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Introduction

Executive Summary

This discussion paper, on the political economy of just transitions, examines how power relations, economic structures, and political institutions work towards shaping policy outcomes and distributional consequences in the context of just transition. It moves beyond technical or managerial framings to interrogate the costs and benefits – or who might win or lose – from different transition pathways, how capital accumulation patterns are reconfigured or reproduced, and which social forces drive or resist transformation. Hence, the discussion paper adopts a political economy lens to reveal the underlying conflicts and power asymmetries that different stakeholders' positions reflect, and to assess whether proposed transition frameworks challenge or reinforce existing patterns of inequality and exploitation.

Keywords

Political economy; just transitions; drivers; obstacles; positions; trends.

Intended audience

The intended audience for this discussion paper includes those interested in reading a concise summary of some of the key drivers and obstacles of just, green transitions, as well as contemporary ideas about positions and trends on that topic, from a critical political economy perspective. In addition, readers will find in this discussion paper a concise summary of insights gained through the production of fifteen case studies on green, just transition by the GreenPaths consortium.

Reading recommendations

This discussion paper summarises stakeholders' positions, drivers, obstacles and trends associated with green transitions using an integrated approach by discussing all four topics using a shared sectoral perspective. However, the four main sections can also be read as standalone sections in the case a reader is particularly interested in one of these perspectives.

Scope

This discussion paper on the political economy of green transitions is based on work by the GreenPaths team who were tasked to consider the stakeholder positions, drivers, obstacles, and trends on this topic (Task 4.3). These considerations, in turn, are based on process whereby all the work done by the GreenPaths team on green transitions in previous work packages was drawn together, in particular, the work done on fifteen case studies of green transitions across multiple sectors in Europe and the Global South, in addition to secondary material on the topic in the scope of expertise of the authors.

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Organization of the work

UC prepared the template deliverable, coordinated and participated in the project meetings on this work, prepared the introductory section and performed editing of the whole document. IPE prepared sections on drivers and obstacles; TNI prepared positions of stakeholders on green transition, FoEE prepared the section on green transition trends; UvA prepared the discussion and conclusions section. Peer review of this discussion paper was done by several team members from INTERMON and UvA and UC.

Approach

After defining the GreenPaths' approach to political economy and just transitions in this discussion paper, we examine the position of stakeholders, drivers, obstacles and trends of green transition organised into three domains: fossil fuel-phase out, decarbonisation, and industrial policy; eco-social state, land use and agriculture; and green industrial policy, finance and employment. Based on this discussion, the discussion lists critical findings, and the conclusions suggest just transition pathways ahead.

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1. Positions on green transitions from the stakeholders' perspective

1.1. Introduction

The concept of *just transition* emerged from trade union struggles in the 1970s and 1980s, when workers in polluting industries began demanding that environmental reforms should not come at the expense of their livelihoods (Galanis et al, 2025). What originated as a radical demand for labour protections has since migrated into mainstream climate policy discourse, appearing in everything from the Paris Agreement to national decarbonisation strategies. The recent COP30 in Brazil established the Belem Action Mechanism for a Global Just Transition (BAM), a global framework resulting from sustained civil society pressure. Nevertheless, the term's proliferation across institutional contexts has obscured fundamental disagreements about what justice means, whose interests matter, and what kind of transformation is actually required.

This discussion paper addresses just transitions in the EU through a critical political economy lens, revealing underlying conflicts and power asymmetries rather than assuming shared goals or technical solutions. Political economy analysis examines how power relations, economic structures and institutional arrangements shape policy outcomes and distributional consequences. It asks who benefits and who loses from different transition pathways, how capital accumulation patterns get reconfigured or reproduced, and which social forces drive or resist structural change. Our approach challenges the managerial framing that treats the transition (or 'transitions', in plural) as a purely technical challenge requiring better policies or more efficient markets.

The GreenPaths project has produced fifteen case studies, which are used as key sources for this discussion paper. Summaries of these case studies can be found in the prior GreenPaths (D3.4), and are summarised in the GreenPaths Hub. These case studies have shown how stakeholders mobilise just transition discourses while pursuing divergent political-economic projects across three thematic clusters: (a) fossil fuel phase-out, decarbonisation and industrial policy; (b) land use, agriculture and the eco-social state; and (c) green industrial policy, finance and employment. The EU, national governments and international organisations function as key institutional actors shaping transition pathways, though their proposals often reproduce existing inequalities whilst claiming to address them. This section provides a preliminary mapping of the actors, policy instruments and political tensions that shape contemporary just transition debates. We trace how different stakeholders deploy the concept whilst pursuing conflicting agendas, revealing the contested terrain on which transition struggles unfold.

1.2. Stakeholder Positions Across GreenPaths' Three Thematic Clusters

1.2.1. Fossil Fuel Phase-Out, Decarbonisation, and Industrial Policy

EU climate policy operates through an expanding toolkit that includes emissions trading, carbon border adjustments, critical raw materials procurement and regional transition funds. The Critical Raw Materials Act (CRMA) aims to secure European access to lithium, cobalt and rare earths needed for the energy transition. In practice, the act outsources environmental and social costs to mining regions in the Global South or the European periphery whilst concentrating value-added processing in core countries, as exemplified by Portugal's Mina do Barroso lithium project (case study 1). The Carbon Border Adjustment Mechanism (CBAM) similarly presents itself as climate policy, whilst functioning as industrial protectionism that hinders development in the Global South. The Just Transition Mechanism targets coal-dependent regions with funding for economic

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diversification and worker retraining, but the available resources appear inadequate relative to the scale of disruption, (see case study 3) and implementation has prioritised business subsidies over guaranteed employment or democratic planning. Recent political developments have further weakened the mechanism's ambition, with the European Commission prioritising industrial competitiveness over social protection whilst paying lip service to Green Deal goals.

Global South governments advance demands for technology transfer, climate finance and resource sovereignty that challenge the terms of green transition as currently structured. They reject transition frameworks that would perpetuate colonial patterns of raw material extraction whilst blocking pathways to industrialisation. These demands surface tensions between immediate energy security needs, long-term climate commitments, and aspirations for economic development that Global North countries achieved through carbon-intensive growth. The insistence on common but differentiated responsibilities reflects not just distributional questions but fundamental disputes about whose development gets sacrificed for whose climate goals (see case studies 5, 6 and 7).

Meanwhile, the International Energy Agency (IEA) has shifted from advocating fossil fuels to net-zero scenarios, though its roadmaps assume continued economic growth and technological solutions rather than fundamental system change. The International Renewable Energy Agency (IRENA) promotes renewable energy deployment whilst remaining largely silent on questions of ownership, control and distribution. The World Bank and regional development banks frame climate finance as investment opportunities, channelling funds through mechanisms that prioritise market viability and financial returns over social and ecological needs. In general, these institutions tend to treat the just transition as a purely technical issue rather than taking into account its many and complex political economy dimensions.

Energy corporations present decarbonisation as an opportunity for diversification into renewables whilst defending continued fossil fuel extraction as necessary for an orderly transition. The gap between net-zero commitments and actual investment patterns suggests greenwashing rather than genuine transformation. Oil and gas majors have invested heavily in lobbying against a rapid phase-out, whilst positioning themselves to capture green hydrogen markets that could extend rather than replace fossil fuel infrastructure. Mining corporations promote critical minerals extraction as climate action, obscuring displacement and environmental damage in the Global South (as documented in the case studies 7 and 12, which examine platinum and cobalt mining in Southern Africa and Serbia's Jadar lithium project). In addition, interviewees perceive that mining corporations did not fulfil their responsibilities as regards restoration (case study 3). Green hydrogen has emerged as a contested frontier, with fossil fuel companies treating it as a lifeline for existing infrastructure and business models, whilst others question whether it serves genuine decarbonisation or merely extends carbon lock-in (case study 11).

Civil society and labour organisations, in particular, those affiliated with the Trade Unions for Energy Democracy (TUED) network, have advanced proposals for democratic public ownership of energy systems, guaranteed employment for displaced workers, and just transition planning that centres workers' and communities' voices rather than corporate interests. These positions recognise that a market-driven transition threatens livelihoods whilst potentially reproducing precarious employment in new green sectors. The unions demand that decarbonisation proceeds through expansion of quality employment under collective bargaining rather than casualisation disguised as labour market flexibility. However, positions vary considerably, with some industrial unions prioritising job preservation over climate action, revealing tensions between immediate member interests and longer-term collective welfare.

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Anti-extractivist movements in both Europe and the Global South challenge the assumption that green transition requires simply replacing fossil fuels with renewable energy that depends on intensified mineral extraction. Empirical evidence from recent research shows that lithium mining in Argentina and Chile (case study 5), cobalt extraction in the Democratic Republic of Congo, or nickel mining in Indonesia tend to reproduce patterns of dispossession (case studies 6 and 7). Environmental justice communities living in *sacrifice zones* contest policies that would maintain their subordination whilst greening production elsewhere. Climate justice networks advocate for a managed decline of fossil fuel industries, paired with guaranteed alternative employment, challenging both market-led transition and technocratic planning that exclude affected communities. Indigenous peoples assert rights over territories targeted for critical minerals extraction, demanding free prior and informed consent rather than consultation theatre. These movements share a rejection of *green capitalism*, which would reproduce colonial extraction under the guise of sustainability branding.

The shift from fossil extractivism to mineral extractivism threatens to reproduce rather than break cycles of dispossession. The energy transition, as currently structured, depends on the Global North's access to Global South resources, perpetuating colonial patterns of unequal exchange (case study 8). Debates over the pace of phase-out reflect tensions between climate urgency and demands for social protection, with those most vulnerable to economic disruption bearing disproportionate costs of rapid change designed primarily to protect the consumption patterns of Global North societies.

1.2.2. The Eco-Social State, Land Use, and Agriculture

The Farm to Fork Strategy positions sustainable food systems within the European Green Deal (EGD), targeting reductions in pesticide use, the expansion of organic farming, and improved animal welfare. However, its implementation has faced resistance from agribusiness lobbies and large landowners who frame environmental regulations as threats to productivity and competitiveness. Tensions with the Common Agricultural Policy (CAP) reveal how subsidy structures continue to favour industrial agriculture (as documented in case study 4 on Slovenia, Croatia, and Serbia, where area-based payments fuel land concentration), whilst the Commission proposes an agroecological transition. Rural development funds nominally support farmers through transition but often flow to larger operations capable of navigating bureaucratic requirements, leaving small producers exposed to market pressures without adequate support.

Green tourism policies promote sustainable rural economies but risk displacing existing communities through processes of rural gentrification. The emphasis on territorial development can obscure questions about who controls land, who benefits from tourism revenues, and whether sustainable tourism represents genuine alternatives or simply greenwashes the extraction of rural spaces for urban consumption. The tourism industry promotes sustainable and eco-tourism whilst often driving displacement and the commodification of rural life, extracting value from territorial resources in ways that mirror those of extractive industries (see case study 13).

National agroecological transition policies vary from ambitious programmes attempting systemic change to market-oriented approaches that treat sustainability as niche product differentiation. Genuine agroecological transformation requires confronting land concentration, supporting peasant farming, and rebuilding local food systems rather than merely subsidising organic certification for export markets (as successfully implemented in Dordogne, France, a model addressed by case study 15). Some regions have experimented with land reform and public land

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management that prioritise food sovereignty over commodity production, though these efforts remain marginal to dominant policy frameworks.

Rural depopulation and territorial justice concerns have gained policy attention, but responses often emphasise infrastructure investment and digital connectivity whilst avoiding deeper questions about the urban bias built into modern capitalism. Protected areas governance presents ongoing conflicts between conservation mandates and local community rights, with protected area expansion sometimes functioning as green-grabbing that dispossesses rural populations in the name of environmental protection, as illustrated by the *Europe's Yellowstone* project in Romania (case study 2).

The Food and Agriculture Organisation (FAO) promotes sustainable intensification and climate-smart agriculture, frameworks that risk greenwashing industrial agriculture rather than supporting genuinely alternative food systems. The Convention on Biological Diversity (CBD) advances conservation targets that can enable green-grabbing when implemented without respect for indigenous and community land rights. The UN Convention to Combat Desertification (UNCCD) addresses land degradation through approaches that sometimes prioritise technical fixes over addressing the political economy of resource extraction and dispossession that drives ecological breakdown.

Agribusiness resists Farm to Fork regulations as threats to profitability and competitiveness, mobilising discourses about food security to defend industrial models. Green finance increasingly treats farmland as an investment asset, driving financialisation that concentrates ownership and displaces small farmers. Large organic food corporations have captured much of the market whilst peasant agroecology struggles for support, revealing how certification schemes enable capital to appropriate sustainability premiums.

Agricultural and rural workers' unions advocate for improved working conditions, secure employment and living wages in sectors characterised by precarity and seasonal migration. Their positions on agroecological transition emphasise that environmental sustainability cannot be separated from social justice for farmworkers, who often face the worst conditions precisely in organic and sustainable operations that exploit workers whilst marketing ethical consumption to affluent consumers.

La Via Campesina and food sovereignty movements challenge corporate-controlled food systems, demanding peasant control over seeds, land and production methods. They advance agroecology as a political project that confronts agribusiness power rather than a set of farming techniques that can be incorporated into industrial agriculture. These movements link food sovereignty to broader struggles against land concentration, free trade agreements and intellectual property regimes that enclose agricultural knowledge.

Anti-green-grabbing movements resist conservation projects that dispossess communities, particularly protected area expansion and offset schemes that privatise commons whilst excluding local populations. They insist that genuine environmental protection must respect territorial rights rather than treating inhabited landscapes as empty spaces available for conservation enclosure. Movements defending environmental justice in rural areas and farming communities document how pollution, resource extraction and climate impacts disproportionately burden rural poor whilst benefits accrue elsewhere. Debates around rewilding reveal tensions between different visions of human-nature relations, with some rewilding proposals threatening to erase peasant and indigenous land management practices.

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Green-grabbing operates as conservation-justified dispossession, with protected area expansion and offset schemes enclosing commons whilst displacing communities. The contest between industrial and peasant agriculture in transition determines not just farming methods but control over food systems and rural territories. Public service decline in rural areas reflects broader patterns of urban bias and territorial inequality that undermine rural livelihoods regardless of environmental policies. Questions about who captures premiums from organic and sustainable products reveal how certification schemes enable large corporations to appropriate sustainability value whilst small producers struggle.

1.2.3. Green Industrial Policy, Finance, and Employment

The EU's Green Deal Industrial Plan attempts to accelerate clean technology manufacturing whilst navigating state aid rules designed to prevent competitive subsidies, as evidenced by Spain's struggles with just transition Agreements and the European Investment Bank's uneven regional distribution of climate finance (case studies 3 and 9). The current European framework reflects tensions between industrial policy ambitions and neoliberal competition that constrain public intervention. Social Climate Fund (SCF) resources target housing retrofitting and energy poverty, but available funding appears inadequate relative to renovation needs, particularly for vulnerable groups systematically excluded by legalistic requirements, as documented in Croatia's energy poverty measures (case study 14). The Renovation Wave Strategy and the Energy Performance of Buildings Directive (EPBD) set ambitious targets, whilst implementation struggles reveal gaps between policy goals and financing mechanisms.

Green taxonomy and sustainable finance regulations aim to channel investment towards environmental objectives, but taxonomy battles reveal competing definitions of sustainability, with the inclusion of natural gas and nuclear power exposing how industrial lobbies shape supposedly technical classifications. REPowerEU promotes hydrogen as a transition fuel, whilst debates continue over whether this enables genuine decarbonisation. The European Investment Bank (EIB) and European Bank for Reconstruction and Development (EBRD) position themselves as green finance leaders. However, questions remain about whether their lending criteria adequately account for social and environmental justice rather than merely funding greenwashed business and the extent to which climate finance is justly distributed.

Green industrial policy developments at the national level vary considerably, with some governments re-embracing active industrial planning whilst others maintain market-oriented approaches that limit public intervention. Public housing renovation programmes exist in several countries but often fail to reach those most in need due to financing structures that require upfront investment or creditworthiness. Employment guarantees and green jobs feature prominently in policy rhetoric. However, actual job creation reveals a gap between promises and reality: Spain's coal transition, the Latin American lithium sector, and renewable manufacturing in Southeast Asia all demonstrate precarity and low wages (case studies 3, 5, and 6).

At the global level, the Organisation for Economic Co-operation and Development (OECD) promotes green growth strategies that assume continued economic expansion alongside environmental improvement through efficiency and innovation. The International Labour Organisation (ILO) advances decent work frameworks for green jobs whilst largely accepting market-driven transition. World Bank climate finance operates through market mechanisms and public-private partnerships that prioritise investor returns. UNFCCC negotiations on climate finance reveal ongoing conflicts between developed and developing countries over adequate

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funding levels and grant versus loan structures. UNEP environmental programmes tend toward technical solutions that avoid confronting underlying political economy drivers of ecological breakdown.

Green finance and environmental, social and governance (ESG) frameworks have proliferated, but evidence suggests they often serve as greenwashing, enabling business-as-usual whilst claiming sustainability credentials. Industrial lobbies advocate competitiveness and access to state aid whilst resisting regulations that would require genuine transformation. The real estate and construction sectors view housing renovation as a profit opportunity, advocating market-based financing rather than public programmes that would guarantee universal access to quality housing.

Trade unions demand quality green jobs with decent wages, secure contracts and union representation rather than casualised employment disguised as labour market flexibility. Industrial unions advance workers' voice in decarbonisation planning, insisting that transition cannot be imposed on workers but must incorporate their knowledge and respect their material needs. Public sector unions advocate an eco-social state expansion that provides quality public services, public employment, and universal social protections as foundations for a just transition, rather than market-based approaches that reproduce precarity.

Housing justice movements demand retrofit programmes that avoid displacement and gentrification, recognising how renovations drive 'renoviction' that displaces tenants from energy-upgraded properties (case study 14). They advocate public and cooperative ownership models rather than market-driven approaches that treat housing as a financial asset. Energy democracy movements advance public ownership of energy systems, challenging the assumption that private utilities can deliver a just transition whilst maintaining profit maximisation imperatives.

Degrowth perspectives challenge sustainable growth frameworks as oxymoronic, arguing that infinite growth on a finite planet remains impossible regardless of efficiency improvements. They propose economic contraction in high-income countries alongside redistribution and decommodification rather than green growth fantasies. This critique is evident in Croatia's tourism sector, where a growth-oriented approach generates extractive practices that marginalise local communities (case study 13). Community wealth-building initiatives experiment with democratic economic models that prioritise local needs, mutual aid and commons governance over market coordination and capital accumulation.

Questions of public versus private green finance determine who owns and controls transition, with market-led approaches concentrating wealth and power whilst potentially underdelivering public goods. Green jobs quality, security and worker power reveal whether new employment reproduces or challenges precarity and exploitation. The sustainable growth framing assumes decoupling of economic expansion from ecological impact despite limited evidence that such decoupling occurs at an adequate scale and speed. Housing decarbonisation without gentrification requires public investment and ownership models rather than market mechanisms that accelerate displacement. Green hydrogen debates reflect broader conflicts over whether transition technologies serve genuine decarbonisation or enable the fossil fuel industry's survival. State aid rules designed to prevent competitive distortion may inadvertently constrain transformative industrial policy that would challenge incumbent power.

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1.3. Towards a Transformative Just Transition

Power asymmetries traverse all three thematic clusters examined here, as evidenced by Morocco's prioritising green hydrogen for European energy security and by EU emissions reductions correlating with increased imported emissions from the Global South (case studies 8 and 10). The interdependencies across thematic clusters mean that the energy transition depends on mineral extraction that requires land, that industrial policy shapes employment and housing conditions, and that finance structures determine what gets built and who benefits. Nevertheless, current frameworks treat these as separate policy areas rather than interconnected aspects of capitalist political economy that require systemic transformation.

Missing from much transition discourse are crucial political economy dimensions. Trade and investment agreements constrain policy space for states seeking to implement transformative measures, whilst intellectual property regimes obstruct technology transfer demanded by Global South countries. The health impacts of fossil fuel extraction, industrial agriculture, and pollution receive insufficient attention despite their centrality to environmental justice. Intersecting inequalities around gender, race and migration status shape who performs care work, who labours in dangerous conditions, and whose knowledge gets valued in transition planning.

North-South dimensions remain inadequately addressed, with EU policies generating global implications that extend colonial patterns of resource extraction and value appropriation. Climate finance continues flowing primarily as loans that increase debt burdens rather than grants, recognising historical responsibility. Technology transfer remains blocked by intellectual property protections that serve Northern corporate interests over global climate imperatives. The promise of green growth for developing countries rings hollow when their industrialisation pathways face constraints never imposed on already-industrialised nations.

Critical assessment of EU and international frameworks reveals genuine achievements in renewable energy deployment, emissions reductions in some sectors, and rhetorical acknowledgement of social dimensions. However, structural limits constrain transformative potential. Market-based mechanisms reproduce commodification and inequality. State aid and competition rules prevent the scale of public intervention required. Private finance imperatives shape supposedly public policy. Imperial relations of extraction and accumulation persist under green branding. These frameworks can deliver incremental improvements but appear incapable of the systemic transformation that climate breakdown and social justice both demand.

Elements of genuinely transformative approaches exist across movements and some policy experiments, though they remain marginal to dominant frameworks. Democratic public ownership of energy systems, land and housing could enable planning for social and ecological needs rather than profit. Truly green and fair industrial policy would support worker-controlled production transitions with guaranteed quality employment. Decommodification of basic needs, including energy, food, housing and care work, would establish material security as the foundation for sustainable communities. Reparative climate finance, recognising historical responsibility, could resource Global South transitions without imposing debt. Food sovereignty and peasant agroecology offer alternatives to corporate-controlled food systems. Worker power through strong unions and workplace democracy would ensure that transitions serve labour rather than capital.

Climate breakdown demands transformation rather than reform, yet current institutions appear constitutionally incapable of delivering change at the necessary scale and speed. Building coalitions across labour, environmental justice movements, peasant organisations, housing

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struggles and anti-extractivist campaigns could create the social forces needed to challenge incumbent power, as evidenced by mass resistance to lithium and mineral extraction projects across Portugal, Romania, and Serbia (case studies 1, 2, and 12). Whether such coalitions emerge with sufficient strength remains uncertain, but the analysis developed here suggests that meaningful just transition requires confronting rather than accommodating the political economy of fossil capitalism.

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2 Drivers of green transitions

2.1 Introduction

Although the EU recently shifted priorities to quickly adapt to rising economic challenges and geopolitical tensions, climate change did not disappear, on the contrary, it remains one of the most complex crises that could lead humanity to environmental breakdown. Yet, "limiting the risk of an environmental disaster requires a radical structural transformation of production and consumption'' (Besley, 2023) that has been allegedly announced, but as regards actual delivery, successfully avoided by the EGD. Launched in December 2019, the EGD reflected this ambitious goal, hoping to "achieve climate neutrality by 2050". Presented by the first von der Leyen Commission as the EU's growth strategy, the EGD was presented as an unprecedented ambitious plan that vowed to re-invent the European business model completely. However, there are serious systemic shortcomings to successfully achieve this transformation through the growth orientation which we will tackle in next section. In this section, we focus on opportunities and drivers of green transition through EGD and beyond. Key drivers of green transition emerge in various fields of action; they can be economic, social, political, technological and environmental and they appear in various conjunctures across the thematic clusters. Yet, most of the drivers are detected in the economic and technological sphere, while social and political drivers are insufficiently developed, "invisibilised" or often absent.

While EGD as a policy framework can realistically play an important role in allowing green transition, a political economy perspective should approach the drivers of green transition from an "elevated" position, integrating and considering societal, cultural or even geopolitical conditions that can often become strong constraints to policy implementation. And although the EGD has already been transformed into the Clean Industrial Deal in the current Commission mandate due to geopolitical uncertainties, global competition and ''greenlash'' during last European Parliament elections, it is indicative that popular support of EU citizens toward climate action and achieving climate neutrality (Eurobarometer, 2025) is still very strong and presents an important foundation to continue with green transition, even if the Clean Industrial Policy takes us in another direction. Yet, this disparity between top-down policy direction that enhances deregulation and undermines previous achievements of the EGD on the one side, and strong popular support toward decisive climate action and continuation of green transition with stronger social dimension on the other, remains the biggest concern.

2.2. Drivers of green transition Across Green Paths' Three Thematic Clusters

2.2.1. Fossil Fuel Phase-Out, Decarbonisation, and Industrial Policy

Key drivers for fossil fuel phase-out are closely linked to climate change mitigation (IPCC mandate, reduction of carbon emissions and achieving climate neutrality), climate adaptation (increasing resilience of communities, prevention of extreme weather events impacts, sectoral adaptation), health concerns (pollution, deaths from extreme weather events), energy security (market shocks and reduction of import reliance), economic viability (falling renewable costs, removing financial support for fossil fuels that can make clean energy more competitive) and further technological advancements (efficient alternatives like renewables and electrification, new green infrastructure), all pushing towards cleaner, affordable, and more resilient energy systems. In most of the cases they rely on technological innovation and re-direction of financial flows away

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from fossil fuel investments. Yet, although renewable investments are growing, they are still not growing fast enough. According to the IEA, higher energy demand for artificial intelligence, data centres and the desire for energy independence is driving investment in renewables. But to meet the targets agreed in global climate talks, the annual investment required in renewable power still needs to double.

In the case of industrial policy, this implies promoting pathways such as electrification, green hydrogen, carbon capture (CCUS), and bioenergy to replace fossil fuels in high-emission sectors such as steel, cement, and chemicals (case studies 1 and 11 are illustrative). This also entails green procurement incentives, decreasing ‘’first-mover disadvantages’’ and tailored pathways and roadmaps for specific industry's needs. For example, the OECD promotes programmes that encourage the adoption and development of net-zero technologies, such as the use of green hydrogen in manufacturing, as well as measures that promote investment and production in sustainable inputs, like grants for wind electricity generation (OECD, 2024).

Furthermore, achieving decarbonization requires synergies between technological development, policy exertion, and societal attitudes. Provided that such policies can accelerate innovation, promote green growth, and limit polluting activities their successful implementation also depends on expected output and policy fine-tuning in an increasingly complex energy landscape, which scenario analysis can help to clarify (Skjaerseth, 2021).

Key decarbonisation drivers are centred around energy efficiency, the electrification of final consumption, the development of green fuels, increasing the share of renewable energy sources in the electric system, and carbon capture and storage (Beccarello, 2023). Although decarbonisation requires massive and robust investments from public and private sector, citizens themselves also can be part of the transition. For example, through the Accelerating Community Energy Financing Schemes project, by October 2025, €1 billion had been mobilised or triggered through community-led financing efforts. This relates to thousands of citizens across Europe pooling their resources, hundreds of municipalities cooperating with local communities, and dozens of ethical financiers opening new pathways for small-scale, socially rooted energy investments (Rescoop, 2025),

If clusters are to kick-start the industrial transition, then greater attention is needed to the social and political dimensions of this process and to a broader range of decarbonisation interventions and cluster types than are represented in current projects. While policy focus on carbon capture, hydrogen and competitive funding approaches for industrial decarbonisation projects at present remain constant, greater attention is also needed to approaches to industrial cluster decarbonisation policy outside of North West Europe and North America and in particular to clusters in developing and centrally planned economies, to the integration and sequencing of decarbonisation interventions (Rattle, 2023, see also case studies 6, 7 and 8).

Yet, it is important to remember the key social drivers which are embodied in the overall public support toward climate neutrality. Although key European policies move away from the ambitious climate targets through simplification and further deregulation, citizen pressures, community action and positive public support toward climate action can be drivers of deeper societal change. Take the cases of Fridays for Future and XR mobilisations in 2019 across Europe preceded to consolidation of the EGD. Although now stagnant and in a defensive mode, citizen climate action can be decisive driver of the decarbonisation and fossil fuel phase out.

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2.2.2 Eco-Social State, Land Use, and Agriculture

Prevailing growth orientation and prioritising technology-first modelling and financial investments in the dominant green transition schemes neglect social, political and cultural dimensions (see case study 10 for an analysis). Yet, they find increasing number of criticisms that promote the concept of eco-social state as a pre-condition for systemic green transition. Key drivers are social and political mobilisations (bottom-up pressure) for climate justice, against social inequalities (or "double injustice") and ecologically damaging growth reliance. This growing social antagonism demanding another vision of society through advocating for the just transition and post-growth are important for the continuation of a green transition that goes beyond growth orientation and toward social and planetary well-being (see case study 1 and 12 as examples).

The global land system faces increasingly complex challenges, including climate change, land degradation and rising demand for ecosystem services. At the same time, it must undergo fundamental transformations to meet the goals of climate protection, improving environmental and social sustainability, food and water security, as well as biodiversity conservation and regeneration.

Key drivers of green transition in Land Use and Agriculture are needed to develop resilience toward climate change impacts, to address food security needs in growing geopolitical uncertainty and policy shifts pushing for sustainable practices such as agroforestry, reduced inputs and better land management (case studies 2 and 4). The concepts of transition and just transitions take on a distinctive character when applied to the agricultural and food sectors, particularly is cases of advocating for regenerative agriculture. In addition to the need to meet targets for greenhouse gas (GHG) emission reductions, the escalating concern about dietary health must be addressed, along with specific questions about the role of livestock and the need to reverse the loss of biodiversity, of special relevance to agriculture because of its dominance of land use in many countries. Key drivers to achieve this are further commitment to net zero GHG emissions by 2050, policy incentives such as The Farm to Fork Strategy, specific strategies for biodiversity, forestry and soils and proposals on zero pollution and animal welfare (IEEP, 2022).

2.2.3. Green Industrial Policy, Finance, and Employment

Recent policy developments, including the US Inflation Reduction Act and the EU Clean Industrial Deal, are part of a shift in climate policy whereby the state plays a more interventionist role to drive economic transformation (Meckling & Allan, 2020; OECD, 2024). Instruments such as subsidies, procurement policies and clean technology incentives, long part of governments' toolkits, are now playing a more prominent and higher-value role, alongside market mechanisms such as carbon taxes and emissions trading (Maltais and Suljada, 2025, case study 9).

One of the key drivers of green industrial policy lies in accelerating the innovation and deployment of low-carbon technologies. We witness rapid decline in the costs of technologies such as solar and wind power and batteries (IRENA, 2024b), and as major economies move to invest heavily in clean energy innovation and deployment, the cost of a range of technologies, such as batteries, electric vehicles and electrolysers for hydrogen production, is likely to fall further (OECD, 2024). This allows for access to advanced technologies at a lower cost and earlier than would otherwise be possible, supporting their own clean energy transitions. In addition, the shift to green industrialization is transforming global trade patterns, creating new demand for

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critical raw materials, renewable energy and low-carbon energy carriers (case studies 1 and 12). Finally, efforts to achieve a green energy transition offer prospects for financial and technical cooperation, especially where international partnerships aim to build capacity across new value chains. In the crisis of multilateral global order and tectonic shifts in trade agreements, invitation to reimagine green industrial policy as a cooperative global endeavour is both the motivation and challenge. This requires credible financial support, meaningful technology partnerships and inclusive trade frameworks.

In the financial sphere, the promotion of sustainable finance and greening monetary policy operations remains one of the key drivers. According to the EIB, an orderly transition to a green economy would, in the long run, reduce climate-related risks for the entire economy and financial system, as well as for the inflation outlook and the assets on the Eurosystem balance sheet. It is claimed that long-term price and financial stability could be immediate benefits (case study 9). Climate change threatens to disrupt businesses, reduce labour productivity, and increase costs of operating high-carbon assets. Financial inclusion, climate resilience, and financial stability, having all three objectives clearly in view will allow for effective conversations about the potential trade-offs and is likely to result in better outcomes.

2.3 Conclusion

To be able to build scenarios based on key drivers of the green transition within a political economy framework, we need to use combined approach integrating top-down, e.g., macro-policy approaches with bottom-up strategies (with the latter allowing for a more dynamic participation of citizens, households, SME's and individuals) in order to complement current institutional, legal, policy, and technological measures (Angelakis et al., 2025). This approach should be based on scenarios where development respects environmental boundaries, growth shifts toward comprehensive human wellbeing, inequality is reduced across the board, and consumption is oriented toward low energy and material output. Stabilisation of planetary ecosystems will unlikely be achieved without a significant change in the purposes and patterns of production and consumption, potentially leading away from the capitalist social metabolism (Medak, 2022).

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3 Obstacles to green transitions

3.1 Introduction

Key contradictions related to the potential of success of the green transition is placed in a very broad spectrum of very often ambivalent definitions of green transition – many of them growth oriented – which directly undermine and hinder the success and the depth of systemic change promised by green transition. This orientation not only prioritises the continuation of indefinite economic growth but also ignores, if not neglects, social and distributive aspects of such a transition that could ensure just solutions for whole society. Recent deregulation outlined in the EU's Omnibus changes set out legislative simplifications such as Corporate Sustainability Reporting Directive (CSRD) and Due Diligence Directive (CSDDD) to cut bureaucracy, reduce costs (especially for SMEs), and boost competitiveness by making rules less burdensome while aiming to keep green goals intact, but facing criticism for potentially watering down commitments. Weakening enforcing mechanisms, postponing reporting and reducing scope of the companies to report under CSRD can show EU's hesitance and reluctance to continue with green transition, if not reflecting a complete U-turn.

Furthermore, pressured by the declining power of the EU at global level, the EU started with the controversial approach of promoting "green extractivism'' with policies and investments focused on ensuring economic growth through production of green energy leading to creation of "sacrifice zones for sustainability'' predominantly placed at EU's periphery (case studies 1, 12). With the new wave of extractivist investments induced with Donald Trump's election in US and followed by a U-turn toward the Clean Industrial Deal, the EU rolls back from the direction set up in the key EGD objectives. This shows not only policy inconsistency and uncertain policy framework but also reveals fragility of green transition and EU's leading role in the process. It also shows a lack of ability of EU leaders to commit their successors to future policies of green transition.

Policy-change occurs when long periods of stability get disrupted by sudden shocks (often due to political or economic crises). The rationale for such a framework is that it allows to emphasize the linkage of new ideas and beliefs to climate action affects policy-making in a comparison between conditions of stability and change (Wendler, 2024).

The policy challenge in these strategies is to see the environmental crisis as simply a technological challenge and an economic opportunity (Medak, 2022). That primarily reflects in the current hegemony of the "technology-first'' policies and prevailing narrative of ecological modernisation. Ecological modernisation assumes that the structure of economic growth can be made sustainable by deploying market instruments to drive the sociotechnical transition away from the present fossil-fuelled technological base. However, scientists are warning that such a market-driven technology-first approach, ensconced in the UNFCCC since at least the Kyoto Protocol, might not be comprehensive and rapid enough to prevent global warming beyond 2°C above the pre-industrial levels and thus a significant breakdown of ecosystems, rendering vulnerable indigenous, low-income, and working-class communities across the world. But while it is currently driven by the falling prices of new renewables and the carbon pricing decarbonising power generation, much harder and slower tasks will be decarbonising manufacturing, housing, transport, and agriculture. The needed reduction to net-zero will be hard to achieve by 2050 given the current rates of growth in low-carbon electricity, carbon drawdown, or biomass (Medak, 2022). Also, economic growth remains to be uncritically elevated as a dominant comparative metric, normative aspiration, and policy objective for capitalist development. These characteristics limit the capacity to engage with green transition (Green, 2023).

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Another important dimension crucial to integrate social dimension of the green transition is more robust public participation, which is in many cases still absent (Smith, 2023). It is the lack of timely and broad participation which is the Achille's heel of the green transition. If impacts of the green transition have been timely and broadly discussed in various realms of society, assessing the needs of all involved stakeholders, its success would be closer and resistance lower. Its absence from the overall transformation has proven to be key reason for its failure and increased societal resistance. It is expected that policymakers find innovative ways of strengthening and maximizing communities' resilience, taking into the account the crucial economic, technological, and legal aspects of the sustainable transition as dictated by the current and dominant international political economy configurations and policy trends. That would imply further strengthening of the existing frameworks and efforts by trying to establish a foundation that facilitates the engagement of all stakeholders concerned by climate change, including by putting the focus on allowing (and encouraging) the participation of the base of the society (Angelakis et al., 2025). Grand societal challenges represent complex, multi-level, multi-dimensional problems that require concerted efforts by various actors (public, private, and non-profit–to be successfully addressed" (Voegtlin et al. 2022). Although whole society is expected to benefit widely from the green transition, social costs of this transition should not place a heavy burden on citizens and communities.

3.2 Obstacles to green transition Across GreenPaths' Three Thematic Clusters

3.2.1 Fossil Fuel Phase-Out, Decarbonisation, and Industrial Policy

New political realignments and conjunctures in the EU seem to freeze, if not roll back, several of the most important green transition regulations. More broadly, that puts the whole green transition project at a huge risk, diminishing even past achievements of the EGD. Further massive subsidies to private energy companies through so-called capacity markets and deregulation through "simplification" increase a risk of creating a wealth transfer from citizens and consumers into the hands of Europe's energy giants. That would lead to unfair relationship where consumers would pay the price as fossil gas firms would cash in on capacity schemes, thus locking in high energy prices and undermining industrial competitiveness.

According to CarbonWatch, with the Commission soon to publish its new package on the Carbon Border Adjustment Mechanism (CBAM), the EU's major industrial players are once again questioning whether the system is "ready". CBAM had already been recently tweaked twice in response to industry demands, including simplification, raising the threshold, addressing export issues, and anti-circumvention measures. Yet even with these adjustments, the same industrial interests that in the past celebrated CBAM as the EU's long-awaited answer to trade issues are now backing away.

This all undermines timely fossil fuel phase-out and decarbonisation which are anyhow burdened with many hurdles (case studies 1, 2, 3, for example). Major obstacles currently present energy supply security concerns amidst the new geopolitical tensions, high costs for new technology, technological limitations (storage, hard-to-electrify sectors, immature tech), infrastructure gaps (grid capacity, charging), policy and regulatory issues (inconsistency, lack of global coordination), increased consumption (Artificial Intelligence), investment risks (fuel availability issue such as in the case of hydrogen) and socio-economic barriers (behaviour change, workforce skills, cost of alternatives, supply chain for critical minerals). If we assess renewables for their capacity to substitute fossil fuels, only solar radiation operates at magnitudes on par and greater

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than the current global primary energy demand. Currently, however, wind turbines are supplying most of the renewable energy. But ultimately, much will hinge on developing both the distributed and centralised generation of solar power. Worryingly, the global investments in renewables are still towered by the investment in fossil fuels (Medak, 2022).

Key challenges include integrating renewables, electrifying industry, updating grids, managing intermittency and shifting consumer behaviour. Furthermore, regulatory gaps, such as lack of supportive economic frameworks can further slowdown investments. That all is further justified by alleged resistance of citizens to changes in lifestyle and energy use, often contrasted with still prevailingly supportive results of public opinion surveys on climate action. In addition, carbon consumption footprint at the EU level is still very high, particularly in the most vital sectors like housing, food and mobility (Axelsson et al., 2024).

This all creates a worrying picture for the continuation of green transition. However, the key question is if the green transition can continue at all with a further focus on growth imperatives that seem to be key metrics for its success and implementation. Without placing fossil fuel phase-out and decarbonisation within a framework of planetary boundaries and social wellbeing, green transition might be due to its fundamentally conflicting interests at risk to fail (see case study 10 for an analysis).

3.2.2 Eco-Social State, Land Use, and Agriculture

Obstacles to an eco-social state involve combined short-termism, increased nationalism and elite capture, the costs of green transition, entrenched fossil fuel dependency, consumerism and social exclusion, resistance to change that hinder the necessary systemic shifts for sustainable, equitable societies. Implementing the key ideas and objectives of the eco-social State – namely by transforming traditional welfare systems to reduce ecological footprints - within the capitalist metabolism seems, in current system, to be mission impossible.

In the case of Land-Use and Agriculture, key obstacles represent urbanisation and land-grabbing through speculative investments and the expansion of built-up areas which consume agricultural and forest land, impacting biodiversity and ecosystem services (case studies 1, 2, 12, for example). Urbanization causes habitat loss, reduces ecosystem services (such as water regulation, carbon storage, pollination) by converting fertile land to concrete, and displaces agriculture, while economic factors like high input costs, price volatility, and poor support hinder the shift to sustainable farming, creating complex challenges for food security and ecological balance. Furthermore, loss of food sovereignty, input costs (fertilizers), price fluctuations and lack of long-term support for sustainable farming hinder transition.

It is important to distinguish between the package of measures that have been devised in the EGD to address the unprecedented and distinctive set of changes necessary in the food system and the long running defensive arguments for maintaining the status quo in the CAP. Accordingly, legitimate compensation to farmers which justifies the description “just transitions” must be tailored to specific groups of potential losers, including farm workers. Measures to support a just transition must have due regard for farm workers and farmers as primary producers and land managers but also must take account of a broader spectrum of those potentially affected, including rural communities, workers in other parts of the food chain and consumers. The programme of interventions both within and outside the CAP should be part of a broader, balanced approach within the whole food system, aiming to allocate a fair distribution of responsibilities, with support available in response to demonstrated need (IEEP, 2022). Additionally, one of the key

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obstacles that relates to CAP implementation are area-based CAP subsidies which structurally reinforce land concentration by favouring larger farms. Consequentially, that leads to land consolidation, an increase of land prices (where landowners benefit more than farmers) and further hindering of generational renewal. These subsidies, based on land size, reward capital invested in land, making it harder for smaller or new farmers to compete and acquire land, thus reinforcing existing wealth disparities in agriculture.

3.2.3. Green Industrial Policy, Finance, and Employment

With the new focus of the EU on neo-extractivism allegedly needed for green transition, there is a risk of a two-track global transition, in which high-income countries move more rapidly toward green industrialization while lower-income countries lag behind, locked into fossil fuel–driven development pathways out of economic necessity. In this case, the EU is at huge risk to play again a detrimental role of hindering development of the Global South and unfairly reducing its own carbon footprint to the detriment of the global majority (see case studies 5, 6 and 7). Given global population and development dynamics, such a divergence risks not only entrenching inequality but also undermining the climate effectiveness of an energy transition that is only achieved by some. Chief among them is the possibility of being locked into extractive roles, exporting raw materials or energy carriers without capturing higher value stages of production (Axelsson et al., 2024).

Accordingly, without tailored policy interventions and international support, the benefits of a green transition may bypass local communities, reinforcing existing patterns of unequal development. Moreover, the rise of green industrial policies, often accompanied by domestic support measures, such as direct state aid, production subsidies, tax breaks, local content requirements, and trade measures such as carbon border adjustments, may distort markets and limit emerging market and developing economies export competitiveness (UNCTAD, 2023a). Such measures can restrict access to markets, raise compliance costs and create uneven playing fields, making it hard for lower-income countries to compete. Although emerging markets and developing economies (EMDE's) may in theory have competitive advantages in green industrial value chains, in practice it can be very difficult to take advantages of these.

The financial incentives and protective measures mobilized by major economies in their domestic industrial policies risk further accentuating the differences in willingness to direct capital to less versus more developed economies. From a broader geopolitical perspective, the heavy reliance on technological innovation for achieving an energy transition heightens the risk of further widening the technological gap between rich and poor countries.

Furthermore, short-termism, policy inconsistency and erosion, if not absence, of long-term stable financial framework present severe obstacles for further investments into green transition. However, the overall approach of the financial sector focused on profit and bankability seem to be an obstacle itself. Rather than being focused on environmental benefits and social wellbeing, key investors seem to request public funds for solutions at the wrong end thus aiming to turn green transition into profitable businesses. For example, the European Banks Federation website states that the main challenge is not a lack of capital, but a lack of transition projects that would be both attractive for investors and fit for banks' financing (EBF, 2025). It therefore looks into solutions to enhance the economic sense of the investments in transition, de-risk the necessary but risky projects and increase their bankability. Additionally, they state that long and uncertain permitting processes for large projects discourage private investors and hinder access to finance.

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They find access to public funding and incentive schemes still cumbersome with complex structures of the fragmented ecosystem, administrative requirements and due diligence. It is stated that, due to the risk of total loss, these projects are also perceived as too risky for private financing without any form of public guarantees and risk sharing mechanism. Self-evident expectations of banks and private investors toward public and households (savings) demonstrate extended extractivist approach in which centre there is no public interest but exclusively private interest of shareholders. Affected communities and most vulnerable social groups that might support achieving climate neutrality in general, mid find this approach unjust and deepening social inequalities, leading to rejection of the overall green transition effort.

3.3. Conclusion

Observing more closely the major obstacles to the just, green transition we find that objectives of the green transition face many difficulties due to the internal conflict in the green transition model itself. Aiming to satisfy and accommodate to interests of investors and multinational companies whose interest is primarily growth, they limit the space for participation and aim further to socialise costs and risks of the transition itself. The long list of obstacles originates from the conflict that aims to feed the growth objectives while neglecting social justice, wellbeing and ecological limits.

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4 Green transitions – trends

4.1 Introduction

This section discusses the commonalities between various strategies of green transition policy implementation, their success in doing so, and trends observed regarding their social and environmental impact from a political economy perspective.

The number of green policies has notably increased over the past decade, with many countries across the planet strengthening their climate action and adopting more stringent policies, particularly in support of renewable energy and carbon pricing. Notably, the pace and extent of policy adoption vary significantly across different countries. At the time of writing, a clear trend emerged in the Global North contexts of a decrease in new green policies.

Our findings suggest that while these green policies are, in some cases, successful given meaningful participation and a holistic approach, they often fail to deliver it in a just way, benefiting people equitably, or fail to achieve the intended emission reduction. Is it essential for institutional stakeholder to not assume “green” is inherently “just”. Evidence from multiple cases reveals that green policies can replicate colonial and extractivist dynamics under a sustainability façade, as explicit in cases of lithium mining for electric vehicle batteries. The EU's focus on economic and CO_2-related costs leads to outcomes where environmental improvements coincide with social deterioration. When well-executed, however, green policies have the potential to stretch their benefits far beyond the scope of emission reductions, but also touching on biodiversity, restoration and social prosperity and cohesion.

As mentioned in the above sections, evaluating the social impact of these green transition policies from a political economy approach reveals that the general trend does not tend towards a just transition, but instead often maintains or reinforces inequalities and power imbalances. Due to the lack of addressing problematic relations between the affected population, policy makers and corporate stakeholders, adverse social effects that were predicted before implementation, were indeed observed afterwards.

At the same time, often, these policies fail to meet their emission reduction objectives. In an ex-post evaluation of 1500 climate policies implemented between 1998 and 2022 in 41 countries, several European climate institutions found only 63 of these 1500 interventions are effective at reaching their intended objective. On the output side, it can be observed that global greenhouse gas emissions are rising faster than ever before. Besides, on a more local scale, many projects that were supported by green policy interventions caused additional environmental harm (see section 4.2.1.).

The next sections discuss these trends regarding social costs and benefits in more detail according to three thematic clusters of the GreenPaths project: section 4.2.1 discusses fossil fuel phase-out, decarbonisation and industrial policy; section 4.2.2 covers eco-social state, land use and agriculture; and section 4.2.3 elaborates on green industrial policy, finance and employment.

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4.2. Green transition trends across GreenPaths' Three Thematic Clusters

4.2.1. Fossil Fuel Phase-Out, Decarbonisation, and Industrial Policy

Green policies tied to a fossil fuel phase-out proved to be able to deliver tangible benefits around carbon emission reduction and uptake of renewable energy (case study 5) which extend far beyond emission reductions. This can encompass socioeconomic including job creation initiatives (case study 3), policy innovations (case studies 5, 7, 10), ecological restoration (case study 3), and public service investments (case study 12). Direct cash transfers have also managed to mitigate the regressive impacts of climate policies (case study 10).

Despite the above-mentioned potential, the benefits of decarbonisation initiatives are more often outweighed by significant socio-environmental costs. Pushes for green technology come with environmental impacts such as pollution, water stress and soil contamination from mining for critical minerals (case studies 1, 3, 5, 12), alongside threats to biodiversity and the creation of green sacrifice zones. Socially and socioeconomically, an intersectional and neo-colonial 'green divide' reinforces preexisting disparities based on gender, ethnicity, urban/rural location and power imbalances between the EU's core and its periphery and the Global North and South. A recurring tension exists between decarbonisation imperatives and livelihood dependencies, where new projects often prioritise temporary, high-skilled employment while displacing pastoral and rural communities, failing to generate sustainable economic alternatives for affected populations (case studies 1, 3, 5, 7). This is compounded by widespread scepticism about the number and quality of jobs green projects create (case studies 1, 3).

At the basis of projects failing to achieve a just transition lies a top-down governance model lacking public participation and transparency. This approach consistently sidelines vulnerable groups, leaving them behind while affluent actors drive the transition (case studies 1, 5). The logic of urgency used to fast-track projects in the EU often sidesteps substantive public consultation and sacrifices a community's right to decide (case study 1). Abrupt implementation can erode social trust and destabilise democracy (case study 3). These governance problems are exacerbated by a flawed system of impact assessment and measurement, often ignoring non-material losses and psychosocial harms (case study 12). We observe that for instance the EGD's Just Transition Mechanism does not firmly bake in indicators, tools and policy appraisal methodologies standard for community based/informed/led policy design and consultation.

As a result, green policies in the context of fossil fuel phase-out, decarbonisation and industrial policy typically end up benefitting large corporations, international investors and state elites; with vulnerable groups (low-income households, rural communities, indigenous peoples, precarious workers) bearing the social and environmental costs and remaining on the short end of state benefits (see case studies 1, 5, 7, 10, 12). Marginalised ethnic groups, women, the elderly and youth are also identified as disproportionately and negatively affected (case studies 1, 3, 5).

The role of the state is pivotal to create policy interventions that are both green and just. For example, the Critical Raw Materials Act (2024). GreenPaths case studies 1, 5, 7, and 12 contain opaque references to human, labour and indigenous peoples' rights, and fails cross-referencing substantive and binding legal instruments under international human rights law (IHRL) that protect rights (e.g. to housing, land, water, cultural heritage etc.) and link to tangible mechanisms for public restitution.

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4.2.2 Eco-social State, Land Use, and Agriculture

Trends in green policies regarding the Eco-social state, land use and agriculture must be seen against the backdrop of two major context elements: the quality of public services and the austerity policies that put these under pressure on one hand, and agricultural policy. First, the austerity pressure on public services is prevalent in all regions of the world, whereas they provide a social safety net and increased resilience at times when green policies risk having adverse socioeconomic impacts. Secondly, agricultural policy is typically characterised by a tension between corporate stakeholders to increase the scale of agricultural activities with an export-driven model in mind, and the conservation of agroecological and ancestral practices, which we observed go hand in hand with biodiversity protection and the reduction of carbon emissions (case study 15). The case studies in this thematic area of the GreenPaths project are all situated in the European Union, meaning the analysis in following section cannot simply be extrapolated to other regions.

Like in the decarbonisation section, socioecological costs such as the proliferation of inequality and injustice occur where a top-down governance model is prevalent, such as in the formation of green sacrifice zones where conservation and rewilding lead to the dispossession and cultural erosion of local communities (case study 2). Costs also arise where there is a lack of coordination between local, national and regional levels (see case study 13). Policy incoherence is also common, such as in the EU's CAP, where environmental aims are undermined by regressive subsidies that fuel land concentration (4). On top, we observe gaps in measurement include a lack of intersectional and socio-geographic data about marginalised, vulnerable and impacted populations, that could provide gender-disaggregated insights on, for example, economic (e)migration patterns, land use, subsidy beneficiaries, employment quality, environmental effects and distributional outcomes (case studies 2 and 4).

In this thematic area, an uneven distribution of costs and benefits is typical, with property owners and urban metropolitan areas with the capacity to access subsidies and finance emerging as winners (case study 13), and with small-scale farmers and communities in EU-periphery countries or regions noticeably excluded from benefits and bearing a higher cost burden (case studies 2, 4) This uneven distribution of impacts and financial incentives highlights pervasive elite capture, institutional fragmentation and a transboundary green divide associated with global power dynamics in green growth. The case of public food procurement in Dordogne, France, demonstrates that when an inclusive, sustainability-driven approach is supported, it can not only reduce emissions, but also foster healthier diets, reduce carbon footprints and boost local farmer incomes without increasing overall costs (case study 15).

4.2.3. Green Industrial Policy, Finance, and Employment

In the context of green industrial policy, finance and employment, similar patterns of costs and benefits arise, how they arise and how either costs or benefits are distributed between stakeholders.

As above, green hydrogen and solar projects have led to important socioeconomic costs such as the loss of cultural heritage and ancestral practices and the proliferation of injustice and inequalities (case studies 8, 11); or to labour precarity associated with green labelled jobs, as in case study 6. When it comes to labour precarity, a noteworthy observation is that temporary, high-skilled employment displaces pastoral and rural communities, which causes a deterioration of sustainable economic models for the affected populations, as seen in case study 8.

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A case in point for the mutually reinforcing effects of public participation in policy design and implementation (and a lack thereof) is that more authoritarian models maintain an image of good green governments that achieve rapid growth and more geopolitical weight, all the while at the expense of labour rights and participation (case study 6). In these industrial projects, not seldomly the argument of urgency and sustainability is used to brush away the need for meaningful participation, due process and transparency (case studies 8 and 11). This narrative, in which CO_2 emission reductions take centre stage and social and justice dimensions are disregarded, entrenches a power dynamic that sidelines vulnerable groups and leaves decisions in the hands of a minority of affluent actors (case studies 6, 9, 11, 14). This can manifest in the formation of green sacrifice zones where conservation and rewilding lead to the dispossession and cultural erosion of local communities (case study 8).

The governance issues are exacerbated by incomplete impact assessments. They miss detecting economic (e)migration patterns, land use, subsidy beneficiaries, employment quality, environmental effects and distributional outcomes and are incapable of evaluating distributive, procedural, and recognition justice (as seen in case studies 11 and 14).

Benefits exist, for example in terms of renewable deployment or subsidies and supportive finance, but they are unbalanced: they typically favour large international investors, state elites, property owners and metropolitan areas. The EU periphery countries and regions, and especially the geographical Global South are systematically excluded from the benefits of the transition initiatives as seen in case studies 9 and 11. This uneven distribution of impacts and financial incentives highlights pervasive elite capture, institutional fragmentation and a transboundary divide associated with global power dynamics in green growth. The strong institutional capacity of developmental states in Southeast Asia, as seen in Vietnam's solar expansion, proves that coordinated state intervention can achieve the rapid deployment of renewables, even if these models require greater democratisation to ensure justice (case study 6).

4.3 Conclusions

The main conclusion is that policies are more effective in consideration of social input and social impact, both in terms of the success of the policy implementation itself, as in achieving the projected emission reductions. The adverse socioeconomic effects described above could have been anticipated and can be expected in future endeavours that follow the same patterns.

An observed trend is that the social impact is not only overlooked, but also not evaluated: impact assessments lack the tools to fully incorporate distributive, procedural, recognitional and cosmopolitan justice and have critical data gaps missing intersectional and geo-locational data on marginalised populations to enable tailored, effective interventions, as seen in case studies 2, 3, 4, 5, 9 and 14.

At the same time, case studies also identify positive policy initiatives to include populations in the green labour transition, which aim to reskill local populations, offer educational opportunities, create economic activity and employment in territories affected by the energy transition in Europe, Latin America and Southeast Asia (as seen in case studies 3, 5, 6 and 10). This must be coupled with robust democratic governance that ensures genuine community engagement and procedural justice, moving beyond tick-box consultation to empower local communities in decision-making about their socioeconomic future and resource use (as seen in case studies 1, 3, 7 and 12).

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Policy interventions are thus more successful where people power is centred and the power imbalance between stakeholders is the smallest. The issues identified in our research are interconnected, intersectional and interdisciplinary and so must the policy solutions be.

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Discussion and Conclusions

This paper has brought forward some of the key stakeholders, drivers, obstacles, and trends for the green transition from a political economy perspective. What is clear from the research is that the "green transition" (or "transitions", in plural) is a contested concept. With a multitude of possible pathways forward that imply widely different material distributions and different power constellations. Its appropriation by (European) institutions has the tendency to obscure underlying struggles for power and resources, which we have tried to unearth as much as possible in this discussion paper. This section draws on these insights to discuss ways forward and draw conclusions from the diverse insights granted by the case studies and this analysis.

Starting with the stakeholder positions, our analysis shows that in the modern globalised economy, there is a wide array of dispersed stakeholders along value chains for which a just transition needs to account. At the centre of this observation are prevailing and largely historic power asymmetries. First, between the Global North and the Global South, where resources (from critical raw materials, to hydrogen, and fossil fuels) that are extracted still predominantly benefit development in the global North. Even where such development leads to greening of economies in Europe, demands for technology transfer, climate finance and resource by Global South countries are largely left unanswered. A rebalancing of Global North and South material and power relations requires such mechanisms to be on the table. Taking a look at the context of Europe more specifically there is a clear shift in positions from stakeholders. Whereas the transition has always been conceptualised in dominantly economic terms, the recent shift from the Commission towards competitiveness and deregulation represents a departure from the EGD. Substantively, there is a pivot towards corporate interests over civil society and NGO's, with the latter facing increased scrutiny with the EU political context. Outside of the EU institutions, a large role is played in shaping the green transition by international and multilateral organisations from the UNFCCC to International Renewable Energy Agency (IRENA) and the World Bank. These organisations often reproduce pre-existing power relations and further "economise" the transition. The transition in Europe is thus dominated by narratives of green growth, green finance, and green industries coming particularly from the Commission, developed countries, multilateral organisations and multinational corporations. In the meantime, alternative positions are being taken not only by Global South countries but particularly also by grassroots organisations and local communities that seek a voice in the green transition. Social movements are increasingly mobilising against climate injustices and unfair distributional consequences of the green transition. In all three thematic areas, we noticed that alternative perspectives to capitalism and green growth were present albeit marginal. Making sure that all voices are heard, especially those from vulnerable groups (indigenous and marginalised groups and communities) is essential to ensuring a just transition. Doing this will require more transformative approaches to democratic ownership, decommodification of basic needs and reparative climate finance.

Gaining some overview of the stakeholder positions allowed us to discuss the drivers of green transitions. The need for a transformation of current systems of production and consumption is at the centre of any transition towards a greener future. Currently, however, only a very limited understanding of the drivers of this transformation are put forward in the dominant model of 'green' or "clean growth". These narratives focus predominantly on technological and economic drivers of the green transition which obfuscates the social, political and environmental drivers of such a transformation. The Commission's recent insistence on deregulation – in particular environmental measures – highlights the risks of such a narrow approach. In this paper we explored the drivers for the three different thematic areas identified. On the one hand, technological advances in electrification and renewable energy are key to allowing a green

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transition and large amounts of resources will be required to deploy these technologies, such efforts alone will likely not be enough to phase out fossil fuels and decarbonise our economies. Social and political choices will need to be made on what energy will be used for to allow our energy systems to green and collective social practices will need to change to be less energy intensive. Politically, stronger commitments are required to phasing out fossil fuels and transitioning land use and agriculture towards truly sustainable production systems. Such changes will not only benefit people but will also allow for a reverse in the loss of biodiversity. Similarly, more interventionist approaches to green industrial policy, finance and employment can offer long-term perspectives on the organisation of climate resilient economies that respect environmental and social boundaries. This requires significant changes not only to the means and financing of production, but equally so to collective material metabolisms.

In identifying the main drivers of the green transition, it becomes clear what can be considered the main obstacles. The EU's agenda of growth directly undermines and hinders the success and depth of the systematic change required by the green transition. Capitalist models of production and consumption increasingly become at odds with social, environmental and even economic sustainability. The recent deregulation effort of the Commission serves as a good example of how specific economic models of growth and competition serve as obstacles for ambitious legal and political action on climate change. The decline of the EU's power at the global level has further exacerbated this move towards backtracking on the just green transition. Narratives of ecological modernisation where technology and markets will bring down carbon emissions have severely slowed down efforts to act so far and the lack of public participation in green transition policies have eroded public acceptance in some places and shifted social costs onto marginalised groups. Focusing on the three themes we can see that major obstacles to fossil fuel phase-out are current debates surrounding energy supply security, infrastructure and regulatory gaps, socio-technological lock in of fossil fuels, corporate capture by important industries and high technology and investment costs. All these factors together hamper the ability of policymakers to act decisively on the rapid phase-out of fossil fuels. Obstacles to sustainable land use, agriculture and the Eco-Social state are similar to those in terms of decarbonising the economy where current economic models of farming and land use swiftly degrade biodiversity and ecosystems. Obstacles here can be seen in the rapid urbanisation, land-grabbing and land concentration as a result of CAP subsidies. In terms of green industrial policy, finance and employment there is a real risk in the current neo-extractivist direction of the EU leading to a two-tiered global transition with high income countries rapidly making advancements towards green industrialisation and lower-income countries being locked into fossil-fuel development pathways. Protectionist measures limit the possibilities of emerging economies to be a player in the future economy. In terms of finance, we see that short-termism and policy inconsistency have been a huge obstacle to moving towards green finance. Financial sectors are still hell-bent on profit and bankability above all. Private interests trump public interests, and such balancing of interests harms the willingness of communities to take part in the green transition.

Having looked at the stakeholder positions, drivers and obstacles, the discussion paper also looked at trends in the green transition. In short, it can be said that, whereas an increasing volume of climate policies have been implemented at different levels, the success of these policies has been disappointing. Whereas action can be seen across all three thematic clusters, these policies often fall short of the transformative actions required, they lead to further socio-economic and environmental costs and in some cases, they further exacerbate distributional injustices. For example, in the field of fossil fuel phase out and decarbonisation, we see that the material requirements of electrification give rise to large scale mining and associated pollution, soil contamination, "green sacrifice zones" and health risks. Similarly, in the field of green hydrogen,

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production risks of green grabbing and large-scale displacements show how the social and environmental risks of the green transition go further than the emissions of CO2. An important contributor to the failure to achieve a just transition was found to lie in top-down governance models that lack public participation and transparency and did not adequately include vulnerable groups. Similar problems exist in the second thematic cluster where we see capitalist extraction models at the heart of land use and agriculture and top-down governance models of conservation and rewilding cut through historical cultural land relations of marginalised communities. Land concentration and enclosure lead to further exclusion of commons and common futures. Alternatives, however, are present for instance in the Dordogne where inclusive and sustainability driven approaches to food public procurement allow for healthier and greener diets produced by local farmers. Finally, in terms of the third thematic cluster of green-industrial policy, finance and employment, we note that, whilst the overall trend has cautiously been moving a green transition, this trend seems to be reverting in the light of geo-political unrest and recent calls for deregulation. While alternative energy infrastructure grew, this growth was often at the expense of societal resources, land, water and the environment. Collective ownership – both in terms of decision making and materially – is almost non-existent in many of the sectors of the green transition. Whereas there are some positive signals from the deployment of renewable energy sources and energy communities, this trend does not yet influence the transition at scale. Most of the decisions on investing in a green future still stay in the hand of a select few policymakers, bankers and industry leaders. In all of this, whereas environmental impacts are increasingly understood and addressed, social impacts are underreported and inadequately addressed.

In conclusion, this discussion paper sought to explore the political economy of the green transition in Europe. Based on an analysis of stakeholder positions, drivers, obstacles and trends, the overall success of a genuine green transition would hinge not only on a transformation of current systems of production, but also our collective organisation of these systems across different scales: from the Global North and South, to the centre and periphery and in different socio-economic strata of society. This transformation requires more than a technological and economic overhaul. As the limits of this current system are reached, we can already see a hopeful future in its cracks. Movements towards a democratisation of the green transition through shared ownership of energy resources, public participation in decision-making, meaningful and skilled employment and communal approaches to health and wellbeing are all signs of more just future social imaginaries of progress.

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