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A POLICYMAKING PERSPECTIVE ON INTERNATIONAL BUSINESS AND THE NATURAL ENVIRONMENT

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Abstract:

Multinational enterprises are central to today's economy, simultaneously driving environmental pressures and holding capabilities to mitigate them. What matters for policymaking is how cross-border firms that orchestrate global value chains shape environmental outcomes that spill over borders, and how policy mixes can steer behaviors. We advance a policymaking perspective, framework, and research agenda on the international business–natural environment nexus. They direct scholars to specify geo-physical, geo-economic, and geo-political linkages; trace how policy instruments shape firm responses, how these scale into system trajectories, and how feedback/feedforward loops alter policy and strategy over time and across places; and unravel emerging tensions.

Keywords:

Multinational Corporations (MNCs) and Enterprises (MNEs); Environmental Issues; Regulation; Global Value Chains; Sustainability; Governance

Introduction

Cross-border business conduct, most visibly through multinational enterprises (MNEs) and the global value chains (GVCs) they orchestrate, sits at the center of the "Anthropocene economy." In an era in which human activity is a driver of environmental (and increasingly geo-physical) change, MNE activity can amplify pressures on ecosystems while also mobilizing capital, technology, and organizational capabilities that can mitigate and adapt to those pressures (Kolk, 2016). Competing emphases on harm versus solutions have fueled heated debates in international business (IB) (Kano et al., 2025; Yu et al., 2023). Yet for policymakers, what counts is not labels but questions that matter: how cross-border enterprises influence environmental outcomes across jurisdictions, how these impacts transcend borders, and how policy combinations can guide behavior without compromising legitimate development and competitiveness objectives. Accordingly, this editorial develops an integrative framework to guide future research on the dynamic, co-evolutionary interplay among cross-border business conduct, the natural environment, and public policy, each simultaneously constraining and enabling the others over time.

Increased flooding, hurricanes, heat waves, unpredictable weather patterns, water scarcity, biodiversity loss, and concerns about the cost and availability of energy, as well as its emission and extraction impacts, have moved the natural environment from background context to an active, constraining system that both shapes and is shaped by IB strategies and GVCs (Bansal et al., 2025; Howard-Grenville & Lahneman, 2021; Williams et al., 2025). We refer to this system as the natural environment (NE): the coupled biophysical foundations of economic activity, which comprise climate, water, land, biodiversity, and material/energy cycles, along with their place-specific conditions and limits. MNEs have shown awareness of these effects, in varying degrees, with fluctuations over time, as shown in voluntary environmental management practices, which include corporate social responsibility (CSR) activities, target setting, sustainability reporting, and participation in multistakeholder standards with jointly set rules for business behaviors (Goerzen et al., 2025; Kolk, 2010; Fransen et al., 2019). At the same time, policymakers are deploying mixes of authoritative (rules and standards), financial (taxes, subsidies), informational (disclosure, labels), and organizational

(public–private platforms, green procurement) instruments that re-code MNEs' incentives around carbon, circularity, and resilience (Ciulli & Kolk, 2023; Patnaik, 2019; Wilhelm, 2024). Accordingly, policy is becoming an increasingly central actor in the IB-NE nexus; not only by enhancing the salience of sustainability issues across economic actors but also by constraining or enabling specific strategic opportunities.

The heightened saliency of NE and the active role of policy makers in the realm of sustainability entails important implications for IB research, including how we theorize the integration of biophysical realities and how we account for complexities arising from multi-actor and multi-geography strategies, and how we account for the role of supranational organizations, where diverse institutional contexts, policy regimes, and ecological conditions interact in dynamic ways. While IB research has generated important insights into localized environmental harms linked to cross-border firm activity (e.g., Rudra et al., 2018), much scholarship still treats the NE and policymaking as exogenous or peripheral, rather than interacting, endogenous forces in the system. This under-specifies the dynamics that matter: how local ecologies condition decarbonization and adaptation; how policy instrument mixes interact across jurisdictions; and how new technologies create new interdependencies along GVCs (Bansal & Hoffman, 2012; Ciulli et al., 2020). Crucially, treating place and time as "controls" rather than what businesses are inextricably immersed in can obscure non-linear feedback, thresholds, and cross-border spillovers, leading to misguided inference and weak prescriptions (Bansal & Knox-Hayes, 2013; Blagoev et al., 2024; Wolkovich et al., 2014). For policy audiences, aligning private incentives with public goals requires theories of change that connect firm choices to ecological outcomes under real governance constraints (De Marchi et al., 2025; Wickert et al., 2021).

We therefore advance a policy-centric research agenda that focuses on understanding the linkages between and underlying multilevel mechanisms at the nexus of the NE, IB, and policymaking that embraces the complexities, tensions, and temporal and spatial dynamics across levels and disciplinary boundaries. Our aim is both scholarly and practical: to help researchers endogenize the environment, specify policy mechanisms, and model temporal–spatial dynamics so that explanations, predictions, and prescriptions cut across contexts and make a difference for the NE, inspiring effective policy actions and MNEs strategies (De Marchi et al., 2025; Ramani et al., 2022). Our objective is not

to propose a grand, monolithic theory of IB and the NE, but rather to equip the field with a coherent approach to making contributions that matter, both to science and to policy. Doing so also invites the academy to reconsider what it values and rewards in impact-oriented research (Gill, 2020; Redgrave, Grinevich, & Chao, 2023).

The framework proposed in this paper is based on three organizing dimensions grounded in multilevel mechanisms. First, *linkages* represent geo-physical conditions, geo-political forces, and geo-economic structures that connect the NE, IB, and policy. Geo-physical conditions (i.e., ecosystem states and proximity to planetary thresholds) influence the feasibility of pro-environmental practices and the marginal impact of firm strategies on the NE. These geo-physical constraints and risks are mediated and transmitted through geo-economic structures (i.e., extraction, trade, interdependence), which determine how environmental pressures are spatially redistributed, priced, amplified, or constrained through GVCs across locations. Geo-political forces, in turn, intervene in and reconfigure geo-economic structures by steering, constraining, or counteracting firm and market responses through policy mixes that differ in stringency, speed, and scale. Second, *temporal and spatial dynamics* embody expectations about future regulation and technology's influence on current investment (feedforward), while implementation experience reshapes strategy and policy (feedback); effectiveness varies by grid carbon intensity, basin stress, biodiversity sensitivity, and administrative capacity. Third, *tensions* arise from the need to translate cognitive ambitions (like “net-zero” or “nature-positive” aspirations) into substantive strategies and operational routines, yet private optimization can diverge from public coherence. These dimensions are interconnected through multilevel mechanisms that link the policy instruments to the firm, the firm's responses to the system, and include feedback/feedforward loops.

As will be explained further in the sections below, in which we outline our framework and research agenda, we treat the NE as *endogenous*, i.e., moving beyond models in which ecological conditions are treated as a fixed, external backdrop. This perspective partially aligns with the NE as non-human agents view that highlights how material forces (e.g., climate dynamics, hydrological cycles, biodiversity loss) exert agency-like effects through feedbacks, thresholds, and disruptions (Contesse et al., 2021; Kortetmäki et al., 2023). It also resonates with emerging legal and policy developments that ascribe rights or standing to parts of nature (e.g., rivers and ecosystems), suggesting

that “nature” can enter governance not only as an outcome to be protected, but as a recognized subject with claims that policymakers and firms must consider, as exemplified by Ecuador’s and Bolivia’s constitutional recognition of the rights of nature (Fuchs, 2025). At the same time, we acknowledge that other traditions, including some stakeholder-theoretic interpretations, treat the NE as a condition affecting stakeholders rather than a stakeholder (or agent) in its own right (Phillips & Reichart, 2000). Our intent is to accommodate both views: whether scholars frame the NE as endogenous system conditions or as a non-human agent with standing, the implication for IB research is similar and consequential, that is, ecological dynamics must be theorized as causally efficacious within the MNE–policy system rather than assumed away as exogenous “context.”

Foundations and Past Efforts

Conceptualizing the Natural Environment

It is easy to forget how recently the NE entered management’s intellectual field of vision. Early warnings. i.e., the Club of Rome’s Limits to Growth (Meadows et al., 1972) and environmental exposés such as Silent Spring (Carson, 1962), signaled that economic activity and ecological systems were coupled, but most business scholarship treated nature as a mute backdrop to human designs (Gladwin et al., 1995; Howard-Grenville & Lahneman, 2021; Shrivastava, 1995; Starik & Rands, 1995). A half-century on, the NE, as a coupled biophysical system encompassing climate, biodiversity, land, water, and material cycles, which both enables and constrains economic activity, generating feedback loops that can redirect firm and policy trajectories, has taken center stage. Evidence from the agricultural sector illustrates this shift: anthropogenic climate change has already slowed global agricultural productivity growth, effectively eroding decades of gains and heightening policy concerns around food security (Ortiz-Bobea et al., 2021). Relatedly, analyses of major crops indicate that the probability of co-occurring hot-and-dry extremes during growing seasons has increased, consistently resulting in negative yield effects that transform climate variability into operational risks, which can propagate along agrifood supply chains (Heino et al., 2023). Climatic tipping points, biodiversity loss, water scarcity, and material-supply stresses now shape the conditions for MNEs and the policy choices that

govern them (Howard-Grenville & Lahneman, 2021; Oh & Oetzel, 2022; Whiteman et al., 2013; Williams et al., 2025).

Several emergent lenses to examine the NE-business nexus crystallize this shift. One of the most notable is the "planetary boundaries" framework, which reframes the concept of *sustainability* as operating within defined physical environmental boundaries, including climate, biosphere integrity, freshwater use, and biogeochemical flows, rather than merely as a portfolio of discretionary firm-level initiatives (Rockström et al., 2023; Rockström et al., 2009; Steffen et al., 2015) by specifying thresholds for the Earth. A complementary lens is Raworth's "Doughnut Economics," which conceptualizes a "safe and just space" for humanity between an ecological ceiling and a social foundation and brings distributive and regenerative concerns into the same frame as biophysical limits (Raworth, 2018).

These lenses have profound implications for IB. If GVCs are pathways through which energy, matter, and information flow, then planetary boundaries are not external constraints; they are the conditions of possibility for cross-border production and exchange. Viewed through the Doughnut model, this also means that cross-border strategies are evaluated not only by whether they remain within ecological ceilings, but by whether they help secure social foundations across the places where GVCs are anchored. The IB scholarship that once centered on phenomena like market access, transaction costs, and institutional distance must therefore grapple instrumentally with the NE, biophysical conditions, environmental vulnerabilities, and the world's regenerative capacity, as well as the physical feasibility of cross-border production and exchange.

The IB–NE–Policy Link: From Neglect to Embeddedness

For much of its history, mainstream management adopted what Shrivastava (1995) notably termed a "denatured view" of the environment. Businesses and business activities were modeled as if they occurred in a vacuum. Research in the field of IB was no exception. Environmental issues appeared as peripheral topics (e.g., compliance costs, CSR) rather than as drivers of advantage and constraint, or even as an actor in its own right. Natural resources and natural disasters were assumed to lie outside the locus of control of firms and managers (Oh & Oetzel, 2022). Even the influential "natural resource" discussions focused more on governance of resource rents than on ecological limits per se (George et al., 2015). Nevertheless, that picture is changing. Recent scholarship radically departs from this

convention by theorizing elements of the NE as non-human agents that can redirect sustainability transitions and, in stakeholder-theoretic terms, as entities that warrant recognition in their own right (Contesse et al., 2021; Kortetmäki et al., 2023), while other stakeholder-theoretic interpretations remain cautious about granting stakeholder status to "the environment" per se, treating it instead as a morally salient condition that shapes duties to (human) stakeholders (Phillips & Reichart, 2000).

To this end, the first stream of IB research instrumentally engaging the NE through a policy lens explored pollution havens and halos (or a "race to the bottom" or "to the top"), asking whether stringent regulation pushes dirty activities abroad or induces upgrading (e.g., Berry et al., 2021; Bu & Wagner, 2016; Pisani et al. 2019). Alongside these macro-pattern accounts, there were more in-depth accounts of localized, place-based consequences of environmental irresponsibility, where cross-border production can translate into concentrated pollution burdens, resource depletion, and community-level harm. The second stream examined green supply chains and corporate environmental responsibility across borders (e.g., Kolk, 2016), while climate work traced how MNEs respond to carbon policy and global advocacy (Kolk & Pinkse, 2008; Pinkse & Kolk, 2012; Guest, 2010). Recent efforts, including those that feature in this special issue (SI), widen the aperture: they analyze how policy mixes shape firm behavior, how circular models reconfigure value capture, and how climate adaptation and physical risks rewire GVCs (Ciulli & Kolk, 2023; De Marchi & Alford, 2022; Howard-Grenville & Lahneman, 2021). Together, these streams establish that environmental phenomena are not exogenous to IB; they are endogenous conditions of international strategy.

Two arguments further strengthen the IB-NE link. First, MNEs are disproportionate contributors to environmental pressures, not simply due to the scale of their activities but because they orchestrate cross-border networks that concentrate emissions, materials, and decision rights (Yu et al., 2023). Their footprint extends through GVCs that they orchestrate, i.e., suppliers, logistics, customers, and capital markets, creating multiple channels for impact (Kano et al., 2025). Second, MNEs possess distinctive powers and capabilities, such as coordination, technology deployment, and standard setting, which are necessary to diffuse mitigation and adaptation solutions (see also De Marchi et al., 2022; Zhao et al, 2024). However, these same capabilities can also be used to arbitrage weak rules or offload risk (Patnaik, 2019; Pisani et al., 2019). This duality suggests that the IB–NE nexus cannot be

understood as a static balance sheet of harms and benefits; rather, it unfolds through dynamic pathways in which expectations, learning, and sequencing shape what firms do and the environmental consequences that follow over time. The IB–NE link is thus two-sided: MNEs and their GVCs are both parts of the problem and the solution.

Furthermore, it is worth noting that environmental issues are not one-off events, but rather ongoing processes. Expectations about future regulation and technology influence investment decisions today (*feedforward*), while implementation experience shapes strategy (*feedback*) (Flynn et al., 2025; West, 2017). For example, technology-forcing regulations and tightening emissions standards in the automotive sector have accelerated firms' commitments to electric mobility, pushing early investment in Electric Vehicle (EV) platforms and battery technologies in anticipation of future compliance requirements (Lee et al., 2010; Rozendaal & Vollebergh, 2025), while learning from deployment, supply constraints, and charging infrastructure has subsequently reshaped product roadmaps and sourcing strategies. Temporal lenses reveal lock-ins, tipping points, and sequencing effects. For instance, early commitments to a particular energy or materials pathway constrain later options (Bansal & Knox-Hayes, 2013; Plakoyiannaki et al., 2024). They also caution against conflating short-term reputation gains with long-term environmental improvements (Bansal & Clelland, 2004; Sharma, 2022).

Attending to space is equally critical. The same strategy, for example, renewable sourcing or supplier auditing, is disseminated differently across regions due to variations in grid mixes, cultural landscape, resource endowments, institutions, and regulatory frameworks. Empirical claims about "what works" must thus specify where and under what conditions, or risk over-generalization (Ghauri et al., 2021). In practice, this means designing studies that straddle multiple levels (firm, network, jurisdiction), capture cross-border interactions (e.g., emissions), and incorporate policy instruments rather than generic "institutional quality" (De Marchi & Alford, 2022; De Marchi et al., 2025).

If the earlier critique was that IB "ignored" the NE, the contemporary risk is representational slippage, i.e., using environmental rhetoric while maintaining models that leave nature exogenous (Hiquet et al., 2023). Scholars have called for aligning management theory with planetary realities, warning against ecological fallacies that infer system-level outcomes from firm-level proxies (Bansal et al., 2025). Relatedly, impact debates urge us to broaden what counts as a meaningful contribution:

explanations and predictions are necessary, but prescriptions that matter when scholarship aims to inform policy choices under ecological constraints (Ramani et al., 2022; Wickert et al., 2021).

Collectively, these developments present a practical challenge for IB scholarship: how to connect MNE and GVC choices to the NE and to the policy instruments that shape, and are in turn shaped by, those choices across jurisdictions. Addressing that challenge requires more than adding environmental variables or policy "controls"; it entails a coherent architecture that specifies the key linkages, the paths through which policy and strategy interact, and the temporal–spatial features that condition what works, where, and when. We therefore introduce an integrative framework for relevant research and policymaking.

A Framework for Making Impactful Contributions at the NE-IB-Policy Nexus

In this editorial, we propose an organizing framework that anchors the IB–NE–policymaking nexus in three focal constructs – policymaking, MNE strategy (including HQs, subsidiaries, and GVC activities), and environmental outcomes – and examines how they co-evolve. As illustrated in Figure 1, our framework specifies three linkages (geo-physical, geo-economic, and geo-political linkages), temporal and spatial dynamics, and tensions that operate through three multilevel mechanism paths (policy instrument → firm responses, firm responses → system trajectories, and feedback/feedforward loops), as will be further discussed in the following sections.

INSERT FIGURE 1 ABOUT HERE

The proposed framework asks scholars to consider, in their research, the IB–NE–policymaking dynamics across the linkages, the underlying influence of multilevel mechanisms, the constitutive nature of temporal–spatial dynamics, and consequential, and then to build claims that remain relevant and meaningful across places and over time.

Linkages: What Connects NE, IB, and Policy?

Cross-border business and the NE are coupled through a small set of system-level linkages that transmit constraints, incentives, and spillovers across places and over time. Linkages represent the channels

through which biophysical realities and public and private governance architectures interact with firm decisions and GVC organization (George et al., 2015; Ghauri et al., 2021). We distinguish three interlocking linkages: (1) *geo-physical linkages*, (2) *geo-economic linkages,* and (3) *geo-political linkages* that matter for understanding and steering the co-evolution of MNE strategy, policymaking, and environmental outcomes.

Our framework begins from a simple premise: the NE sets real, place-specific constraints that shape what cross-border strategies can achieve. *Geo-physical linkages* specify how the state of natural ecosystems and their proximity to planetary thresholds–i.e., how close a place or system is to biophysical limits beyond which change can become abrupt, difficult to reverse, or systemically destabilizing–condition both the feasibility and the effectiveness of firm choices. In electricity-intensive activities, for example, the climate impact of "electrifying" operations depends heavily on how clean the local power system is: life-cycle evidence on heat pumps shows that their operational emissions largely track the carbon intensity of the electricity that runs them, so the same technology can deliver major gains in one location but modest ones in another (Aridi et al., 2025). In water-intensive sectors, basin stress influences location and sourcing decisions: expansions in already-strained catchments translate small volume increases into disproportionate ecological harm, thereby elevating physical risk and social license exposure (Pfister et al., 2009). These links are not merely covariates to be "controlled away"; they are conditions that make some decarbonization and resource strategies effective, while others appear promising but underdeliver.

A second linkage shows how those biophysical realities are translated into economic incentives, dependencies, and vulnerabilities through markets and GVCs. *Geo-economic linkages* are market-mediated and structural phenomena of production, referring to how extraction, trade, prices, and interdependence distribute environmental burdens, risks, and rents across firms and locations. They are distinct from geo-political linkages, which concern the public policy instruments that states deploy to steer these market processes. The emphasis here is on resource extraction, the economic value of natural resources, material interdependence, and depletion dynamics, created, transmitted, and extracted through GVCs (Krishnan et al., 2023; Ponte, 2022). Resource dynamics and technological shifts alter prices and reallocate bargaining power along supply chains; firms respond by re-sourcing, re-designing,

or relocating. For instance, rare-earth policy shocks and the ensuing price spikes did not just shift costs. They forced downstream firms to re-engineer their supply chains: firms diversified away from single-source dependence, qualified alternative suppliers and materials, renegotiated contracts to secure volumes, and accelerated substitution, recycling, and (in some cases) upstream integration to reduce future exposure, which is clear evidence that resource geopolitics and scarcity operate as economic (market-mediated) channels affecting strategy (Gholz & Hughes, 2021). Likewise, empirical work on pollution havens versus the race-to-the-top shows that firm characteristics and GVC governance conditions whether stricter standards trigger offshoring, local upgrading, or supplier development (Berry et al., 2021; Bu & Wagner, 2016). Cities and regions that credibly invest in environmental quality can also attract foreign direct investment (FDI), indicating that ecological amenities and signaling can be economically priced into location decisions (Pisani et al., 2019). Intermediaries like lead firms, platforms, financiers, and standard setters then propagate requirements, information, and incentives across borders; digital circularity platforms, for example, illustrate such brokerage roles (Ciulli & Kolk, 2023; Ciulli et al., 2020).

The third linkage highlights the fact that policy is not merely background noise; it is an active force that can amplify, redirect, or dampen geo-economic dynamics across borders. *Geo-political linkages* arise from the choice, design, and interaction of policy instruments across jurisdictions, and how these instruments steer or counteract the geo-economic forces above (Howlett, 2023; Rogge & Reichardt, 2016). To organize this complex terrain, we propose classifying policy instruments, i.e., governance tools, public policy instruments, and private GVC governance devices (e.g., standards, audits, platforms), that shape cross-border incentives, constraints, and information flows. These instruments shape the IB–NE nexus along three instrument axes: stringency, speed, and scale (Figure 2). Because instruments vary along these axes, their cross-border interactions can generate frictions and arbitrage opportunities that MNEs actively navigate (Patnaik, 2019; Wilhelm, 2024). This typology also anticipates our first multilevel mechanisms discussed below, especially policy instrument → firm responses path, because differences in stringency, speed, and scale are precisely what determine how and when firms perceive constraints, incentives, and information, and thus how they adjust investment, sourcing, and governance choices.

INSERT FIGURE 2 ABOUT HERE

The stringency axis captures the force of the instrument (mandatory vs. voluntary): instruments high in stringency (e.g., carbon taxes and product/technology standards) typically exert stronger, more uniform pressures on MNEs and other firms than voluntary tools, such as eco-labels or voluntary disclosure. Speed axis distinguishes measures with immediate, step-change effects (e.g., abrupt tightening of standards or pricing rules) from those rolled out through phase-in calendars that shape firms' investment sequencing and transition risk (e.g., staggered implementation under the European Union's (EU's Corporate Sustainability Reporting Directive). Scale axis signals jurisdictional reach: supranational instruments can reshape cross-border sourcing and location decisions more broadly than local measures, as illustrated by EU-wide due diligence initiatives (e.g., the Corporate Sustainability Due Diligence Directive), trade-linked instruments such as the Carbon Border Adjustment Mechanism, and land-use rules such as the EU Deforestation Regulation, alongside multilateral agenda-setting through the United Nations' biodiversity conferences. The influence of supranational and national institutional arrangements, especially the complementarities and conflicts between them, will thus be central in determining the direction and effectiveness of NE policies, and it opens a clear research agenda on how public policy and private GVC governance jointly enable (or hinder) upgrading, leakage, and burden-shifting across places.

For example, mandatory disclosure (informational) can amplify the effects of carbon pricing (financial/authoritative) by reducing information frictions in multi-tier supply chains; green procurement (organizational) can underwrite demand for compliant inputs, accelerating technology diffusion; and border controls (authoritative) can reduce unsanctioned hazardous cross-border emissions by aligning incentives between regulated and less or unregulated jurisdictions (Van Assche et al., 2024). Access to critical resources is framed as a geo-political issue rather than solely an environmental one. Environmental policies, on the other hand, particularly those related to carbon reduction, clean technologies, and resource extraction, are often perceived as instruments that can influence competitive dynamics between countries with different levels of resource endowments.

Because policy instruments cut across heterogeneous administrative capacities and legal traditions, policy mixes must be evaluated not only in isolation but as systems whose effects depend on where (jurisdictional reach), when (phase-in calendars), and with what they are combined (complements vs. conflicts) (De Marchi & Alford, 2022; Rogge & Reichardt, 2016). A defining feature of the clean-energy transition is that these policy mixes often require governments to balance the acceleration of sustainability against economic security and distributional concerns. For example, permitting low-cost imports of Chinese EVs can accelerate fleet electrification and emissions reduction, yet it can also heighten concerns about strategic dependence, industrial competitiveness, and domestic employment, prompting the use of trade and industrial policy instruments alongside climate policy.

Multilevel Mechanisms: How Do Linkages Impact MNE Behaviors and Change in the NE?

The linkages discussed above inform us about the pathways through which ecological constraints, market interdependence, and governance pressures are transmitted. *Mechanisms,* as conceptualized here*,* explain how these forces generate (often nonlinear) trajectories of firm behavior and environmental change. We organize these generative processes into three mutually reinforcing multilevel mechanism paths, i.e., policy instrument → firm responses, firm responses → system[1] trajectories, and feedback/feedforward loops, that together connect governance design and firm capabilities to biophysical outcomes across places and over time.

Along the first path of *policy instrument → firm responses*, policy mixes and private governance instruments shape firm behavior through multiple channels (not an exhaustive list). Incentive-and-constraint effects alter relative payoffs and feasible sets through many tools—not only carbon pricing and product/technology standards, but also subsidies and tax credits, bans and permitting requirements, border measures, due diligence obligations, and public procurement rules that reshape cost structures and compliance exposure (Howlett, 2023; Patnaik, 2019; Rogge & Reichardt, 2016). Information, visibility, and credibility effects reduce information frictions and enable scrutiny by requiring traceability, reporting, and third-party verification through mandatory disclosure regimes, reporting standards, and certification/audit architectures that can span across tiers and borders

[1] In our terminology, "system" refers to the coupled socio-ecological system constituted by GVCs and the biophysical stocks and flows they affect (e.g., emissions, water stress, land-use change, waste/recovery).

(Christensen et al., 2021). Coordination and capability-building effects emerge when instruments (and private governance) facilitate the alignment of incentives and aggregate demand through procurement, standard harmonization, platform orchestration, and collaborative infrastructure, thereby accelerating diffusion and learning across GVCs (Ciulli & Kolk, 2023; Ciulli et al., 2020). Critically, some instruments are explicitly technology-forcing: by setting credible future constraints (often with phase-ins), they pull forward investment into new technological pathways and reconfigure competitive dynamics well before full implementation.

The second path of *firm responses → system trajectories* emphasizes that IB decisions do not stop at the firm boundary: when repeated across actors and scaled through GVCs, they reconfigure system states. This includes operational footprint decisions (where firms locate and what technologies they deploy), which change emissions profiles relative to grid intensity, water withdrawals relative to basin stress, and waste flows relative to local recovery capacity, thereby shifting the realized environmental consequences of production (Rockström et al., 2023; Rockström et al., 2009; Whiteman et al., 2013). It also includes GVC reallocation mechanisms, where firms respond to regulatory tightening, cost shocks, or stakeholder pressure by re-sourcing, re-routing trade, or relocating activities, which can result in upgrading in some places and leakage or displacement in others (Berry et al., 2021; Bu & Wagner, 2016). Finally, GVC governance mechanisms, including contracting, standard-setting, supplier development, traceability systems, and platform-based coordination, reshape "who does what, where," and with what practices, shifting impacts upstream or downstream and altering the distribution of environmental burdens and rents (De Marchi & Alford, 2022; George et al., 2015). This is analytically distinct from geo-physical linkages, since while geo-physical linkages describe how ecological conditions constrain what firms can do, firm responses → system trajectories describe how firm and GVCs choices change those conditions, potentially moving localities closer to or farther from ecological thresholds.

The third path of *feedback/feedforward loops* highlights the recursive nature of our framework and the focal phenomenon it addresses. Feedforward mechanisms operate when expectations about future policy, technology, and market conditions shape investment decisions today, for example, when credible phase-in schedules, tightening performance requirements, or anticipated reporting obligations

prompt the acceleration of commitments to new technologies, supplier qualification, and asset reconfiguration (Flynn et al., 2025). Feedback mechanisms operate when implementation and experience reshape subsequent strategy and policymaking. Operational data, audit results, litigation, and enforcement, as well as realized physical disruptions, reveal costs, co-benefits, unintended consequences, and political feasibility, leading firms to adjust and policymakers to recalibrate their instrument types (Rogge & Reichardt, 2016). Capturing these dynamics requires researchers to model the temporal structure explicitly (lags, phase-in calendars, asset lifetimes, and sequencing) and specify *who* forms *which* expectations, *when*, and *through what channels* these expectations and learnings reshape subsequent choices (Bansal & Knox-Hayes, 2013; Plakoyiannaki et al., 2024).

Together, these three paths connect public governance design and private governance with MNE/GVC responses and, ultimately, biophysical trajectories across places and over time.

Dynamics: How do Mechanisms Evolve across Time and Space?

Because environmental change, policy, and investment unfold on different temporal and geographical scales, temporal and spatial dynamics are crucial. Ecological and organizational time rarely align: biophysical processes can be embodied by what's called slow-burning yet seminal change, punctuated by extreme events, whereas firms and regulators operate on relatively short-term budgeting, election, and reporting cycles that compress attention and action (Blagoev et al., 2024; Kunisch et al., 2021; Wolkovich et al., 2014). A temporal-trajectory view (Hernes et al., 2025) is relevant here with the implication that the timing of disclosure, investment, and policy compliance should be theorized as interlocking sequences rather than independent decisions, with attention to when actors anticipate and when they learn.

Effective decarbonization and nature-positive strategies depend on the order in which actions occur and the temporal horizons they invoke. Some policy instruments are early-stage catalysts in that they move first in the policy sequence by establishing shared information and comparability (e.g., scope disclosures and supplier mapping) (Christensen et al., 2021); others are complements that either mobilize or respond to collective demand (e.g., green public procurement coupled with product or process standards) (Kivimaa & Kern, 2016; Van Assche et al., 2024); still others function as backstops

that close loopholes and reduce unsanctioned hazardous cross-border emissions (e.g., due diligence enforcement). Well-designed sequences match instrument "time signatures" to investment lifetimes: short-cycle tools (disclosure, certification) should lead or accompany longer-cycle commitments (capex for abatement, supplier retooling), while enforcement instruments phase in alongside rising capability (Flynn et al., 2025). There is, therefore, a need for specifying hypothesized lags and identifying which actor anticipates what, when, and with which consequences. This point aligns with temporal-organizing perspectives that emphasize how actors knit together past, present, and imagined futures.

As recent environmental policy reversals demonstrate (e.g., Kling et al. 2025), transitions are rarely linear. Complex environmental challenges exhibit non-linearity, emergence, and multi-causality; yet management research often uses linear, single-level models that under-represent these properties (Carmine & De Marchi, 2023b; Kimsey et al., 2025). Threshold effects, such as tipping points in technology cost curves like the adoption of solar energy, lock-ins resulting from sunk infrastructure and supplier dependence, and reversals, including policy rollbacks and exogenous shocks, generate discontinuities that standard, smooth-response models often overlook. The upshot is to theorize and test effects like threshold effects, for example, when cumulative procurement volumes drive learning rates that make a technology bankable. Such threshold effects naturally fit into a temporal-trajectory model: organizations reconstitute their operations during shocks and then reconfigure their strategies toward altered futures, sometimes drawing on deeper "temporal depth" to reassemble past capabilities for new conditions (e.g., reviving older, more resilient practices or materials). Explicitly modeling these re-projections and reconfigurations improves external validity for IB settings exposed to multi-jurisdictional policy shifts and climate extremes (Bansal & Knox-Hayes, 2013; West, 2017).

Furthermore, place matters. The same instrument mix performs differently across contexts because, e.g., grid carbon intensity, basin water stress, biodiversity sensitivity, legal capacity, and infrastructural density vary spatially. Indeed, climate change, biodiversity losses, or any other planetary boundary thresholds are global phenomena, but have very specific local manifestations (see De Marchi & Gereffi, 2023; Peri & Robert-Nicoud, 2021; De Marchi, 2026). Locations differ substantially in their exposure to climate change and environmental hazards, as well as in their levels of natural resource endowments. While one country may enjoy a relatively clean and livable NE, the other may critically

suffer the consequences of ecological degradation. Comparative designs should therefore identify not only whether results generalize across contexts, but also why and where they do: e.g., contrasting the effectiveness of the same supplier standard under a coal-heavy versus a renewables-rich grid, or in basins with divergent hydrological constraints.

Three literature streams are especially useful for gaining a better understanding of temporal and spatial dynamics. First, research linking geography and intraorganizational networks demonstrates how local knowledge environments interact with internal collaboration structures to shape innovation, implying that the local relational fabric mediates the internalization of global policy and environmental signals (Funk, 2014). Second, spatial institutional analysis demonstrates that actors strategically manipulate material, social, and symbolic dimensions of space to disrupt or defend institutional logics, suggesting that multinational responses to NE policy mixes may hinge on how they occupy, reconfigure, or insulate "spaces" across jurisdictions (Rodner et al., 2019). Third, panarchy theory emphasizes that socio-ecological systems evolve through nested adaptive cycles across scales over time (Gunderson & Holling, 2002). Shocks or slow variables in one level (e.g., a basin, region, or global regime) can cascade to others, making policy effectiveness inherently contingent on cross-scale interactions and timing. Together, these insights imply developing more granular analyses of space, moving away from country-level analysis to consider, for example, regions or cities as well (see e.g., Goerzen et al., 2024), but also to go beyond administrative boundaries only, i.e., to consider ecological systems such as water basins or ecological socio-ecological systems (De Marchi, 2026). Therefore, an important question to examine is which policy instruments are most effective at the regional level, both within and outside regional integrations or jurisdictions.

Tensions: What are the Prevalent Tensions in the IB–NE–Policy Nexus?

A mature and conscious sustainability conversation recognizes that many conflicts and challenges in the IB–NE–policy nexus are enduring paradoxes rather than transitory trade-offs (Carmine & De Marchi, 2023b; Hahn et al., 2015; Van der Byl & Slawinski, 2015). In cross-border settings, these tensions are amplified by spatial and temporal heterogeneity in ecosystems and institutions (Carmine & De Marchi, 2023a; Kolk, 2016). The task, then, is not necessarily to resolutely "solve" tensions but

to navigate them and, if possible, reconcile them through credible mechanisms and policy-compatible designs.

In this editorial, we first focus on *tensions between aspirations, strategy, and implementation operations*. The well-known gap between seeing and doing often reflects slippage across the cognitive domain (aspirations), substantive (strategy), and implementation (operations) layers (Joseph et al., 2020). "Net-zero" and "nature-positive" commitments might transform into policy-practice decoupling, as they create sensemaking frames that can devolve into performative symbolism absent robust roadmaps and operational routines (Sharma, 2022), or a means-ends decoupling, in case they entail the effective implementation of policies, but a failure to achieve important environmental improvements (Halme et al., 2018). This could occur at both the MNE level, in terms of strategy development and implementation failures between headquarters and subsidiaries, and at the GVC level, when misalignments emerge between strategies and environmental performance at the MNE and its suppliers (e.g., Krishnan et al., 2023).

A paradox approach reframes the challenge: hold the ambition and the constraints in view, then design both-and mechanisms that translate purpose into repeatable practice (Hahn et al., 2018; Hahn et al., 2015). Regarding these tensions, the paradox literature points to multiple ways of engaging them (Lewis, 2000; Putnam et al., 2016; Schad et al., 2016; Smith & Lewis, 2011); rather than claiming a definitive set of "effective" tools, we highlight two illustrative approaches that are especially actionable in IB settings[2]. The first is *capability sequencing*, i.e., pairing near-term informational tools (such as disclosure and product-level traceability) with the development of organizational and authoritative tools (green public procurement, product/technology standards), so that public cognitive intent accumulates into substantive strategy and operational discipline. The second is a *practical-wisdom* stance that equips managers to adjudicate value conflicts under uncertainty, bridging the ideal and the feasible without collapsing into cynicism (Sasse-Werhahn et al., 2020). In short, scholars and policymakers may consider transitioning from declarative alignment to operational alignment by integrating the ambition into practical matters, such as procurement calendars, engineering specifications, and supplier contracts.

[2] We focus on two for parsimony; others include separation/integration strategies, temporal cycling, and multilevel governance arrangements (see e.g., Lewis, 2000; Putnam et al., 2016; Schad et al., 2016; Smith & Lewis, 2011 for further details).

The second tension we focus on between *private optimization and public policy coherence* reflects the challenge of aligning firm-level decision-making logics, whether shareholder value, stakeholder value, or purpose-driven, with system-level outcomes. Even when firms intend to act systemically, competitive pressures, fiduciary duties, and uneven regulation can lead to individually rational choices that collectively misalign with public goals, for example, shifting emissions geographically to arbitrage regulatory asymmetries (Berry et al., 2021; Bu & Wagner, 2016). Paradox theory recommends acceptance and integration rather than denial, which involves recognizing these structural pulls and designing governance that re-aligns the payoff matrix (Hahn et al., 2015; Van der Byl & Slawinski, 2015).

The third tension, *disclosure vs. decisiveness*, involves moving from talk to walk. Transparency can sharpen attention and reduce information frictions, yet disclosure without decisive tools risks entrenching reporting theater. Conversely, mandates without information produce blunt instruments and blind spots (Christensen et al., 2021). The paradox lens suggests that informational instruments can be designed as gateways that trigger or condition access to authoritative, financial, and organizational tools, thereby converting symbolic compliance into sequenced action, where seeing becomes doing. This, in turn, directs attention to the specific tension a study highlights and to the concrete sequencing or coupling mechanism through which it can be traced and productively managed.

Eventually, especially in the face of tensions, it may be implausible to identify one primary tension, model or trace it explicitly, and, critically, state the policy or managerial tool that resolves or productively manages it (Wegener et al., 2025). In management practice, it means building paradox-capable systems, i.e., governance architectures and learning routines that do not wish to resolve tensions but channel them toward system-level improvement (Ozanne et al., 2016; Sasse-Werhahn et al., 2020). In sum, tensions in environmental sustainability are not defects to be eliminated but design features of the IB–NE–policy landscape. When treated with a paradoxical mindset, they may become research leverage, clarifying mechanisms, boundary conditions, and sequences, as well as practical tools.

Special Issue Contributions and Future Research Directions

We organize a future research agenda around the four interlocking building blocks that are reflected in our framework: linkages, multilevel mechanisms, temporal–spatial dynamics, and tensions. The contributions to this SI discussed herein can be regarded as "exemplars" of (some of) these building blocks, as they have emerged interactively with the development of this editorial. Our editorial and SI contributions focus on more integrated approaches and the complex dynamics of GVCs, both over time and across local and national settings, covering different scales. This approach also includes a more macro-oriented view that illustrates the nonlinear influence of MNE characteristics and home/host country conditions on FDI. We will connect such insights with further research opportunities next.

Linkages

The first set of research opportunities concerns how scholars conceptualize and empirically "locate" the dominant linkage(s) shaping a phenomenon and, crucially, how they interact. Rather than assuming a single constraint (e.g., "regulation" or "resources"), future work can treat environmental and governance conditions as bundles of interdependencies, i.e., linkages, that are transmitted through GVCs. This induces IB research to ask sharper questions, such as: *Which biophysical state or threshold is responsible for these linkages? Through which market structures and GVC architectures are they transmitted? Through which policy mixes are they amplified, dampened, or rerouted?*

A particularly fertile direction is to theorize linkages at the level where they become actionable for firms and policymakers: the GVC. Across many settings, the "ecological feasibility" of strategies is not solely nested within firms, but rather within GVCs. This suggests research that maps environmental burdens (carbon, water, land-use, and biodiversity exposure) onto specific GVC segments and governance nodes (lead firms, platforms, financiers, and standard setters), then examines how policy instruments shift the allocation of burdens and rents. Our SI's emphasis on GVCs, diffusion, and circular-economy policy offers natural points of departure for this kind of linkage-explicit work. Particularly, the complex interactions between different policy instruments (ranging from voluntary to mandatory) at various scales, from local to global, are crucial to incorporate into the investigation of geo-physical, geo-economic, and geo-political linkages.

To this end, a forward-looking linkage agenda should treat geo-political linkages not only as "policy pressure," but as contested cross-border design choices. The clean-energy transition makes visible how policy mixes increasingly pursue multiple objectives at once: decarbonization, competitiveness, and economic security, creating new IB questions about fragmentation, trade measures, and strategic dependence. A key exemplar research frontier is to explain when such multi-goal governance architectures accelerate environmental progress versus when they induce leakage, retaliation, or "green mercantilism" dynamics that reshape location and sourcing. In this mix, we also need to consider the role of societal contestation, such as litigation and court cases in the context of climate change.

Mechanisms

Papers in this SI make a clear contribution to advancing our understanding of multilevel mechanisms. Bass et al. (2025), for example, develop a typology that clarifies how MNEs shape environmental outcomes at the GVC level by influencing supplier strategies. Their framework differentiates MNE impacts, ranging from causing damage and eroding ecosystem resilience to reducing harm and ultimately generating positive environmental effects, thereby mapping firm-level strategic choices onto system-level trajectories. This typology aligns closely with the *firm responses → system trajectories* in our framework and highlights how these impacts are further shaped through *feedback/feedforward loops* with policy instruments. Different policy tools (authoritative and informational instruments versus financial and organizational ones) enable distinct GVC-level outcomes, moving the analysis of policy effects beyond a binary "good versus bad" logic toward a more granular, mechanism-based understanding. Similarly, Curran and Joltreau (2026) underscore the importance of understanding the *policy instrument → firm responses* and *firm responses → system trajectories* in our framework. Their study of circular economy policies in the French textile industry provides evidence of how such policies impact firms' strategies and innovation trajectories. Their findings reveal a stark divergence in outcomes: while these policies enable material transformation for circular-born firms, they often elicit largely symbolic responses from MNEs, failing to trigger systemic change across the industry's GVC.

Along those lines, several research opportunities lie ahead. A first opportunity is to move from associational claims to mechanism-explicit accounts that can adjudicate between competing explanations, such as compliance versus capability-building, symbolic adoption versus substantive reconfiguration, and local upgrading versus displacement. Likewise, along *policy instrument → firm responses*, scholars can open up the "black box" of policy mixes by theorizing which channel is doing the work (incentive/constraint, information/credibility, coordination/capability-building), and how channels combine (complements, substitutes, conflicts). This invites designs that exploit variation in stringency, speed, and scale (and their interactions) to identify causal effects, for example, when disclosure regimes trigger real changes only once paired with procurement rules, border measures, or enforceable standards; or when technology-forcing instruments shift investment ahead of implementation by changing expectations and competitive dynamics.

Second, along *firm responses → system trajectories*, there are research opportunities to theorize how firm decisions scale into system trajectories through (i) operational footprint mechanisms, (ii) GVC reallocation mechanisms (leakage vs upgrading), and (iii) GVC governance mechanisms (standard-setting, traceability, supplier development, platform coordination). Here, "system" outcomes should be treated as more than reputational or disclosure metrics: research designs can connect strategy to biophysical consequences, and then to policy-relevant outcomes. The methodological frontier is integrative: linking firm/GVC data with geospatial and environmental datasets, and modeling displacement, rebound, and spillovers rather than assuming locality.

Third, with *feedback/feedforward loops*, researchers can explicitly model the temporal structure and the interconnections among NE, MNE/GVC strategies and policies, identifying the operative feedback or feedforward loop by specifying which actors form which expectations, when they do so, and with what consequences (Bansal & Knox-Hayes, 2013; Plakoyiannaki et al., 2024).

Dynamics

A third set of directions builds on one of the core premises of this editorial: time and place are not nuisance controls; they are constitutive elements of the IB–NE–policy nexus. Ferretti et al. (2026) in this SI exemplify this logic by showing how the diffusion of sustainability practices unfolds unevenly

across space and over time. Focusing on voluntary sustainability standard organizations, they demonstrate that diffusion across low- and middle-income economies is uneven and systematically conditioned by national institutional configurations. Indeed, such a diffusion depends on the specific policy mix, which shapes MNE adoption practices and, in turn, the environmental outcomes that might materialize. Their analysis underscores that sustainability diffusion is a temporally sequenced and spatially embedded process, aligning closely with our framework's emphasis on interlocking policy instruments, firm responses, and system-level trajectories.

Similarly, Kannen et al. (2026) reinforce the view that firm responses are contingent on specific regional policy landscapes. They demonstrate that the adoption of green management practices involves a nonlinear interplay between MNE characteristics and both home- and host-country institutional conditions, highlighting that policy effects on firm behavior cannot be assumed to be uniform or linear. Panarchy theory adds that such nonlinearity is often cross-scale (Gunderson & Holling, 2002). This premise opens up a promising research opportunity to examine how nested, temporal, cross-scale adaptive cycles, spanning local ecosystems, regional economies, and supranational policy regimes, transmit shocks and slow-moving pressures across levels, which reshape the sequencing and effectiveness of policy mixes and MNE responses. Along those lines, future work can therefore treat sustainability as a sequence problem: environmental change unfolds through lags, lock-ins, and tipping points; policy unfolds through phase-ins, learning, and revision; and strategy unfolds through investment cycles, asset lifetimes, and capability accumulation. A promising agenda is to specify what the relevant "clock" is (policy calendar, technology learning curve, ecological regeneration rate, capital turnover) and then test how mismatches between clocks create persistent underperformance, backlash, or transition risk. This invites research that makes expectations observable (e.g., forward guidance, announced standards, phase-in schedules, disclosed pathways) and then traces how different actors form and revise beliefs over time. Empirically, this can motivate event-based designs around announcements and credible commitments, alongside longitudinal designs that capture learning (what implementation reveals about costs, feasibility, and unintended consequences).

Spatial dynamics, in turn, push IB to treat heterogeneity as a mechanism, not noise: the same "sustainability practice" can produce different outcomes depending on grid mixes, ecological

vulnerability, policy capacity, and GVC structure. A provocative (and practical) research direction is to replace generic "distance" variables with ecological and governance-relevant distance measures, including differences in carbon intensity, water stress, land sensitivity, enforcement capacity, and instrument compatibility across jurisdictions.

Tensions

A final set of directions concerns tensions as durable design features of the IB–NE–policy landscape. Future work can examine, for example, when and how coupling informational visibility with authoritative or financial tools shifts firm choice sets, making "offshore and disclose" less attractive than "upgrade or switch technology", and through what conditions such combinations avoid unintended leakage or burden shifting. A second avenue is to study the effectiveness and political economy of border-oriented instruments (e.g., enforcement and adjustment measures) in reducing regulatory arbitrage while managing competitiveness and distributional effects across jurisdictions (Lopez et al., 2025). A third avenue is to analyze when organizational tools, such as green public procurement, successfully underwrite early demand for compliant inputs and tip supplier incentives toward upgrading rather than relocation (Ciulli & Kolk, 2023). Together, these research directions align with what Ozanne et al. (2016) term paradox-savvy orchestration at the triple-bottom-line intersection: leveraging tensions as sources of innovation while empirically identifying which governance combinations narrow destructive degrees of freedom through policy-firm co-design.

Future studies can also examine whether, and under what conditions, linking supplier disclosure to preferential procurement or credit access makes transparency consequential by translating information into market rewards and penalties. Another avenue is to investigate the sequencing problem: whether phasing product/technology standards alongside "disclosure maturity" improves verifiability (audits can substantiate reports) and enables credible escalation over time. Furthermore, future research can assess whether publishing phase-in calendars aligned with typical investment lifetimes preserves decisiveness while improving planning, reducing stranded-asset risk, and accelerating adoption (Flynn et al., 2025). Taken together, these questions resonate with calls for design routines that work with, rather than suppress, paradoxical tensions—potentially converting "seeing" into "doing" through structured sequences (Hahn et al., 2018; Joseph et al., 2020).

To address the tension between private optimization and public policy coherence, future work can avoid the strawman assumption that firms cannot adopt a system perspective by posing a more diagnostic question: *under what governance conditions do system-oriented strategies survive competition and cross borders?* Scholars can distinguish settings where system-oriented firm behavior is privately sustainable (because policy and market design reward it) from settings where it is competitively punished (because rivals can arbitrage). This creates a concrete research program on the design of payoff matrices across jurisdictions, especially as clean-energy and industrial policies jointly reshape incentives, and as economic security concerns increasingly co-determine what "coherent" policy looks like in practice.

To address the tension between disclosure and decisiveness, the key research move is to treat informational instruments as gateways rather than endpoints. Disclosure can reduce information frictions, but without meaningful incentives and enforcement, it can devolve into box-ticking and symbolic compliance; conversely, mandates without adequate information can become heavy-handed and poorly targeted, creating blind spots. This invites studies that trace concrete sequencing or coupling mechanisms, when disclosure conditions, procurement eligibility, credit access, border treatment, or the escalation of standards are involved, and that identify when such architectures produce real environmental change versus merely re-labeling activity. Eventually, especially in the face of tensions, it may be plausible to identify one primary tension, model or trace it explicitly, and, critically, state the policy or managerial tool that resolves or productively manages it.

Concluding Remarks

Given the current status of the NE and the heightened awareness that has resulted from it, IB can no longer treat the NE as a backdrop. In the Anthropocene economy, ecological conditions are becoming the conditions of possibility for cross-border production, investment, and exchange, and MNEs and GVCs are central to both environmental pressures and the capabilities required for mitigation and adaptation. If IB scholarship is to be consequential for policymakers and practitioners, it must move beyond virtue narratives and deliver explanations that connect firm choices to measurable environmental outcomes under real governance constraints.

We advance a policymaking perspective and a framework that makes those connections tractable. Our framework directs scholars to specify how geo-physical, geo-economic, and geo-political linkages interact in a given setting; to trace the operative mechanism path, that is, how governance tools shape firm responses, how those responses scale into system trajectories, and how feedback/feedforward loops alter both policy and strategy over time; and to treat time and place as constitutive elements rather than nuisance controls. Our invitation is straightforward: future work should make these choices explicit, follow the causal chain across jurisdictions and along GVCs, and test how policy mixes, varying in stringency, speed, and scale, combine with firm capabilities to produce (or fail to produce) durable environmental improvement. Doing so will help the field generate research that is ecologically faithful, empirically credible, and genuinely usable for policymaking and multinational strategy in a world of tightening ecological constraints.

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Figures

Figure 1: A framework of key ingredients of the IB–NE–policy landscape

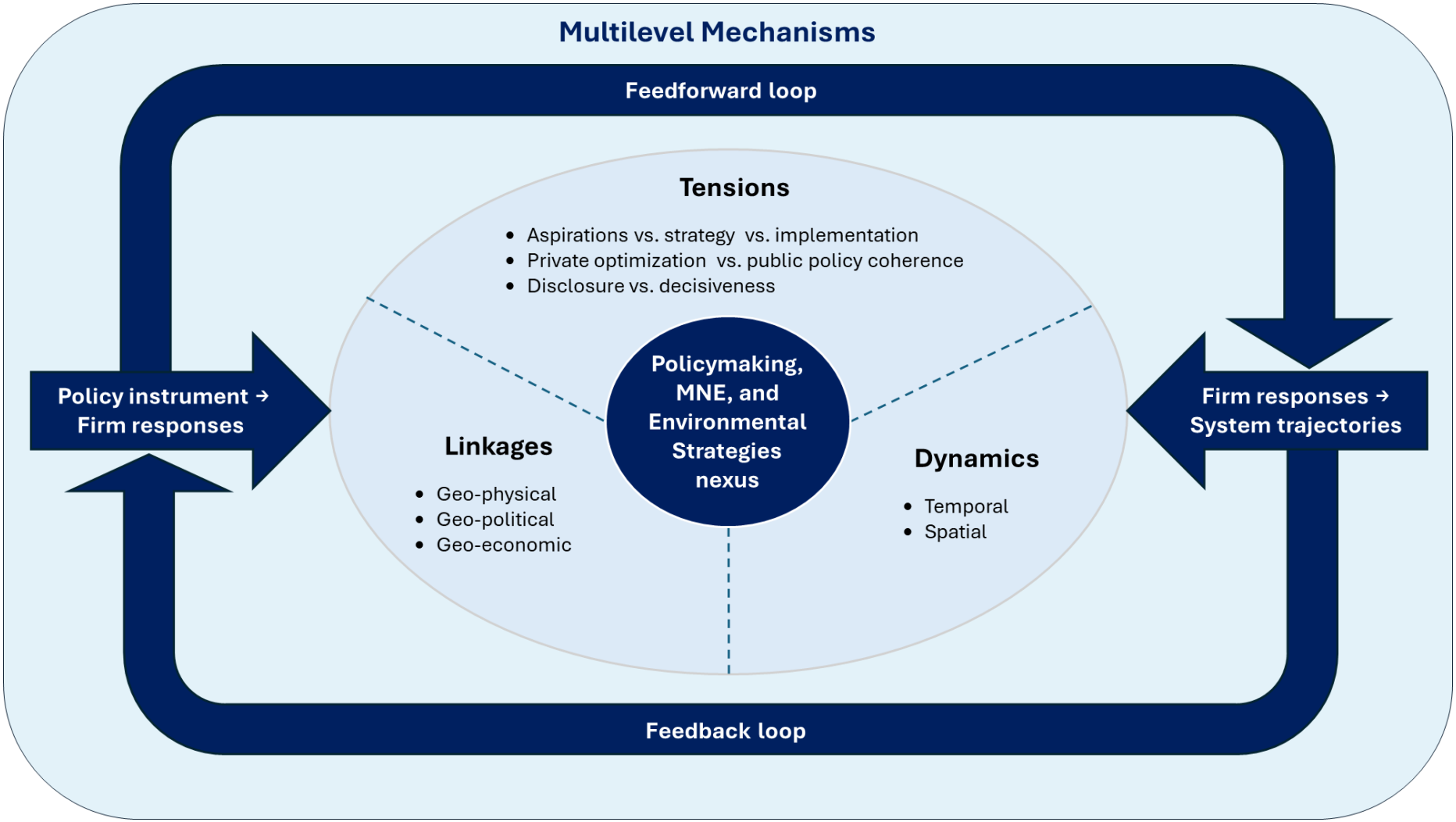

Figure 2: A classification of policy instruments at the IB-NE nexus