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From headline trillions to actual millions: climate financing needs estimates in the age of implementation

A guide to navigating existing estimates for emerging markets and developing economies

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We would like to extend our special thanks to **Bertrand Badré**, who not ony greatly enriched this work with his valuable insights, but also contributed to this title "From headline trillions to actual millions" upon reflecting on his contribution in the landmark 2015 joint MDB report, *From Billions to Trillions: Transforming Development Finance* and on the fact that what we need most today is no longer a rallying call for increased mobilisation, but effective means to encourage it.

EXECUTIVE SUMMARY

The longstanding commitment by developed countries to mobilise US$100 billion per year for climate action in developing countries was met in 2022 but no longer matches the scale of climate action needed. Its update through the adoption of the New Collective Quantified Goal (NCQG) on climate finance at COP29 in November 2024 marked a significant political milestone yet left most of the key operational issues unresolved.

As the focus shifts from raising the bar to delivering on these ambitious new goals, this report critically reviews the methodologies and narratives behind existing climate finance needs estimates to understand their relevance in this new context. We examine what these figures represent, how they are constructed, how they might be used to guide practical efforts in the years ahead, and where the most urgent improvements are needed.

Central to this analysis is the Independent High-Level Expert Group on Climate Finance (IHLEG)'s Third Report, titled ***Raising ambition and accelerating delivery of climate finance*** (Bhattacharya *et al.*, 2024).

The IHLEG, jointly launched by the COP26 and COP27 Presidencies, provides landmark estimates on the financing needs of the transition and how to meet them. Their third report, published in November 2024, estimates that financing needs for climate action in EMDEs, excluding China, amount to US$2.4 trillion annually by 2030, rising to US$3.3 trillion by 2035. They also provide an indicative breakdown of how this financial burden could be shared across sources. The report takes an unusually broad view, including not only clean energy transition and adaptation costs, but also loss and damage (L&D), natural capital, and just transition expenses. Its estimates come from a variety of sources, each with different assumptions, timelines, and sectoral definitions.

The IHLEG report exemplifies both the ambition and the limitations of current approaches. Its breadth is significant: it spans five pillars of climate action and provides a detailed disaggregation of finance sources and uses. Yet, the supporting data remains fragmented and inconsistent – particularly outside the clean energy sector – and shared understanding is still incomplete even for key concepts, such as what qualifies as a "financing needs estimate."

By unpacking the IHLEG figure then positioning it within the landscape of existing estimates, this report highlights that the numbers commonly cited in international fora conceal profound differences in scope, ambition, and methodology. Without a clear understanding of the assumptions behind them, they risk misleading rather than informing. Estimates vary by an order of magnitude depending on choices such as whether China is included in EMDE groupings, whether costs of capital are incorporated, or whether the scope is limited to mitigation or extends to adaptation, loss and damage, or other transverse sectors. Each estimate reflects particular assumptions: about the pace and ambition of climate action, about the cost of capital in developing contexts, and about the roles of public versus private finance. These assumptions are rarely made explicit, yet they decisively shape both the headline figures and the narratives built around them.

We thus highlight critical areas for improvement and outline elements for the way forward.

- First, aggregated estimates must be made more internally coherent, or at the very least, more interpretable, by building on existing consistent frameworks.
- Second, the longstanding ambiguity around the additionality of climate finance must be addressed so that discussions in different political fora rely on common premises– particularly in distinguishing between development-aligned and climate-specific investments, and incremental versus total costs. As things stand, estimates differ by orders of magnitude depending on whether they reflect total or incremental costs – and the two are sometimes blended within the same report without clearly defined boundaries.
- Third, and perhaps most crucially, the outlook must shift from abstract investment estimates to actionable financing strategies. This means incorporating cost of capital considerations and specifying financing sources and instruments with their inherent constraints for both public and private actors.

However, decision-makers cannot afford to wait for perfect understanding to start acting. The existing aggregate estimates, however imperfect, were critical to driving agreement on the scale of required climate action but improving them will take time. While the research community must strive to address these quality issues, both researchers and decision-makers must also make the most of what is available now to steer climate action. To do so, it is important to:

- Recognize that incoherent mitigation and adaptation scenarios, combined with poor-quality data, will continue to impede the production of robust estimates of climate financing needs – and acknowledge those figures only as broad indications of where to go. Their real value lies in framing collective understanding and aligning expectations.
- Focus on what else these estimates can tell us – which actors are called to contribute, which instruments

should be preferred, what assumptions on cooperation, leverage, investment-trigger are made – and how to make them real

- Identify where mobilisation scenarios diverge most strongly, and how to reconcile them in an ambitious but realistic proposition: in this aspect, the diverging opinions of IHLEG authors and NCQG signatories about the mobilization of private finance should raise questions and clarification attempts

- Work with ranges of uncertainty, whose low and high values are quite often more clear-cut and more easily explained than deceptively neat central values. In this respect, the unique adaptation needs figure used by the IHLEG report is less informative than the two values put forward by the underlying Adaptation Gap Report.

As climate finance debates evolve from pledges to implementation, success will depend less on the precision of funding estimates and more on our ability to convert high-level ambition into credible, inclusive, and actionable financing strategies. From headline trillions to actual millions, the challenge ahead is not just about determining how much is missing – the focus should be on closing this gap in practice.

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ACRONYMS

AGR	Adaptation Gap Report
AR6 WGII	Working Group II (Adaptation) of the Sixth Assessment Report
BAU	Business As Usual
COFOG	Classification of the Functions of Government
COP	Conference of Parties to the United Nations Framework Convention on Climate Change
DFI	Development Finance Institution
EMDEs	Emerging Markets and Developing Economies
GHG	Greenhouse Gas Emissions
IAM	Integrated Assessment Model
IEA	International Energy Agency
IHLEG	Independent High Level Expert Group on Climate
IPCC	Intergovernmental Panel of Experts on Climate Change
L&D	Loss and Damage
LMIC	Lower Middle-Income Countries
LTS	Long Terms Strategy
MDB	Multilateral Development Bank
NAP	National Adaptation Plan
NCQG	New Collective Quantified Goal on Climate
NDC	Nationally Determined Contributions
NZE	Net Zero Emissions (scenario)
OECD	Organisation for Economic Cooperation and Development
RCP	Representative Concentration Pathway
SCF	Standing Committee on Finance
SDG	Sustainable Development Goals
UMIC	Upper Middle-Income Countries
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change

INTRODUCTION

These are pivotal years for mobilising finance in support of climate action. The 2009 Copenhagen commitment by developed countries to mobilise US$100 billion per year for climate action in developing countries was met in 2022 but no longer matches the scale of climate action needed. Its update through the adoption of the New Collective Quantified Goal (NCQG) on climate finance at COP29 in November 2024 marked a significant political milestone, yet left most of the key operational issues unresolved.

The Baku to Belém 1.3T Roadmap bears responsibility for translating commitments into a credible framework for implementation, by COP30. This is no small task: COP29 delegates agreed to raise the previous target to US$300 billion by 2035 (with minor changes in scope), but also to «work together to scale up financing for climate action in developing countries from all public and private sources to US$1.3 trillion». This represents a quadrupling of the core, public-finance driven target, yet public finance efforts have so far failed to mobilise large-scale private action: the OECD's most recent progress report on the US$100 billion target shows that private finance mobilised in 2022 will still account for less than 20% of total finance mobilised (OECD, 2024a).

Are the climate finance needs estimates that delivered the 1.3T target still fit for supporting its implementation? Over the past few years, a number of estimates of climate finance needs for EMDEs put forward widely different values (see, for example, Tan & Pettinotti, 2024; Falduto *et al.*, 2024). This paper unpacks these estimates to highlight their methodological differences and show that they do not merely influence the size of the financial ask – they reflect, and shape, the broader narrative about who should pay, how, when, and for what purpose. This in turn, provides food for thought into how these estimates can support not only stronger political ambition – from billions to trillions – but also the coordination and mobilisation to achieve these daunting new goals – from trillions back to millions.

Central to this analysis is the Independent High-Level Expert Group on Climate Finance (IHLEG)'s Third Report, titled ***Raising ambition and accelerating delivery of climate finance*** (Bhattacharya *et al.*, 2024).

The IHLEG was jointly launched by the COP26 and COP27 Presidencies, gathering highly-reputed experts tasked with 'developing and putting forward policy options and recommendations to encourage and enable the public and private investment and finance necessary for delivery of the commitments, ambition, initiatives and targets of the UNFCCC Paris Agreement, reinforced by the Glasgow Climate Pact, the Sharm el-Sheikh agenda, and the COP28 Global Climate Finance Framework'.

In line with this mandate, the third IHLEG report provides a high-level benchmark for financing needs – US$2.4 trillion annually by 2030, rising to US$3.3 trillion by 2035 for emerging markets and developing economies (EMDEs) excluding China – but also an indicative breakdown of how this financial burden could be shared across sources. It takes an unusually broad view, including not only clean energy transition and adaptation costs, but also loss and damage (L&D), natural capital, and just transition expenses. Its estimates come from a variety of sources, each with different assumptions, timelines, and sectoral definitions.

This ambitious effort to comprehensively assess climate finance needs exposes the limitations of the current knowledge landscape: persistent data gaps, methodological inconsistencies, and a lack of consensus on what constitutes a "finance needs estimate."

This paper first unpacks the IHLEG estimate, then positions it within the landscape of existing estimates, highlighting how implicit methodological choices may explain gaping differences between final estimates. It then summarises three critical areas for improvement (improving internal consistency, dealing with the additionality of climate finance, moving from investment estimates to financing scenarios) and outlines recommendations for each of them. It concludes by arguing that even imperfect estimates can be of great use to support the acceleration of finance mobilisation that we need now.

1. UNPACKING THE IHLEG REPORT - A KEY REFERENCE IN INTERNATIONAL TALKS

KEY MESSAGES

The IHLEG's third report, published in 2024, provides **global estimates of investment and financing needs, with details for EMDEs excluding China**. IHLEG reports are a landmark of international climate finance discussions and expected to be central to the Baku to Belém roadmap talks in the run-up to COP30.

The IHLEG estimates that **US$6.5 trillion in total investment is needed on average per year by 2030 across all economies. US$2.4 trillion is needed in EMDEs alone, excluding China**. These figures rise to US$7.5 trillion and US$3.3 trillion per year respectively for the 2030-2035 period, four times the current investment level for EMDEs.

The report covers **five key areas for climate action**: clean energy transition, adaptation and resilience, loss and damage, natural capital, and just transition.

For each area, the IHLEG relies on one or two main external assessments, including the IEA's Net-Zero scenario, UNEP's Adaptation Gap Report, Heinrich Böll Stiftung's Loss and Damage Finance Landscape, and SYSTEMIQ's Financing Nature. These sources may rely on definitions and assumptions that are not necessarily consistent and many of these inconsistencies could not be reconciled in the final report.

The Independent High-Level Expert Group on Climate Finance (IHLEG) was tasked by the COP Presidencies and UN Climate Change Champions to *"help develop and put forward policy options and recommendations to encourage and enable the public and private investment and finance necessary for delivery of the commitments, ambition, initiatives and targets of the UNFCCC Paris Agreement"* (Songwe *et al.*, 2022).

In November 2024, the IHLEG published its third report (Bhattacharya *et al.*, 2024), which updates its previous estimates of the investment needs "for delivery on the Paris Agreement". Its estimates stand as a landmark of international climate finance discussions and are fundamental in the Baku to Belém roadmap talks in the run-up to COP30.

BOX 1. INTERNATIONAL NEGOTIATION FIGURES AND IHLEG ESTIMATES

The COP29 delegates **agreed on three target figures for climate finance by 2035**:

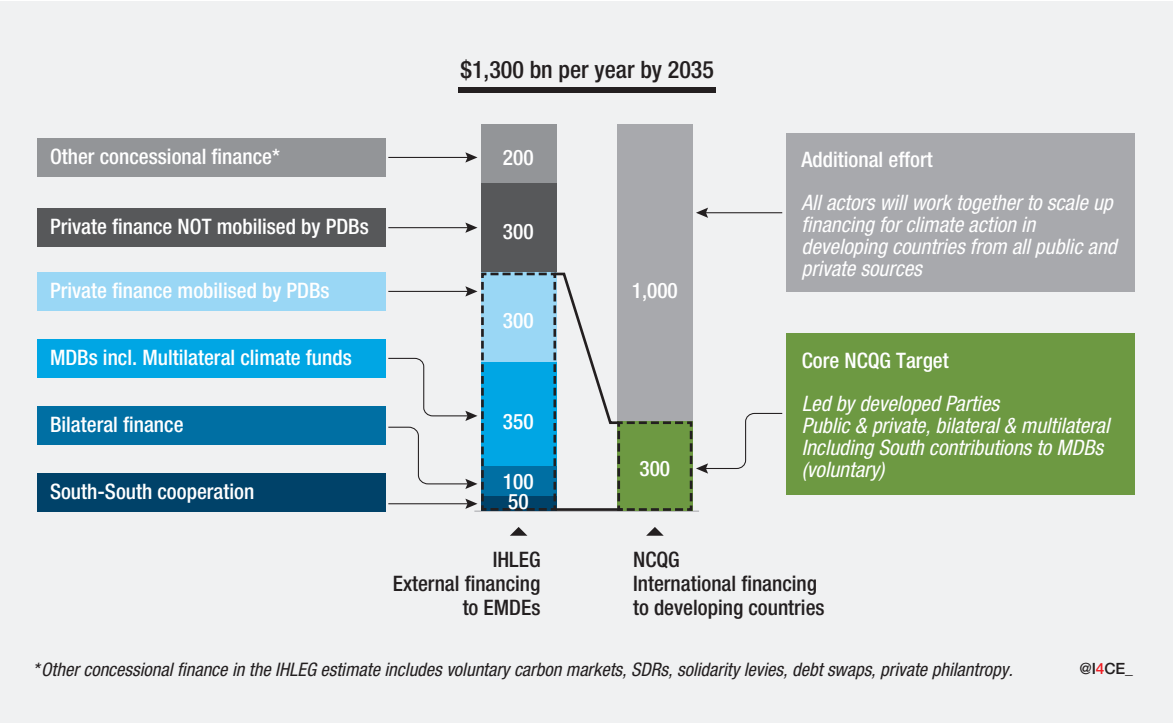
- UNFCCC climate funds will triple (US$5.2 billion);
- Developed countries will take the lead in mobilising financing for developing countries 'from a wide variety of sources, public and private, bilateral and multilateral' (US$300 billion).
- All actors will work together to scale up financing for climate action in developing countries from all public and private sources (US$1.3 trillion).

IHLEG authors provided detailed financing estimates for external financing needs in EMDEs (excluding China) in 2030, with an aggregated figure for 2035 (US$3.4 trillion, including both domestic and external finance).

While the overall figures are similar (~US$1.3 trillion in the IHLEG report for external finance only), their underlying disaggregation is quite different. The IHLEG scenario relies heavily on international public finance (including private finance catalysed by public development finance institutions), with a minor role played by international private finance and/or innovative sources, as discussed under the Baku-to-Belem roadmap. In contrast, the NCQG agreement (which provides much less detail) places the bulk of the burden on yet to be defined mechanisms for scaling up finance for developing countries, other than through existing public development banks (PDBs) or multilateral development banks (MDBs). The IHLEG's expected direct MDB contribution alone exceeds the core target of the NCQG – while the latter's scope includes MDBs, bilateral, South-South cooperation and mobilised private finance.

Figure 1 illustrates the respective disaggregations.

FIGURE 1. COMPARISON OF IHLEG NEEDS ESTIMATES AND NCQG PROPOSAL TO 2035 (US$BN)



Note: This figure is indicative only, as several assumptions were required in order to make a comparison between the IHLEG and NCQG figures.

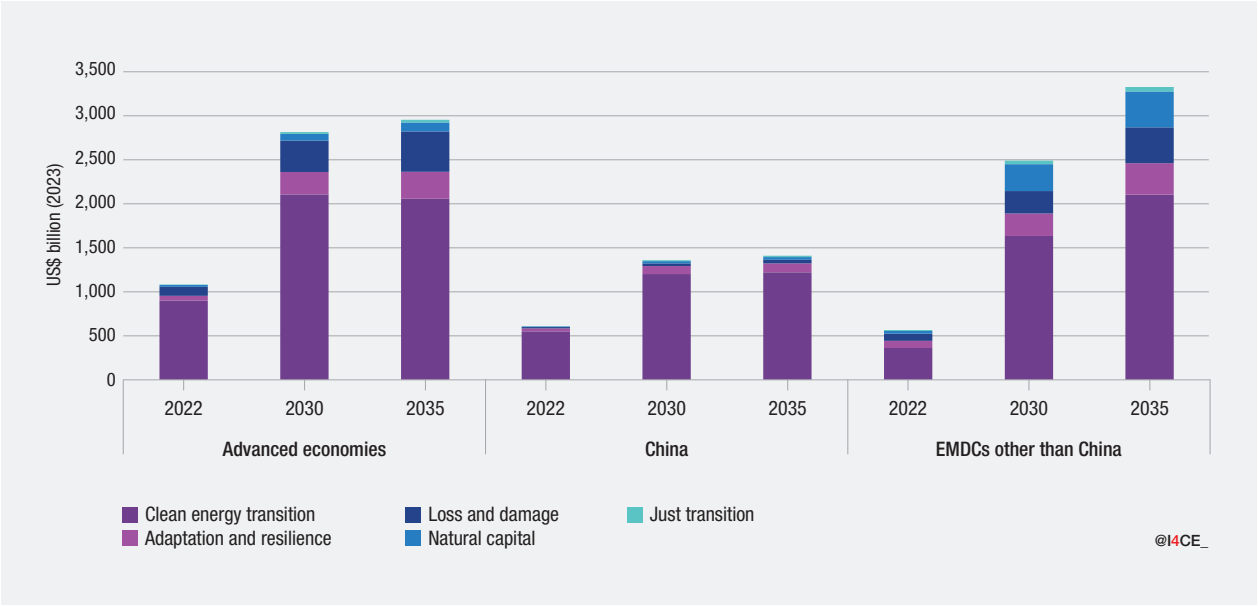
- **China is excluded from the IHLEG estimate presented here** as a recipient country, but is included in the NCQG target. This does not significantly distort the figures, as while China represents ~30% of all EMDEs' investment needs in 2035 according to the IHLEG estimates, less than 1% of China's climate finance comes from external sources and should thus be reflected here (see, for example, CPI, 2024b, Fig. 3.5 for 2022 data).
- **IHLEG authors only provide an aggregated estimate** for investment needs in EMDEs in 2035. The disaggregation provided here relies on extrapolations that conservatively maintain the 2030 ratios of each funding source in the 2035 figure.
- **The IHLEG does not specify the share of private finance mobilised by DFIs**, only providing a general figure and stating that 'a significant portion of private finance will be catalysed by DFIs'. We adopted a middle-ground assumption, considering a leverage effect of less than 1:1 for DFI-catalysed finance, which is quite low.
- **The South-South cooperation counted towards the NCQG core target will be so on a voluntary basis** according to the final deliberation. It may thus not cover the whole extent of South-South cooperation as described by the IHLEG figure, although it is too early to tell which percentage will be reported in the end.

The report provides global estimates of investment and financing needs across five key areas for climate action: clean energy transition, adaptation and resilience, loss and damage, natural capital, and just transition. For EMDEs, excluding China, it reflects on the disaggregation of these investment needs across several funding sources, both public and private, national and international (see **Figure 3**).

According to the authors, US$6.5 trillion in total investment is needed on average per year by 2030 across all economies (advanced economies, China, and EMDEs other than China). US$2.4 trillion per year is needed in EMDEs alone, excluding China (see **Figure 2**). These figures rise to US$7.5 trillion and US$3.3 trillion per year respectively for the 2030-2035 period. In EMDEs, investments thus need to increase more than fourfold compared to the 2022 level.

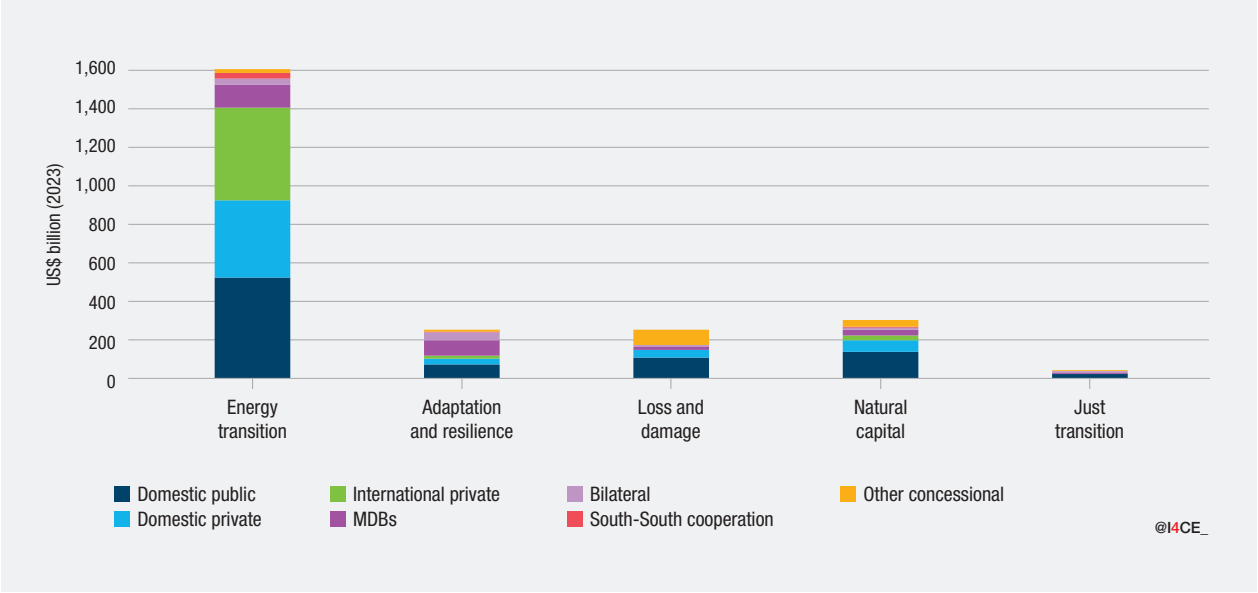
The following sections provide sectoral detail on these figures.

FIGURE 2. TOTAL CLIMATE INVESTMENT NEEDS BY ECONOMIC REGIONS FOR 2030 AND 2035



Source: Bhattacharya et al., *(2024).*

FIGURE 3. FINANCING CLIMATE ACTION IN EMDEs OTHER THAN CHINA BY 2030 – MATCHING SOURCES TO NEEDS



Source: Bhattacharya et al., *(2024).*

1.1. Clean energy transition

IHLEG estimates are mostly based on the work of the International Energy Agency (IEA), in particular the World Energy Outlook 2024 (IEA, 2024b) and the Roadmap to Increase Investment in Clean Energy in Developing Countries (IEA, 2024a) – which both use the IEA's Net Zero Emissions by 2050 (NZE) scenario – with inputs from the World Bank and the Just Transition Finance Lab.

The NZE scenario aligns with the goal of limiting global average temperature rise to 1.5°C and supports energy-related Sustainable Development Goals (SDGs), such as universal access to energy and improvements in air quality. The boundary between climate and development investment needs is often blurred in the report and its underlying sources, making it challenging to isolate the strictly climate-related portion. IHLEG's clean energy transition needs also encompass investments for early coal phase-out and costs associated with a just energy transition.

IEA estimates cover energy supply, electricity grids (transmission and distribution), and end-use sectors, excluding *e.g.* aviation or maritime transportation. They factor in carbon capture utilisation and storage (CCUS) technologies and energy efficiency improvements in buildings, transport and industry. They are provided for all economies, per region. It is worth noting that the IEA's needs assessment in *e.g.* energy supply and low-emissions fuels relate to total investment costs, while in most end-use sectors only the additional costs related to climate action are considered. For example, the investment cost of electric vehicles only includes the battery cost. The IEA figures used here reflect investment costs, excluding cost of capital considerations.

1.2. Adaptation and resilience

The IHLEG report is mostly based on the 2023 and 2024 Adaptation Gap Reports (UNEP, 2023:2024 – abbreviated AGR). AGR provides two estimates issued from different framings and methods: the low value (US$215 billion/year in 2022 prices) is derived from global sectoral[1] models with national detail while the higher (US$387 billion/year in 2022 prices) is from an extrapolation of investment adaptation finance needs cited in National Adaptation Plans (NAPs) and Nationally Determined Contributions (NDCs). The IHLEG figure (US$330 billion/year for EMDEs, including US$80 billion/year for China) strikes a middle ground between these two estimates (it is not clear how the final figure is calculated). Additional data was provided from the AGR team to the IHLEG, to allow it to remove China from the numbers. It is unclear how IHLEG's 2030-2035 estimates were derived from AGR 2020-2030 averages.

Modelled cost estimates in the AGR show that the choice of objective (*e.g.*, how far impacts are reduced, *i.e.*, to optimal levels or down to existing risk levels), as well as the climate projections used (*e.g.*, hotter or cooler, or wetter or drier model outputs) lead to a wide range of needs estimates, with a factor of 20 reported for the coastal zones between the lowest and highest estimates, for example. In turn, these influence the level of residual damage (see below 'climate scenario'). The AGR 2023/24 identifies a strong increase in the estimated adaptation costs, as compared to the previous 2016 estimate[2]. The increase is attributed to the consensus that climate impacts will be higher than previously anticipated (in line with the IPCC AR6 WG2 findings), as well as a slightly expanded coverage of risks.

The upper range of the AGR costs, which are derived from NAP and NDC financing needs estimates, represent country-determined needs. Only 85 developing countries provided some elements of cost estimates for adaptation needs, so these figures were extrapolated based on per capita adaptation finance needs by income group. However, as NAP and NDC figures are developed using different methods and assumptions, this in turn leads to a high range of uncertainty surrounding the extrapolated global values.

The scope of the sectoral analysis in AGR is also sometimes heterogeneous. Modelled costs for the agriculture and the flood protection sectors are reported for the period from 2010 to 2050 rather than 2030, for instance. The models for each sector use different approaches and vary in detail. Four more sectors[3] are cited in the AGR, but no cost estimates are provided due to insufficient research elements, though some of these will be captured in the 2025 update.

1 Coastal zones, flood protection and water, infrastructure, and agriculture, completed with analysis of modelled impacts (and derived adaptation costs to address these) for fisheries, aquaculture, and marine resources; health; early warning and social protection; terrestrial biodiversity and ecosystem services.

2 Though the Adaptation Gap Report is published every year, underlying research on financing needs was last conducted in 2016 (Adaptation Finance Gap Update report).

3 These are: Built Environment and Labor Productivity; Business and Industry; Capacity-building, Governance, and Implementation; and Social Sectors and Socially Contingent Effects.

1.3. Loss and damage

IHLEG's loss and damage figures rely mostly on the *Loss and Damage Finance Landscape* (Richards *et al.*, 2023), which in turn uses data from Markandya & González-Eguino (2019), covering six geographies comprising mostly EMDEs[4]. This Integrated Assessment Model (IAM)-based research considers loss and damage as a loss of GDP in response to selected mitigation and adaptation pathways. However, the approach used to derive the IHLEG figures is not clear, as they do not match exactly the source data (there is a possibility that the difference comes from the update to current US$).

The adaptation response considered in these loss & damage costs may not be consistent with the one outlined in the adaptation section, as IAMs come up endogenously with their own adaptation response minimizing overall costs (mitigation, adaptation, loss and damage). Nor are they consistent with the mitigation scenarios used for the 'Clean Energy' estimates (detailed below). Finally, loss and damage calculations rely on discount rates assumptions, from 0.1% to 3%, which explain most of the outcome spread.

1.4. Natural capital

The IHLEG estimate of "investments in natural capital that are required to tackle climate change" covers sustainable land management and agriculture, conservation, and ecosystem protection and restoration. The 2022 figure is adapted from CPI's *Global Landscape of Climate Finance 2024* (CPI, 2024b). Future needs estimates are mainly based on the SYSTEMIQ report "Financing nature: a transformative action agenda" (SYSTEMIQ, 2023), completed with elements from the Dasgupta Review (Dasgupta, 2021) and the UNEP *State of Finance for Nature 2023* (UNEP, 2023).

The SYSTEMIQ report estimates additional investments needed annually for nature by 2030, in four categories: 1) biodiversity conservation and restoration, 2) sustainable agriculture, fisheries and forestry, 3) shifting diets and 4) infrastructure and extractives impact reduction. Investment figures exclude existing investment levels across conservation, restoration and food and land use, rather than gross investment.

The IHLEG report does not explain how the natural capital investment needs were calculated from the underlying sources and the specific scope and methodological choices. It is unclear if the needs estimate refers to bare investment costs or if it includes financing costs, if the underlying mitigation and adaptation pathways are consistent with the ones outlined in the clean energy transition and adaptation calculations, and how potential overlaps are dealt with, as IHLEG's adaptation needs estimates also include nature-related actions in the agriculture sector.

1.5. Just transition

The IHLEG estimates for a just transition include "investment needs in people, communities, and in some cases, direct income support", that are required to ensure a just and inclusive transition, fair resource distribution, and to address historical inequities and engage marginalised communities. This includes for instance investments to manage transition-related jobs disruptions or shifting prices. It excludes just transition costs related specifically to the energy transition, which are included in the clean energy transition needs estimate.

The source and method to estimate the financing needs are not specified. Methodological hurdles in estimating just transition financing needs include a lack of universal definition of the just transition, and of what qualifies as investment in the just transition. Taking into account non-economic impacts of the transition is also often challenging. In addition, there are limited country-specific assessments on financing needs for a just transition, and few data available. In addition, just transition financing needs are highly dependent on the mitigation pathway, the pace and level of global warming, and the transition impacts on people and communities.

Table 1 summarises the choices detailed in the section above, for each pillar of the IHLEG estimate.

4 Middle East and North Africa, Sub-Saharan Africa, East Asia, South Asia, China, Latin and Central America and the Caribbean.

TABLE 1. SYNTHESIS OF IHLEG ASSUMPTIONS AND METHODOLOGICAL CHOICES BY SECTOR

	Energy transition	Adaptation and resilience	Loss and damage	Natural capital	Just transition
Main data source	**IEA, 2024, Roadmap to Increase Investment in Clean Energy in Developing Countries**	**UNEP, Adaptation Gap Report 2024**	**Markandya and Gonzaléz-Eguino, 2019**	**SYSTEMIQ, 2023, Financing nature**	*Not specified*
Investment needs estimate (by 2030)					
IHLEG central figure (US$bn)	**1,600**	**250**	**250**	**300**	**40**
Range of figures in sources (US$bn)	*n.s.*	101 - 975	290 - 580 (including China)	*n.s.*	*n.s.*
Scope					
Climate vs development investments	Climate and energy-related SDGs	Both climate and development	Climate and disaster risk reduction	Climate: **investment "to tackle climate change"**	Both: **"investment in people, communities […]"**
Scenarios and data gaps					
Temperature target	**1.5°C**	2°C - 3°C	1.7°C - 2°C	*n.s.*	*n.s.*
Data disaggregation/ data gaps	*Quite granular, a few data gaps*	*Variable / country level*	*Not granular*	*Lack of details*	*Lack of details*
Methodological choices					
Incremental or total needs	Mix of both (depending on the sectors)	Mix of both (depending on methods)	Total	Total	*n.s.*
Investment vs financing needs	Investment costs	Mix of both	Investment	CAPEX and OPEX	*n.s.*

- *n.s.*: not specified.
- **Bold text indicates information taken directly from the IHLEG report.**
- Regular text reflects information taken from each sector's original data source.
- *Italic text represents the authors' own analysis.*

Sources: authors' analysis.

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2. PURPOSE-BUILT FINANCE NEEDS: WHY SCOPE, AMBITION, AND SOCIOECONOMIC ASSUMPTIONS MATTER MORE THAN TOTALS

KEY MESSAGES

Climate investment and financing needs estimates for EMDEs vary substantially in existing literature, from US$ 500 billion to US$ 2,500 billion per year by 2030.

This variability reflects both data gaps and the specific purpose, intended use, and target audience of each estimate – whether it aims to highlight the scale of investment needs, inform international negotiations, support policy and planning, or fulfil reporting requirements – and the corresponding assumptions and methodological choices.

Individual decisions can cause overall estimates to vary by 20-50%. Their combination can thus easily lead to differences of an order of magnitude in final figures.

The decision to report on **investment vs financing needs, incremental vs total costs**, as well as the underlying assumptions regarding **growth, cost curves, and discount rates**, are the three most influential factors in finance needs estimates.

The IHLEG estimates stand at the high end of the range of existing figures. This results primarily from:

1) a broad thematic scope (*i.e.*, what qualifies as climate finance),

2) a comprehensive sectoral scope,

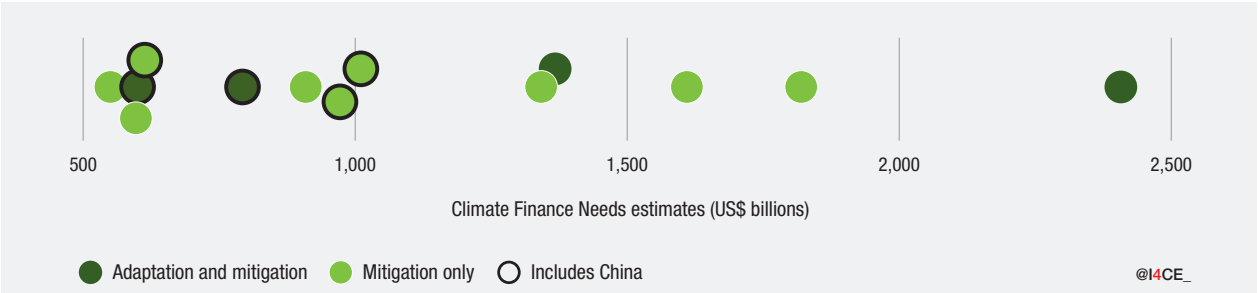
3) inclusion of total needs (with exceptions),

4) inclusion of all finance sources (public, private, national, international).

2.1. Divergent needs estimates: objectives and methodologies

There are a wide range of international climate finance needs estimates that vary significantly across sources. An OECD review in 2024 (Falduto *et al.*, 2024)Parties decided that a New Collective Quantified Goal (NCQG found that annual needs in developing countries range from **US$500 billion to US$2,500 billion by 2030** [5] (see **Figure 4** below).

FIGURE 4. SAMPLE ESTIMATES AND UNCERTAINTY RANGES OF ANNUAL CLIMATE FINANCE NEEDS IN DEVELOPING COUNTRIES BY 2030



Note: Estimates are not geographically consistent. The inclusion or exclusion of certain large countries can have noticeable effects on the estimates. Notably, many estimates exclude China.

Source: (Falduto et al*., 2024), modified by authors; underlying figures based on (Clima Capital Partners, 2022; Energy Transitions Commission, 2023; McKinsey Global Institute, 2022; Songwe et al., 2022; UNFCCC SCF, 2021).*

5 Original figure includes adaptation-only estimates, sitting between US$250 and US$500 billion.

Two main factors explain this disparity:

- **Data gaps at country level**: Many estimates lack comprehensive country-level data. Some countries have not produced financing estimates, while others provide incomplete sectoral coverage or inconsistent timeframes. The Second Needs Determination Report (UNFCCC SCF, 2024) reports that **142 of 154 developing countries specify needs in their NDCs**, and just **98 provide actual cost estimates**.
- **Divergent objectives and methodologies**: Estimates are shaped by their purpose – whether highlighting financing gaps, informing negotiations, supporting national planning, or meeting reporting requirements for international institutions or private actors.

These differences lead to varied methodological choices, influencing both the figures and their relevance for different uses. These choices fall into four broad categories:

- Scope choices: the country coverage, sectoral scope, or financing sources included.
- Climate ambition: nature of the objective, targets and trade-offs between mitigation, adaptation and loss & damage efforts.
- Techno-economic assumptions: economic trends, discount rates, tech costs, cost of capital.
- Level of disaggregation: granularity of sectoral and regional breakdowns.

The following sections analyse these structuring assumptions, their impact on final figures and the overall narrative, and benchmark the specific choices made by IHLEG against existing literature. Most of the international estimates providing the basis of this review were identified thanks to (Falduto *et al.*, 2024; Tan & Pettinotti, 2024; UNFCCC SCF, 2024). A detailed table of their analysis is provided in the Annex.

2.2. Scope-related choices

Scope directly shapes final needs estimates and affects the achievable level of detail – broader scopes often require more research and data processing. A broad scope also increases the risk of aggregating data based on inconsistent assumptions or baselines. **Table 2** outlines key scope choices that influence needs assessments.

TABLE 2. SCOPE-RELATED CHOICES, IMPACT ON FINAL ESTIMATES, AND IHLEG CHOICES @I4CE_

	Why it matters	Impact on final estimate	Options identified in literature	IHLEG choice
Country coverage	Geographical scope impacts final estimates and achievable level of detail, but it also changes the political narrative. Excluding non-Annex I countries such as China or South Korea implicitly acknowledges the view that their role moved from recipient to somewhere between recipient and donor.	Moderate, but high if China is included, increasing figures by ~40%.	Coverage varies from global to limited subsets like 98 developing countries; China is often excluded.	Excludes China but lacks a precise list of covered countries; sources used differ in scope, limiting clarity.
Thematic scope	The thematic scope reflects the tension between dedicated mitigation actions and mainstreaming climate into development planning, with implications for the amounts negotiated and for reporting and decision-making in international financial institutions.	Moderate. Clean energy transition dominates the estimates (~60%) and almost all studies consider it. Including or not other sectors has thus limited consequences as they individually account for around or below 10%.	Thematic coverage ranges from clean energy transition only to broad sustainable development perspectives. Adaptation and L&D are often under-costed, if mentioned.	Includes development-related efforts such as natural capital, just transition, and some SDG goals, making it one of the widest identified thematic scopes.

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	Why it matters	Impact on final estimate	Options identified in literature	IHLEG choice
Sectoral scope	Sectoral scope is strongly linked to thematic focus, as mitigation and adaptation, for example, may not target the same priority sectors. However, existing methodologies are frequently incompatible across sectors, leading to standardization challenges.	Moderate. According to CPI, financing needs are quite evenly spread over sectors, the most important (energy and transport) accounting for ~30% of total needs.	Mitigation needs assessments tend to focus on clean energy transition while adaptation estimates focus on agriculture. Few reports consider the whole economy; some transversal studies consider infrastructure only.	IHLEG focuses on energy, agriculture, and infrastructure. The coverage varies by theme.
Reporting investment vs. financing needs	Investment-only figures miss the cost of capital, which varies widely by country, project, and financing source. It is a key barrier to investing in climate transition in EMDEs.	High. Financing costs can triple project costs for utility-scale solar PV projects for example, according to IEA research. Reducing the cost of capital by 1% would reduce clean energy financing costs by about US$ 150 billion per year in EMDEs.	Both cases are found, although financing estimates in minority. Bottom-up needs assessments such as NDC costings tend to provide investment estimates, while financing considerations usually rely on top-down approaches.	IHLEG mentions both investment and financing estimates, but costs of capital seem unrealistically close to zero, with a lack of clarity on how they are calculated.
Incremental vs. total needs	Incremental needs highlight additional effort in international negotiations, while total needs guide practical investment planning. Incremental needs estimates may require better data and more BAU-related assumptions.	High. Investment needs High- and low-emission scenarios differ only very slightly, leading to incremental costs representing only a fraction of total cost.	Most studies focus on total needs; some provide business-as-usual (BAU) for comparison.	IHLEG relies on sources that mix incremental and total needs without clear distinction.
Finance sources tracked	Capturing all finance sources (public and private, domestic and international) highlights flexibility options and improves realism by highlighting "hidden" costs borne by the private sector (incl. households) such as the consequences of regulation vs. subsidies.	Moderate to high. According to IHLEG, each block accounts for ~25% of total needs.	All scope choices are reflected, from narrow 'international public finance only' to capturing all public and private, domestic and international flows.	IHLEG includes all financing sources (public and private, domestic and international).
Time horizon	Longer horizons increase total investment costs. However, long-run annual incremental costs can be very small in the case of large up-front investments, looping back on the incremental vs total cost choice of representation.	Moderate to low. Influenced by damage functions and discounting choices. However, most estimates are expressed as annual needs and due to discounting, later periods always weigh less than current ones.	The estimates reviewed mostly use 2030, 2035, or 2050 as a time horizon, starting in 2015, 2020 or 2025.	IHLEG presents 2025-2030 figures; extrapolation method to 2030-2035 is unclear.

2.3. Climate ambition

Climate ambition is a key driver of cost estimates, reflecting trade-offs between mitigation, adaptation, and loss and damage targets. These trade-offs depend on how climate goals are framed – *e.g.*, economic optimality vs. risk tolerance. Ambitious mitigation can lower adaptation and L&D costs, but within any temperature pathway, there remains a key trade-off between investing in adaptation and accepting residual losses.

TABLE 3. AMBITION-RELATED CHOICES, IMPACT ON FINAL ESTIMATES, AND IHLEG CHOICES @I4CE_

	Why it matters	Impact on final estimate	Options identified in literature	IHLEG choice
Mitigation pathway	Mitigation ambition can involve specific targets (e.g. net-zero) in addition to temperature goals. More ambitious goals raise financing needs for 2025-2030, while allowing overshoot lowers short-term costs but increases sensitivity to factors like discount rates.	Moderate to low for mitigation costs. Mitigation costs increase by ~20% from the 2°C to the 1.5°C scenario in the reviewed literature. However, delayed or reduced mitigation also has an impact on adaptation and L&D costs.	Temperature targets vary between 1.5°C and 2°C, sometimes including additional constraints (net-zero, no carbon capture and storage (CCS), investment peak in 2045, 'early ambitious policies'). The 1.5°C target, although still rather standard, is increasingly unrealistic given current commitments and policies.	IHLEG explicitly refers to the 1.5°C and net-zero targets for clean energy transition. Climate ambition is less clear elsewhere, referring to the Paris Agreement without further detail.
Adaptation scenario (temperature and argets)	Adaptation objectives must balance the costs of mitigating climate impacts through emissions reduction and adaptation measures, with those of managing their consequences.	Moderate. Adaptation investment needs are small compared to mitigation, as most adaptation actions incur recurring costs. Within INV needs, the target level of acceptable risk matters more than expected temperature pathway for 2020-2030.	Most needs estimates consider a 2°C scenario, with some considering a 1.5°C scenario. Specific adaptation targets are most often not explicit.	IHLEG's main source, the Adaptation Gap Report, offers two figures: one from top-down sectoral modelling, the other extrapolated from country-stated needs using, in turn, varied methods. How these two figures are combined is unclear.

2.4. Socioeconomic assumptions

This category covers factors like economic growth, discount rates, demographics, technology costs, and capital costs. Though not directly tied to climate policy, small shifts in these parameters can alter investment needs by hundreds of billions. IHLEG bases its macroeconomic assumptions on the World Economic Outlook and World Bank forecasts disaggregated by region, as clarified by the authors – but not detailed in the report. Other contextual assumptions remain unclear. Most major needs assessments similarly lack transparency on these assumptions, making cross-comparisons difficult despite their critical influence.

2.5. Disaggregation choices

Disaggregation choices closely follow scope decisions: the broader the scope, the harder it is to break down figures. Yet disaggregation is key to making needs estimates actionable. Negotiating and allocating climate finance requires not just country-level data, but also clarity on sources, instruments, and destinations. While disaggregation has little direct impact on total figures, it can significantly improve precision – especially when accounting for variables like country-specific capital costs.

TABLE 4. DISAGGREGATION CHOICES, OPTIONS IDENTIFIED IN LITERATURE, AND IHLEG CHOICES @I4CE_

	Why it matters	Options identified in literature	IHLEG choice
Geographical detail	Aggregated analysis can group very different countries, leading to significant over- or underestimates of financing needs depending on the proxies applied. While useful for global negotiations, such figures also lack the granularity needed to guide effective implementation.	The assessments reviewed range from country or even region-level (*e.g.* Needs Determination report) to broad aggregates covering all developing countries.	IHLEG presents aggregated financing needs for EMDEs, excluding China. Although a few country examples are cited, most of the analysis relies on aggregated data, limiting the potential for further disaggregation.
Thematic detail	Thematic detail enhances consistency by clarifying the interconnections and trade-offs between adaptation, mitigation, loss and damage, and broader development goals.	Most studies considering several dimensions of climate action treat them separately (with sometimes a category for joint mitigation & adaptation action).	IHLEG provides separate estimates for mitigation, adaptation and loss & damage, based on distinct sources with consistency issues.
Financing source detail	Capturing the diversity of financing sources is essential for international negotiations that address only a subset of them. It also enables more realistic mobilization scenarios by accounting for the specific capacities of each financing source.	Many assessments focus solely on investment needs, making any breakdown by financing source irrelevant. When such disaggregation is included, it typically covers 4 to 10 distinct types of financing sources.	IHLEG breaks down investment needs into 7 financing sources: domestic public & private, external private, multilateral development banks (MDBs), bilateral finance, South-South cooperation, and 'other concessional'.
Instrument detail	Instrument breakdown enhances realism and applicability (*e.g.* accounting for leverage, concessionality). It is closely related to the disaggregation of financing sources.	The assessments reviewed go from no detail to disaggregation into taxes, subsidies, private finance, MDB lending, mobilized MDB finance, etc.	IHLEG does not provide a specific instrument disaggregation, only financing source detail.
Sectoral detail	Project-level clarity enables investment mobilization but is data intensive.	Project-level detail appears in some backward-looking tracking exercises and bottom-up costed needs from country NDCs, but most needs assessments range from sub-sector granularity to no sectoral detail at all.	IHLEG's sectoral detail depends on the theme. Mitigation figures are broken down into energy production and consumption, yet no such thing exists for *e.g.* natural capital.
Gap filling approach	Data gaps remain a major challenge for credible global climate finance estimates. Only 98 of 154 developing countries provide costed needs in their NDCs, often incomplete. Global assessments must either fill these gaps or acknowledge that they present a lower-end estimate.	Some estimates (*e.g.* Needs Determination Report) do not fill the gaps. Those which do either extrapolate bottom-up figures or use top-down constructions that directly consider regional aggregates. Both options can lead to over- or under-assessments.	IHLEG's final estimate reflects the diverse approaches of its sources. Its main mitigation input – the IEA net-zero roadmap – combines bottom-up extrapolation with top-down modelling.
Time detail	Averaging or summing estimates over long periods can hide short-term needs, encouraging decision-makers to postpone action towards the end of the period. Climate planners use long horizons (2035, 2050) but Ministries of Finance prefer shorter timeframes (2-3 years).	Most studies use 5 to 15-year time steps. 20-year time periods are occasionally used to cover the 2030-2050 period.	IHLEG considers 2025-2030 and 2030-2035, reporting average annual figures per period.

FIGURE 5. SUMMARY OF IHLEG CHOICES COMPARED TO OTHER EXISTING ASSESSMENTS[6]

Note: Hatching indicates heterogeneous IHLEG choices across themes. Darker shades highlight most impactful choices.

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6 IHLEG choices where compared to 11 other leading studies in the field, both from international organisations (IPCC, UNFCCC) and independent / private sources (McKinsey, ETC, CPI, etc.) The full comparison table is available in Annex.

3. THREE PRIORITIES TO SHARPEN CLIMATE FINANCE NEEDS ESTIMATES – AND MAKE BETTER USE OF EXISTING ONES

The two previous sections used the example of the IHLEG's Third Report to examine, first, how current estimates of climate finance needs for EMDEs are constructed, and second, how these estimates reflect methodological choices that implicitly advance narratives about the transition. We also underscored how significantly these assumptions can influence the final figures – often more than the uncertainty from underlying data. This highlights the importance of not using trillion-dollar estimates in climate debates without some explanation of their context and logic: in the end, a number without context or narrative is just a guess.

In this section, we identify three key challenges that must be addressed in order for finance needs estimates to meaningfully inform both policy discussions and finance mobilisation efforts. These are: (1) articulating disparate climate objectives and dealing with incomplete and inconsistent data; (2) addressing conceptual divergences and practical implications surrounding the additionality of climate action; and (3) improving the translation of investment needs into financing needs.

Each of the following subsections explores one of these challenges in detail, using examples from the IHLEG report to illustrate their significance. They also propose ways to enhance existing data or use it more effectively. A summary of the three challenges and proposed responses is provided in the box below.

KEY MESSAGES

Three key challenges must be addressed for finance needs estimates to meaningfully inform both policy discussions and finance mobilisation efforts.

(1) Articulating disparate climate objectives and dealing with incomplete and inconsistent data

Inconsistent assumptions and targets undermine the coherence and credibility of aggregated needs estimates. Mitigation estimates generally align with 1.5°C or 2°C pathways, while adaptation costs may refer to pathways with warming up to 4°C, as in the IPCC's AR6 WGII report. Adaptation and L&D costs estimates are typically derived from separate simulations, although they are in practice interdependent. These inconsistencies are compounded by wide disparities in data quality and in definitions of what qualifies as climate finance across countries.

Improving the internal consistency of needs estimates – or at least providing common interpretive frameworks – requires better use of the Paris Agreement's Transparency Framework and lessons from the IPCC's scenario work. It also demands groundwork: countries must improve their own reporting and estimation methods.

Yet, decision-makers cannot afford to wait for perfect data. Current figures should be seen as indicative of the scale of effort required, not as precise forecasts. Users of these estimates should focus on the mobilisation narrative they support, but also question the credibility of said narrative: What barriers are identified? Where do estimates diverge? What uncertainty ranges are acknowledged?

(2) Addressing conceptual divergences and practical implications surrounding the additionality of climate action

Additionality has a major influence on investment needs estimates. Two issues are especially important. First, the boundary between climate and development finance is often unclear, complicating how needs are counted and reported across institutions like the UNFCCC and OECD. Second, estimates may be based on either incremental or total costs; while both are valid, they are not directly comparable - making it essential to specify which is used.

EMDEs often refer to incremental costs in order to emphasize the additional effort required for climate action and the corresponding need for external support, while advanced economies tend to focus on total costs. These differing approaches – and their underlying biases – should be made explicit. Estimates should clearly state their assumptions and, where possible, present alternative cost scenarios. While greater standardisation and interoperability are important, they have limits. Civil society also has a key watchdog role to play in ensuring transparency and accountability.

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(3) Improving the translation of investment needs into financing needs

As attention shifts from identifying total investment needs to determining how these needs will be met, providing realistic estimates for financing needs and corresponding finance mobilisation scenarios is the new frontier for research efforts feeding into climate negotiations.

High capital costs hinder public and private developers from financing climate projects in EMDEs. They reflect both the availability of capital and the willingness of financial institutions to deploy it. Channelling climate finance towards EMDEs goes beyond facilitating investment: it is also about competing with more attractive opportunities elsewhere.

Providers of climate finance needs estimates must now focus on detailed assessments of the terms and conditions of various financing instruments and sources. Investment needs estimates should be aligned with realistic assessments of available financial resources to avoid gaps between ambition and feasibility. Such approaches also entail thinking beyond "investment gaps" by identifying who might be the final investor and how these actors are themselves financed.

Moreover, full financing costs – including interest rates and risk premiums – should now come up for appraisal and be incorporated in existing investment needs estimates.

3.1. Articulating disparate climate objectives and dealing with incomplete and inconsistent data

Efforts to estimate needs across a broad sectoral and geographical scope face two hurdles. From a top-down perspective, mitigation and adaptation targets are internally inconsistent, making aggregation of model-based estimates perilous. From a bottom-up perspective, there are significant disparities in the quality, and even the basic definitions, of climate finance data between countries.

Understanding the issue

Investment needs depend heavily on the choice of mitigation and adaptation targets; they are also interrelated. Adaptation needs depend on the mitigation scenario and temperature increase, and the chosen level of adaptation, climate-proofing, and/or inaction in the face of climate change. Loss and damage estimates, in turn, depend on both the temperature pathway (and thus climate response) and level of adaptation efforts – adaptation investments reduce, among others, loss and damage costs.

There is no universal consensus on the appropriate level of ambition for adaptation, and the benchmarks for mitigation are increasingly being questioned. While the 1.5°C aspirational target from the Paris Agreement has not been contested in subsequent official negotiations, the temperature trajectory stemming from current policies is well above 1.5°C, raising questions about the feasibility of even the 2°C target. Consequently, needs assessments based on 1.5°C have become increasingly disconnected from actual action over time, potentially compromising their direct policy applicability and credibility. These assessments are also becoming more expensive as the opportunity window closes and the cost of catching up with wasted time increases. In the near term, the needs for adaptation are more closely linked to the trade-off between adaptation and loss or damage than to mitigation-related actions. For example, Markandya & González-Eguino (2019) show that residual loss and damage costs can range from 98% to 2432% of adaptation costs by 2030, depending on the region considered and level of adaptation efforts.

In addition, needs estimates are significantly affected by the availability and quality of data. As of the writing of this report, only 98 countries have submitted NDCs that include cost estimates, and even these are often incomplete or based on uncertain assumptions. This significant data gap undermines the ability to establish truly needs-based targets and hampers the financing of the transition at country level. Moreover, the methodologies used to address data gaps, such as extrapolating from existing datasets or applying assumptions to disaggregate top-down assessments, are not themselves harmonized.

Among the five dimensions of action detailed in the IHLEG report, the clean energy transition has received the most comprehensive analysis, with numerous estimates from various institutions – see for instance (CPI, 2024a). By contrast, the remaining four areas are less well-known, especially loss and damage, natural capital, and just transition. Available data is less disaggregated, and estimates are less robust.

Examples from the IHLEG report

The IHLEG clean energy transition objectives are aligned with the IEA NZE scenario, which aims for net-zero greenhouse gas (GHG) emissions globally by 2050 and limiting global average temperature increase to 1.5°C (IEA, 2023a).

The reference temperature pathways for computing adaptation needs is difficult to interpret (see section 1) but stands most certainly above +2°C in 2050. Central modelled values providing the low range of the AGR are derived from an RCP4.5 profile, consistent with a 2°C temperature rise (UNEP, 2024). NDCs and NAPs, which provide the high range of adaptation needs in the AGR, are not easily comparable, as countries use different, unspecified methodologies to estimate their needs.

The warming scenario used for loss & damage estimate (Markandya & González-Eguino, 2019) refers to a temperature pathway between +1.7°C and +2°C. The corresponding adaptation estimates within the Markandya & González-Equino report strongly diverge from the final adaptation figures in the AGR report, suggesting that they are not directly comparable.

Policy implications and recommendations

The extent to which needs estimates can be trusted is a core issue, since these figures are then used to set targets in international negotiations and organise the financing of the transition at country level.

Improving consistency

Consistency issues can be improved in several ways.

First, by building upon the work laid out by the Paris Agreement's Transparency rulebook. The UNFCCC-borne reporting framework agreed upon in 2021 started yielding results in 2024. The associated Enhanced Transparency Framework aims to generate interoperable data; the next generation of needs estimates should build on these new standards and leverage the information they bring together. Developers of tools for tracking climate finance (such as taxonomies, budget tagging, SDG-bond reporting schemes) should also keep in mind that such systems should be interoperable. The IDB's attempt to link budget tagging to mainstream financial classification systems such as COFOG (Pizarro *et al.*, 2021) can inspire such efforts. The groundwork by the Standing Committee on Finance should also infuse the definitions used by exercises such as the IHLEG report, all the more so as a body mandated by COP Presidencies.

In parallel, work should continue on harmonized approaches and scenarios that encompass the full climate responses, including mitigation, adaptation, and the resulting accepted climate damages. The IPCC has come a long way in this field with the creation of RCP and SSP scenarios; this common interpretative framework should be more relied upon and more explicitly referred to when trying to build needs estimate that span several aspects of climate action.

Reducing data gaps

Reducing data gaps falls primarily on countries themselves, as they must build financing plans to take their NDC and long-term climate strategies from planning to reality. In this aspect, the Second Needs Determination Report (UNFCCC SCF, 2024) is clear: efforts are insufficient, with 142 of 154 developing countries specifying needs in their NDCs, and only 98 providing actual cost estimates. LTS are even less common, with only 6 of the G20 countries able to discuss any kind of financing aspects in their official LTS as of 2023 (CEEW, New Climate Institute, 2023). Initiatives such as the Integrated National Financing Framework Facility are rightly called for in the FFD4 draft outcome document: they are badly needed to support countries in opening discussions about finance. Finally, greater emphasis must be placed on adaptation, loss and damage, and conservation of natural capital, which are underdeveloped areas of the international climate discussion. The development of new sets of indicators for consistently tracking progress towards sustainable finance should also be pursued (I4CE *et al.*, 2025).

Clarifying what the estimates can bring, and what they can't

Decision-makers cannot afford to wait for perfect understanding to start acting. Headline numbers, however imperfect, were useful to agree on the scale of required climate action, but improving them will take time. While the research community must strive to address these quality issues, both researchers and decision-makers must make the most of what is available now to steer climate action. To do so, it is important to:

- **Recognize that incoherent mitigation and adaptation scenarios, combined with poor-quality data, will continue to impede the production of robust estimates** of climate finance needs – and consider those figures only as broad indications of where to go.
- **Focus on what else these estimates can tell us** – which actors are called to contribute, which instruments should be preferred, what assumptions on cooperation, leverage, investment-triggers are made – and how to make them real.
- **Identify where mobilisation scenarios diverge most strongly, in terms of the instruments and sources of finance mobilised**, and how to reconcile them in an ambitious but realistic proposition: in this aspect, the diverging opinions of IHLEG authors and NCQG signatories about the mobilization of private finance (see **Box 1**) should surely raise questions and clarification attempts.
- **Work with ranges of uncertainty**, whose low and high values are quite often more clear-cut and more easily explained than deceptively neat central values. In this respect, the unique adaptation needs figure used by the IHLEG report is less informative than the two values put forward by the AGR.

3.2. Addressing conceptual divergences and practical implications surrounding the additionality of climate action

Calculating financing needs, or mobilising climate finance, depend on a clear understanding of what climate finance is and what it is not. The question may seem simple, but the answer is not, for at least two reasons:

First, climate objectives often overlap with development objectives. Development and climate finance are deeply intertwined, both on mitigation aspects such as clean energy access for all, or adaptation needs such as climate-resilient agriculture or water management. This holds true across negotiation forums, donor budgets, public planning instruments, and reporting frameworks, resulting in blurred boundaries that hinder financial tracking and accountability.

Second, needs assessments may focus either on the incremental costs of climate action or on the total costs of climate-relevant investments. This choice significantly influences the final estimate, as some climate-forward options are not substantially more expensive than their business-as-usual counterparts. The difference becomes even more pronounced when operational costs are considered. For example, climate-resilient buildings, electric vehicles and renewable energy technologies often require higher upfront capital investment but tend to have lower operating expenses over time.

Understanding the issue

Climate and development overlap

The overlap between climate and development finance, and how or whether to address it, is an open question.

Some authors (e.g. Steele, 2015) argue that the amount of overlap depends primarily on the type of climate action (adaptation vs mitigation) and the typology of the recipient country (least developed, low-income, or middle-income). Adaptation activities in least developed countries (LDCs) and low-income countries are generally directed at reducing poverty, increasing household income and building resilience, so climate and development finance can overlap completely. On the other hand, much of the climate investment in upper middle-income countries (UMICs) directly supports renewable energy technology or market development. In many cases, these developments are already self-sustaining and may not need additional development finance to catalyse private participation.

For certain aspects of climate action, methodological issues prevent from distinguishing between strict development and climate objectives. For instance, investment in natural capital has no universal definition. Distinguishing between sustainable and unsustainable investments is often complex and context-dependent, as many investments are not inherently high- or low-emission investments. For instance, investing in farm machinery could boost yields and reduce pressure to clear forests. However, it might also incentivise farmland expansion by increasing potential profits (SYSTEMIQ, 2023).

This somewhat theoretical debate has very practical consequences, as it shapes the decisions of donors: for example, a recent OECD analysis shows that climate finance is relatively concentrated in UMICs, and that LDCs receive a lower share of climate-related development finance than their share of total development finance (OECD, 2024b).

Definitions of incremental climate action

The debate over the definition of «new and additional» finance, first raised after the Copenhagen Accord (2009) (Brown *et al.*, 2010), remains unresolved today, and has its own implications.

Defining incremental climate action relies on several technical choices, and the theoretical approach is challenging to implement in practice. Key parameters include the reference scenario or baseline used, the sectoral scope (*i.e.*, whether sectors where investment needs will decrease are taken into account), and the time horizon used (I4CE, 2023). It is however difficult, for example, to determine the share of a building renovation project that can be labelled as climate-related costs. In the specific case of loss and damage, separating incremental from total costs would rely on climate change attribution; that is, an estimate of the likelihood that an extreme event has taken place because of climate change: a figure that is difficult to produce with any type of accuracy.

Besides, incremental needs estimates need to factor in the savings generated by a climate-sensitive investment compared to a climate-blind (*i.e.*, no practical consideration given to climate risk or to emissions reduction) alternative. However, recurring expenses are generally not captured in needs estimates, as international funders are less prone to finance such expenses (United Nations Environment Programme, 2023). This issue is particularly salient for adaptation-related costs, where recurring expenses tend to weigh more heavily than they do for mitigation efforts.

Although different approaches to additionality may continue to coexist, achieving clarity and consistency regarding the choices made in estimates and negotiations is essential to avoid underestimating or misallocating the investments required for climate action.

Relevance for climate negotiations

Beyond the sheer methodological issues, different stakeholders hold diverging, politically motivated views on the definition of additionality:

Incremental costs are often used by EMDEs to highlight additional climate-related efforts and the associated need for external support. National policy tools, such as green budgeting, are designed to support

this objective by highlighting both domestic efforts and where external finance would make the biggest difference. This position makes sense from a historical negotiation perspective, under the principle of Common But Differentiated Responsibilities of the United Nations Framework Convention on Climate Change (UNFCCC). It also reflects the fact that developing countries must first address urgent development needs and potential crises, with less room for longer-term considerations. Last, it reflects a lack of mainstreaming of climate-related financing considerations in EMDEs, where climate finance is often dealt with by separate departments (Environment Ministries, donor-dedicated offices, etc.).

By contrast, most advanced economies typically focus on the total costs of climate action, based on the premise that most of the climate effort goes into replacing existing assets (*e.g.* gas power plants, buildings), or investing in new, additional capital (*e.g.* CCUS). Total investment needs are also more relevant for national-level planning, as they reflect the full cost of investments required from both public and private sectors. This broader view is essential for developing and implementing climate financing strategies from countries' perspectives.

Examples from the IHLEG report

The IHLEG report incorporates development objectives to varying degrees depending on the sector, extending beyond its stated focus on "investments to achieve the Paris Agreement targets". For instance,

- Clean energy transition needs estimates include achieving energy-related SDGs (such as universal access to energy by 2030 and major air quality improvements), following the IEA's NZE scenario. They also factor in some just transition costs (especially for coal phase-out).
- Adaptation-related investment needs for agriculture include infrastructure along the value chain to improve trade. Measures such as irrigation or soil and water conservation are included as adaptation measures, yet cannot be distinguished from productivity-enhancing measures that would feature in an agricultural development program.

'Incremental cost' and 'total investment cost' approaches also co-exist in the report:

- In clean energy transition estimates, investment assessments for energy supply and low-emissions fuels are based on total investment costs. On the contrary, in most end-use sectors, only the additional costs related to climate action are considered. For example, the investment cost of electric vehicles only includes the battery cost.
- For adaptation, the term 'incremental' usually refers to a slow process of adaptation, that 'maintains the essence and integrity of a system', as opposed to transformational adaptation (IPCC, 2021). The AGR's underlying research report (United Nations Environment Programme, 2023) acknowledges that adaptation is often delivered through a mainstreaming approach, with these synergies or trade-offs affecting the cost of adaptation.
- For loss and damage, the costs presented are an estimate of total losses caused by future climate impacts, rather than an increment in losses between two future scenarios.

Policy implications and recommendations

It is unavoidable that different actors with different viewpoints and needs will use different estimates, constructs, and narratives.

These choices and biases should however be exposed and clarified so that the debate stays transparent and negotiations are conducted in the most informed way possible, to limit asymmetry of information and impossible targets that undermine the credibility of the whole negotiation process.

International stakeholders with a say in reporting schemes and data standardisation should strive to categorise climate-positive investments according to their intent, following a 'Rio Markers' approach: development-driven, climate-blind spending (*e.g.*, electric buses: their primary purpose is air quality improvement and traffic reduction, but they also bring climate co-benefits); development-driven, climate-enhanced spending (*e.g.*, climate-resilient infrastructure); and climate-driven efforts (*e.g.*, accelerated coal phase-out). It is of interest to be able to track the flows separately, because these topics are negotiated in different «arenas» and by different people.

Data producers, especially the producers of leading global estimates or roadmaps, should strive to improve their geographical granularity, particularly by disaggregating financing needs by country income levels. While this is obviously a resource-intensive task burdened by a lack of quality data (as discussed above), and will not be completed anytime soon, any improvement in this area is instrumental in strengthening the credibility and usefulness of investment needs assessments. It also drives countries themselves to produce better data through international reporting schemes.

They should also make explicit their assumptions, and possibly present separate cost scenarios – one based on fully incremental costs, the other on total investment costs – rather than blending the two. The underlying assumptions used for estimating incremental costs must be transparently documented to enable comparison across studies and support informed decision-making on resource mobilisation and allocation.

Civil society organisations and research institutes have a watchdog responsibility to clarify biases, make the motivations more transparent, facilitate comparisons, and make sure that negotiations are conducted in good faith. As a contribution to reducing this ambiguity, I4CE plans to produce scenarios that make explicit the role of assumptions by exploring the range of estimates with incremental or total costs, in order to represent the most focused vs broadest approach to climate action.

3.3. Improving the translation of investment needs into financing needs

The cost of capital can significantly inflate financing needs, especially in EMDEs where it is typically high and presents a major barrier to investment. However, most needs estimates focus solely on investment needs. To turn the ambitious Baku-to-Belém roadmap into reality – by moving from setting targets to actually mobilising finance – it is essential to take the cost of capital, or financing costs, into account.

Understanding the issue

High capital costs make it difficult for public and private developers to finance climate projects in emerging and developing economies, especially in capital-intensive sectors like solar and wind. According to the IEA Cost of Capital Observatory database (IEA, 2023b), the cost of capital is at least twice as high in developing countries as in advanced economies. For instance, in 2021, the real cost of capital for utility-scale solar PV was around 3% in Europe, 7% in Mexico, and over 9% in Brazil. Public interventions to reduce these costs are often constrained in highly indebted countries.

From the perspective of financing sources, the cost of capital reflects both the availability of capital and the willingness of financial institutions to deploy it. It is shaped by a range of country-specific risks – macroeconomic, political, technical, regulatory, and reputational – as well as by investor preferences. For instance, some investors exclude specific countries or entire regions from their portfolios, effectively shrinking the pool of available capital and driving up the cost of what remains. MDBs and official development banks have privileged instruments to address this issue, but they fall far short of the volumes needed.

Channelling climate finance towards EMDEs goes beyond facilitating investment: it is also about competing with more attractive opportunities elsewhere. Fiscal incentives supporting domestic reindustrialisation and defence-related investment, particularly in advanced economies, are increasingly drawing investor attention away from EMDEs. As a result, the task of making climate action in EMDEs a priority for global investors has become even more difficult.

These risks and barriers contribute to increasing the cost of capital in EMDEs, which in turn raises total financing needs – when including financing costs – for project developers.

Examples from the IHLEG report

The types of needs aggregated by the IHLEG authors vary between sectors and often lack clarity. For example, investment needs for the clean energy transition reflect only capital investment costs. Modelled adaptation costs represent investment costs7 rather than total financing needs. By contrast, estimates of adaptation needs based on NDCs and NAPs include planning and implementation costs, and tend to cover the entire financing needs. On natural capital and just transition, IHLEG doesn't mention whether financing costs are included within the investment needs.

These same figures are, however, presented as financing needs in the report's central figures (IHLEG figures 2.1 and 2.2, reproduced here as **Figure 3**) and matched to corresponding funding sources, without further information on the associated financing costs.

Policy implications and recommendations

While needs estimates are necessary, they are not sufficient: a detailed understanding of how project developers access funding – through which specific sources, instruments, and at what cost – is essential to improving financial access. Investment needs estimates highlight the scale of finance that the climate transition requires. Now that this scale has been agreed upon at COP29 in Baku in 2024, the effort should turn to determining which actors can contribute, to what extent, and under what conditions. This is the real cost of the transition.

Researchers estimating climate finance needs must now focus on detailed assessments of the terms and conditions of various financing instruments and sources in order to strengthen the credibility, and, more importantly, the usability of their estimates. Investment needs estimates should be aligned with realistic assessments of available financial resources to avoid gaps between ambition and feasibility. As illustrated in **Figure 1** by the rough side-by-side breakdown of the IHLEG needs estimates and the NCQG terms, there is no single scenario. Detailed assessments exist at the national level, such as the I4CE scenarios for financing of the transition in France (I4CE, 2024). Such approaches also entail thinking beyond mere "investment gaps", identifying who might be the final investor, and how these actors are themselves financed. They should also seek to identify resource competition and supply constraints, such as the domestic investment pull described above, in order to support the work of negotiators, legislators and decision-makers trying to make private sector involvement a reality.

Moreover, full financing costs – including interest rates and risk premiums – should now come up and complete existing investment needs estimates. To this end, enhancing the geographical breakdown of data and improving the classification by project type and financial instrument will be essential to better targeting country financing strategies and monitoring progress effectively. The discussion that has escalated from billions to trillions in scaling climate finance needs must now unpack the billions again, and even millions, in order to make global mobilisation a reality.

7 These include capital and recurring costs for some sectors.

CONCLUSION

While political ambition has surged in recent international climate agreements – most notably through the New Collective Quantified Goal (NCQG) and the associated Baku-to-Belém Roadmap – the mechanisms for turning these commitments into real financial flows remain largely undefined. This report revisits existing estimates of international climate finance needs in light of this new context, aiming to clarify what these figures actually represent, how they are constructed, how they might be used to guide practical efforts in the years ahead, and where the most urgent improvements are needed.

As shown throughout, the numbers commonly cited in international forums conceal profound differences in scope, ambition, and methodology. Without a clear understanding of the assumptions behind them, they risk misleading rather than informing. Estimates vary by an order of magnitude depending on choices such as whether China is included in EMDE groupings, whether costs of capital are incorporated, or whether the scope is limited to mitigation or extends to adaptation, loss and damage, or other transverse sectors. Each estimate reflects particular assumptions: about the pace and ambition of climate action, about the cost of capital in developing contexts, and about the roles of public versus private finance. These assumptions are rarely made explicit, yet they decisively shape both the numbers and the narratives built around them. The IHLEG report exemplifies both the ambition and the limitations of current approaches. Its breadth is significant: it spans five pillars of climate action and provides a detailed disaggregation of finance sources and uses. However, the underlying data remains patchy and uneven, particularly in sectors beyond clean energy.

We thus highlight critical areas for improvement and lay out some directions for the way forward.

- **First, aggregated estimates must be made more internally coherent**, or at the very least, more interpretable, by building on existing consistent frameworks.
- **Second, the longstanding ambiguity around the additionality of climate finance must be addressed** so that discussions in different political fora rely on common premises– particularly in distinguishing between development-aligned and climate-specific investments, and incremental versus total costs. As things stand, estimates differ by orders of magnitude depending on whether they reflect total or incremental costs – the two approaches being sometimes used and blended within the same report yet rarely defined with clear boundaries.
- **Third, and perhaps most crucially, the outlook must shift from abstract investment estimates to actionable financing strategies**. This means incorporating cost of capital considerations and specifying financing sources and instruments with their inherent constraints for both public and private actors.

However, decision makers cannot afford to wait for perfect understanding to start acting. Headline numbers, however imperfect, were critical to driving agreement on the scale of required climate action, but improving them will take time. While the research community must strive to address these quality issues, both researchers and decision-makers must make the most of what is available now to steer climate action. To do so, it is important to:

- **Recognize that incoherent mitigation and adaptation scenarios, combined with poor-quality data, will continue to impede the production of robust estimates** of climate financing needs – and acknowledge those figures only as broad indications of where to go. Their real value lies in framing collective understanding and aligning expectations.
- **Focus on what else these estimates can tell us** – which actors are called to contribute, which instruments should be preferred, what assumptions on cooperation, leverage, investment-trigger are made – and how to make them real.
- **Identify where mobilisation scenarios diverge most strongly**, and how to reconcile them in an ambitious but realistic proposition: in this aspect, the diverging opinions of IHLEG authors and NCQG signatories about the mobilisation of private finance should surely raise questions and clarification attempts.
- **Work with ranges of uncertainty**, whose low and high values are quite often more clear-cut and more easily explained than deceptively neat central values. In this respect, the unique adaptation needs figure used by the IHLEG report is less informative than the two values put forward by the AGR.

As climate finance debates move on from pledges to implementation, success will depend less on the precision of financing needs estimates and more on our ability to convert high-level ambition into credible, inclusive, and actionable financing strategies. From headline trillions to actual millions, the challenge ahead is not just about determining how much is missing – the focus should be on closing this gap in practice.

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