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Five types of "degrowth" and a plea for "agrowth"

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Abstract

In recent debates on environmental problems and policies the strategy of “degrowth” has appeared as an alternative to the paradigm of economic growth. This new notion is critically evaluated by considering five interpretations of it. It is next argued that “agrowth”, i.e. being indifferent about gUUrowth, is a more logical social aim to substitute for the current goal of economic growth, given that GDP (per capita) is a very imperfect indicator of social welfare. The resulting six views are compared along four criteria, namely environmental effectiveness, social-political feasibility, economic efficiency and risk of rebound. The paper ends with proposing a policy package that consists of six elements, some of which relate to concerns expressed by degrowth proponents.

Keywords

Environmental policy, equity, GDP paradox, grassroots initiatives, (over)consumption, reducing work-time, regulating advertisement.

1 Introduction

Recently, the notion of "degrowth" has attracted considerable attention as an alternative to the paradigm of economic (=GDP) growth (Schneider et al., 2010). It is not immediately evident, however, that this represents a useful addition to the vocabulary of environmental and social sciences. If we want to debate it in the context of solutions to environmental problems of our time, then we should in any case have a common understanding of it. My experience in discussing and reading about degrowth, however, is that it is defined and interpreted in multiple ways. This evidently does not contribute to a transparent exchange of ideas. I have come across five main interpretations of degrowth:

1. GDP degrowth

2. Consumption degrowth

3. Work-time degrowth

4. Radical degrowth

5. Physical degrowth

In Section 2, these interpretations will be described and evaluated. In addition, a few other notions of degrowth (*market degrowth, selective degrowth, degrowth in rich countries, and population degrowth*) will be briefly mentioned along the way.

Next, Section 3 will propose an alternative focus, namely ignoring GDP information which suggest "agrowth", i.e. being indifferent about economic growth. Section 4 briefly compares the six resulting views or strategies on the basis of the criteria *environmental effectiveness*, *social-political feasibility*, *economic efficiency* and *risk of rebound effect*. The discussion culminates in Section 5 in the proposal of a policy package consisting of six elements. Concluding remarks are offered in Section 6.

2 Five types of degrowth

2.1. GDP degrowth

This means striving for negative GDP growth or a reduction in GDP (Gross Domestic Product).[1] This is the most logical interpretation and useful one in the sense that it is likely to be understood as such by most economists, politicians and newspaper readers. The reason is that it sounds as the opposite of (economic) growth, which in common use and the media is synonymous with GDP growth. According to this interpretation of degrowth, the crisis in terms of less GDP growth or even a reduction in GDP is then seen by some as good for the environment – forgetting, however, about reduced investments in renewable energy and related research.

Anyway, this type of degrowth means a blunt instrument of environmental policy which reverses the

[1] One might also call this "market degrowth" as GDP is an aggregate measure of all transactions in formal markets. Alternatively, the term "market degrowth" could denote the idea of a shift away from formal markets to informal interactions and local transactions between humans (more in line with radical degrowth – see Section 2.4).

causality between policy and growth as it is normally understood. Instead of putting good policy first and then seeing whether degrowth is a consequence, the degrowth strategy is to put degrowth first and then hope that the environment will come out well. However, this cannot guarantee a very focused, effective and efficient approach. Worse even, degrowth might turn out to be dirty. Smaller is not always more beautiful – although I certainly would not go as far as Wilfred Beckerman to say that generally "Small is ugly".

I think the focus of the degrowth strategy on the scale or size of the economy is neglecting the important role of the composition of both consumption and production, which can considerably change in response to stringent environmental regulation (and to a lesser extent the more complicated contribution of technological change). To put it a bit simplistically, we want especially the dirty or dirtiest sectors to "degrow" if they do not succeed in adopting sufficiently clean technologies or realizing a substitution away from dirty inputs. Of course, no one can hope to plan for all this. A more subtle type of regulation and information provision will be needed, which surely will be unable to avoid some type of price regulation.

The main argument against a GDP degrowth strategy is perhaps that it submits to the growth paradigm in the sense that it continues giving much importance to the notion and indicator of GDP.

2.2. Consumption degrowth

This means striving to reduce the amount of consumption, however measured. Such a strategy is then hoped to translate into less resource use and less pollution. This is, however, not sure to be an effective approach to environmental regulation, while it is certain to be a very inefficient one. Equally problematic is that the measurement of consumption degrowth is ambiguous. One can focus on physical/quantity or monetary/value indicators, but neither are guaranteed to be a good proxy of environmental impact. A simplistic indicator like the total weight (kilogrammes) of consumption may seem an adequate approach at first sight, but it would immediately exclude the consumption of services, even though these may indirectly cause much environmental pressure. In view of such measurement-indicator problems, a consumption degrowth strategy runs a serious risk of remaining a vague, conceptual approach.

Supporters of this strategy have the hope that frugality (voluntary restraint or simplicity) will drive consumption down. As identified in the literature on environmental psychology, some people are indeed able to apply voluntary restrictions to their consumption behavior which are environmentally motivated (Gsottbauer and van den Bergh, 2009). The question is of course how environmentally effective this is, and in particular whether one can safely assume this to work for a significant proportion of all consumers. Only looking at shopping malls, television, roads and airports should make one very skeptical about this. One can anyway wonder whether it is realistic or even fair to ask from ordinary people that they give up the luxuries of modern life, to in some way go back in time. It is unlikely that hunter-gatherers or Henri David Thoreau ("Walden") can serve as a role model for them.

The other extreme is (equal) individual quota on consumption, perhaps for a range of heavily environmentally damaging goods and services (notalby gasoline), to realize consumption degrowth in an equitable manner. However, this resembles too much a communist society which will undoubtedly be difficult to find political support for.

A problem with focusing directly on consumption degrowth is that it may activate a rebound mechanism. Especially a voluntary reduction of consumption of certain types of goods and services may well lead to an increase in other types of consumption since disposable income will remain the same. Alternatively, it may lead to savings, which in turn implies more money being available for others to borrow and spend (van den Bergh, 2010). Against this background, I think there is much to say in favor of the traditional policy perspective that product and service prices need to reflect much better environmental and climate externalities, which will then force people to change their behavior as well as control or minimize rebound

effects.

The focus on the size of total consumption underrates the importance of shifting from dirty to cleaner consumption. In other words, the composition of consumption will change, most effectively in response to environmental price regulation. Of course, in the process also the total scale of consumption will be affected. But whether consumption degrowth will be the outcome should not really matter. In any case, I do not think it is justified or well-argued to set it as a goal or starting point.

Thinking about (over)consumption, nevertheless, suggests one problem that requires policy action. This concerns commercial advertisement, which does not always contribute to welfare – in fact much of it really represents a social cost. Regulation of such advertisement is likely to affect welfare in a positive way and possibly can alter the composition of consumption in an environmentally favorable way. However, this would need more study. Unfortunately, the social cost of advertising is a neglected topic in the social and environmental sciences.

Note finally that the relevance of changing the composition of both production and consumption was translated into the notion of "selective growth", popular in the Netherlands during the 1970s after the Club of Rome's publication on the limits to growth. One might now perhaps also speak of "selective degrowth".

2.3. Work-time degrowth

Increased labor productivity due to improved education, skills, labor division (specialization) and technological progress has mainly been used to produce (and consume) more goods and services instead of gradually and structurally making a change to shorter working weeks, more holidays and earlier retirement. The latter would mean not only less production and lower wages, and therefore less consumption, but arguably also less work stress and more happiness due to more leisure and time for family and friends.

In fact, just like many governments advice their citizens not to smoke cigarettes, not to drink too much alcohol, not to drive to fast, not to have unsafe sex, and not to eat unhealthy or too much food, they might warn against working too much. This strategy might even hope for more support now in times of crisis characterized by high rates of unemployment. Ironically, one group of economists and politicians seems convinced we have to work longer hours, and several countries now face proposals for postponing the age of retirement.

It should be realized that although the debate on a reduction in average working hours is old it has had a quite modest impact. On the other hand, there is much diversity to be observed between countries in terms of average working hours, women participation in labor markets, and use of part-time labor contracts. A study by the OECD (2006) made adjustments in GDP by valuing leisure at average income (GDP) per worked hour, which resulted in a ranking of countries that differed considerably from that according to GDP per capita. In this ranking, The Netherlands scored best of all OECD countries. Two factors contribute to this: the inactive part of the working force is relatively large here, while part-time working is very common. One the other end of the spectrum is a country like the USA with a very high average income but also a very long working week (or high average number of working hours).

The attractiveness of interpreting and striving for degrowth in terms of a shorter work week is threefold. First, working hours is a very concrete, one-dimensional aim and its reduction is easily interpretable (as opposed to consumption, as argued in Section 2.2). Second, there are many direct welfare benefits associated with working less beyond a sufficiently high, threshold income per capita (as shown by happiness research; van den Bergh, 2009). Third, it will reduce both the push (production capacity) and pull (spending power) factors of consumption growth, so that it represents a more effective strategy to

reduce consumption and associated environmental pressure than directly trying to reduce the quantity of consumption (degrowth type 2). In fact, degrowth of working hours will reduce income and thus spending power which in turn will limit consumption rebound effects as discussed in Section 2.2.

Nevertheless, even though shorter working weeks may reduce consumption effectively, they will not serve as a very effective, efficient and directed tool for reducing environmental pressure associated with consumption.

2.4. Radical degrowth

Perhaps for the majority of degrowth proponents the notion of degrowth denotes a radical change of (or many radical changes in) the economy. This may involve changes in values, ethics, preferences, financial systems, markets (versus informal exchange), work and labor, the role of money, or even profit-making and ownership. Such an approach comprises degrowth notions 2 and 3, but it is broader. Fournier (2010) has called it "escaping from the [capitalist] economy".

The main problem I see here that this is such grand, imprecise idea which lacks a good, thorough analysis that it will be impossible to sell politically. More importantly, it is void of a good view on systemic solutions and instrumentation, making it unclear how to upscale radical changes in lifestyles and grassroots initiatives by small subsets of the population ("niches") to society as a whole. Alternative lifestyles have always existed but have never been adopted by the large majority of people. So why would this now suddenly be different?

Writings on this issue tend to be normative and idealistic rather than analytical and realistic. They seem to be motivated more by political ideology about justice and equity than about solving urgent and threatening environmental problems (an "ecological imperative"). That's fine of course, but does not necessarily offer an effective approach to battle environmental problems. One can certainly be positive about the underlying humanistic ideals of equality, solidarity, citizenship, locality, and "good life". However, a drastic change in the economy upfront seems an overly risky experiment and a diffuse, undirected strategy that is not sure to meet the desired environmental aims. Moreover, it may well result in social and economic chaos and instability.

Thinking about radical changes should try to incorporate insights about realistic human behavior and diversity from modern psychology and behavioral economics. These are already slowly changing mainstream economics and ideas about public policy (Gsottbauer and van den Bergh 2009). Given the urgency of environmental and notably climate change problems I would rather go for a less risky strategy of adapting the current systems and where necessary adding new institutions – to begin with an effective international climate agreement. What we need most of all is a hard environmental constraint on our economy (complemented by price regulation and possibly other types of regulation, like of commercial advertising and taxing status goods with serious environmental repercussions) and then let consumers, producers and investors adapt to it. Possibly, this will go along with fundamental, radical changes in our economy and institutions, but it does not seem necessary to have a blueprint of these upfront.

2.5. Physical degrowth

This denotes a reduction of the physical size of the economy, notably in terms of resource use and polluting emission. Such degrowth is then aimed to lead to an environmentally sustainable economy or steady-state economy in Herman Daly's words. Such an interpretation is really old wine in new bottles. Writings on limits to growth during the 1970s and on sustainable development during the 1980s and 1990s had the same aim. Also environmental regulation as proposed by economists since the 1970s was motivated by, and meant to, keeping the economy within safe environmental limits. Not surprisingly, then, few people will be against such physical degrowth, just like almost everyone was/is in favor of sustainable development. This should make one suspicious about the relevance of all these notions.

Moreover, one should be careful with the precise definition of physical degrowth. We certainly do not want to reduce some simplified, aggregate measure of total tons of materials and substances in the economy (whether stocks or flows). We should instead be concerned with environmentally relevant substances/materials and assign these appropriate weights in any aggregation efforts.

The important question is, however, whether labeling the mentioned old ideas as physical degrowth delivers any new insights about environmental policy. And before that comes the question what is wrong with the existing ideas about such policies. I have not yet seen good answers to these. I think the main shortcoming of the dominant policy ideas is threefold. First, they may need to be extended with complementary instruments (like regulation of advertisement and the advice to work fewer hours). Second, more attention needs to be devoted to how social-political feasibility and acceptance can be improved, which may involve revising policy formulation. Third, policies should reckon with bounded rationality (e.g., habits, myopia) and other-regarding preferences (e.g., imitation, reputation concerns, comparison and status-seeking). However these three shortcomings do not in any specific way undermine the environmental policy goal of controlling the physical-environmental dimensions of the economy. As a result, it is unlikely that the use of the terminology "physical degrowth" will help to obtain any new, relevant policy insights.

Finally, many degrowth proponents tend to equate interpretations 1 and 5, that is, they assume that *physical degrowth* = *GDP degrowth*. However, the past as characterized by a very high correlation between physical scale and GDP (mainly due to weak environmental regulation) may not well reflect future scenarios which will (inevitably) be characterized by stringent environmental regulation.[2]

3. Replacing GDP (growth) fetishism by "GDP agrowth"

Here I will propose my own view, which can be summarized as opposing GDP growth fetishism, but not GDP growth. This is a subtle and essential difference, which is unfortunately not well recognized by either growth proponents or opponents.

I have argued above that GDP, consumption and radical degrowth (types 1, 2 and 4) are not so convincing

[2] A notable difference between recent writings on degrowth and Herman Daly's conception of the steady state is that the first does not mention "population degrowth", i.e. strategies to reduce (or stabilize) the size of the human (world) population. Nevertheless, it is evident, even trivial, that the human population is an important factor behind anthropogenic environmental pressure, as reflected by the famous I=PAT equation.

in terms of either relevance or realism (instrumentation), while physical degrowth (type 5) is not new and thus does not offer any new insights. There is more to say in favor of work-time degrowth (type 3) as it focuses the attention on a concrete and relevant quantity from a welfare angle. However, as a separate strategy it will not result in effective environmental regulation. My general proposal would therefore be to implement specific environmental policies along with adequate complementary policies and strategies, as discussed in detail in Section 5. Whether the resulting policy package will then give rise to GDP growth or degrowth should be irrelevant, as GDP (per capita) is not a good proxy of social welfare. I agree though with Hueting (2010), who argues that effective environmental regulation is likely to result in GDP degrowth, or at least during an initial period of transition, simply because a large part of economic growth is realized in sectors which generate much pollution. But we should not reverse the causality (as in the GDP degrowth strategy).

GDP is the fundamental problem, not growth of it. I will try to explain this. GDP growth is good in some periods or for some countries. But growth is not generally necessary or sufficient for progress. Neither is degrowth necessary or sufficient for sustainability. Correlations between GDP and welfare or between GDP and environmental impact are not constant and fixed over time and space. As said, one cannot exclude the possibility of "dirty degrowth". The goal of unconditional GDP growth is a constraint on our search for progress: it frustrates good policies in many areas (climate, labor, health, public utilities). Some have called it the "neoliberal ideology/tyranny of growth" (Fournier, 2008) and "GDP fetishism" (Stiglitz, 2009). However, we should not fall in the trap of replacing this by GDP degrowth fetishism (i.e. the GDP degrowth strategy). Note further that being against GDP or against unconditional GDP growth (= GDP growth fetishism) does not imply being against growth. The reason is that once GDP information is no longer taken seriously (ignored as a social goal) one cannot be otherwise than neutral or indifferent about GDP growth (and likewise about GDP degrowth). This indifference is a good reason to use the term "GDP agrowth". The term "agrowth" is also proposed by degrowth supporter of the first hour Latouche (2010). He associated "agrowth" with the notion and term "atheism".

Degrowth is a too unprecise and ambiguous term. The latter is immediately clear from the five interpretations of it presented in Section 2. Moreover, degrowth is likely to meet strong resistance from the mainstream (or it will just be ignored) and thus will run a serious risk of staying a marginal line of thought. Fine of course if some degrowth proponents are happy with a rearguard fight, but there is much to say in favor of trying to influence the mainstream. On the other hand, one might positively value a diversity of strategies, including less and more radical idea(l)s. Some of these may intend to shock, like the notion of "degrowth", while others are intended to exert a certain influence on the minds of mainstream economists and politicians. Where "agrowth" should be categorized is of course too early to say.

4. Comparison of the six views

Table 1 compares the various degrowth types along four criteria, namely environmental effectiveness, social-political acceptability or feasibility, economic efficiency, and limiting the risk of (environmental or energy) rebound. Rebound is really part of effectiveness, but since it is a neglected and fundamental source of ineffectiveness of certain strategies it seems useful to deal with it explicitly and separately. Physical degrowth scores best on environmental effectiveness, but of course it is vague about how to reach it. Work-time degrowth may be one way to do it. No type scores positive on social and political feasibility, although my estimation is that degrowth types 1, 2 and 3 perform especially bad here. On efficiency GDP agrowth scores best because an information failure (GDP information) is removed. For consumption and physical degrowth the efficiency depends on the way they are implemented (i.e. which instruments are used). Finally, rebound may be best controlled by limiting income and thus purchasing power (GDP or work-time degrowth) and of course by physical degrowth (assuming an effective limit). Admittedly, degrowth type 5 and "GDP agrowth" differ in style from the others; they may be seen as sort

of complementary, and are therefore not well comparable perhaps. Degrowth type 4 (radical degrowth) is the most vague in content. Degrowth types 1 (GDP degrowth) and 3 (work-time degrowth) are the most concrete as they concern a very clear indicator whose value needs to decrease, namely GDP and average work-time, respectively.[3]

Table 1 Evaluation and comparison of degrowth types and agrowth

Degrowth type	Environmental effectiveness	Social and political feasibility	Economic efficiency (welfare, costs)	Limiting rebound
1. GDP degrowth	-	--	--	-/+
2. Consumption degrowth	-	--	Depends on how implemented (instruments)	-
3. Work-time degrowth	-/+ (less rebound)	-	+	+
4. Radical degrowth	-	--	--	-
5. Physical degrowth	++	-+	Depends how implemented (instruments)	++
6. GDP agrowth	+ (weight in growth-environment tradeoff shifts to environment)	-+	++ (information failure removed)	very indirect/vague connection

Legend: '+' denotes a positive and '-' a negative judgement, all in relative terms, on a scale {--, -, -/+, +,++}

5. Implications: an effective policy package

Rather than aiming to degrow in one way or another, I would suggest to worry about effective environmental and complementary policies and especially how to get democratic-political support for these. I see the need for six complementary policies and institutional changes:

1. Global environmental problems cannot be tackled by voluntary action and grassroots initiatives (which certainly does not mean they should be hampered). An effective international agreement,

[3] GDP, consumption and possibly also work-time and radical degrowth types may be specified as "degrowth in rich countries". This reflects the idea that (some) developing countries still need to grow out of poverty, for which "environmental space" is needed. This might then according to degrowth proponents be created by negative (GDP, consumption or work-time) growth in rich countries. More generally, this suggests a distinction between degrowth in all countries and degrowth only in (sufficiently) rich countries (irrespective of the adjective of "degrowth").

first of all for climate change, is critical for any effective national environmental policies and strategies. For only then countries can implement safe climate policies without harming their competitive position, which will contribute to the social-political acceptability of such policies in these countries. The policies will then change the composition of production and consumption towards cleaner products and services, as well as stimulate technological change (though insufficiently – see element 5 below). The main and unresolved problem is of course how to get democratic-political support for an effective international climate agreement. An increasing number of studies is devoted to this, but the question is whether the many creative ideas in science find their way to society and politics.

2. Encourage people to work fewer hours rather than always translating labor productivity improvements into higher incomes and more consumption. A shorter average working week will contribute to limiting the rat race for income and consumption, curb the continuous increase of purchasing power and (because rebound is then limited as well) associated increases in environmental pressure, reduce (over)working stress, and leave more time available for leisure, friends and family. This evidently links up with the concerns behind work-time degrowth.

3. Regulate advertisement, notably of status goods, which stimulates people unnecessarily to be unsatisfied with their current collection of products, to compare themselves with others and indirectly to strive for more income and consumption. Advertisement has a huge social cost which unfortunately has not yet been translated in adequate public regulation (unlike virtually all other social costs). In line with this, a complementary policy of taxing status goods with serious environmental repercussions could be considered (Howarth, 1996). These ideas connect to some of the concerns behind the consumption degrowth strategy.

4. Research on pro-environmental behavior suggests that individuals may, within boundaries, voluntarily reduce or limit certain types of environmentally relevant consumption. Communication and information provision can motivate such behaviors. These involve the diffusion of information regarding consumption and the environment in schools, media and books. Such efforts may have the greatest impact if they focus on social interaction, notably provide information that links the endorsed behavior to the relevant social reference group, family members or friends. In addition, examples and social rewards and punishment mechanism such as social approval/disapproval via the power of peer pressure can be used to reach environmentally desirable behaviors (Gsottbauer and van den Bergh, 2009). Interventions by means of regulatory (paternalistic) policies are more effective in inducing people to make socially desirable decisions and are legitimate if consumer preferences are inconsistent with long-run environmental sustainability. Nevertheless, effective communication strategies can strengthen the desired effects of such regulation, but they have so far been neglected as a serious environmental policy instrument.

5. Stimulate economists, politicians and the public media to ignore GDP, or at least give less importance to changes in GDP (per capita). The priority given to GDP growth is misplaced and not supported by economic science. Less value assigned to GDP will mean judging environmental and climate policies as less costly or more beneficial to our society (van den Bergh, 2010). Environmental policies should be set such that we keep within safe environmental limits. Whether such policies will then give rise to GDP growth or degrowth should be irrelevant, as GDP (per capita) is not a good proxy of social welfare.

6. Finally, technological specific policies (like research subsidies) are needed to influence the direction of research, theoretically ideally to correct for R&D spillovers – so that appropriability

technol gical scenarios.[4]

Good, effective environmental policies should by definition lead to physical degrowth in terms of a reduction in resource use and pollutive emissions. In this sense, traditional environmental policy thinking (notably as proposed by mainstream environmental economics) is not inconsistent with physical degrowth. Few thinkers on degrowth seem to realize this.

Tradable permits is theoretically an instrument that perfectly matches physical degrowth as it puts a hard environmentally relevant limit on the economy. Not surprisingly, Herman Daly proposed this instrument for limiting the population size in his steady-state economy. Of course, this is not to deny that it is associated with practical implementation problems, notably regarding the initial distribution of permits.

6. Concluding remarks

My main concern about degrowth as an overarching goal to solve environmental problems is that it reflects a misinterpretation of the relevant causality. It suggests that degrowth, however interpreted, is a first step, necessary and perhaps sufficient, to reach environmental aims. Instead, I would say a good, safe environmental policy (or set of policies) may lead to degrowth, which is a reverse causality. I do not mind a degrowth outcome in general, although my final judgement would have to depend on the specific interpretation of degrowth (and I have considered five of them here). But I do mind using degrowth as an ineffective and inefficient (blunt) instrument to reach environmental aims. One may argue, of course, that one should not worry too much about a degrowth strategy, as it is highly uncertain to receive widespread social and political support.

A degrowth strategy gives much weight to the scale of the economy or consumption, and underestimates or even neglects the role of composition and technical change.[5] In relation to consumption it also often reflects a belief in the effectiveness of volutuntary, bottom-up solutions. One additional idea, or rather belief, that I have often encountered is that environmental policies do not work, or will not be implemented, and that we therefore have to find solutions outside the standard environmental policy framework. This view and judgement I cannot share. Without (standard) policies which have been discussed for decades now we certainly will not be able to solve the major global environmental problems. Their global and externality nature requires that we strike international agreements and then implement good incentives to alter all behavior that contributes to these environmental problems. This is not enough, as suggested in the previous section, but it represents the core of any effective solution.

The voluntary, bottom-up view behind many degrowth expressions in my opinion gives insufficient

4 On the other hand, in the absence of a carbon tax, subsidizing a renewable backstop such as solar or wind energy can stimulate early exhaustion of fossil fuels and aggravate global warming. This has been called the green paradox (van der Ploeg and Withagen, 2010). So a combination of environmental regulation and technological specific policies is desirable.

5 This is not to say that one should be categorically optimistic about technological change (Ehrlich et al., 1999). Empirical studies indicate that its contribution over the next 25 years, a critical period for solving enhanced global warming, should be expected to be smaller than the effect of emissions reduction through changing behavior of consumers and producers with regulatory instruments (leading to "economic restructuring"). In addition, technological innovation is costly, takes much time, and may go along with considerable rebound effects, notably in the case of improvements in the (energy) efficiency of general purpose technologies (van den Bergh, 2010).

attention to modern insights of psychology and behavioral economics. These state that we humans (including in our behavior as "economic agents") show bounded rationality, myopia, a large degree of self-interest (and a smaller role for altruism), and a propensity to compare, seek status and imitate (sensitivity to fashions). Add to this the interactions between large numbers of individuals, increasing returns to scale which lead to lock-in of undesirable behaviors and technologies, and (energy) rebound, and we end up with an altogether impressively complex and difficult to alter system (Gsottbauer and van den Bergh, 2009). This should stimulate social scientists to think about systematic solutions and instruments as well as very clever strategies to attain social-political acceptance for these. Just proposing new grassroots initiatives is too easy and idealistic. It neglects the aforementioned complications. Of course, this does not mean a plea against grassroots initiatives but more attention for their upscaling and system-wide impacts and associated policies. Possibly, something can be learned here too from studies in psychology and economics on how to elicit pro-environmental behavior.

My personal belief is that to set in motion important systemic solutions, we need to more consistently and persistently argue against a systemic piece of misinformation, namely the GDP indicator and the associated pre-occupation with unconditional economic or GDP growth. GDP affects decisions in many parts and at many levels of the economy and thus acts as a systemic barrier to good policies – in the realm of the environment, social security, labor markets, income inequality and poverty, and health and leisure. If we manage to get GDP information out of the centre of political attention we will have removed an enormous hurdle to good environmental policies. GDP represents the largest information failure in the world. It has more impact than many economists and environmental scientists realize. Witness the intense media attention for negative and positive changes in GDP during the current crisis, both when it started and now that things are getting better in some countries. It should remind us of the ultimate priority that is assigned to GDP in politics and society at large.

Unfortunately, rational arguments do not always convince. GDP support is dogmatic, not rational. It is fed by misinformation through education and media treatment of GDP. Many economists agree that GDP per capita is not a good measure of social welfare but are then still unwilling to set it aside. I have called this the GDP paradox. It can be explained by two beliefs or common responses from economists (van den Bergh, 2009): first, they will argue that GDP does not have so much impact on reality; secondly, they will stress that despite its shortcomings as a welfare indicator, GDP information still serves a number of very useful purposes. I strongly disagree with both beliefs, as elaborately motivated elsewhere. To counter the GDP dogma, rather than simply repeating the shortcomings of GDP as a proxy of social welfare, we need to systematically and repeatedly argue against these specific beliefs.

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