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Toward a post-growth industrial policy for Europe: navigating emerging tensions and long-term goals

Richard Bärnthaler [a], Sebastian Mang[b] and Jason Hickel[c]

[a]University of Leeds, School of Earth and Environment, Sustainability Research Institute, Leeds, UK; [b]New Economics Foundation, Brussels, Belgium; [c]Autonomous University of Barcelona, Institute for Environmental Science and Technology (ICTA-UAB), Barcelona, Spain

ABSTRACT

Amid mounting geopolitical, socio-economic, and ecological crises, industrial policy has returned to the forefront of policy debates. However, the EU's industrial policy framework – centred on Single Market Resilience, Strategic Autonomy, and Competitive Sustainability – contains self-undermining contradictions. While aiming for resilience, it fails to strengthen foundational non-market institutions; in seeking strategic autonomy, it exacerbates resource dependencies and eco-imperialist tensions; and in promoting competitive sustainability, it remains reliant on profit-driven private sector strategies that delay necessary transitions. This article critically examines these contradictions using immanent critique and conjunctural analysis, proposing an alternative post-growth framework based on Foundational Liveability, Peaceful Planetary Co-Existence, and Democratically Coordinated Sustainability. To bridge the gap between current constraints and transformative change, we use critical problem-solving to outline contested but feasible next best transition steps within the current politico-economic order. By integrating post-growth insights into industrial policy, this article offers a roadmap for aligning economic activity with planetary boundaries and social well-being.

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1. Introduction

The resurgence of industrial policy across G20 countries marks a shift away from the neoliberal emphasis on 'neutral' market governance toward more interventionist and geopolitically motivated strategies (McNamara, 2023). In the EU, this shift has been catalyzed by mounting crises – including the ecological crisis, the cost-of-living crisis, energy shortages, supply chain vulnerabilities, and geopolitical ruptures – as well as by external pressures such as the US Inflation Reduction Act and China's increasing dominance in strategic industries like electric vehicles, solar energy, and microchips. The EU's response has centred on three key industrial policy pillars: *Single Market Resilience* (promoting economic integration through the free movement of goods, services, capital, and labor while ensuring supply chain stability), *Strategic Autonomy* (reducing reliance on critical imports to enhance security), and *Competitive Sustainability* (accelerating the green transition by strengthening its 'business case') (European Commission, 2021; European Council, 2024a).

CONTACT Richard Bärnthaler r.barnthaler@leeds.ac.uk
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However, despite its ambitions, the EU's industrial policy is internally contradictory and structurally incapable of achieving its stated objectives. It seeks to ensure resilience, yet fails to strengthen the foundational non-market institutions essential for economic and social stability. It pursues strategic autonomy, yet deepens resource dependencies and fuels eco-imperialist tensions. It aims for sustainability, yet remains dependent on profit-driven private sector strategies that delay the necessary phase-out of unsustainable industries. As a result, the current industrial policy framework risks reinforcing – rather than resolving – the crises it is meant to address.

This article critically examines these contradictions using immanent critique, conjunctural analysis, and critical problem-solving, demonstrating how, here and now, the EU's industrial policy pillars can only be realized in deficient and self-undermining ways. To address these dysfunctionalities, we draw on post-growth research to propose a reconceptualized framework for industrial policy – one that emphasizes *Foundational Liveability* (strengthening the provisioning of essential goods and services), *Peaceful Planetary Co-Existence* (mitigating extractivist pressures and geopolitical conflicts through a multipolar, regionalized approach), and *Democratically Coordinated Sustainability* (shifting from market-driven green growth to deliberate, democratically planned economic transformation).

To bridge the gap between current contradictions and a reconceptualized post-growth industrial policy framework, we draw on existing literature to outline feasible next-best transition steps that can be implemented within existing politico-economic conditions. These include: a *Foundational Economy Strategy* to gradually reclaim public control over essential services, strengthening their resilience and accessibility through decommodification; a *Sufficiency Strategy* to systematically reduce Europe's material footprint and resource dependence – framed as a pragmatic approach to economic sovereignty, security, and cost savings; and *Green Economic Planning*, a form of state-led decarbonization that moves beyond passive market incentives while accommodating compromises with specific capital factions to drive structural transformation.

By integrating post-growth insights into industrial policy and geopolitics, this article bridges two key research gaps. First, there has been relatively limited engagement in post-growth scholarship with the geopolitical and industrial dimensions of economic transformation, which constrains its political viability (though see emerging work in International Relations/International Political Economy on post-growth, e.g. Albert, 2024; Allan, 2024 Hasselbalch & Kranke, 2024). Second, mainstream industrial policy debates have mostly ignored post-growth insights, failing to adequately address structural political economic dependencies that drive ecological overshoot and social inequalities. By bringing these perspectives together, this article provides a roadmap for industrial policy that aligns economic activity with planetary boundaries and human well-being.

The article is structured as follows: Section 2 outlines the methodology. Section 3 provides a brief historical overview of European industrial policy. Section 4 draws on post-growth research to highlight the need for a fundamental shift in approach. Section 5 critiques the EU industrial policy framework, identifies its contradictions, proposes a reconceptualized alternative, and outlines feasible next-best steps for achieving these objectives within the present context. Section 6 concludes with key takeaways and implications for future research and policy.

2. Methodology

This article builds on the tradition of immanent critique and Robyn Eckersley's (2021) critical method for addressing transition tensions, which combines conjunctural analysis with situated, critical problem-solving to navigate complex transformations (see also Bärnthaler, 2024a,

2024b). Following this approach, we adopt a methodology that systematically interrogates tensions and contradictions within EU industrial policy to reconfigure it and explore pathways toward transformative change within the current politico-economic order.

We apply *immanent critique* to uncover internal contradictions within key pillars of EU industrial policy. Rooted in the tradition of critical theory and notably developed by thinkers like Hegel and later Marx, immanent critique interrogates systems from within their own normative claims to reveal possibilities for emancipatory social change (Antonio, 1981) – to 'develop new principles for the world out of the world's own principles' (Marx, 1843). Instead of imposing external standards, it questions the conditions of a system's success – its ability to solve its own problems – and, in so doing, points toward possibilities for its transcendence and transformation. As Rahel Jaeggi (2018) argues, immanent critique aims to highlight 'the crisis-proneness of a particular social arrangement' and to expose structural dysfunctionalities that cannot be resolved within the existing constellation.

This helps reveal that, here and now, core objectives – such as Single Market Resilience, Strategic Autonomy, and Competitive Sustainability – can only be realized in deficient and self-undermining ways. The emphasis on the *here and now* is crucial, as contradictions always emerge within specific conjunctures – periods 'during which different social, political, economic, and ideological contradictions come together to give society a distinctive shape' (Hall & Massey, 2010, p. 57). It is within such conjunctures that contradictions are actualized and become pressing, creating concrete entry points, opportunities, and risks for political intervention (see also Grumiller & Raza, 2025). While a full conjunctural analysis is beyond the scope of this article, we highlight key *conjunctural tension points* – developments through which contradictions in EU industrial policy become urgently manifest, opening space for political contestation and potential transformation (Section 5.1). Hence, rather than merely *proposing* new industrial policy principles ('from the outside'), we *develop* emancipatory and transformative alternatives from within the current framework's own contradictions (Section 5.2). This approach aligns with critical theory's commitment to using explanatory research to inform an agenda for a more equal and just society (Wigger, 2022).

Finally, navigating between the melting yet contested present and the possibility of a better future requires *situated, critical problem-solving*. Eckersley (2021) contrasts critical problem-solving with uncritical problem-solving, which treat problems as fixed puzzles rather than questioning their underlying assumptions and the internal contradictions they rest upon. In contrast, critical problem-solving begins by unsettling *some* of these assumptions to identify the 'next best transition steps' – that is, those that are feasible within a given conjuncture and hold the greatest transformative potential. These are the best of the politically possible next best steps available here and now. Such steps, explored in Section 5.3, may be incremental or more radical, depending on available political opportunities. Their full transformative impact cannot be known in advance, but a stepwise approach allows for adaptation based on political and policy learning (Eckersley, 2021, p. 256).

In summary, this methodology enables us to examine where we are now, identify key tensions and dysfunctionalities, determine where we need to be to overcome them, and outline how to get there.

3. Defining and tracing industrial policy in Europe

Industrial policy refers to government strategies aimed at shaping economic structures to achieve public-policy goals (Aiginger & Rodrik, 2020; Juhász et al., 2024). It is typically divided into horizontal and vertical approaches. Horizontal policies focus on general framework conditions like

research, innovation, and education, while vertical policies target specific sectors, activities, and technologies (Andreoni & Chang, 2016).

After WWII, Europe's industrial policy sought to integrate industries like coal and steel into a European market while shielding them from international competition. Vertical policies and the concentration of strategic industries were tolerated due to the perceived threat from US companies (Pichler et al., 2021). However, since the 1980s, industrial policy shifted from direct intervention to more indirect tools (Bulfone et al., 2023). EU competition law has increasingly limited vertical interventions, promoting market efficiency as 'neutral' governance both internally and in global trade and investment (McNamara, 2023, p. 2).

This apolitical framing has shifted with the recent resurgence of industrial policy. Public power is now more actively – though still incrementally – used to shape markets in alignment with the interests and values of a political community, promoting a more interventionist governmental role, and expanding vertical policy spaces (Ergen & Schmitz, 2023; McNamara, 2023). For example, the European Emissions Trading System has been increasingly flanked by micro- and meso-oriented vertical interventions, such as the European Innovation Fund (to fund green industrial activity), the Modernization Fund (focused on regional restructuring), the Just Transition Mechanism (supporting workers and communities affected by the transition to a green economy), the Temporary Crisis Framework (focused on energy supply restructuring after the invasion of Ukraine and later repurposed for greening), and InvestEU (providing financing for sustainable investment, innovation, and job creation), all of which have been 'partially conditional on project-based state planning' but take place 'under conditions of the bloc's uniquely weak state capacities' (Ergen & Schmitz, 2023, p. 16). In addition, having failed to shape the world in its image, the EU has also reinforced trade defense mechanisms, such as foreign subsidies regulations, the carbon border adjustment mechanism, and foreign investment screening (De Ville, 2023).

This resurgence marks a rupture in neoliberal market governance, creating new political pressures and conjunctural tensions within the EU. These affect political coalitions (e.g. those advocating for strategic autonomy), institutional conflicts (e.g. between DG Competition's pressure to limit market 'distortions' and DG Climate's decarbonization focus), democratic legitimacy (e.g. the EU's interventionist role amid a lack of genuine EU electoral politics), and the EU's geopolitical role (McNamara, 2023).

4. Why a new approach to industrial policy is necessary: insights from post-growth

No European country meets the needs of its residents while remaining within planetary boundaries. Europe's ecological overshoot is severe, with resource use and emissions in member states exceeding planetary boundaries by on average between 88% (Bulgaria) and 354% (Lithuania) (Fanning et al., 2022). Despite being one of the wealthiest regions worldwide, the EU also faces significant social challenges: more than 16% live in poverty, over 8% suffer from energy poverty, about 10% are dissatisfied with democracy, and social inequality is perceived as high (Gómez-Alvarez Díaz et al., 2024). Hence, Europe's economy needs restructuring to reduce resource use and emissions while ensuring well-being (Koch, 2025). Industrial policy is central to this effort; however, existing approaches fall short for several reasons.

First, the EU's pursuit of green growth (which seeks to increase aggregate production while at the same time reducing resource use and emissions to sustainable levels), lacks empirical support. Several reviews have found there is no evidence that high-income countries can decouple economic growth from material footprint at the necessary speed and scale, even under optimistic assumptions (Haberl

et al., 2020; Hickel & Kallis, 2020; Vázquez et al., 2023). In terms of emissions, the decoupling rate achieved in high-income countries falls far short of what is required to meet the Paris Agreement objectives (Vogel & Hickel, 2023). Sufficiently rapid decarbonization will require high-income countries to reduce aggregate energy use. Green growth theory hopes that efficiency improvements can achieve these goals, but in growth-oriented economies efficiency improvements tend to be either leveraged to increase total production or are offset by the scale effect of growth, making the required absolute energy and material reductions difficult to achieve (Hickel, 2020; Shove, 2018). Thus, it is essential to directly scale down less-necessary and material- and energy-intensive production. Current industrial policy neither adequately addresses this nor employs the necessary tools to do so.

Second, despite high levels of aggregate production and resource use, millions lack essential goods and services, as production is largely controlled by capital, prioritizing profit over need. More growth will not solve this; direct strategies are needed for universal access to essentials. Market liberalization has exacerbated the problem. Enrico Letta's recent EU report (2024, p. 101) highlights the ongoing tension between the EU's market liberalization and its Social Agenda, noting that liberalization has increased wealth gaps and privatization of social services, prioritizing profit over quality and well-being. This has led to artificial scarcity of public goods and services, forcing people to work long hours and contribute to expanding whatever form of production just to afford their daily needs (Hickel, 2019). Associated inequalities tend to erode trust, increase anxiety, promote excessive (positional) consumption, and undermine support for climate policies.

Post-growth research aims to resolve these problems by 'replac[ing] the goal of increasing GDP with the goal of improving human well-being within planetary boundaries' (Kallis et al., 2025, e62). The objective is to reduce less-necessary production to enable faster decarbonization and other ecological goals, while focusing on socially beneficial production to ensure universal access to necessary goods and services. Thus, from a post-growth perspective, a new industrial policy approach is needed (Hardt et al., 2021) – one that shifts the economy away from socially detrimental yet profitable industries, such as SUV production, fast fashion, financialized housing, and industrial animal farming, toward socially beneficial but less or non-profitable sectors like public transit, agroecology, and building retrofits. This aligns with the IPCC's (2018) call for 'rapid, far-reaching, and unprecedented changes.'

5. Current state of EU industrial policy, emerging tensions, long-term goals, and paths forward

This section carries out the analysis outlined in Section 2. Section 5.1 examines three, tightly interlinked, EU industrial policy pillars – Single Market Resilience, Strategic Autonomy, and Competitive Sustainability – highlighting their emerging tensions and contradictions. Building on this, Section 5.2 reconceptualizes these pillars – as Foundational Liveability, Peaceful Planetary Co-Existence, and Democratically Coordinated Sustainability – to address current dysfunctions. Finally, Section 5.3 explores pathways for transitioning to such a reconceptualized industrial policy framework within current politico-economic constraints.

5.1. The current state of EU industrial policy and its emerging tensions

5.1.1. The tension underpinning Single Market Resilience: missing prioritizations of economic activities

Single Market Resilience aims to ensure the free movement of goods, services, capital, and people (i.e. workforce and consumers) while preventing supply chain disruptions in future crises. This

approach combines monitoring systems, emergency measures, and efforts to reduce dependencies (see Section 5.1.2) with strategies to boost innovation and competitiveness (see Section 5.1.3). It also focuses on reducing regulatory trade 'barriers', which in the context of European integration have traditionally been understood as vertical policy measures, such as public ownership, sectoral subsidization, regional policies, and sectoral targeting (Ergen & Schmitz, 2023). To achieve this, the EU has implemented initiatives like the Single Market Enforcement Task Force. In addition, a new industrial ecosystem approach (see Figure 1) has been introduced to view Europe's economy as an integrated Single Market, where disruptions in one sector can impact the entire ecosystem (European Commission, 2021; European Council, 2024b).

This pillar is underpinned by tensions and contradictions. Crises like the COVID-19 pandemic and the gas crisis have highlighted the need to prioritize industries and economic activities systematically (Bärnthaler & Gough, 2023), rather than maintaining an undifferentiated commitment to *the* Single Market, i.e. the free movement of whatever kind of goods, services, and capital. In practice, essential provisioning systems were distinguished from non-essential ones and treated accordingly. While the industrial ecosystem approach acknowledges the complexity of the EU's industrial landscape by clustering sectors and value chains – including private, public, and semi-public actors – it fails to introduce systematic prioritization. Instead, it largely replicates the existing economy without distinguishing between essential and non-essential sectors (e.g. health vs. tourism), and key areas like housing are overlooked, simply categorized under 'construction' without distinguishing between essential and non-essential forms. Similarly, the broad application of Single Market rules often subjects essential sectors – such as care, housing, and transport – to short-term market logics, weakening their resilience (ETUC, 2024; Neujeffski & Hoedeman, 2023). This creates

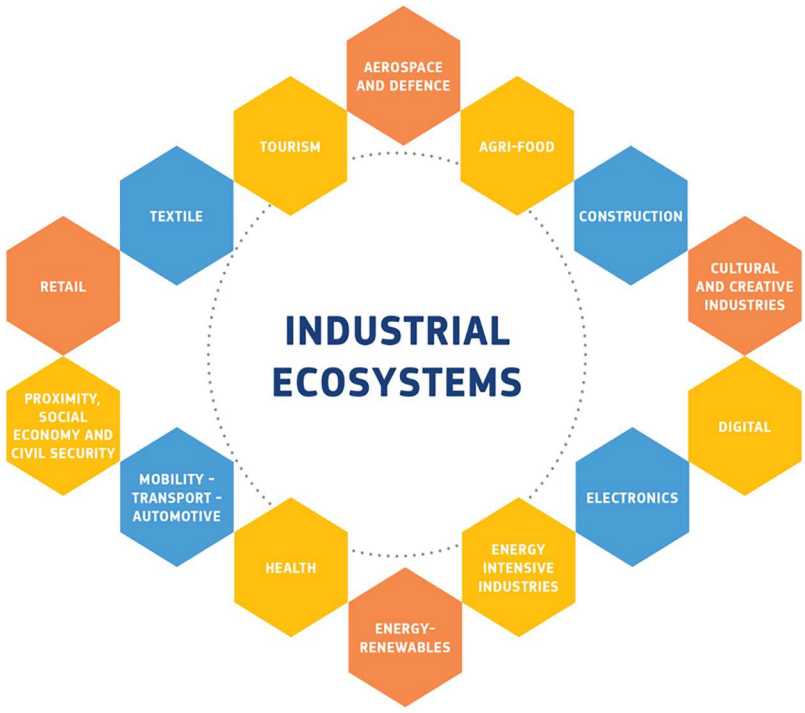

Figure 1. The EU's industrial ecosystem approach; from European Commission (n.d.).

contradictions: the Single Market's resilience depends on strong non-market or partially decommodified institutions (Fraser, 2014; Gough, 1975), yet its current structure – reinforced by 'competitiveness' as the primary yardstick and deregulation as a key method for achieving it – neither prioritizes nor adequately protects these institutions, often undermining its own foundations.

These tensions – between systematic economic prioritization and an indiscriminate commitment to *the* (Market) Economy – surface in multiple European policy debates, such as the conflict between deepening the Single Market through liberalization and rethinking it to support industrial policy amid 'the resurgence of power politics' (Letta, 2024, p. 4). Similarly, enforcing uniform market rules across diverse economic activities often clashes with the EU's Social Agenda, creating artificial scarcities of essential goods and services through liberalization and marketization. In the current conjuncture, these unresolved tensions – manifested in the cost-of-living crisis and widespread labor protests in essential sectors – have fuelled the rise of far-right and neo-fascist parties (e.g. Abou-Chadi et al., 2024), which, in turn, reinforce neoliberalism, weaken trade unions, and promote welfare and labor market chauvinism. This is particularly problematic given essential services' reliance on migrant labor and deepening social polarization. Finally, inadequate economic prioritization also intensifies conflicts over critical raw material extraction (discussed in Section 5.1.2), facilitating resource exploitation under the guise of a green transition without scrutinizing which uses are genuinely 'critical' (Petitjean & Verheecke, 2023).

5.1.2. The tension underpinning Strategic Autonomy: increasing eco-imperialist conflicts

Strategic Autonomy seeks to mitigate disruptions in global value chains by reducing critical dependencies (European Commission, 2021, p. 5). To this end, the European Commission has conducted systemic analyses, identifying highly dependent products, particularly in energy-intensive industries, healthcare, and the green and digital transitions (European Commission, 2021, p. 11). It also incorporates trade defense tools, such as the Anti-Coercion Instrument, which enables the EU to block foreign investments, impose tariffs, and restrict foreign banking. Additionally, strategic partnerships shift the focus from comparative advantage to bilateral trade and geopolitics (Schmitz & Seidl, 2023). Finally, the Critical Raw Materials Act (CRMA), strongly advocated by the defense and aerospace sectors (Petitjean & Verheecke, 2023), aims to onshore and boost EU-based extraction, processing, and recycling of critical raw materials to support strategic technologies and military applications (European Commission, 2024).

Despite significant new measures – such as the Anti-Coercion Instrument (though potentially slow in execution and procedurally constrained) and expanded policy spaces for strategic cooperation – the pursuit of Strategic Autonomy remains embedded in a framework riddled with contradictions. Strategic Autonomy is considered a cornerstone of the EU's long-term security. However, the CRMA, whose targets are based on a sharply anticipated increase in critical raw material consumption, requires an extensive expansion of resource frontiers within and beyond the EU (Tröster et al., 2024). This expansion fuels eco-imperialist tensions (Brand & Wissen, 2024; Claar, 2022; Vela Almeida et al., 2023), exacerbating multiple potential sources of conflict and ultimately threatening the EU's long-term security. In this sense, the 'security-growth imperative' (Albert, 2024) – where economic expansion is justified in geopolitical and security terms – is increasingly eating its own tail, as the relentless pursuit of resource-intensive growth exacerbates the very vulnerabilities and instabilities it seeks to counteract (Vezzoni, 2023).

These tensions are manifest in several conjunctural moments. For example, Global South nations are increasingly challenging Western-dominated resource extraction by forming alliances – such as the Lithium Triangle (Argentina, Bolivia, Chile) – and implementing export restrictions,

including Indonesia's nickel export ban, China's recent controls on rare earth mineral exports, the cobalt export halt from the Democratic Republic of the Congo, and expanding BRICS cooperation on critical raw materials. These efforts to reclaim resource sovereignty are set to intensify rather than subside in an era of declining Western hegemony. At the same time, resource conflicts are also escalating within Europe. The CRMA risks replicating colonial extraction patterns within the EU, disproportionately affecting rural and indigenous communities (e.g. the Sámi in northern Europe; Guzik et al., 2021) and the European periphery (e.g. Serbia and Portugal; Lazarević, 2024). Historically, the EU shifted significant environmental damage, resource appropriation, and labor exploitation to the Global South (Dorninger et al., 2021; Hickel et al., 2022); now, as Aime Césaire's 'boomerang' of colonial relations suggests, these dynamics are re-emerging within Europe in the context of the CRMA through weakened environmental protections and shortened public consultations (Tröster et al., 2024), as well as increased repression. As in the Global South, these tensions are expected to intensify rather than subside – especially if mining in the EU expands into more densely populated areas, where low social acceptance could further fuel conflicts (Wolf, 2023).

5.1.3. The tension underpinning Competitive Sustainability: innovation and the private sector cannot drive systemic change

Competitive Sustainability, recently reinforced through the *Clean Industrial Deal*, seeks to accelerate the green transition by articulating a compelling 'business case' – one that leverages technological innovation, unlocks green finance, and derisks private investment (European Commission, 2021; Gabor & Braun, 2025). This pillar also utilizes key industrial policy tools, including mutual debt mechanisms for strategic interests, bond financing through the European Investment Bank and national development banks, updated public and private procurement criteria, and revised competition and state-aid rules – for example, to support Important Projects of Common European Interest (IPCEIs) aimed at fostering cross-border investment and green technology adoption (European Commission, 2021; McNamara, 2023; Mertens et al., 2021; Schramm et al., 2022).

However, Competitive Sustainability's reliance on incentives, private profitability, and technological innovation – favoring a gradual phase-in of green industries and technologies without directly disrupting unsustainable sectors – is contradictory, as it fails to drive the green transition at the necessary scale and pace (Hickel & Kallis, 2020; Pichler et al., 2021). It may foster innovation, but lacks mechanisms of exnovation, i.e. the purposive termination of unsustainable infrastructures, technologies, products, and practices (Heyen et al., 2017, p. 326). As such, the EU's weak derisking regime, structured around financial capital with limited public spending and low state discipline, promises structural transformation without altering macro-financial dynamics but is undermined by its own coordination failures and regressive distributional effects (Gabor & Braun, 2025). Prioritizing project profitability over systemic shifts, it reinforces private capital's (infra)structural power while constraining the state's ability to direct investment or phase out carbon-intensive sectors (Braun, 2020; Gabor, 2023). Even more interventionist derisking remains dependent on financial incentives like tax credits and subsidies, allowing firms to opt in selectively, shaping green investment around profit expectations rather than public planning priorities (Gabor & Braun, 2025). As a result, investments remain profit-driven rather than transformative, delaying a renewable energy transition despite cost advantages over fossil fuels (Christophers, 2024). Similar dynamics apply to SUV production and industrial agriculture, which remain 'competitive' over public transport and agroecology. Consequently, Competitive Sustainability is structurally incapable of addressing the 'sunshine problem' – the phasing out of still-profitable industries rather than merely managing the decline of uncompetitive 'sunset' industries (Ergen & Schmitz, 2023).

These contradictions manifest in several conjunctural moments. For example, the structural bias toward techno-economic interests – embedded in the notion of Competitive Sustainability – allows fossil fuel companies to position themselves as key advisers in the energy transition while branding themselves as innovators of negative-emission technologies, profiting from carbon removal while continuing to profitably emit CO_2 (Bärnthaler et al., 2024). This dynamic entrenches systematic overshoot (Malm & Carton, 2024) and fosters 'reactionary decarbonization' (Levien, 2025). Further tensions arise when competitive industries that drive growth – such as high-end internal combustion engine (ICE) car production – must be scaled down to meet environmental goals (Pichler et al., 2021, p. 144), exposing the fundamental contradiction of and tensions within Competitive Sustainability.

5.2. Long-Term Goals: Reconceptualising EU industrial policy objectives

5.2.1. From Single Market Resilience to Foundational Liveability

The objective of Foundational Liveability is derived from the *Foundational Economy Collective*, highlighting that everyday liveability is dependent on essential services, social infrastructures, and residual income (Calafati et al., 2023). It emerges from the unresolved tensions within Single Market Resilience, recognizing that market resilience ultimately depends on the resilience of foundational non-market institutions and relations. This perspective underscores the requirement to differentiate economic activities based on their criticality in meeting human needs. This reconceptualization is rooted in an axiological shift – a fundamental change in how value is understood – central to post-growth research. It moves away from the neoclassical theory of value, which is based on preference satisfaction and the liberal principle of 'preference neutrality' – a framework that prevents assessing the social contribution of different sectors, groups of workers, and consumption and production practices (Gough, 2017). Instead, it advocates for a needs-based value theory, prioritizing economic activities that are critical to human need satisfaction, allowing for meaningful distinctions and priorities within contemporary economies (Bärnthaler et al., 2021; Bärnthaler & Gough, 2023; Brand-Correa & Steinberger, 2017; Hickel & Sullivan, 2024; O'Neill et al., 2018; Vogel et al., 2021).

This reconceptualization allows for the introduction of a – clearly non-exhaustive – heuristic framework: a hierarchical, three-layered, needs-centred industrial ecosystem approach (see Figure 2; also Bärnthaler et al., 2021). It differentiates between foundational reliance systems (for daily essentials), lifestyle and comfort support systems (for occasional goods and services), and tradeable serving systems (for inputs). Socio-economic resilience ultimately depends on the functioning and accessibility of *foundational reliance systems* – such as housing, healthcare, and utilities – where need satisfiers (the goods and services that fulfil needs) are primarily delivered through collective infrastructures and networks rather than as individual commodities (Schafran et al., 2020). Above this foundation, *lifestyle and comfort support systems* provide non-essential goods and services such as tourism, gastronomy, and other mundane lifestyle services, offering occasional pleasures that can in principle be postponed. While transformation in these systems should encourage sustainable forms of hedonism (Soper, 2020), foundational reliance systems take precedence when conflicts arise – such as livelihood needs versus over-tourism – or when biophysical boundaries are at risk (Gough, 2017). Finally, *tradeable serving systems* are intended to *support* sustainable foundational reliance systems and lifestyle and comfort support systems, necessitating the decommissioning of value chains, sectors, and actors that do not contribute to these systems – such as (carbon-intensive) luxury production and extractive finance (Bärnthaler & Gough, 2023 Fanning

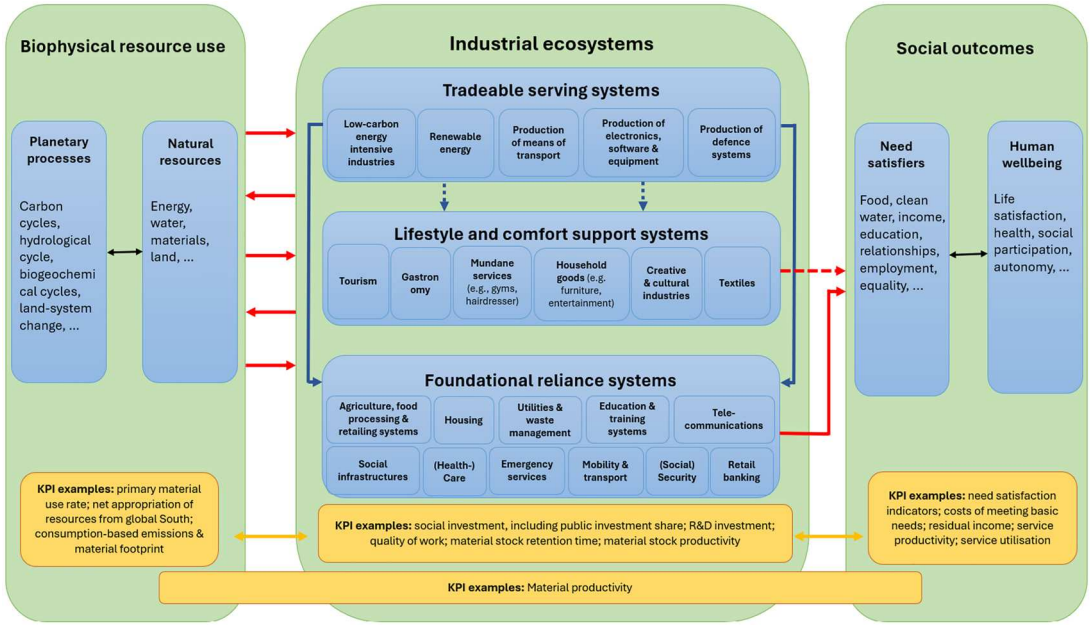

Figure 2. Hierarchical, three-layered, needs-centred industrial ecosystem approach; inspired by O'Neill et al. (2018), Foundational Economy Collective (2022), and Bärnthaler et al. (2021). The figure serves as a heuristic, re-clustering the industrial ecosystems from Figure 1 without being exhaustive or representing the entire industrial ecosystem. Drawing on the provisioning framework (O'Neill et al., 2018), the red arrows on the left and right illustrate how provisioning systems mediate the relationship between biophysical resource use (on the left – resource inputs such as raw materials and outputs such as waste) and social outcomes (on the right). The blue arrows in the central box indicate that tradeable serving systems provide inputs to other systems. The dashed lines (representing inputs and outcomes related to occasional goods and services) and the solid lines (representing inputs and outcomes related to daily essentials) suggest a potential prioritization of solid over dashed lines in cases of conflict or when biophysical boundaries are at risk. The orange boxes highlight exemplary key performance indicators throughout the provisioning process (for more details, see Appendix).

et al., 2020; Oswald et al., 2023) – or that operate unsustainably, like the fossil fuel industry (Tilsted & Newell, 2025).

This reconceptualization also involves a shift in key performance indicators, as current metrics prioritize competitiveness, productivity growth, and inputs over sustainable well-being outcomes (Renda, 2021; Vezzoni, 2023). Instead, the focus shifts to biophysical and social outcome metrics (see examples in Figure 2, detailed in Appendix) and a reorientation of the European Skill Agenda for workforce up- and re-skilling toward building collective capacities for a de-fossilised and transformed economy centred on need satisfaction.

5.2.2. From Strategic Autonomy to Peaceful Planetary Co-Existence

The principle of Peaceful Planetary Co-Existence draws inspiration from Karl Polanyi's (1945) vision of peaceful regional co-existence and arises from the current contradictions of Strategic Autonomy, recognizing that long-term security cannot be achieved through the continued expansion of resource frontiers in the Global South and in Europe's periphery. Andreas Novy (2022) presents this approach as an emancipatory response to the failures of liberal hyper-globalism – dominated by the West – and

the rise of nationalistic capitalism, advocating for territorial self-determination to empower diverse mixed economies with proper policy spaces.

Recognizing the challenges of global rulemaking amid current geoeconomic and geopolitical conflicts, this approach pursues a minimal global compromise based on internationally accepted standards, such as human rights and core labor standards ratified by nearly 140 nations (Raza, 2022). It calls for strengthening global rules on trans-regional issues – including climate, biodiversity, peace, and tax avoidance – while rejecting the imposition of Western models, including liberal democracy and 'free-market' capitalism, on the Global South (Novy et al., 2023). Instead, it upholds sovereign equality, the right to territorial self-determination, and non-interference, marking a shift from historical Western dominance toward a more multi-polar and regionalized geopolitical framework. Moving toward this broad, long-term vision amid today's multi-polar pressures in geopolitics requires immediate concrete steps to mitigate rising geopolitical and internal resource conflicts while strengthening the EU's territorial capacity to meet needs (see Section 5.3.2).

5.2.3. From Competitive Sustainability to Democratically Coordinated Sustainability

The final pillar of a reconceptualized industrial policy framework is Democratically Coordinated Sustainability, which emerges in response to the dysfunctionality of Competitive Sustainability. As an incentive-driven market governance approach, Competitive Sustainability – rooted in the notion of 'weak sustainability' (Ayres et al., 2001) – has systematically prioritized private business competitiveness and profit over ecological limits and social equity. This approach has failed to sufficiently accelerate the green transition and has contributed to the disproportionate exploitation and appropriation of planetary resources by wealthier economies (exacerbating geopolitical tensions and risks, as outlined in Section 5.1.2).

Post-growth research highlights the need for democratic planning and the deep democratization of economic decision-making as a prerequisite for reallocating productive capacities to meet needs within planetary boundaries (Durand et al., 2024; Graham, 2023; Koch, 2024; Steinberger et al., 2024). Given that shielding the economy from democratic oversight is a defining feature of capitalism (Meiksins Wood, 1981), this shift would likely require post-capitalist condition. It would enable democratically coordinated mechanisms to determine what should be produced – including necessary exnovations – to ensure that economic activities remain within planetary boundaries while effectively meeting societal needs. This democratization of economic decision-making – shifting power over economic development from corporate planning to an iterative, multi-actor process that integrates central planning authorities, local production units, worker and consumer councils, and citizen assemblies (e.g. Durand et al., 2024; Hart-Landsberg, 2023) – would create the necessary conditions, though not a guarantee, for equitably redistributing collective resources. This shift could move investment and production away from currently profitable but wasteful, environmentally harmful, or less-necessary activities, and toward those essential for well-being and social-ecological transformation.

5.3. Toward the next best transition steps: bridging current tensions and long-term goals

5.3.1. A foundational economy strategy to stabilize social foundations

The inherent tensions within Single Market resilience have created fractures and conjunctural entry points for intervention. A weakened reliance system threatens socio-economic stability – including market resilience – while fuelling social discontent, exacerbating inequalities as well as labor market precarity, and triggering political backlash (see Section 5.1.1). Overcoming these tensions requires a

new focus on Foundational Liveability, underpinned by a hierarchical, needs-centred industrial ecosystem approach (see Section 5.2.1). This raises the question of next best transition steps to achieve this objective.

A key leverage point in addressing these tensions is exposing critical blind spots in EU industrial policy. Current strategies often prioritize large firms – so-called *European Champions* – and export-driven industries while not sufficiently addressing the economic anxieties of left-behind regions and the quality of employment and services in foundational sectors (Foundational Economy Collective, 2022). While innovation is vital, if its benefits do not translate into secure, high-quality jobs and improved public services, it risks deepening inequalities and fuelling political backlash (Kenny & Luca, 2021). To prevent this, industrial policy should prioritize foundational services alongside manufacturing (Edgerton, 2023). Réka Juhász et al. (2024) highlight that this broader view of industrial policy aligns with concepts like regional or place-based policies (Barca, 2019) or New Municipalism (Thompson, 2021), emphasizing its relevance at local and municipal levels. While just transition policies for heavy industry are essential (Pichler et al., 2021), the average European worker is more likely employed in care, food service, transport, or retail – sectors vital to daily life yet often overlooked in industrial policy (Froud et al., 2025). Given that 40% of Europe's workforce is employed in the foundational economy (Foundational Economy Collective, 2022), strengthening these sectors is crucial for delivering tangible improvements in livelihoods and social cohesion (Coote & Percy, 2020; Mastini et al., 2021; Vogel et al., 2024).

Hence, a next-best transition step in EU industrial policy is improving the quality and accessibility of essential services while enhancing wages, job security, and working conditions. The (re)municipalization and (re)nationalization of essential services have gained traction in recent years (Kishimoto et al., 2020), offering a popular entry point for industrial policy interventions to reshape how essential goods and services are produced and provided. Leverage points within the EU's institutional framework include expanding exemptions under competition law for greater direct public provisioning, further revising state aid rules to enable strategic public investment (linked to social-ecological conditionalities), and using the European Semester process to prioritize public-led service models in country-specific recommendations. Strengthening public control over foundational reliance systems can also trigger further systemic shifts, such as by curbing extractive rent-seeking (Bärnthaler 2024a; Stratford, 2020), expanding eco-social public procurement (strengthening sustainability and social criteria in the EU Public Procurement Directive, as well as its enforcement), supporting coordinated public buffer stock systems (e.g. for food staples; Weber & Schulken, 2024), and imposing social conditionalities and public-interest obligations along the value chain (Froud & Williams, 2019; Mazzucato & Rodrik, 2023). Additionally, price caps on essential services, where needed, can be implemented through existing EU competition and Single Market regulations, drawing on precedents like the Council's gas price cap.

A renewed industrial policy focus on reclaiming public control over essential services is not only a next-best step toward transformation due to its popular support, the presence of contested but existing leverage points within the EU's current institutional architecture, its distributional implications – as lower-income groups spend a disproportionately large share of their income on essential services – and empirical evidence indicating that higher levels of public provisioning are linked to higher need satisfaction and lower energy requirements (Vogel et al., 2021). It is also a next best step because it creates new opportunities for further steps toward deeper structural transformations by raising fundamental questions about provisioning: Who controls it? What ownership structures exist? Who produces what, under what conditions, and for whom?

5.3.2. Sufficiency as a strategy of security

The contradictions underpinning Strategic Autonomy – seeking enhanced security while exacerbating eco-imperialist tensions in an era of declining Western hegemony (see Section 5.1.2.) – create conjunctural entry points for interventions toward a long-term vision of Peaceful Planetary Co-Existence (see Section 5.2.2). Achieving this vision requires immediate concrete steps to mitigate rising geopolitical and intra-EU conflicts driven by the expansion of resource frontiers while simultaneously strengthening the EU's sovereign capacity to meet the needs of its population. This has become even more urgent given the increasingly unreliable and erratic behavior of the U.S. as a 'strategic partner', creating further vulnerabilities.

A credible strategy linking Strategic Autonomy with Peaceful Planetary Coexistence prioritizes demand management to reduce overall resource use as a key element of industrial policy (Nilsson et al., 2021; Vezzoni, 2023). This approach is grounded in a sufficiency strategy – 'a set of policy measures and daily practices which avoid the demand for energy, materials, land, water, and other natural resources while delivering well-being for all within planetary boundaries' (Saheb, 2021; see also: Bärnthaler et al., 2025; IPCC, 2022, p. 35). A detailed assessment of a low-energy demand, 1.5°C-compatible pathway for Europe by Wiese et al. (2024) highlights that such a strategy could enhance Europe's sovereignty and improve its chances of meeting decarbonization targets. By decreasing reliance on critical imports and high-risk negative-emission technologies, it could enable energy independence by 2050, halve Europe's energy demand, and reduce costs by minimizing less-necessary infrastructure investments (ibid.).

The European Environmental Bureau (2024) identifies several leverage points within the EU's current institutional architecture to adopt a sufficiency strategy. This includes binding 2040 targets for energy and material footprint reduction, a revised EU Governance Regulation with sufficiency reporting in National Energy, Climate, and Materials Plans (NECMPs), and the creation of a permanent EU citizens' assembly to co-develop and monitor sufficiency policies. Sectoral measures include redirecting transport infrastructure investment to favor public transit, cycling, and local supply chains, banning unnecessary short-haul flights, and restricting excessive vehicle sizes. In buildings and spatial planning, sufficiency can be promoted by prioritizing retrofits over new construction, implementing progressive energy and water tariffs, and embedding sufficiency principles into existing EU urban planning frameworks. For materials, products, and food systems, a new EU Directive on Sustainable Resource Management can impose binding material reduction targets, stricter eco-design rules to phase out single-use products and extend product lifespans, and stronger water governance policies to ensure equitable access and prevent resource conflicts. Across sectors, tax reforms can facilitate sufficiency, leveraging EU funds (e.g. Recovery and Resilience Facility, Cohesion Funds, Social Climate Fund) to support local and citizen-driven initiatives, and providing technical assistance to municipalities and energy communities through DG GROW's Technical Support Instrument.

Integrating sufficiency into scenario modeling and existing EU governance frameworks – through financial rules, planning reforms, and alignment with cost-of-living and energy security priorities – provides a viable path forward without requiring major institutional overhauls. While the immediate and full-scale implementation of sufficiency priorities seems unlikely in the current politico-economic landscape, a sufficiency strategy can nevertheless serve as a crucial next-best step as it encompasses multiple sectoral and cross-scale initiatives in mobility, housing, energy, and food that can foster diverse struggles and coalitions. Crucially, positioning sufficiency not primarily as a climate policy but as a pragmatic approach to economic sovereignty, security, and cost savings can significantly improve its acceptance in the current politico-economic

conjuncture. In an era of rising living costs, energy security concerns, and EU sovereignty debates, this framing strengthens its feasibility, broadens its appeal, and entails the potential for unconventional alliances across different contexts.

5.3.3. Green economic planning within the current politico-economic order

Competitive Sustainability faces internal limitations to sufficiently accelerate the green transition due to its dependence on private sector profitability, market-based governance, and the dominance of economic efficiency over directional innovation and exnovation as well as of incentives over coercive regulation (see Section 5.1.3; also: Nilsson et al., 2021). To overcome these obstacles, Democratically Coordinated Sustainability envisions democratic planning under post-capitalist conditions to democratically shift productive capacities from currently profitable activities to those essential for well-being and social-ecological transformation (see Section 5.2.3). However, while Competitive Sustainability faces insurmountable structural barriers to accelerating the transition, planning approaches that assume a deep democratization of the economy – that is: post-capitalist conditions – require a systemic, revolutionary political-economic transformation. This outcome is highly unlikely in the short term, especially given the current constraints on state agency imposed by powerful capitalist interests and the infrastructural power of financial actors in an era of globalized financialization (Ban & Hasselbalch, 2024). A feasible transition strategy here and now should therefore identify coordination mechanisms that enable rapid decarbonization through sustained coercive power, while accommodating compromises with certain capital factions (Bärnthaler, 2024a; Downey, 2025; Newell, 2019).

Ban and Hasselbalch (2024, p. 2) outline contours of such a strategy, describing it as 'occupying a middle ground between an ineffective liberal status quo and a more distant post-capitalist future'. Termed *green economic planning*, it is defined as 'a form of state-led decarbonization whereby the state designs and implements structural complementarities between macro-financial architectures, industrial policy, and private sector incentives' (ibid, 1). This approach draws lessons from indicative planning in post-war economies, contemporary sectoral planning[1], and corporate strategic planning.

A key takeaway from this analysis is the need to move beyond the derisking state (Gabor & Braun, 2025; Mazzucato et al., 2024; Newell, 2024) – shifting from (more or less) unconditional corporate welfare to institutional mechanisms that *continuously* align private capital with strategic public priorities (Bulfone et al., 2023). This requires a set of next-best interventions. *Credit guidance*, aligned with central banks' mandates to mitigate systemic risks, can restrict lending to destructive sectors while directing finance toward sustainable activities (Hickel & Stevenson, 2024; Kedward et al., 2024; Olk et al., 2023). *Public-private liquidity guarantees*, backed by central banks (Ban & Hasselbalch, 2024), combined with *differential reserve requirements* that penalize brown investments (Downey, 2024), further shape credit allocation while enhancing liquidity. In parallel, alongside the redesign of fiscal rules to create policy space (Mang & Caddick, 2023), long-term and coordinated *public investment* – through institutions such as the European Investment Bank and other collective borrowing mechanisms – can help prevent fragmentation across member states (De Ville, 2023). Recent work by Prieg et al. (2024) has also made the case for stronger *monetary-fiscal coordination* to support these objectives. Simultaneously, deepening ongoing *vertical interventions* can facilitate the dismantling of unsustainable value chains and regional restructuring (Ergen & Schmitz, 2023). Expanding *state ownership* in key sectors like finance and energy would strengthen public control over critical industries to drive decarbonization (Ban & Hasselbalch, 2024). Moreover, *socializing innovation* – through public investment, shared

research, and equitable technology access – distributes the costs, risks, and benefits of technological advancements more fairly, preventing their concentration among a few private actors (ibid.).

These mechanisms can drive disruptive industrial policy (Cosbey et al., 2017), while also benefiting certain capital factions; for example, post-war France demonstrated how planned credit financed long-term projects, such as high-speed trains, across 49 sectors over 20 years, filling gaps left by private finance while consistently delivering positive capital returns for each sector (Monnet, 2018). While planning always depends on historical contingencies, Ban and Hasselbalch's (2024, p. 6) analysis shows 'that even strongly coercive forms of planning do not require post-capitalism, 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'.

There are certainly significant risks involved, particularly corporate capture, but the outcomes of next-best transition steps are always somewhat uncertain, with their success and effectiveness depending on political and policy learning (Eckersley, 2021). Crucial to this learning process is enhanced worker and community participation and representation in the transformation process (Barca & Leonardi, 2018), which can be supported by tying public financial support and access to credit to increasing worker involvement (Pichler et al., 2021). As such, green economic planning within capitalism can help rebuild state capacities (including necessary systems of calculation; Allan, 2024), enhance (cross-)sectoral coordination, shape historically conditioned expectations (e.g. what constitutes 'reasonable' or 'normal' profit; Albert, 2024), and gradually create new spaces for democratic decision-making. In the long term, these developments could foster the socialization and deeper democratization of the economy.

6. Conclusion

This article critically examines the resurgence of industrial policy in the EU. It argues that the current pillars of EU industrial policy – Single Market Resilience, Strategic Autonomy, and Competitive Sustainability – are internally contradictory and are, as such, only realizable in deficient or self-undermining ways. Using immanent critique, conjunctural analysis, and critical problem-solving, the article reveals how these pillars, here and now, undermine their own objectives, what is necessary to overcome these contradictions, and how to navigate the path forward within existing politico-economic conditions.

Single Market Resilience undermines market resilience by undervaluing its dependence on foundational non-market or partially decommodified institutions and relations, which require systematic prioritization. In the current conjuncture, these unresolved tensions – exposed by the intensifying cost-of-living crisis – have fuelled political backlash, effectively exploited by the far right. Strategic Autonomy seeks to enhance the EU's long-term security but instead exacerbates eco-imperialist tensions by expanding resource frontiers, increasing vulnerabilities amid declining Western hegemony. Competitive Sustainability aims to accelerate the green transition, yet its reliance on private profitability, market governance, incentives, and technological innovation as gradual phase-in imposes structural limitations.

To overcome these immanent tensions and contradictions, we propose reconceptualizing the EU's industrial policy pillars as: Foundational Liveability (based on a hierarchical, needs-centred industrial ecosystem approach), Peaceful Planetary Co-Existence (based on a multipolar, regionalized geopolitical framework), and Democratically Coordinated Sustainability (based on democratic planning under post-capitalist conditions). To bridge the gap between these long-term

goals and present conjunctural tensions, we explored feasible next best transition steps that, while contested, can be realized within current politico-economic conditions. We consider these next best steps as part of a transitional phase – what Michael J. Albert (2024, p. 933) describes as the 'messy middle ground of hybrid political-economic formations that confound neat categories'. Figure 3 summarizes this below:

By bridging post-growth and industrial policy debates, this article provides a roadmap for transforming EU industrial policy to align with planetary boundaries and social needs. Its underlying logic mirrors Gough's (2017, p. 193) three-stage model, transitioning from the present toward a post-growth future by recomposing consumption and production. As such, we agree that *disruptive* green industrial policy, here and now, can initiate political-economic shifts as a foundation for long-term post-growth transformations (Allan, 2024) – especially, as Albert (2024) emphasizes, when these shifts are driven by deepening conjunctural tensions, evolving conceptions of 'security', and broad alliances among movements, labor, progressive policymakers, and elements of 'green' capital. While post-growth research has developed a broad range of policy instruments

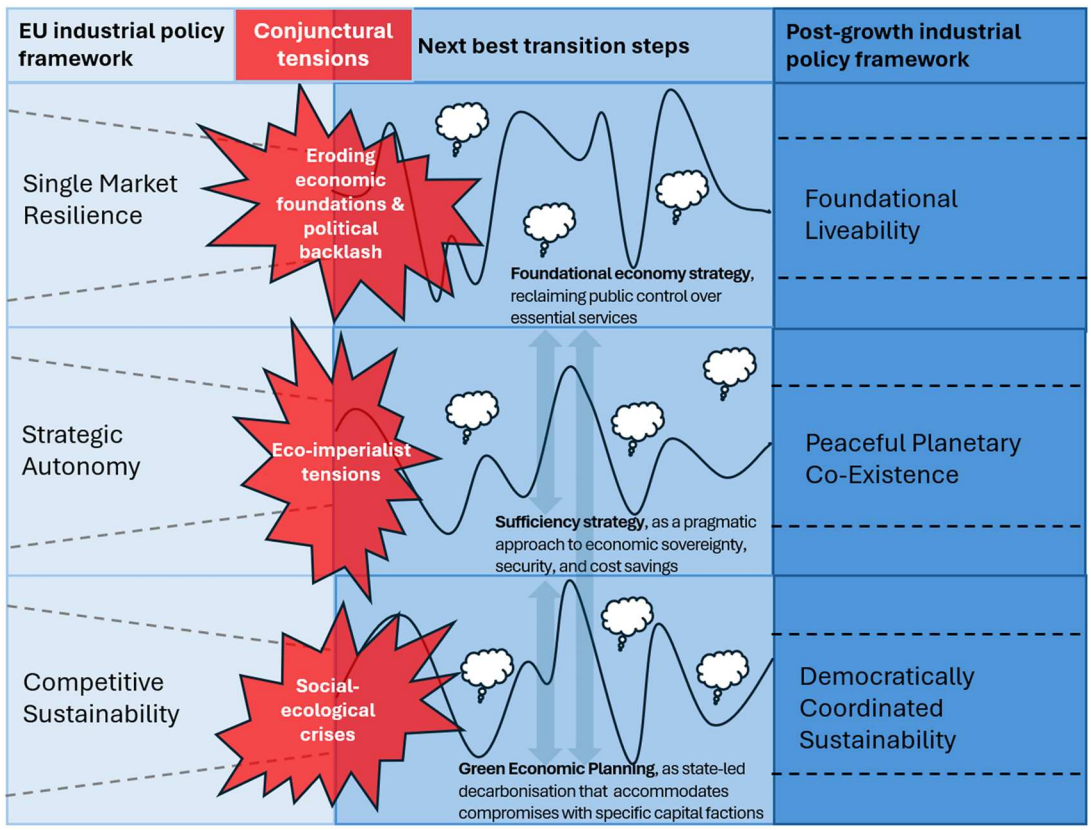

Figure 3. Roadmap toward a post-growth industrial policy framework. The figure illustrates transition pathways from the current EU industrial policy framework toward a post-growth industrial policy framework. The red 'explosions' highlight key conjunctural tensions that could drive regime shifts and serve as entry points for the next best steps. While the outlined transition steps are critical, they are not exhaustive, as indicated by the 'thought bubbles'. The arrows in the middle represent synergies between these transition steps, which are discussed further below.

(e.g. Cosme et al., 2017; Fitzpatrick et al., 2022), it often lacks integrated policy mixes as well as coherent strategies and political programs – particularly in industrial policy – that can drive transformative change in the immediate term. In the current context of geopolitical instability and rearmament in Europe – which may advance the EU's state-building process (Kelemen & McNamara, 2022) – developing coherent post-growth industrial strategies is more urgent than ever. True security demands more than increased defense spending; it requires socio-economic stability, energy independence, increased sovereignty, and functioning ecosystems.

Although we lack the space to explore this in detail, the next best steps discussed in this article have critical synergies. For example, essential public services can function as equitable rationing, ensuring *sufficient* access to life's necessities, while increased public control over essential sectors strengthens green economic planning. At the same time, state-controlled public and private credit creation eases budgetary constraints, enabling investment in essential sectors and facilitating sufficiency-oriented demand management. Together, these steps both require and foster public institution-building. While critical, these steps are not exhaustive. Partly overlapping complementarities include a job guarantee (Hickel, 2020; Olk et al., 2023) – mobilizing labor for essential services and supporting workers in transition – alongside the emerging field of just supply-side phase-out interventions (Newell & Daley, 2024).

While we have identified exemplary leverage points for next-best transition steps within the EU's institutional architecture, future research should examine these more systematically and in greater depth. A thorough analysis of the actors, political projects, strategies, and power resources that enable or obstruct next-best steps within the current institutional framework is also essential. This is crucial for navigating today's structurally unjust and communicatively distorted political contexts to identify the most effective and feasible intervention points with the greatest transformative potential toward a post-growth future.

Note

1. These also include what Pichler et al. (2021) refer to as *implicit industrial policies*, such as EU vehicle fleet emission standards that replace current flexible fleet targets with absolute emission caps for individual cars, which can significantly shape sectoral structures.

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Notes on contributors

Richard Bärnthaler is a political economist and Assistant Professor in Ecological Economics at the Sustainability Research Institute (SRI) at the University of Leeds, where he also leads the Economics and Policy for Sustainability research group. He serves as a board member of the European Society for Ecological Economics and as an Associate Editor at the journal *Sustainability: Science, Practice, and Policy*.

Sebastian Mang is a political economist and Program Lead at the New Economics Foundation, where he primarily covers European economic policy, with a special focus on fiscal policy. The views and recommendations expressed in this article are those of the author and do not necessarily reflect the position of the New Economics Foundation.

Jason Hickel is ICREA Professor at the Institute for Environmental Science and Technology (ICTA-UAB) at the Autonomous University of Barcelona, and Visiting Professor at the International Inequalities Institute at the London School of Economic and Political Science.

ORCID

Richard Bärnthaler http://orcid.org/0000-0003-3595-2127

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Appendix

Examples of novel KPI's for industrial ecosystems.

Indicator name	Description	Source
Material productivity	$\frac{\text{service provision}}{\text{primary material in flow}}$ Physical requirements from nature to satisfy needs (e.g. health, education); decoupling of numerator growth from denominator growth suggests positive tendency.	Tanikawa et al. (2021)
Primary material use rate	$\frac{\text{primary material in flow}}{\text{overall material in flow}}$ Portion of primary materials (domestically extracted and imported) as share of overall material use; values range from 0 (fully circular material use) and 1 (no circular use).	Tanikawa et al. (2021)
Net appropriation of resources from global South	Indicates unequal exchange relations.	Hickel et al. (2022)
Consumption-based emissions	Calculates greenhouse gas emissions associated with final consumption of goods and services, including producing, transporting, using, and disposing them.	e.g. Haberl et al. (2020)
Material footprint	Estimates the extraction and use of primary materials across the entire global supply chain network needed to support an economy's level of consumption.	Wiedmann et al. (2015)
Social investment and public investment share	Private and public investment in foundational reliance systems (as share of total investment), along with the share of public investment within overall social investment.	–
R&D investment	R&D spending on foundational reliance systems (as share of total R&D investment).	–
Quality of work	Includes eight dimensions: pay and benefits, job security and stability, skills and employability, health and well-being, work intensity, representation and voice, equality of opportunity and treatment, human rights, job satisfaction.	International Labour Organisation (2021)
Material stock retention time	$\frac{\text{material stock}}{\text{overall material in flow}}$ Scale of extraction of materials from the natural environment in relation to the size of the in-use stock; lower inflows to stock signal less demand for replacement and maintenance of the stock (implying a longer lifetime of existing stock) – can reflect high-quality and sufficient level of stock, but also underperforming stocks and sluggish material flows; thus: indicator to be examined in view of absolute values of flows and stocks.	Tanikawa et al. (2021)

(*Continued*)

Continued.

Indicator name	Description	Source
Material stock productivity	$\frac{\text{service provision}}{\text{material stock}}$ Capacity of material stock to provide the services it was intended to deliver; issues like product design (e.g. smaller cars) can decrease the required mass of materials to deliver a unit of service.	Tanikawa et al. (2021)
Need satisfaction indicators	Disaggregated social indicators such as healthy life years, nutritious food, energy poverty, and access to public mobility.	Doyal and Gough (1991, chapter 8)
Costs of meeting basic needs	Basic good inflation metric, based on basket of essential goods and services; enables comparing income against the cost of basic needs in different contexts.	Hickel and Sullivan (2024); Moatsos (2016), Allen (2020)
Residual income	Shows the households margin available for discretionary spend; measured by (a) adding up the inescapable cost of household essentials (e.g. housing, transport, utilities) and then (b) subtracting these essentials from post-tax disposable household income.	Calafati et al. (2021)
Service productivity	$\frac{\text{societal benefit}}{\text{service provision}}$ Addresses the capacity of increased services to improve well-being; e.g. to what extent does an increase of housing floor space support well-being.	Tanikawa et al. (2021)
Service utilization	$\frac{\text{service provision (utilised)}}{\text{service provision (extant)}}$ Measures a given service's sufficiency; values lower than 1 indicate oversupply of the extant stock, e.g. empty housing; values higher than 1 indicate under capacity, e.g. underequipped hospitals.	Tanikawa et al. (2021)