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ABSTRACT

In the US and UK, Green New Deal (GND) agendas have gained significant support as means to reconcile environmental sustainability with a socially fairer economy. Their transformative vision has stimulated proposals such as more public goods, workers' cooperatives, eco-localisation and caring activities. When seeking support from major political parties, however, GND agendas have undergone pressure to accept decarbonisation technofixes, as promoted by carbon-intensive industries in alliance with their trade unions. Such promises have provided an investment imperative for dubious low-carbon remedies, or an alibi to await their feasibility, or both at once. These agendas imagine the nation as a unitary economic space needing technoscientific advance for a global competitive advantage. Divergences within the labour movement express rival sociotechnical imaginaries of a low-carbon future. This conflictual process has shaped what counts as Green and Deal for a GND. Similar tensions will arise around any low-carbon transition, given the wider capitalist frameworks of Green Keynesianism and Green Growth. To go beyond them will depend on political struggles to disrupt the hegemonic cross-class alliance, to create different alliances and to gain state support for their agendas.

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1. Introduction

In recent years, Green New Deal (GND) agendas have gained significant support as a means to reconcile decarbonisation, environmental sustainability and a socially fairer economy. In such agendas, an economically-active state would make and stimulate investment in low-carbon systems, towards a “net-zero carbon” economy. GND agendas have gained extra impetus from mass protest demanding “System Change not Climate Change.”

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All this has stimulated wider debate on the system that must be changed, for what alternative future and by what means. This article analyses how political processes have mutually shaped Green and Deal, involving tensions between system change versus continuity. The article is based on publicly available documents, with advice from some activists involved in GND agendas.

2. Strategic Lacunae: Concepts for Investigation

For any low-carbon transition such as a GND, eco-socialist writers have raised several difficult issues. To substitute low-carbon systems, how could the necessary investment avoid great environmental burdens of GHG emissions and material inputs, especially in imports from the global South? Given the conflict with high-carbon sunk investments, how could such a transition overcome capitalist opposition? And likewise, avoid assimilation by capitalist agendas, often called Green Growth or Green Keynesianism? (See Goldstein and Tyfield 2018; White 2020).

GND agendas have undertaken to provide employment security, entailing many dilemmas. On the one hand, a jobs guarantee implies rising consumption and thus resource burdens, in conflict with GHG reduction targets and especially climate justice in the global South (Beuret 2019). On the other hand, a low-carbon transition may accelerate trends towards automation and need less paid labour, in a capitalist context where jobs remain the basis for income (Stoner 2020). How can these aims and constraints be reconciled? How to go beyond dependence on capitalist employers for livelihoods?

An equitable low-carbon transition would depend on stronger support from the organised working class (Sica 2019). Yet this political task faces divergent stances of trade unions in the public sector versus carbon-intensive sectors, as manifest in their Just Transition agendas (TUED 2018). Such agendas have several ambiguities, especially whether low-carbon systems merely supplement carbon-intensive systems or replace them.

Some transition agendas have proposed to expand labour-intensive caring activities; these have several aims, e.g. to valorise caring skills, to provide socially useful employment and to minimise burdens on natural resources (Bhattacharya 2019). Although valid, such proposals neglect technical aspects of structural change. More generally, low-carbon transition agendas accept a false binary between social versus technical solutions, thus limiting scrutiny of socio-technical design (White 2020, 21). Any low-carbon or decarbonisation technology has a design favouring some socio-economic arrangements and resource usages, thus warranting critical evaluation as societal choices.

Those lacunae can be investigated through some analytical questions:

- (1) How do low-carbon transition agendas deal with carbon-intensive industries? What political processes mutually shape Green and Deal?

- (2) How do GND agendas understand social and technoscientific change – as either separate or as integrally linked?
- (3) How could the latter understanding inform eco-socialist strategies?

Answers require some analytical concepts, as explained below.

For the first question, let us consider the dual concepts of economic and sociotechnical imaginaries. As understood by cultural political economy, an “imagined economic space” may become grounded in an “imagined community of economic interest” (Jessop 2005, 162). To assemble effective coalitions, actors “articulate strategies, projects and visions oriented to these imagined economies” (Jessop 2010, 345). In their performative role, such imaginaries serve to mobilise the conditions to achieve specific futures. As the dominant economic imaginary since the 1990s, the nation becomes a single competitive space facing a common external threat and opportunity for global markets (Rosamond 2002, 169).

A related concept, “sociotechnical imaginary,” describes state-led projects promoting and imagining technological solutions that can help to fulfil a vision for a feasible, desirable future. Sociotechnical imaginaries often underlie or anticipate a state agenda (Jasanoff 2004, 2015). Within each sociotechnical imaginary, advocates co-produce a distinctive form of natural resources, knowledge and social order. Along those lines, any transition agenda links Green, technoscientific knowledge and a Deal, respectively.

For the second question above, the adjective “sociotechnical” has more general meanings. Any technoscientific design facilitates a specific social order, e.g. by favouring cooperative versus competitive market relations. Any such design emerges from sociotechnical networks of diverse actors. Each brings their own expertise, frames and criteria for success, which may be integrated within a single frame for sociotechnical change (Bijker 1997; also Law 1986). Although the academic literature emphasises multi-actor cooperation, the term “sociotechnical” can illuminate conflicts within or between networks. Indeed, rival sociotechnical networks may promote divergent societal visions, as in conflicts over a low-carbon transition.

Those dynamics already have arisen around Just Transition, which has divergent versions within each country (Farand 2018; TUED 2018). By contrast, at least in the US and UK, the Green New Deal has an institutional ownership generating a distinctive trajectory. Its dynamics warrant answers to the above questions, as a basis for insights about transition agendas. Beyond the limits of national policies, joint community-trade union initiatives may find opportunities for local pilot projects, in turn, sharpening issues for national agendas (see final section).

3. Green New Deals: Reconciling Employment with Environment?

The GND concept has resonances with the 1930s US New Deal, where a rising labour movement helped to transform the political-economic system. A laissez-faire anti-working-class state was turned into a social democratic regime expanding infrastructural investment, as the basis for a higher-wage, higher-productivity economy. Its legal guarantees for workers' rights facilitated mass-membership industry-wide trade unions, in turn benefiting workers' collective power in general.

Those resonances with workers' collective agency have helped build widespread support for a GND today. In the US and UK, GND agendas promise employment security. Early versions inspired collective imaginations about lower-energy, low-carbon systems with secure high-quality trade-union jobs.

Structural changes could reduce today's energy usage by 40 percent by the year 2050, thus facilitating decarbonisation of the remainder (Grubler et al. 2018). System change would depend on a political commitment for significant replacement, in particular: public goods replacing many individual consumer goods, cheaper renewable energy replacing fossil fuels, low-carbon public transport replacing some private transport, agroecological methods replacing industrial food production, a plant-based diet replacing meat, etc.

As regards those issues, prevalent GND agendas remain at best ambiguous. They face many political tensions among contradictory aims and among potential allies. These tensions have been discursively softened by decarbonisation technofixes (next section 2.1), a feature of prevalent socio-technical imaginaries (section 2.2).

3.1. Fossil Fuels to be Decarbonised?

For several decades, "clean" fossil fuels have been imagined as a long-term future, offering a politically convenient evasion (Greenpeace USA 2015; Krüger 2017; Smolker 2015). In particular, Carbon Capture and Storage (CCS) has been central in recent capitalist agendas for Green Growth, whereby technological-managerial innovations would somehow reconcile climate protection with economic growth. These agendas anticipate that such technofixes will eventually decarbonise or displace carbon-intensive systems, mainly through market forces (Dale 2016).

This vision plays an everyday role in system continuity, regardless of when or whether fixes ever become commercially viable. The International Energy Agency regrettably classified CCS as "not on track." Nevertheless, optimistic expectations prevail: its net-zero carbon scenario for the year 2060 includes 7 percent energy from fossil fuels with CCS, as well as 2 percent from biomass with Bio-Energy CCS (IEA 2017).

Numerous experts have emphasised the limitations of such technofixes (e.g. Jacobson 2020). In particular, Carbon Capture and Storage (CCS):

- needs a great energy input, potentially undermining the potential savings in GHGs;
- captures only some of the CO₂ emissions from any installation;
- has been economically-technically effective only through Enhanced Oil Recovery, i.e. pumping the carbon into an oil reservoir to increase the pressure and so facilitate extraction (GTM 2018; see also Schlissel and Wamsted 2018), hence futile from a climate perspective; and thus
- remains implausible as a significant means to decarbonise fossil fuels in the foreseeable future, if ever.

Apart from the above exception, US investors have abandoned many CCS pilot projects over the past decade.

3.2. Trade Union Divergences on Decarbonisation

Despite the expert caveats about decarbonisation technofixes, carbon-intensive companies and their trade unions have jointly promoted them. As one reason, fossil-sector workers often have achieved greater job security and wages than in other sectors (e.g. Mitchell 2011). These gains may seem jeopardised by substituting renewable energy (Nilsen 2021).

By contrast, based more in public-sector unions, Trade Unions for Energy Democracy (TUED) emphasise the fundamental problem, namely: capitalist economic structures drive rises in resource usage especially fossil fuels. CCS has minimal prospects to mitigate the GHG emissions. For the US coal industry, “even if CCS is deployed on a mass scale, the health impacts and environmental damage associated with extracting, transporting, and burning coal will not be eliminated and may become worse due to the ‘energy penalty’ associated with CCS” (TUED 2015, 2).

Although natural gas extraction may be relatively less harmful, CCS likewise remains problematic for decarbonising this energy source. This chimera has been driven by a search for economic competitiveness and growth. Instead, trade unions must “develop transformational strategies that are anchored in a paradigm of sharing, solidarity, and sufficiency” (TUED 2018, 43).

Extending all those doubts about CCS, social scientists have analysed the wishful basis for CCS attracting optimistic expectations (Lohmann 2009; Markusson et al. 2012). Even a modest financial investment serves to reconcile “low carbon” scenarios with fossil fuels, especially coal in the US and natural gas in the UK. Such technofixes have become central to wider socio-technical imaginaries accommodating trade unions and companies from

carbon-intensive sectors (By contrast with major political parties, Green Parties generally have elaborated a GND as an ideal wish-list, without any regard to multi-stakeholder alliances).

This article will analyse how GND agendas have engaged with those contradictory agendas, especially to deal with carbon-intensive sectors, in tension with the GND's early supporters seeking system change. Such tensions became salient when early proponents sought wider support as a basis for a government programme of the US Democratic Party and UK Labour Party. Let us look at those two contexts in turn, and then take a deeper look at where the tensions come from.

4. US Justice Democrats' GND

As antecedents of a Green New Deal, the US has had significant linkages between trade unions and environmentalist agendas. Yet tensions between them have limited the prospects for structural change towards less resource-intensive production systems. These dynamics can be illustrated by three brief examples.

Landmark alliances were forged in the 1960s–1970s by the Oil, Chemical and Atomic Workers International Union (OCAW), especially under the leadership of Tony Mazzocchi. Early on he took up campaigns for women's equal pay, then occupational health and safety, soon linked with environmentalist issues and organisations for a transformative agenda. But this was undermined by his trade-union rivals and companies, jointly exploiting workers' fears about job losses (Leopold 2007).

Dating from 2016, "The BlueGreen Alliance unites America's largest labor unions and its most influential environmental organizations to solve today's environmental challenges in ways that create and maintain quality jobs and build a stronger, fairer economy" (BGA 2016). It has sought to upgrade the natural gas network as an alternative to coal. Within this narrow focus, it has had difficulty to expand an environmentalist alliance.

Labour Network for Sustainability (LNS) has sought to strengthen links between the labour and environmental movements "by developing policies necessary for an economy that is both just and environmentally sustainable." It launched a programme for "Making a Living on a Living Planet" (MLLP). In 2011, it joined mass opposition to the Keystone XL pipeline, which was supported by the AFL-CIO. At the same time, LNS sought to mediate conflicts with trade unions in carbon-intensive sectors, e.g. through a multi-group statement, "Labor-Environment Solidarity for a More Just and Sustainable Economy" (LNS 2013). Supporting the Green New Deal, it raised slogans such as, "Reject the 'jobs versus environment' narrative. We can do both" (Cha and Brecher 2019). It addressed doubts from trade unions in carbon-intensive sectors (LNS 2019; see below). Those three

initiatives briefly illustrate tensions that arose more starkly around the US GND as promoted by Justice Democrats.

4.1. Frontline Communities Versus Dirty Industries

In the US, the Green New Deal agenda originated in the Sunrise Movement, an environmentalist social movement. In 2018, Sunrise declared:

The Green New Deal is a 10-year plan to mobilize every aspect of American society to 100% clean and renewable energy by 2030, a guaranteed living-wage job for anyone who needs one, and a just transition for both workers and frontline communities.

It has sought “to end the corrupting influence of fossil fuel executives on our politics.” It opposed the neoliberal politics dominating the Democratic National Committee and its election candidates.

Well before the 2018 mid-term Congressional elections, the Sunrise Movement made several demands on Democratic Party nominees, in particular: that they support policies to replace fossil fuels with renewable energy, and that they refuse any funds from the fossil fuel industry. It endorsed several candidates; some were elected to Congress. They soon targeted House Majority Leader Nancy Pelosi, especially by occupying her office with demands to support a Green New Deal. In January 2019, the Sunrise Movement coordinated more than 600 local groups or a joint letter asking legislators to do so.

The groups’ joint demands included: “Halt all fossil fuel leasing, phase out all fossil fuel extraction, and end fossil fuel and other dirty energy subsidies.” Sunrise’s 2018 electoral successes had included the new U.S. Representative Alexandria Ocasio-Cortez, popularly known as AOC. As a democratic socialist, she was already a prominent figure in the Justice Democrats, seeking to elect politicians independent of corporate funds. In February 2019, she and fellow US Representative Ed Markey co-sponsored a Green New Deal House Resolution, which gained numerous Congressional sponsors.

The Resolution advocated an economic transformation that would shift socio-political power through mass participation: “A Green New Deal must be developed through transparent and inclusive consultation, collaboration, and partnership with frontline and vulnerable communities, labor unions, worker cooperatives, civil society groups, academia, and businesses.” Likewise this agenda has sought to include dispossessed groups by “stopping current, preventing future, and repairing historic oppression of indigenous peoples, communities of color, migrant communities, deindustrialized communities, depopulated rural communities, the poor, low-income workers, women, the elderly, the unhoused, people with disabilities, and youth” (US HR GND 2019).

Such a popular mobilisation would shape public investment in “clean green” technology, contributing to these aims:

to achieve net-zero greenhouse gas emissions through a fair and just transition for all communities and workers; to create millions of good, high-wage jobs and ensure prosperity and economic security for all people of the United States; to invest in the infrastructure and industry of the United States to sustainably meet the challenges of the twenty-first century. (US HR GND 2019)

Although the HR GND Resolution sought a low-carbon “economic transformation,” the text had at least three potential limitations. First, “net zero” has great scope to continue fossil fuel usage through carbon offsetting. Second, especially for the transport, manufacturing and agriculture sectors, the “net zero” commitment has a recurrent qualifier: “eliminating pollution and greenhouse gas emissions as much as technologically feasible.” This ambiguous phrase could encompass diverse scenarios ranging from green capitalist to ecosocialist (Riofrancos 2019); the former relies on future technoscientific advance to reconcile contradictory objectives, while attributing any delays or constraints to technological gaps.

Third, the Resolution left scope for capital-intensive technofixes with doubtful environmental benefits. Originally AOC had argued that US electricity should come only from renewable power sources, e.g. solar, wind or wave. However, seeking the broadest support, the House Resolution ambiguously advocated “clean, renewable, and zero-emission” energy sources. This language left open scope for system continuity such as nuclear power, even fossil-fuels with CCS, as well as large-scale air travel. Such a broad scope was acknowledged by Representative Markey (cited in Roberts 2019).

4.2. Decarbonisation “Technologically Feasible”?

The GND concept had enthusiastic support from many US trade unions, especially those in the public sector, even before the February 2019 House Resolution. Despite its promise of employment security and ambiguity about fossil fuels, trade unions in those high-carbon sectors raised objections. The AFL-CIO Energy Committee criticised the GND HR on several grounds, e.g. that it focuses overly on decarbonising energy production, lacks a credible plan to decarbonise transport and omits engineering solutions such as CCS. Thus it “makes promises that are not achievable or realistic” (AFL-CIO Energy Committee 2019).

The Labour Network for Sustainability acknowledged the salient concerns about jobs. In past historical changes, workers had been “transitioned out of existence.” To avoid such a fate, “Workers and their unions need to be at the table to insist that future changes not be at the expense of workers and communities.” For creating good jobs through decarbonisation, the

GND will build on the US' past technological advances; it "will jump-start necessary technological advances in electrification from renewables; upgrading and modernizing the grid; accelerating electrification of cars, buses, trucks, and even planes; in regenerative agriculture; and in many other fields" (LNS 2019). This response accommodated techno-optimist reassurances, within an imperative for all trade unions to be involved in shaping the GND agenda.

As highlighted in the House Resolution, carbon-intensive sectors have systematically damaged "frontline and vulnerable communities." They are predominantly lower-income, ethnic minorities and communities of colour; they suffer the greatest harm from the fossil-fuel industries and road traffic. Many live and work in areas which have poor public transport, reinforcing dependence on private motor vehicles as a vicious circle. So they would especially benefit from a GND.

Such communities and their resistance originally inspired the slogan "environmental justice" in the 1980s (Bullard 1996). Their role gives a broader meaning to care work:

In the Global North, we have workplace struggles of migrant workers who perform the bulk of care work in homes and hospitals, alongside a growing strike wave led by teachers and nurses. These are joined by community struggles for clean water and clean air, most often led by communities of color, exposing the deliberate, racialized poisoning of the environment by capital. (Bhattacharya 2019)

The GND invites such communities to help shape a transition replacing dirty industries that have poisoned them.

For this objective, a systemic remedy would threaten past investment in current carbon-intensive systems and thus provoke sharp political conflict. Perhaps, for this reason, the GND HR "does not squarely establish a timeline for when we turn off the tap on fossil fuels," lamented activists such as WE ACT for Environmental Justice (Mock 2019). Such communities likewise would most benefit from "a more sustainable food system that ensures universal access to healthy food" (AOC 2019, 9); but the GND remains silent on the carbon-intensive unhealthy livestock industry.

Along lines of the original GND from the Sunrise Movement, Naomi Klein advocates reducing sectors such as "air travel, meat consumption, and profligate energy use," and ending "the carbon-intensive lifestyle of suburban sprawl and disposable consumption." These systemic changes would use all available tools including "public infrastructure, economic planning, corporate regulation, international trade, consumption, and taxation." As a prerequisite for such changes, we would need "a massive, broad-based effort to radically reduce the influence that corporations have over the political process" (Klein 2019, 90).

A promotional film imagines a GND transition in the year 2030. Referring back to the year 2019: “We knew that we needed to save the planet and that we had all the technology to do it” (AOC 2019). Indeed, an environmentally sustainable, socially just, net-zero carbon society has been technologically feasible for a long time, but incompatible with dominant production systems (see further in section 5). Hence the GND House Resolution recurrently mentions “technological feasibility” as an ambiguous proviso for dealing with carbon-intensive sectors. Analogous tensions have arisen in the UK, where the Green transformative potential has been constrained by a labour movement Deal, as the next section shows.

5. UK Labour Party's GND

In the UK, the Green New Deal concept has a long history. After the 2008 financial crisis, when governments were bailing out banks for their benefit, a civil society GND counterposed an alternative. It was “a sustained programme to invest in and deploy energy conservation and renewable energies, coupled with effective demand management” for energy, financed through state instruments. This agenda came from several environmentalist experts, coordinated by the New Economics Foundation (GNDG 2008). The New Labour government soon appropriated the GND concept for its ecomodernist agenda, featuring state investment in capital-intensive innovation. This version went no further before the government's defeat in the 2010 general election.

A decade later the concept re-emerged from a new group, Labour for a Green New Deal. This promoted a “socialist zero carbon” economy by 2030. This ambitious target would enable Labour Party members to “lead a radical reconstruction of our country from the ground up” (LFF 2019; LabGND 2019a). The GND “must urgently phase out all fossil fuels.” It “will invest in mass deployment of carbon-neutral heavy industry technology.” Its agenda would “transform the economy through unprecedented investment in technology, infrastructure and people.” It declared, “We can take the economy out of the control of the super-rich, and put it in the hands of ordinary people” (LFF 2019; LabGND 2019a)

This original vision conflicted with agendas from trade unions in carbon-intensive sectors, calling themselves “the energy unions.” At the previous year's TUC conference they had sponsored a motion to “develop a political and lobbying strategy” for a Just Transition to a low-carbon economy, “led by the voices and experiences of energy unions and their members.” In particular, the government should ensure “a balanced energy mix,” which would include “investment in renewables, new nuclear and lower-carbon gas.” This provoked dissent, especially from public-sector unions, which were marginalised (Farand 2018).

5.1. General Election Agenda

That divergence within the TUC conference arose within the Labour Party. Much internal debate resulted in the GND motion at the 2019 annual conference (LabGND 2019b). It was silent on several issues, e.g. fossil fuels, North Sea oil extraction and nuclear power; the latter two were already Labour Party policy. The motion undertook to “take transport into public ownership and invest in expanded, integrated, free or affordable green public transport that connects Britain.” It promised “a radical car scrappage scheme to increase electric vehicles” but not to reduce private car transport or its energy demand. As Labour’s shadow minister for Business, Energy and Industrial Strategy, Rebecca Long-Bailey MP announced an agenda for an “electric car revolution” (Levy 2019).

That emphasis came from a different agenda for a Green Industrial Revolution (GIR) agenda, which had been developed separately. Through numerous “Transform Your Town” events, the GIR campaign built a network of activists and proposals for local economies (LP COU 2019). “The ‘By the Many’ brand was a hallmark of the Labour Party’s community-based organising during the 2019 general election” (Small Axe 2019).

Led by the Unite trade union, however, it emphasised state investment in capital-intensive projects, especially “finance to re-shore supply chains and reduce the global carbon footprint of manufactured goods” (Unite 2019, 11). This assumed that UK technoscientific innovation would eventually decarbonise them more effectively than other countries. The GIR’s agenda to re-industrialise Britain shaped the 2019 election manifesto along different lines than the earlier GND.

The manifesto modestly undertook “to achieve the substantial majority of our emissions reductions by 2030 in a way that is evidence-based, just and that delivers an economy that serves the interests of the many, not the few” (LP Manifesto 2019, 13). The latter phrase, drawn from Shelley’s famous poem, was the main campaign slogan. In the spirit of that slogan, Labour’s GND promised transformation – but also entrenched much continuity.

Previous governments had privatised the energy sector and promoted dependence on natural gas. The Corbyn leadership proposed to nationalise the energy industry as necessary means to implement strong policies on climate change and socially just electricity provision. Yet its manifesto promised to nationalise only the distribution grid, not the Big Six energy generation companies (LP Manifesto 2019, 16). Behind the scenes, they were politically protected by the GMB, one of the “energy unions” (Levy 2019).

The manifesto also promoted public-interest alternatives: “We will expand distributed and community energy... We will support energy workers through transition and guarantee them retraining and a new,

unionised job on equivalent terms and conditions” (LP Manifesto 2019, 16). A Labour government would also tax the tech giants to “pay for the operating costs of the public full-fibre network” and would break their hold on advertising revenues (LP Manifesto 2019, 53).

A broader agenda would re-industrialise the UK economy. “We can invest in our Green Industrial Revolution, deploying our collective resources to rapidly green our economy, creating one million skilled jobs and laying the foundations of a society that thrives and endures.” This aim identified with UK-based capital gaining a global competitive advantage through economic growth: “And by taking radical action at home, UK companies will be in a prime position to make up a large share of the global green economy which by the late 2020s is expected to grow to \$9 trillion” (LP GTF 2019, 3).

Likewise presuming continuity, moreover, it emphasised capitalist enterprises as the main means to green production methods. With its Green Industrial Revolution (GIR) agenda, the Labour Party evoked successful features of the original Industrial Revolution – productivity, innovation, economic growth – as if these were readily compatible with social justice and environmental sustainability. “The GIR proposes treatment for the symptoms of our ailing economic model – investment in green industry, decarbonisation of vital services like energy and transport – without proposing a cure for the disease itself,” according to a founder of Labour for a Green New Deal (Buller 2020).

In the Labour Party’s 2019 manifesto, the necessary finance would come from a Green Transformation Fund. Its narrative contrasted past industrial failures with a UK economy that would become globally more competitive, especially by anticipating future technologies such as CCS:

Britain was left behind in the race to develop wind and solar technology: Labour won’t let that happen again. Our plans will put UK companies and workers in pole position to lead the world in designing and manufacturing the next generation of green technology, including marine power, hydrogen and carbon capture and storage ... (LP GTF 2019, 13)

Its plan for “emerging technologies” undertook to decarbonise the most carbon-intensive sectors by depending on a hypothetical technofix. Through CCS, “We will invest £1.5 billion to make UK heavy industries the lowest carbon in the world, creating 15,000 new jobs and protecting tens of thousands of jobs reliant on those industries” (2019, 13).

Despite the Left-wing shift towards the Corbyn leadership of the Labour Party, its nationalist ecomodernist framework had continuities with New Labour’s sociotechnical imaginary from a decade earlier (Levidow and Papaioannou 2016). Both have imagined the nation as an economic space for generating eco-efficient capital-intensive innovation that would become globally competitive.

5.2. Green Industrial Revolution: System Continuity

As a difficult task for a low-carbon transition, heating systems must phase out natural gas, which has many potential substitutes. The Manifesto simply listed them (LP GTF 2019, 15). By contrast, the Green Transformation Fund emphasised the hydrogen option, which somehow would become zero-carbon despite deriving from natural gas.

Indeed, the “green transformation” plan sought technofixes for supplying “zero-emissions hydrogen” to decarbonise energy-intensive sectors:

Hydrogen gas burns with zero emissions, and can be used as substitute for natural gas in our homes, and as a fuel source for heavy goods vehicles and some industrial processes. We will invest £2.5 billion in the production and transport of hydrogen, with a focus on investments in Yorkshire and Humber, and the North East, creating 26,500 jobs.

Industrial processes like steel, cement and glass production emit carbon dioxide. CCS is the process of capturing those emissions at source, then transporting and storing carbon dioxide underground in rock formations. We will invest £1.5 billion to make UK heavy industries the lowest carbon in the world, creating 15,000 new jobs and protecting tens of thousands of jobs reliant on those industries. (LP GTF 2019, 13)

Decarbonisation technofixes gave hydrogen a central role as a storage and transmission medium. This agenda evaded crucial questions, namely: how much energy would be necessary to extract, transport and reliably store the carbon from natural gas; what renewable energy source could power the process, and thus on what basis it would be truly low carbon. Green technofixes were meant to reconcile contrary objectives.

This agenda for “zero-emissions hydrogen” came from the cross-class alliance of carbon-intensive sectors, especially trade unions in the natural gas industry, thus reinforcing its political-economic power. In 2018, this agenda had been launched as the *H21 North of England* project, a partnership between Northern Gas Networks and Equinor, Norway’s state oil company. Equinor had already developed a CCS process to decarbonise natural gas and supply hydrogen fuel for industrial purposes there (NGN 2018).

The NGN-Equinor partnership had several reasons for targeting the UK. The government has made a commitment to decarbonise heating, by means yet to be determined. Equinor has sought a UK showcase for globally exporting its CCS system; UK policy anticipates technology export as a general rationale for state finance. And disused North Sea installations provide a plausible storage site for carbon.

The H21 NoE project would greatly expand Equinor’s CCS process, as well as natural gas imports, to heat houses throughout northern England. The gas would be converted to hydrogen, often called “blue hydrogen,” which has “close to zero emissions at the point of use” (NGN 2018, 57).

Yet natural gas extraction has persistent methane emissions, impeding decarbonisation. This industry agenda has implicitly assumed that the CCS process would obtain its energy input mainly from offshore wind power, and that this energy source would have no rival uses, despite policies for widespread electrification.

By 2019, the NGN-Equinor decarbonisation agenda had gained strong support from trade unions in the fossil fuel sector, national infrastructure agencies and many Labour MPs, especially in northern England. Then the Labour Party rebranded industry's CCS-hydrogen agenda as a GND. Through this cross-class alliance, Green and Deal were mutually shaped along capitalist high-carbon lines, thus reinforcing the industry's leadership role. This would relegate "the many" to the role of consumers and employees. This contradicted the political agenda to "secure democratic control over nationally strategic infrastructure" (LP Manifesto 2019, 15). Energy-sector unions have further promoted "The Magnificent 7 shovel-ready projects," including CCS, thus exaggerating its decarbonisation capacity (Unite 2021).

6. Green Keynesianism Constraining a Low-Carbon Transition

The Introduction posed some questions about GNDs: What process mutually shapes Green and Deal? How do participants understand and deal with sociotechnical aspects? Answers here compare the US and UK cases above, informed by the dual analytical concept "economic-sociotechnical imaginaries," namely: Dominant political agendas imagine the nation as a unitary economic space whose competitive advantage needs technoscientific advance, in turn the crucial basis for decarbonisation and wider societal benefits. Sociotechnical design choices are generally bifurcated between future technoscientific advance and societal benefits which thereby may become feasible; caring activities are kept separate from apparently technical issues.

These concepts help illuminate the prevalent US and UK versions of a GND, as well as pressures that they have undergone. In both countries, the original advocates sought a transformative process linking employment security, greater socio-economic equity, and a zero-carbon economy by 2030. The latter aim had an inherent conflict with carbon-intensive sectors, protected by the hegemonic cross-class alliance between trade unions and employers.

GND agendas have left open scope to soften or postpone such conflicts through technofixes such as Carbon Capture and Storage (CCS). Technofix promises have provided an investment imperative for dubious low-carbon remedies, or an alibi to await their feasibility and thus continue carbon-intensive systems, or both at once. Those sectors' trade unions have

either criticised the GND for omitting CCS (as in the US) or appropriated the GND for CCS and thus system continuity (as in the UK).

Given those analogous tensions in the two countries, let us look at their drivers in the wider political context. Absent civil revolt strengthening the working class, a GND would be negotiated between the state, citizens' groups, trade unions and business. Although some businesses could gain; many would lose or even disappear in order to decarbonise the economy (Beuret 2019, 5). Within those constraints, there is considerable scope to shape the agenda. In such a political context, the relevant policy framework has been widely analysed as Green Keynesianism, seeking to reconcile state-led stimulus for capitalist economic growth with environmental criteria.

As the first Keynesian national project, the original New Deal featured an economically active state to foster industrial, technological, and social advance. Its labour-capital accord used public resources to rebase economic growth on privatised and fossil-fuelled wealth (Huber 2013). Apart from new hydroelectric power, it depended on fossil fuels to power higher-productivity jobs, which in turn helped trade unions to bargain for stably higher wages. Legislation to subsidise food prices improved the livelihoods of small-scale farmers, turning them into allies (Patel and Goodman 2020). The New Deal provided an initial economic stimulus and new political model, which was greatly expanded in the early 1940s rearmament for World War II. This great investment provided a basis for more fossil-fuelled, capital-intensive, skilled jobs.

By contrast with that project, a Green New Deal is meant to reconcile high-quality jobs with a low-carbon economy. It leaves ambiguous the form or extent of economic growth which would count as Green. As energy usage continues to rise, new low-carbon sources readily supplement carbon-intensive ones rather than replace them. GND agendas potentially overlap with mainstream capitalist agendas for Green Growth, which has been defined by advocates as follows: "Green growth means fostering economic growth and development, while ensuring that natural assets continue to provide the resources and environmental services on which our well-being relies" (OECD 2011, 6).

As a crucial issue, private finance could be directed or incentivised for diverse accounts of Green Growth (likewise GND). Beyond funds from extra taxes, state investment or loan guarantees would stimulate putatively low-carbon infrastructure and eco-efficient technology. Such finance would leverage private-sector investment. As advantages from investors' standpoint, the state would incentivise a less risk-averse approach in the private sector. Along these lines, the European Strategic Energy Technology Plan (SET) Plan has encouraged financial incentives for private equity and venture capital to "adjust their risk profiles," especially for greater investment in renewable energy (EC 2007).

That EU strategy resonates with global capitalist perspectives on green finance: “the private sector may work with public finance institutions and their blended finance, risk-sharing, and pipeline development tools;” these “green financial products” would “unlock private-sector investment in low-carbon solutions.” Through such a partnership, “Public budgets can continue to play a central role in clean energy deployment by guaranteeing revenues, especially in new markets and for newer technologies,” according to a Bloomberg report on low-carbon finance (CFLI 2020, 7–8).

This state-technology nexus provides a rhetorically green alternative to private-sector finance. Green New Deal agendas could readily “slip into an uncritical and wholesale endorsement of a very specific, venture capital- (and military-)funded understanding of technology and the innovation agenda underwriting it.” The green entrepreneurial state is too readily presumed to serve the public interest (Goldstein and Tyfield 2018). This deception has been criticised by the GND’s early advocates but remains a strong pressure on political parties.

7. Conclusion: Political Struggles Over a Low-Carbon Transition

In the US and UK, Green New Deal (GND) agendas have gained significant support as means to reconcile decarbonisation, environmental sustainability, and a socially fairer economy. Yet the labour movement has had significant divergences. Fossil fuel industries have sought continuity through decarbonisation technofixes, often with political support from their trade unions, unduly associating workers’ secure livelihoods with fossil energy. Their stance contrasts with many public-sector trade unions, seeking an economic transformation. These divergences exemplify tensions between system change versus continuity.

Those tensions became sharper as GND agendas sought support from major political parties. Such political struggles have shaped what counts as Green and Deal. Each agenda is informed by an economic-sociotechnical imaginary; each co-produces natural resources (Green), technoscientific expertise and social order (Deal) in a distinctive form. Given such conflicts, the state could play various roles in shaping a low-carbon transition.

Within the capitalist framework of Green Keynesianism, the state could:

- accommodate a cross-class alliance involving carbon-intensive sectors, their trade unions and “green” finance capital;
- relegate environmental issues to market competition among low-carbon techno-fixes, facilitated by state subsidies or loan guarantees; or
- directly invest in specific trajectories, e.g. for techno-fixes speculatively decarbonising fossil fuels.

All those options could maintain carbon-intensive sectors in some form or establish putatively “low-carbon” economic growth intensifying resource burdens. This would be the default mode from presuming a state saviour:

A properly political critique would contend that the Green New Deal sustains the fantasy that an enlightened state can save us from climate catastrophe, a fantasy that discourages us from taking the radical actions that are in fact a prerequisite for the state doing anything at all. (Riofrancos 2019)

Hence the need for a creatively disruptive social movement. Its political action would need to rupture the hegemonic cross-class alliance in carbon-intensive sectors. “To rewrite common sense is to unpick the alliances that the current bloc works to maintain, to find the fault lines that can pry that bloc apart, and to develop the organisational links that can build a counter-hegemonic bloc” (Patel and Goodman 2020, 432).

Such a bloc would transform the hegemonic meanings of economy, work, jobs, Green, technology, etc. For this imaginative Green New Deal to succeed, we “will need the skills and expertise of many different kinds of storytellers: artists, psychologists, faith leaders, historians, and more,” argues Naomi Klein (2019, 271). This agenda would re-orientate work around “life-making jobs,” rather than the irrational production of endless commodities (Bhattacharya 2019). Under such pressure, the state could finance worker-community cooperatives rivalling corporate interests and displacing their production systems.

Such alternatives can and do draw upon eco-localisation imaginaries. These envisage several changes localising production-consumption circuits, increasing public goods, enhancing socio-economic equity, and minimising resource burdens (Levidow and Papaioannou 2016; North 2009; North and Longhurst 2013). Such an agenda would evaluate any decarbonisation technology as a sociotechnical design choice that favours some socio-economic arrangements and resource burdens, contrary to the stereotypical binary between technical/social change.

Some new opportunities have arisen. As some local authorities declare a climate emergency, they face demands for local versions of a GND. This could mean facilitating cooperative enterprises as an alternative to profit-driven companies (McInroy 2020). During the Covid-19 crisis, businesses have sought significant public funds to survive. Governments have faced demands to set several conditions, e.g. that they treat their staff fairly and decarbonise their operations. Such demands can strengthen agendas for system change.

Local initiatives could trial GND policies to deliver multiple societal benefits, thus concretising an alternative vision (Buller 2020). These efforts depend on multi-stakeholder alliances creating cooperative organisational forms. If such a local initiative retrofits houses with insulation and heat

pumps, for example, then the tangible benefits could marginalise the “blue hydrogen” capitalist technofix. Such local pilot projects also prepare alliances for any wider opportunities that may arise.

Whatever may be the name of a low-carbon transition, similar conflicts will arise within the labour movement and beyond. Such conflicts will entail rival sociotechnical imaginaries of feasible, desirable futures. To go beyond Green Keynesianism and Green Growth, political struggles will need to disrupt the hegemonic cross-class alliance, to create new alliances and to gain state support for their alternatives.

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