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Green economic planning for rapid decarbonisation

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ABSTRACT

Sustainable futures require deep social and economic transformations to address climate change adequately. The current landscape of intergovernmental and market-based coordination is not delivering this outcome. In response, political economic scholarship is congregating around the concept of the green state as a corrective to the status quo. In spite of this resurgence of interest in the green state, much research takes place in issue-specific silos without exploring synergies between them. Our contribution is to call for an integrative agenda focused on ‘green economic planning’, a form of state-led decarbonisation whereby the state designs and implements structural complementarities between macro-financial architectures, industrial policy, and private sector incentives. Our evidence for this approach is taken from historical cases of indicative planning in post-war democracies, contemporary cases of sectoral planning by states, and finally, planning by multinational corporations. We draw not only on political economy but also on scholarship in the fields of business, environment, energy and economic history. The upshot is a new research agenda focusing on state planning capacity in hierarchical coordination institutions and multinational corporations as research laboratories for the study of the organisational and technological infrastructure needed for state planning.

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Introduction

Political economic analysis of sustainable futures has been too slow to recognise ‘the depth of the social transformation entailed in addressing climate change adequately’ (Paterson 2021, p. 395). We are reminded of the starkness of the challenge by each new report from the Intergovernmental Panel on Climate Change (IPCC) or other bodies. In 2022, the United Nations Environment Programme (UNEP 2022, p. xvi) declared that ‘incremental change is no longer an option: broad-based economy-wide transformations are required to avoid closing the window of opportunity to limit global warming to well below 2°C, preferably 1.5°C’. To date, such transformations have been understood through the ‘compromise of liberal environmentalism’ (Bernstein 2001), which predicates environmental governance on the maintenance of the liberal economic order. The problem with this compromise is that it has not delivered on the promise of adequate public and private mobilisation to achieve deep sustainability transformations (Mann 2023).

In the face of this monumental challenge, International Political Economy (IPE) faces two choices. One choice is to chronicle the collapse of the global political economy as it buckles under the multiple crises engendered by continued ecological degradation (Kemp et al. 2022). The other choice for the IPE community is to fully explore deeply transformative options for change that entail much

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greater state intervention (Gabor and Braun 2023, Hasselbalch et al. 2023). Yet what kind of such radical options should we talk about in IPE? At the time of writing, we have six years left to reduce global carbon emissions by 45% from their current level, according to the scenarios tested by the IPCC's (2022) Sixth Assessment Report. This places insurmountable structural obstacles in the path of radical ecological options, such as degrowth (Durand et al. 2024) or ecosocialism (Vettese and Pendergrass 2022), both of which require systemic political and economic transformation (highly unlikely in the short term) to drive decarbonisation.

Given the unfulfilled promises of liberal environmentalism, on the one hand, and the political obstacles to radical alternatives to it, on the other hand, we explore an overlooked option in the pursuit of sustainability transformations: 'green economic planning'. This concept refers to a form of state-led decarbonisation whereby the state designs and implements structural complementarities between macro-financial architectures (policies and institutions that design, implement, and fund monetary, fiscal, and financial policies, Gabor and Braun 2023), industrial policy (Allan et al. 2021) and existing private sector planning capabilities (Bensussan et al. 2023). For rapid decarbonisation to occur, green economic planning needs to ensure that the needed industrial policies are adequately financed by macro-financial frameworks and coordinated with corporate planning. Only by forging such complementarities within a repurposed form of statecraft can we realistically envisage the hyper-growth of green sectors and the phase-out of high-carbon sectors in a short time span. The added value of a research agenda in green economic planning consists of clarifying the specific ways in which one can illuminate complementarities between previously insulated streams of scholarship. Interest in planning is currently emerging in political economy and beyond (Planning for Entropy 2022, Durand et al. 2024, Groos and Sorg 2025). This scholarship is insightful, but because it assumes postcapitalist conditions, it is less relevant for rapid decarbonisation within the current politico-economic order. Our distinctive position is to define green economic planning as occupying a middle ground between an ineffective liberal status quo and a more distant postcapitalist future.

The conventional challenge for green economic planning is that planned sustainability transitions would happen after decades of withdrawal of the state from such complex forms of coordination. Our answer, in brief, is that capitalist states have done intersectoral planning before with good results, that sectoral planning is still used today by some leading economies, and that contemporary states can integrate technical lessons from multinational firms that have become the most active and sophisticated users of centralised forms of planning across sectors and borders during the past decades. To be effective and politically realistic, green economic planning must learn from both the public and private experience of economic planning under capitalism. Drawing together these different sources of inspiration allows us to contribute to existing debates in political economy and environmental politics about the green state (Bailey 2020, Hausknot 2020, Eckersley 2021) and the role of the state more broadly in sustainability transformations (Johnstone and Newell 2018, Babić and Dixon 2023). Today, IPE is increasingly situating the state as the prime agent of sustainability transformations and we aim to contribute to this development by specifying the forms of organisation that allow states to more effectively direct such transformations.

The article is organised as follows: we begin with a literature review and then move into the body of the article, where we recover the main lessons for green economic planning from post-war history, contemporary state practice and private sector cases. These lessons are then combined in the last section, where we provide a future research agenda for green economic planning.

Green planning: The state of the art and beyond

The field of IPE has begun to take the climate seriously over the past few years (Newell et al. 2021, Paterson 2021, p. 4), but we still lack a stronger research agenda unpacking the desirable politico-economic *agency*, especially state agency, in the face of ecological crisis (Johnstone and Newell 2018, Hasselbalch et al. 2023). Paterson (2021, p. 398) notes that the important question of *how*

to *organise* all of the existing theoretical, methodological, and substantive developments into a programme that can facilitate a *rapid* societal transformation is urgently lacking. The question of which instruments and forms of organisation are best suited to such a programme is sorely unaddressed (see Newell and Simms 2021).

A growing genre of IPE research uses the field's comparative advantages to propose institutional infrastructures for better addressing the green transition. Some, for example, use the critical macro-finance approach in IPE to outline the contours of a desirable monetary infrastructure (Guter-Sandu et al. 2024). Others investigate the challenges of building a green developmental state (Swilling et al. 2016, Thurbon et al. 2023) as opposed to a green derisking state emerging from liberal environmentalism (Gabor and Braun 2023). This rising normative work responds to disillusionment with the global programme of intergovernmental negotiations and treaties to address climate change (Bernstein and Hoffmann 2019), as well as with market-based solutions such as carbon markets (Stuart et al. 2019). This has led to growing IPE interest in the 'green state' or 'environmental state' and its role in driving sustainability transformations in recent years (Paterson 2016, Bailey 2020, Beck and Larsen 2024), including an emphasis on industrial policy and state ownership (Allan et al. 2021, Babić and Dixon 2023). It remains unsettled whether modern states can coordinate the growth of green sectors *and* the degrowth of fossil sectors, or whether they face insurmountable contradictions between sustainability goals and state structures or imperatives (Hausknost 2020, Eckersley 2021). The required depth of state transformation and capitalist practice is a constant source of contention in this literature (Bailey 2020, Eckersley 2020).

We propose that green economic planning provides a way forward by specifying how the green state can coordinate bold sustainability transformations across high-emission sectors and first-order policy domains (monetary, fiscal, financial, industrial policy) structured by current systemic conditions. In terms of scope, the paper focuses on green industrial policy and its macro-financial conditions, leaving aside the trade, labour and welfare functions of the state. This focused scope is justified because decarbonisation is predominantly about the reorientation of public and private investment, which hinges on favourable macro-financial considerations and industrial policy initiatives targeting the carbon footprint of industry, agriculture, transportation, etc. (Gabor and Braun 2023). Other state functions are important, but ultimately second-order priorities. Our aim is to use evidence to make the case for a more encompassing form of organised response that leverages potential complementarities between coordinated state action in the first-order policy domains we mention. We draw not only on political economy, but also on scholarship in the fields of business, environment, energy, and economic history. The scope of the paper is limited to highlighting our field's potential to address and formulate such a programme of green economic planning, the specific contours of which remain as tasks for future research.

A clarification is in order at this point: we distinguish green economic planning from the revival and redesign of socialist planning for socio-ecological purposes (Planning for Entropy 2022, Vettese and Pendergrass 2022, Groos and Sorg 2025). Under the labels of 'democratic economic planning' or 'ecosocialist planning', these works seek to learn from the failures of the Soviet Union's centralised planning models, and to distinguish their version of a democratic socialist economic system from both centralised planning on the one hand, and 'market socialism' on the other hand (Tremblay-Pepin 2022). They are also often emboldened by digital technology and big data to overcome calculation problems (Morozov 2019). The most decentralised versions of planning can be found among those approaches that advocate 'planning from below' (Harnecker et al. 2019), which have recently been embraced by degrowth scholars (Durand et al. 2024).

Our distinctive position in relation to postcapitalist planning, is that even if one were sympathetic to it, one would nevertheless confront the misalignment of scientific and political time horizons. Based on climate science, there is not enough time to first overhaul a critical mass of economies simultaneously according to socialist democratic planning and then to realise emission reductions. Assuming this could be organised rapidly enough, however, there is a more serious obstacle. Post-capitalist planning proposals do not factor in the problem of short-term constraints on state agency

exercised by the power of capitalist interests (Przeworski and Wallerstein 1988, see also Hausknost 2020). Absent political revolutions, states have to compromise with private capital as no government will vote in favour of the drastic reductions of private investment that are implied by postcapitalist planning. This is even more true when the strength of Przeworski & Wallerstein's original critique is amplified by research on the structural and infrastructural power of financial interests in the age of globalised financialisation (Braun 2020).

How, then, can we revisit the importance of turning to ecological planning given these critiques? The next sections show that there is a massive (and overlooked) tradition of *indicative economic planning* in post-war capitalist societies, which we can learn from. Furthermore, we should embark on developing a normative green economic planning agenda based on the current planning of green energy infrastructures. Finally, we should learn from corporate experiences with planning, a topic that IPE scholars have largely neglected to date.

Our cases of planning are drawn from a range of capitalist economies characterised by both strong state institutions and strong forms of coordination between the state and corporate elites in Denmark, France, the Netherlands, Japan and China. This selection bias is deliberate. First, planning is unlikely to make a difference in economies that lack these two conditions (see the failure of British post-war planning, as per Wood 2000). Second, while strong states with developmental environmentalist orientations and democratic governance are numerous in advanced economies and some Global South ones (Thurbon et al. 2023), even limited forms of intersectoral planning are preferable to liberal decarbonisation when states are weak. Niches of excellence in intersectoral industrial policy in countries as different as Poland or Chile underscore this point (Naczyk 2022, Collington 2024). Third, our case selection is relevant to the core sources of global emissions. Most of the top ten carbon emission countries (which are responsible for more than two-thirds of global emissions, see Friedrich et al. 2023) meet at least one of the case selection requirements posited in the paper. Other top emitters have strong forms of state capitalism (Saudi Arabia and Russia) or histories of intense state-corporate coordination within democracies (Germany and South Korea). Given the structural importance of Europe, US and China in setting the global terms of trade, finance and monetary systems, the adoption of green planning in the capitalist core would perhaps force structural demand drivers for decarbonisation in fossil fuel exporting superpowers like Russia, Iran and Saudi Arabia.

Planning in post-war capitalism

Associated with socialist thought and Soviet practice, planning also had a life under capitalism. This was the case not just with the war economy, but also with peacetime planning under capitalism and democracy in post-war Europe or Japan. In these cases, planning was known as *indicative* (as opposed to central), that is, planning 'directed at market failures of an informational character' (Estrin and Holmes 1990, p. 532). In a more complex sense, indicative planning does not only frame the goals of transformation and facilitate negotiation among the actors. It also changes their expectations and calculations through a range of instruments blending coercion and incentives: state credit, monetary policy, subsidies, procurement and regulation (Estrin and Holmes 1990, Monnet 2018, pp. 216–270). This more forceful kind of planning is called for 'when economies of scale in the associated transaction costs and bounded rationality limit the spontaneous private exchange of information' (Estrin and Holmes 1990, p. 532), a condition met by the challenges of the climate crisis (Monnet 2022). The planning experience that scholars see as most successful (France) had both coercive and voluntary elements (Estrin and Holmes 1990, p. 532), with Dutch and Japanese planning as less forceful cases of indicative planning.

Dutch indicative planning was the weakest variety on the spectrum. It relied on flexible spatial plans for what investment should ideally go where even before investment decisions were made, with corporatist institutions involved along the way. The severe social dislocations produced by the war were addressed through national plans linked to provincial and municipal plans that

coordinated state priorities with local businesses and communities. Each level developed planning expertise, and 'planology' became an academic discipline with a strong cybernetic component. Over decades this generated a specialised elite corps of planners working largely insulated from political interference (Mastop and Postuma 1991, pp. 58–59).

In contrast, French planning was of a 'harder' and larger but also more politicised variety. It aimed not just to align spatial plans and socio-economic life, as in the Netherlands, but at altering the very structures of the French economy. The plan had three phases: technocratic design, democratic vetting and technocratic implementation. First, the Planning Commissariat (140 staff) and the Finance Ministry set the national growth rate target following an agreement between the Commissariat's horizontal divisions (Economics, Finance and Regional) and a dozen sectoral ones (Energy, Transport, Industry, etc.). To develop targeted policy instruments for how to reach the plan targets, the Commissariat assembled issue-specific commissions (3000 staff per plan). The agreed plan was submitted to a corporatist body with two hundred representatives of various interest groups and intellectuals as well as to the High Planning Council (Ministers, heads of various national bodies, such as the Chamber of Commerce, the employers' federation, and trade union groups) (Kindleberger 1967). Planning enrolled both private and state-owned corporations in finance, railroads, aviation and electricity. Managed under rules of autonomy, they had to be persuaded by the planning bureaucracy to participate in implementation, which means that the state-owned corporate sector had to be involved in the design phase of the plan. Born from a crisis of political representation after the war, the plan had a final democratic phase whereby the Commissariat submitted the plan to the National Assembly (French Parliament) for ratification, which entailed debates leading to modifications of expert proposals (Kindleberger 1967).

What made French planning special was state credit, which was reliant on a dirigiste debt management system using non-market techniques for raising debt (Kapadia and Lemoine 2020). According to Eric Monnet (2012, pp. 19–20), two-fifths of national income and half of the gross investment came from the state with public enterprises (11% of net national product and 30–35% of gross investment) and household savings pooled by nationalised commercial banks playing a key role. Leveraging control over credit, the state used the planning apparatus to pick the sectors that would benefit from cheap and patient financing. The Planning Commissariat, the Credit Council, the central bank and state-owned banks (the four major commercial banks had been nationalised in 1945) acted in sync. The central bank and the financial supervisory authority worked to impose controls on interest rates while using sector-specific rediscounting and banking supervision to provide targeted medium and long-term credit incentives for banks, while the Planning Commissariat reduced informational constraints. In contemporary parlance, this was not a derisking state but a developmental state with the state in the driving seat of systemic transformations.

The system was dirigiste, but not socialist. Rather than decide formal quotas of credit by sectors, these financial institutions relied mainly on recommendations made strong by a rediscounting policy that reduced credit to agriculture and SMEs while boosting it for manufacturing. The planned credit apparatus was substantial: it targeted 49 sectors over twenty years and financed long-term projects aimed at reaching the technology frontier but which were under-served by private finance, from nuclear power (Hecht 2009, pp. 50–53, 65–70) to high-speed trains (Fourniau 1999, pp. 4–9, 19–20). The system delivered to capitalists: marginal returns of capital for each sector over the period 1954–1974 had a positive correlation for *every year* of the sample (Monnet 2012, p. 6).

On this spectrum, Japan's successful post-war economy fell in the middle. Like France, Japan used indicative planning in the infant industry phase – but unlike France, Japan's planning apparatus limited its interventions to cartel competition restrictions, patient public finance for industrial policy and joining research teams at various firms. Of essence for green planning is Japan's experience with having the state plan the phase-out of declining industries like coal as early as the 1960s (Sato 1990, p. 642). Sato shows that, like in France, Japanese planning was steeped in war and destruction. A planning agency was established in anticipation of the war in 1937 and the massive shortage of goods and the extent of industrial destruction ensured the continuation of

economic planning during the US occupation of Japan and, in subtler forms, after Japan regained its independence in 1952. Like France, Japan used five-year indicative plans well into the neoliberal era (with similar instruments based on expenditure, tax, public credit and administrative guidance). These plans contributed to Japan's diversified and complex industrial boom in new and high-value sectors while being 'instrumental in reducing business fluctuations and in stabilising Japan's growth process' (Sato 1990, p. 642). However, unlike in France the degree of centralised institutional dirigisme was more limited in the implementation phase (Sato 1990, pp. 632–633).

For the purposes of green planning, this section tells us that even strongly coercive forms of planning do not require postcapitalism, that ambitious planning apparatuses helped deliver structural transformations, that state credit is essential for impactful planning, and that planning can be mobilised both for sectoral growth and degrowth. Indicative planning paved the foundations for post-war recovery and subsequent industrial upgrading from Western Europe to Japan, with macrofinancial and industrial policy coordination by central bureaucracies caught between the imperatives of accountability and technocratic autonomy. What brought this planning system into crisis during the late 1970s was the same combined processes of stagflation unanticipated by the prognosis devices of the planners, financialisation of state debt and the ideological ascent of neoliberalism (Monnet 2018). States taking decarbonisation seriously can benefit from resuscitating these capabilities building on selective sectoral planning experiences that survived in the interstices of neoliberalism, with often remarkable outcomes. In the next sections, we show that rebuilding planning capabilities does not need the particular circumstances of post-war embedded liberalism to exist.

Contemporary planning by states

Inter-sectoral indicative planning withered out during neoliberalism, yet sectoral planning survived in some democracies. For example, sub-national climate adaptation planning is widespread even in the United States (Miao 2019), and EU cohesion policy aiming to develop infrastructures that reduce inequalities between EU regions relies extensively on planning (Malý and Mulíček 2016). Yet the most advanced form of public sector planning today is in military logistics (Erbel and Kinsey 2018) and energy (Pecenak et al. 2019). Consider the case of Denmark, the country with the most sustainable and secure energy system in OECD and which developed an energy planning process in the late 1970s (Sovacool 2013, Krog and Sperling 2019). The Danish Energy Agency (DEA) is at the centre of the administrative part of the planning apparatus. It deploys multi-year plans for all sectors relevant to the production, transmission, and utilisation of energy in the country. The actual plan, however, is designed by the energy ministry which issues the DEA with a National Energy and Climate Plans after involving both democratic actors (political parties represented in the Danish legislature) and technocratic actors (Danish Utility Regulator, Agency for Data Supply and Efficiency, Danish Meteorology Institute). The DEA takes the plan, models it, generates scenarios and runs it through hearings and decentralised strategic planning with municipalities, companies and independent suppliers who act as power producers. In the end, after regional consultations with the Nordic countries and the EU, the Danish Parliament debates the plan, adopts it and gives it the status of a democratically and technically sound strategic document.

Following this procedure, the DEA then turns the plan into a framework for state subsidies, loans, grants, tax exemptions (and, respectively, tax increases on fossil fuels), as well as regulations facilitating renewable energy investments and discouraging polluting sectors. To back DEA plans with leverage over private energy players, the Danish state maintained a majority stake in both the largest energy company (Orsted) and the grid for electricity and natural gas via the wholly state-owned enterprise (Energinet.dk). Scholarship on Danish energy sees this strategic energy planning as the primary tool for Denmark's advanced decarbonisation in the energy sector (Krog and Sperling 2019). Furthermore, by turning local farmers and residents into renewable energy cooperatives at the municipal level using loan guarantees from the state-owned Energinet.dk, the planning process gains a stronger democratic facet in its implementation as well (Sovacool 2013). By

simultaneously deploying increased ‘centralisation’ and ‘decentralisation’, Danish planning maximises democratic input not just at the national and municipal levels. Planning governance such as this should assuage those who criticise planning for containing the risk of becoming a potential enabler of authoritarianism or a source of inefficiency.

Of course, as rich literature shows, inter-sectoral planning remains a structural feature of China, the country with the world’s largest deployment of renewable energy and the source of some of the world’s critical green technologies. China is a case of ‘developmental environmentalism’ structured by five-year plans enforced by macroeconomic, administrative and financial channels that combine coercion and incentives (Thurbon et al. 2023) and marked by productive tension between intense centralisation and decentralisation (Zhang et al. 2022, pp. 192–199). Even in China, where central planning institutions are the world’s most ample, it is more decentralised forms of planning based on mobilising bottom-up stakeholders to make their own choices that delivered the most robust cases of success in decarbonisation. Indeed, the realities of the Chinese renewable sector or of electric vehicles make a strong case against the view of China as a clear case of environmental authoritarianism and, instead, as something closer to indicative planning with Chinese characteristics. Thus, in implementation, planners have mandated less and less about which trajectories could deliver to the attainment of those goals, leaving the details to provincial and city governments working with state-owned firms and private firms as part of a large tapestry of economic experiments (Zhu et al. 2019, pp. 8–9). For example, planners were constrained by and had to coordinate with state-owned private electricity utility companies and mostly privately owned green tech firms, as major investors in wind and solar parks (Nahm 2017). Also, local political, business and civil society actors play an increasingly important role in the implementation of the plan on climate issues in particular (Wang et al. 2018, Zhang et al. 2022). But the most striking characteristic of the Chinese green planning system is that, like the French one, it relies on a particular macro-financial structure. A mostly state-owned banking system boosted by state-owned non-bank financial institutions (‘government guidance funds’ and asset management funds) delivers to both state-owned and privately owned firms the ample and patient capital needed to invest in the sectors targeted by the plan. In this context, the Central Bank of China ensures the monetary and regulatory frameworks needed to make the indicative essence of the plan acquire real traction in the incentives of firms (Larsen 2022, pp. 362–367).

To sum up, sectoral planning is alive and serves decarbonisation well in liberal democracies such as Denmark’s. Perhaps ironically, French indicative planning as a form of intersectoral coordination has been reborn in the particular political conditions of China. Irrespective of the political regime type these macro forms of planning are embedded into, they send the message that planning is not a historical relic but an essential tool of successful economies that embarked on decarbonisation. The next section shows that this is even more the case with a quintessential actor of neoliberal globalisation: the multinational corporation.

Planning in corporations

As the previous sections show, planning is pervasive in contemporary capitalism. However, the character and forms of planning have changed considerably with ‘the retreat of the state’ (Strange 1996) since the 1980s. Neoliberal reforms facilitated the massive growth of corporations, but even the most neoliberal policy regimes are embedded in forms of strategic planning and forecasting. However, such policy tools are not backed by the macro-financial sticks and carrots that indicative planning entails, nor do they create mechanisms of state-corporate coordination in which the state occupies the driving seat. As firms internationalised and grew in size and complexity, this created a need to organise internal logistics and relationships between units and divisions to a much greater extent than before. Yet this was not a flat world of market competition. Instead, as Herbert Simon (1991, pp. 27–28) has argued, it was an ‘organisational economy.’ By opening international markets, neoliberal reforms, perhaps surprisingly, advanced the organisational economy even more than the

market economy. Indeed, the reforms compelled firms to *plan*, at the very moment when states were told to stop doing so.

Susan Strange (1996) provided numerous examples of extensive corporate planning in her seminal book: IBM influenced both markets and regulatory standards on a global scale, Exxon shaped global energy markets through detailed planning of exploration activities combined with vertical and horizontal integration of fossil fuel supply chains, and Toyota centrally planned processes that became renowned sources of their competitive advantage. Recently, Phillips and Rozworski (2019) showed how capitalist firms planned for success, drawing on Walmart's corporate history. Specifically, Walmart cultivated and developed a mastery of its organisational economy that refined planning instruments. IKEA also transformed from a parochial Scandinavian firm into a global giant by centrally planning its supply chain (Jonsson et al. 2013). The last 100 years of *Harvard Business Review* reveal a persistent and evolving role for corporate planning (Bensussan et al. 2023). Indeed, planning has now become an integrated structural part of contemporary corporate life, so much so that there is a well-developed field of academic studies in strategic supply chain planning (Charvet et al. 2008). In general, there is a shared conclusion within SCM research that the sustainability challenges facing companies create even greater pressure to integrate and strategically plan their supply chains (Jabbour 2020).

Planning is used not only to optimise supply chains and logistics but also to extract additional profits, for example through aggressive price planning for tax circumvention. According to Matti Ylönen and Teivo Teivainen (2018, p. 446), 'there is evidence that corporate planning conducted through cross-subsidisation and administered prices is so widespread that characterising real-world global capitalism as a market economy is misleading'. Indeed, corporations frequently employ non-market-based and hierarchical forms of organising and transacting to extract and defend profits (Seabrooke and Wigan 2022). As Christoph Sorg (2023, pp. 1–2) argues, the market-planning binary has been thoroughly deconstructed by economic social science: in modern capitalism, markets are not 'free' and planning is endemic. Sorg (2023, pp. 5–9) draws his own examples from the financial sector: Asset managers act as 'horizontal planners' by aligning corporate strategies in different sectors with their own financial interests, index funds and institutional investors influence industry-wide standards and practices, and central banks and financial institutions shape industrial growth and risk management through credit allocation.

Are these corporate planning lessons useful for states? The differences between state planning and corporate planning are smaller than the political economy literature conventionally assumes (Ylönen and Teivainen 2018, pp. 446–447). Although states are obviously subsumed to entirely different obligations and expectations in fulfilling their core objectives and maintaining legitimacy (Paterson 2010), that does not mean there are no lessons to draw from corporate planning. Indicative planning never learned the lessons from modern, high-tech corporate planned chains of supply, value, and wealth. Although these forms of corporate planning are often used to circumvent public objectives, they are impressive in their technical sophistication and the high degree of coordination they achieve across networks and jurisdictions. They are also a 'black box' for political economy scholarship, which knows only little of corporate planning techniques, devices, infrastructures, and expertise. Nothing prevents the green state from upcycling technical corporate planning lessons towards sustainability goals, provided that those lessons can be translated to the political environment of the modern state.

A burgeoning literature on revitalising economic planning in the era of digitalisation suggests that we are not alone in arguing that states can learn from corporate experiences and technologies (Bensussan et al. 2023, Groos and Sorg 2025). Some suggest that technologies such as big data analytics, artificial intelligence and machine learning, or blockchain could solve the calculation problems that plagued planning in the past (Morozov 2019). Most of this scholarship is oriented towards democratising and socialising the economy to address not only the climate problem but the ills of capitalism as such – in comparison to their position, the distance towards repurposing corporate

planning infrastructures and digital technologies for green economic planning *within* capitalism is much smaller.

Liberal objectors to all forms of state planning would retort that the hyper-complexity of globalised market transactions nullifies the effectiveness of planning. Instead, this section shows that the very torchbearers of liberal globalisation, the multinational corporation and high finance, in fact, nullify this objection to planning. Due to time pressure, the deep and rapid transitions required within the coming decade must happen in coordination with multinational corporations and private finance (Newell 2020), but green economic planning is necessary to push for radical change and avoid the risk of incremental ‘trasformismo’ (Newell 2019). Over the longer term, green economic planning could contribute to democratising and socialising the economy, but our concern in this paper is more immediate. Although we have no historical examples of deliberate transitions driven by environmental imperatives, lessons drawn from the past demonstrate the need for corporate resources and capacities (acting in tandem with the state) to unfold rapid transitions (Newell and Simms 2021). In the next section, we outline what the implications of this realisation should be for state agency in the green transition.

Towards a research agenda for green economic planning

Planning not only holds promise but has already been effectively deployed by states and multinational corporations. That said, our case studies show that there were specific historical contingencies to planning: war economy (Japan), post-war destruction and trauma (post-war Europe and Japan), energy shock (Denmark), and state socialism (China). The main conclusion here is that one needs crises of very large, indeed existential magnitude, to get intersectoral planning going as a legitimate option under capitalism. Calls to urgency lay bare the risks of elite capture of the policy agenda or state apparatus, where imminent disaster is used to ‘trump and supersede political conflict’ (Newell and Simms 2021, p. 911), which in the worst instances could lead to authoritarianism or the deployment of risky technologies. To pre-empt these problems, a positive research programme on green economic planning is urgent. We see three main sub-agendas developing to this end.

First, we need more work on *hierarchical coordination institutions* that have historically characterised indicative planning. Such institutions should go beyond tweaking the risk-return portfolio calculations of the derisking state. Instead, the coordination institutions of green economic planning can use control over credit conditions, guarantees for public-private liquidity (liquidity issued by financial institutions backed by central banks), capacity to socialise innovation functions, enhanced state ownership in finance and energy, or capacity to entice and coerce private finance to align state decarbonisation targets and business incentives. As such, decarbonisation might appear as a functionally hierarchical system with the coordination institutions of state planning on top, the macro-financial regime in the middle and industrial policy or economic statecraft policies for firms at the bottom. Diminished since their post-war halcyon days, these capabilities are being bolstered by current geopolitical concerns in ways that remain poorly understood. This begs for reconciling the hierarchical nature of coordination institutions with the imperatives of geoeconomic competition *and* democratic legitimacy. Energy decarbonisation in Denmark shows that centralisation did not lead to authoritarian drift. Indeed, the Danish lesson is that accelerated centralisation was accompanied by heightened democratic input in terms of both planning procedures and collective ownership. IPE scholars specialising in comparative economic systems and the way they are integrated through global value chains could further develop this line of work.

Second, green economic planning proposes that large corporations with complex multinational operations are ideal research laboratories for revisiting the traditional neoclassical objection that market interactions are too complex to be planned by the state. Indeed, a micro-founded approach to planning for capitalist economies with contemporary calculative devices could bypass liberal objections to socialist calculation (Morozov 2019). As such, green economic planning reverses Mariana Mazzucato’s (2013) perspective that there would not be internet and smartphones

without DARPA (the investment arm of the Pentagon) by suggesting that there will not be green state planning without learning from the likes of IBM, Walmart, or Toyota. A key research question for this strand is thus: how do we go from corporate planning to public inter-sectoral planning? A fruitful direction of research where IPE has a comparative advantage is the current work on how central banks, economic models and other calculative devices can open up novel opportunities for more complex macro-financial management (Sorg 2023, Thiemann 2023).

Third, if our analysis is correct, then states with both weak institutions and poor state-business coordination should refrain from green planning as it could fail and delegitimise planning itself. Still, these deficiencies can be overcome by political mobilisation (Collington 2024). Further research might investigate how this will happen under conditions of geoeconomic competition (Babić and Mertens 2024) and what synergies could exist between green indicative planning and democratic planning for degrowth (Durand et al. 2024). Finally, we need more work on how much scope for planning there is in Global South countries subject to structural constraints originating in global and regional trade regimes (Swilling et al. 2016, Shadikhodjaev 2018), forms of geopolitically-infused protectionism in core economies (Hopewell 2021), or financialisation of state debt (Ban and Bohle 2021).

These three directions leave outside their scope the design, legitimacy and boundaries of green economic planning. We are aware that green economic planning contains within itself the risks of both technocratic and corporate capture of deep sustainability transformations (Newell 2019). How can actors within the democratic state and its allies in society establish hard boundaries against corporate capture of green economic planning without risking an investment strike? To the extent that private finance co-produces the macro-financial infrastructures for deep sustainability transformations, how can green planning institutions still discipline private financiers? How can the losers of the planned degrowth of high-emitting sectors be democratically represented and economically compensated without compromising the democratic process and decarbonisation targets? The answers to questions such as these may constitute the basis on which political economy would engage more transformatively with the climate crisis while cutting across insulated research silos. Our discipline has a rich tradition in identifying the possibilities of compromises between the state, capital and society under international economic constraints. The research agenda that we propose should build on this tradition to develop insights about green economic planning while charting normative horizons that safeguard democratic aspirations.

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