BEYOND TARGETS:
DEMYSTIFYING LONG-TERM CLIMATE STRATEGIES

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As the Paris Agreement turns 10, it's worth spotlighting one of its lasting innovations: long-term low-emissions development strategies. What began as voluntary tools from a handful of technically advanced countries now guide nations worldwide through the complex decisions required to deliver the transformative transitions envisioned by the Paris Agreement, while aligning climate action with national development ambitions.

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ABOUT THE 2050 PATHWAYS PLATFORM

The 2050 Pathways Platform is an initiative that was launched in Marrakech at COP22. The objective of the Platform is to support countries seeking to devise long-term, net greenhouse gas, climate-resilient, and sustainable development pathways. For further details on the Platform, please visit our webpage at 2050pathways.org. The 2050 Pathways Platform is hosted by the European Climate Foundation.

ABSTRACT

Long-Term Strategies (LTSs or LT-LEDS) entered the climate policy toolkit with the Paris Agreement as voluntary instruments to articulate long-term low-emissions development. Initially conceived as technical documents centered on modeling decarbonization pathways and underpinning NDCs, LTSs have, over a decade of practice, evolved beyond one-off emission-focused analyses.

Experience shows that while many of its technical levers are stable, the pace of technological change, political-economy dynamics, and the long-lived nature of infrastructure require an iterative, development-focused approach. Contemporary LTSs function as governance frameworks that link long-term vision to near-term choices, provide an umbrella to multiple national mitigation, adaptation and resilience objectives, enable a space to articulate those with distinct national development priorities, and provide a signal to guide investment, managing uncertainty linked to a long-term transition.

This brief identifies core elements of a successful LTS: a credible long-term vision tied to immediate priorities; robust analytical foundations paired with participatory processes that build legitimacy; integration with national planning and sectoral strategies; fit-for-purpose institutions and mandates, including mechanisms for periodic updates that keep strategies decision-relevant.

It also addresses persistent misconceptions that limit impact: (1) an LTS is only “about climate change”; (2) it belongs exclusively to climate experts; (3) it is primarily a modeling exercise; (4) it focuses on distant end-states rather than present decisions; a nd (5) it must be an “all or nothing” undertaking.

Crucially, this brief does not advocate LTSs for their own sake. They are valuable as a process to enable countries to respond effectively to climate change at the scale required while advancing socio-economic objectives. By embracing their evolution and clearing up misconceptions, LTSs can serve as a practical, living strategies that bridge commitments and implementation.

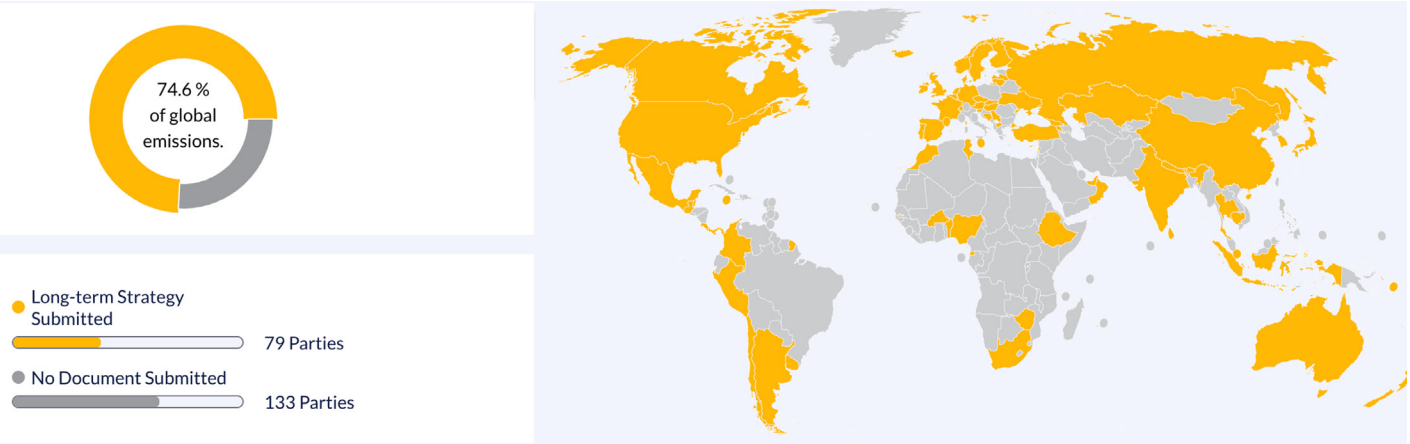
INTRODUCTION

Given its multi-generational nature, it has always been clear that addressing climate change would require a combination of short- and long-term planning to guide implementation. This understanding is reflected in the Paris Agreement, as it invites countries to submit both Nationally Determined Contributions (NDCs) and long-term low-emissions development strategies (LT-LEDS), or, more succinctly, long-term strategies[1] (LTSs).

LTSs became enshrined in international climate policy in 2015, through Article 4 of the Paris Agreement. In Paragraph 19, it specifies that "All Parties should strive to formulate and communicate long-term low greenhouse gas emission development strategies, mindful of Article 2, taking into account their common but differentiated responsibilities and respective capabilities, in the light of different national circumstances." LTS were initially intended to be "a formal document a country uses to communicate its plans for long-term low-emissions development"[2], which would be primarily focused on describing and modeling a country's plausible decarbonization pathways to inform its greenhouse gas (GHG) reduction targets and guide sectoral planning; and to serve as the underpinning for NDC progression[3]. Importantly, while Parties are compelled to submit and update their NDCs, the development of an LTS remains strictly voluntary. Equally significant is that, unlike NDCs and most other UNFCCC reports and documents, LTS don't have a predefined structure of information required, which allows for flexibility to country-driven approaches that better respond to local circumstances, encouraging innovation and exploration of possible pathways, a feature that has proven valuable and is worth preserving..

Despite not being mandatory under the Paris Agreement, as of August 2025 there are 79 official LTSs registered in the UNFCCC Long-term strategies portal[4], 10 of which have been officially updated in some way since they were first presented. Notably, although less than 40% of Parties have presented an LTS, the UNFCCC Secretariat estimates that they "account for 76% total global emissions in 2019, 87% GDP, 68% population"[5]. A separate analysis by Climate Watch estimates 74.6% of global emissions covered in 2025, as illustrated in Figure 1.

FIGURE 1: Global LTS coverage as of October 2025 (including individual EU Members)



Source: Climate Watch.

Another notable indicator of the importance of LTS is that, even in the currently complex geopolitical and socioeconomic environment, more countries continue to develop their LTSs. For example, based on support requests made under the 2024 NDCP Global call, no less than 48 additional LTS are currently being developed[7]. The following sections offer a refreshed view on how LTSs are evolving, moving past conventional views to reveal their expanding scope, depth, and relevance in shaping national transitions.

THE EVOLUTION OF THE LTS

The Glasgow Climate Pact[8] - adopted at COP 26 - "urges Parties [...] to communicate LT-LEDS [...] towards just transitions to net zero emissions by or around mid-century, to update the strategies[...] regularly, as appropriate, in line with the best available science" and "notes the importance of aligning NDCs with LT-LEDS." This seemingly mundane snippet marks a key milestone in the evolution of LTSs in climate policy: from one-off, emissions-centric analysis into an iterative process that, unlike any other, is directly linked to 1.5°C with a net zero goal and with much greater emphasis on development in the era of climate change.

The main purpose of LTSs has remained largely the same: serving as practical roadmaps for Parties' decarbonization. This role has been enhanced to explicitly articulate a net-zero objective by mid-century, centered around a just transition. At the same time, the scope of LTSs has expanded to include adaptation, development, and socio-economic dimensions, areas that were previously underrepresented and still need strengthening in many existing strategies.

What has evolved most is our understanding of how LTSs contribute to this vision. Under the initial "static" conception, where LTSs were not expected to be updated. There was an implicit assumption that once the "long-term" objectives (i.e., mid-twentyfirst century) were analytically defined[9], and a country figured out its own strategy, it wouldn't change much, only the tactics would. Those tactics, and the political-economy challenges of setting and delivering on short-term milestones, would then be iteratively addressed via "progressive" NDCs.

Experience to date has borne out parts of this assumption, and disproved others. On one hand, it has demonstrated that many of the methodological elements that produce successful LTSs, and the main technical levers for decarbonization, like renewable energy, the electrification of transport and stopping deforestation, have turned out to be stable[10]. On the other, it has proven that the complexity and scale of the system that needs to be transformed (the global economy), the speed of technological innovation and adoption, the growing urgency to step up efforts to avoid overshooting the 1.5°C - or even 2°C - threshold, and the critical role of socio-economic impacts and political economy dynamics[11] make it necessary for LTSs to become iterative exercises, and to increase their focus on development, not just decarbonization.

In addition, to remain relevant, LTSs must provide concrete guidance that informs short-term decisions under immediate political cycles, complementing the commitments made in NDCs by strengthening countries' climate plans' credibility, coherence and alignment with the Paris Agreement's 1.5°C target[12]. This requires expanding the way ambition is conceived and measured to include not only quantitative targets, but also the robustness of the structural plans, institutional foundation, and systems behind them[13].

Ultimately, while much of the "what" has to be done in an LTS remains stable over the years, the "how" it should be done changes and brings along important socio-economic implications, demanding that policy and planning remain responsive.

From least-cost decarbonization to development in the era of climate change

One of the most salient features of the evolution of LTSs is the shift from assuming decarbonization would be a net cost for most countries, towards the recognition that, when done correctly, decarbonization can be a vehicle for socio-economic development and improving quality of life. The previously cited LT-LEDS Synthesis Report, for example, found that 85% of LT-LEDS highlighted synergies with economic growth, 76% with job creation, 59% with social welfare and human well-being with reduced inequalities. Moreover, 81% contained information on just transition and related elements, with 26% incorporating a dedicated chapter to it. Peer-reviewed and technical analysis provides further evidence for this shift, with numerous analyses finding net economic benefits from country-[14, 15, 16] and region-level[17, 18, 19] decarbonization pathways. As the benefits of decarbonization become clearer, and the costs of inaction[20] (including climate impacts[21], stranded assets,[22, 23,] and lost competitiveness[24]) become more apparent, they are beginning to be incorporated into investment

decisions. Investors, particularly international financial institutions[25] and multilateral development banks[26, 27] but increasingly also the carbon markets[28], ratings agencies[29, 30, 31] and private investors[32, 33, 34] are recognizing strong decarbonization, resilience, and just transition policies as important elements in a country's risk and investment profile. Another line of argument is that changing development pathways is the most effective way to change emissions pathways, ie, 'good' development as a driver of a low emissions profile, not just an impact of it[35, 36, 37].

In addition to the expected focus on mitigation, adaptation and resilience considerations have also turned out to be a key dimension of LTS, with "82% LT-LEDS provided an overview of national adaptation and resilience policies and strategies of developed countries, together with NAPs of developing countries" and "78% LT-LEDS provided information on synergies between adaptation and mitigation actions, while 62% emphasized that adaptation and resilience efforts must be jointly undertaken with mitigation efforts" according to the aforementioned LT-LEDS Synthesis Report by the UNFCCC Secretariat. This shift toward incorporating mitigation and adaptation is necessary for, and a sign of progress toward establishing climate action as inextricable from social and economic development planning in the age of climate change.

Another key element of the evolution of LTS is the growing recognition that political economy considerations are essential for building a truly robust strategy. A technically ideal intervention is of little value if it cannot be implemented or sustained. Carbon pricing, for examplehas long been promoted as the most efficient policy for decarbonization[38]. Yet adoption has been slow, and in the few countries where it has materialized, carbon prices are often set too low to drive meaningful change—largely due to political economy constraints[39, 40, 41, 42]. Critically, it is not just the opinions of CEOs, politicians, or community leaders, so-called "decision makers" that matter. Civil society at large has repeatedly played a major role in shaping climate policy, both for[43, 44] and against[45, 46] it. All of this has shifted focus away from a narrow technical definition of least-cost decarbonization pathways towards a more expansive development-focused analysis. This perspective integrates both socio-economic* and technical** elements, and recognizes rapid, resilient decarbonization as a requirement rather than as the ultimate objective of an LTS[47]. Accordingly, LTSs increasingly emphasize aspects such as job creation and institutional capacity alongside measures like reforestation and the electrification of transport.

From one-off analysis to iterative process

As their framing and scope have changed, so has the nature of LTSs, from a static one-off analysis to a long-term, iterative process. The World Resource Institute's (WRI) Brief Guide to Reviewing Countries' *Long Term Strategies*[48] sums it up aptly: "The process is as important as the output itself [...] Effective process design must be deliberate..."

Experience has demonstrated the critical importance of a broad and iterative participatory process that goes beyond policymakers and experts to meaningfully engage wider voices, including those traditionally marginalized from policymaking, such as Indigenous Peoples, workers or trade unions, youth, and local communities. A 2020 Organization for Economic Cooperation and Development (OECD) working paper titled *Long-term low emissions development strategies: Cross-country experience*[49] found that addressing the concerns of wider stakeholder groups in the LTS process

* These include, for example: job creation and labor transition planning, equity and social inclusion, public health impacts, energy access and affordability, fiscal and economic resilience, distributional impacts, urban planning and mobility, food security and rural livelihoods, education and skills development, social protection mechanisms, institutional and governance capacity.

**These include, for example: renewable energy deployment (solar, wind, hydro, etc.), grid modernization and energy storage, electric vehicles and charging infrastructure, public transport electrification, carbon capture and storage (ccs), green hydrogen production and use, building energy efficiency and electrification, industrial decarbonization technologies, smart and digital infrastructure, sustainable agricuture and land-use technologies.

"embeds climate change mitigation within broader societal dialogue and agreements. This helps to anticipate and resolve trade-offs while enhancing the political support..."[50]

While critical, stakeholder engagement and participatory processes also have limitations and carry their own risks. More consultation is not always synonymous with better outcomes, and effective policymaking requires balancing inclusiveness with decisiveness. The objective, then, is not to ensure unanimity, but to guarantee that those most directly affected are appropriately informed, their perspectives considered, and their voices meaningfully reflected in an LTS co-development process. When done well, engagement not only enhances legitimacy and trust but also improves policy relevance, helps anticipate distributional impacts, strengthens accountability, and helps build lasting coalitions that can sustain action across political cycles.

Although at first glance moving from a one-off analysis to an iterative process may seem like it makes the whole endeavour more complicated, it is actually critical to making a robust LTS manageable. By taking a process approach, countries don't have to do it all at once, breaking down complex requirements into discrete work packages that can be taken on step by step. This approach also creates space for conversations and stakeholder engagement, to build trust, and to gradually develop the local capacities and governance arrangements required for the long-term viability of any plan.

From International Commitments to Transition-Fit Governance

Initially conceived as frameworks to meet international commitments under the Paris Agreement, LTSs are increasingly being used as core governance instruments. Existing structures are often not suited to implement transformative, long-term efforts, which may require tailored governance and institutions.[51] A 2025 OECD policy paper[52] found that NDCs "are often underpinned by sectoral sub-targets and, in some cases, mission-oriented innovation policies. However, their implementation too often remains caught in traditional, siloed approaches that do not give enough flexibility to redesign the governance to mission needs." As it scales, it will need increasingly robust governance arrangements, i.e., an institutional home that hosts and manages the processes and performs the tasks to prepare, develop, and guide each iteration of the process, and a legal mandate. Crucially, governance must not only manage the technical aspects of the LTS process, such as scope, data collection, analysis, and policy debate, but also ensure it leads to concrete, actionable outcomes. Thankfully, those can be developed iteratively too.

It is also important to note that, in many cases, the process of formulating the LTS itself can gradually expand both the governance structures and the political relevance of the process, as well as the capacity and resources to implement it. What often begins as a focused effort on climate governance can evolve into a broader engagement with planning and economic actors, building political buy-in across sectors. These processes are rarely linear, and they often evolve organically, growing in complexity and scope as the LTS develops relevance against broader socio-economic objectives. Careful design and coordination make it possible to leverage international commitments and the resources available to support them to strengthen national capacities and processes, so that they support national development in the age of climate change, rather than just fulfilling international requirements for their own sake, which then attracts further resources[53].

As discussed above, LTSs have evolved from the passive framework for decarbonization into one of the main cogs -an active part- of the conceptualizing and delivering on development in the era of climate change. LTSs have become the space to undertake technically robust, co-developed transition planning, integrating socio-economic objectives, while establishing governance structures fit for purpose to guide implementation of transformative action.

COMMON MISCONCEPTIONS ABOUT LTS

These misconceptions are provided in an attempt to synthesize key features of the evolution of the LTS to this point. Thus, most of them fall in the category of outdated concepts rather than outright conceptual errors. Reflecting on these evolving perceptions can help unlock the full value of LTSs in delivering national development priorities and accelerate the global transition to meet the commitments under the Paris Agreement.

Misconception #1
An LTS is only "about climate change"

LTS are developed in response to climate change, and therefore apply a climate change lens. However, they are fundamentally about national development, what it means and how to achieve it within the constraints, and addressing the challenges and opportunities of climate change. As noted by the OECD's Long-term low emissions development strategies: Cross-country experience: "On the one hand, the well-being approach systematically takes into account climate considerations when developing strategies and policies across the economy, thus ensuring that non-climate actions do not compromise climate change mitigation goals. On the other hand, analysing climate policies through the lens of wider well-being makes synergies and trade-offs between climate and other well-being goals more visible, thus facilitating their management and the achievement of a two-way alignment (i.e. between climate and broader well-being goals). The creation of LT-LEDS provides a unique opportunity to pursue the well-being approach." Similarly, the World Bank's Country Climate and Development Reports (CCDRs) have taken the approach to guide countries in prioritizing actions that reduce emissions, strengthen resilience, and advance development simultaneously. When it comes to long-term planning, countries consistently emphasize that LT-LEDS create a space to bridge climate ambition with development priorities, where the "D" from LT-LEDS is the focus.

Misconception #2
An LTS is for or by "climate experts"

Although LTSs have an intrinsic climate framing, they are made up of "non-climate parts" like transport policy, zoning regulations, or agricultural practices. These "non-climate parts" ultimately drive GHG emissions and should therefore be the focus of decarbonization pathways[54]. The substance of an LTS is agreeing on a shared vision of the future that fits within the limits of what our planet can support. Figuring out what that vision looks like, and how to get there will require the perspectives and expertise from every walk of life. Ensuring that this transformation does not reproduce current patterns of inequality and marginalization will require deliberate efforts to ensure meaningful participation by currently marginalized groups and communities that will be affected, positively or negatively.

Misconception #3
An LTS is about modeling emissions pathways

Experience has clearly demonstrated that development outcomes can not be achieved by technical interventions alone. Modelling is undoubtedly a key component of LTS, providing much-needed quantitative inputs for decision-making. However, it is only one of the tools, which represents only one of the lenses that have to be considered. Other elements, including the policy questions to be explored around the transition process, transformational narratives which provide the basis for exploration and modeling, a robust process that delivers meaningful engagement with a broad array of stakeholders, and participatory monitoring and evaluation to inform continuous improvement, are at least as important as modeling for a successful LTS. Solid political and sectoral buy-in as well as local capacity

and governance arrangements that can evolve and scale are also critical non-modelling components of a robust LTS. In practice, overemphasizing modeling to the detriment of other elements can be as problematic as not having any modeling to work with.

Misconception #4
An LTS is about a goal in the distant future

Although an LTS looks at the distant future, it does it to inform decisions in the present. One of the main uses of an LTS is to understand the consequences of short-term policies and investments for achieving long-term goals. This is often achieved by iteratively combining forward-looking analysis, which looks at the long-term impact of short-term interventions with backcasting, which starts with the desired end-state and works backwards from there to identify important actions to take or avoid. While 2050 may seem distant, the lifetime of much of the infrastructure and equipment that generate emissions—power plants, buildings, industrial boilers, and heavy-duty vehicles—is often also quite long. Many of the decisions that will be made in the next few years will still be having an impact mid-century. LTSs make the long-term consequences of these decisions explicit, helping us make better decisions today and facilitating prioritization to avoid lock-ins and expand transformative actions.

Misconception #5
An LTS is “all or nothing”

As the scope and intended uses of an LTS evolve and expand, it is important to avoid letting the perfect become the enemy of the good. As noted above, all of the elements of a robust LTS, from modeling to engagement, and from mandate to governance can be built up over time. As long as countries take precautions to avoid lock-in, and they leverage an iterative process to scale into transformation, they can start small and grow as they learn. What is needed is not the “best model”, or the “best process” in the abstract, but a continually evolving “best fit” given local priorities and resources.

CONCLUSION

LTSs have evolved from a one-off analysis centered on GHG emissions that was meant to statically frame each country's short-term climate plans, the NDCs, into central gears of national and international climate action efforts. However, this evolution is not seen consistently throughout the submitted LTSs. Instead, many of these fall short of the best practice described above, which is also continuously evolving to better respond to countries' development planning needs in the context of climate change.

The key learning from the past 10 years of LTS's journey is clear: it is essential to go beyond a narrow technical definition of least-cost decarbonization pathways towards a more expansive development-focused process which recognizes rapid, resilient decarbonization as a requirement for prosperity rather than as the ultimate objective. Embracing this evolution, the enhanced processes and analysis to support them, and clearing up misconceptions around it will make LTSs more useful and relevant to a broader array of stakeholders and use cases. This will ultimately make them more politically sustainable and easier to implement, and therefore more effective and relevant as a tool to deliver action.

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