and climate protection. Cf. Alexy 1995, p. 127 et seq.; Illies 2003, p. 129 et seq.; Kuhlmann 1985; Apel/ Kettner 1993; to some extent Habermas 1983, p. 56 et seq.; implicit Ott/ Döring 2004, p. 91 et seq. The classics Immanuel Kant and John Rawls remain, in contrast, at least incomplete with regard to the theoretical basis of their substantiations although basic terms like rationality, human dignity, freedom, impartiality and separation of powers can be associated with them.

[48] Berger/ Luckmann 1960, p. 2 have shown and advocated this differentiation in their classical (and often misperceived) analysis.

there are "objective" perspectives, as well – otherwise the "subjective" of a subjective perspective could not be determined in a meaningful way.

According to most economists, sociologists and political scientists, the possibility to give objective answers to normative questions (in contrast to questions about facts) does not exist. A "norm" for (not only climate) economists is simply what people on a factual basis prefer. Only a weighing and balancing process that quantifies could then be labeled objective. This process would include preferences (not to be determined in a rational way) that can be expressed in standardized monetary values, thus, establishing their comparability. Whenever an economist wonders about the correct climate protection policy he would not ask: What is the climate political scope of freedom, including that of spatially and temporally distant human beings, and its rules organizing the balancing process in which different political decisions are possible? Economists would on the contrary usually come up with questions like how much money people would spend today in order to have a stable global climate or what would be advantages and disadvantages (expressed in monetary values) of a possible climate change on the one hand and certain climate protection policies (or the scenarios they will supposedly bring about) on the other hand. Such a preference based approach could conclude: Correct is what all can agree to. Or: Correct is what mathematically adds up to the best result. Political scientist would suggest: Correct are the factual preferences of the respective majority.[49] In every case it is important to note that in a certain way all these perspectives, as mentioned above, focus on an action theory or anthropology that is based on self-interest (homo oeconomicus) but could be considered strictly separately. To put their differences in a nutshell: "Human beings are on a factual level self-centered and egoistic" (= anthropology) – "and it is good that way, because, when they listen to their factual preferences a just societal order will eventually crystallize" (= theory of justice, in this case normative preference theory).

4.4 Why normative preference theory is not convincing

Most economists base their objective or "efficient" climate protection policy advice on normative preference theory.[50] Other approaches, especially normative ones without "figures" like the one developed here, are criticized as unscientific and irrational. Still, preference theory faces many grave objections, not only (but also) when it comes to determine climate protection policy:

- A widespread objection familiar to neo-classical economics is that the methods to quantify factual preferences simply do not work. Relevant interests and the necessary balancing process of these interests cannot be expressed adequately in monetary values. Furthermore, factual preferences cannot be determined through the "revealed morality of the market" (not even if it were correct to apply preference theory). And even if it were somehow possible to determine factual preferences, then future damages should not be discounted. All these aspects will be dealt with separately in chapter 5. Here, it is solely to be demonstrated – for the economist maybe rather surprisingly – that apart from the problems arising with its application preference theory is simply not convincing on its theoretical level.
- Our factual desires are per se correct according to preference theory (from this point

[49] Many times this is not expressed openly but presupposed implicitly; cf. only Stern 2009, chapter 5; Panther 2006, p. 21 et seq.; differing Ott/ Döring 2004, p. 41 et seq. and passim.
[50] See, despite their contrariness, Stern 2009, chapter 3 and 5 and Nordhaus 2008, p. 38 et seq. and 59 et seq.

on, one could only ask further whether decisions should be based on the average benefit, the net-benefit or a real consensus). Thereafter, there is no longer a touchstone to answer questions like "how does the world really work". There would simply be no point in further discussing any theory of justice or ethics, they would have been abolished.

- But we do not only face practical but also logical problems as preference theory is substantiated with a naturalistic-fallacy: Why should our factual preferences (a fact) per se be regarded correct (a norm)?
- Should we, then, according to these standards consider dictatorships that are supported by majorities just? And, should a factual ignorance, for example for the interests of future generations that cannot express any preferences today, per se be fine?
- If we opt for "average preferences" or the "preferences of a majority" we should also be able to answer the following question: May 50,1 % of the people within a society make any kind of decision, or 74,4 % or 84,5 %? And why should any majority per se be right without being hindered by some kind of legal framework (in the shape of civil rights and liberties common to liberal democracies)?
- Above all, preference theory is self-contradictory on a conceptual level. Whoever states that there are no universal normative principles and concludes, therefore, that we have to apply preference theory, employs a universal principle himself. So, the statement "with normative assumptions everything is relative" refutes itself. The possibility of an objective morality is not logically disputable; to deny it would be self-contradictory.

That, however, does not mean egoistic preferences have no influence whatsoever on the governance of climate protection. They do. It only proves that preference theory does not have substantial moral or legal foundations – and no normative boundaries or refutations either. These can be found, though, through the principle of freedom and its rules to organize the balancing process. This principle can include the interests of future generations, does not face the outlined theoretical and practical problems, but preserves the fundamental intention – everyone is supposed to decide for him/ herself – and, above all, deduces this intention in a compelling and universal manner.

4.5 For a theory of justice based on rational discourse as the better alternative to preference theory

There is, however, one essential presupposition: the principle of freedom including all rules/ principles that derive form it (like the division of powers in modern democracies) needs to be the sole universal criterion for substantiating justice. But, why should that be the case? And, why should such a statement be "objective"? Here are some thoughts on this matter, very briefly. In a pluralistic world it is unavoidable to argue about normative questions. Even fundamentalists and autocrats inevitably do it from time to time. They, like everybody else, use language to do so. But, whoever reasons and uses arguments (ie. in a rational manner, meaning with words like "because, as, therefore") in a debate, in other words, whoever says something like "X is not correct because of Y", logically implies (1) objectivity in questions of

morality and (2) freedom, whether one likes it or not[51]:

1. We logically presuppose that normative questions can be decided with rational arguments (and ergo objectively) and not only subjectively or based on preferences; otherwise we contradict ourselves. We actually take that for granted on a day to day basis whenever we come up with hypotheses about normative questions and try to substantiate them in order to entitle them with the aura of objectivity instead of just presenting them as something solely subjective. It should be impossible to lead a life without ever phrasing sentences without words like "because, as, therefore". That is why the possibility (!) of objectivity in normative questions cannot be escaped. Even if someone said I am a skeptic and I think that objectively there are only subjective statements about moral questions the possibility of objective statements is implied logically as this sentence is only valid if there is objectivity. Then, however, the criticism of objectivity cancels itself out.

2. Furthermore, we also logically assume that in every debate every debater is granted with the same impartial respect. Arguments are egalitarian and the opposite of brute force and belittlement; they aim at intellectually autonomous individuals as without autonomy one cannot examine and verify arguments. No one would be able to state: "My thesis X and its substantiation could easily be dismissed by Mr. P, you however, Mr. Q, should – as the fool you are – believe in it." Also, no one could say: "After we have silenced Mr. P we could convince ourselves that X is indeed a good reason Y." It conflicts with the purpose of "arguments" to understand the process of reasoning as something merely relative to the addressee – a reason *is convincing* and *can be realized* by everyone. Who participates in a discussion about justice by using arguments (ie. sentences with "because, as, therefore") but then does not grant the abovementioned impartial respect to his debaters ergo contradicts what he himself logically presupposes.

Consequently, whenever I admit to reasoning in debates about justice *and, thus, to rationality* I have to grant impartial respect to all debaters – it does not matter whether all debaters realize the implications of their reasoning or whether some join the discussion for the sole purpose of persuasion – as this is a matter of strict logical implication that derives from the act of "talking" itself (it is not in contrast about our factual self-image which allows no deduction of whatsoever). Respecting autonomy as a derivative of self-determination is, therefore, implied by rationality and has to be put into effect for the *individual* in order to establish *respect for the individual autonomy*: That is to say, collectives as such cannot take part in a discourse, but, single, reasoning human beings.[52]

This is the substantiation of the principle of respect for the autonomy of the individual (*dignity of man*[53]). In addition to that, but hardly distinguishable, we have found the justification

[51] So called negative or transcendental pragmatic arguments of the following kind have been used by Alexy 1995, p. 127 et seq.; Illies 2003, p. 129 et seq.; Kuhlmann 1985, passim; implicitly also Ott/ Döring 2004, p. 91 et seq. and passim. The structure of a negative (and not deductive) argument with which an infinite regress or a "randomly chosen axiom" can be prevented goes back to Platon, Augustinus and Thomas of Aquin (as a logical figure but not referring to the issue at hand). For some misunderstandings that often occur in the discourse "philosophy/ economy", see the dispute between Dilger 2006, p. 383 et seq. and Ekardt 2006a, p. 399 et seq.

[52] A whole set of fictive or real arguments against this justification of (1) the possibility of rationality and (2) of human dignity and impartiality as sole universal principles that can be deducted from rationality are discussed by Ekardt 2010c, § 3; Ekardt 2007, chapter 3.

[53] The principle of human dignity itself is not a freedom right or human right. It is not a norm at all that refers to any kind of singular case, neither ethical nor legal. Human dignity is rather the reason for human rights (in con-

of the principle that justice also means to be independent from subjective perspectives (*impartiality*). Both substantiations taken together are the foundation of the right to freedom for all human beings.[54] There are no other competing principles for lack of stringent substantiation. *That is why equal liberal self-determination including the circumstances that promote it is the sole criterion for justice. Whoever is a human being, therefore, ergo necessarily presupposes (only) the right to self-determination for everyone else.* And this right to freedom and self-determination is granted to every human being even if they never talked to each other. Because, reasons brought up in justice-related questions (in contrast to statements referring to private or aesthetic questions) are directed towards everyone, as anyone could potentially disprove them – that being said, I have to pay respect to every human being as soon as I, even if only sometimes, reason. And everybody does that. The following example is to illustrate and check these thoughts. No one could seriously say: "Mr. P who is not here right now could refute my theses – you on the other hand should believe in my arguments as you are foolish enough not to question them." Whoever says something like that would simply not give any reasons.

We eventually find that the universal principle of freedom is substantiated. And as potential participators of a discourse are included, as well, I even have to grant freedom to human beings that are temporally and spatially separated. That is one of the central arguments for expanding the principle of freedom to future generations, i.e. for global and intergenerational justice and, therewith, for sustainability – next to the idea that freedom as such always implies the need for protection where it is threatened. A "Kantian/ discourse ethical" concept of rationality and autonomy, as illustrated here in brief, opts differently than an "economic-Hobbesian" one. However, both concepts focus on freedom. But, for discourse-ethics freedom is not only about factual preferences in terms of the sovereignty of consumers.[55]

5. The balancing processes – efficiency through quantifications and discounting?

To solve the global and intergenerational conflict between colliding realms of freedom, in other words and applied to the topic of this paper to find the right dimension for our climate protection policy, is not a simple task. Both the normative balancing process itself and that of the relevant facts (see chapter 2.) by means of which it can be identified how much a certain interest is indeed affected are characterized by uncertainties. For the relevant climate data these problems could be illustrated above. One could (as was elaborated elsewhere[56]) deduce *ethical and – on a similar argumentative basis – legal* rules of procedure for the balancing process and derive with institutions for this procedure from the principle of freedom. One of

trast to being a norm/ a right on its own); it, therefore, guides the application of other norms – in our case, different types (realms) of freedom that belong to human beings – and proclaims autonomy as the central idea of our legal system. The "inviolability" of human dignity and its visible – in norms like Art. 1 par. 2-3 of the German constitution and the EU Charter of Fundamental Rights – character as a "reason" shows that all this is not only philosophically but also legally correct. For the current state of discussion, see Ekardt/ Kornack 2006, p. 349 et seq.; Ekardt/ Kornack 2010e; similar, e.g., Enders, 1997; for a contrasting viewpoint, see Böckenförde 2003, p. 809 et seq.; differentiating Heinig 2008, p. 330 et seq. and p. 353 et seq.

[54] That freedom exists because of dignity is, e.g., explicitly stated in Art. 1 par. 2 of the German constitution (it says "darum" (= therefore) exists freedom, i.e. because of human dignity, and is also supported by the explanatory documents (Gesetzgebungsmaterialien) on the EU Charter of Fundamental Rights; see Ekardt/ Kornack 2010e.

[55] Although following a different path, this is also the conclusion of Rothlin 1992 and Ott/ Döring 2004, p. 78 et seq. and 91 et seq.; rather a (in our opinion hardly to the point) critique of profit-oriented competition can be found in Hoffmann 2009, p. 23 et seq.; see further Nutzinger 2004, p. 7 et seq. and 51 et seq.

[56] Cf. supra fn. 41; similar Susnjar 2010 and Alexy 1986.

these rules is that the factual basis for a decision has to be determined as thoroughly as possible.[57] Another balancing rule is: Only freedom and its fundamental preconditions or supporting circumstances, respectively, are interests that can be included in a balancing process. Liberties that derive from freedom or its presuppositions can only be interfered with insofar as it is absolutely necessary to strengthen other liberties. In case someone is assigned to avoid or remove the interference of a liberty it should be, whenever possible, the one who caused the interference in the first place (again, a rule implied by the term "freedom" itself). Yet another rule that was already deduced is the precautionary principle: Even if the facts a decision has to be based on are uncertain an infringement of the principle of freedom or its presuppositions always has to be acknowledged. In such cases it could, however, be regarded as a less significant infringement. A whole set of further rules could be thought of. Still, weighing and balancing interests will never only result in "exactly one" correct conclusion. Not even in climate policy. Thus, there is a theoretical margin (or discretion) for just climate protection policy – it is not randomly big, though. And, there is no arbitrary number of institutions that are supposed to fill it. Instead, freedom also implies institutional rules: An eligible decision-maker (parliament) that could be voted out, as well, has to make the decisions that, if necessary and according to the separation of powers, have to be put in more concrete terms by administrative bodies and courts – likewise, there has to be a constitutional court to observe the compliance of the decisions with the abovementioned rules referring to the weighing and balancing process.[58]

Economists, in contrast, quantify infringed interests (rights) and calculate the correct amount of climate protection policy. This process requires the inclusion of everything that has monetary value (for which there is a preference) or can be translated into such, be it life or health, or else it will not be considered.[59] They do not need any specific rules for the balancing process. Whatever was determined as factual cost or benefit somehow merges with the preferences and leaves the decision-maker with no margin that still has to be filled. This approach is very tempting as, theoretically, there is only one correct policy advice based on "lucid figures". Nevertheless, it is for many reasons very problematic. First (see chapter 4.), the underlying normative preference theory is not coherent and not convincing. Second (see chapter 2.), there is not enough precise data even for costs and benefits that have a market value, at least in cases like climate change with its manifold cumulative impacts on the global economy that might even span over more than 100 years. Third, there are, as in parts was already demonstrated and will now be deepened, unsolvable practical problems with regard to normative preference theory.[60] The calculation of costs due to climate change (and, by comparison, that of climate protection policy) distracts from the problem that some things do not have monetary value and cannot be quantified[61], like (massive) damages to life and health. And, the absence of such damages does not have a market value, neither does peace (understood as the

[57] The actual decision for a certain extent of climate protection policy based on the weighing and balancing of interests or efficiency thinking is itself a normative statement and not a factual one (even if, as demonstrated, within the limits of the above-mentioned rules balancing procedures have, this normative statement is to be regarded objective). Facts alone can never deliver decisions as they are only possible if normative criteria are available.

[58] Furthermore, one can deduce that there should be a decision on the national or transnational level, whichever is suited best for it (the global level in case of climate protection policy); see Ekardt/ Meyer-Mews/ Schmeichel/ Steffenhagen 2009e, chapter 1, 3 and 5.

[59] Cf. Nordhaus 2008, p. 4; critical also Burtraw/ Sterner 2009.

[60] For a critique concerning this matter see Ekardt 2010c, § 6; in parts also Mathis 2009, p. 113 et seq.; Otsuka 2006, p. 109 et seq.; Meyer 2006, p. 136 et seq.

[61] Conceding to this is Stern 2009, p. 92.

"absence of wars over resources"); then, however, both these aspects cannot be settled in a meaningful way with economic effects of climate change and climate protection policy. Interests without a market value cannot artificially get one, as economists argue, by simply determining the "hypothetical willingness" of the people to pay for life and health, in other words for the absence of thunderstorms etc. Obviously, such a willingness is fictitious and, therefore, not really informative (it is important to note – and will be examined further in the upcoming chapter on discounting – that to read off preferences by means of a "morality of the market" is not helpful here). Furthermore, the readiness to pay for something is naturally restricted by the ability to pay and would then lead to the remarkable result that Bill Gates´ interests are worth much more than that of a Bangladeshi as Bill Gates can pay for almost anything and a regular Bangladeshi for almost nothing. In contrast to mainstream economists, Stern is aware of that. Nevertheless, he suddenly allocates a number to "non-market related" damages.[62] Within the scope of preference theory he correctly (see below) allocates the same market value to every human being, but, without any further argumentation and, therefore, inconsistently.

Yet another problem of climate economics is the discounting of future damages which are supposed to weigh less than today´s damages.[63] This seems to be plausible at first glance whenever today´s victim and the victim in the future is the same person. But why should a damage a Bangladeshi has to endure in 50 years (1) per se be less important than mine today? One could argue: Someone who is yet to be borne cannot yet articulate any preferences, so his/ her voice is of no importance. That would be, as was already hinted at, the immediate conclusion of the preference theory. Then, however, it would be consequential not to discount at all but rather to declare all damages insignificant that could happen to anyone who is not yet alive in the future. Because of the passage of time, however, the living could have their problems with discounting, too. Even if we generally agree to preference theory, why should any economic theorist dictate whether I have a certain preference today and whether I am not interested in the future? The unrealistic expectation of "eternal growth" (2) is no justification for discounting, regardless of whether it is applied to the living or future generations; here, the limits to growth have to be kept in mind. Even empirical findings (3) concerning real market prices that, according to many economists, express a preference for the presence over the future do not justify discounting. Because (a), there are no observable market price trends or trends of interest rates that make any kind of statement about factual preferences with regards to damages *occurring over a period of hundreds of years* – and are *irreversible by nature*. What is more, to solely rely on market prices would also mean (b) to unilaterally focus on the preferences of the living.

Stern criticizes that a "morality of the markets" is used to determine preferences (and also blames other economists for doing so)[64], but not the standard of discounting and its relation to limitless growth. He offers an – at least debatable – argument for discounting, though: (4) the uncertain occurrence probability of future events that lead to damages. Whether this complex problem can be expressed mathematically is doubtful, as well. Whenever there is absolutely no way to achieve any kind "calculated probability" a seemingly clear discount factor is arbitrary and, thus, not superior to the general rules for a balancing process (see above). Even if

[62] Cf. Stern 2006, p. 148.
[63] For a detailed and critical analysis of the problem of discounting, see Unnerstall 1999, p. 320 et seq.; cf. also Rawls 1971; supporting the method of discounting is Birnbacher 1988.
[64] Cf. Stern 2009, p. 80 et seq. and 95 et seq.

we kept all this aside discounting would only be feasible if the damage that is supposed to be discounted, in spite of the presented critique, could be expressed in monetary values. They hardly ever are.

All that shows another fundamental problem of (not only, but especially climate) economic theories: Supposedly clear mathematical results conceal presuppositions that are not always completely stringent and in many ways open to doubt. And not only underlying normative assumptions (for example, with respect to discounting and preference theory) but also the factual basis is often questionable: like the scale of impending damages or the idea of unlimited growth.[65] So, the morally and legally correct dimension of climate protection policy cannot be calculated. In fact, we simply have to *make decisions* within the scope of possibilities set by the deduced rules that structure the balancing process. As mentioned before, it has to be a decision for considerably more climate protection than before. In short:[66] (1) Current climate protection policy probably already ignores the rule that decisions have to be based on correct data: In particular, that the steps that have already been taken to counter climate change are considered to be the adequate response to prevent drastic damages. (2) Furthermore, the intergenerational and global/ cross-border dimension of the constitutional right to freedom has not yet been recognized by politics and that, because of these components, there are rights of future generations and that of the proverbial Bangladeshi to be honored when legal/ parliamentary decisions are made.[67] (3) The right to a minimum subsistence (ie. of those living today (globally) and in the future) as the essential presupposition to freedom is not included (its periphery at best) in the balancing process. Because, freedom without any physical basis is pointless. Such a right is established by (among other things) providing a basal access to energy and a, at least to some extent, stable climate. Thus, strict measures to protect the climate are mandatory. Decision-makers have so far avoided recognizing this insight just as much as the probable evaluation that the restricted budget for further emissions would have to be distributed in an egalitarian way, given (a) its shortage and (b) the compulsory nature of at least some human emissions.[68] By the way, Stern also considers that a uniform distribution would be just but draws on the inconsistent (as the burden of proof remains unclear) argument that there are no arguments *against* it.[69]

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[65] For yet another reason there is only little cause "to believe" in economic assumptions per se: If economic anthropology (i.e. man is essentially self-interested) is correct than economists will also preferably give political advice that assures the funding of their research. This might also be responsible for the with regards to "scientific method" hardly adequate practice to "express everything in figures" favored by politicians and the media alike.

[66] On a legal and ethical level that also implies: in case of actions against lawmakers constitutional courts have (or had) to decide in favor of the plaintiff and force lawmakers to rethink and re-decide on their respective climate protection policy with the following aspects in mind. In more detail, cf. Ekardt 2010a.

[67] Focusing less on the preventive level and (in our opinion suboptimal) more on the subsequent level of liability is Verheyen 2006.

[68] With regards to ideas on a substantial climate change policy, including a (virtual) per-capita-distribution of emission-rights as the basic criterion for "climate justice" (with some modifications concerning the problem of the industrialized countries' historical emissions), see Ekardt 2009b, chapter 4-5; Ekardt/ von Hövel 2009c, p. 102 et seq.; this is economically presupposed – and without any real normative justification – by Wicke/ Spiegel/ Wicke-Thüs 2006 and (however without citing them and a number of other authors) WBGU 2009.

[69] The approach developed here, in contrast to Sen 1999, has justified (and not only asserted) universal freedom and, therewith, the relevance of its preconditions (and, furthermore, a theory from which rules structuring the balancing process can be deduced). These advantages also exist compared to "theories concerning basic human needs" (inspired by Marxist or Rousseauian ideas); in addition, the latter also have the flaw of mixing descriptive anthropology and normative theory of justice. Also, they do not have a method to determine its basic categories (what is there a "need" for?) and they mingle justice and conceptions of what a "good life" is supposed to look like (with potentially authoritarian tendencies). Viewed against this background, Ott/ Döring 2004, p. 78 et seq. seems to be problematic.

Nonetheless, economic theory can be very helpful to examine the factual basis of political decisions and – as long as it is only used for goods that have a monetary value and the figures are unvarnished, i.e., for example, even costs for possible wars over resources have been included (not even Stern does that[70]) – it may also be of assistance to structure the balancing process. In case we really want to calculate we should at least try to completely specify the costs we calculate with. That is how economists could provide us with the factual basis for necessary balancing processes. It would show that the concrete costs due to climate change like drought failures or damages caused by storms would be more expensive than effective climate protection policy; this is where some of the accomplishments of the IPCC-Reports and also the Stern-Report can be located. Similarly important seem to be statements referring to the probability of certain events. Even though the accuracy here of both economists and natural scientists will in our opinion be lower than what we might hope for as the actualities of climate change and the world economy are simply too complex. Dies schließt innerhalb der Abwägungsregeln (!) *Tatsachen*-Quantifizierungen durch den Gesetzgeber wie erwähnt nicht aus; und innerhalb der Abwägungsregeln (!) darf der Gesetzgeber seinen Spielraum für subjektive Gewichtungen innerhalb des objektiven Rahmens auch so transparent machen, dass er normativen Belangen einen Zahlenwert zuordnen; dies ist dann aber eben eine subjektive Entscheidung und hat nichts Objektives an sich.

A possibly more humble, no longer normative, less focused on quantifying and natural sciences; in short: a climate economics that is much more linked with other climate social sciences and becomes part of a general theory of balancing could after all be the result, provided that these social sciences deal with the illustrated problems: the limits of growth; a normatively and logically stringent theory of justice; the theoretical backgrounds to an adequate balancing process; anthropological problems; and, by the way, a theory of governance that goes beyond a merely economic perspective (see below, chapter 6.).[71] Climate economics is (and will keep on being) very prominent in, albeit not exclusive to, this field of expertise (Governance), as well. It is, therefore, convincing that Stern admits to the shortcomings of the economic approach to climate policy – even if only "across the board" and without showing an interest in the fundamental problems of growth and preference theory.[72]

Efficiency theory has to be defended, however, against John Rawls' allegation following the (again misleading) headline "efficiency versus justice". It says, efficiency theory – in other words: utilitarian and Hobbesian ethics – would not know *absolute* rights (rights or parts of rights not open to the balancing process, in contrast to *universal* rights in the sense of being "applicable everywhere"!)[73]. Indeed, efficiency theory is averse to such rights and so is the approach established above that is based on weighing and balancing interests; there is little reason to recognize absolute rights in a world where aspects of the right to freedom collide on a daily basis and where that kind of collisions are the – very ordinary – object of politics in general (and of climate politics). Such rights can only very sporadically be justified; essentially in

[70] Stern 2006, p. 151, only very generally speaks about more and more „instability".
[71] Many climate social scientists, however, favor working on merely factual descriptions of existing (and possibly incorrect) theories of justice, climate discourses, how climate is perceived and so on – cf., in this respect, some of the articles in Voss 2010 – which seems to be less important (unless it is helpful to elucidate the anthropology behind lacking climate protection).
[72] Cf. Stern 2006, p. 149 et seq.
[73] Cf. Rawls 1971, p. 19. German legal scholars – e.g. Böckenförde 1991, p. 188 et seq. – tend to make the same mistake and seem to think that rejecting quantifications would also include the dismissal of balancing procedures (in most cases). Therewith, they mistake the universality of values for their absoluteness. See also Heinig 2008, p. 353 et seq., who does not distinguish precisely between the principles referring to justice and the subsequent balancing procedure.

situations where the approval of a weighing and balancing process would mean to undermine basic civil liberties and free democracy as a whole (for example: torture as a means to solve crimes).

To summarize some of the essential points with regards to ethical aspects: (even climate) ethical realization is in no way empirical knowledge and especially not referring to natural science; in fact, it is normative (= evaluative) insight. Even if the application of an ethical or legal norm often requires the examination of natural scientific facts as such they do not substantiate ethical or legal results. Still, the basic principles of ethics, even though it is normative, can be specified in an objective manner. Thus, ethics is not "subjective" or "merely conventional" and its starting points are not arbitrarily chosen "axioms". The concrete decision of ethical questions, in contrast, contains ambiguity. Rules for the balancing process and institutional competences that confine the scope for possible decisions in ambiguous situations can, in turn, be identified objectively. As ethics in general deals with the collision of contrasting interests, every ethical decision ultimately is about weighing and balancing certain aspects of freedom (or their presuppositions). So, absolute rules or strict prohibitions not to balance at all (put pointedly, for example, an absolute right to live in a stable climate whatever the costs may be) are hardly justifiable.[74] But that does not mean the balancing process could be mathematically resolved in quantifications – even if "figures" can be presented more easily politically and in the media than, as regards content, complex statements. "Figures" can therefore only be symbols, but they cannot replace the intricate balancing process (even if, as it is discussed in France at the moment, the benchmark "gross national product" – including all goods with a market value – would be substituted by something like a "welfare-index" in the sense of Amartya Sen and others).

6. Governance: Can „more business ethics and CSR" be effective climate protection instruments? At the same time: On the misleading separation of „bottom up"/ „top down"-approaches

To finalize this paper, one last question shall be raised in all shortness: What conclusions do economists draw from efficiency analysis or from the balancing process as regards climate protection instruments? Elsewhere I have supported and further developed the idea of a worldwide emission trading system, which is also pursued by many economists, however, based on much more incising climate protection goals and with a dual social component within the industrialized countries and with respect to the developing countries as a compensation for global and strict climate protection goals.[75] That this approach has to be implemented on a global level results from (a) the global nature of the climate problem and (b) from the danger for both climate protection and competitiveness that emissions might be transferred from countries with ambitious climate protection policies to other countries (so called „carbon leakage") – for example, when a steel-producing enterprise relocates its production plants from Europe to China.

[74] Based on what was demonstrated here one could also try to give an answer to the question whether the often repeated accusations of economic efficiency analysis to be blind on one eye for questions regarding distributive justice are correct. This answer would probably be: yes and no. Because, there is no way to deduct a strict imperative that says we have to redistribute extensively. Certain "social elements" result from theory of justice with respect to the balancing procedure, like a right to a subsistence minimum; beyond that the lawmaker has a wide margin for questions of distributive justice. Cf. Ekardt/ Heitmann/ Hennig 2010d und Ekardt 2007, chapter V.

[75] For further details, see the references supra note 41.

It should be pointed out that there are economists who instead of focusing on political inputs in climate protection matters more and more emphasize the possibility of "bottom up"-approaches. Of course, every voluntary entrepreneurial commitment to climate protection (or sustainability for that matter) has to be welcomed. It will have its benefits for the companies, even if the commitment is only a means to an end, for example, to get new clients, to improve employee motivation or may it simply be to reduce costs for resource consumption. However, to call on certain businesses or the citizens and to have faith in voluntary initiatives, unregulated free trade and a self-regulatory economy[76] will not be able compensate for missing political decision in climate protection matters[77]:

- First of all, neither citizens nor companies are the adequate authority to fulfill the ethically necessary, demanding tasks that come along with the complex weighing and balancing process. Moreover, that process is located in legally formed politics, i.e. the legislator. Its often missing concreteness is a well-known problem of purely ethical appeals that have not been brought into a legal form (to, thus, become more concrete).
- There is a second key problem attached to hoping for voluntary commitment: Such a commitment, as already hinted at, will regularly only last as long as it is accompanied by a potential to obtain certain entrepreneurial self-interests. We should not forget that a massive change is necessary. And the question is: Can we really assume that, for example, the car-industry voluntarily (i.e. without any kind of monetary incentive system like emission-trade) adapts to new societal rules like that from now on "we only share our cars" and simply modifies its productions from cars to bicycles? How are people that, according to the diagnosis of most economics, are mainly focused on their self-interest supposed to cut emissions completely (!) and voluntarily to almost zero? And, why should the above mentioned rebound effects vanish in the wake of a growth that private companies pursue when they both endeavor to manufacture more efficient products and, at the same time, try to sell more and more of said products? And, how can consumers, especially in the light of the realistic anthropology that economists call for, be able to bring about a change of that magnitude by simply making different purchase decisions? The more so as those most affected by climate change, the global and future poor, have the least amount of purchase power to apply pressure on corporations. In the end, to bet on voluntary entrepreneurial commitment always means to accept the questionable paradigm of unlimited growth.

On the instrumental or governance level we have to abide by the anthropological insight of many "climate macro economists" instead of believing in the teachings of "climate business economists" focusing on CSR: Within the market system our climate occurs ostensibly as a good that is "free of charge" and, as a consequence, is overused. There are many other human characteristics deepening this problem, like to mostly think in short terms, the tendency towards convenience and habits, emotionally induced non-perception of spatially and temporally distant damages and so on. To establish a regulatory framework (like, for example, taxes or certificate trading) with clear-cut goals and the means to enforce them and that includes imminent climate damages, in other words a regulatory framework that puts an end to market failures, is the only way to tackle these problems and has not yet been put in effect properly measured by the task ahead of us. That, however, can be explained by the "vicious circle" be-

[76] As an example for the following problems, see Becker 2009, p. 7 et seq.; Davidson 2009, p. 22 et seq.; Wieland 2009; Suchanek/ Lin-Hi 2007, p. 67 et seq.

[77] In more detail and with further references, see Ekardt 2010b, § 1 C. II.; Ekardt 2010c, § 8.

tween politics and voters, illustrated in the chapters on the anthropology of the climate problem. Its solution can hardly be expected without political and legal input which, in turn, because of the vicious circle, is closely linked to a radical shift in the way people think.

All this cannot be changed by calling for more "bottom up" instead of "top down" approaches in climate politics. Of course, voluntary commitments ("bottom up") are to be welcomed in general in free and liberal societies; in case they cannot be expected with reasonable certainty alternative means are necessary. This is no threat to freedom at all. On the contrary, distinct political guidelines guard the freedom of future generations and people in developing countries that have not contributed much to climate change. Instead economic preference theory is destabilizing modern democracy: the seemingly exact climate economical statements make politicians appear completely irrational if they do not follow the climate protection policy proposed by economists. They are not. Therefore, the other climate sociologies should no longer leave the leading role to climate economists. Not only in the interest of climate protection but also in the interest of a further improved climate economics that, at first sight, might appear more humble but ultimately integrates a much more convincing and realistic concept for weighing and balancing interests.

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