

## Article

# Degrowth or Green Growth: A Reflection on the Recent Public Discourse in Norway

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**Abstract:** This study offers a reflection about the ongoing debate on “degrowth” and “green growth”, as depicted in the Norwegian mass media. It addresses the following two interrelated research questions. How do the topics of public debate, where the concepts of degrowth and green growth are used, connect and overlap? In these connections and overlaps, how do the two concepts relate to each other? We read all the articles published in Norway on ten newspapers and magazines, which have mentioned “degrowth” or “green growth” since January 2018, to identify recurring interpretations of the two concepts and related social and political dilemmas. Then, we isolate elements in the articles, which may represent sources of discord and misunderstanding, and synthesize them into “core” topics, to provide a simplified basis for future debates.

**Keywords:** degrowth; green growth; resource productivity; economic restructuring; future analysis

## 1. Introduction

Instability in the global economy and inequality in economic conditions, across and within countries, have, in the last decades, raised doubts about the paradigm of “growth” as a political goal. In many countries, growth had been set as a main objective to pursue, with Gross Domestic Product as one of the main indicators for political success. Although this view had never been free from critiques, the opposition to it has progressively become wider and more vocal, fueled also by a growing concern that economic value, as measured through GDP, is not encompassing all aspects of well-being, neither at individual nor at social level [1]. The debate has become increasingly tangled with the discussions set around the current environmental emergencies, as global phenomena like global warming have shed light on a possible abuse of natural resources. Environmental concerns had previously generated a strand of economic and political thinking, attempting to reconcile economic growth with a renewed attention on planetary boundaries [2]. The emission of greenhouse gases damages constitutes a negative externality for society, which challenges standard economic theories because of its long-term horizon and intrinsic uncertainties [3,4]. Under the umbrella expression of “green growth”, policy-makers have brought forward several strategies which would be able to sustain economic value creation in spite of a lower environmental footprint, possibly by changing prices to include environmental externalities [5]. In line with a progressive adoption of the expression in official texts of international organizations, the paradigm of green growth has been seen as projecting the world towards the goal of sustainable development [6]. The governments and their industrial policies could acquire a renewed role by expanding the global supply of clean technologies [7]. Similar policies could help economies survive financial or pandemic crises [8]. In economic terms, a primary objection to green growth stems from the consideration that an investment shift from expanding productive capacity to controlling pollution would ultimately reduce growth [9]. Such objection rephrases the hypothesis that green growth strategies lie upon unrealistic expectations of efficiency improvements [10]. Other objections base upon the political consideration that green growth could strengthen existing patterns of capitalist development [11].



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“Degrowth” has been brought forward as a paradigm which could set a new political agenda, centered around the idea that today’s focus on growth as a political goal can be inconsistent with necessary ecological measures [12]. Its success as an activist slogan has propelled debates in the academic arena [13], in spite of its ambiguity as a concept and of frequent confusions on its definition [14]. Degrowth proponents have argued that this lack of precision also allows a more open vision for creating a better world wherein people live with less [15]. However, a focus on degrowth as an overarching goal might wrongly suggest that degrowth is a sufficient step to reach environmental aims [16]; a focus on social welfare could instead clarify the discourse on economic growth and the environment [17]. Questions about more stringent qualifications of degrowth have met the objection that the current fetishism of growth is broader than the fetishism of GDP [12] and a “decolonization of the imaginary” is needed to liberate thought, desires, and institutions from the logic of accumulation for accumulation’s sake [1]. Unmonetized values and practices could then avoid “commodification” and localized experiences with non-capitalist practices could be scaled up [18]. “Deeper” democracies could arise where social enterprises support each other [19] and where informal work, either household, community, amateur or social enterprise-based, compensates for a “thinner” presence of commercial exchanges in human relations [20]. The green growth paradigm would instead perpetuate linear concepts of progress as material and upward growth, maintaining the role of nature as a means to an economic end [21].

The academic degrowth discourse has been shaped mainly by authors from high-income, mainly Mediterranean, countries [22]. The expression “green growth” has instead populated the academic debate in Norway (see e.g., [23,24]). Given the widely recognized urgency of new political actions to address global environmental challenges, the expressions “degrowth” and “green growth” have spilled out of the academic community to enter the public debate. Both concepts of “degrowth” and “green growth” seem to propel original efforts from citizens to design new political solutions for the existing challenges. On the other hand, the two concepts appear to be insufficiently defined in the mass media, sometimes giving rise to unnecessary polarizations in the public opinion. Previous studies of the news coverage on green growth have shown that a green growth objective can help improving a country’s “international status, while perpetuating its internal political structure [25–27]. “Degrowth” appears instead as a word capable of stimulating new political visions on existing techno-economic issues [28,29], although it may spark negative feelings and mislead judgements [30].

Our study attempts to collect and reorder the ideas on “degrowth” and “green growth” appeared on Norwegian newspapers since January 2018. The choice of Norway as the focused geographic area for our newspaper review constitutes a vantage point for our research. The high economic status and stable political scenario of Norway could allow degrowth to be more economically acceptable, and less politically disruptive, than in other countries. At the same time, Norway’s high endowment of both fossil resources and renewable resources makes a “greener” economic path for the economy neither a necessity nor a utopia, but rather an option. Our study addresses the following two interrelated research questions. How do the topics of public debate, where the concepts of degrowth and green growth are used, connect and overlap? In these connections and overlaps, how do the two concepts relate to each other? We do not reflect on whether the use of the two expressions has contributed positively or negatively to the public discourse; instead, we look at the public discourse where the two expressions have been used and we synthesize it into few essential elements for future debate. More details about our procedure are described in Section 2, while Section 3 illustrates our results and Section 4 concludes.

## 2. Materials and Methods

Our study bases upon a review of newspaper articles issued in Norway in recent years. We have chosen ten different newspapers: Dagsavisen, Klassekampen, Aftenposten, Agderposten, Morgenbladet, Finansavisen, Teknisk ukeblad, Magma, Forskerforum, and

Kapital. All of them publish mainly articles in Norwegian language. However, they address different types of audiences within Norway, by following a more generalistic approach (Aftenposten), aiming at businessmen and entrepreneurs (Finansavisen), positioning themselves in the political debate (Klassekampen), or providing technological information (Teknisk ukeblad). What they have in common is the fact that they do not address directly an academic audience: they are not academic journals. Our study is therefore purely devoted to a review of the public discourse on “degrowth” and “green growth” aimed at synthesizing its essential elements; the newspaper articles constitute both a source for deeper reflections and an inspiration for scientific thinking. Rather than providing answers, our work tries to extrapolate, from a variety of sources, a set of main topics and questions, in order to reorient future debates on degrowth and green growth. Such reorientation may be needed since, on the one hand, points of confusion often emerge around words and concepts employed in the articles and, on the other hand, different articles may sometimes use different words to express same stances.

Two initial searches were conducted through the newspapers, with end date 12 October 2020 and with no boundary set as start date; we used respectively the search string “degrowth” and the search string “grønn vekst” (Norwegian texts often contain the translation of the English term “green growth”, while keeping the expression “degrowth” in the original English language). The two searches detected respectively 23 and 366 articles. Notably, the first article on “green growth” was detected for year 1995, but there were only nine more articles containing the same string until year 2009. For the string “degrowth”, 5 articles were published until year 2017, four of which appearing on the left-winged newspaper Klassekampen; the remaining 18 articles were published since 2018, on a variety of newspapers. Since 2018, we can, in particular, observe a sharp increase in the number of articles retrieved on both topics: we decide therefore to consider, for our final list of articles to read, all the articles detected through the two previous searches and published between 1 January 2018 and 12 October 2020 (the day of our search). Indeed, also due to possible variations over time in the meaning of the two expressions, it is convenient for us to focus on a restricted time span, which still is able to provide a sufficient article base for our reflection on the recent public discourse. The Appendix A shows the final list of newspaper articles, progressively numbered with the letter “a” as a prefix to each number, in order to simplify non-academic referencing in our main text.

The newspaper articles have been read in their entirety. During this first reading, some excerpts were selected from each article which would refer, either explicitly or implicitly in the reader’s view, to “degrowth” and “green growth”, the two concepts behind the two search strings. Some articles were completely devoted to the topic of our interest, while some others were mentioning degrowth and green growth as side issues. However, all the excerpts from all articles have gone through a second reading phase, this time aimed at finding common elements which would lead to a useful synthesis. Few main themes emerge from the synthesis, each one presented as a subsection in the following. For a simpler exposition, our results will be presented in a sequence which moves from more particular aspects of the debate towards more abstract elements, always looking for possible generalizations. We will cite specific newspaper articles when pairing our general reasoning with particular inspirations in the media.

### 3. Results

#### 3.1. Local Redistribution of Green Growth Revenues

A good starting point for our reflection is the ongoing debate about the possible placement of windmills along the Norwegian coast. The theme is, in Norway, central to the discussion on “green” policies and is also strongly present in the mass media. In particular, articles like [a70] express the possibility to transfer part of the revenues from electricity production at the windmills, or, more in general, part of the taxation from enterprises active in producing wind energy, to the municipalities where the production sites are located. This type of proposal is here linked to the particular case of windmills, but could

be valid as well for other types of “greener” production which might bring some sort of damage to the local population. We can refer to this case as an example of a “path to green growth” which may potentially have more support at national level than at municipal level, creating a tension between interests at different geographic scales. The damage to the local population would come, for instance, in the form of higher noise or of a worse view on the seaside. Moreover, alterations of the natural ecosystems may also become relevant. In some areas, the position of windmills could also reduce the economic possibilities coming from tourism. In all these cases, some sort of revenue sharing with the local population has sometimes been advised, together with the contribution from the newly established firms to projects of public relevance; some experiments in this sense have already taken place.

This type of solutions allows some contact or even some bargaining processes across different geographic and political scales, mediating between interests at national level and interests at local level. Interestingly, this debate is partially reproposing, within the context of green growth, older discussions of the “Not in my neighborhood” paradigm, typically occurring when energy production pollutes especially the local environment. Three issues must be considered here. First, even at the local level there may be people which would be more affected than others, and therefore even the municipal authorities, evaluating at the same time different amounts of potential damage, may not be in the best position to mediate between interests across different geographic scales. Second, the damage might hold even in the long run, as the investments needed for the plant establishment may take a long time to be recovered by firm revenues. We do not go here into the details of possible solutions from the taxation side, but it is worth pointing out that, also at local level, the decision-makers of today may not represent the interests of the future population. The paradox of this “green growth” case is that it is unclear whether future inhabitants, probably more exposed to the dangers of global warming, might welcome these solutions better or worse than the current population. The multi-scale nature of potential conflicts is therefore a first element to highlight; in the next subsection, we can see how it affects several aspects of the debate.

### 3.2. Global Pollution and National Green Growth

The debate around windmills and the diversity of opinions across different scales partially mirrors the opposite case when a polluting enterprise (part of the “non-green” economy) wants to establish itself at a new location. A notable difference is that, in the latter case, some dynamics are inverted: the enterprise would damage also the whole world through its pollution, while its economic benefits would often not go beyond national borders. In other words, the polluting enterprise may contribute to “non-green growth” of the country where it is located. The relation between “green growth” in some countries and “non-green growth” in other countries has been depicted in the mass media (see articles [a72; a82]) and involves economic and environmental trade-offs at the global level. Roughly speaking, a path towards national green growth assumes possibilities of growth in a country accompanied by a decrease in pollution created by the country’s activities. This path can entail the “greening” of some economic sectors and a “restructuring” of the economy through a shift of capital and labor from more polluting sectors to less polluting sectors.

However, such a shift may also occur by the transfer and relocation of polluting activities to other areas of the world. For instance, sites of physical production in the South of the world could be developed to allow an exclusive focus, in the North of the world, on more remunerating layers of the value chain: R&D, design, and marketing. In other words, “pollution havens” in the South can be tools for the creation of green growth in the North. In the North, economic value would be created in the country without high emissions in the same country. Definitions of “green” and “growth” set only at national level might then bring forward examples of, and initiatives for, green growth which could not be replicated, at the same time, by all countries: this path of green growth could work at national level but not at global level. There could even occur the paradoxical result that

relocation activities towards the South, stemming from national green growth efforts in the North, would raise the overall pollution in the world, as the enforcement of environmental laws in the South of the world, on the same activities, might be more difficult than in the North. Notice that such issues bring to the same paradox as for the cases of improvement in labor conditions in the North, which have sometimes pushed labor-intensive activities towards the South, with ambiguous results on the global human rights situation.

A second, less direct, consequence of a national restructuring process for green growth might occur when a higher focus on environmental goals in a country pushes for an increase of more resource-intensive, and potentially more polluting, activities in other countries, even in the absence of activity relocation. If the production pattern of a country has changed to allow national green growth, but the consumption patterns do not change at the same time, then an increased import of material products could still cause an increase of resource-intensive, and possibly more polluting, activities in another country [a112,a117]. In other words, a “greener” production at national level, not accompanied by a “greener” consumption at national level, might bring green growth within a country but not necessarily at global level.

Finally, we can consider the case when both the national consumption in the North becomes greener, in the sense of less oriented towards material goods, and the national production in the North becomes greener, in the sense of a shift away from the production of material goods, but, at the same time, an increased demand for material final goods in the emerging economies of the world is satisfied by an increased production in the same countries. In this case, the country of the North that has restructured itself towards “greener” objectives would be isolated in its effort by matching production and consumption, without using its political and technological capabilities to “green” the world through its exports.

### 3.3. Exports: Global “Greening” through National Growth?

The relation between production and consumption, at national level, is often essential in a strategic perspective, for instance, to guarantee an internal demand for technologies which still are at an infancy stage. The same technologies could later, after having reached a higher level of maturity, enter an international market. From an environmental point of view, exports might represent the possibility of a country to influence the global climate by “greening” consumption globally. This would be the case, for instance, when the materials used for export are more environmentally friendly, or even when the energy used in the production process comes from renewable resources (see, e.g., [a90], for the case of hydroelectricity and exports). “Greener” intermediate goods might also enter global value chains and further help the environment, by contributing to the production of goods in importing countries having lower environmental standards and/or less access to renewable resources. The growth of the exporting country might then “green” the global market, beyond national borders.

However, for the case of products or processes which are not yet ready to compete internationally, attention should still be given to the dimension of the domestic market of the country. This is because some technologies may still need some local anchoring in the domestic market in order to be develop their full potential; public support may also needed to propel the internal demand. Public support might act indirectly, by guaranteeing proper infrastructures for the consumption of new “green” products. Notably, even when the resulting demand is only partially conveyed into a private market, it would still be closely connected to the needs and desires of the local population. Such needs and desires would indeed constitute the political base for the public support to the greener technology, at a stage which would anticipate the “green growth by export” previously described. In other words, the vision for a green future in a technologically pioneering country may be necessary for the future creation of “green” value through exports.

### 3.4. *The Evolving Relation between Mankind and Nature*

The discussion about the influence of internal demand and of public support, for the development of “greener” products and processes, leads us to several additional reflections. The first, and possibly the most important, reflection is about the values set in the population, in terms of ethics, religion, and society. A long-term view on these values, as shaped by the history of the country, would help to define the country’s capabilities of today. In turn, variation, or new applications, of those values might also expand the country’s potential for green growth, see, e.g., [a75] on the philosophical grounds for the relation of mankind with nature. For the case of Norway, the relation with nature has been essential to the country for a long time: scarce population and extreme forms of weather may have helped making nature a central element of life for many. An exclusive view of nature as a material resource for economic development, by ignoring all its other roles and meanings for the population, would bias an analysis about the possibilities for green growth. Instead, a look at the philosophical premises behind the meaning of the word “green” would help assessing, first of all, whether green growth can be achieved and, second, how it could be achieved. The way in which the value attributed to nature, by the population, has evolved, as mirrored by the media, has changed over time. During the last decades, the “protection of nature” was meant as a protection of ecosystems existing in the country, a protection of an system of relations between living beings. Instead, in recent years, the public attention has shifted, probably also following an evolution of values, towards problematics connected to the climate emergency. The word “green” would now be considered in strict relation to CO<sub>2</sub> emissions and humanity’s influence on the global average temperature. The most obvious reason for this shift is the perceived urgency of finding solutions to global warming. The protection of a local ecosystem may sometimes conflict with the protection from a global catastrophe: the case of windmills previously mentioned is exemplary to this difference, at least in its media depiction.

Similar types of evolution in the ethics towards nature emerge in relation to personal behavior and consumption patterns. For instance, [a61] points the attention on meat consumption, on the one hand, and on husbandry practices, on the other hand. In particular, some debate has taken place about the effects of animal feed, in Norway, on rainforest ecosystems, in America. The shift of feeding inputs in the Norwegian primary sectors has sometimes consequences not only for animal welfare in the country, but also for nature beyond national borders. In this case, the issue relates to the technological shift from traditional agricultural and husbandry practices towards more modern production systems, justified by a higher resource productivity. Indeed, husbandry is among the “green” sectors where competition exerts strong pressures towards cutting costs and increasing production. Under the paradigm of green growth, the existence of particular breeds, in the husbandry traditions of Norway, might be threatened. In terms of industrial organization, an increase in resource productivity might be accompanied by the disappearance of small-size farming in favor of the development of large enterprises. A question remains whether the increasing consumption of meat and fish at global level, seen as consistent with green growth paradigm, might also be consistent with the perpetuation of traditional husbandry practices. The debate between degrowth and green growth would then revolve also around views on possible work practices in the primary sectors.

### 3.5. *Geography of Green Jobs*

The situation of agricultural firms brings two more issues into view. On the one hand, it brings forward possible changes in the geography of workforce following a green growth spurt. Indeed, dynamics generated by the adoption of new technologies, not only in agriculture and husbandry but in all economic sectors, to ensure a higher productivity, could lead to a higher geographic concentration of job positions. Phenomena of urbanization have been going on for a long time, all around the world, also due to shifts of workforce from primary sectors towards secondary and tertiary sectors. However, technological improvements within the primary sectors, possibly coming as a result of

policies for green growth (with higher production from the same resources) or for degrowth (with similar production from lower resources), might further influence the availability of job positions in peripheral areas. Whether these job positions would be increased or decreased is not obvious, but the magnitude of change could be important in countries already experiencing an urban/rural dichotomy [a68].

The dynamics within the labor force would be important as well. If a process begins which transfers labor from more polluting activities to activities which produce less, then it would be relevant to assess how much, and how fast, the workforce could adapt to such new economic structure of the country. Some workers may have become specialized over time, through education or through work experience, into activities which could be wiped out by green growth [a85]. Their transfer to other activities could come at a cost in terms of lower wages or of job stability. Technological progress could make some forms of human capital obsolete. If such capital had been accumulated over time and with effort, its loss would represent a negative element of green growth, unless a renovation of competences is enacted. The proponents of degrowth have, instead, mentioned the possibility of reducing work time, in order to allow a higher productivity without a higher exploitation of natural resources [a83, a111]. In other words, more efficient methods of production, possibly resulting from technological progress, could translate into a lower amount of hours worked per week instead of into higher revenues and value added. In this respect, the debate between green growth and degrowth connects tightly with the debates on “citizen income” and on welfare [a127].

### 3.6. Degrowth, Green Growth, and Welfare

The welfare system enters, as a topic, the debate between degrowth and green growth in several ways. Taxation, which in turn depends on growth, usually supports the welfare of a country. A strategy centered around degrowth could be threatened by some weakening in the welfare system [a116]. Similar risks may even exist for a strategy set around green growth, whenever previous growth has lied, for a long time, in fossil-based activities and the future “green” growth could hardly reach the previous “non-green” growth. These considerations are not rare to be found in countries which evaluate new environmental policies; in Norway, an additional element comes from the existence of an important sovereign wealth fund, established to invest the surplus revenues of the Norwegian petroleum sector. Even if with important limitations, such wealth fund contributes to domestic welfare and sums up to other fossil-related additions to welfare [a79]. In times of crisis, as a recent pandemic outburst has suggested, the use of “non-green” public funds can also provide unemployment benefits or family support. A challenge for green growth would then be twofold: to provide sufficient generation of value, which would serve as a taxation base, and to coexist with other political goals, which would allow a sufficiently high taxation rate. Notably, the challenge would be even stronger in countries with lower technological capabilities and lower economic conditions. In such countries, a policy for degrowth would be politically impossible unless implemented together with radical measures to adjust inequality; at the same time, a policy for green growth would hardly be able to guarantee sufficient value creation. The next subsection will show, through a simple example, the meaning of “value creation” in this context.

### 3.7. Gross Domestic Product and “Green Value”

Value is the most basic, but also most important, concept behind any discussion on degrowth and green growth. If there is confusion about the concept of value (meant now in economic terms), the whole debate between degrowth and green growth would be confused, and any argument behind any of the two strategies would lie on weak grounds. The confusion would easily transfer from the concept of value to the concept of Gross Domestic Product, whose “growth” is under investigation and which is defined as the sum of the “value added” by all activities within a country. For the purpose of our study, we will avoid a general digression on the theories of value in economics, and we will now focus on

the relation between value added and profits. Indeed, this relation is strictly connected to the relation between growth and capital, one of the most “politically sensitive”, and thus most debatable, issues in this respect. In the public discourse, there often comes the idea that “greening” a country may be inconsistent with growth because it reduces profits. Inspired by articles like [a55], we can try to clarify this particular aspect of the debate through a simple example.

Let us first remember that the value added of a firm, which on aggregate forms the GDP of a country, includes not only the profits of the firm (roughly speaking, the revenues minus the costs) but also that part of the costs which wages the employed labor. Then, let us assume that a firm buys an intermediate good for a price equal to 10, the firm’s workers work on it, their wages equal to 20, and the final good is sold for a price of 35. With these assumptions, the value added (and contribution to GDP) is 25 (the sum of the wages, equal to 20, and of the profits, equal to 5). Let us now consider a second case, where a regulation forces the firm to “green” its product through some additional work, causing an increase equal to 3 in labor costs, but, because of a high competition on the market, it is forced to keep the same price for the final good. The firm will still buy the intermediate good at the price of 10, the workers will work for an aggregate salary equal to 23, but the final good will still be sold for a price of 35. For this second case as for the first one, the value added is equal to 25, even if its distribution between labor and capital has changed: 23 to labor (through wages) and 2 to capital (through profits). In this second case, the introduction of a regulation has not changed the contribution of the firm to GDP: there has been “greening” without degrowth. Notably, within GDP, some of the profits have now been substituted by “green value”, in the form of wages to workers operating on “greening” activities. Let us now go to a third and final case, in which the firm tries to transfer, onto final consumers, the additional labor costs brought by the “greening” regulation. An important assumption changes here: in this third case, there is a very rigid demand for the final good and a very low competition in its market; the firm therefore has much more freedom in choosing the price of the final good. The firm still buys the intermediate good at 10, as in the previous two cases, and the workers work on it for an aggregate salary of 23, as for the second case, but this time the firm sells the final good for 38 instead of 35. In this third case, the value added is 28, distributed between wages (23, as in the second case) and profits (5, as in the first case). The value added is higher than in the previous two cases: there has been “green growth”, with respect to the first case, following the introduction of an environmental regulation. Profits have not changed, but useful additional labor has been employed, whose price has been internalized by the market and thus appears in the GDP.

This example shows that additional work needed to make production “greener” can translate into a higher contribution of the firm to GDP. In particular, the environmental value created by the firm can translate into economic value, accountable as such in the macroeconomic indicators of the firm’s country. Green growth would thus seem to be easily accessible. However, a first counterargument could point at the allocation of resources: would the workers that have been employed to perform the “greening” additional work have a more productive employment somewhere else, in the firm or in the country? In particular, could they be occupied on an activity which would generate a product, or a service, with a higher market value than the environmental value “internalized”, in the example, by the market? The answer to these questions would strongly depend on the ability of the state, or in general of political powers, to reconduct a general “environmental” will, existing within the public opinion, to a market value. If the public authorities decide, for instance, to introduce a regulation which forces firms to be more protective towards the environment, in the face of an inelastic demand for their products, then they could have the possibility of “greening” without necessarily choose “degrowth”. A second counterargument could focus on the incentives to investment under capitalism: if the entrepreneurs’ profits are in danger of a decrease, the private investments could also decrease (see also [a86]), possibly bringing the whole GDP down. A dialogue with the capitalists might then be necessary for public authorities to implement green policies without hitting private investments too hard. Such

a dialogue might not be easy, as vested interests may exist both at national and local level for maintaining a status quo, also in the light of investments made under older regulations and contexts [a82]. Attempts for “green washing”, that is for emphasizing isolated green activities without a complete strategic reorientation, might further disturb the political dynamics towards green objectives. Unexpected help could, in this respect, come from the financial markets. If the markets are sufficiently liquid, the simple prediction of new regulations could alter the stock prices and provide incentives for a shift of financial capital, towards those firms which appear to be already on a new, more environmental, path (see, e.g., [a85]). The shift of financial investments would translate into a shift of physical investments, set to favor “greener” products and processes. If the economy is sufficiently “rational” and informed, and if much of the financial capital of firms is dependent on open markets, then “green” physical investments and economic restructuring could take place well before the political dialogue comes to a conclusion.

### 3.8. Long-Term Dynamics

With the example above, we have shown that value creation at firm-level could contribute to an increase in GDP, and possibly generate green growth, consistently with different possible distributions of value between factors of productions or, in general, within the society. If we measure material resource productivity in economic terms, that is, as economic value of the output divided by the material amounts of inputs, the example above would also show possible increases in resource productivity. However, resource productivity can also be meant in technological terms, that is in terms of material amount of output over material amount of input. We do not go now into detail about the way of quantifying such “amount”; instead, we want to point the attention on the long-term dynamics which has served, and could serve in the future, the attempts of mankind to produce material final goods in the most efficient possible way. We ask ourselves the question: what if the immaterial share of a final good, that is the value coming from immaterial inputs, becomes progressively higher, thus making it possible to have “material” final goods with a progressively lower “material” component? Or, including services in our focus: what if the immaterial share of a final “output” becomes less and less dependent on material intermediate goods and physical capital?

Let us consider two phenomena, in the recent development of the Western economies, which relate to the question above (compare [a101]): “digitalization” of many goods and services, on the one hand, and the need for new solutions in health and care to face an increasing average age, on the other hand. Both “technological push” and “demand pull” are raising the economic value of goods and services following these two directions and, in macroeconomic terms, we can thus expect an increasing share of GDP depending on activities with a high “immaterial” component [a126]. Such variation in the composition of GDP corresponds to a lower environmental impact of economic activities without a lower aggregate economic value. To define such variation as “green growth” would, however, require additional qualifications of the word “green”, which often refers to the composition of material inputs, but could, in principle, refer also to the proportion between material and immaterial inputs.

When looking at the longer term, another phenomenon is worth observing: the almost monotonic increase, over the last millennia, in technological possibilities and resource productivity (see also [a105]). Scientific achievements and technical improvements have helped mankind to serve its primary needs, while making worktime available to satisfy other desires. The increasing availability of worktime has been used to create value, even if not always in economic terms and especially not always under market conditions. However, a human being rarely stays idle even if, through higher productivity of material inputs and of worktime, his/her needs and desires get satisfied more easily: creation is a human instinct. Whether the value stemming for such creation can appear in the GDP is an accounting issue, often depending on whether the value created by mankind is visible in the form of market prices and is registered as part of economic transactions. This is

often, but not always, the case: for instance, the value of the food produced by agricultural entrepreneurs is, at least partially, accounted for in the GDP, even when consumed directly. That is: even when not being an object of transaction and not having been separately priced on the market. Even if this case can be seen as an exception rather than a rule in macroeconomic accounting, it shows that economic growth, as measured today, already depends on non-market components, in spite of a common misperception in the public opinion. A question could be asked about why the exception made for agriculture would not hold for other value-creating non-marketed activities. Consider, for instance, the case of a musician who earns his daily income by playing music at public concerts. Assume that she also likes to play music for her family, without being paid, and employing the same human capital (musical education and skills) and physical capital (musical instrument) as for the service she markets. Is there a clear reason why such value, created but not marketed, does not appear in the GDP? Drawing on the parallel with the food consumed directly by agricultural producers, we can say that any reason for not considering such value creation as “growth” has to do with current practices of accounting, rather than with the intrinsic definition of GDP. Actually, this type of output, built mainly on immaterial inputs, could be considered as contributing to economic growth, or to “green growth” under its wider definition, if we were accounting for the home music performance by using the same metrics (the potential market price) used to account for other non-market activities. This example is not to say that GDP should be built on home performances, but to clarify that the inclusion of non-marketed value in the GDP computations, possibly coming from immaterial inputs, is fully consistent with the current definition of GDP and could give rise to new concepts of green growth.

The personal attitude towards value creation, typical of human beings, and its macroeconomic counterpart leads also to questions about the long-term geopolitical effects of growth. This issue, mentioned sometimes in the context of degrowth and less frequent under green growth debates, rises from the difficulties in coordinating an international policy effort affecting, positively or negatively, growth. If it is hard to ensure that a country would give away some percentage points of growth in order to pursue a “greening” policy, it is even harder to imagine a stable political situation, in the long-term, when foreign countries are able to achieve higher growth, with higher living standards, by attributing a lower weight to environmental concerns than our country. The twentieth century has witnessed the dissolution of regimes built around income equality; even if multiple causes were behind this process, one important factor was the difference in the standard of living between countries, at least in the perception of the public opinion. Private and individual consumption is today still a strong political driver; a green policy aimed at nurturing public goods might have a higher probability of success, also in geopolitical terms, by reconducting green public goods into individual preferences.

#### 4. Conclusions

From our reflections above, it appears that macroeconomic and geopolitical developments are intertwined with individual preferences and personal stories (see also [a60]). Ideas about the future depend on social instances put forward today, consistent with our values of today. Identifying future scenarios relies on information about the present which goes beyond mere acceptance of the present. An interesting approach to future scenarios, and a final inspiration to us, can be seen in an architectural exhibition recently held in Oslo [a119, a125]. The exhibition was based on possible images of the future, as imagined today in accordance to an idea of “degrowth”. New ways of conceiving society were depicted through an artistic medium. We could add that a similar type of exhibition would also be useful in relation to green growth: establishing how the future can emerge from a choice of today, made on the base of our values of today [a67]. Such depictions of the future would also help realizing that the values behind “green growth” and behind “degrowth” may be less far from each other than what appears: there may be scenarios of the future which could be liked by supporters of both strategies. Is the distinction between

“green growth” and “degrowth” strategic, and based on a different perceptions about the possibilities offered today, or is it rather rooted in different values, with a difference in desires for the future? An understanding on both “possibility” and “will” of today appears necessary to define collective strategies, and calls for dialogues on topics which encompass both technology and ethics, possibly mediated by social scientists. Hard sciences will be necessary to understand the physical environmental boundaries of the present and to delimit the range of possibilities for the future; at the same time, the current emergencies must not translate into an atrophy of imaginative tools.

The depictions offered by the newspapers on degrowth and green growth, in their possibilities and in their prospects, are not distant from what the academic journals suggest. A first, and perhaps obvious, difference between academic and non-academic discourse lies in the fact that newspaper articles tend to focus on some specific aspects, without considering all the existing connections between relevant topics. Such connections appear more clearly in the academic discourse. However, some important messages have correctly translated, without strong distortions, from academia to newspapers; this is especially the case of the “multiscale” aspects of environmental challenges, when political decisions in one place affect environmental damages in another place. We have shown how these aspects correctly appear in the mass media, especially in the form of international trade-offs. The public discourse seems indeed to have benefited from academic inputs, even if a North–South dichotomy, suggested by the media, may sometimes obscure important geopolitical dynamics. Deeper reflections would also be needed when the media, more or less directly, call for urgent political decisions to avoid environmental catastrophes: here, the newspapers seem to provide a flattened timeline which does not elaborate on the adaptation processes and the traumatic changes entailed by those urgent decisions, before the final goals are reached, especially in terms of welfare loss over short time horizons.

Decision-makers set priorities not only on strategic grounds, but also on the basis of social, political, and human values, which may differ from country to country and from person to person. Even if this is common knowledge, both in academic and non-academic contexts, it is still the case that discrepancies in terms of values may sometimes be confused, in the public discourse, with diverging opinions in terms of strategies. We have suggested that more clarity could be made by reflecting on the evolving relation between mankind and nature, as well as on the possible definitions of “green value”. Indeed, part of the confusion stems from the gray areas left by the academia in the definition of “growth”, gray areas which have partly translated to the mass media. An antithesis often appears in these media, possibly inherited by the academia, between social, political, and human values, on one hand, and economic value, on the other hand. Once the different qualifications of value will be better described in the academic circles, the expressions “degrowth” and “green growth” will probably look less distant in the public discourse.

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## Appendix A. Newspaper Article Selection

\* **Articles mentioning “green growth”:**

- a1 Velkommen, Elvestuen!—Dagsavisen 23.01.2018
- a2 Vi har en naiv tro på resirkulering—Aftenposten 30.04.2018
- a3 Klimaplan for utslippskutt og grønn vekst—Dagsavisen 14.05.2018
- a4 Forsker er skeptisk—Resirkulering er ikke god miljøpolitikk—Dagsavisen 25.05.2018
- a5 Frittgående rektor—Finansavisen 16.06.2018
- a6 Et grønt skifte må svi—Dagsavisen 24.08.2018
- a7 Gjennomgripende forandringer må til—Aftenposten 04.09.2018
- a8 Når politikere kaster ordgranater—Aftenposten 17.09.2018
- a9 Født i en verden i krise—Klassekampen 29.09.2018
- a10 Tror ikke på peke-fingeren—Klassekampen 04.10.2018
- a11 Preker ikke moral—Klassekampen 06.10.2018
- a12 Optimistenes fallitt—Aftenposten 17.10.2018
- a13 Slik når vi bærekraftmålene—Dagsavisen 17.10.2018
- a14 Årets julegave til Det hvite hus?—Dagsavisen 24.11.2018
- a15 Drømmen om grønn vekst—Aftenposten 26.11.2018
- a16 Kamp om hoder—Klassekampen 28.11.2018
- a17 Verden trenger grønn vekst—Aftenposten 30.11.2018
- a18 Åmli kan få spennende skoletilbud—Agderposten 01.12.2018
- a19 Han stiller segi spissen forkampen mothøyrekreftene—Aftenposten 02.12.2018
- a20 Det ZERO ikke vil snakke om når de snakker om miljø—Aftenposten 08.12.2018
- a21 FutureBuilt flytter grensene for hva som er mulig—Teknisk Ukeblad 18.12.2018
- a22 Fra matavfall til miljøvennlig drivstoff og ny mat—Teknisk Ukeblad 18.12.2018
- a23 Vi trenger klimaprofitører—Dagsavisen 20.12.2018
- a24 Håpløs realisme—Klassekampen 21.12.2018
- a25 Grønn illusjon—Klassekampen 16.01.2019
- a26 Er det klima for en grønn avtale?—Aftenposten 17.02.2019
- a27 Tapt sak akkurat nå—Klassekampen 21.02.2019
- a28 Karbonfella—Klassekampen 02.03.2019
- a29 Klimakrisen: Hva hvis grønn vekst er umulig?—Aftenposten 02.03.2019
- a30 Tid for ny klimaøkonomi—Aftenposten 08.03.2019
- a31 De utfordrer Ap—Klassekampen 14.03.2019
- a32 Solberg ber næringslivstoppene si hva de vil ha—Agderposten 03.04.2019
- a33 Tenk om vi ikke overbefolker verden likevel—Aftenposten 06.04.2019
- a34 Greta Thunbergs strid: Når frykt og håp skiller lag—Aftenposten 09.04.2019
- a35 «Grønn vekst» er umulig—Morgenbladet 17.05.2019
- a36 Grønn vekst er mulig—Morgenbladet 24.05.2019
- a37 Europeisk grønn vekst—Dagsavisen 28.05.2019
- a38 Store tanker om grønn vekst—Dagsavisen 05.06.2019
- a39 Næringspolitikk—Klassekampen 05.06.2019
- a40 Tar MDG inn i varmen—Klassekampen 05.06.2019
- a41 Bare en tanke—Klassekampen 05.06.2019
- a42 Rødgrønne vil doble norsk industrieksport—Aftenposten 05.06.2019
- a43 Alle monner drar, må vi tenke—Dagsavisen 06.06.2019
- a44 Skal vi ikke tro på FNs naturpanel?—Morgenbladet 07.06.2019
- a45 Vekst og uvekst—Morgenbladet 07.06.2019
- a46 Hva forteller EU-valget oss?—Klassekampen 11.06.2019
- a47 Vindkraft-debatten Sørsteds naive tro—Agderposten 13.06.2019
- a48 Rebell, snart far—Morgenbladet 14.06.2019
- a49 Vi må snu veksten—Klassekampen 21.06.2019
- a50 Randeberg gjenvalgt som president—Teknisk Ukeblad 25.06.2019
- a51 Jo, vi må faktisk ha kjernekraft—Aftenposten 25.07.2019
- a52 Det finnes ingen grønn kapitalisme—Morgenbladet 02.08.2019
- a53 Nye energi-kilder kun som supplement—Aftenposten 07.08.2019
- a54 Grønn vekst i Norge mot 2050—Magma 27.08.2019

- a55 Hvordan måle ekte grønn vekst og unngå grønnvaskingsfellen—Magma 27.08.2019
- a56 Bærekraftige forretningsmodeller—Magma 27.08.2019
- a57 Høyres åtte valgløfter—Agderposten 28.08.2019
- a58 Å spire og gro—Klassekampen 28.08.2019
- a59 Forbauset over MDG—Klassekampen 29.08.2019
- a60 Er mikrofonen på?—Morgenbladet 30.08.2019
- a61 Hellige kyr—Klassekampen 30.08.2019
- a62 Er du grønn, stem på Rødt!—Klassekampen 30.08.2019
- a63 Velger du dommedag eller fremtidshåp?—Agderposten 04.09.2019
- a64 Vi har bare én klode—Klassekampen 04.09.2019
- a65 Grønnvasket høyrepolitikk funker ikke—Klassekampen 09.09.2019
- a66 Ørnen snakker ikke til meg lenger—Klassekampen 14.09.2019
- a67 Forbannet da jeg ble skutt—Dagsavisen 18.09.2019
- a68 Her er Støres grønne plan—Klassekampen 24.09.2019
- a69 Slik rammer Greta—Morgenbladet 27.09.2019
- a70 Vi trenger et nytt nasjonalt kompromiss om vindkraft—Aftenposten 27.09.2019
- a71 Lite bekymret, Stoknes?—Morgenbladet 04.10.2019
- a72 En grønn ørn?—Klassekampen 28.10.2019
- a73 Kan hende det gjelder å redde vår jord—Dagsavisen 13.11.2019
- a74 Vekst—Klassekampen 20.11.2019
- a75 Vi trenger en grønn deloffentlighet. Tidsskriftet Pan tar skritt i riktig retning, skriver Bernhard Ellefsen—Morgenbladet 22.11.2019
- a76 Her kan de samarbeide—Klassekampen 29.11.2019
- a77 Grønne visjoner—Klassekampen 07.12.2019
- a78 Venstre ser ett-tallet—Dagsavisen 12.12.2019
- a79 50 år med oljeeventyr—Aftenposten 23.12.2019
- a80 Folk i Birkenes vurderer å flytte hvis de får vindkraft-verk som nærmeste nabo—Agderposten 28.12.2019
- a82 Ny olje: Vi dro ut for å finne det grønne skiftet, og kom tilbake med tro, håp og Tesla-lærdom.—Klassekampen 28.12.2019
- a83 Reis fanen ren og grønn!—Klassekampen 31.12.2019
- a84 Det viktigste er å gjennomføre—Morgenbladet 03.01.2020
- a85 Helt i går, helt i dag—og kanskje også i morgen?—Dagsavisen 07.01.2020
- a86 Helt, også i morgen?—Dagsavisen 13.01.2020
- a87 Forskere mener grønn vekst er mulig To mulige scenarier—Aftenposten 08.02.2020
- a88 Klokkene ringer for oss—Morgenbladet 13.03.2020
- a89 Koronakrisens grønne mulighet—Dagsavisen 29.04.2020
- a90 Vi trenger kapitalbroer til større markeder—Finansavisen 05.05.2020
- a91 En viktig film alle bør se—Aftenposten 08.05.2020
- a92 Unik mulighet for reformer—Dagsavisen 13.05.2020
- a93 Perfekt anledning til grønn omstilling—Dagsavisen 28.05.2020
- a94 Ut av avhengigheten—Klassekampen 30.05.2020
- a95 Drømmen ble til Trosvik hagepark—Dagsavisen 09.06.2020
- a96 Rødgrønne grønne tanker—Dagsavisen 24.06.2020
- a97 Arbeiderpartiet smelter med iskanten—Dagsavisen 24.06.2020
- a98 Rødgrønne grønne tanker—Dagsavisen 24.06.2020
- a99 Trenger både vind- og vannkraft—Aftenposten 25.06.2020
- a100 Uklarhet på begge sider—Dagsavisen 27.06.2020
- a101 Ute av lage—Klassekampen 07.07.2020
- a102 Vekst og velstand—Klassekampen 09.07.2020
- a103 Den vekstbaserte kapitalismen er blitt en tvangstrøye—Dagsavisen 15.07.2020
- a104 Svar til Ådne Naper—Klassekampen 31.07.2020
- a105 Hvem fant på evig vekst?—Klassekampen 24.08.2020
- a106 Blandet økonomisk ettermæle for Abe—Dagsavisen 29.08.2020

- a107 NHO: Gullalderen er over. Men vi kan skape en ny gullalder—Aftenposten 31.08.2020
- a108 Gull og grønne skifter—Aftenposten 06.09.2020
- a109 Skal det være øl fra brødrester eller suppe på en spiker?—Morgenbladet 25.09.2020
- a110 Noe å stå opp om morran for—Dagsavisen 30.09.2020
- \* Articles mentioning “degrowth”:**
- a111 Bærekraftig begrepsbruk – svar til Jerven—Klassekampen 08.01.2018
- a112 Uærlighet i klima-politikken—Aftenposten 09.04.2018
- a113 Et grønt skifte må svi—Dagsavisen 24.08.2018
- a114 Her sitter vi fire kolleger og vrir tungene over et ord.—Morgenbladet 21.09.2018
- a115 Skal vi ikke tro på FNs naturpanel?—Morgenbladet 07.06.2019
- a116 Vekst og uvekst—Morgenbladet 07.06.2019
- a117 Kan vi snart våge å snakke om kjernekraft?—Aftenposten 15.07.2019
- a118 Hvordan måle ekte grønn vekst og unngå grønnvaskingsfellen—Magma 27.08.2019
- a119 Arkitekturens helg i Oslo—Aftenposten 26.09.2019
- a120 Gjenbruk av bygg:—Klassekampen 26.09.2019
- a121 Tøm og røm for alle penga—Klassekampen 26.09.2019
- a122 Fornyelse på en gammelmodig måte—Aftenposten 28.09.2019
- a123 Rivning av Y-blokken er det stikk motsatte av det vår tid trenger—Morgenbladet 11.10.2019
- a124 En ny økonomi?—Aftenposten 13.10.2019
- a125 Museet som tvangstrøye—Morgenbladet 18.10.2019
- a126 Velstandsvekst i respirator—Finansavisen 08.04.2020
- a127 Den vekstbaserte kapitalismen er blitt en tvangstrøye—Dagsavisen 15.07.2020

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