

# Growing by decreasing

## *Crescer decrescendo*

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RESUMO: Para justificar a tese sob o lema “crescer decrescendo”, este artigo apresenta três argumentos. Em primeiro lugar, a evolução das ideias sobre como lidar com os efeitos colaterais ambientais do crescimento econômico passou dos “limites ao crescimento” para o conceito unificador de “além do crescimento”, com o “crescimento verde” e o “decréscimo” como dois polos do debate recente. Em segundo lugar, há indicações de convergências importantes relativamente às prescrições políticas em qualquer “estratégia verde”. Terceiro, algumas pistas sugerem que, apesar das convergências, o principal desafio é superar a inércia nos sistemas de produção-consumo, desestabilizando a configuração dominante e induzindo uma mudança nas preferências dos consumidores.

PALAVRAS-CHAVE: Crescimento verde; decréscimo; estratégia; mudança tecnológica; transição.

ABSTRACT: To justify the thesis under the motto “growing by decreasing,” this paper presents three arguments. First, the evolution of ideas about tackling the environmental side effects of economic growth went from “limits to growth” to the unifying concept of “beyond-growth,” with “green growth” and “degrowth” as two poles of the recent debate. Second, there are indications of important convergences regarding policy prescriptions in any “green strategy.” Third, some clues suggest that, despite the convergences, the main challenge is overcoming the inertia in production-consumption systems by destabilizing the dominant configuration and inducing a change in consumers’ preferences.

KEYWORDS: Green growth; degrowth; strategy; technological change; transition.

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## INTRODUCTION

As collective awareness about the Anthropocene increases, economic growth strategies are more likely to achieve net positive environmental results. This means programs that attain a positive balance between two kinds of economic activities – the ones that should be stimulated because they contribute to the greater resilience of ecosystems and those that need to be increasingly restricted because they maintain the inertia of current environmental problems.

This prognosis may seem a truism, but many would classify the title of this article as a paradox. It is a relationship in which – at the same time – two poles complement and oppose each other. Discarding this Columbus’s egg best explains the coexistence of so many new perspectives regarding the relationship between economic growth and the environment.

The two typical schemes lie at the extremes – one insists on rejecting any “limits” to traditional growth, and the other just proposes immediate degrowth. However, the admission of intricacies among the poles has generated at least three other schools: “green economy,” “green growth,” and “prosperity without growth.” The last one is also called “a-growth,” “post-growth,” or “beyond growth.” Furthermore, they have all been tangled up in the “Green New Deal” wave.

Yet, in practice, national economic policies that align with sustainable development do not correspond directly to any one of these schools. Even if it is possible to identify some uniformity in the sphere of energy transition policies, this is not enough to configure a growth strategy. One only needs to consider the immense diversity of subnational economies, agri-food systems, infrastructures, and urbanization patterns to realize the tremendous distance to overcome before true “strategies” for growth towards some type of “Green Economy” could emerge.

To justify the proposal of this article in favor of the motto “growing by decreasing,” a three-part exploration is proposed, with the following contributions. First, it shows that the evolution of ideas about tackling the environmental side effects of economic growth went from “limits to growth” to the unifying concept of “beyond growth,” with “green growth” and “degrowth” as two poles of the recent debate. Second, it presents the convergences regarding policy prescriptions that should be part of any green strategy. Third, it argues that, despite the convergences, the main challenge is overcoming inertia in production-consumption systems by destabilizing the dominant configuration and inducing a change in consumers’ preferences.

### 1. FROM “THE LIMITS TO GROWTH” TOWARDS “BEYOND GROWTH”: 1970-2020

Less than a decade after its 1961 foundation, the OECD (Organization for Economic Cooperation and Development) – the “temple of growth for industrialized countries” – developed a particularly lively debate questioning quantitative

growth under the label, “problems of modern society.” These discussions were symptomatic of wider societal discourses and more general uncertainty as to the longer-term prospects of industrialization, modernization, and consumer capitalism (Schmelzer, 2016:245).

Within the OECD, the driving force behind this new perspective was a group of scientists and bureaucrats affiliated with the organization’s scientific branch. Although largely neglected by historical research and in the public memory, this group of international bureaucrats, who were concerned about the negative effects of modernization and economic expansion, proved instrumental in launching the Club of Rome. They built a transnational discourse coalition to advance new perspectives on economic growth, whose 1972 report *Limits to Growth* (*LtG*) had a major impact on public debates (Schmelzer, 2016:246).

Fifty years after the *LtG*, a new report to the Club of Rome – *Earth for All* – advances a narrative about our future that is a practical blueprint for avoiding climate catastrophe and increasing everyone’s well-being (Dixson-Declève, 2022). In fact, its “Giant Leap” scenario is quite optimistic as it projects a rise in global GDP *per capita* by over 130% between 2020 and 2100, without explaining how that could be achieved with a smaller impact than today. This is in clear contrast to Victor (2023), who is skeptical about the possibility of avoiding climate catastrophe and simultaneously increasing global GDP in the long term.

It can be said, without risk of exaggeration, that the hectic debates triggered by the *LtG* needed fifteen years to bring about a first global consensus, thanks to the adoption by the UN Assembly – only in 1987 – of *Our Common Future* report. Then, Rio-92 reinforced the legitimization of its main message: sustainable development.

Yet, as relevant as such a historic achievement may have been, it must be recognized that it was a skillful way to avoid the heart of the problem. The eleven generic allusions in the report to a “new era of economic growth” could not help governments search for new policies consistent with sustainability – as a new value – and with sustainable development as the first utopia of the Anthropocene, as suggested by Veiga (2014, 2017).

## Green Economy

This demand contributed most to providing visibility to the idea of a “Green Economy,” starting in the United Kingdom in 1989. At the request of the UK Department of the Environment, three volumes of the famous *Blueprint for a Green Economy* appeared, written by teams of economists led by the late David W. Pearce (Pearce et al., 1989, 1991, 1993).

For these pioneers of modern “Environmental Economics” – which may also be called “Green Economics” – the achievement of a “Green Economy” would essentially depend on urgent progress in three key policy areas: valuing the environment, accounting for the environment, and incentivizing environmental improvement.

They recommended a “wedge” between economic growth and the environment – a wedge to “uncouple” the process of economic growth from its environmental impact.

To put it another way: if we can alter the ratio of growth to environmental impact, we can afford to grow and generate the resources that are needed to alter the growth process in the developing world so that the same environmental mistakes are not made. (Pearce et al., 1991:12)

However, in 1991, another book titled *The Green Economy* appeared in the United Kingdom, but with very different contents. Its author – Michael Jacobs – unlike the group led by David Pearce, showed sympathy for ideas developing on the other side of the Atlantic, which had already given rise in 1989 to the “International Society for Ecological Economics” (ISEE).

The ideas were those being proposed in the USA and Canada – mainly by Herman E. Daly (1938-2022) – using the path opened by his irascible adviser – Nicholas Georgescu-Roegen (1906-1994). The ISEE was founded based heavily on Daly’s work. With eleven regional societies around the world, it hosts a biennial conference and publishes the successful academic journal *Ecological Economics*.

The build-up of the “Ecological Economics” field is best depicted by the biography of Daly authored by Peter Victor (2022):

[Daly’s] criticisms of growth have been reflected in the various adjectives used to describe different kinds of growth, but growth just the same – green growth, inclusive growth, sustainable growth, smart growth, broad-based growth, clean growth, shared growth, resilient growth and pro-poor growth, climate-friendly growth – presumably because growth in practice is none of these. Daly’s alternative to economic growth is more radical. (Victor, 2022:140)

Since the 1970s, Daly made the case for a “steady-state economy,” which does not grow in physical terms. All countries should seek development, but growth should be restricted to poor ones where its benefits are most obvious. Even then, he said that growth in these countries can only be temporary without overwhelming the capacity of Earth’s resources and ecological systems. The time for growth could be extended if developed economies were to practice material and energy degrowth and reduce their demands on the biosphere in general (Victor, 2022: xx).

New ways have been suggested to qualify “economy” and/or “economics.” Some, such as “doughnut,” “the circular,” “the well-being,” “regenerative,” “post-growth,” and “beyond growth,” are clearly inspired by Daly’s proposals for a steady state (Victor, 2022:197, 203).

There is a clear contrast between the formation in North America of the ISEE – harboring so many variants of the most radical criticism of economic growth – and the persistence in the United Kingdom of much softer ideas about the green economy.

This is shown by the “Green Economics Institute,” which was founded in 2003 and has published for twenty years *The International Journal of Green Economics*.

## Green Growth

However, in global terms, beginning in 2005, the idea of a Green Economy had already begun to be rejected in favor of the slogan “Green Growth.” The “Seoul Initiative Network on Green Growth” was launched that year, on March 24-25, at the “Ministerial Conference on Environment and Development in Asia and the Pacific” under the auspices of the United Nations Economic and Social Forum. A period of clear consolidation followed until 2012, in a maturing process that mainly involved the OECD and the World Bank and culminated in the Rio+20 conference.

In January 2012, UNEP, OECD, the World Bank, and the Global Green Growth Institute signed a Memorandum of Understanding to build a “Global Green Growth Knowledge Platform,” which is a “cutting-edge global initiative to identify and address major knowledge gaps in green growth theory and practice.” This was a real turning point, showing a clear victory for the “Green Growth” banner rather than a supposed convergence with that of the “Green Economy.” The facts listed in the following paragraphs aim to demonstrate this.

The South Korea-based Global Green Growth Institute (GGGI), founded in 2010 and supported by Australia, UAE, Japan, UK, Denmark, and Norway (who have all committed multi-year funding), became an intergovernmental organization in June 2012. GGGI is dedicated to pioneering and diffusing a new economic model of economic growth and is designed to be an open, global laboratory to support experimentation and collective learning by countries seeking to leapfrog the resource-intensive and environmentally unsustainable model of industrial development pioneered by advanced economies in an earlier era (GGGI, 2023).

The World Bank published the *Inclusive Green Growth Report* (May 2012), which criticizes the neoclassical theory of growth (i.e., that growth in output – GDP – comes from increases in physical capital, labor, and productivity) because it fails to recognize that economic production depends directly on the stock of natural resources and the quality of the environment. Their analytical framework considered how environmental policies could increase conventionally measured GDP through four channels linked to input efficiency, stimulus, and innovation effects. It stressed that the ultimate test of green growth is welfare, not output: “Welfare can be assessed by viewing utility as depending on the current level of consumption and the direct effect of the environment (through its health effects and amenity value.”

The OECD also developed a “Green Growth Strategy,” bringing together green growth in its national and multilateral policy surveillance exercises to provide policy advice targeted to the needs of individual countries. For the OECD, the sources of growth will emerge from productivity, innovation, new markets, confidence, and stability. Green growth can also reduce risks to growth from bottlenecks and imbalances.

## Green New Deal and Degrowth

However, two other facts need to be highlighted. Three years earlier, in March 2009, the same UNEP launched a 40-page Policy Brief entitled “*Global Green New Deal*.” This was preceded, in 2008, by a report called “*The Green New Deal*,” published by the London-based New Economics Foundation (NEF).

Neither of these was the first to use the term. In January 2007, Thomas L. Friedman called for a Green New Deal (GND) in a *New York Times* column titled “A Warning from the Garden.” However, Friedman’s call was limited to technological change – for an “energy New Deal.” “We need more of everything,” he wrote, “solar, wind, hydro, ethanol, biodiesel, clean coal and nuclear power – and conservation.”

The NEF persevered through the financial crisis of 2007-2008 to develop its plan for addressing and averting financial breakdown, climate change, and biodiversity collapse. A proposal that seems to have gone through ten years of hibernation but which – in 2018 – began to have immense impact, reorganizing discourses and altering debates. A recent initiative by Canadian researchers offers a detailed overview of what, today, could be understood as the GND tide (Tienhaara & Robinson, 2023).

A descriptive analysis of the confusing impacts of the “GND” proposal on the hitherto victorious banner of “Green Growth” would be impossible. A good sample of the variety of perceptions is in the study by Kallis et al. (2023). The rhetorical diversity makes any reconciliation between concerns about the environment and economic growth impossible.

Polewsky et al. (2024) confirmed that Green Growth and Degrowth are two rather isolated fields of research with little exchange and mutual reference on related topics. Using a computational literature review, they systematically reviewed 1449 journal articles on Green Growth and Degrowth published between 1972 and 2020. Their analysis revealed that Green Growth research is highly policy-oriented, focuses on practical implementation, and builds on empirical research methods. On the other hand, Degrowth research is highly theory-driven, focuses on the analysis of complex human-nature interrelationships, and builds on a sound theoretical and conceptual foundation.

Even though GDP reduction is not an objective of degrowth, researchers in this field assume a reduction in large-scale, resource-intensive activities will consequently involve a decrease in GDP. It would have to mean a dramatic reduction in material standards in high-income parts of the world.

The degrowth field sees the more top-down statist spirit of a GND – with its emphasis on technology, big infrastructures, international financial flows, and jobs – as a discourse fit for the “initial reforming phase.” Pushing the argument to its logical conclusion, a degrowth transition cannot be achieved within capitalism (Mastinia et al., 2021).

## Beyond Growth

In such a context, there are reasons to think that the “Beyond Growth” flagship could become – or indeed may be becoming – a unifying concept for writers and practitioners whose primary and urgent goal is to shift policy and practice in the direction of environmental sustainability and social equity. This was the main conclusion of a recent study – which seems to come closest to the idea, defended here, of “growing by decreasing” – from the excellent “Forum for a New Economy,” which included Michael Jacobs as one of its three authors:

The OECD (2020) report’s idea of going “beyond growth” helpfully suggests that growth is too simplistic an objective and something more sophisticated and contemporary is needed. Whether through these routes or others, it is clear that the policy content of a “post-growth” political economy still needs considerable elaboration. But in the post-growth discourse, a new way forward may be found for an old debate, free of some of the dogmas and disagreements that have bedeviled it for half a century. (Likaj et al., 2022:31-2)

Therefore, nothing could be stranger than the fact that the 2020 *Beyond Growth* report remains so hidden, even in meticulous studies specifically devoted to the OECD’s vision of “sustainability and green growth.”

## 2. CONVERGENCE

Many of those who admit the intricacies between the poles of simply rejecting any “limits” and proposing immediate degrowth have recently converged in their responses to the following questions: (i) Do ecological constraints imply interrupting growth? (ii) What is the role of policy instruments in transitioning to a Green Economy?

### Global Economic Growth Still Needed

Climate change represents an existential threat because, in addition to provoking social unrest, leading to large-scale migrations, and triggering wars or other forms of conflict with huge economic costs, it puts ecosystems and biodiversity at risk. This is now a starting point even for economists such as Olivier Blanchard, Christian Gollier, and Nobel laureate Jean Tirole (2023).

In the medium and long term, the effects of unmanaged climate change will be so serious that they will most likely make any (misguided) attempt at carbon-intensive growth unfeasible. This makes the absolute decoupling of output growth from greenhouse gas emissions and resources a huge challenge for green growth.

However, another more daunting problem is how to avoid excessive accumulation of unwanted stocks (GHGs in the atmosphere and the oceans) and excessive



depletion of natural capital or valuable ecological “funds” (Daly et al., 2007), such as forest cover and wildlife habitat, while the economy continues to grow (Victor, 2023). Most resource and environmental problems are problems of stocks, not flows.

Furthermore, it is far from sufficient to look only at the domestic degradation of natural capital within a country. Trade expansion in recent decades has allowed higher-income countries to “off-shore” the adverse impacts of their consumption on ecosystems and biodiversity, through trade in commodities, goods, and services with lower-income countries (Wiedmann et al., 2013). Therefore, growth in global output cannot continue forever. In the last decades of this century and the next century, environmental hardships may well restrict growth (Stern & Stiglitz, 2023).

In any case, in the short term, interrupting growth would be politically unacceptable and could undermine the accessibility of climate policies in general. This is the basic assumption of Nobel laureate Joseph Stiglitz and Nicholas Stern, best known for the 2006 study commissioned by the British government on the effects of climate change on the world economy (Stern & Stiglitz, 2023). Investment and some growth will be needed over the next 2 or 3 decades to overcome poverty worldwide and progress towards the Sustainable Development Goals.

The challenge of building a low-carbon economy is an independent sustainability goal. However, it could also be seen as an opportunity to create “good” green growth – an increase in levels of human well-being (not measured only in monetary terms) with reduced use of energy and material resources, but also new lifestyles and sustainable production standards. Thus, the direction in which growth occurs is at least as important as its rate (Mazzucato & Perez, 2022; Terzi, 2022).

The problem is not only focusing on the growth rate but also on GDP as a measure of economic activity and any other better measure of economic performance to appraise and identify sustainable development. An economy could record a high rate of output or income growth by depreciating its assets, which would not be visible in national statistics. Consuming natural capital by demanding more ecosystems’ resources and services than the biosphere’s supply has been one of the means that affluent countries have depended on for their economic growth, for the last 70-80 years (Daly et al., 2007; Dasgupta, 2021).

In a recent attempt to provide an economic framework and solutions to the problem of biodiversity loss, Dasgupta (2021) follows a long tradition of ecological economists (Daly et al., 2007) who emphasized bringing the economy back to the biosphere’s limits.

Dasgupta’s (2021) modeling of the global economy builds on the complementarities between the processes governing the supply of provision and regulation of ecosystem services. If one of them is sufficiently disrupted, the others will be disrupted as well. These complementarities set bounds on the efficiency with which the biosphere’s goods and services can be converted into output, implying that the global economy is bounded. That is, unbounded growth in output, consumption, and wealth is not possible.

One important implication of considering these ecological constraints on humanity’s demands is not to fall into the trap of being unconditionally pro- or anti-



GDP growth. GDP is an estimate of the costs, not the benefits, of market-related activities in society, while excluding non-market activities. It does not measure social welfare, which depends on a multitude of factors. Furthermore, the welfare implications of pollution and the use of natural resources are not captured by GDP (Van den Bergh, 2011; Raworth, 2017).

To judge whether a path of economic development is sustainable, nations need to adopt a system of economic accounts that records the social worth of the economy's wealth, i.e., the entire portfolio of assets, including ecosystems (Dasgupta, 2021). This accounting system must inform about variations of those stocks that underpin human well-being. Most importantly, it should include a set of well-chosen biophysical indicators, which focus on dimensions of environmental sustainability that remain difficult to capture in monetary terms, as recommended by Joseph Stiglitz, Amartya Sen and Jean-Paul Fitoussi (Stiglitz et al., 2010).

Although the focus on stocks is far from being a consensus in the green growth literature, the Review on the "Economics of Biodiversity" (Dasgupta, 2021), the so-called "Dasgupta Review," is likely to influence the public debate in the coming years. It raises, within the economic mainstream, the concern about the quantity and quality of natural capital, beyond manufactured and human capital, bequeathed to future generations instead of merely growth in output flow (green or not).

### **Beyond Relative Prices: The Role of Public Investments**

How to address the imbalance between humanity's demand and Nature's supply? Correcting this imbalance not only implies an increase in Nature's supply through conserving and restoring ecosystems but also transforming our institutions, including property and use rights, regulatory policy, social norms, finance, education, and national accounting (Dasgupta, 2021).

Without public intervention, the economy will rapidly head towards an environmental disaster, particularly because the market size effect and the initial productivity advantage of brown inputs will direct innovation and production to that sector, contributing to environmental degradation. More importantly, delayed intervention is costly, not only because of the environmental hardships, but because it increases the technological gap between green and brown sectors, implying a more extended period of slow growth in the future (Acemoglu et al., 2012).

Pricing environmental damages, for example, through a carbon tax, has many virtues. However, many analysts (Acemoglu et al., 2012; Lamperti et al., 2019, 2020; Stern & Stiglitz, 2023; Blanchard et al., 2023; Mazzucato & Perez, 2022) agree that it will not be sufficient to simply rely on a carbon price, due to a series of market failures, for example, in investment decisions. Path dependence on investments is strong where profit opportunities are clear.

On the one hand, using only gradual changes in relative prices – both to reduce current emissions and to influence the path of research and green technologies – may lead to lock-in, as currently cost-effective alternatives will be reinforced. Grad-

ually increasing CO<sub>2</sub> taxes may be ineffective until the productivity gap between brown and green technologies is small enough.

On the other hand, in the absence of other complementary policies, extremely high taxes on CO<sub>2</sub> would be needed to make green technology an evolutionary surviving strategy to achieve global warming of less than 2°C by 2100. These carbon taxes would lead to excessive distortions (Acemoglu et al., 2012) and drastically increase the risk of a major unemployment crisis caused by a rise in energy prices, large declines in investment, and a rise in bankruptcy rates (Lamperti et al., 2020).

Because of this difficulty in overcoming inertia in the search for and adoption of technology simply by raising the carbon tax, risky public investment must be directed towards creating opportunities and ensuring that investments in green innovation are rewarded (Mazzucato & Perez, 2022; Mazzucato, 2018). Policies should encourage innovative startups and subsidize the demonstration of some key technologies. An industrial policy must be designed to overcome social, environmental, and technological challenges and not to promote certain companies or support losing industries (Blanchard et al., 2023).

Therefore, consensus is increasing among influential economists from different traditions of economic thought. The most important convergences regarding a green policy framework can be synthesized in the four following claims. (i) Relying only on changes in relative prices, e.g., through environmental taxes, will not be sufficient to avoid ecological catastrophe. (ii) Avoiding it will require command-and-control instruments with standards, targeted bans, and protected areas. (iii) Most importantly, it will require substantial public and private investments in research and development of green technologies and sustainable and resilient infrastructure. (iv) Thus, it is crucial to tightly connect any green strategy to innovation policy, financial policies, and the structure of taxation (Acemoglu et al., 2012; Stern & Stiglitz, 2023; Blanchard et al., 2023; Lamperti et al., 2019, 2020; Dasgupta, 2021; Mazzucato & Perez, 2022; Terzi, 2022).

### 3. INERTIA

The convergences relate to an inclusive green growth position because they take for granted that growth will still be mandatory in many regions for a long time to come due to its benefits. However, there is also some recognition that growth cannot be eternal in what could be called “post-growth” or “beyond growth.”

Historically, growth has meant environmental degradation. Yet, without growth, societies have experienced unemployment, more poverty, and, thus, social crises. If social objectives remain but long-term ecological constraints growth, how they can be achieved in its absence must be considered (Jackson, 2017; Victor, 2019).

At the core of the “beyond-growth” approach is the argument that no rate of economic growth, whether positive, negative, or zero, is automatically correlated either with social or environmental benefits or costs (Van den Bergh, 2011). It

entirely depends on what is growing, what is decreasing, and how production and consumption are organized.

Social efforts towards facing important challenges of the 21st century – such as battling climate change, reducing biodiversity loss, improving health and well-being, and reducing inequalities – might well be consistent with the growth of aggregate output. The latter does not necessarily mean that growth is spread indiscriminately across all sectors and activities. Certainly not in the case of green growth, since it would require a change in the composition of economies, with absolute degrowth in brown technologies, consumption, and investments (Cechin & Pacini, 2012).

It is not enough for green investments to be additional to total investments. On the contrary, they must replace brown investments, reducing them in at least the same proportion. The same applies to consumption. If the increased expenditures of consumers mean ever-increasing demands for brown goods, any restrictions on the production of brown goods would lead to massive increases in their prices, possibly frustrating policies designed to reduce their production.

Economists reflecting on green growth strategies emphasize scale economies in production, increasing availability of complementary innovations and network externalities, which reduce costs and improve performance as the adoption of green innovations increases. It often means upscaling and subsidizing promising niche innovations and investing in infrastructure. However, what is downplayed is the importance of (i) destabilizing the dominant configuration of consumption-production systems as a driver of shaping the speed of transitions and (ii) inducing a change in consumers' preferences towards valuing more green services and reducing their appetite for brown goods.

### **Destabilizing the Economic *Status Quo***

Understanding the destabilization and decline of dominant consumption-production systems is crucial to design effective policies that accelerate the sustainability transition. This is one of the main lessons from the research field on “socio-technical transitions” (Geels et al., 2023).

Niche innovations with the potential to bring about the deeper changes in consumption-production systems needed for sustainability transitions – such as car sharing, agroecology, and electricity “prosuming” (when energy consumers become energy producers) – have remained small, diffused slowly, and been dismantled by greenwashing (Von Flüe et al., 2023).

Firms and users can be reluctant to invest, develop, and purchase innovations because of high costs, poor performance, small market demand, uncertainties, and locked-in systems. There is no guarantee that niche innovations will inevitably win these struggles. However, if they win, a new phase emerges in which the original consumption-production regime declines and a new one expands, becoming increasingly anchored in changed institutions, power structures, infrastructures, user practices, and views of normality.

Acceleration occurs when innovations are brought to a critical scale in regime arrangements that allow them to benefit from positive feedback, and the dominant configuration of consumption-production systems is destabilized (Geels et al., 2023). For instance, public intervention may keep large-scale brown investments – high carbon, polluting investments – from being rewarding, such as investing in carriages at the beginning of the 20th century, at the dawn of the automobile era (Terzi, 2022).

To shape the speed of the energy transition, for example, public subsidies that harm the biosphere must be identified and reduced. When accounting for the negative externalities arising from fossil fuel subsidies, the aggregate cost of these subsidies is greater than US\$ 5 trillion annually, much larger than their monetary cost (Coady et al., 2019).

Further, private financial flows that directly harm and deplete natural assets must also be identified and reduced. Recent research suggests that while private finance devoted to biodiversity ranges from US\$ 6.6 billion to US\$ 13.6 billion per year (OECD, 2020a), the world's largest financial institutions provided, in 2019, more than US\$ 2 trillion worth of loans to sectors which have been identified as primary drivers of biodiversity loss and ecosystem disruption (Portfolio Earth, 2020).

Therefore, policymakers must also act by withdrawing policy support, disempowering incumbent actors, and promoting countervailing social norms (Geels et al., 2023). This can be done by eliminating perverse subsidies and reducing financial flows to environmentally harmful activities, as emphasized by the latest Global Resources Outlook (UNEP, 2024). Furthermore, ecological economists (Costanza, 2023) have long proposed that unique measures are needed to increasingly restrict economic activities that maintain the inertia of current environmental hardships.

Four of these measures are:

1. creating cap-and-auction systems for basic natural resources, including quotas on depletion, besides those that exist for pollution and greenhouse gas emissions;
2. phasing out the consumption of fossil fuels;
3. dismantling incentives towards materialistic consumption, with stronger regulation of advertising and taxing status goods with serious environmental repercussions; and
4. reducing work time, by encouraging a different work-time norm and stimulating people to make deliberate choices about it. The aim here is to facilitate translating labor productivity improvements into less work time rather than always higher incomes and more consumption.

Rather than embracing the aim of growth or degrowth *ex ante*, societies could do better in finding democratic support for these institutional changes and policies, which have a destabilizing potential.

## Cultural Mismatch

The direction of technological change is likely to be influenced by the market size of green goods and services. Therefore, preferences can be an important source of path dependency in green innovation processes (Bezin, 2019). It is important to understand how preferences are formed culturally and transmitted intergenerationally.

Because culture evolves slowly, cultural traits, including consumption habits, might not always be optimal given the current environment. Some reliance on culture and tradition might be an efficient strategy. However, when the state of the world changes, some individuals will tend to hold on to pre-existing traditions suited for the prior environment rather than the current one. This “cultural mismatch” helps explain contemporary issues that are of interest to policymakers and economists (Nunn, 2022) and perhaps the persistence of brown consumption habits and maladapted institutions in the face of a serious environmental crisis.

The size and persistence of the mismatch will depend on the number of “traditionalists” relative to the number of “non-traditionalists.” The former are individuals who guide their choices by the values, beliefs, and actions of the previous generation. The latter are those who place less value on tradition, expending costly effort to understand the state of the world to choose their action with this knowledge (Nunn, 2022). Likewise, path dependence in green innovation might depend on (i) the number of consumers who place a high value on environmental quality and, therefore, in green services, relative to the number of people who keep brown traditional consumption habits, and (ii) the speed of conversion from brown to green preferences (Bezin, 2019).

On the one hand, it is unrealistic to assume that individuals’ consumption can be directed towards sustainable choices only through information and education, while adequate infrastructure to deliver green mobility, housing, and energy supply is still lacking, and price signals and advertising push them strongly in unsustainable directions. On the other hand, interventions that help to aid the adoption of new beliefs, values, or actions, which are better matched to the contemporary environment, can improve welfare and reduce the prevalence of a mismatch in the current generation as well as all subsequent generations (Nunn, 2022). This implies a call for wider use of non-monetary instruments, such as standards and targeted bans, in addition to formal and parental environmental education, although they do not necessarily substitute policy instruments based on pricing (Bezin, 2019; Dasgupta, 2021).

Environmental education is critical for the political acceptability and longevity of price-based instruments since it reduces the cost of using them (Bezin, 2019). Beyond this effect, environmental education increases the understanding of the biosphere’s processes and promotes the connection of people to Nature from an early age. The consequences of consumption habits that degrade Nature are usually untraceable to those who are responsible. Therefore, the rule of law, social norms, and prices are insufficient to make people account for Nature in their daily

choices. This implies the need to rely on self-enforcement to reduce consumers' appetite for brown goods (Dasgupta, 2021).

## CONCLUSION

The main result of combining the historical overview with the most promising aspects of current debates is neither the proposition of abandoning growth nor the idea of relying upon it. The Gordian knot to be cut is in the composition and structure of economic activity. The best way to favor green futures at all territorial levels is to adopt policies capable of imposing setbacks on activities that are most harmful to ecosystems, so that the most virtuous ones may be encouraged.

Therefore, going “beyond growth” will mean, at the same time, “growing by decreasing” and “decreasing by growing.” In the future, the net result of such a balance (in terms of GDP or any other better measure of economic performance) will vary over time and may be positive or negative.

This general orientation is the core of possible growth strategies aimed at the advent of green economies. However, such strategies will necessarily have great heterogeneity. The main challenge for them to flourish will be the ability to break inertia, simultaneously discouraging brown behaviors while heavily financing green ones.

Evidently, in some situations, certain activities might be beneficial for reducing inequalities, although neutral or negative for maintaining or increasing the resilience of ecosystems, which is a serious difficulty to consider for anything that could look like some kind of green growth strategy. Understood in this way, policies that are precursors of such types of strategy are already emerging here and there. However, the main uncertainties about their flourishing can also be easily identified.

On the side of brown activities, everything seems to indicate that resistance could be much more tenacious than normally assumed. A good example is the impotence of the Climate Convention, whose erratic governance appears to prolong the hegemony of fossil energy. Nothing better should be said about the Biodiversity Convention. On the green activities side, there is a worrying slowness in the two top priorities: (i) heavy investments in scientific and technological research aimed at more sustainable innovations and (ii) the broadest, most general, and unrestricted dissemination of the resulting knowledge.

Without a strong acceleration of such a virtuous marriage, the coordinated movements that prove to be promising growth strategies for green economies will likely remain very low. Commercial and financial initiatives such as those planned since 2019 by the flagship “EU Green New Deal” could certainly help. However, recent global geopolitical trends have unfortunately tended to increase the resistance and persistence of brown practices, postponing the emergence of green transitions, because they are in a diametrically opposite direction.

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## ERRATA

No artigo **Growing by decreasing / Crescer decrescendo** de Andrei Cechin e José Eli da Veiga, com número de DOI: <<http://dx.doi.org/10.1590/0101-31572024-3619>>, publicado no periódico **Brazilian Journal of Political Economy**, v. 44 n. 4, pp. 433-584, na página 1.

Na página 1, no título:

*Onde se lia:*

Growing by decreascing

*Leia-se:*

Growing by decreasing