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**Global Climate Governance: The Paris Climate Agreement, Achievements and Challenges**
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**ABSTRACT**

*This article provides a comprehensive assessment of the Paris Climate Agreement's achievements and persistent challenges within the broader architecture of global climate governance. Moving beyond the celebratory narrative of diplomatic success, the analysis examines the Agreement's paradigmatic shift from the Kyoto Protocol's top-down regulatory model to a bottom-up, facilitative framework centered on nationally determined contributions, hybrid legal obligations, and iterative ambition cycles. The article identifies four principal achievements: the near-universal ratification establishing a global normative framework and catalyzing the net-zero movement, the construction of a common transparency architecture culminating in the first Global Stocktake, the institutionalization of climate justice through the Loss and Damage Fund, and the systematic mobilization of subnational and non-state actors creating a polycentric governance reality. Against these accomplishments, the analysis confronts four structural challenges: the persistent mitigation ambition and implementation gap leaving the world on a catastrophic trajectory, an accountability architecture incapable of compelling state compliance, a climate finance system mired in mistrust and definitional battles, and a geopolitical landscape where energy nationalism and supply chain weaponization undermine cooperative logic. The article advances a reform agenda encompassing domestic legal enforceability, prescriptive evolution of the Global Stocktake, transformative climate finance architecture, and the judicialization of Paris norms through transnational litigation. The central argument contends that the Agreement's defining diplomatic genius, its nationally determined, facilitative design, has simultaneously become its principal structural weakness, and that the critical decade ahead demands institutional creativity that matches the scale of the crisis the Agreement was designed to address.*

**Keywords:** Paris Agreement, Global Climate Governance, Nationally Determined Contributions, Global Stocktake, Climate Finance, Transnational Climate Litigation

**Introduction**

The problem of climate change presents a textbook example of a wicked global commons problem, defined by profound scientific complexity, deep uncertainty, and a fundamental mismatch between the short-term distribution of economic costs and the long-term, diffuse nature of climatic benefits. The atmosphere functions as a vast, non-excludable resource, creating a structural incentive for individual nations to free-ride on the mitigation efforts of others while reaping the benefits of any emission reductions achieved collectively (Stavins, 2011). This tragedy of the horizon is compounded by the radical temporal and spatial

disconnection between the source of greenhouse gas emissions and the impacts of a destabilized climate system, where those least responsible for historical emissions, the poorest and most vulnerable nations, are disproportionately exposed to catastrophic effects (Intergovernmental Panel on Climate Change [IPCC], 2022). Unlike conventional transboundary environmental problems subject to clear treaty solutions, climate change is intricately woven into every sector of the global economy, from energy production and industrial agriculture to transportation and urban development. Addressing it demands a fundamental transformation of the global energy base, a reimagining of financial flows, and a managed transition that directly challenges entrenched fossil fuel interests and long-standing models of state sovereignty. The wicked nature of the problem thus lies not only in the biophysical inertia of the carbon cycle but in the sheer political difficulty of orchestrating a coordinated, equitable, and enforceable response among nearly 200 sovereign states with wildly divergent historical responsibilities, developmental priorities, and national capacities (Keohane & Victor, 2016).

The evolution of the formal global response to this threat was marked by a profound and ultimately dysfunctional structural divide long before the Paris Agreement was conceived. The 1992 United Nations Framework Convention on Climate Change (UNFCCC) established the foundational principles of the regime, most notably the principle of common but differentiated responsibilities and respective capabilities, but its operationalization in the 1997 Kyoto Protocol created a rigid, binary architecture that doomed its long-term viability. The Kyoto model imposed legally binding emission reduction targets exclusively on a set of developed, industrialized nations listed in its Annex I, entirely exempting major emerging economies from any such commitments, a design informed by the historical responsibility principle but one that quickly became politically untenable (Bodansky, 2016). This sharp differentiation meant that by the end of the Protocol's first commitment period, the instrument covered a rapidly shrinking share of global emissions, with the United States, a leading historic emitter, never ratifying the treaty, and Canada subsequently withdrawing (Victor, 2011). This top-down, targets-and-timetables approach, while theoretically elegant, proved politically catastrophic, as it demanded that sovereign states accept internationally negotiated and legally binding outcomes without a corresponding domestic political consensus, a reality starkly confirmed by the collapse of the 2009 Copenhagen climate conference. The Copenhagen Accord, a political rather than a legal document, served as a crucial post-mortem, signaling the death of the Kyoto firewall and introducing the voluntary pledge-and-review system that would become the genetic code of the Paris Agreement, yet it also revealed a deeply fractured diplomatic landscape that required a novel institutional solution (Falkner, 2016).

The pivotal moment arrived at the 21st Conference of the Parties in 2015, where the adoption of the Paris Agreement signified a fundamental paradigmatic shift from the command-and-control logic of Kyoto to a bottom-up, facilitative architecture of global cooperation. Central to this new framework was the mechanism of Nationally Determined Contributions (NDCs), a procedural obligation for all parties, without categorical distinction, to prepare, communicate, and maintain successive domestic climate plans that reflect their highest possible ambition (Rajamani, 2016). The diplomatic genius of the Agreement lay in its hybrid legal character, establishing a legally binding process for cyclical pledging, reporting, and review, while leaving the substantive content of those pledges to national sovereign discretion, a formula that secured near-universal participation (Bodansky, Brunnée, & Rajamani, 2017). The thesis of this analysis contends that the Paris Agreement represents a historic diplomatic achievement, having successfully created a universal normative framework and a powerful catalytic signal that has redirected global investment flows, entrenched a long-term temperature goal, and mobilized a

broad ecosystem of subnational and corporate actors. This success is real and measurable in the rapid decline of renewable energy costs and the proliferation of net zero pledges. Yet, concurrently, the instrument's defining feature, its bottom-up, nationally determined architecture, is also its profound structural weakness. The aggregate ambition of the initial round of NDCs was, and remains, grossly insufficient to hold the increase in the global average temperature to well below 2°C above pre-industrial levels, let alone to pursue efforts to limit the increase to 1.5°C, and a substantial implementation gap persists even between these inadequate pledges and real-world policies (United Nations Environment Programme [UNEP], 2023). The Agreement's soft accountability mechanism of transparency and peer pressure has so far proven incapable of closing this chasm, raising the stark question of whether the very architecture that made agreement possible may, by design, prevent the achievement of its own ultimate objective.

### **Literature Review**

Scholarly understanding of the Paris Agreement draws from competing theoretical traditions, each illuminating distinct dimensions of its operation while obscuring others. Regime theory and neoliberal institutionalism frame the Agreement as a sophisticated response to the impediments that prevented effective cooperation under Kyoto. International institutions reduce transaction costs, enhance information sharing, and create iterative frameworks allowing states to overcome collective action problems inherent in a global common's dilemma (Keohane & Victor, 2016). The Paris Agreement, with its five-year ambition cycles, transparency framework, and Global Stocktake, facilitates cooperation by building mutual confidence that others are acting, thereby lowering the political costs of unilateral ambition. Its procedural obligations create a repeated game structure, transforming a single-shot prisoner's dilemma into an ongoing relationship where reputational concerns can drive ambition upward (Barrett, 2016). This state-centric framework has been challenged by polycentric governance theory, derived from Elinor Ostrom, which insists effective climate action cannot emerge exclusively from a singular intergovernmental process. This perspective directs attention to initiatives by cities, regions, corporations, and transnational civil society, partially institutionalized within the Paris framework through the Marrakech Partnership for Global Climate Action (Jordan et al., 2018). Polycentricism argues these diverse sites of authority provide experimentation and learning at scales where trust and mutual monitoring are achievable, creating mutually reinforcing commitments that generate meaningful reductions when the formal process falters (Ostrom, 2010).

Running against these optimistic accounts, realist and critical scholarship injects a sobering emphasis on sovereignty, power asymmetries, and the structural limits of international law. Realist perspectives contend that the Paris Agreement's non-binding substantive targets reflect the unwillingness of powerful states to cede control over their core economic and energy security interests to an international authority (Downie, 2022). The elaborate architecture of pledging and review constitutes organized hypocrisy, allowing states to perform commitment internationally while preserving domestic latitude to pursue fossil fuel expansion and sidestep the restructuring a 1.5°C pathway demands (Victor, 2011). Critical scholars probe distributive and historical justice dimensions that regime theory brackets, arguing the Paris framework systematically privileges industrialized nations by centering mitigation ambition while marginalizing binding commitments on finance, technology transfer, and loss and damage that the Global South has demanded for decades (Newell & Lane, 2020). The language of nationally determined contributions is a discursive move displacing responsibility from a collective, differentiated obligation onto a voluntaristic framing that obscures structural inequalities in the global political economy of carbon. The gap between these accounts is not merely academic, as

it shapes whether actors invest in reinforcing the Paris architecture or build pressure from the outside through litigation and direct action.

A rich literature interrogates the regulatory architecture of the Paris Agreement, focusing on the historic shift from a regulatory model to a catalytic and facilitative regime. Thomas Hale (2016) characterizes this as a turn from externally imposed compliance toward orchestration, wherein UNFCCC institutions guide and steer states rather than command them through binding caps. The centerpiece is the pledge and review mechanism, conceptualized through experimentalist governance, where broad goals are set at the center while sovereign states pursue them through contextually appropriate strategies, with periodic reporting and peer review creating iterative learning over time (Sabel & Victor, 2017). This account argues the initial inadequacy of NDCs is a feature, not a bug, because the architecture escalates ambition through successive cycles of commitment, review, and stocktaking. Legal scholarship has engaged deeply with the Agreement's hybrid character, a fusion of hard law procedural obligations and soft law substantive targets that Lavanya Rajamani (2016) has analyzed precisely. The obligation to submit an NDC and pursue domestic mitigation measures is legally binding, while achieving the NDC's numerical target is not, a construction essential to securing US participation alongside European demands for robust transparency and accountability (Bodansky, 2016). The scholarly consensus is that this hybridity created conditions for universality, yet debate remains over whether it provides sufficient foundation for the deep decarbonization science mandates.

Despite this richness, significant analytical gaps remain, particularly after the first Global Stocktake concluded at COP28 in 2023. The first gap concerns over-emphasis on the ambition mechanism dichotomy, a debate focused narrowly on the gap between NDC pledges and temperature goals, neglecting integrated analysis of justice and equity pillars that Global South states consider the precondition for enhanced ambition. Governance scholarship treats climate finance, technology transfer, and loss and damage as separate issues rather than constitutive elements of regime effectiveness inextricably linked to raising NDC ambition in developing countries (Okereke & Coventry, 2016). The operationalization of the Loss and Damage Fund at COP28 represents a transformative development whose implications for regime coherence and legitimacy have not been fully theorized. A second gap is the absence of a consolidated post-Global Stocktake assessment connecting the diagnostic achievements of that review to the structural challenges that continue to beset the regime. The Stocktake produced a frank consensus on the implementation gap and the necessity of tripling renewable capacity, yet operated in the register of collective exhortation, with no mechanism to translate findings into revised commitments or apportion responsibility for collective failure (van Asselt, 2024). The literature has yet to analyze how the catalytic logic can be reformed to bridge the chasm between a sophisticated diagnostic process and the reality of nationally determined contributions that remain on a catastrophic trajectory. This points to an urgent research agenda engaging with the hard political and institutional preconditions for transforming a facilitative model into one capable of mandating the transformation the climate crisis demands.

### **Problem Statement**

The Paris Agreement has successfully constructed a universal normative framework and catalyzed unprecedented global climate action, yet the scholarly consensus reveals a profound and persistent contradiction at its core. The literature demonstrates that the Agreement's facilitative, bottom-up architecture, which secured near-universal participation through nationally determined contributions, has simultaneously produced an aggregate ambition gap that leaves the world on a trajectory toward catastrophic warming well beyond the 1.5°C goal. The existing scholarship, however, remains trapped in a narrow ambition-mechanism dichotomy

that overemphasizes the quantitative shortfall of pledges while systematically under-theorizing the inextricable linkage between enhanced ambition and the unfulfilled justice pillars of finance, technology transfer, and loss and damage that Global South states identify as non-negotiable preconditions for their accelerated action. Furthermore, the first Global Stocktake has laid bare a critical governance deficit, namely the chasm between a sophisticated global diagnostic process capable of identifying necessary transformations and an institutional architecture devoid of mechanisms to translate collective exhortation into enforceable national commitments. This gap demands urgent scholarly attention to the political and institutional conditions under which a facilitative governance model can be reformed to mandate the speed and scale of transformation the climate crisis demands.

### **The Architectural Shift**

The foundational achievement of the Paris Agreement cannot be grasped without a clear-eyed reckoning with the spectacular collapse of its predecessor's regulatory logic. The Kyoto Protocol represented the high-water mark of a top-down, targets-and-timetables approach, establishing legally binding emission reduction commitments exclusively for a set of developed nations listed in its Annex I, a construction predicated on the principle of historical responsibility for the accumulated stock of greenhouse gases in the atmosphere (Victor, 2011). This architecture proved to be a political disaster of the first order. The United States Senate's unanimous Byrd-Hagel Resolution of 1997 signaled a fatal domestic constraint, stipulating that the country would not accept binding targets without meaningful participation from major emerging economies, leading ultimately to the non-ratification of the Protocol by the world's largest historical emitter and a catastrophic loss of environmental coverage (Falkner, 2016). The binary firewall between Annex I and non-Annex I nations, while normatively coherent in theory, created a geopolitical trap in practice, as rapidly industrializing nations like China, India, and Brazil were exempted from any emission constraints even as their aggregate emissions soared, a dynamic that fundamentally undermined the regime's legitimacy in the eyes of developed country publics and parliaments. The Copenhagen Accord of 2009, though widely reviled as a diplomatic failure in its chaotic final hours, served as an instructive and essential bridge to the Paris model by formally burying the Kyoto firewall. At Copenhagen, the BASIC bloc of Brazil, South Africa, India, and China, alongside the United States, brokered a political accord that for the first time saw all major emitters voluntarily pledge emission reduction actions, a radical departure from the mandatory differentiation that had structured climate politics for nearly two decades (Bodansky, 2016). This accord demonstrated the political viability of a pledge-based system while simultaneously exposing the profound trust deficit that a purely voluntary framework would need to overcome, lessons that were absorbed directly into the institutional DNA of the Paris Agreement.

The Paris Agreement's resolution of the differentiation deadlock constitutes one of the most significant acts of diplomatic creativity in modern international environmental law, replacing a rigid, static, and ultimately self-defeating binary with a dynamic and context-sensitive formulation. The abandonment of the Annex I and non-Annex I firewall was not a rejection of the foundational principle of common but differentiated responsibilities but rather a sophisticated recalibration of its legal expression, formalized in the phrase "Common But Differentiated Responsibilities and Respective Capabilities, in light of different national circumstances," now known by its acronym CBDR-RC-NC (Rajamani, 2016). This linguistic innovation, seemingly modest, performed enormous political work. By inserting "in light of different national circumstances," the Paris text introduced a dynamic and temporal element into the differentiation calculus, acknowledging that national circumstances evolve over time and that emerging economies bear a progressively greater responsibility to act as their

capabilities grow, a crucial concession to developed countries led by the United States (Bodansky, Brunnée, & Rajamani, 2017). Simultaneously, by retaining the core CBDR-RC language, the text affirmed the enduring relevance of historical responsibility and the differentiated obligations it implies, a red line for the BASIC bloc and the broader G77 coalition of developing nations. This formula succeeded where Kyoto failed because it was strategically ambiguous enough to allow all major parties to claim vindication. The United States could argue that the Agreement had broken decisively with the Kyoto logic of categorical exemption for China, while China and India could maintain that the principle of differentiation remained intact and would continue to structure obligations regarding finance, technology transfer, and the pace of emission reductions (Stavins & Stowe, 2017). This carefully calibrated ambiguity on differentiation was the indispensable political precondition for securing the universal participation that had eluded climate diplomacy for a generation.

The operational engine of this new differentiation paradigm is the mechanism of Nationally Determined Contributions, which transformed the very nature of climate obligations from a static, externally imposed burden into a dynamic, self-determined instrument of national policy. The Paris Agreement establishes a legally binding procedural obligation for all parties, without categorical distinction, to prepare, communicate, and maintain successive NDCs, each of which must represent a progression beyond the party's previous contribution and reflect its highest possible ambition (Rajamani, 2016). This proceduralization of obligation is the core legal innovation of the Paris architecture, creating a framework of binding international law around the act of pledging and reporting while leaving the substantive content of the pledge to national sovereign discretion, a design that masterfully navigated the ratification constraints of the United States while meeting European demands for a legally enforceable framework. The mandatory progression principle is particularly significant because it embeds a ratchet mechanism directly into the legal text, ensuring that the collective ambition of the regime can, in theory, only move in one direction over time, even if the pace of that progression remains a function of domestic political will rather than international prescription (Keohane & Victor, 2016). The NDC mechanism reframes the political economy of climate action by transforming it from a sacrifice made for a collective goal into a domestically defined development pathway, a shift that recognizes the sovereign reality that deep decarbonization cannot be imposed from the outside but must be owned and driven by national political processes. This catalyst logic has proven remarkably effective in generating procedural participation, with virtually every party submitting successive NDCs, yet the profound question the architecture leaves unresolved is whether a system predicated on self-determined ambition can ever generate the aggregate emission reductions that the collective temperature goal mandates, a tension that remains the central drama of the post-Paris era.

### **Key Achievements of the Paris Agreement**

The Paris Agreement's most unprecedented achievement was its near universal ratification at a speed that shattered all precedents in multilateral environmental diplomacy. Entering into force less than a year after its adoption, the Agreement secured the endorsement of 195 Parties, encompassing virtually the entire community of sovereign states and standing in stark contrast to the Kyoto Protocol's limited and shrinking coverage (Bodansky, 2016). This diplomatic triumph represented the creation of a truly global normative framework in which every nation, regardless of development level or geopolitical alignment, acknowledged a shared responsibility to contribute to the collective climate effort. The entrenchment of a long-term temperature goal, holding warming to well below 2°C and pursuing efforts toward 1.5°C, established a scientifically grounded benchmark that has been internalized by domestic courts, corporate boards, and

financial regulators worldwide (IPCC, 2018). Furthermore, Article 4 introduced the objective of achieving a balance between emissions and removals in the second half of this century, catalyzing the global net-zero movement. This normative signal has proven remarkably powerful, with over 140 countries representing approximately 90 percent of global GDP adopting net-zero targets, alongside thousands of corporations aligning strategic planning with mid-century decarbonization (Hale et al., 2021). The Paris Agreement thus fundamentally altered the baseline assumptions of economic actors, transforming climate neutrality from a niche aspiration into a central organizing principle of the global economy, even as the binding policy frameworks required to realize these targets remain substantially underdeveloped.

The construction of a robust transparency architecture and the successful completion of the first Global Stocktake represent a second pillar of achievement addressing the trust deficit that plagued international climate cooperation for decades. The Enhanced Transparency Framework established common reporting and review rules applicable to all Parties, a radical departure from the bifurcated Kyoto system that exempted developing countries from rigorous obligations and fueled persistent recriminations about data reliability (Rajamani, 2016). All countries must submit biennial transparency reports detailing greenhouse gas inventories, progress toward NDCs, and adaptation responses, providing the informational foundation for mutual confidence in the regime. This framework proved its value in the first Global Stocktake at COP28 in 2023, a remarkable diagnostic achievement that synthesized thousands of inputs to produce a technical assessment of unprecedented candor, explicitly acknowledging the world is not on track and that fundamental transformation is urgently required (van Asselt, 2024). The political outcome was a consensus document that, for the first time in UNFCCC history, called for transitioning away from fossil fuels, tripling renewable energy capacity, and doubling energy efficiency improvements by 2030 (United Nations Framework Convention on Climate Change, 2023). While legally non-binding and operating in the register of collective exhortation, these decisions represent a normative watershed that has legitimated policy interventions targeting the fossil fuel system directly, a domain previously fiercely protected by producer states.

A third historically vital achievement has been the institutionalization of climate justice through operationalizing mechanisms to address loss and damage, tackling the deepest moral failure in the climate regime's prior structure. For decades, vulnerable developing nations had insisted that mitigation and adaptation pillars were incomplete without a third pillar addressing irreversible harm from climate impacts, a demand developed nations resisted on grounds it would open limitless liability claims (Okereke & Coventry, 2016). The breakthrough at COP27, where Parties agreed to establish a dedicated Loss and Damage Fund, followed by operationalization decisions at COP28 securing initial pledges and locating the Fund within the World Bank's architecture, represents a tectonic shift in climate justice politics (Broberg & Martinez Romera, 2024). This achievement is primarily normative and institutional rather than financial, acknowledging formally within the climate regime's legal architecture that the causal chain linking historical emissions to present suffering creates obligations beyond the voluntary logic of development assistance. The Fund's establishment implicitly acknowledges the profound limitations of mitigation and adaptation achievements, recognizing that even ambitious emission reductions will not prevent severe impacts for which the most vulnerable bear negligible responsibility, thereby addressing a core justice challenge that threatened the long-term legitimacy of governance among nations most existentially threatened by climate change (Mechler et al., 2020).

The fourth major achievement has been the systematic catalysis of climate action beyond the nation-state, institutionalizing a polycentric governance reality that broadened the foundations

of the low-carbon transition. The Marrakech Partnership for Global Climate Action and the subsequent Race to Zero campaign have created formal pathways for cities, regions, businesses, investors, and civil society to register commitments, report progress, and integrate efforts with the formal intergovernmental process (Chan et al., 2019). This institutional innovation recognizes that a significant share of decarbonization potential lies in decisions of subnational governments controlling building codes and transportation systems, and corporate actors directing capital flows and deploying technologies. The Race to Zero campaign has mobilized over 13,000 non-state actors, including more than 1,100 cities representing over a billion people and financial institutions with assets exceeding \$130 trillion, all committed to net-zero emissions by 2050 with interim 2030 targets (Hale et al., 2023). The scholarly significance lies in confirming polycentric governance theory's insight that effective responses to collective action problems emerge from mutually reinforcing actions of diverse, semi-autonomous centers operating at multiple scales (Jordan et al., 2018). This polycentric reality creates a political dynamic operating in partial autonomy from electoral cycles and geopolitical tensions that paralyze formal negotiating rooms, building momentum, creating demonstration effects, and raising the political costs of inaction for national governments that might otherwise seek to free-ride.

### **Persistent and Emergent Challenges**

The most damning challenge confronting the Paris Agreement lies in the brutal arithmetic of the mitigation ambition and implementation gap. The UNEP Emissions Gap Report has documented that aggregate unconditional NDCs place the world on a trajectory toward a temperature increase between 2.5°C and 2.9°C by century's end, rendering the Agreement's temperature goal functionally aspirational rather than operational (United Nations Environment Programme [UNEP], 2023). The scientific imperative demands global emission reductions of 43 percent below 2019 levels by 2030 to retain any plausible pathway to 1.5°C, yet current NDC projections indicate emissions will instead rise by approximately 3 percent over the same period (IPCC, 2022). This collective failure is compounded by the profound disconnect between long-term net-zero targets and the near-term policies required to place those targets within reach. Over 140 countries have enshrined mid-century net-zero pledges, yet fewer than 20 percent are supported by concrete 2030 policy levers such as carbon pricing, phaseout schedules for internal combustion engines, or binding renewable portfolio standards (Hale et al., 2023). The net-zero movement has generated a dangerous dynamic, allowing governments to claim climate leadership through distant promises while deferring politically costly near-term decisions, a phenomenon scholars term the plausibility gap that threatens the credibility of the entire Paris architecture (van Asselt, 2024). This implementation deficit is a political pathology rooted in electoral incentives that favor distributing future promises over imposing present costs, a structural feature of democratic capitalism the Agreement's facilitative logic was never designed to counteract.

Compounding the ambition deficit, the Paris Agreement's accountability architecture has proven structurally incapable of compelling laggard states to close the gap between procedural compliance and substantive performance, a vulnerability geopolitical fragmentation has exploited with devastating effect. The binding obligation to submit and report on an NDC combined with the non-binding nature of achieving its content has created an accountability chasm the facilitative compliance mechanism cannot bridge (Bodansky, 2016). Article 15 establishes a mechanism that is expert-based, facilitative, and non-adversarial, operating through transparency and peer pressure without capacity to impose financial penalties or trade sanctions on states failing to meet their pledges (Rajamani, 2016). This name and shame logic assumes reputational concerns will discipline state behavior, yet the empirical record since 2015

offers scant evidence this holds under geopolitical stress. The energy crisis following Russia's invasion of Ukraine triggered a wave of fossil fuel infrastructure investment, with governments scrambling for liquefied natural gas terminals rather than accelerating phaseout, all without meaningful consequence from the Paris compliance mechanism (Downie, 2022). Simultaneously, the corrosive failure of developed countries to meet the \$100 billion annual climate finance target by 2020 has inflicted a wound of mistrust between the Global North and South that continues to poison negotiations over the post-2025 New Collective Quantified Goal (Okereke & Coventry, 2016). The NCQG deliberations have surfaced definitional battles, as developing countries insist finance must be primarily grants rather than loans exacerbating sovereign debt distress, while developed countries seek to broaden the donor base and count mobilized private finance toward their commitments (Broberg & Martinez Romera, 2024). These negotiations unfold against a landscape where energy nationalism has resurfaced and clean energy supply chains for critical minerals have become objects of strategic competition weaponized through export controls rather than shared through the cooperative logic the Paris framework presumes (Victor, 2011).

### **Reinforcing the Paris Framework for the Critical Decade**

Transforming the Paris Agreement into a planetary rescue mechanism depends on bridging the chasm between international pledges and domestic legal enforceability through systematic translation of NDCs into binding national legislation. Climate framework laws represent the most potent innovation for marrying international ambition with domestic accountability, establishing enforceable emission trajectories and independent advisory bodies aligned with the Paris five-year mechanism. The United Kingdom's Climate Change Act of 2008 served as the pioneering template, a model since replicated by over 60 countries including New Zealand and Germany (Averchenkova et al., 2017). This approach transforms climate targets from discretionary goals into statutory obligations binding future governments, as demonstrated by the Urgenda decision where Dutch courts ordered accelerated reductions relying on the Paris temperature goal (Mayer, 2018). Framework laws remain insufficient without a parallel shift from economy-wide targets to sectoral transformation pathways, demanding detailed roadmaps for power, transport, and industry specifying technology trajectories and regulatory phase-out schedules. The European Union's Fit for 55 package exemplifies this, translating the bloc's target into specific mandates for renewable deployment, vehicle standards, and a carbon border adjustment mechanism under supranational oversight (Oberthür & von Homeyer, 2023). Without such legal scaffolding and sectoral specificity, NDCs risk remaining aspirational documents lacking the institutional grounding required to bend emission curves at the speed the 1.5°C threshold demands.

The second reform frontier concerns evolving the Paris Agreement's catalytic logic from a diagnostic posture toward a prescriptive intervention model, a transformation the first Global Stocktake has made both possible and urgent. The Stocktake synthesizes collective progress yet operates through exhortation with no mechanism translating sectoral imperatives into differentiated national mandates (van Asselt, 2024). A reformed Ambition Cycle would empower the Stocktake to generate concrete guidance through facilitative dialogue producing recommendations on measures required to align each NDC with the collective temperature goal (Stavins & Stowe, 2017). This evolution from diagnosis to prescription would operate through transparency rather than sanction, shifting expectations toward substantive adequacy. Complementing this, club-based agreements circumvent the consensus gridlock structurally generated by the 195-Party architecture. The Global Methane Pledge demonstrates this potential, securing commitments from over 150 countries through a focused coalition outside

the formal NDC process (Victor & Sabel, 2022). Analogous initiatives targeting steel decarbonization, zero-emission shipping, and sustainable aviation create agile environments where major actors align interests without veto power from fossil fuel-dependent economies (Rayner, 2021). The strategic relationship should be complementary reinforcement, with clubs demonstrating feasibility and generating standards subsequently universalized through formal Paris mechanisms.

The third-dimension concerns transforming climate finance from perpetual acrimony into a credible investment engine integrating financial flows with justice imperatives. The persistent failure to meet the \$100 billion target has inflicted a trust injury no commitment can heal, because decarbonization pace depends directly on external finance terms (Roberts & Weikmans, 2017). Scaling innovative finance beyond discretionary allocations is essential, including levies on fossil fuel windfall profits, taxes on maritime and aviation fuels, and financial transaction taxes generating predictable revenue streams (Ciplet et al., 2018). The International Maritime Organization's shipping carbon levy, projected to raise \$40 to \$60 billion annually, exemplifies mechanisms generating finance while correcting price signals in hard-to-abate sectors (Streck & von Unger, 2022). Beyond quantum lies a structural challenge demanding a shift beyond the donor-recipient frame toward shared investment recognizing climate-resilient development as a global public good. The New Collective Quantified Goal due in 2025 presents an opportunity to integrate climate finance with trade policy, link debt sustainability with climate performance, and operationalize just transition partnerships without punitive conditionalities (Dibley et al., 2023). South Africa's Just Energy Transition Partnership established a model of developed countries providing comprehensive packages structured around nationally owned plans, a template requiring dramatic scaling (Newell, 2022). The framework's integrity depends on delivering the estimated \$2.4 trillion annually for emerging markets by 2030, demanding institutional creativity comparable to Bretton Woods (Songwe et al., 2022).

The fourth dimension emerges from transnational climate litigation, progressively judicializing Paris norms and creating an external accountability backstop the formal compliance mechanism was never designed to provide. Domestic courts now interpret the temperature goal and highest possible ambition as justiciable standards, fundamentally altering the NDC system's legal significance (Peel & Osofsky, 2018). The German Constitutional Court declared the Climate Protection Act partially unconstitutional for disproportionately burdening future generations, explicitly invoking the Paris temperature goal as an intergenerational justice standard and compelling strengthened targets (Kotzé, 2021). This dynamic has expanded into international tribunals. The International Tribunal for the Law of the Sea delivered a landmark 2024 advisory opinion holding emissions constitute marine pollution under UNCLOS, establishing a binding obligation explicitly linked to the Paris temperature goal and best available science (International Tribunal for the Law of the Sea [ITLOS], 2024). Parallel International Court of Justice proceedings, initiated by Vanuatu, promise to clarify state obligations, potentially establishing Paris objectives articulate due diligence standards engaging state responsibility (Wewerinke-Singh & Salili, 2020). The European Court of Human Rights added further jurisprudence, ruling Switzerland's insufficient measures violated Article 8 rights by evaluating its NDC against the carbon budget implied by the Paris temperature goal (Heri, 2024). This transnational judicial ecosystem constructs a normative web progressively hardening the Agreement's soft law into enforceable obligation through courts reading its provisions against the scientific imperatives from which they derive their moral urgency.

**Conclusion**

The Paris Agreement stands as a monumental diplomatic achievement that has fundamentally reconfigured the architecture of global climate governance, yet the evidence assembled in this analysis compels the sobering conclusion that its very design features, so essential to securing universal participation, now constitute the principal impediment to achieving its own temperature objectives. The shift from Kyoto's top-down regulatory model to a bottom-up facilitative framework succeeded brilliantly in creating a universal normative order, entrenching a long-term temperature goal, catalyzing a global net-zero movement, and institutionalizing mechanisms for transparency, stocktaking, and climate justice that were unimaginable under the previous regime. The operationalization of the Loss and Damage Fund, the successful completion of the first Global Stocktake with its historic call to transition away from fossil fuels, and the mobilization of thousands of subnational and corporate actors through the Marrakech Partnership all testify to the Agreement's genuine and lasting contributions. However, these achievements coexist with a brutal implementation reality in which aggregate NDC pledges steer the planet toward catastrophic warming between 2.5°C and 2.9°C, the accountability architecture lacks any capacity to compel laggard states toward compliance, the climate finance system remains a source of profound mistrust between North and South, and geopolitical fragmentation actively undermines the cooperative logic the regime presumes. The Paris Agreement has thus succeeded in constructing the grammar of global climate action while failing to generate the syntax of implementation, a tension that the critical decade ahead will resolve either through transformative reform or through the tragic validation of the regime's structural inadequacy.

Reinforcing the Paris framework for the decisive decade ahead demands a program of institutional reform that extends across four interconnected domains, none of which can succeed in isolation. First, the translation of international pledges into binding domestic legislation through climate framework laws and sectoral transformation pathways must become the universal norm rather than an exemplary exception, grounding NDC ambition in national legal orders where citizen enforcement and judicial oversight can operate. Second, the catalytic logic of the Global Stocktake must evolve from a diagnostic exercise generating collective exhortation into a prescriptive mechanism capable of producing differentiated implementation guidance, complemented by agile club-based agreements that circumvent the consensus gridlock of the universal forum. Third, climate finance must be transformed from a perpetual source of broken promises into a credible engine of investment at the \$2.4 trillion annual scale the science demands, a shift requiring innovative revenue sources, a paradigm movement beyond the exhausted donor-recipient frame, and the integration of finance with trade and debt sustainability in a new global compact. Fourth, the dramatic rise of transnational climate litigation, which is progressively hardening the Paris Agreement's soft law into enforceable obligation through domestic and international courts, must be understood not as a threat to the negotiated regime but as an essential external accountability backstop that compensates for the facilitative compliance mechanism's structural limitations. The window for these reforms is narrowing with each successive Emissions Gap Report, and the 2025 NDC submission round represents a moment of truth that will reveal whether the Paris framework can generate the ambition it was designed to catalyze or whether more fundamental transformations in the structure of global governance will be required to confront the existential challenge of the climate crisis.

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