



Methodological and Ideological Options

A Green New Deal without growth?

Riccardo Mastini^{a,*}, Giorgos Kallis^{a,b}, Jason Hickel^c^a ICTA-UAB, Universitat Autònoma de Barcelona, Barcelona, Spain^b ICREA, Barcelona, Spain^c Goldsmiths, University of London, London, UK

ARTICLE INFO

Keywords:

Green new deal
Degrowth
Decarbonisation
Green growth
Ecological economics
Political ecology

ABSTRACT

The IPCC warns that in order to keep global warming under 1.5°, global emissions must be cut to zero by 2050. Policymakers and scholars debate how best to decarbonise the energy system, and what socio-economic changes might be necessary. Here we review the strengths, weaknesses, and synergies of two prominent climate change mitigation narratives: the Green New Deal and degrowth. Green New Deal advocates propose a plan to coordinate and finance a large-scale overhaul of the energy system. Some see economic growth as crucial to financing this transition, and claim that the Green New Deal will further stimulate growth. By contrast, proponents of degrowth maintain that growth makes it more difficult to accomplish emissions reductions, and argue for reducing the scale of energy use to enable a rapid energy transition. The two narratives converge on the importance of public investments for financing the energy transition, industrial policies to lead the decarbonisation of the economy, socializing the energy sector to allow longer investment horizons, and expanding the welfare state to increase social protection. We conclude that despite important tensions, there is room for synthesizing Green New Deal and degrowth-minded approaches into a ‘Green New Deal without growth’.

1. Introduction

The IPCC SR15 report (Masson-Delmotte et al., 2018) estimates that in order to have a 50% to 66% chance of keeping global warming below 1.5 °C, global emissions need to be reduced to around half their present level by 2030 and reach net-zero by 2050. The report concludes that countries must urgently come up with concrete plans for rapid emissions reductions.

In this paper we compare two master narratives on climate change mitigation that represent a break with traditional market-based environmental policy: the Green New Deal (GND) and degrowth. Both have gained visibility in academia in recent years, with the GND becoming commonplace in public debate. The idea of a GND has been discussed since 2007, but recently a coalition of grassroots environmental groups, progressive politicians, and policy think tanks in the United States has advanced a new formulation, inspired by FDR's New Deal, that led to House Resolution 109 (presented to the US Congress in February 2019). In the wake of these events, climate justice movements in Europe have also started embracing the GND platform. Degrowth in comparison is a (relatively new) field of academic research and advocacy, mobilized by grassroots movements as a framework for articulating social and environmental justice demands (Demaria et al., 2013). Our premise here is that instead of seeing the GND and degrowth

as antagonistic and trying to prove which one is right and which wrong (e.g. Pollin, 2018), it is more constructive to assess the strengths and weaknesses of each in order to identify possible synergies, while recognizing tensions.

A main source of friction between the two narratives is the question of economic growth. Some GND advocates maintain that investments in renewable energy will grow related activities, have spillover effects, and stimulate the economy (Pollin, 2018). Economic growth will then increase the revenues available for clean energy investment and accelerate its deployment.

The degrowth argument holds instead that the slower the rate of economic growth, the easier it is to achieve emissions reductions. This is because the rate of change of carbon emissions is equal to the rate of change of output multiplied by the rate of change of carbon intensity. Relying on GDP growth to finance the deployment of renewable energy means increasing total energy demand, which makes emissions reductions more difficult to achieve.

Section 2 analyses the genesis and evolution of the GND and argues that its recent formulation marks a break from previous iterations, something that has received less attention than it should by ecological economists. Section 3 outlines the degrowth position in relation to climate breakdown and mitigation, responding to critiques, including by economist Robert Pollin (2018), that degrowth has little to offer to

* Corresponding author.

E-mail address: riccardo.mastini@uab.cat (R. Mastini).

these questions. Section 4 focuses on the question of growth in more detail and argues in favour of the degrowth diagnosis, but claims that degrowth could be compatible, under certain conditions, with a GND. Section 5 compares the two approaches, and identifies elements of synergy and tension, while exploring what a ‘GND without growth’ could look like.

2. Green New Deals

In this section, we trace the history of the Green New Deal. Our interest is not historiographical and we do not provide this story as a mere background to the analysis that follows. Rather, we present the history because it reveals the increasing openness of GND discourse to anti-growth and anti-capitalist ideas, and suggests potential points of convergence between GND and degrowth narratives. Not much has been written about the shift from GND 1.0 to 2.0, which we highlight here, and ecological economists would be forgiven for assuming that one is a continuation or reincarnation of the other.

Whereas the term ‘Green New Deal’ (GND) has appeared in academic and policy debates since at least the 1990s (Czeskleba-Dupont et al., 1994; Henderson and Woolner, 2005), it first entered the mainstream in 2007 in a *New York Times* op-ed by Thomas Friedman. In the run-up to the 2008 U.S. presidential election, Friedman argued that the candidate able to put forward an ambitious and credible energy and environmental agenda would have a clear advantage (Friedman, 2007). He called the plan a GND, because like the original New Deal it would be a “broad range of programs and industrial projects to revitalize America” (Friedman, 2007). To nurture clean energy technologies to a point that they would really scale “would be a huge industrial project” that requires “government regulations and prices”. Friedman argued that the GND has the “potential to create a whole new clean power industry to spur our economy into the 21st century” (Friedman, 2007).

After the collapse of the Lehman Brothers in September 2008 (see Fig. 1), many economists and policy-makers came to see in the GND a strategy for re-starting the US economy (Hertsgaard, 2009). Barack Obama embraced the narrative of the GND (Kaufman, 2018) on the campaign trail, and in 2009 his administration approved the stimulus package *American Recovery and Reinvestment Act*. The total stimulus amounted to US\$976 billion, of which US\$117 billion was oriented towards energy efficiency and renewable energy (Barbier, 2016). Similarly, the think tank New Economics Foundation set out an ambitious plan for the United Kingdom to invest massively in decarbonising the economy and to deliver an economic stimulus in response to the financial crisis, an agenda presented in the report *A Green New Deal* (Elliott et al., 2008). The European Green Party was also among those calling for a GND in the EU to respond to the financial crisis.

With the financial crisis becoming a global economic recession, numerous governments and international institutions adopted the idea of adding energy efficiency and renewable energy investments to their countercyclical fiscal stimulus packages (Kapoor et al., 2011). The United Nations Environment Programme issued the policy brief *Global Green New Deal* in March 2009 (see Fig. 1) to coordinate various

national economic stimulus plans (UNEP, 2009). The report recommended an expenditure of 1% of GDP on green initiatives, but the G20 group overall spent only 0.8% of GDP (amounting in total to US \$513 billion) by the end of 2009 (Barbier, 2016). The only countries that met UNEP’s investment target were South Korea (5%), China (3.1%), Saudi Arabia (1.7%), and Australia (1.3%) (Barbier, 2016).

However, in 2010 the global economic consensus turned from stimulus to austerity. The G20 meeting in Toronto in June 2010 marked a point of departure away from Keynesian economics, which had up to that point informed state responses to the global financial crisis (Blyth, 2015). Under the banner of “growth friendly fiscal consolidation”, balanced budgets and deficit hysteria became the dogma of G20 governments and “talk of a Green New Deal withered on the vine” (Kaufman, 2018).

The GND discourse has lately come to the fore of American political debates in a new incarnation articulated by a coalition of grassroots movements (Sunrise Movement, Justice Democrats, and Democratic Socialists of America), progressive politicians (most notably, Congresswoman Alexandria Ocasio-Cortez), and think tanks (New Consensus and Data For Progress). In March 2019 Congresswoman Alexandria Ocasio-Cortez and Senator Ed Markey presented House Resolution 109 in the U.S. House of Representatives (see Fig. 1). This is a non-binding resolution that cannot be considered for the legislative process. The preamble establishes that the GND should address a climate crisis and an economic one of wage stagnation and growing inequality. To address the former crisis, H.R. 109 sets the goal for the U.S. to achieve net-zero greenhouse gas emissions through a 10-year mobilization, but without specifying when the target should be reached. It also aims to decarbonize the transportation, agriculture, manufacturing, and infrastructure sectors “as much as is technologically feasible”. This wording combined with the net-zero greenhouse gas emissions goal suggests that proponents are supportive of carbon dioxide removal, but without specifying with which negative emissions technologies. To address the latter crisis, H.R. 109 sets out numerous social objectives: creating high-quality union jobs and offering training for workers affected by the transition, expanding the welfare state by providing free health care and affordable housing to all citizens, and fostering environmental justice by stopping current, preventing future, and repairing historic oppression of frontline and vulnerable communities.

This new incarnation of the GND bears a close resemblance to U.S. President Franklin D. Roosevelt’s New Deal, which was a set of social and economic reforms that the federal government undertook between 1933 and 1936 in response to the Great Depression. The New Deal included landmark agencies and legislation that made it very popular among American citizens (Rauchway, 2008). In the 1930s, the U.S. also faced the Dust Bowl and to stop topsoil loss and restore damaged landscapes the *Civilian Conservation Corps* – a public work relief program for unskilled manual labor – planted hundreds of millions of trees (de Graaf, 2019). The New Deal also founded the federally-owned corporation Tennessee Valley Authority that provided electricity generation and economic development to the Tennessee Valley, a region particularly



Fig. 1. Time diagram with landmark events of the New Deal, of the GND 1.0, and of the GND 2.0.

affected by the Great Depression and neglected by private utilities because of the high costs associated with the electrification of rural areas (Bruenig, 2019). Key features of the New Deal – such as public ownership of energy utilities, social and labour reforms, and a job guarantee – have come to characterize the GND narrative since 2018.

Like the New Deal, the GND vision articulated in H.R. 109 points to the need for an interventionist economic approach to decarbonization by placing strong emphasis on public investments, industrial policies, and indicative planning. This proposal can be traced back to the basic argument that the private sector cannot innovate without the public sector giving it purpose and direction (Mazzucato and McPherson, 2018). According to The Economist (2019) the new incarnation of the GND “is an outright rejection of the orthodox economic approach to climate change.” In this new GND framing, the climate emergency is not a market externality to be fixed through pricing, but rather it is part of a social crisis. Such crisis can be addressed only “by redistributing economic and political power” (The Economist, 2019). This marks a radical departure from the first incarnation of the GND. Indeed, as Galvin and Healy (2020) argue, the GND 1.0 adopted an “ecological modernization” approach, predominately focusing on investments in technological solutions, without sufficient regulation to forcibly reduce CO₂ emissions. While the GND 1.0 tried to harness capitalist investment for climate benefit mainly through R&D funding, mild subsidies, and pricing carbon, the GND 2.0 would use “the power of public investment and coordination to prioritize decarbonization at speed, scope, and scale” (Aronoff et al., 2019). The GND 2.0, furthermore, rejects the primacy of market-based environmental policy instruments that seek to address the market failure of externalities by incorporating the external cost of production or consumption activities through taxes or by creating property rights to establish a proxy market for the use of environmental services. Instead, the GND 2.0 embraces command-and-control environmental regulation that involves the government establishing the reduction of pollution levels and monitor the manner in which it is achieved.

While the GND 1.0 could be considered a technocratic exercise in devising top-down policy proposals for restarting the economy after the 2009 Financial Crisis by investing in green technology, the GND 2.0 depends on and sees itself as part of grassroots movement-building in the context of environmental justice struggles. Just as a historic wave of labor unrest in 1934–1937 ensured Roosevelt's presidential election and pushed him to approve New Deal legislation in his first 100 days in office (Rauchway, 2008), similarly frontline and vulnerable communities, which the harms caused by climate change and pollution have been dumped on, and young environmentally-aware citizens could represent the constituencies from which support for the GND could come (Wallace-Wells, 2019).

The strong effect that H.R. 109 had on the GND narrative is epitomized by the fact that U.S. Senator Bernie Sanders published a GND plan (Sanders, 2019) along similar lines during the 2020 Democratic Party presidential primaries. But unlike H.R. 109, Sanders' plan includes a ban on imports and exports of oil and gas, a ban on mountaintop mining and fracking, and a moratorium on permits to drill on public lands. This amounts to including in the GND supply-side policies to directly restrict the extraction and distribution of fossil fuels, in line with the ‘keep it in the ground’ slogan of the climate justice movement (Battistoni and Riofrancos, 2019). Other innovative elements of Sanders' plan are the objective of exceeding the U.S. fair share of global emissions reductions in order to at least partly compensate for the standing climate debt that the U.S. has with the Global South. The plan proposes that the U.S. will reduce domestic emissions by at least 71% by 2030 and reduce emissions among less industrialized nations by 36% by 2030 by investing \$200 billion in the Green Climate Fund. All these are attributes that further contribute to the radicalism of the GND 2.0 discourse compared to its previous incarnation.

3. Degrowth narratives about climate stabilization

In the context of counterculture movements in France in the late 90s, environmental and anti-capitalist activists started using the term ‘décroissance’ (degrowth). Since 2008 academics and activists have been organising biennial international conferences making degrowth a subject of scientific research with hundreds of articles published in peer-reviewed journals. Environmental and social activists increasingly turn to degrowth as a framework for articulating their demands for a more ecologically sustainable and economically fair society (Demaria et al., 2013).

Degrowth is not a political platform, but rather an ‘umbrella concept’ that brings together a wide variety of ideas and social struggles. Unlike the GND narrative, it has not yet had a clear policy impact and no mainstream think tanks or political parties have endorsed it to date. However, some Members of the European Parliament (especially from green and social democratic parties) and NGO networks (such as, Friends of the Earth Europe, Greenpeace EU, the European Environmental Bureau) show increasing interest in degrowth. These and other organizations collaborated in organising the Post-Growth Conference at the European Parliament in September 2018. In the same month, 238 academics published an open letter calling on the European Commission to abandon growth as an economic objective in favour of stability and well-being (O'Neill, 2018).

Ecological economists have defined degrowth as an equitable downscaling of throughput, with a concomitant securing of wellbeing (Kallis et al., 2018). Despite the fact that GDP reduction is not an objective of degrowth, Schneider et al. (2010) write that “sustainable degrowth will involve a decrease in GDP as currently measured, because of a reduction in the large-scale, resource-intensive productive and consumptive activities that constitute a big portion of GDP. The degrowth hypothesis is that GDP can go down and nevertheless quality of life can improve.”

From a degrowth perspective, the ecological emergency arising from the crossing of several planetary boundaries is a sign that growth cannot continue. One of the core hypotheses of degrowth is that GDP growth cannot be decoupled from throughput at the scale needed to reduce resource use in line with planetary boundaries. As for emissions: while absolute decoupling of GDP from emissions is possible (and is already happening in high-income countries), it is not feasible to reduce emissions fast enough to respect the carbon budgets for 1.5 °C and 2 °C if the economy keeps growing (Hickel and Kallis, 2019). All the models projecting that climate stabilization can be achieved while global GDP grows at the normal rate of 2–3% per year rely heavily on negative emissions technologies that are unproven at scale (Anderson, 2015).

Degrowth postulates that it is easier to achieve decarbonization with slower economic growth than without. This is because the rate of carbon emissions in an economy is equal to the rate of change of output multiplied by the rate of change of carbon intensity. Looking at a group of 18 developed economies that have reduced their national emissions over the period 2005–2015, Le Quéré et al. (2019) found that – in addition to investments in renewables – reductions in energy demand deriving partly from lower GDP growth rates have been a key driver of reduced emissions. Conversely, carbon emissions reductions greater than 3–4% per year are very unlikely to be compatible with continued economic growth (Anderson and Bows-Larkin, 2013).

The degrowth literature also questions the suitability of renewable energy to fuel economic growth. GDP growth is driven by an increase in energy use derived from energy-dense sources that are abundant and cheap (Kallis and Sager, 2017). Consequently, to ensure economic growth in the long run it is necessary to increase energy supplies and/or the rate of energy efficiency (Warr and Ayres, 2010). However, the EROI (the ratio of the amount of usable energy delivered from a particular energy resource to the amount of usable energy used to obtain that energy resource) for renewable energy sources – between 10:1 and 20:1 – is lower than that of fossil fuels (Murphy and Hall, 2010).

Table 1
Comparison of New Deal, GND 1.0, GND 2.0, and degrowth narratives.

	New Deal	GND 1.0	GND 2.0	Degrowth
Objectives	Employment, Stimulating aggregate demand	Stimulus-growth, Employment, Environmental standards,	Climate change mitigation, Employment, Social and environmental justice	Abolish pursuit of growth, Reduce all environmental pressures, Autonomy/limits, Social & environmental justice
Origins	Trade Unions, Presidency of Franklin D. Roosevelt, New Deal coalition	Keynesian economists, United Nations Environment Programme, Presidency of Barack Obama, G20	Coalition of U.S. red-green grassroots movements, New Consensus, Left wing of US Democratic party, UK Green Party, UK Labour Party, DiEM25	Grassroots environmental activists, Social and environmental science academics
Expression	Programs, Public work projects, Financial reforms and regulations	Opinion pieces, UNEP's policy brief 'Global Green New Deal', U.S. Green Party and European Greens' policy proposals, New Economics Foundation's 'A Green New Deal' report, G20's countercyclical green investments	Opinion pieces, U.S. House Resolution 109, Labour GND platform, Decarbonisation and Economic Strategy Bill 2017–19, Policy reports	Academic papers and books, Opinion pieces
Outcomes	Reform of Wall Street, Relief for farmers and unemployed, Social Security, Political power shifts to Democratic New Deal Coalition	G20's US\$513 billion green fiscal stimulus	Positioning of candidates in U.S. elections, Raise in public awareness (exemplified by Google Trends)	Biennial Degrowth International Conferences, Post-growth Conference at the European Parliament (2018), Academic discourse, Radicalization of environmental NGOs and activist groups
Countries prevalent	U.S.	U.S., China, South Korea, E.U.	U.S., U.K., E.U.	France, Spain, Italy, U.K.

Capellán-Pérez et al. (2018) simulate that if renewables increased from 15% to 50% by 2050 average EROI would drop to 3:1 when accounting for the energy required to extract and build the infrastructure, which is less than the 11:1 deemed necessary for a growing economy (Fizaine and Court, 2016).

Degrowth scholars reject also the assumption that the deployment of renewable energy is sufficient on its own to displace fossil fuels in energy production. Historically, new energy sources have added more energy without removing older sources: for instance the discovery of oil as an energy source has not replaced coal, but simply added to growing coal use (Fressoz and Bonneuil, 2013). Historical patterns suggest that past 'energy transitions' should be more accurately described as 'energy additions' (York and Bell, 2019). The average trend in many nations around the world over the past 50 years shows that each unit of electricity generated by non fossil-fuel sources displaced less than one-tenth of a unit of fossil-fuel-generated electricity (York, 2012). Hence, in the context of climate change mitigation, some degrowth advocates have proposed – along with a decline in energy consumption at the societal level – a cap on the total emissions that a country is allowed to generate (Kallis, 2015; Marcellesi, 2012; Daly, 2013).

Degrowth advocates are not only concerned with climate change, but also with the increase in the material throughput of the economic system. Scaling up renewable energy production presents a problem in that the mineral intensity of renewable energy is higher than that of fossil fuels: producing 1 kWh of electricity from renewable energy requires 10 times more metals than from fossil fuels (Arnsperger and Bourg, 2017). Increasing the extraction of these minerals will further drive ecological breakdown, and in some cases limited resource availability may limit the expansion of renewable energy. For instance, with an annual growth of 10% in extraction rates, proven lithium reserves would become exhausted in 50 years (Bardi, 2014). Renewable energy can mitigate some environmental impacts, but only at the expense of exacerbating others. This leads to other social and ecological issues that are at the centre of degrowth research: environmental conflicts arising from struggles for the control of resources (Scheidel et al., 2020), local pollution where the mines are located (Li et al., 2014), and conflicts over land-use change (Capellán-Pérez et al., 2017).

In proposing a GND, Pollin (2018) claims that “a major weakness of the degrowth literature is that, in concerning itself with broad themes, it gives very little detailed attention to developing an effective climate-stabilization project.” While degrowth scholars have elaborated numerous policy proposals (Cosme et al., 2017), it is true that they have not formulated specific proposals for emissions reductions; their contributions have generally focused on showing how GDP growth makes bending the curve of carbon emissions harder (Burton and Somerville, 2019). Kallis (2019a, 2019b) maintains that there is no shortage of technologies and policies for reducing emissions, but that they have not yet been put into practice because of the negative effects that they would have on economic growth. From a degrowth perspective, climate change is an issue that can be addressed only through a more systemic transformation of social and economic practices and institutions. But if we are to zero in on climate mitigation policies *stricto sensu*, degrowth scholars and activists have to date proposed carbon taxes, abolishing fossil fuel subsidies, divesting from the fossil fuel industry, rapidly switching to renewable energy, and adopting lifestyle changes that increase efficiency and reduce consumption (Stuart et al., 2019). We will discuss more in depth what the ecological transition should look like from a degrowth perspective in section 5 where we put forward some proposals for a 'GND without growth'.

Degrowth is not only about government policies, it is also about value changes and changes in everyday modes of living. The degrowth scholarship emphasizes aspects of cultural transformation, epitomized by grassroots projects and communities practicing alternatives and prefigurative politics. Such initiatives, often mentioned also in the context of the commons or 'post-capitalism', include community gardens, alternative and solidarity economy networks, community

currencies, time banks, open software collectives, and cohousing and eco-communes (Alexander, 2013). Such initiatives involve lower consumption and shorter production–consumption circuits based on the principle of sufficiency. They attempt to develop practices of production, consumption or exchange that provide social value outside the domain and logic of the GDP economy (Kallis, 2018).

Before we move to the tensions and synergies of the two approaches, let us summarise in Table 1 the core elements of (different versions of) new deals and degrowth.

4. Differences on the question of economic growth

A main source of friction between GND 2.0 and degrowth is the question of economic growth. Some proponents of the GND see growth as both the engine *and* a result of the ecological transition. While H.R. 109 does not explicitly mention economic growth as a policy objective, the idea is implicit in the text given its goals to “spur economic development” and “to grow domestic manufacturing”. Three major policy experts associated with the GND debate in the U.S. argue that boosting working class wages and upgrading infrastructure would strengthen economic growth, therefore making H.R. 109 “fiscally responsible” (Talbot Zorn et al., 2019). This idea is problematic from a degrowth perspective because it fails to address the issue of growing energy and material flows.

Pollin's (2018) advocacy of GND on the basis of criticizing degrowth is a good reference for this discussion. Pollin criticizes degrowth because “some categories of economic activity should now grow massively” in the context of the ecological transition. Degrowth scholars however responded to Pollin that they do not argue that certain activities, such as those deemed desirable from a socio-ecological perspective, should not expand (Burton and Somerville, 2019). While necessary sectors expand, less necessary sectors can be scaled down with a possible shrinking of GDP.

One question Pollin does not address is why a renewable energy transition requires *aggregate* growth. If the objective is to achieve specific kinds of goals, it makes more sense to invest in those directly, rather than to grow the whole economy indiscriminately and hope for a specific outcome. For instance, if the State increases expenditures in order to decarbonize the energy system, this could be used to directly increase renewable energy production (sustainability-oriented policy), rather than to boost aggregate demand (growth-oriented policy).

Pollin (2018) links GND to growth by proposing that GND should be funded with a set share of national GDP, specifically at 2% per annum. Growth is desirable, then, because “higher levels of GDP will correspondingly mean a higher level of investment being channeled into clean-energy projects” (Pollin, 2018). Granted, the higher GDP, the easier it may be to increase investments to renewables, easing competition with other public expenditures. Private investments also, driven by profit as they are, become harder in a context of contraction. But, at least in principle, an increasing proportion of a shrinking GDP could be directed to a clean energy transition, if governments were to take greater control of the direction of investment by a socialisation of strategic sectors. It is not clear, in other words, why a significant investment on a GND cannot be made within stagnant, or even contracting, economies.

Degrowth advocates insist on the importance of financing an energy transition without growth because from a degrowth perspective spurring economic growth in order to increase investment in clean sectors of the economy has undesirable, second order consequences, such as the expansion of dirty economic sectors. Growth is an integrated process and it is hard to imagine how to grow selectively the 'goods' while reducing the 'bads' (Kallis, 2019a). Furthermore, there are serious concerns whether the growth rates Pollin foresees can be sustained in the long-run, given signs of high-income countries entering a period of secular stagnation.

It is true though that certain financing strategies could make

Table 2
Differences between the GND and degrowth narratives and possible synergies between them.

	GND 2.0	Degrowth	GND 2.0 \geq DG	DG \geq GND 2.0
Growth	Agnostic, Pro green growth	Against growth, Managing without growth	More resources for green investments when there is growth	Caution not to tie GND to delivery of growth, Preparation to manage without growth if need be
Climate stabilization	Decarbonization of the economy, Investments in renewable energy sources, Efficiency improvements	Investments in renewable energy and efficiency improvements, Decarbonization of the economy, Downscaling of throughput, Sufficiency	Public investment bank, Industrial policies, Socialisation of the energy sector	Reducing individual consumption, Minerals scarcity and land-use change from renewable energy deployment, Climate change is not the only problem with growth
Policies	Massive public investments, Just Transition, Job Guarantee, Expansion of the welfare state	Work-sharing, Basic and maximum income, Green tax reform, Environmental caps and bans, Universal Basic Services	Emphasis on public intervention and investment, Concrete measures for Just Transition	Policies to secure employment without growth, Policies to reduce aggregate economic activity, Legislation for longer-lasting products, Shift from private provisioning to public provisioning
Strategy	Policy change, Shift in public investment, Grassroots activism	Economic policy change, Democratic negotiation of legitimate needs, Self-limitation	Importance of using the leverage of public investment to steer towards a massive transformation of the economy	Prefigurative politics, Starting cultural change
Constituency	Progressive politicians, Social justice and environmental activists	Eco-communities, Red-green activists, Green-left politicians	Effecting regulatory change, Reaching out to mainstream discourse	Constructing a more radical discourse, Connecting global justice and ecological transition

economic growth necessary for funding the GND, such as in the case of green bonds. When bonds have positive yields, governments are obliged to pay interest to bondholders, this requires growing tax revenues. The idea of using green bonds to fund the GND is premised on Richard Kahn's principle of the multiplier (1931): deficit spending should be used to increase growth in order to raise sufficient tax revenues to cover the debts. This is the Keynesian core of the GND narrative and, indeed, it relies on economic growth to avoid ballooning public debt. As Pettifor (2019) puts it, "the GND economy will not be debt-free, but its credit creation systems will be balanced by tax revenues gained from employment, used to repay loans to prevent the build-up of debt and deficits."

But it could be that it is problematic to resort to deficit spending for funding the GND. As Klein (2019) argues, "any credible GND needs a concrete plan for ensuring that the salaries from all the good green jobs it creates aren't immediately poured into high-consumer lifestyles that inadvertently end up increasing emissions [...]. This is the problem with what we might call the emerging 'climate Keynesianism': the post-World War II economic boom did revive ailing economies, but it also kicked off suburban sprawl and set off a consumption tidal wave that would eventually be exported to every corner of the globe." The 'public expenditure-growth-tax' model may not be compatible with ecological principles (Bailey, 2015).

This raises difficult questions about how to finance the energy transition in a degrowth scenario. We discuss three strategies for funding public investments without relying on economic growth. Firstly, public expenditures could be reallocated away from socially- and environmentally-harmful sectors (such as, armaments or fossil fuel subsidies) or gleaned from the expected positive effects of the ecological transition (such as, reduction in public health costs, unemployment benefits, defensive expenditures, and climate change adaptation).

Secondly, governments could tap into private and corporate savings by means of progressive taxation. For instance, Cox (2020) focuses on the richest third of US households, with tax rates graded by income within this group. 100% wealth taxes could be used for the top bracket, effectively instituting a wealth cap (Buch-Hansen and Koch, 2019). A more progressive tax system would have the added benefit of reducing inequality, reducing positional consumption (one of the main drivers of emissions) and increasing social well-being (Wilkinson and Pickett, 2010).

Thirdly, money creation could be decommodified and reorganized as a common good. A sovereign money system would entail debt-free money creation on the part of a country's central bank with the aim of

directly spending it into existence on any project decided by the government. Since sovereign money is created debt-free, it does not require economic growth for the repayment of accruing debt (Positive Money, 2018).

Aronoff et al. (2019) suggest a possible point of convergence between the degrowth and GND narratives when they argue that in the context of a "radical GND", economic growth should not be a social objective. This is because "GDP growth has never been a great metric for the things we care about. The past forty years show that it can continue without benefiting most people's well-being or trickling down. Contrary to the ideology of capitalism, materially intensive growth can't continue forever. We can't pretend ecological limits don't exist. And contrary to the arguments of clean technophiles, there's zero evidence that growth can be meaningfully 'decoupled' from resource use, or occur without environmental impact" (Aronoff et al., 2019). Hence, what high-income countries need is "a 'last stimulus' of green economic development in the short term to 'jump off the growth treadmill, break with capital, and settle into a slower groove" (Aronoff et al., 2019). Here, unlike Pollin, there is an acknowledgement that building say solar panels and wind turbines might lead to the growth of certain economic sectors for a limited amount of time, but continuous and generalized economic growth should not be the objective.

5. A Green New Deal without growth?

Table 2 compares the more radical, recent version of GND 2.0 with degrowth, looking for possible synergies and complementarities (see Table 2). The idea here is of trying to think what a GND without growth, or a 'degrowth GND' could look like. Part of the thinking presented here has informed the campaign *Green New Deal for Europe* led by the pan-European political movement Democracy in Europe Movement 2025 and its report 'A Blueprint for Europe's Just Transition' (2019), to which we contributed. Basic tenets of such a GND include: public investment and asset ownership in the energy sector; policies for a just transition, including a job guarantee; decommodification and universal access to basic services; resource caps and policies to reduce resource use; environmental justice for resource-providing communities; and explicit social and economic policies to manage without growth. We present each below.

A GND without growth should lower the profitability requirements of investments for supporting the energy transition. This, in turn, raises the issue of ownership of energy enterprises and assets. Recent GND proposals emphasise the need for public control of the energy sector

(Pollin, 2019), which finds some echoes also in degrowth literature (Kunze and Becker, 2015). Indeed, in order for a growing share of public investment of a contracting economy to be directed to the clean energy transition, it is necessary for the government to take greater control of investments (Kallis, 2018). Investments in renewable energy will bring returns over much longer timeframes than traditional financial markets expect, and it is therefore necessary to rethink the ecology of investment: “there is likely to be a substantially enhanced role for public sector’s investments and asset ownership since its rates of return are typically lower than commercial ones, allowing longer investment horizons and less punishing requirements in terms of productivity” (Jackson, 2009). Social ownership of essential infrastructures can also lead to a more democratic control over the economy, arguably an essential element of both degrowth and the GND (Eskelinen, 2015). To this end, public development banks can play a crucial role in providing loans and subsidies for publicly- and community-owned enterprises (Marois, 2017).

The GND puts at centre a Just Transition framework. It envisions that workers in brown industries should be fully retrained to find new job opportunities in clean sectors. An essential element of this vision is that labour unions should be at the negotiating table to make sure that the transition is co-created and co-shaped (Newell and Mulvaney, 2013). Degrowth scholars agree with this approach, but they go one step further by calling “for a truly democratic, worker-controlled production system” (Barca, 2019). This would also entail a shift in income and welfare creation from industrial production to social and environmental reproduction: maintenance, recycling, repair, and restoration of environmental and infrastructural resources, as well as education, culture and care.

In terms of employment policies, the proposal for a job guarantee is another point of convergence between the GND and degrowth narratives. A job guarantee enables full employment despite contracting aggregate economic activity and it creates the possibility for people to earn a living outside the sphere of capital accumulation (Alcott, 2013; Unti, 2012). Work provided through the job guarantee can be channeled towards environmentally sustainable projects as it involves production for use rather than exchange. The job guarantee can be aimed at activities with high social value, such as care work, habitat restoration, and community services. A job guarantee can also be instrumental to the implementation of other degrowth measures, such as work-time reduction: the State could initiate a shorter working week and, in so doing, pressure private employers to follow suit.

H.R. 109 aims to provide high-quality health care, affordable housing, and economic security to all U.S. citizens: arguably, the expansion of the welfare state is one of the core principles of the GND narrative. Similarly, the concept of ‘gratuity’ plays a central role in degrowth (Ariès, 2018) and it amounts to removing essential social services from the market. The decommodification of essential services aims at transferring their allocation away from the sphere of the market and to the sphere of social rights (Gough, 2017). This ensures that people can live flourishing lives without needing high incomes to do so (Hickel, 2019), undermining the notion that economic growth must be pursued in order to improve the lives of working people.

This approach has other benefits as well. For one, public services have a lower environmental impact than their private equivalents (Gough, 2017). Plus, reducing dependence on individual consumer goods mitigates competition for social status and, consequently, counteracts consumerism; less unequal societies tend to have lower levels of average emissions per capita (Wilkinson and Pickett, 2010). Policy proposals that provide for basic needs in a fair and sustainable way include: a progressive tariff structure for water and electricity, an enhanced and free public transport system, public housing with passive houses, and low-carbon public amenities (swimming pools, libraries, community gardens, etc.). A GND without growth could, for instance, involve the adoption of a policy of Universal Basic Services (Coote et al., 2019).

For the GND without growth to fit within rapidly-shrinking 1.5C and 2C carbon budgets, the low EROIs of renewable energy sources, and principles of international social justice, it entails that aggregate energy demand must be reduced, and this can be achieved with a gradually declining cap on energy use. Reductions in energy demand can best be achieved by reducing material throughput, since material extraction and consumption is a major driver of energy demand. This approach to reducing material throughput has the added benefit of releasing pressure on ecosystems (i.e., land-use change, biodiversity loss, etc.) (Grubler et al., 2018).

Policy proposals that go in this direction include legislation for longer-lasting products (banning planned obsolescence, introducing right to repair, mandatory recyclability, mandatory long-term warranties, etc.), and a shift from private provisioning to public provisioning (i.e., public transportation instead of private cars, public water instead of bottled water, etc.). Furthermore, a GND without growth must be cognizant of the social and ecological impacts of the material extraction required for the clean energy transition, and of the fact that this extraction will largely happen in global South communities (Riofrancos, 2019). Replacing a rapacious fossil-fuel industry with an equally predatory renewables industry is not in line with the principles of global justice (Ajl, 2018). Supply chain justice should be at the forefront of the energy transition to ensure that the materials required are handled with commitment to social and environmental justice in the rest of the world.

Reducing energy and material throughput will most likely end up slowing down GDP growth and destabilizing institutions that require and depend on growth. A GND without growth must pre-empt these problems by adopting policies for ‘managing without growth’ (Victor, 2018). Such policies can, for instance, include work-time reduction to facilitate work-sharing (Kallis et al., 2013), wealth redistribution through income and wealth caps (Buch-Hansen and Koch, 2019), green tax reform (Cattaneo and Vansintjan, 2016), and environmental caps (Mastini and Rijnhout, 2018).

Having charted the possibilities of a GND without growth, we should recognize that there are also tensions between GND and degrowth visions, that some may find irreconcilable. As a reviewer to this paper noted, the main problem that makes the two proposals difficult to bridge is not just growth and finance, but differences in terms of the degree of structural change involved in each proposal and their underlying values/ideology. If one pushes the degrowth argument to its logical conclusion, given the dependence of capitalism on growth, a degrowth transition cannot be achieved within capitalism. Likewise, if one takes seriously degrowth’s arguments about the scale of the necessary energy and resource use reductions, and for paying reparations and ecological debts to exploited regions, as well as avoiding further injustices in the future, this is very likely to include a dramatic reduction in material standards in high-income parts of the world. Many in the degrowth camp have advocated for a more radical restructuring of social organization in the mold of transition towns, low-impact living, ecoregions with minimal trade, etc. This vision obviously chokes with the more statist spirit of a GND, with its emphasis on technology, big infrastructures and large flows of money, and on jobs and salaries. While the GND is quite a radical policy agenda, it does not go as far as challenging capitalism, but rather thinking of how to reform capitalism from within. And its emphasis on top-down action, even if movement mobilized, does not sit necessarily easily with degrowth’s emphasis on bottom-up actions and prefigurative, grassroots politics.

On the other hand, one should recognize that these are also differences and tensions that the degrowth movement faces internally, with a tension between reformist and state-based approaches and more ‘socialist utopian’ vision around eco-regions and a radically altered, non-capitalist future (Kallis, 2018). D’Alisa and Kallis (2019) try to articulate a new understanding of the state for the degrowth movement, going beyond top-bottom or politics-grassroots dichotomies. Based on Gramsci’s theory of the state they argue that policies can be understood as

the culmination of movement demands building upon embodied everyday, grassroots practices. This echoes André Gorz's concept of "revolutionary reforms", which the degrowth movement has mobilized: reforms that, if they were to be implemented, would require the very contours of the system to change radically to accommodate them (Kallis, 2018).

The GND from this perspective can be understood as a potentially revolutionary reform. It is a contested concept, it is a battlefield, and its meaning and ambition will be the result of the struggle waged by social movements (Riofrancos, 2019). Therefore, climate justice and degrowth activists should neither accept it acritically nor reject it, but rather hijack it towards more radical positions (Wolf and Mueller, 2019). Like its namesake before it, the GND is a social compromise: it is the response to decades of environmentally conscious class struggle. Hence, climate justice and degrowth activists need to hold two contradictory thoughts at once. First, that "as the most promising piece of social and environmental legislation the GND is worth fighting for" (Heron, 2019). Second, that if it were to be watered down (the way that the European Green Deal has been, for instance) it might just result in new rounds of primitive accumulation and commodification of nature (McCarthy, 2015).

6. Conclusions

The latest articulation of the GND narrative represents a valuable alternative to traditional market-based climate policy. It posits the importance of public investments for financing the energy transition, of industrial policies to lead the decarbonisation of the economy, of the socialisation of the energy sector to allow longer investment horizons, and of the expansion of the welfare state to provide social protection to citizens in the context of heightened environmental vulnerability and any economic contraction. Furthermore, the GND in its recent reincarnation emphasizes the Just Transition framework and of a Job Guarantee scheme for retraining and employing workers displaced from brown sectors.

We have argued that all of these proposals are coherent with the degrowth narrative. To be effective, however, the GND must place at its centre the reduction of throughput to facilitate a rapid decarbonisation of the economy and to avoid environmental problem-shifting and further extractivism in the Global South. All these elements are essential for a 'GND without growth'. Adopting this approach, however, means taking a critical stance against the claim that GDP growth is necessary for funding the ecological transition. A GND should not depend on GDP growth for its financing, but rather should mobilize financial resources through the reallocation of public expenditures, the increase of marginal taxation on the top income brackets, and the public issuance of sovereign money. And just as economic growth would not be necessary to fund GND investments, so it would not be necessary to increase human well-being and social equality as the adoption of degrowth policies (such as decommodification of basic services, work-sharing, and wealth redistribution) are more effective strategies for achieving these objectives.

While a degrowth society would be based on different social values and economic structures than the present ones, we believe that the GND can provide a transitional strategy (Parrique, 2019). Hence, the GND is a discourse fit for the initial reforming phase, in which State intervention in the economy and top-down policies are needed, and we believe that there are openings for shifting the GND towards a greater convergence with degrowth. Therefore, we agree with Pollin (2018) that one cannot wait for capitalism to end before we get serious about climate stabilization. This means that one should be ready to engage with 'revolutionary reforms' within the current system - reforms which, when implemented, may not only radically reduce carbon emissions, but may also stretch the limits of the very system. In our view, a GND without growth is such a revolutionary reform.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

The project that gave rise to these results received the support of a fellowship from "la Caixa" Foundation (ID100010434). The fellowship code is LCF/BQ/IN18/11660059. This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No. 713673. We also acknowledge support by the 'María de Maeztu' Unit of Excellence (MDM-2015-0552) grant and the COSMOS (CSO2017-88212-R) grant from the Spanish Ministry of Economy and Business (MINECO).

References

- Ajl, M., 2018. Beyond the Green New Deal. The Brooklyn Rail. <https://brooklynrail.org/2018/11/field-notes/Beyond-the-Green-New-Deal>.
- Alcott, B., 2013. Should degrowth embrace the job guarantee? *J. Clean. Prod.* 38, 56–60.
- Alexander, S., 2013. Voluntary simplicity and the social reconstruction of law: degrowth from the grassroots up. *Environ. Values.* 22 (2), 287–308.
- Anderson, K., 2015. Duality in climate science. *Nat. Geosci.* 8 (12), 898.
- Anderson, K., Bows-Larkin, A., 2013. Avoiding Dangerous Climate Change Demands de-Growth Strategies from Wealthier Nations. Kevinanderson.info (accessed on September 29th, 2019).
- Ariès, P., 2018. *Gratuité vs Capitalisme: des propositions concrètes pour une nouvelle économie du bonheur*. Larousse Paris, France.
- Arnspurger, C., Bourg, D., 2017. *Écologie intégrale. Pour une société permacirculaire*. Presses Universitaires de France, Paris, France.
- Aronoff, K., Aldana Cohen, D., Battistoni, A., Riofrancos, T., 2019. *A Planet to Win*. Verso Books, London.
- Bailey, D., 2015. The environmental paradox of the welfare state: the dynamics of sustainability. *New Polit. Econ.* 20 (6), 793–811.
- Barbier, E.B., 2016. Building the green economy. *Can. Public Policy* 42, S1–S9.
- Barca, S., 2019. The labor(s) of degrowth. *Capital. Nat. Social.* 30 (2), 207–216.
- Bardi, U., 2014. *Extracted: How the Quest for Mineral Wealth Is Plundering the Planet*. Chelsea Green, London, UK.
- Battistoni, A., Riofrancos, T., 2019. Bernie Sanders's Green New Deal Is a Climate Plan for the Many, Not the Few. *Jacobin*. <https://jacobinmag.com/2019/08/bernie-sanders-climate-green-new-deal>.
- Blyth, M., 2015. *Austerity: The History of a Dangerous Idea*. Oxford University Press, Oxford, United Kingdom.
- Bruenig, M., 2019. How to Make the TVA a Clean Energy Juggernaut. *Jacobin*. <https://jacobinmag.com/2019/01/tennessee-valley-authority-green-new-deal>.
- Buch-Hansen, H., Koch, M., 2019. Degrowth through income and wealth caps? *Ecol. Econ.* 160, 264–271.
- Burton, M., Somerville, P., 2019. Degrowth: a defence. *New Left Rev* 115.
- Capellán-Pérez, I., de Castro, C., Arto, I., 2017. Assessing vulnerabilities and limits in the transition to renewable energies: land requirements under 100% solar energy scenarios. *Renew. Sust. Energ. Rev.* 77, 760–782.
- Capellán-Pérez, I., de Castro, C., Salamanca, A., González, L.J., 2018. Dynamic EROI of the Global Energy System in Future Scenarios of Transition to Renewable Energies. *Cattaneo, C., Vansintjan, A., 2016. A Wealth of Possibilities: Alternatives to growth*. Green European Foundation, Brussels, Belgium.
- Coote, A., Kasliwal, P., Percy, A., 2019. *Universal Basic Services: Theory and Practice*. Institute for Global Prosperity. University College, London.
- Cosme, I., Santos, R., O'Neill, D.W., 2017. Assessing the degrowth discourse: a review and analysis of academic degrowth policy proposals. *J. Clean. Prod.* 149, 321–334.
- Cox, S., 2020. *The Green New Deal and Beyond*. City Lights Books, San Francisco.
- Czeskleba-Dupont, R., Grunwald, A., Hvelplund, F., Lund, H., 1994. *European Energy Policy and Green New Deal: Proposals for the Realisation of Energy-Economic Alternative*. Institut fuer Oekologische Wirtschaftsforschung, Berlin (Germany).
- Daly, H., 2013. Top 10 Policies for a Steady-State Economy. <https://steadystate.org/top-10-policies-for-a-steady-state-economy/>.
- de Graaf, J., 2019. The Promise of the Green New Deal. *Front Porch Republic*. <https://www.frontporchrepublic.com/2019/03/the-promise-of-the-green-new-deal/>.
- Demaria, F., Schneider, F., Sekulova, F., Martinez-Alier, J., 2013. What is degrowth? From an activist slogan to a social movement. *Environ. Values* 22 (2), 191–215.
- D'Alisa, G., Kallis, G., 2020. Degrowth and the State. *Ecological Economics* 169.
- Economist, The, 2019. A Bold New Plan to Tackle Climate Change Ignores Economic Orthodoxy. <https://www.economist.com/finance-and-economics/2019/02/07/a-bold-new-plan-to-tackle-climate-change-ignores-economic-orthodoxy>.
- Elliott, L., Hines, C., Juniper, T., Leggett, J., Lucas, C., Murphy, R., Pettifor, A., Secrett, C., Simms, C., 2008. *A Green New Deal*. New Economics Foundation. London.
- Eskelinen, T., 2015. Possibilities and limits of Green Keynesianism. In: *Borgnäs, K.,*

- Eskelinen, T., Perkiö, J., Warlenius, R. (Eds.), *The Politics of Ecosocialism: Transforming Welfare*. Routledge, London, United Kingdom, pp. 113–127.
- Fizaine, F., Court, V., 2016. Energy expenditure, economic growth, and the minimum EROI of society. *Energy Policy* 95, 172–186.
- Fressoz, J.B., Bonneuil, C., 2013. *L'Événement Anthropocène*. Seuil, Paris, France.
- Friedman, T., 2007. A Warning from the Garden. *The New York Times*. pp. A17. <https://www.nytimes.com/2007/01/19/opinion/19friedman.html> (accessed on September 29th, 2019).
- Galvin, R., Healy, N., 2020. The green new Deal in the United States: what it is and how to pay for it. *Energy Res. Soc. Sci.* 67, 101529.
- Gough, I., 2017. *Heat, Greed and Human Need: Climate Change, Capitalism and Sustainable Wellbeing*. Edward Elgar Publishing, London.
- Grubler, Arnulf, et al., 2018. A low energy demand scenario for meeting the 1.5C target and sustainable development goals without negative emissions technologies. *Nat. Energy* 3, 515–527.
- Henderson, H.L., Woolner, D.B., 2005. *FDR and the Environment*. Palgrave Macmillan, London.
- Heron, K., 2019. Capitalists Fear the Green New Deal — And for Good Reason. *ROAR*. <https://roarmag.org/essays/capitalists-fear-the-green-new-deal-and-for-good-reason/>.
- Hertsgaard, M., 2009. A global green deal. *The Nation*. <https://www.thenation.com/article/global-green-deal/> (accessed on September 29th, 2019).
- Hickel, J., 2019. Degrowth: a theory of radical abundance. *Real-World Econ. Rev.* 87, 54–68.
- Hickel, J., Kallis, G., 2019. Is green growth possible? *New Polit. Econ.* 1–18.
- Jackson, T., 2009. *Prosperity without Growth: Economics for a Finite Planet*. Earthscan, London.
- Kallis, G., 2015. Can we prosper without growth? 10 policy proposals. *Green Eur. J.* <https://www.greeneuropeanjournal.eu/can-we-prosper-without-growth-10-policy-proposals/> (accessed on September 29th, 2019).
- Kallis, G., 2018. *Degrowth*. Agenda Publishing, Newcastle upon Tyne, UK.
- Kallis, G., 2019a. A Green New Deal Must Not be Tied to Economic Growth. *TruthOut*. <https://truthout.org/articles/a-green-new-deal-must-not-be-tied-to-economic-growth/>.
- Kallis, G., 2019b. *Limits. Why Malthus Was Wrong and why Environmentalists Should Care*. Stanford University Press.
- Kallis, G., Sager, J., 2017. Oil and the economy: a systematic review of the literature for ecological economists. *Ecol. Econ.* 131, 561–571.
- Kallis, G., Kalush, M., O'Flynn, H., Rossiter, J., Ashford, N., 2013. Friday off: reducing working hours in Europe. *Sustainability*. 5, 1545–1567.
- Kallis, G., Lange, S., Muraca, B., Paulson, S., Schmelzer, M., 2018. Research on degrowth. *Annu. Rev. Environ. Resour.* 43, 291–316.
- Kapoor, S., Oksnes, L., Hogarth, R., 2011. *Funding the Green New Deal: Building a Green Financial System*. Green European Foundation, Bruxelles.
- Kaufman, A.C., 2018. The surprising origins of what could be the 'Medicare for all' of climate change. *The Huffington Post*. https://www.huffpost.com/entry/green-new-deal_n_5b3146c3e4b0b5e692f0912e (accessed on September 29th, 2019).
- Klein, N., 2019. *On Fire: The Burning Case for a Green New Deal*. Penguin Books, London.
- Kunze, C., Becker, S., 2015. Collective ownership in renewable energy and opportunities for sustainable degrowth. *Sustain. Sci.* 10 (3), 425–437.
- Le Quéré, C., Korsbakken, J.I., Wilson, C., Tosun, J., Andrew, R., Andres, R.J., 2019. Drivers of declining CO2 emissions in 18 developed economies. *Nat. Clim. Chang.* 9 (3), 213.
- Li, Z., Folmer, H., Xue, J., 2014. To what extent does air pollution affect happiness? The case of the Jinchuan mining area, China. *Ecol. Econ.* 99, 88–99.
- Marcellesi, F., 2012. 10 prioridades para la gran transformación. <http://florentmarcellesi.eu/2012/11/06/apuntes-sobre-la-crisis-ecologica-y-prioridades-para-la-gran-transformacion/>.
- Marois, T., 2017. *How Public Banks Can Help Finance a Green and Just Energy Transformation*. The Transnational Institute, Amsterdam, The Netherlands.
- Masson-Delmotte, V., Zhai, P., Pörtner, H.O., Roberts, D., Skea, J., Shukla, P.R., Pirani, A., Moufouma-Okia, W., Péan, C., Pidcock, R., Connors, S., 2018. *Special Report on Global Warming of 1.5 °C*. Intergovernmental Panel on Climate Change.
- Mastini, R., Rijnhout, L., 2018. *Sufficiency: Beyond the Gospel of Eco-Efficiency*. Friends of the Earth Europe, Brussels, Belgium.
- Mazzucato, M., McPherson, M., 2018. *The Green New Deal: A Bold Mission-Oriented Approach*. Institute for Innovation and Public Purpose. University College, London.
- McCarthy, J., 2015. A socioecological fix to capitalist crisis and climate change? The possibilities and limits of renewable energy. *Environ Plan A* 47 (12), 2485–2502.
- Murphy, D.J., Hall, C.A., 2010. EROI or energy return on (energy) invested. *Ann. N. Y. Acad. Sci.* 1185 (1), 102–118.
- Newell, P., Mulvaney, D., 2013. The political economy of the 'just transition'. *Geogr. J.* 179 (2), 132–140.
- O'Neill, D., et al., 2018. The EU needs a stability and wellbeing pact, not more growth. *The Guardian*. <https://www.theguardian.com/politics/2018/sep/16/the-eu-needs-a-stability-and-wellbeing-pact-not-more-growth> (accessed on October 18th, 2019).
- Parrique, T., 2019. The political economy of degrowth. *Economics and Finance*. Université Clermont-Auvergne; Stockholms universitet.
- Pettifor, A., 2019. *The Case for a Green New Deal*. Verso Books, London.
- Pollin, R., 2018. De-growth vs a green new Deal. *New Left Rev* 112, 5–25.
- Pollin, R., 2019. Here's What a Green New Deal Looks like in Practice. *Truthout*. <https://truthout.org/articles/heres-what-a-green-new-deal-looks-like-in-practice/>.
- Positive Money, 2018. *Escaping Growth Dependency*. London.
- Rauchway, E., 2008. *The Great Depression and New Deal*. Oxford University Press, USA.
- Riofrancos, T., 2019. *Plan, Mood, Battlefield - Reflections on the Green New Deal*. Viewpoint Magazine. <https://www.viewpointmag.com/2019/05/16/plan-mood-battlefield-reflections-on-the-green-new-deal/> (accessed on September 29th, 2019).
- Sanders, B., 2019. *The Green New Deal*. <https://berniesanders.com/en/issues/green-new-deal/>.
- Scheidel, A., Del Bene, D., Liu, J., Navas, G., Mingorría, S., Demaria, F., Avila, S., Roy, B., Ertör, I., Temper, L., Martínez-Alier, J., 2020. Environmental conflicts and defenders: a global overview. *Glob. Environ. Chang.*
- Schneider, F., Kallis, G., Martínez-Alier, J., 2010. Crisis or opportunity? Economic degrowth for social equity and ecological sustainability. *J. Clean Prod.* (18), 511–518.
- Stuart, D., Gunderson, R., Petersen, B., 2019. Climate change and the Polanyian counter-movement: carbon markets or degrowth? *New Polit. Econ.* 24 (1), 89–102.
- Talbot Zorn, J., Beachy, B., Gunn-Wright, R., 2019. A green new Deal is fiscally responsible. Climate inaction is not. *The Guardian*. <https://www.theguardian.com/commentisfree/2019/feb/25/green-new-aoc-deal-fiscally-responsible-climate-inaction> (accessed on September 29th, 2019).
- UNEP, 2009. *Global Green New Deal*. Green Economy Initiative, Nairobi, Kenya.
- Unti, B.J., 2012. Full Employment & Degrowth: The social and ecological sustainability of the job guarantee. In: *Proceedings of the International Degrowth Conference Venice*.
- Victor, P.A., 2018. *Managing without Growth: Slower by Design, Not Disaster*. Edward Elgar Publishing, London, UK.
- Wallace-Wells, B., 2019. How Alexandria Ocasio-Cortez's allies supplanted the Obama generation. *The New Yorker*. <https://www.newyorker.com/news/the-political-scene/how-alexandria-ocasio-cortezs-allies-supplanted-the-obama-generation> (accessed on September 29th, 2019).
- Warr, B.S., Ayres, R.U., 2010. Evidence of causality between the quantity and quality of energy consumption and economic growth. *Energy*. 35 (4), 1688–1693.
- Wilkinson, R., Pickett, K., 2010. *The Spirit Level. Why Equality Is Better for Everyone*. Penguin, London.
- Wolf, O.F., Mueller, T., 2019. Green new deal: dead end or pathway beyond capitalism? *Turbulence*. <http://www.turbulence.org.uk/turbulence-5/green-new-deal/index.html> (accessed on June 18th, 2020).
- York, R., 2012. Do alternative energy sources displace fossil fuels? *Nat. Clim. Chang.* 2 (6), 441.
- York, R., Bell, S.E., 2019. Energy transitions or additions? Why a transition from fossil fuels requires more than the growth of renewable energy. *Energy Res. Soc. Sci.* 51, 40–43.