

# Climate Finance Outlook of Southeast Asia

Navigating Climate Finance at the  
Local Level in Southeast Asia:  
Cases from Indonesia, Malaysia,  
Thailand, and Vietnam



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# FOREWORD

In an era marked by unprecedented environmental change, the urgency to address climate challenges has never been greater. The Southeast Asia region, with its vibrant economies, diverse ecosystems, and densely populated urban areas, stands at the forefront of this global crisis. As we navigate these turbulent times, understanding and optimising climate finance becomes paramount to achieving sustainable and resilient development. This publication, meticulously prepared by the United Cities and Local Governments Asia Pacific (UCLG ASPAC) as the host of the Secretariat of the Global Covenant of Mayors for Climate and Energy (GCoM) in Southeast Asia, offers an essential outlook on climate finance specifically tailored for the Southeast Asia region.

The region faces numerous climate-related challenges, from rising sea levels threatening coastal communities to extreme weather events disrupting livelihoods and infrastructure. Effective climate finance is crucial for supporting both mitigation and adaptation efforts, enabling local governments to implement innovative solutions and to invest in resilient infrastructure. This report provides a comprehensive analysis of the current climate finance landscape and highlights key opportunities and challenges. It aims to guide policymakers and local leaders in Southeast Asia through the complexities of climate finance, offering insights into funding mechanisms, investment strategies, and best practices for leveraging financial resources to address climate risks effectively.

The importance of climate finance cannot be overstated. It is not merely about securing funds but ensuring that these resources are used effectively to drive meaningful change. This publication is a valuable tool for local governments, financial institutions, and stakeholders, equipping them with the knowledge needed to make informed decisions and catalyse impactful climate action.

The report's findings were developed with the support of the GCoM Asia Project and reflect our shared commitment to enhancing climate finance knowledge and fostering collaboration among key stakeholders. These efforts are instrumental in our collective journey toward a sustainable future. As we delve into the insights presented in this report, let us embrace the opportunities it unveils and take decisive action to harness climate finance for the benefit of our communities and the preservation of our environment.

The path ahead is challenging, but with informed leadership, strategic financial planning, and strong partnerships, we can build a resilient Southeast Asia that thrives despite the adversities of climate change. Through concerted efforts, we can ensure that climate finance becomes a catalyst for sustainable development, benefitting not only the present generation but also those to come.

**Dr. Bernadia Irawati Tjandradewi**

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# EXECUTIVE SUMMARY

## Background

Climate finance serves as a crucial mechanism in addressing the global challenge of climate change, facilitating the mobilisation of resources necessary to confront its multifaceted impacts. This encompasses a wide range of financial mechanisms designed to bolster both mitigation and adaptation initiatives, which ultimately will foster resilience and sustainable development worldwide. Through the collaboration of diverse stakeholders, including public and private sectors, climate finance assumes a pivotal role in achieving the objectives outlined in landmark international agreements, such as the Paris Agreement and the Sustainable Development Goals (SDGs) (OECD, 2021).

## Objectives

- **Comprehensive Global Analysis:** To examine funding sources, scrutinise allocation patterns, and explore the evolving dynamics shaping the international climate financing landscape.
- **Clarity on Goals:** To define the collective aspirations shaping the course of climate financing, encompassing both international and regional commitments.
- **Exploration of Southeast Asia Countries:** To conduct a detailed exploration of climate financing within Southeast Asian countries, focusing on pilot cities and their unique local contexts (ADB, 2021).
- **Definition of Local Perspectives:** To provide an in-depth exploration of climate financing within each pilot city, highlighting challenges and innovative solutions.
- **Best Practices Dissemination:** To extract invaluable lessons from successful approaches adopted by cities in securing climate finance through case studies and examples.
- **Gaps Identification:** To identify existing gaps in climate financing within Southeast Asian countries and cities, shedding light on areas requiring strategic interventions.
- **Development of Recommendation Strategies:** To formulate tailored recommendations for climate financing strategies at the local level, thereby providing actionable pathways for sustainable climate finance practices.



## Methods

- **Framework Development:** This research started with the development of a comprehensive framework, ensuring timely and standardised project delivery. This framework was guided by principles aimed at avoiding redundant efforts, maintaining scientific aspects, and fostering the spirit of co-creation.
- **Secondary Data Collection:** This research includes a diverse array of secondary data, including reports, regulations, policies, and academic articles. These data were collected from various sources to maximise the depth of results.
- **Desk Study:** The collected secondary data underwent thorough analysis through a desk study approach. This involved extracting relevant information from previous studies, policies, and project reports related to climate change and climate action initiatives.
- **Stakeholder Engagement for Primary Data Collection:** Primary data was collected through the facilitation of Focus Group Discussions (FGDs) involving representatives from beneficiary groups, including senior government officials and development partner representatives.
- **Analysis:** Data analysis encompassed a variety of methods, including coding method analysis for the literature review and FGDs, content analysis of Climate Action Plans (CAP) documents, and gap analysis to identify discrepancies between expectations and experiences in climate action initiatives.
- **Strategy and Recommendation:** Building upon the findings from the gap analysis, strategies were formulated to address identified gaps and optimise efforts towards meeting the evolving needs of climate action initiatives.

## Findings

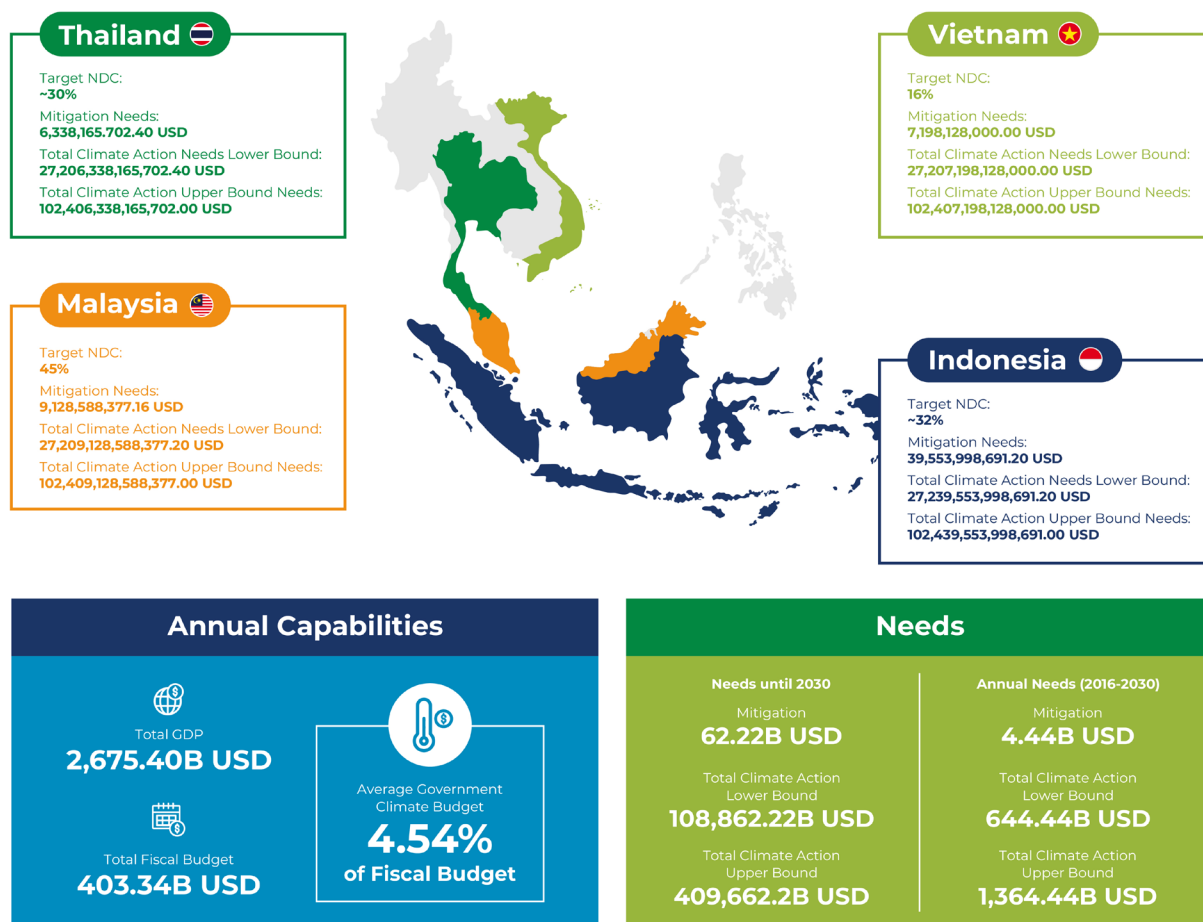
In evaluating the cost associated with reducing one ton of carbon dioxide equivalent (CO<sub>2</sub>e), it is essential to consider the inherent variability influenced by intervention types, technologies, and sectors. The variability of estimates arises from different studies due to varying assumptions and methodologies. Studies conducted by Gillingham & Stock (2018), Mooney (2014), and Ashworth (2022) provide illustrative examples:

- Substituting coal-fired electricity generation with the wind: Estimated cost of USD 29 per ton of CO<sub>2</sub>e.
- Implementing weatherisation measures in residential homes: Estimated cost of USD 31 per ton of CO<sub>2</sub>e.
- Transitioning to electric vehicles: Estimated cost of USD 58 per ton of CO<sub>2</sub>e.
- Implementing carbon capture and storage technology in natural gas power plants: Estimated cost of USD 78 per ton of CO<sub>2</sub>e.
- Afforestation initiatives such as planting trees: Estimated cost of USD 100 per ton of CO<sub>2</sub>e.

These figures represent short-term costs, which measure the initial expenditures and emissions reductions over the lifespan of a project. However, long-term costs may differ from these estimates, taking into account spillover effects, such as innovation and learning-by-doing. Gillingham & Stock (2018) and the International Monetary Fund or IMF (2019) propose subsidising solar and wind energy generation, which could potentially lead to cost reductions over time, rendering them more competitive with fossil fuel alternatives. Conversely, Enkvist, Naucler, & Rosander (2007) posit a different perspective, indicating that the average cost for reducing one ton of greenhouse gas (GHG) emissions could be up to EUR 40, approximately equivalent to USD 43.3.

The *Adaptation Gap Report* (2022) highlights the substantial financial needs, estimating them to range between USD 160 to 340 billion annually by 2030 for developing countries. Similarly, from a city-centric perspective, the State of Cities climate finance report indicates that the cost of adaptation falls within the range of USD 11 to 20 billion (UNEP, 2022). These figures underscore the significant financial resources required for both mitigation and adaptation measures.

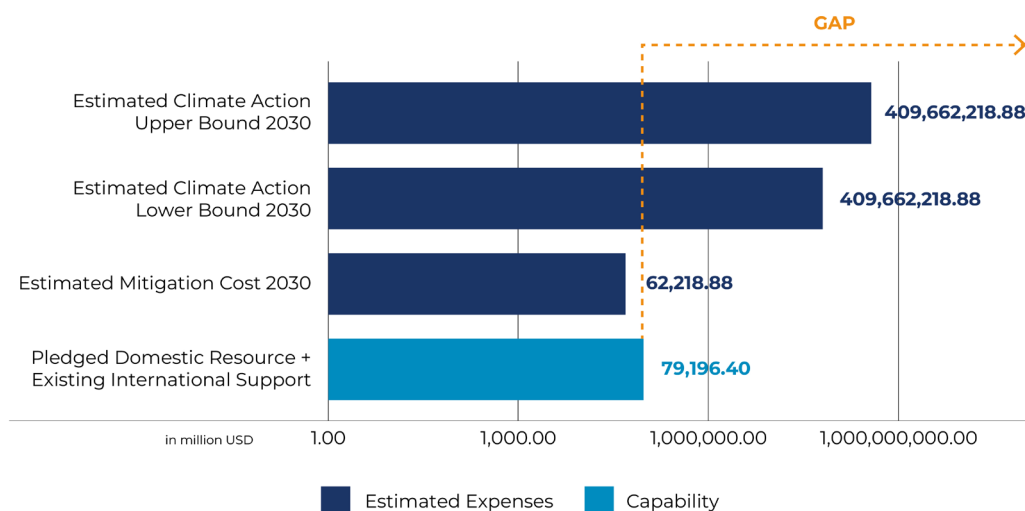
With the need to focus on the outlook of climate financing, particularly in countries in Southeast Asia (SEA), such as Indonesia, Malaysia, Thailand, and Vietnam, this study includes an examination of the costs associated with climate action within the studied SEA countries (Figure 1).



**Figure 1: Aggregated Capabilities and Needs of Four Studied Countries in 2030**

In examining the needs versus capabilities of SEA countries, there are significant disparities between the financial requirements for addressing climate-related challenges and the resources available for access.

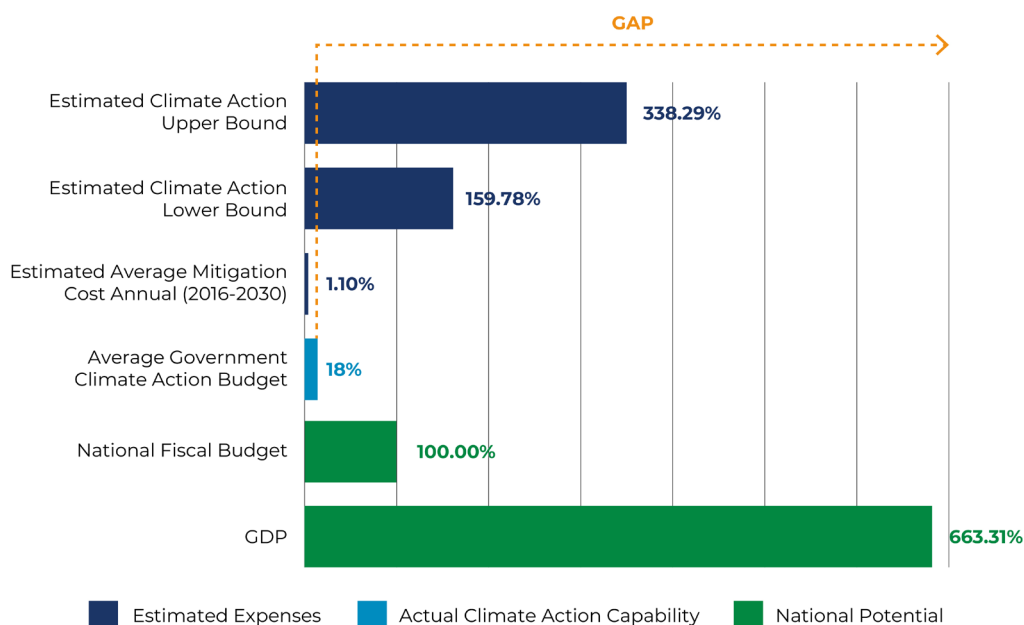
In terms of capability, the domestic resources pledged for climate actions by SEA countries for the year 2030 amount to approximately USD 27,959.16 million. This figure is supplemented by international support received until 2021, amounting to a total of USD 51,237.24 million. When combined, the pledged domestic resources and existing international support amount to USD 79,196.40 million. While this demonstrates a significant commitment to climate action, it falls short of the extensive financial resources required to meet the region's climate-related needs (Figure 2).



**Figure 2: Gap between Estimated Cost of Climate Action and Domestic Resources and International Support in Studied SEA Countries in 2030**

The projected mitigation cost for the year 2030 in SEA countries is notably higher, standing at USD 62,218.88 million. Additionally, the estimated lower and upper bounds for climate action costs in 2030 are approximately USD 108.86 million and USD 409.66 million respectively. These figures underscore the substantial financial requirements entailed in implementing climate mitigation and adaptation measures across the region (Figure 2).

A thorough analysis of the annual comparison between capability and needs in SEA countries reveals a challenging scenario where the financial requirements for climate action significantly exceed the available resources.



**Figure 3: Gap in Conducting Climate Action Compared to Annual Country's Capability in Studied SEA Countries**

In terms of capability, the total Gross Domestic Product (GDP) of four (4) studied SEA countries stands at a significant USD 2,675.40 billion, indicating a strong economic foundation. Moreover, the accumulated national fiscal budget is set at USD 403.34 billion, demonstrating a substantial financial commitment from the country governments. However, when considering the average government climate action budget, which commonly amounts to 18% of the total national budget, the proportionate allocation of resources to climate action remains relatively modest in comparison to the overall budget (Figure 3).

The needs for climate action present a sobering reality. The estimated average mitigation cost annually from 2016 to 2030 stands at approximately USD 4.44 billion representing a substantial financial burden. Furthermore, the annual climate action costs, encompassing both the lower and upper bounds, are staggering, amounting to USD 644.44 billion and USD 1,364.44 billion respectively. These figures underscore the magnitude of financial resources required to effectively address climate change on an annual basis (Figure 3).

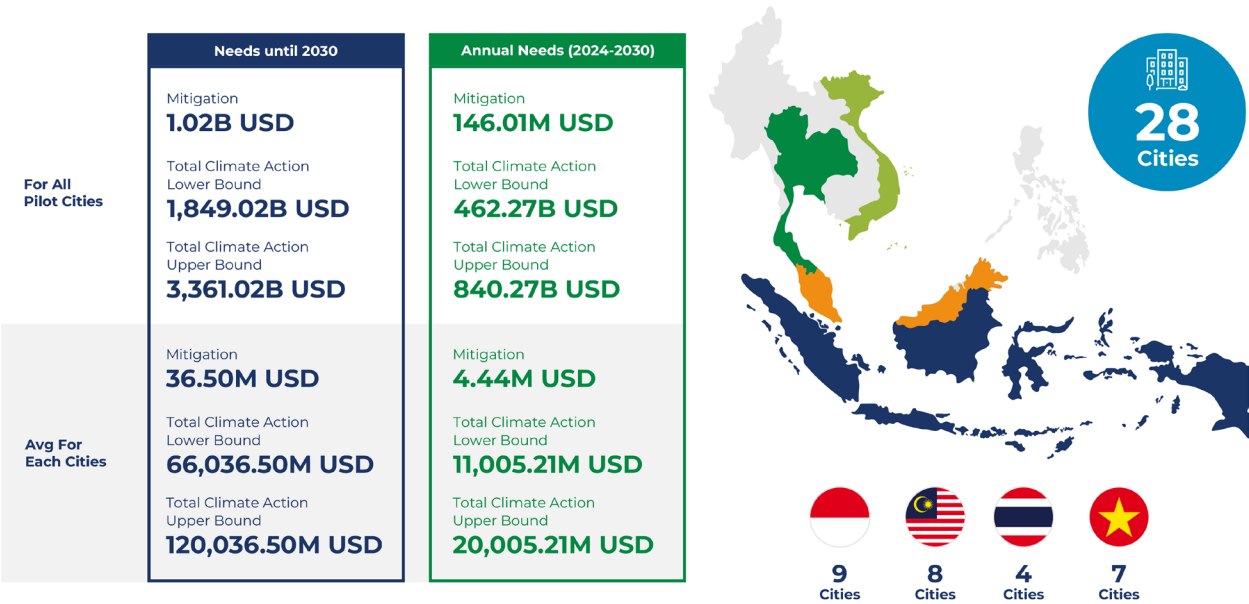


Figure 4: Aggregated Annual Capabilities and Needs of Cities in Studied SEA Countries

Delving into city-level dynamics within SEA, the provided data illustrates the estimated annual mitigation costs and total annual costs of climate action needed for the 28 pilot cities, alongside average figures for each city in the region (Figure 4). These estimates provide insights into the financial requirements associated with both mitigating and addressing the impacts of climate change at the city level.

It is crucial to acknowledge a significant disparity between the estimated costs and the known budgetary capabilities of these cities. While the data highlights substantial financial demands for climate action, particularly concerning the upper bounds, the actual budgetary capacity of the cities remains uncertain. This disparity underscores a critical challenge in accessing the necessary climate finance to effectively fund these initiatives.

These data emphasise the pressing need for enhanced financial mobilisation and innovative financing mechanisms to support cities in their climate action initiatives.

Accessing climate finance is imperative for cities to effectively address climate change challenges. It becomes apparent that there are significant obstacles regarding climate finance accessibility. Despite having identified the need for climate action, cities encounter limitations in accessing the necessary financial resources to implement comprehensive initiatives.

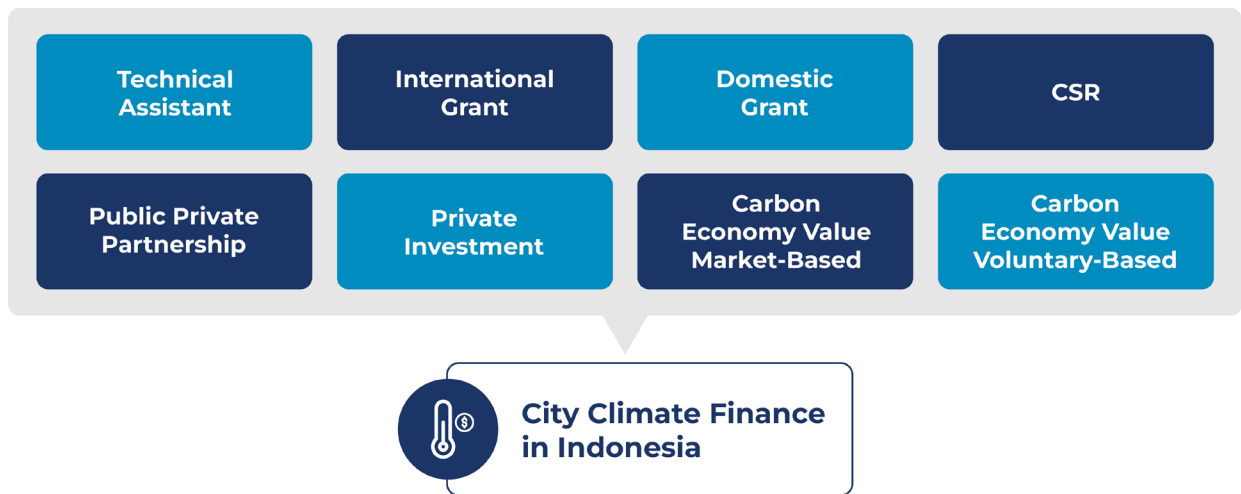


Figure 5: Accessible Financial Schemes for Cities in SEA countries

The analysis reveals the existence of a variety of financing instruments, presenting potential avenues for funding climate actions in cities (Figure 5). However, the accessibility of these instruments varies, posing obstacles to effective utilisation. While international grants are available, they may require intricate coordination with national-level authorities, thereby adding complexity to the process. Similarly, emerging schemes like carbon economic value present regulatory uncertainties, which requires additional support and coordination at the city level to ensure access.

### Strategy and Recommendation

In light of existing challenges, it is crucial for cities to navigate the landscape of climate finance strategically. This involves leveraging accessible financing options, such as technical assistance and national grants, while actively engaging with national-level authorities to facilitate access to other available mechanisms. The variation in financing scheme accessibility across cities underscores the importance of tailored approaches and coordinated efforts to address the diverse needs and circumstances of each city and local government.

The pursuit of sustainable development and resilience against climate change hinges significantly on the availability and accessibility of climate finance. However, our analysis reveals a significant gap between the resources pledged for climate actions and the actual needs, presenting substantial challenges to effective climate action implementation at both national and city levels in SEA countries.



At the national level, the challenges primarily revolve around policy alignment, coordination mechanisms, and the predominant focus on mitigation over adaptation. Limited engagement with development partners and the lack of integrated planning further widen the gap between needs and capabilities.

Meanwhile, cities face their own set of challenges, including limited access to funds, restricted engagement in matchmaking programmes, and insufficient knowledge and capacity for practical planning and decision-making.

Strategic interventions are essential at all levels to address these challenges. At the national level, policymakers must enhance policy frameworks, strengthen coordination mechanisms, and promote transparency and accountability in climate finance management. City-level efforts should focus on capacity building, streamlining administrative procedures, and promoting stakeholder engagement to effectively access and utilise climate finance resources. Development partners play a crucial role in providing technical assistance, facilitating knowledge sharing, and establishing matchmaking mechanisms to bridge the gap between cities and funders.

Tailored recommendations have been formulated to address the specific contexts and challenges faced by national governments, city-level authorities, and development partners. These recommendations underscore the importance of collaboration, innovation, and capacity building in unlocking the potential of climate finance to drive sustainable development and resilience in the region.

While Southeast Asian countries demonstrate significant economic capacity and governmental fiscal resources, the annual financial needs for effective climate action far surpass the available resources. Bridging this gap necessitates enhanced financial mobilisation, innovative financing mechanisms, and international cooperation. By leveraging collaborative partnerships with development partners and exploring new avenues, such as green bonds and public-private partnerships (PPP), countries can unlock additional funding sources to support more comprehensive climate action initiatives. Furthermore, by fostering international cooperation and leveraging global climate finance mechanisms, countries can access the support needed to implement impactful climate action initiatives. Through concerted efforts and strategic interventions, national governments, city-level authorities, and development partners can work together to address the challenges in accessing and utilising climate finance, ultimately advancing climate action goals and building resilience to climate change impacts, thereby creating a more sustainable future for generations to come.

# GLOSSARY

ADB	:	Asian Development Bank
ASEAN	:	Association of Southeast Asian Nations
AVG	:	Average
BaU	:	Business as Usual
BUR	:	Biennial Update Report
CAP	:	Climate Action Plan
CAPEX	:	Capital Expenditures
CO <sub>2</sub>	:	Carbon dioxide
CSO	:	Civil Society Organisations
CSR	:	Corporate Society Responsibility
e	:	Equivalent
EU	:	European Union
EUR	:	European Euro
FDI	:	Foreign Direct Investment
FGD	:	Focus Group Discussion
FS	:	Feasibility Study
GCF	:	Green Climate Fund
GCoM	:	Global Covenant of Mayors for Climate and Energy
GDP	:	Gross Domestic Product
GHG	:	Green House Gasses
GRC	:	Global-Regional Coherence
IMF	:	International Monetary Fund
IPCC	:	Intergovernmental Panel on Climate Change
IUC	:	International Urban Cooperation
M&E	:	Monitoring and Evaluation
MAF	:	Mitigation Action Facility
MDB	:	Multilateral Development Bank
NDC	:	Nationally Determined Contribution
NGO	:	Non-Governmental Organisations
OECD	:	Organisation for Economic Co-operation and Development
OPEX	:	Operational Expenditures
PA	:	Paris Agreement
PFS	:	Pre-Feasibility Study
PPF	:	Project Preparation Facility
PPP	:	Public Private Partnership

REDD+	:	Reducing Emissions from Deforestation and Forest Degradation
SDGs	:	Sustainable Development Goals
SEA	:	Southeast Asia
TA	:	Technical Assistance
TAP		Transformative Actions Program
UCLG ASPAC	:	United Cities and Local Government Asia Pacific
UNDP	:	United Nations Development Programme
UNEP	:	United Nations Environment Programme
UNESCAP	:	United Nations Economic and Social Commission for Asia and the Pacific
UNFCCC	:	United Nations Framework Convention on Climate Change
USD	:	United State Dollar
VCM	:	Voluntary Carbon Market
WB	:	World Bank

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# 01. Background

## Climate Action and Finance

Climate finance is a pivotal force in the global fight against climate change, serving as a catalyst to mobilise resources and confront the multifaceted challenges posed by climate-related issues. On the international stage, climate finance encompasses a variety of financial instruments carefully designed to bolster mitigation and adaptation initiatives. Its primary aim is to strengthen the resilience of communities vulnerable to the impacts of climate change, guiding countries toward sustainable development and low-carbon practices.

Within the realm of climate finance, funding can originate from various sources, including public and private sources, as well as domestic and international contributors. These funds can be allocated towards mitigation strategies, aiming to reduce greenhouse gas (GHG) emissions, or adaptation efforts, which strengthen communities against the impacts of a changing climate. This financial support becomes particularly crucial in guiding countries toward achieving the objectives outlined in international agreements, such as the Paris Agreement (PA) and the Sustainable Development Goals (SDGs).

Climate action demands substantial financing, and the financial commitment required is undeniably significant. It is an investment-intensive endeavour that requires resources for developing and implementing transformative projects. One illustrative measure to assess this financial commitment is the cost associated with reducing one ton of carbon dioxide equivalent (CO<sub>2</sub>e). The financial outlay required to achieve this reduction is a critical consideration in climate finance discussions. Understanding these costs highlights the financial scale and commitment necessary to achieve tangible impacts in the global fight against climate change.

In essence, climate finance is not only about allocating funds, it represents an investment in a sustainable future. It entails the strategic deployment of resources that transcend borders and sectors, reflecting a collective commitment to mitigating the adverse effects of climate change and fostering a resilient and sustainable global community.

The cost of reducing one ton of CO<sub>2</sub>e depends on the type of intervention, technology, and sector involved. Due to different assumptions and methodologies used across studies, there is no single definitive answer to estimate the cost. However, recent literature provides some examples of the cost of reducing one ton of CO<sub>2</sub>e (Gillingham & Stock, 2018; Mooney, 2014; and Ashworth, 2022):

- Replacing coal-fired electricity generation with the wind: USD 29 per ton of CO<sub>2</sub>e
- Weatherising a home: USD 31 per ton of CO<sub>2</sub>e
- Adopting electric vehicles: USD 58 per ton of CO<sub>2</sub>e
- Capturing and storing carbon from natural gas power plants: USD 78 per ton of CO<sub>2</sub>e
- Planting trees: USD 100 per ton of CO<sub>2</sub>e

These figures represent short-term costs, measuring upfront expenditures and emissions reductions over a project's lifespan. However, some interventions may entail lower long-term costs, considering spillover effects like innovation and learning-by-doing. For instance, subsidising solar and wind generation may induce technological improvements and cost reductions over time, making them more competitive with fossil fuels (Gillingham & Stock, 2018 and IMF, 2019). Conversely, another study (Enkvist, Naucner, & Rosander, 2007) suggests that the average cost of reducing one ton of GHG emission is up to EUR 40 or approximately USD 43.3 as of March 2024.

Addressing climate change will not be complete without adaptation efforts. Based on the Adaptation Gap Report (2022) the annual needs for adaptation in developing countries range from USD 160 to 340 billion by 2030. Moreover, from a city perspective, the cost of adaptation falls between USD 11 to 20 billion (UNEP, 2022). These figures underscore the substantial financial resources required to enhance resilience and mitigate the impacts of climate change at all levels.

## **Global Architecture of Climate Financing Status**

The landscape of global climate finance has evolved significantly since the establishment of the United Nations Framework Convention on Climate Change (UNFCCC) in 1992. The Convention laid the groundwork for various mechanisms and funds, such as the Green Climate Fund (GCF), the Adaptation Fund, and climate-related components integrated into traditional development finance institutions, aimed at supporting developing nations in their climate action. These entities collectively contribute to the mobilisation and allocation of financial resources crucial for addressing climate challenges on a global scale (IPCC, 2014)

Both multilateral and bilateral contributions play crucial roles in climate finance. Multilateral development banks, including the World Bank (WB), and regional development banks, provide essential support through concessional loans and grants to countries. Developed countries also offer bilateral contributions directly to developing countries, often earmarking these funds for climate-related projects and programmes. These financial flows are strategically directed to help developing nations face unique challenges in mitigating and adapting to the impacts of climate change (IPCC, 2014)

The Paris Agreement marked a pivotal moment in the global climate effort, solidifying commitments to climate finance. Adopted in 2015, the agreement established a comprehensive framework to mobilise finance on an unprecedented scale. Developed nations pledged to collectively mobilise USD 100 billion annually by 2020, with a commitment to further increase financial support post-2020. This substantial financial backing aims to empower developing countries to achieve their climate goals while adapting to the impacts of climate change. However, the latest report by the Organisation for Economic Co-operation and Development (OECD) reveals that global climate finance reached USD 79.6 billion in 2019, reflecting a 2% increase from 2018. Despite this growth, it falls short of the USD 100 billion per year target for 2020, underscoring the existing gap in financial commitments (OECD, 2021). Moreover, the distribution of climate finance is uneven across regions and sectors, with adaptation finance accounting for only 21% of the total, and the least developed countries and small island developing states receiving only 14% and 2% respectively (OECD, 2021).



## Climate Finance in Southeast Asia

In Southeast Asia (SEA), climate finance holds crucial importance due to the region's heightened vulnerability to the adverse effects of climate change. SEA countries face a range of climate-related challenges, including rising temperatures, sea-level rise, extreme weather events, and biodiversity loss. Notably, four Association of Southeast Asian Nations (ASEAN) countries—Myanmar, the Philippines, Vietnam, and Thailand—were ranked among the top ten nations most affected by extreme weather events from 1999 to 2018, according to the Global Climate Risk Index developed by GermanWatch. Addressing these challenges necessitates investment in low-carbon and climate-resilient development, requiring substantial financial resources (OECD, 2021 and Eckstein, Kunzel, Schafer, & Winges, 2020).

A report by the Asian Development Bank (ADB) indicates that climate finance inflows to SEA countries amounted to USD 22.9 billion in 2019, marking a 12% increase from the previous year (ADB, 2021). Public sources accounted for 87% of this finance, with multilateral development banks (MDBs) and bilateral donors being primary contributors. In contrast, the private sector contributed only 13%, primarily through foreign direct investment (FDI) and commercial loans. Indonesia, Vietnam, and the Philippines were the largest recipients of climate finance in the region, receiving USD 7.5 billion, USD 6.6 billion, and USD 3.6 billion, respectively. Energy, transport, and agriculture emerged as the main sectors receiving climate finance, comprising 40%, 24%, and 10%, respectively. Mitigation projects received a substantial share (82%) compared to adaptation projects (18%) (ADB, 2021).

Opportunities and challenges are abundant for enhancing climate finance in SEA countries. Utilising green bonds, which have seen significant issuance in SEA countries, presents a promising avenue for financing environmentally friendly projects. National development banks (NDBs) can play a crucial role by providing long-term and concessional financing, technical assistance (TA), and policy support for climate projects. It is crucial to strengthen the enabling environment for climate finance by improving policy frameworks and enhancing institutional capacities. Challenges include addressing financing gaps, balancing trade-offs and co-benefits, and navigating the impacts of the COVID-19 pandemic. Despite the challenges, the pandemic also presents an opportunity for SEA countries to rebuild in a more sustainable and resilient manner by integrating climate considerations into recovery plans and stimulus packages (Martinus & Qiu, 2022).

In conclusion, climate finance serves as a key driver for Southeast Asian countries in advancing low-carbon and climate-resilient development. While some significant gaps and challenges require attention, there are ample opportunities and potential. Enhancing domestic capacities, collaborating with international partners, and ensuring effective and efficient mobilisation and access to climate finance are essential steps for SEA countries to successfully navigate the complex landscape of climate finance.

## Cities in Southeast Asia

Continuing from the broader context of climate finance in Southeast Asia, it is imperative to explore the specific landscape of climate financing for cities within the region. While the financing framework for national climate action provides a foundation, city-level initiatives require tailored approaches. This is because cities play a pivotal role in both contributing to GHG emissions and implementing impactful climate mitigation and adaptation measures. As urbanisation intensifies across SEA, the need for sustainable urban development becomes increasingly urgent.

SEA faces escalating climate challenges, from rising temperatures to sea-level rise, demanding urgent responses, particularly in its cities. Urban climate financing has emerged as a critical strategy for SEA's sustainable development, tailored to address city-specific vulnerabilities. Leading cities like Jakarta, Ho Chi Minh City, and Metro Manila prioritise collaboration among local governments, communities, and the private sector, aligning with local governance structures (IPCC, 2014). Projects prioritise inclusivity, targeting vulnerable communities, and contributing to equitable urban development through transformative approaches (UNESCAP, 2021).

Challenges persist, including limited access to finance and capacity constraints, but opportunities arise from innovative financing mechanisms and private sector engagement (OECD, 2021). Despite these challenges, SEA cities demonstrate transformative initiatives such as Bangkok's flood resilience measures and Ho Chi Minh City's climate-smart urban development, showcasing the region's commitment to building climate-resilient urban landscapes (World Bank, 2015; UNESCAP, 2021; and ADB, 2019).

## Support for Cities

The United Cities and Local Governments Asia Pacific (UCLG ASPAC), an association of cities and local governments, plays a pivotal role in addressing climate change challenges through strategic partnerships and initiatives. Serving as the Secretariat of the Global Covenant of Mayors for Climate and Energy (GCoM) Southeast Asia, UCLG ASPAC coordinates GCoM Global-Regional Coherence (GRC) in the Asia Pacific region. Positioned at the forefront of climate resilience, UCLG ASPAC also implements the European Union (EU)-funded Climate Resilience Inclusive Cities (CRIC) project, demonstrating a commitment to supporting cities and local governments in climate actions.

The EU allocates resources, with a budget of EUR 5.2 million for the implementation of the GCoM Asia Project (EU, 2022). This financial commitment empowers countries like Indonesia, Malaysia, Thailand, and Vietnam to develop comprehensive Climate Action Plans (CAPs). These plans encompass essential elements, including CO<sub>2</sub> emission inventories, reduction goals, and risk analyses, fostering a holistic approach to climate action. The project extends beyond planning, providing technical assistance and establishing monitoring and reporting mechanisms crucial for aggregating achievements at the local level, setting a noteworthy example of effective climate financing in supporting cities in SEA countries.

In the pursuit of climate change mitigation and adaptation goals, in alignment with the Paris Agreement, it is essential to strategically pause and evaluate the collective efforts of countries and cities. This moment of reflection serves as a pit stop, allowing for a thorough assessment of the progress made in combating the challenges of climate change. Specifically focusing on climate financing, this reflective pause allows for a comprehensive overview to evaluate the effectiveness of initiatives undertaken by countries and cities in the region.

As the secretariat of GCoM SEA, UCLG ASPAC offers a nuanced outlook in this study, examining the climate financing efforts of four Southeast Asian countries and the influence of strategic partnerships forged with these pilot cities. Given the pivotal role that SEA countries play, not only in the context of Asia but also on the global stage, this pit stop is an urgent necessity. It provides a focused lens to assess the progress made in climate financing, highlighting its crucial role in bolstering climate actions. Therefore, this pit stop stands as a crucial juncture, offering a dedicated vantage point to assess, reflect, and envision the trajectory of climate financing in SEA countries.

## 02. Objectives

### Elevating Horizons: A Strategic Pit Stop for Climate Financing Insights of Southeast Asia

This study is a comprehensive assessment and an overview of the multifaceted landscape of climate financing in Southeast Asia. Aligned with our strategic objectives, this study allows for a “pit stop” providing deliberate evaluation that transcends boundaries. This study's objectives are as follows:

- 1. Comprehensive Global Analysis:** This viewpoint expands beyond borders, unravelling the dynamics of global climate financing. This study examines funding sources, investigates allocation patterns, and explores the evolving dynamics that define the international climate financing landscape.
- 2. Clarity on Goals:** This study's exploration is guided by aspirational goals directing climate financing endeavours. From international to regional commitments, this study aims to define the collective aspirations shaping the course of climate financing.
- 3. Exploration of Southeast Asia Countries:** This study embarks on a detailed exploration of climate financing within the region. This study focuses on countries hosting pilot cities, such as Indonesia, Malaysia, Thailand, and Vietnam, where the local nuances of climate funding come into sharper focus.
- 4. Definition of Local Perspectives:** Descending to the local level, this study conducts an in-depth exploration of climate financing within each pilot city. From urban challenges to innovative solutions, we navigate through the details of local climate financing landscapes.
- 5. Best Practices Dissemination:** This study observes cities' best practices in navigating the climate financing landscape. Through case studies, this study derives invaluable lessons on the effective approaches adopted by cities in securing climate finance.
- 6. Gaps Identification:** Identifying existing gaps in climate financing within Southeast Asian countries and cities is critical. This process sheds light on areas requiring strategic interventions and enhancements.
- 7. Development of Recommendation Strategies:** This study tailors recommendations for climate financing strategies at the local level. These recommendations are customised to the unique contexts of cities, offering actionable pathways for sustainable climate finance practices.

In this pit stop, we move beyond conventional perspectives, elevating our viewpoint to examine the expansive landscape of climate financing. Our objectives align with a commitment to not only understand the current state but also to identify strategic pathways for resilient and sustainable futures at both global and local levels.

## 03. Methods

The development of this document's goals consists of six key steps, as explained in Figure 6 below.



Figure 6: *Development Process of Climate Finance Outlook of SEA*

**Framework Development** – This research started with the development of a framework, ensuring timely project completion with standardised quality. Three guiding principles were employed: 1) avoid redundancy; 2) ensure scientific and conceptual rigour; and 3) facilitate co-creation.

**Secondary Data Collection** – This study collected and utilised secondary data, including published reports, regulations, policies, and academic papers. Additionally, data was gathered through comprehensive searches on various search engines to maximise results.

**Desk Study** – Following secondary data collection, the study underwent a desk study process to analyse the collected data. This involved extracting information, data, and knowledge from previous studies, policies, and project reports related to climate change and climate actions. The primary resource utilised was the Climate Action Plan (CAP) documents from the pilot cities.

**Stakeholder Engagement for Primary Data Collection** – Primary data were also derived from five Focus Group Discussions (FGD) meetings with representatives of the beneficiary groups, such as governments and development partners. The FGD served as a platform to explore potential government involvement in the initiative.

**Analysis** – Data analysis was conducted through the following methods:

1. Coding method analysis for literature review and FGD data.
2. Content analysis of CAP documents across Southeast Asian countries.
3. Gap analysis provided empirical insights into gaps arising from inconsistent perceptions of expectations and experiences in climate action.

**Strategy and Recommendation** – Using the insights gained from the gap analysis, strategies were developed to address identified gaps and optimise efforts to effectively meet the needs.

## 04. The Ultimate Goals of Climate Action

### Global Context: Holistic Goals for Global Climate Action

Climate financing serves as a crucial tool in addressing the global challenges posed by climate change, particularly in developing countries, with overarching goals that guide international efforts. The ultimate objectives of climate financing, as outlined in various international agreements and reports, entail a holistic approach to combatting climate change and fostering sustainable development. These goals, supported by key references, such as the Global Landscape of Climate Finance 2023, the Organisation for Economic Co-operation and Development (OECD) report on Climate Finance and the USD 100 Billion Goal, and the United Nations Framework Convention on Climate Change (UNFCCC) webpage on the New Collective Quantified Goal on Climate Finance, underscore the following key aspects:

#### 1. GHG Emission Reduction and Net-Zero by 2050

The primary purpose of climate financing is the reduction of greenhouse gas (GHG) emissions, aligning with global efforts to achieve net-zero emissions by 2050. This ambitious target aims to mitigate the impacts of climate change and transition to a low-carbon future (IPCC, 2014). Highlighting this ambitious goal, the International Energy Agency's (IEA) "Net Zero by 2050" report suggests that achieving global net-zero emissions by 2050 would require an annual investment in the energy sector of approximately USD 4 trillion by 2030 (OECD, 2021).

#### 2. Enhancing Adaptive Capacity and Resilience

Climate financing aims to enhance the adaptive capacity and resilience of vulnerable communities and ecosystems to the impacts of climate change. This goal recognises the disproportionate effects of climate change, especially on developing countries. To address this problem, the Global Centre on Adaptation has called for a significant increase in funding for adaptation, with estimates reaching USD 180 billion annually by 2030 (Gillingham & Stock, 2018). Furthermore, the Global Commission on Adaptation's flagship report, "Adapt Now," highlights the potential for high returns on investment in climate adaptation initiatives (OECD, 2021).

#### 3. Alignment with the Paris Agreement and SDGs

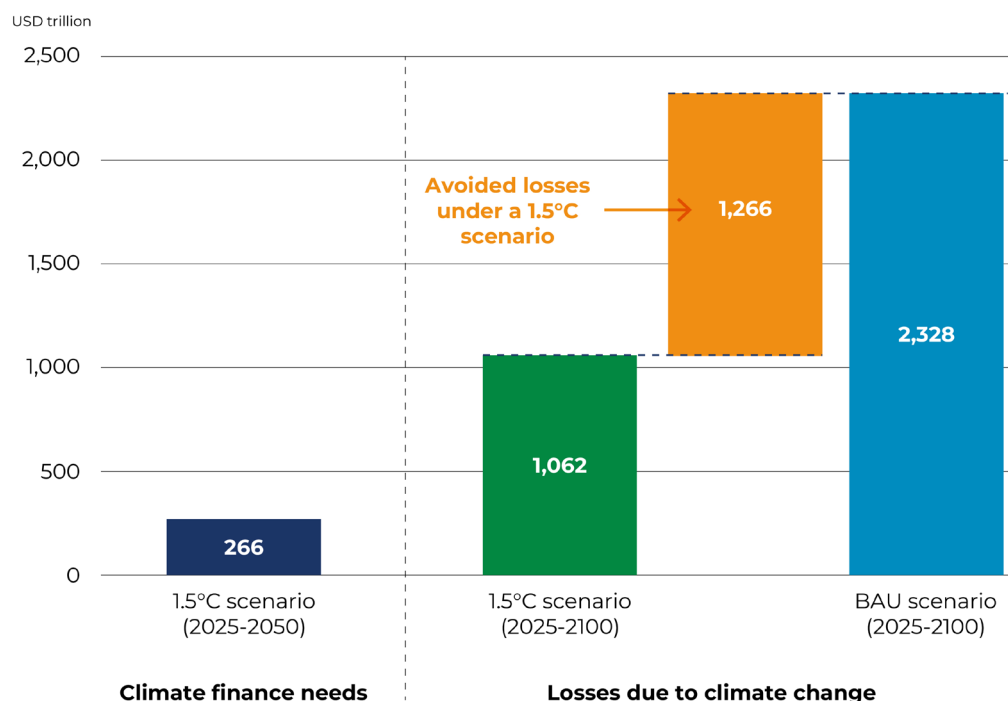
Climate financial flows are expected to align with the objectives of the Paris Agreement (PA) and Sustainable Development Goals (SDGs). As a global framework for climate action, the PA plays a pivotal role in shaping the direction of climate financing. Additionally, aligning financial flows with the SDGs ensures a comprehensive approach to sustainable development and climate action. The United Nations Conference on Trade and Development (UNCTAD) estimates that achieving the SDGs requires an annual investment of USD 5 to 7 trillion globally (Ashworth, 2022).

#### 4. Supporting a Just and Inclusive Transition to a Low-Carbon Future

Climate financing seeks to support a just and inclusive transition to a low-carbon and climate-resilient future. This goal underscores the importance of considering equity, inclusivity, and social justice in climate-related initiatives, ensuring that the transition benefits all communities, particularly those most vulnerable to climate impacts (IPCC, 2014). While quantifying specific funding needs for this transition is challenging, the concept of a "just transition fund" gains attention, highlighting the need for social safety nets, job transitions, and community inclusion.



Despite positive momentum, there is an urgent need for more substantial global action. Political willingness, emerging South-South climate financial flows, and increased public awareness are driving this momentum. Available funds estimated at USD 1.27 trillion in annual climate flows, must be strategically distributed to meet the estimated needs ranging from USD 5.4 trillion to USD 11.7 trillion annually until 2030 (Mooney, 2014). Looking ahead, the needs are projected to increase significantly, ranging between USD 9.3 and 12.2 trillion annually in the following two decades.



**Figure 7: Gap on Climate Finance**  
(Source: Mooney, 2014)

The projected social and economic costs of a warming world will far outstrip those of transition, and the costs of inaction will rise the longer we delay. Figure 7 illustrates how increasing climate investments to the levels needed by 2050 (USD 266 trillion cumulatively), will result in a considerable reduction in social and economic losses by 2100 of USD 1,266 trillion lower compared to a business-as-usual (BaU) scenario. Sticking to the BaU scenario would result in more than double the losses of a 1.5°C scenario (Mooney, 2014).

## Southeast Asia Context: Towards Regional Resilience

In Southeast Asia (SEA), climate financing plays a pivotal role, particularly in addressing the region's vulnerability to climate risks and fostering sustainable development. The provision of funds aimed at reducing GHG emissions and adapting to climate change is especially critical for SEA, given its susceptibility to rising sea levels, extreme weather events, and biodiversity loss. Moreover, the region faces challenges in meeting its energy demands, urbanisation, and economic development in a sustainable manner, underscoring the importance of climate financing in achieving climate goals and facilitating a green recovery from the COVID-19 pandemic. Estimates indicate that the region needs USD 210 billion annually for adaptation and mitigation investments, amounting to 5.7% of the region's GDP (OECD, 2021 and ADB, 2021).

According to a report by the Asian Development Bank (ADB), Asia and the Pacific received an estimated USD 75 billion in climate finance in 2019, with SEA accounting for around 20% of its total. The primary objectives of climate financing in SEA are aligned with the Nationally Determined Contributions (NDCs) of Southeast Asian countries under the PA, with a focus on promoting low-carbon growth and fostering a resilient recovery from the pandemic (OECD, 2021).

### Key Goals of Climate Financing in Southeast Asia

#### 1. Implementing NDCs under the Paris Agreement

The primary objective of climate financing is to support ASEAN countries in achieving their NDCs, which are voluntary commitments to reduce GHG emissions and adapt to climate change. These commitments vary in scope, ambition, and conditionality but they collectively emphasise sustainable development and low-carbon growth (OECD, 2021).

#### 2. Green and Resilient Recovery from COVID-19

Climate financing is directed towards fostering a green and resilient recovery from the COVID-19 crisis. Investments are channelled into sectors that contribute to both economic recovery and climate resilience, ensuring that the recovery is environmentally sustainable and socially inclusive (Eckstein, et al., 2020).

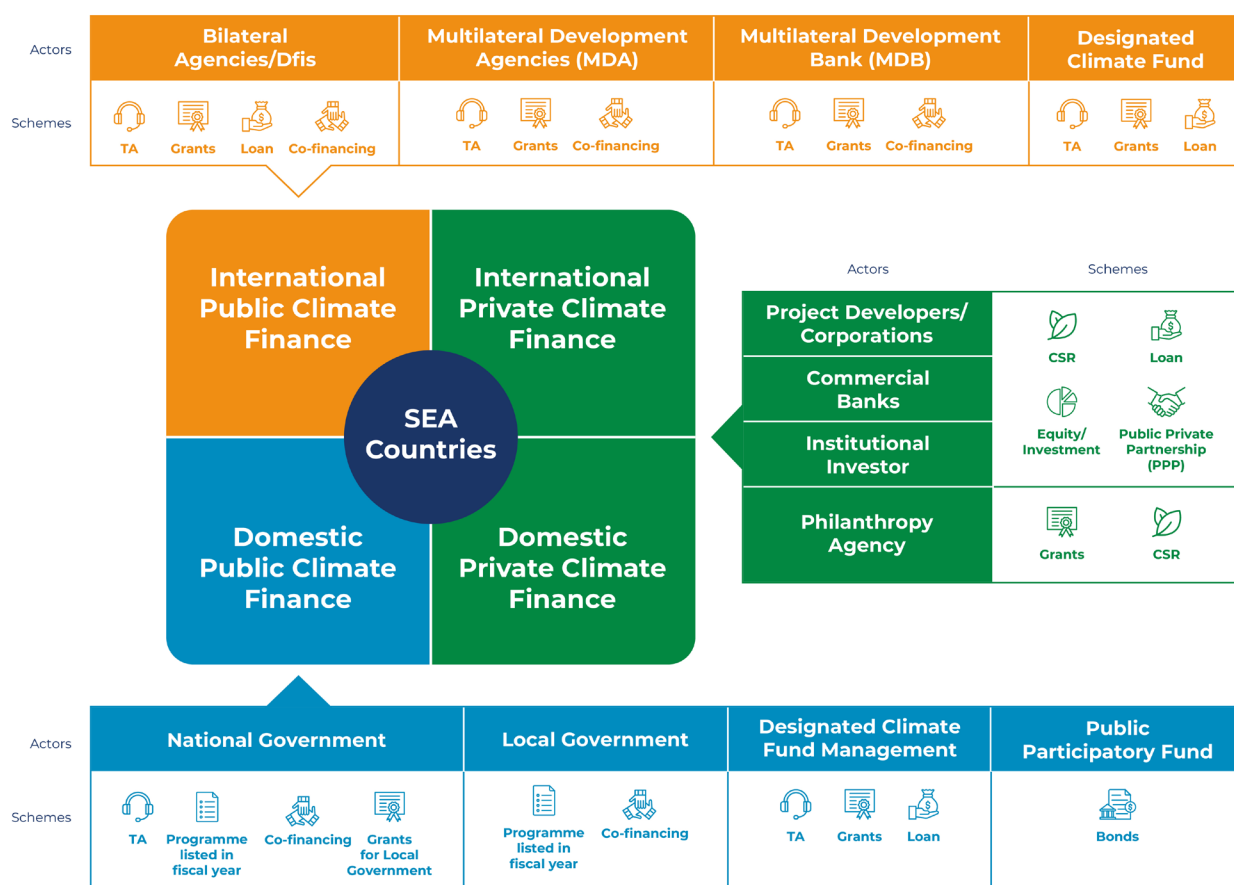
#### 3. Sectoral Focus Areas

Climate financing in SEA addresses key sectors and areas crucial for sustainable development, including renewable energy, energy efficiency, transportation, waste management, forestry, agriculture, water resources, coastal and marine ecosystems, and disaster risk reduction (OECD, 2021).

## 05. The Outlook: Climate Finance Landscape in Southeast Asia

This study examines the climate finance landscape across different levels, spanning from the regional level in Southeast Asia (SEA) to the national and local level (cities) participating in the International Urban Cooperation Asia (IUC Asia) Project and the Global Covenant of Mayors for Climate and Energy Asia (GCoM Asia) Project. The analysis concentrates on four countries: Indonesia, Malaysia, Thailand, and Vietnam, with particular insights drawn from a total of 28 pilot cities that have pledged their climate action through their respective Climate Action Plans (CAPs). This outlook serves as a platform to showcase the analysed information and data gathered during various meetings and events, as well as insights from existing reports and research. In addition, the description of efforts in climate action from SEA countries affiliated with UCLG ASPAC is explained as follows.]

### 5.1 Architecture of Climate Financing in SEA



**Figure 8: Climate Finance Architecture in Southeast Asia**  
(Source: modified from UNFCCC, 2022)

It is important to understand the architecture of the financing flow in the region, particularly those targeting climate change solutions. This understanding is key to the development of CAPs and facilitating the mobilisation of financing schemes. As a result, suitable strategies for accessing climate finance can be developed based on identified needs. Figure 8 illustrates how financing schemes function in SEA countries, specifically Indonesia, Malaysia, Thailand, and Vietnam. In general, there are four financing schemes based on the source of funding origin.

## International Public Climate Finance

There are four main entities within the international public climate fund component: bilateral agencies/development finance institutions (DFIs), multilateral development agencies, multilateral development banks (MDBs), and designated climate fund management (Figure 8). OECD data from 2000 to 2021 reveals that approximately USD 45,323 million has been committed to actions in the region. Bilateral agencies account for over 70% of this funding, with more than 80% as a debt instrument (Figure 9).

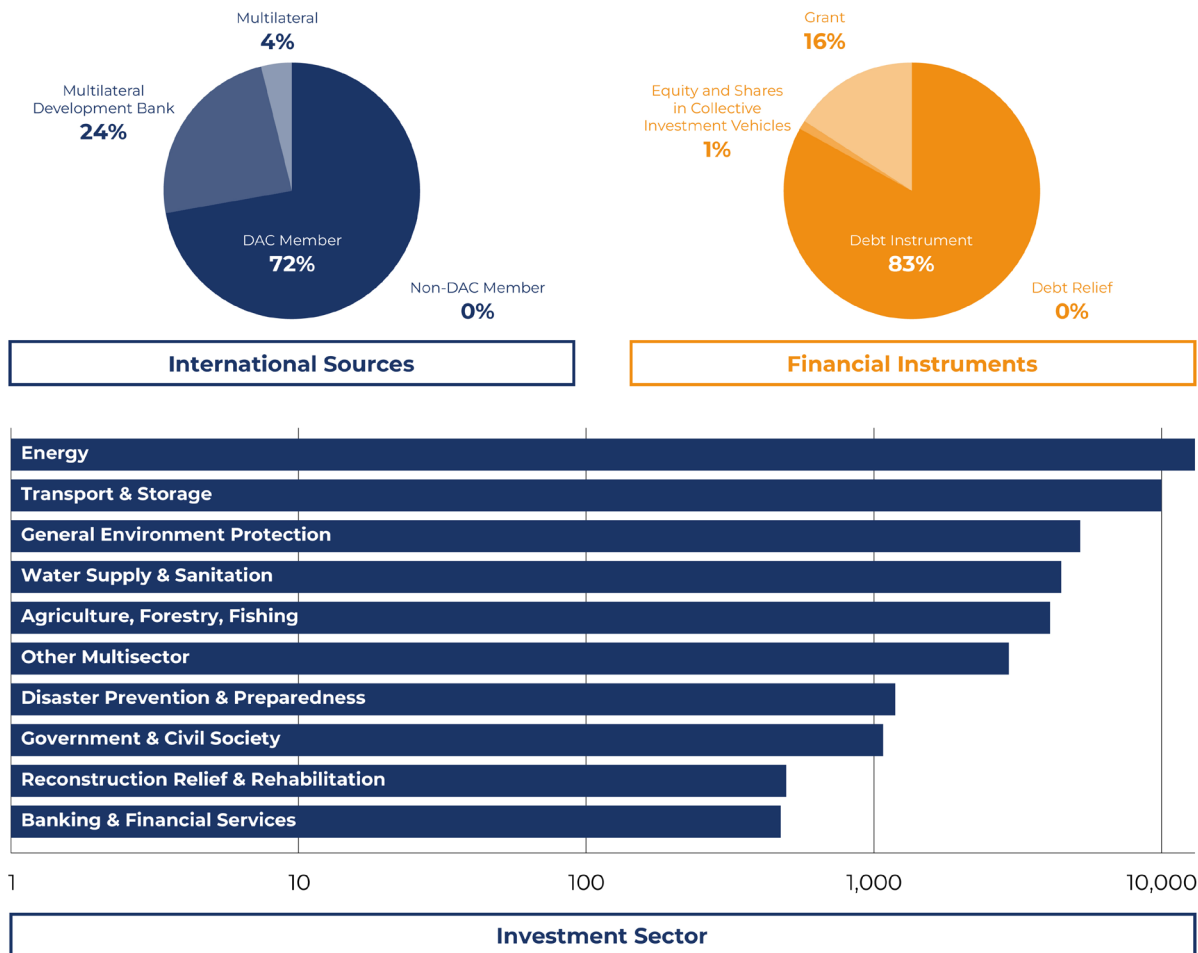


Figure 9: Sources, Instruments, and Sectors of International Public Climate Finance  
(Source: OECD, 2024)

The disbursement of this financing source was mainly used in mitigation actions and energy was the top sector in investment. Meanwhile, adaptation was not in the top three, the highest commitment to adaptation action is invested in the water sector.

### Bilateral Agencies

Bilateral agencies operating in the studied SEA countries, such as the Korea International Cooperation Agency (KOICA) and Japan International Cooperation Agency (JICA), have committed to finance climate actions. Bilateral agencies also include DFIs in financing climate action. According to the OECD, approximately USD 32,464 million has been invested in these SEA countries, with 79% disbursed in the form of loans. Figure 10 illustrates that the majority of investments in climate action are directed towards mitigation efforts, with the top three sectors prioritised outlined. Moreover, Japan emerges as the dominant investor in this region.

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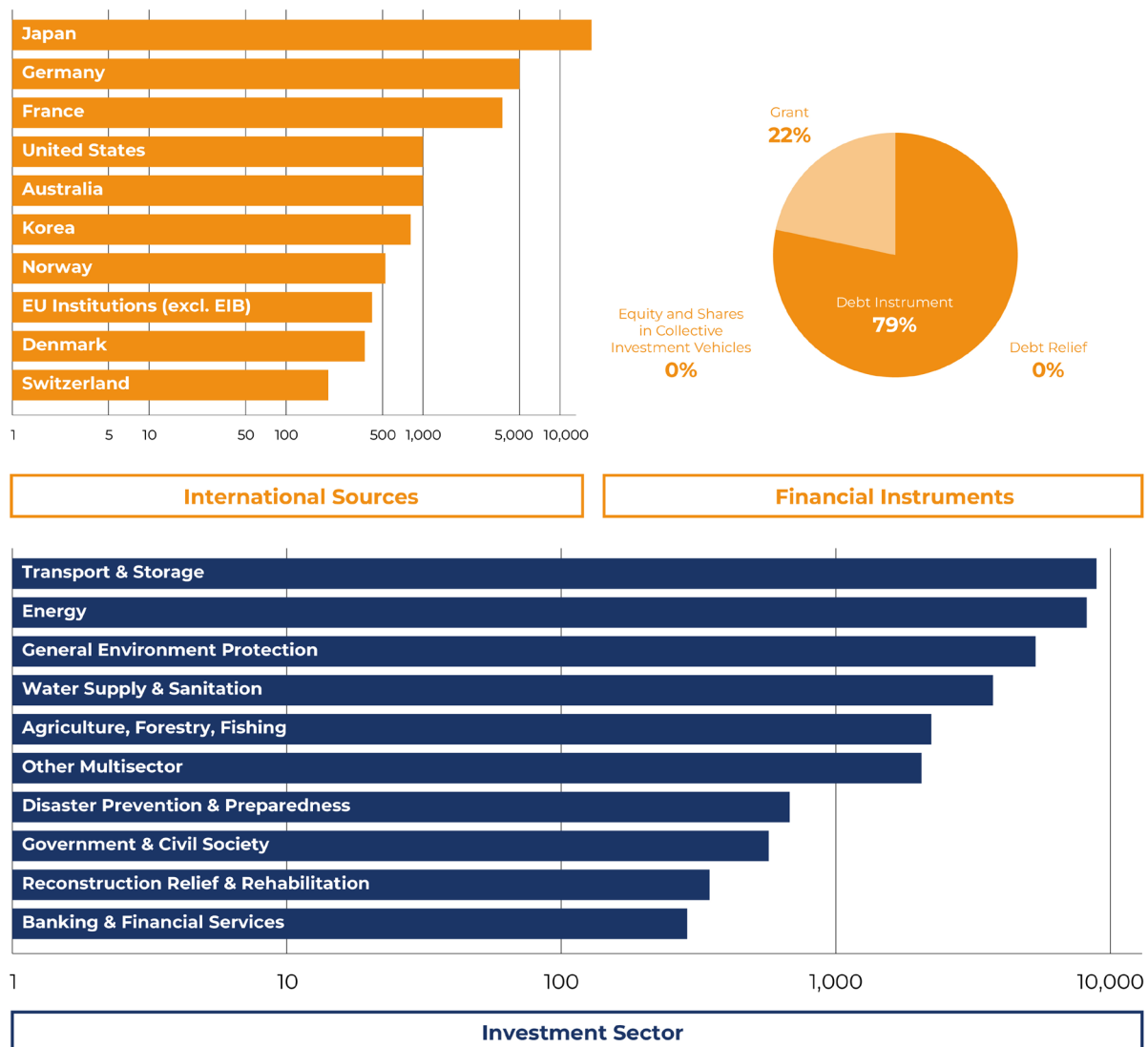


Figure 10: International Public Climate Finance from Bilateral Agencies  
(Source: OECD, 2024)

Multilateral Development Banks (MDBs)

Up until 2021, MDBs have pledged approximately USD 10,916 million towards financing climate action in the studied SEA countries, with more than 90% of financial instruments classified as loans. In this region, the World Bank (WB) and the ADB emerge as dominant investors. MDBs have shown a particular interest in mitigation actions, as evidenced by the top three investment sectors (Figure 11).

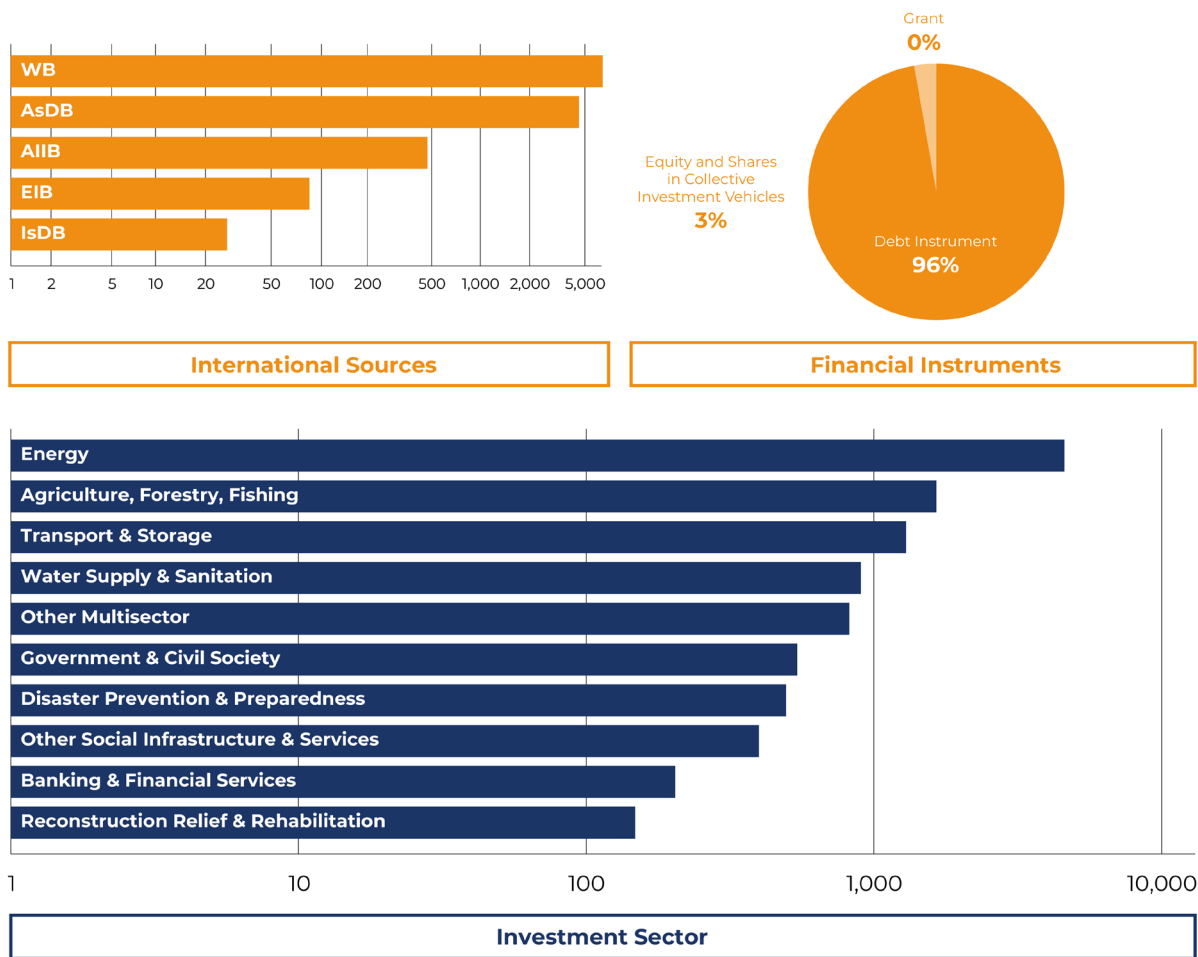


Figure 11: International Public Climate Finance from Multilateral Development Banks  
(Source: OECD, 2024)

## Multilateral Development Agencies (MDAs) and Designated Climate Funds

Multilateral Development Agencies (MDAs) like the United Nations (UN) agencies play a crucial role in integrating climate considerations into broader development agendas by providing financial assistance, technical expertise, and capacity-building support. Moreover, designated climate funds, such as the Green Climate Fund (GCF) and Global Environment Facility (GEF), are pivotal in financing climate-specific projects. These funds, sourced from pledges by countries and agencies, are dedicated solely to combating climate change, focusing on both mitigation and adaptation efforts.

From 2000 to 2021 (Figure 12), OECD data shows that at least USD 1,943 million has been committed to climate actions in Southeast Asian countries, with 61% provided as loans predominantly from designated climate funds. The top ten investors in this region are mainly from designated climate funds, highlighting their dominant role in climate finance. Only one of these top investors is a multilateral agency, the Food and Agricultural Organization (FAO). These funds have significantly supported mitigation actions, with major investments in sectors like renewable energy and sustainable transportation, underscoring their essential role in mobilizing and targeting resources effectively for climate action.

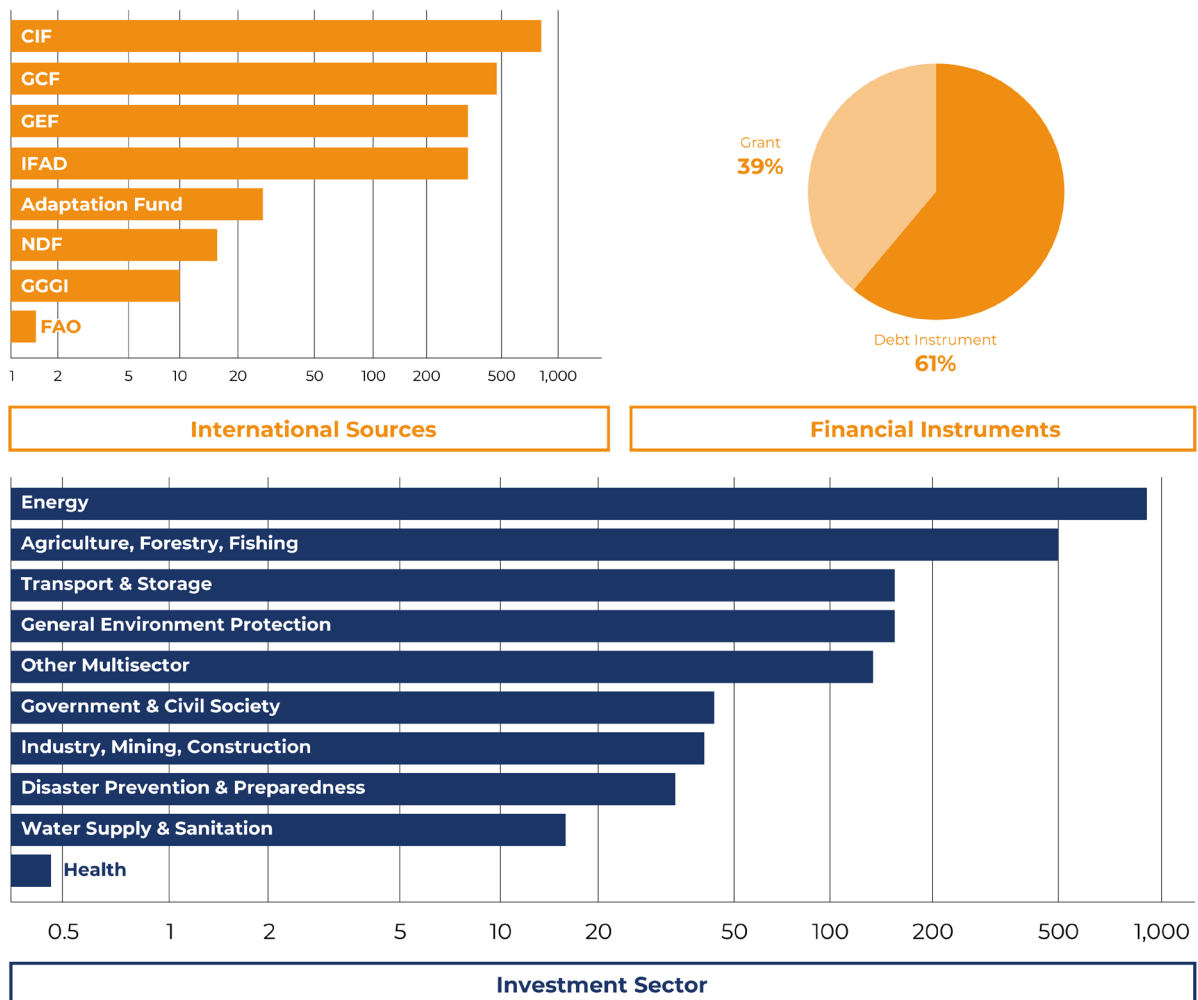


Figure 12: International Public Climate Finance from MDAs and Designated Climate Fund  
(Source: OECD, 2024)

## International Private Climate Finance

The private sector plays a pivotal role in addressing climate change, complementing public and multilateral efforts. By contributing financial resources, private institutions help implement critical climate actions and foster innovation in climate technologies and solutions. Their investments are essential not only for driving sustainable economic growth but also for ensuring that business practices align with environmental goals. As major economic drivers, private companies have the capacity to scale up climate actions, leverage additional funding, and promote sustainable practices across industries.

Between 2000 and 2021, the OECD recorded USD 90.91 million from international private institutions committed to funding climate actions in Southeast Asia (Figure 13). Over 95% of these funds were provided as grants, indicating a strong emphasis on non-repayable support for climate initiatives. This private sector funding has primarily focused on mitigation actions, with significant investments in key sectors such as renewable energy, energy efficiency, and sustainable transportation.

Moreover, the private sector's involvement in climate finance is vital for bridging the funding gap needed to meet international climate targets. Their contributions help catalyze larger projects, attract co-financing from other sources, and demonstrate the viability of climate investments. By playing an active role in climate financing, private institutions not only fulfil their corporate social responsibilities but also contribute to the global effort to mitigate climate change and its impacts.

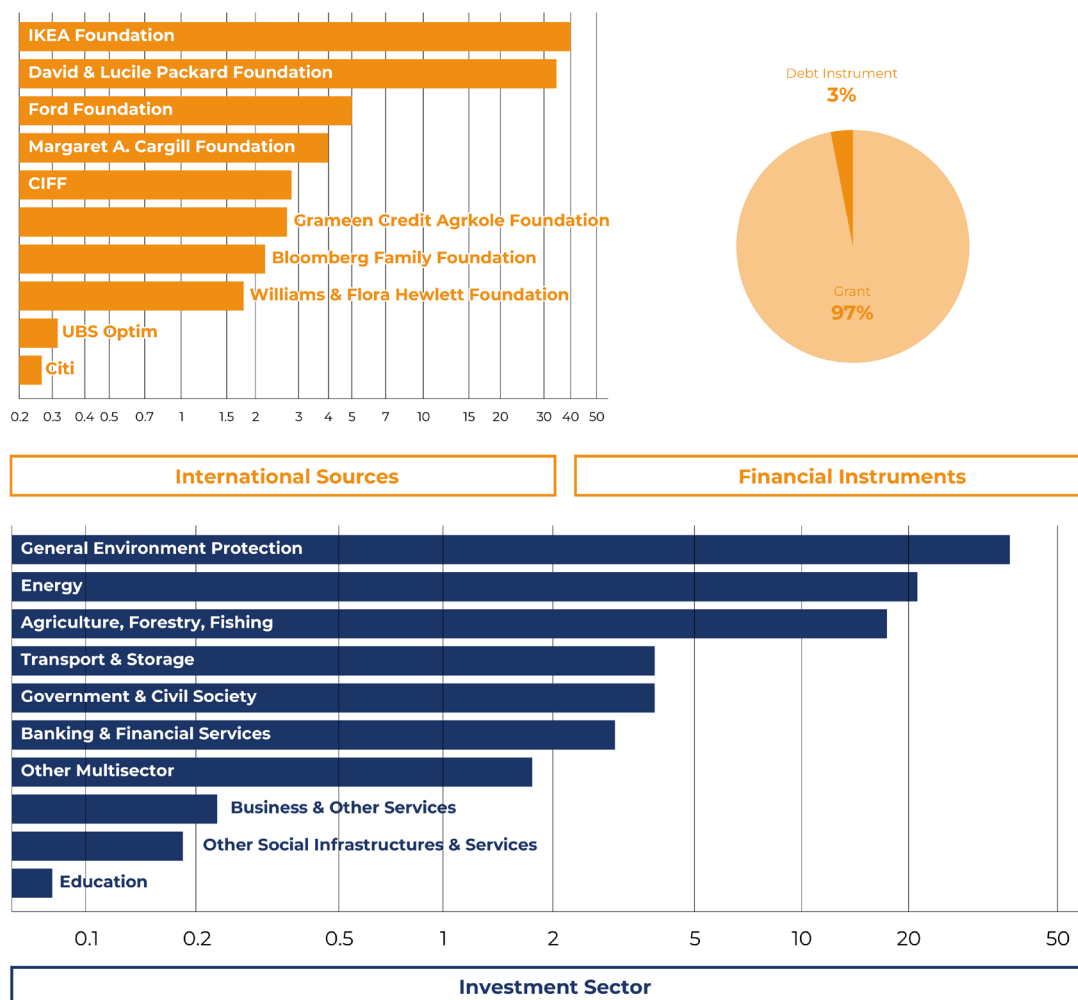


Figure 13: Sources, Instruments, and Sectors of International Private Climate Finance  
(Source: OECD, 2024)



## Domestic Public Climate Finance

In SEA countries, public sources of funding are crucial for financing various programmes and initiatives, with each category serving distinct purposes within the framework of national and local governance (Figure 8).

### National Government Budget

This includes funds allocated from the national treasury to finance diverse programmes and initiatives. Such funds are typically earmarked for specific purposes, such as Technical Assistance (TA), programmes listed in the fiscal year, co-financing arrangements, and grants for local government projects.

### Local Government Budget

Local governments also have their designated budgets, often sourced from the national budget, and are utilised for programmes listed in the fiscal year, co-financing arrangements, and other local initiatives. These budgets are instrumental in addressing localised needs and priorities within SEA countries.

### Designated Climate Fund Management

Several SEA countries have established designated climate funds managed by accredited entities. These funds may include TA, grants, and loans specifically targeted at climate-related projects and initiatives. Countries such as Indonesia and Vietnam have accredited entities for the Green Climate Fund (GCF) and other climate funds such as the Reducing Emissions from Deforestation and Forest Degradation (REDD+) fund, showcasing a commitment to addressing climate challenges through specialised funding mechanisms.

### Public Participatory Fund

Bonds, issued by governments or corporations, represent an emerging financial instrument that fosters public participation in climate mitigation and adaptation funding initiatives. In the context of SEA countries, sovereign bonds can be particularly impactful. Sovereign bonds are issued by national governments and are backed by the full faith and credit of the government. Green sovereign bonds, specifically designated for environmentally sustainable projects, are gaining traction. By issuing sovereign bonds, SEA countries can attract both domestic and international investors, thus mobilising significant resources for climate action.

The bond markets are pivotal in financing climate action in SEA, with outstanding bond sizes reflecting the region's significant financial capacity. Indonesia leads with a market exceeding USD 300 billion, showcasing the immense potential for channelling funds towards climate-related initiatives. Through the introduction of green bonds and sharia/Islamic law compliance bonds (sukuk), Indonesia demonstrates a firm commitment to financing environmentally friendly projects, aligning with global sustainability objectives (ADB, 2024).

Malaysia boasts a well-developed bond market with bonds totalling USD 433 billion, renowned for its stability and liquidity. This market offers opportunities for financing climate action, including investments in renewable energy and energy efficiency projects. Thailand follows closely, with a bond size of USD 444 billion, primarily comprising government bonds. The Thai Bond Market Association's (ThaiBMA) support for various bond types, including green bonds, strengthens the market's capacity to finance environmentally beneficial projects. While Vietnam's bond market is still developing, its bond size of USD 91.5 billion signifies growing potential for climate finance. With government bonds, municipal bonds, and corporate bonds in its portfolio, Vietnam is gradually emerging as a key player in financing climate initiatives within the region (ADB, 2024)

Reliance on fiscal year budgets is prevalent in SEA countries, with funds being allocated and tagged for specific purposes in the national and local planning processes. In addition, based on the latest Biennial Update Report (BUR), the studied SEA countries have pledged from USD 439.9 million to USD 18,066 million to finance climate actions (Table 1).

**Table 1: Domestic Resources for Climate Action in SEA Countries**

Country	Indonesia	Malaysia	Thailand	Vietnam
Domestic Resource Pledged for Climate Actions	18,066 million	453.26 million	439.9 million	9,000 million

*(Source: Ministry of Natural Resources, Environment and Climate Change, Malaysia, 2022; Government of Thailand, 2022; Socialist Republic of Vietnam Ministry of Natural Resources and Environment, 2020; Ministry of Environment and Forestry Republic Indonesia, 2021)*

However, there is a growing recognition of the necessity for specialised funding mechanisms to tackle climate change effectively. This recognition is shown by the establishment of designated climate funds in countries like Indonesia and Vietnam, aimed at mobilising resources specifically for climate-related initiatives.

Moving forward, it is important for SEA countries to continue strengthening their financial management systems, enhancing transparency, accountability, and efficiency in the allocation and utilisation of funds. Promoting public participation through instruments like sovereign bonds can help diversify funding sources and engage citizens in addressing climate change issues effectively. Through a combination of traditional budgetary allocations and innovative financing mechanisms, SEA countries can enhance their capacity to finance and implement CAPs to achieve the SDGs.

## Domestic Private Climate Finance

The reliance on domestic private sector financing for climate change projects in Southeast Asian countries underscores the critical role that non-governmental entities play in addressing environmental challenges. Consequently, mobilising private sector resources is essential for implementing timely and effective climate adaptation and mitigation measures. As an example, in Vietnam, the private sector supports around USD 21 billion for its climate actions, according to Vietnam's Third Biennial Updated Report to the UNFCCC in 2020. The availability of diverse financial instruments, including grants, equity or investment, loans, corporate social responsibility (CSR) initiatives, and public-private partnerships (PPPs), provides flexibility in funding mechanisms tailored to the specific needs and priorities of each country.

Grants serve as catalysts for innovation and early-stage projects that may not initially attract private-sector investment due to perceived risks or uncertain returns. By providing non-repayable funds, grants enable governments, non-profit organisations, and community groups to initiate climate action initiatives, conduct research, and pilot sustainable solutions. These projects can range from reforestation efforts and ecosystem restoration to the deployment of renewable energy technologies and the development of climate-resilient infrastructure. Grants play a crucial role in kick-starting climate projects, demonstrating their feasibility, and attracting additional investment from private sector stakeholders.

Equity investments and PPPs represent complementary approaches to mobilising private sector capital for climate finance in SEA countries. Equity investments involve direct ownership stakes in climate-related ventures, such as renewable energy projects, sustainable agriculture initiatives, or green infrastructure developments. Private sector investors, including venture capital firms, impact investors, and institutional investors, seek opportunities that offer both financial returns and positive environmental outcomes. PPPs, on the other hand, leverage collaboration between governments and private sector entities to finance and implement large-scale climate projects. These partnerships combine public resources, policy support, and regulatory frameworks with private sector expertise, innovation, and investment capital. PPPs are particularly effective in addressing infrastructure gaps, scaling up climate solutions, and ensuring projects align with national development priorities and sustainability objectives. By harnessing the strengths of both sectors, equity investments and PPPs drive innovation, foster economic growth, and advance climate resilience across SEA countries.

## Other Emerging Sources

There is an emerging climate finance source known as Carbon Economic Value (CEV). As a financial instrument, CEV presents a promising avenue for addressing environmental challenges, particularly in SEA countries. Despite the development of policies at the national level, its implementation remains suboptimal, especially at the city level.

*Table 2: Carbon Economic Value in SEA Countries*

	Mechanism	System
Carbon Economic Value	Non-Market-Based	Government to Government/public institution with the price set under bilateral or multilateral agreement
	Market-Based	This mechanism lets the institutions buy the carbon limit. Institutions can trade the limit or the emissions offset
	Carbon Tax	The regulator sets a fixed limit for the amount of CO <sub>2</sub> to be emitted and then taxes every ton of CO <sub>2</sub> emitted in excess of the defined limit at fixed rates

In SEA countries, the practical implementation of CEV involves various classifications, each with distinct mechanisms and systems. The **non-market-based** approach typically pertains to the Voluntary Carbon Market (VCM), where agreements between governments and private institutions set the carbon price, reflecting a voluntary commitment to carbon reduction. One significant scheme within VCM is REDD+, which aims to incentivise forest conservation and carbon sequestration.

The **market-based** approach involves government or regulatory bodies issuing emission limits, which emitter institutions are required to purchase. Through Emission Trading Systems (ETS), emission offsets can be traded, allowing market forces to determine prices. In contrast, the **carbon tax** mechanism entails fixed rates set by the government, where emitters must pay for emissions exceeding prescribed limits.

The adoption of these financing sources is still nascent in SEA countries. While national-level policies have been formulated, challenges persist in translating these sources into effective implementation, particularly at the sub-national level. Despite being a regulatory grey area, it is important to recognise the potential of CEV and lay the groundwork for its future utilisation.

At the national level, efforts should be directed towards refining policies and fostering enabling environments for the adoption of CEV instruments. This includes establishing regulatory frameworks, capacity building, and implementing stakeholder awareness initiatives. Additionally, mechanisms for monitoring, reporting, and verifying carbon reductions must be implemented to ensure transparency and accountability.

Extending the implementation of CEV instruments to the sub-national level, particularly within cities, is crucial. Local governments wield a significant influence in addressing climate change and reducing carbon emissions due to their proximity to communities and direct impact on local environments. Bridging the gap between national policies and local implementation is essential, as this effort will support cities to integrate CEV mechanisms into their planning and decision-making processes.

Currently, in some SEA countries, CEV, especially in the form of VCM through REDD+ strategies, remains prominent. However, the purchase and trading of emissions are still predominantly developed within power plant companies. Therefore, CEV is still in its early stages and requires further advancement for comprehensive application across all sectors.

Despite current challenges and uncertainties, CEV holds significant potential as a financing mechanism for mitigating climate change and promoting sustainable development in SEA countries. By continuing to develop and refine policies, fostering collaboration between stakeholders, as well as empowering local governments, SEA countries can harness the benefits of CEV to create a greener and more resilient future.

## 5.2 City Common Practice: Available Climate Financing Mechanism for Southeast Asian Cities

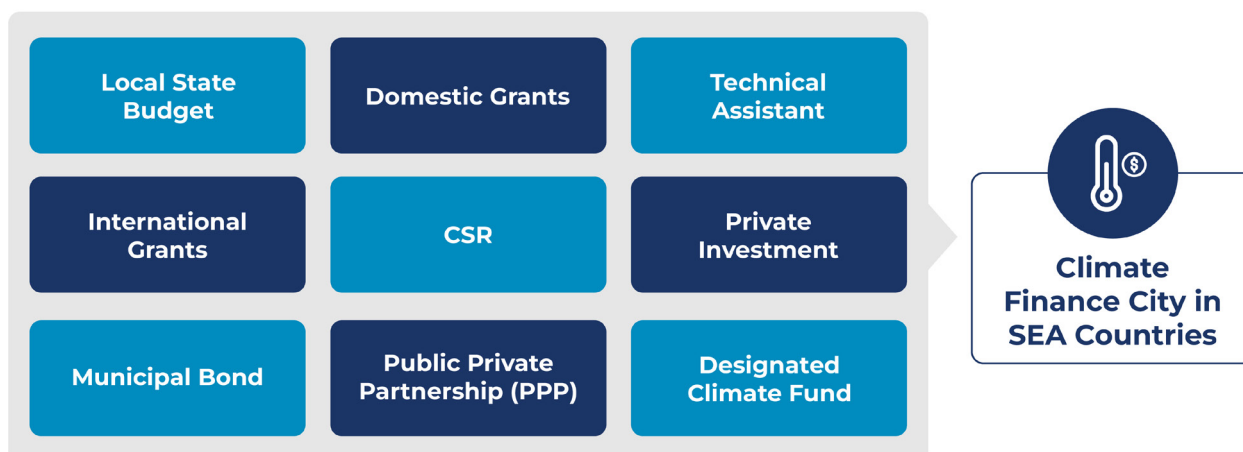


Figure 14: Accessible Financing Schemes for SEA Cities

Nine financing instruments have been identified as available and accessible to finance climate actions in cities (Figure 14). However, not all of these instruments are directly accessible to cities. For instance, international grants may not be directly accessible to cities in all countries, requiring further consultation and coordination with national-level authorities. Similarly, limitations regarding carbon economic value persist. Despite being a relatively new scheme and thus existing in a regulatory grey area, certain countries do not permit direct city access to CEV. Consequently, the involvement of additional actors at the city level becomes imperative to facilitate access, ultimately enabling cities to benefit from the scheme.

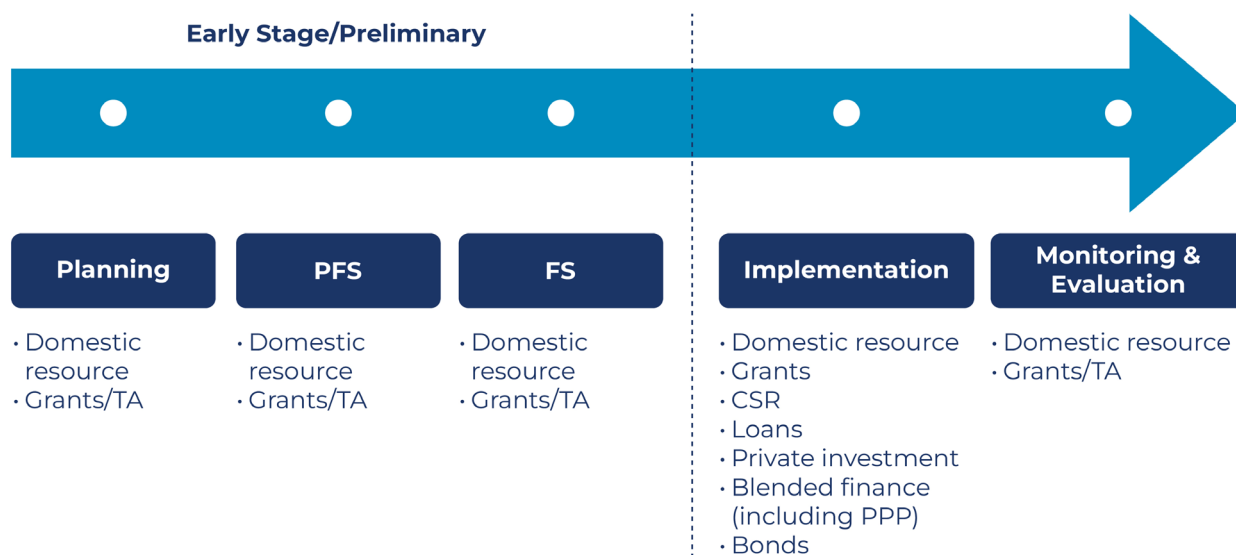


Figure 15: Common Practice of Financing Schemes for SEA Cities at Different Project Stages

The findings on accessible climate financing for cities extend to the project phase which encompasses the early stage or preliminary phase, implementation phase, and monitoring and evaluation phase (Figure 15). According to our findings, financing sources during the early-stage phase are limited to domestic resources (both local and/or national levels), grants, and grants in the form of technical assistance (TA).

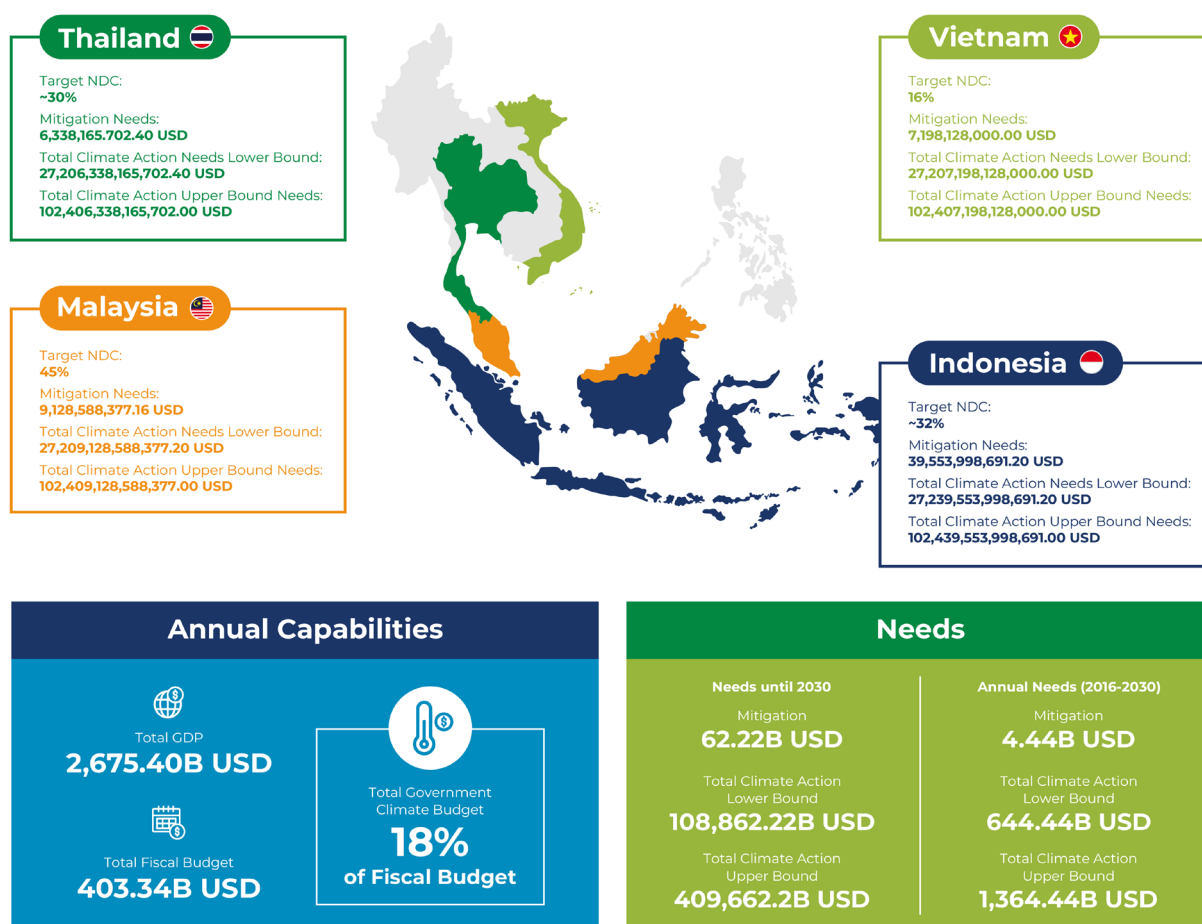
During the implementation phase, grant, and CSR could cover small pilot projects. However, for larger-scale initiatives, more complex financing schemes, such as private investment, blended financing (including PPP), bonds, or even loans, are required beyond relying solely on domestic resources. It is important to note that loans are commonly directly inaccessible to cities in SEA countries. Instead, loans are accessible at the national level, with the city as the beneficiary.

In the monitoring and evaluation phase, cities commonly rely on domestic resources. However, some cities may also utilise grants or technical assistance for this phase. It is important to highlight that this phase has a cycle looping back to the implementation phase. The insights gained from the monitoring and evaluation phase are utilised to ensure the implementation remains on track or is further strengthened.

## 5.3 Climate Finance of Southeast Asian Countries: Overview from the National to the City Levels

This sub-chapter provides an overview of the current status and capabilities needed to fight climate change, focusing on Southeast Asia. It examines the information at both national and local levels, drawing on data from four studied countries (Indonesia, Malaysia, Thailand, and Vietnam), particularly 28 pilot cities within these countries. Additionally, it showcases the availability of financing schemes for climate action at the local level. The sub-chapter highlights the crucial role of international support in bolstering climate finance, demonstrating how global contributions complement national efforts in these four nations. To give a better understanding, Figure 16 - Figure 18 demonstrate the needs and capability, international level, and the needs for cities.

### National Needs and Domestic Resources Capacity Status



**Figure 16: Estimated Cost and Capacity of Climate Action Implementation in Studied SEA Countries**  
(Source: Mitigation calculation is based on the average GHG emissions reduction per ton CO<sub>2</sub>e of around USD 43.3, Enkvist, Naucler, & Rosander, 2007)

## International Support 2000-2021

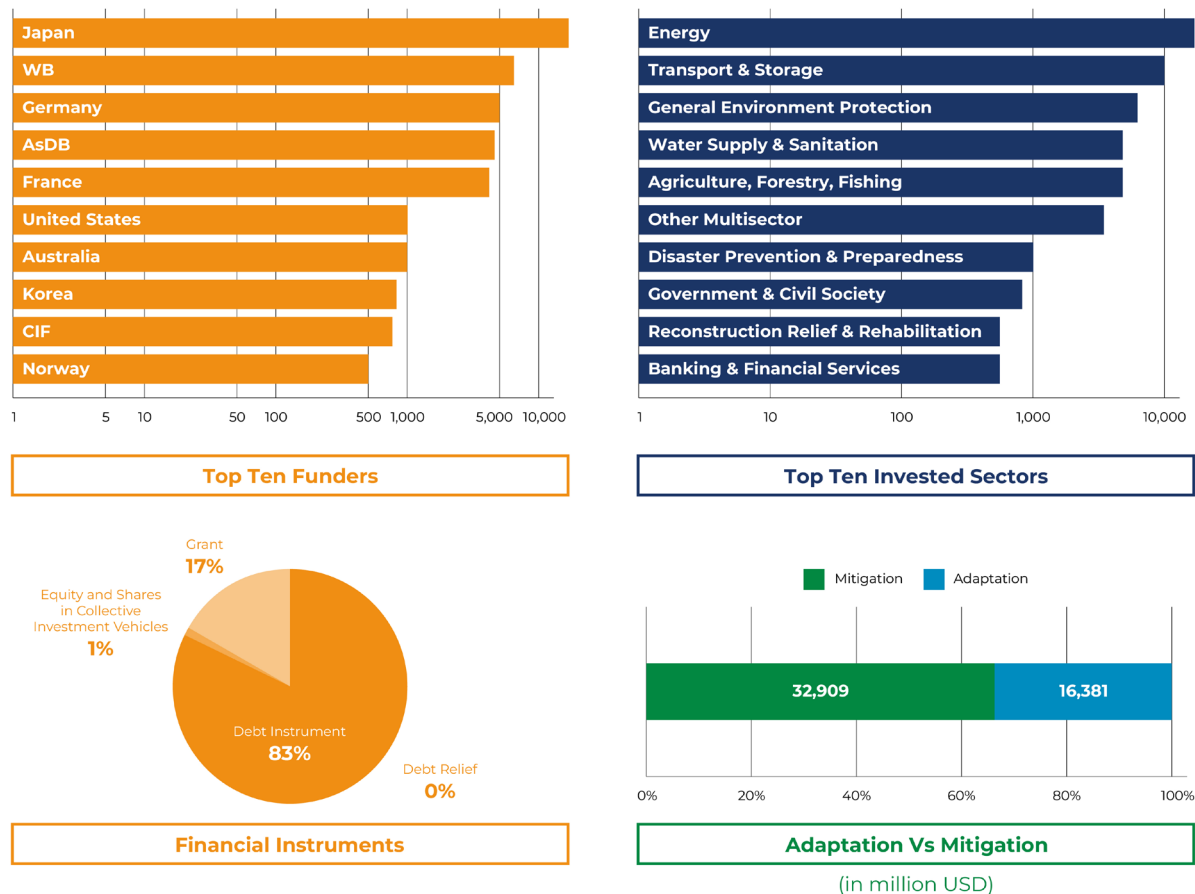


Figure 17: International Support for Climate Actions in Studied SEA Countries  
(Source: OECD, 2024)

## The City Perspective

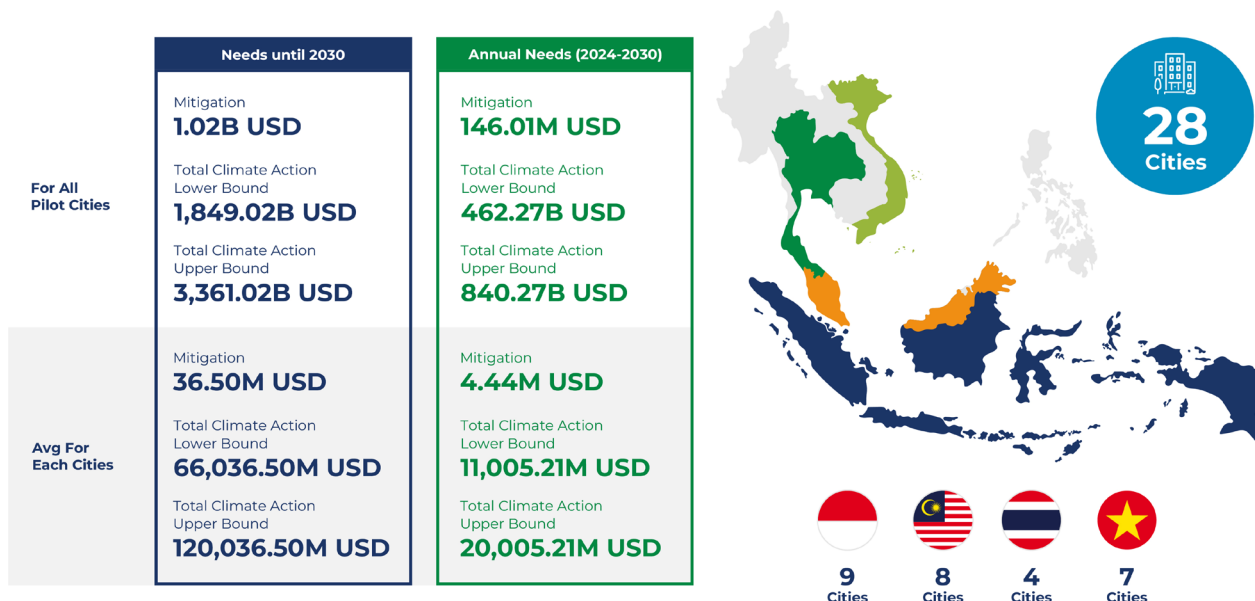


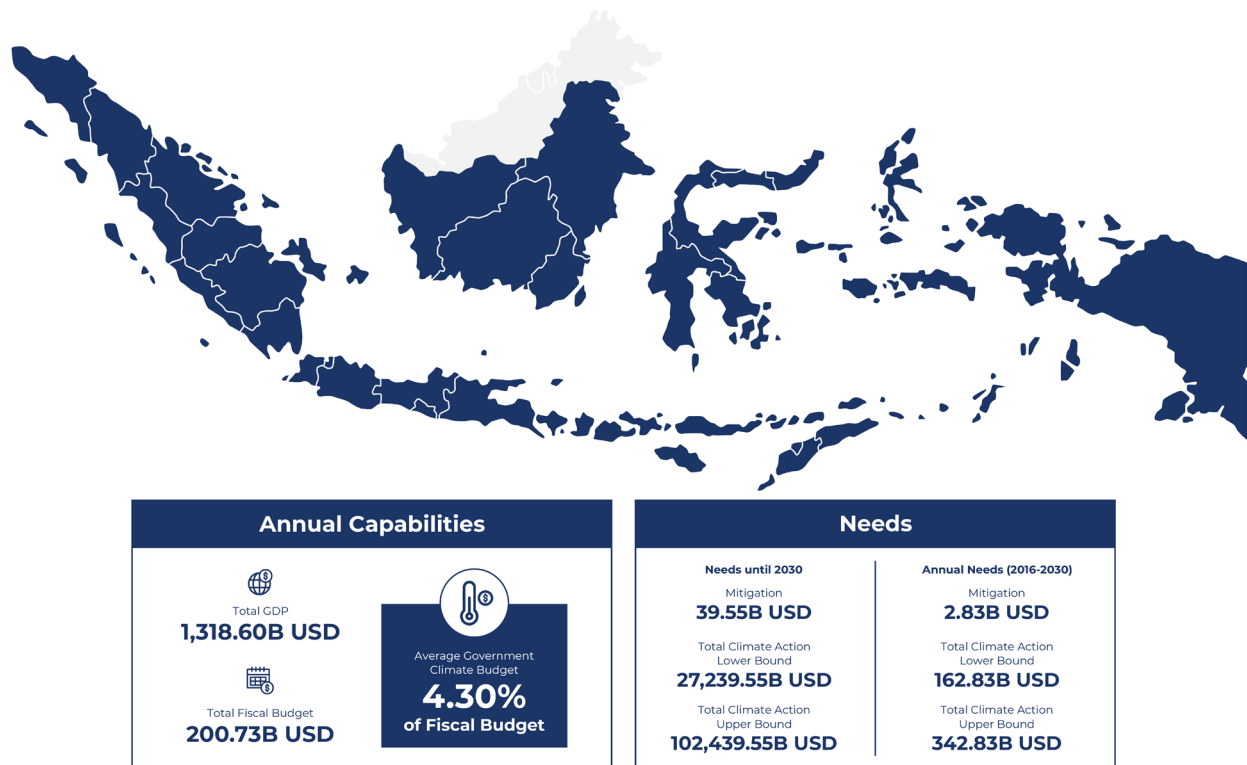
Figure 18: Climate Action Needs of SEA Pilot Cities



Furthermore, to provide a better understanding of each country, the following sub-chapters, illustrated by Figure 19 - Figure 30 and detailed in Table 3 - Table 10, showcase the climate finance outlook at both the national and city levels for each of the studied Southeast Asian countries.

## Indonesia

### National Needs and Domestic Resource Capacity Status



**Figure 19: Estimated Cost and Capabilities of Climate Action Implementation in Indonesia**  
(Source: Government Climate Budget, UNDP, 2023)

International Support 2000-2021

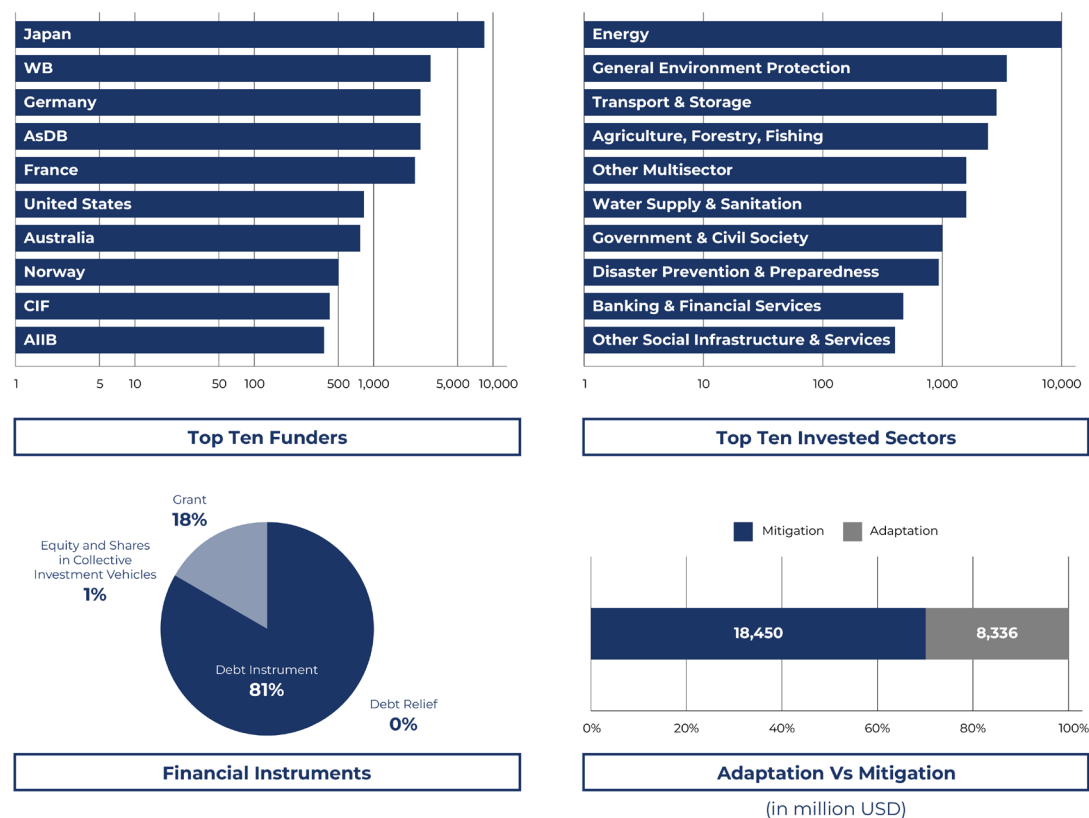


Figure 20: International Support for Climate Actions in Indonesia  
(Source: OECD, 2024)

Cities' Perspective

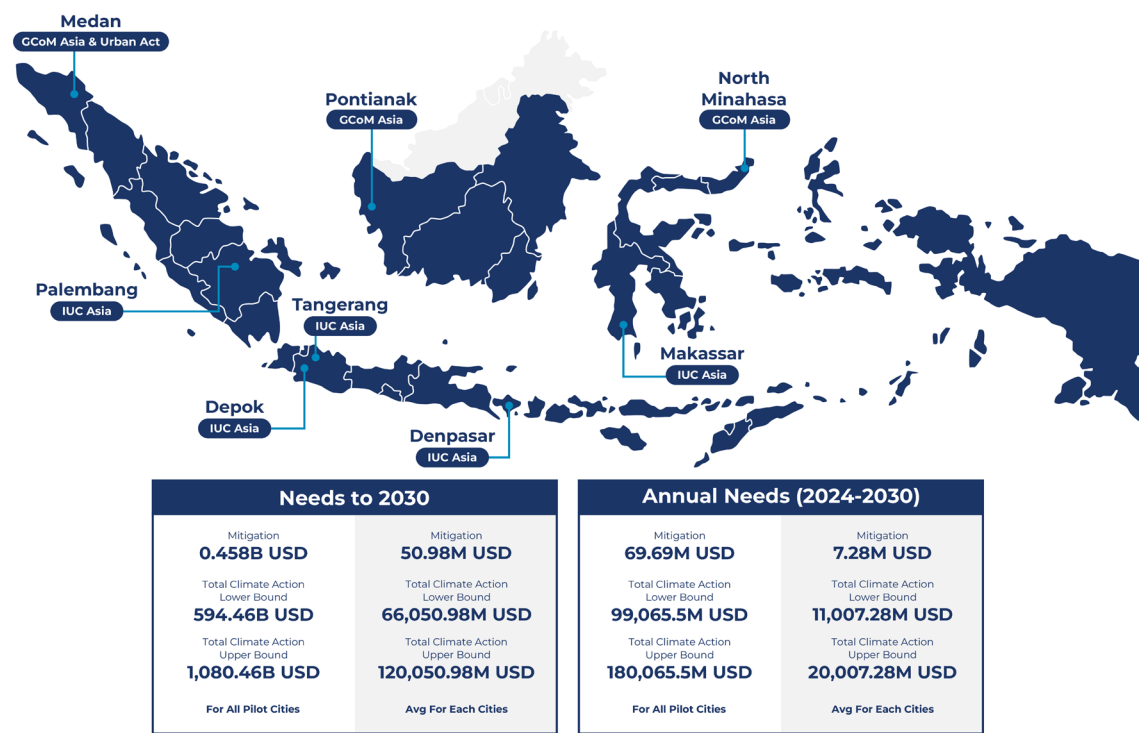


Figure 21: Summary of Climate Action Cost for Cities in Indonesia

**Table 3: Details of Estimated Cost of Climate Action Initiatives in Indonesian Pilot Cities**

City	Estimated Annual Mitigation Cost (2024-2030)	Estimated Annual Cost of Total Climate Action - Lower Bound (USD)	Estimated Annual Cost of Total Climate Action - Upper Bound (USD)	Estimated Cost of Mitigation by 2030 (USD)	Estimated Cost of Total Climate Action - Lower Bound by 2030 (USD)	Estimated Cost of Total Climate Action - Upper Bound by 2030 (USD)
Denpasar	1,428,762.02	11,001,428,762	20,001,428,762	10,001,334.11	66,010,001,334.11	120,010,001,334.11
Depok	4,218,775.33	11,004,218,775	20,004,218,775	29,531,427.29	66,029,531,427	120,029,531,427.29
Makassar	9,199,708.09	11,009,199,708.09	20,009,199,708.09	64,397,956.61	66,064,397,956.61	120,064,397,956.61
Malang	1,334,013.04	11,001,334,013	20,001,334,013	9,338,091.25	66,009,338,091.25	120,009,338,091
Medan	14,696,882.93	11,014,696,883	20,014,696,883	102,878,180.50	66,102,878,180.50	120,102,878,181
North Minahasa	1,069,045.53	11,001,069,046	20,001,069,045.53	7,483,318.70	66,007,483,318.70	120,007,483,319
Palembang	6,539,906.90	11,006,539,907	20,006,539,907	45,779,348.33	66,045,779,348.33	120,045,779,348
Pontianak	2,293,650.54	11,002,293,651	20,002,293,650.54	16,055,553.77	66,016,055,553.77	120,016,055,554
Tangerang	24,764,803.58	11,024,764,804	20,024,764,803.58	173,353,625.09	66,173,353,625.09	120,173,353,625.09

**Table 4: Accessibility Status of Climate Finance for Cities in Indonesia**

Type of Financing	Accessibility Status for City
Technical Assistance (TA)	Yes
International Grants	Indirect, requires coordination with the national level
Loan	No
Public Private Partnership (PPP)	Yes, with acknowledgement from the national level
Private Investment	Yes, with acknowledgement from the national level
CSR	Yes
National Grants	Yes
Municipal Bond/Green Bond	Yes, with coordination with the national level
Carbon Economical Value (CEV) Market	No
Carbon Economical Value (CEV): Voluntary-Based	Frozen
Carbon Tax	Not yet determined
Access to the designated climate fund	Possible to consult with accredited entities as well as further coordination with the national level

## National Needs and Domestic Resource Capacity Status

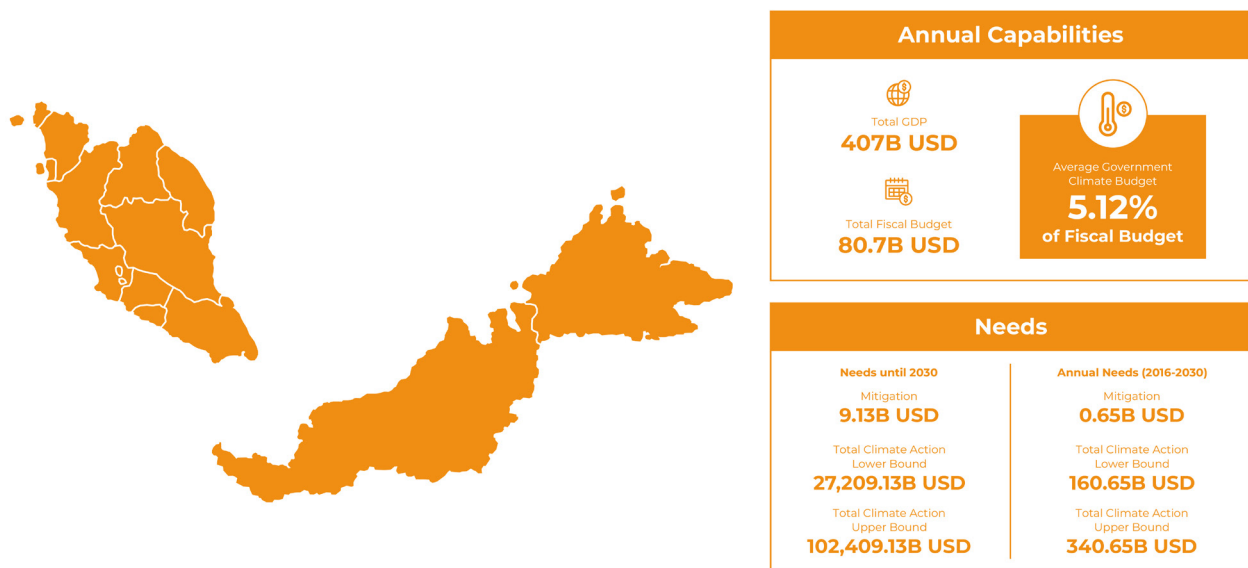


Figure 22: Estimated Cost and Capabilities of Climate Action Implementation in Malaysia

(Source: Government Climate Budget: Based on the calculation of climate-related actions from the NRECC budget and SDGs Budget for SDG 12, 14, and 15 (Ministry of Finance, 2024; Ministry of Finance, 2024; The Malaysian Reserve, 2022))

## International Support 2000-2021

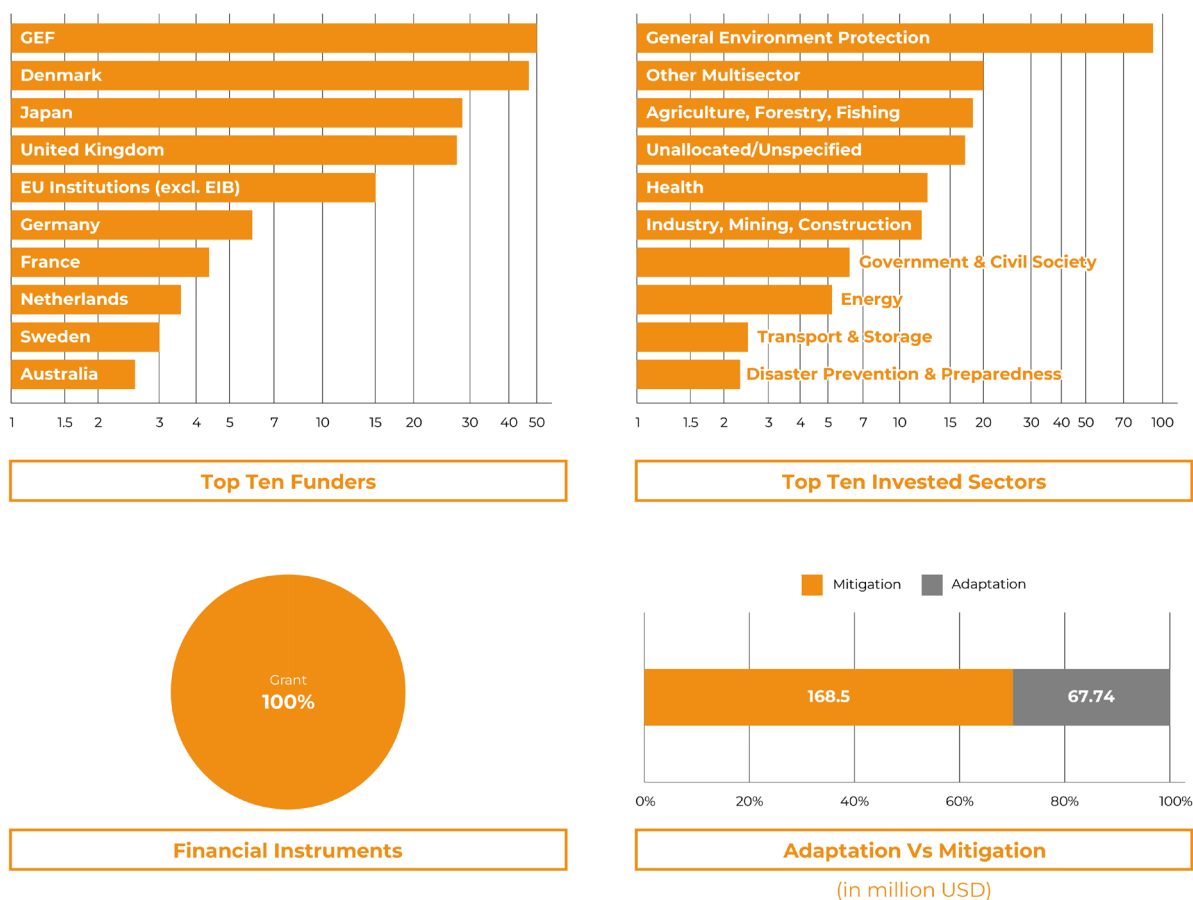


Figure 23: International Support for Climate Actions in Malaysia

(Source: OECD, 2024)

## Cities' Perspective

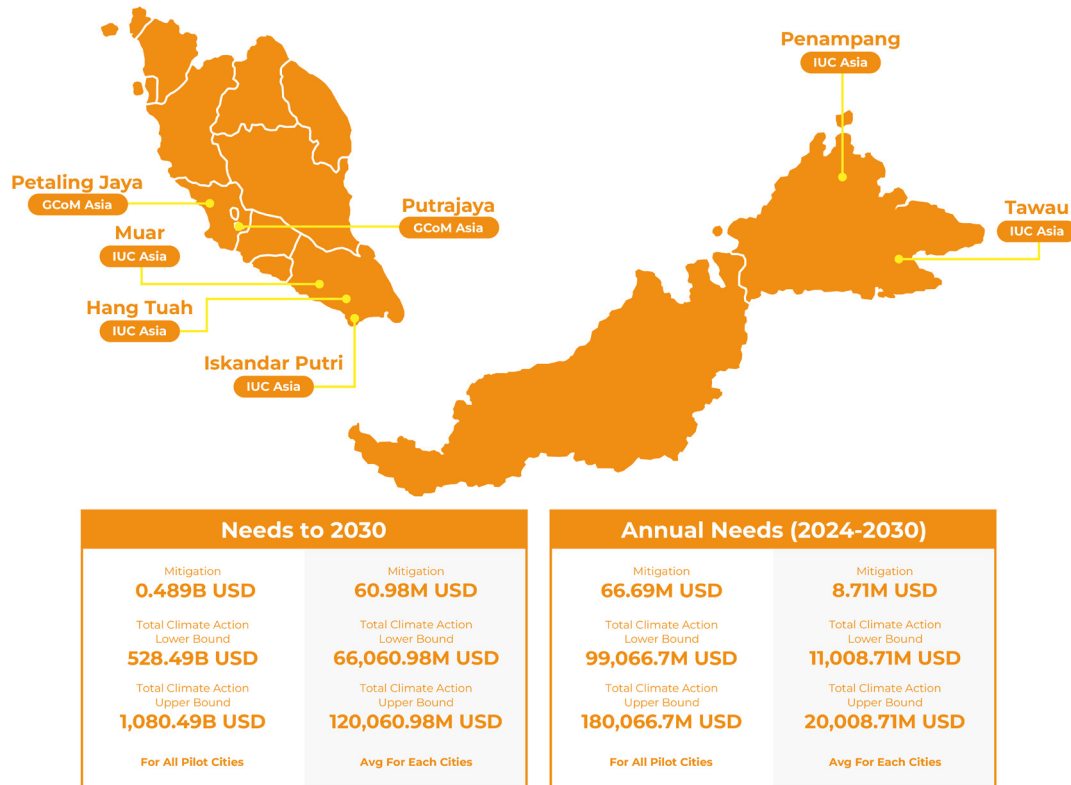


Figure 24: Summary of Climate Action Cost for Cities in Malaysia

Table 5: Details of Estimated Cost of Climate Action Initiatives in Malaysian Pilot Cities

City	Estimated Annual Mitigation Cost (2024-2030)	Estimated Annual Cost of Total Climate Action - Lower Bound (USD)	Estimated Annual Cost of Total Climate Action - Upper Bound (USD)	Estimated Cost of Mitigation by 2030 (USD)	Estimated Cost of Total Climate Action - Lower Bound by 2030 (USD)	Estimated Cost of Total Climate Action - Upper Bound by 2030 (USD)
Hang Tuah	4,240,454.66	11,004,240,454.66	20,004,240,454.66	29,683,182.64	66,029,683,182.64	120,029,683,182.64
Iskandar Putri	23,124,455.14	11,023,124,455.14	20,023,124,455.14	161,871,186.01	66,161,871,186.01	120,161,871,186.01
Muar	9,337,065.14	11,009,337,065.14	20,009,337,065.14	65,359,455.97	66,065,359,455.98	120,065,359,455.98
Penampang	1,874,490.07	11,001,874,490.07	20,001,874,490.07	13,121,430.49	66,013,121,430.49	120,013,121,430.49
Petaling Jaya	14,716,220.74	11,014,716,220.74	20,014,716,220.74	103,013,545.20	66,103,013,545.20	120,103,013,545.20
Putrajaya	4,203,421.99	11,004,203,421.99	20,004,203,421.99	29,423,953.91	66,029,423,953.91	120,029,423,953.91
Segamat	5,769,646.77	11,005,769,646.77	20,005,769,646.77	40,387,527.39	66,040,387,527.39	120,040,387,527.39
Tawau	6,425,496.57	11,006,425,496.57	20,006,425,496.57	44,978,475.99	66,044,978,475.99	120,044,978,476.00

**Table 6: Accessibility Status of Climate Finance for Cities in Malaysia**

Type of Financing	Accessibility Status for City
Technical Assistance (TA)	Yes
International Grants	Yes, on climate adaptation at the national and city government levels
Loan	None from the public sector with international MDBs. MGTC manages the Green Technology Financing Scheme (GTFS) nationally
Public Private Partnership (PPP)	Yes, with acknowledgement from the national level
Private Investment	Yes, with acknowledgement from the national level
CSR	Yes
National Grants	Yes
Municipal Bond/Green Bond	<p>Yes</p> <ul style="list-style-type: none"> <li>• Sustainability-linked bonds (SLB) and Sustainability-linked sukuk (SLS) are the fastest-growing segments within the sustainability-themed bonds market.</li> <li>• Social, sustainability or other SRI sukuk issuance made under the SC's SRI Sukuk Framework from 25 August 2020 onwards.</li> <li>• Bond issuances made under the ASEAN Green Bond Standards, ASEAN Social Bond Standards or ASEAN Sustainability Bond Standards from 29 October 2020 onwards</li> </ul>
Carbon Economical Value (CEV) Market	Possible with further coordination with Bursa Malaysia
Carbon Economical Value (CEV): Voluntary Based	Possible with further coordination at the national level
Carbon Tax	Not yet determined
Access to the designated climate fund	Possible with further coordination at the national level

## Thailand

### National Needs and Domestic Resource Capacity Status

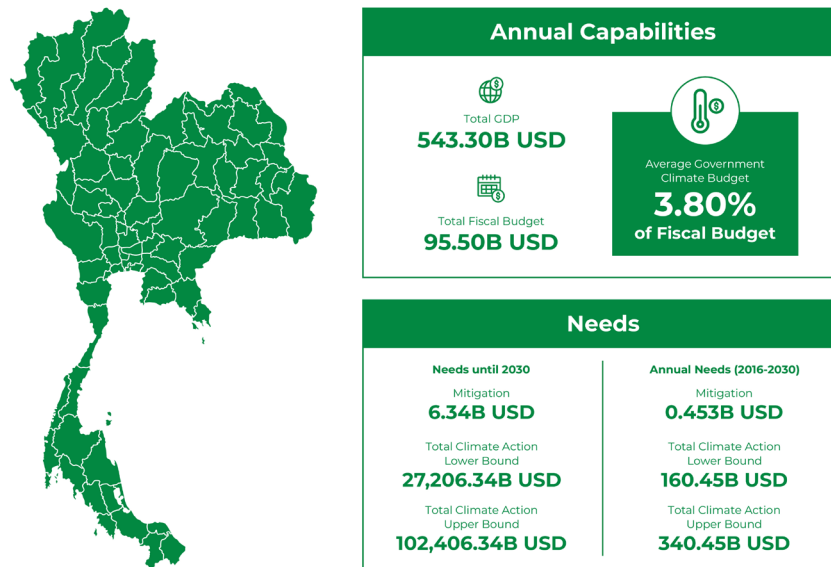


Figure 25: Estimated Cost and Capabilities of Climate Action Implementation in Thailand  
(Source: Government Climate Budget, Budget Bureau, 2022)

### International Support 2000-2021

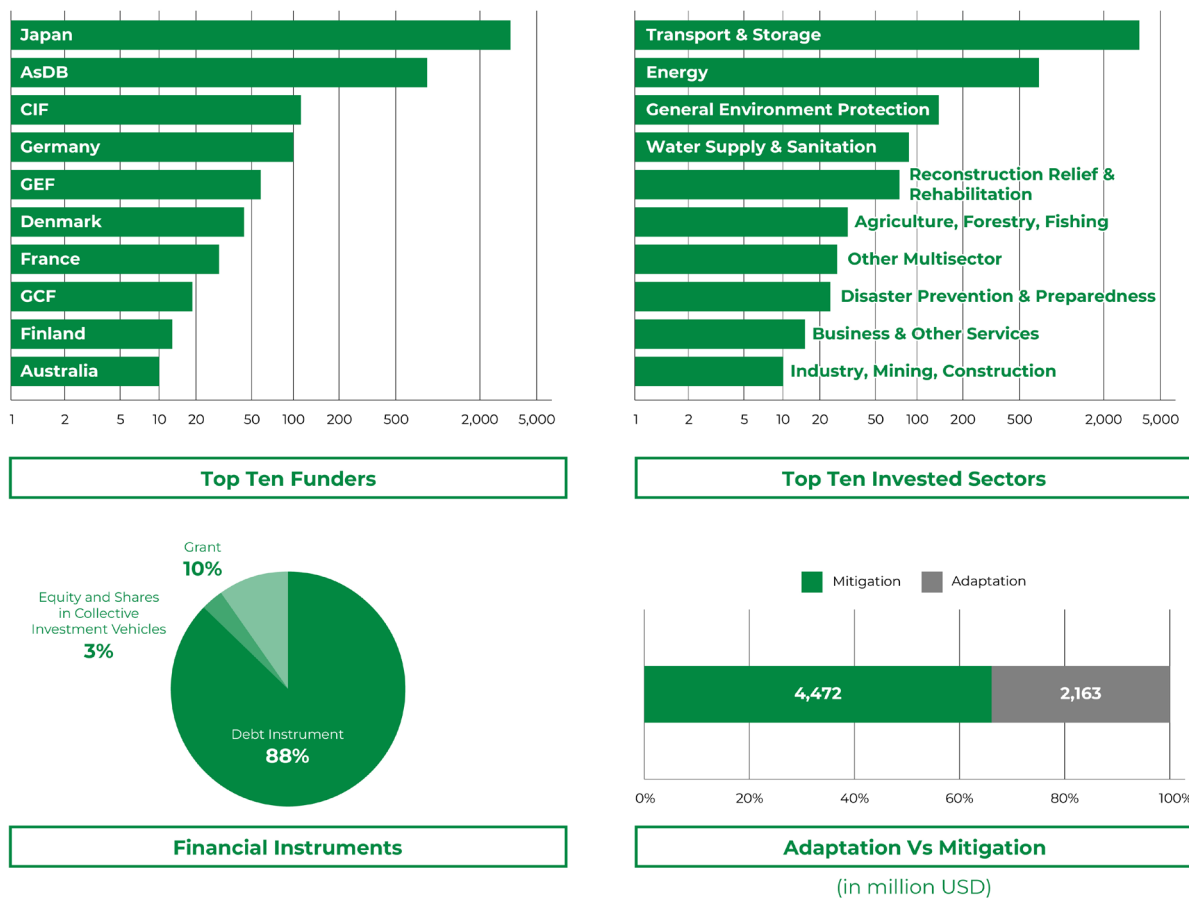


Figure 26: International Support for Climate Actions in Thailand  
(Source: OECD, 2024)

## Cities' Perspective

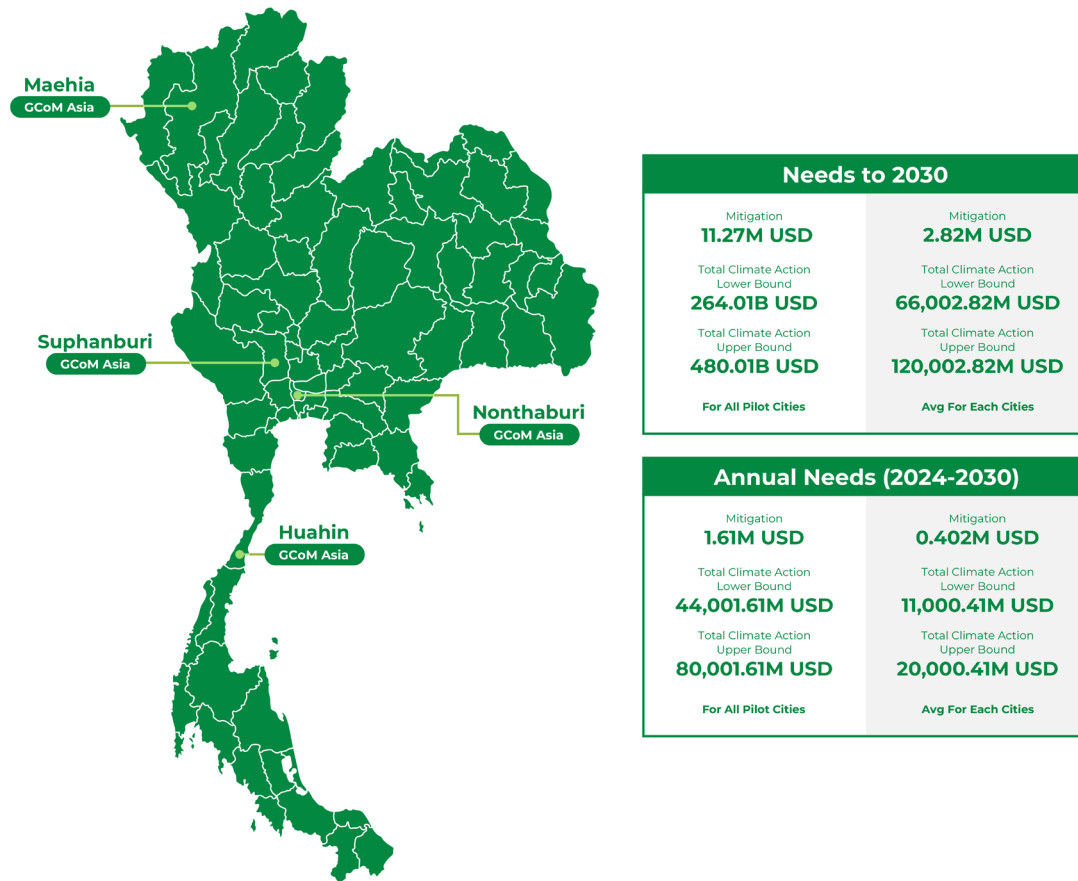


Figure 27: Summary of Climate Action Cost for Cities in Thailand

Table 7: Details of Estimated Cost of Climate Action Initiatives in Thai Pilot Cities

City	Estimated Annual Mitigation Cost (2024-2030)	Estimated Annual Cost of Total Climate Action - Lower Bound (USD)	Estimated Annual Cost of Total Climate Action - Upper Bound (USD)	Estimated Cost of Mitigation by 2030 (USD)	Estimated Cost of Total Climate Action – Lower Bound by 2030 (USD)	Estimated Cost of Total Climate Action - Upper Bound by 2030 (USD)
Huahin	120,425.82	11,000,120,425.82	20,000,120,425.82	842,980.77	66,000,842,980.77	120,000,842,980.77
Mae Hia	73,395.58	11,000,073,395.58	20,000,073,395.58	513,769.09	66,000,513,769.09	120,000,513,769.09
Nonthaburi	726,371.71	11,000,726,371.71	20,000,726,371.71	5,084,601.98	66,005,084,601.98	120,005,084,601.98
Suphanburi	689,531.87	11,000,689,531.87	20,000,689,531.87	4,826,723.10	66,004,826,723.10	120,004,826,723.10



**Table 8: Accessibility Status of Climate Finance for Cities in Malaysia**

Type of Financing	Accessibility Status for City
Technical Assistant (TA)	Yes, with acknowledgement from the national level
International Grants	Indirect, requires coordination with the national level
Loan	No
Public Private Partnership (PPP)	Yes, with acknowledgement from the national level
Private Investment	Yes, with acknowledgement from the national level
CSR	Yes
National Grants	Yes
Municipal Bond/Green Bond	Possible under further coordination with national level
Carbon Economical Value (CEV) Market	Policies under development with a chance of city involvement
Carbon Economical Value (CEV): Voluntary Based	Possible under further coordination with national level
Carbon Tax	Not determined yet
Access to the designated climate fund	Possible with further coordination with national level

## National Needs and Domestic Resource Capacity Status

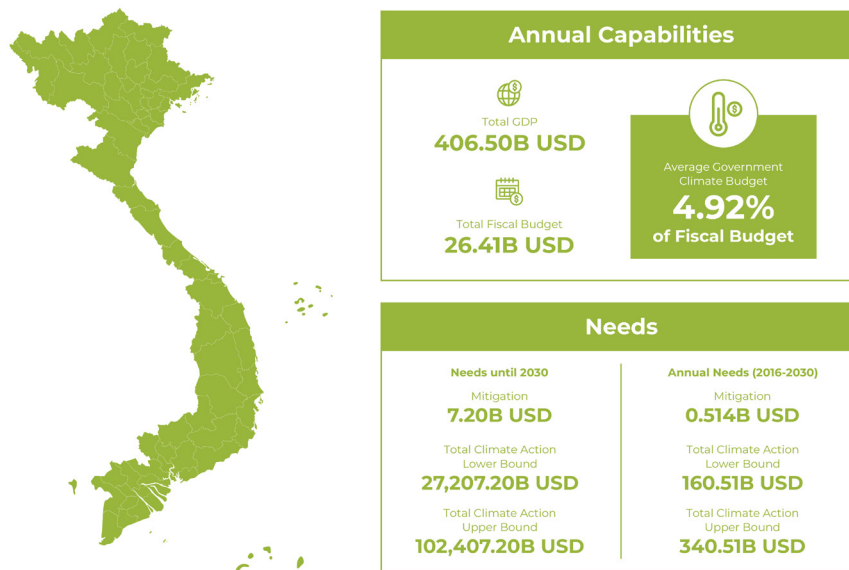


Figure 28: Estimated Cost and Capabilities of Climate Action Implementation in Vietnam  
(Source: Government Climate Budget, UNDP, 2024)

## International Support 2000-2021

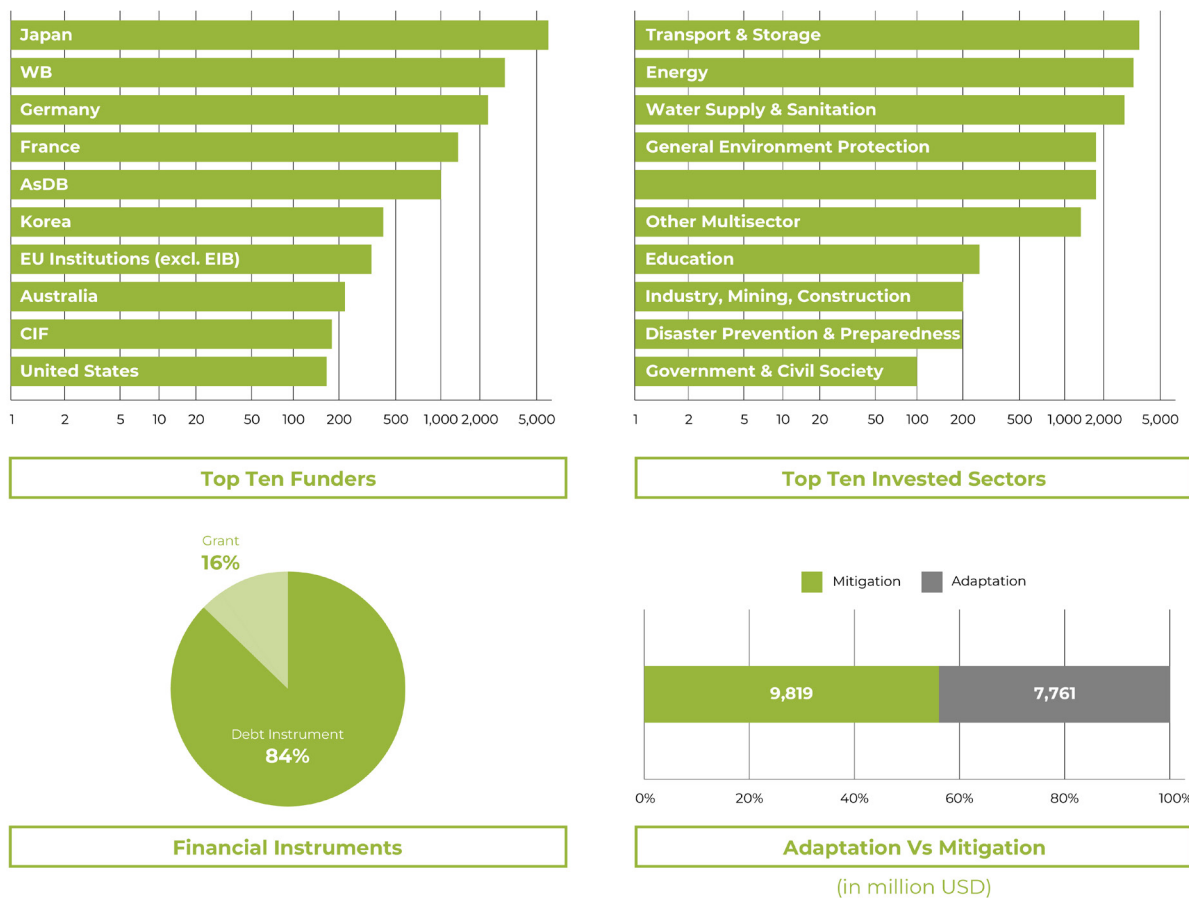


Figure 29: International Support for Climate Actions in Vietnam  
(Source: OECD, 2024)

## Cities' Perspective

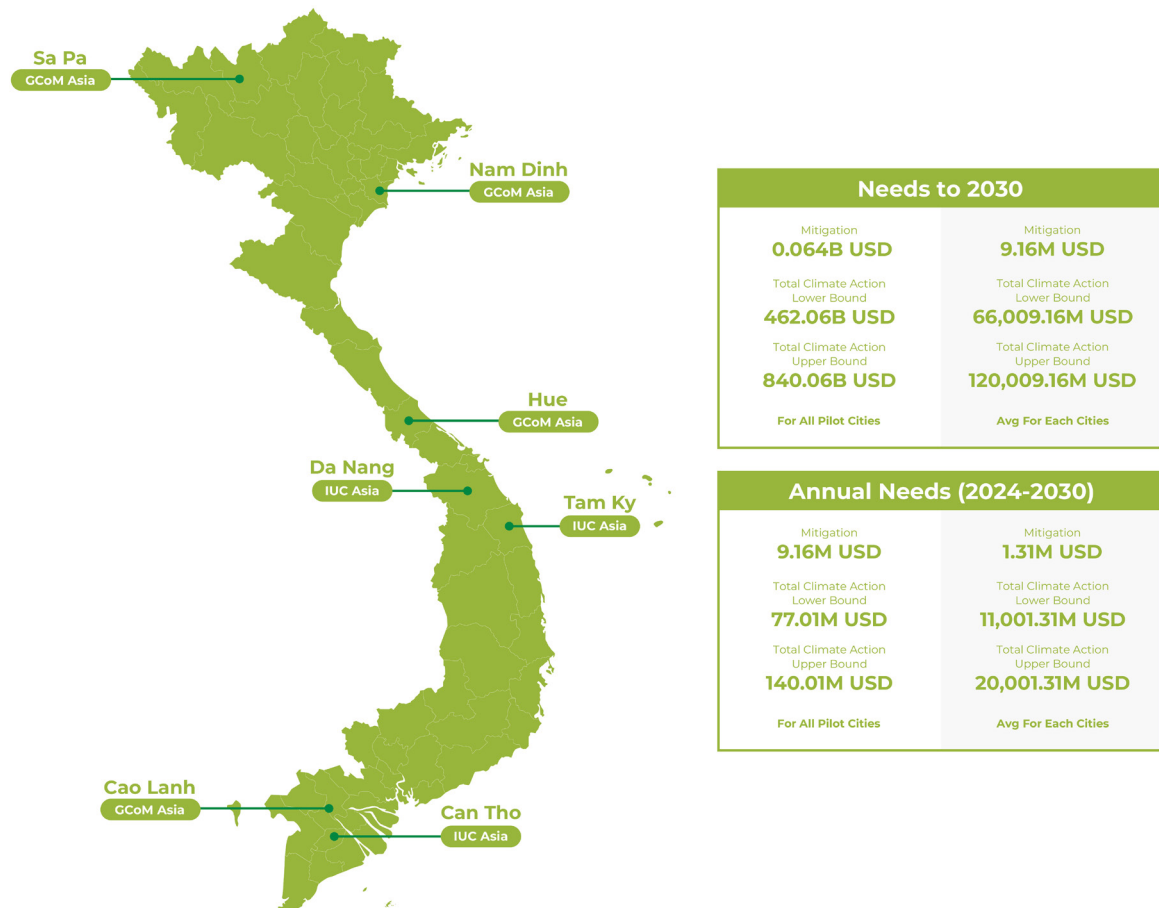


Figure 30: Summary of Climate Action Cost for Cities in Vietnam

Table 9: Details of Estimated Cost of Climate Action Initiatives in Vietnamese Pilot Cities

City	Estimated Annual Mitigation Cost (2024-2030)	Estimated Annual Cost of Total Climate Action - Lower Bound (USD)	Estimated Annual Cost of Total Climate Action - Upper Bound (USD)	Estimated Cost of Mitigation by 2030 (USD)	Estimated Cost of Total Climate Action Lower Bound by 2030 (USD)	Estimated Cost of Total Climate Action - Upper Bound by 2030 (USD)
Cao Lanh	385,099.33	11,000,385,099.33	20,000,385,099.33	2,695,695.32	66,002,695,695.32	120,002,695,695.32
Can Tho	3,306,611.91	11,003,306,611.91	20,003,306,611.91	23,146,283.37	66,023,146,283.37	120,023,146,283.37
Da Nang	2,825,616.71	11,002,825,616.71	20,002,825,616.71	19,779,316.97	66,019,779,316.97	120,019,779,316.97
Hue	1,491,003.34	11,001,491,003.34	20,001,491,003.34	10,437,023.35	66,010,437,023.35	120,010,437,023.36
Nam Dinh	738,521.75	11,000,738,521.75	20,000,738,521.75	5,169,652.26	66,005,169,652.26	120,005,169,652.26
Sapa	134,979.82	11,000,134,979.82	20,000,134,979.82	944,858.77	66,000,944,858.77	120,000,944,858.77
Tam Ky	281,236.90	11,000,281,236.90	20,000,281,236.90	1,968,658.28	66,001,968,658.28	120,001,968,658.28

**Table 10: Accessibility Status of Climate Finance for Cities in Vietnam**

Type of Financing	Accessibility Status for City
Technical Assistant (TA)	Yes
International Grants	Yes, could be indirect/direct, depending on the scope of investment (e.g., grants over USD 1 million should register with the national government, grants below USD 1 million should register with the province)
Loan	No
Public Private Partnership (PPP)	Yes, could be indirect/direct, depending on the scope of investment (e.g., investments over USD 1 million should register with the national government, and investments below USD 1 million should register with the province)
Private Investment	Yes, could be indirect/direct, depending on the scope of investment (e.g., investments over USD 1 million should register with the national government, and investments below USD 1 million should register with the province)
CSR	Yes
National Grants	Yes
Municipal Bond/Green Bond	Yes
Carbon Economical Value (CEV) Market	Possible with further coordination at the national level
Carbon Economical Value (CEV): Voluntary Based	Possible with further coordination at the national level
Carbon Tax	Not determined yet
Access to designated climate fund	Possible with further coordination at the national level

## 5.4 Best Practices



Figure 31: Best Practices from SEA Cities Facilitated by GCoM Southeast Asia Secretariat

As of late February 2024, 19 cities, facilitated by the GCoM Asia Project, have progressed beyond their climate action plans (CAPs), as outlined in Figure 31, in their pursuit of climate finance. Among them, 18 cities have actively pursued climate finance through the Project Preparation Facility (PPF), including the City Climate Finance Gap Fund (Gap Fund) and Transformative Actions Program (TAP). Additionally, one city has secured a grant to finance its climate action initiatives.

The Global Covenant of Mayors for Climate and Energy (GCoM) played a pivotal role in these advancements. GCoM's contributions extend beyond advocacy and facilitation in accessing funding through PPF. It has also provided technical assistance through the GCoM Bankable Cities initiative, aiding in the development of bankable projects in three cities (Figure 31). Furthermore, GCoM has supported implementation actions in four cities, with one city receiving support in each pilot country (Figure 31).

## 06. Gaps and Challenges

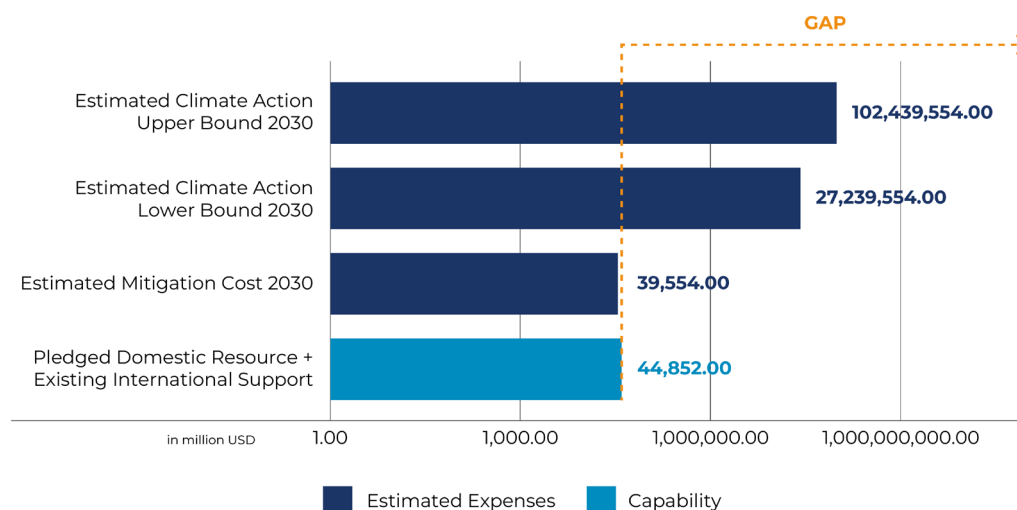
As we embark on the journey towards the collective goals for 2030, it is essential to address the significant gap between aspiration and achievement. This chapter explores this disparity, carefully analysing the differences between the goals and current capacities, as highlighted by this assessment.

Following extensive research outlined in the previous chapter, it becomes clear that this gap is not merely theoretical but rather a tangible reality, supported by empirical evidence rooted in concrete data accumulated over time. This gap stands as the focal point of our efforts, where ambitious aspirations intersect with realities, prompting a determined search for solutions.

As we navigate the complex array of challenges, it becomes evident that our journey is not a solitary one. Indeed, our findings have been enriched and clarified through continuous dialogue and engagement with the cities across the studied countries in Southeast Asia (SEA). Each meeting, event, and interaction has served as a crucible for understanding where challenges exist.

Thus, as we delve deeper into this chapter, we concentrate on two main things: the specific gaps in each country's context and the broader challenges we all face. Through this examination, we aim to forge a path forward that transcends national boundaries and unites us into a front against the challenges ahead.

## 6.1 Indonesia



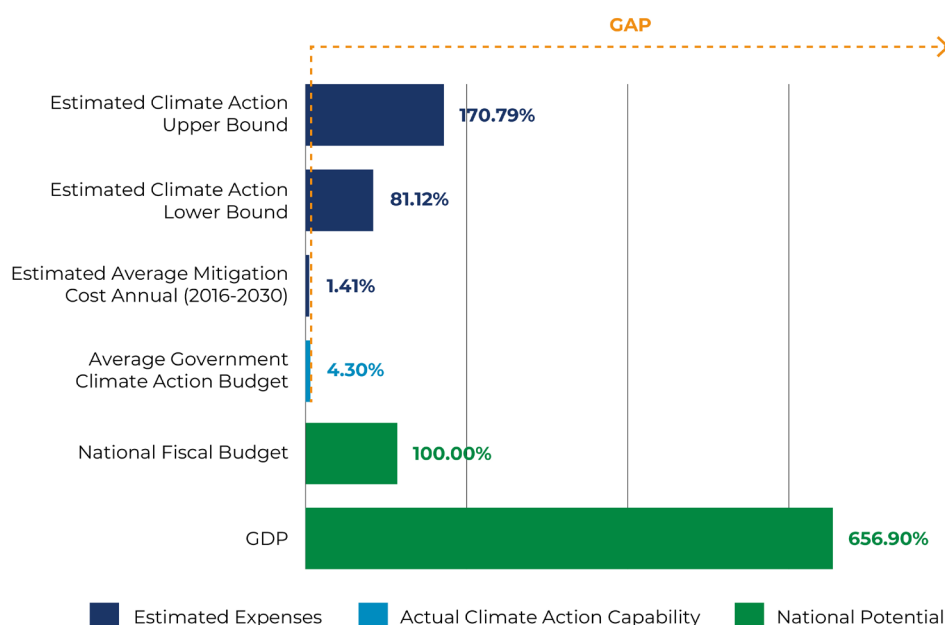
**Figure 32: Gap between Estimated Cost of Climate Action 2030 and Current Resources and Support in Indonesia**

In terms of capability, Indonesia demonstrates a significant commitment to climate action. The pledged domestic resources for 2030 amount to USD 18,066 million, reflecting a substantial investment from within the country. Furthermore, Indonesia has garnered significant international support, totalling USD 26,786 million up until 2021. When combined, these commitments amount to an impressive USD 44,852 million, underscoring Indonesia's proactive stance on the global climate front (Figure 32).

Upon examining the needs, Figure 32 presents the estimated mitigation costs for 2030 alone amount to a substantial USD 39,554 million, highlighting the significant investment required to effectively reduce emissions and address the impacts of climate change. Moreover, the lower bound estimation for climate action needs in 2030 significantly escalates to more than USD 27 trillion, while the upper bound reaches a prominent over USD 102 trillion (Figure 32).

This stark contrast between capability and necessity underscores the magnitude of Indonesia's climate challenge. While the nation demonstrates commendable resolve and tangible commitments, the scale of action required far exceeds current capacities. To bridge this gap, Indonesia must not only allocate its existing resources efficiently but also actively seek additional avenues for support and collaboration, both domestically and internationally.

Achieving Indonesia's 2030 targets will undoubtedly pose challenges, yet they remain within reach. By strategically allocating resources, building strong international partnerships, and adopting innovative approaches to climate action, Indonesia can progress towards a sustainable and resilient future. However, realising this vision requires dedication, collaborative efforts, and a collective commitment to protecting our planet for generations to come.



**Figure 33: Gap between Climate Action Costs and Country's Annual Capability in Indonesia**

When viewed on an annual basis, Indonesia's approach to climate action reveals a disparity between its economic strength and its financial commitments towards environmental sustainability. With a GDP of USD 1,318.6 billion, Indonesia demonstrates considerable economic prowess on the global stage. However, this contrast becomes evident when compared to its allocated budget for climate action, which stands at only 4.30% of the national fiscal budget, translating into a modest USD 56.68 billion where the actual funds available for climate action shrink to USD 8.63 billion. This discrepancy highlights the need for realignment in Indonesia's financial strategy to bridge the gap between available resources and those dedicated to climate initiatives (Figure 33).

The pressing demand for climate action presents a stark reality of Indonesia's environmental challenges and the investment required to mitigate them. The estimated average annual mitigation cost from 2016 to 2030, amounts to a substantial USD 2.82 billion, highlighting the significant financial resources needed to effectively combat Indonesia's climate-related issues. Furthermore, the annual climate action lower bound, standing at USD 162.82 billion, outlines the minimum investment necessary for addressing climate imperatives each year. In contrast, the upper bound estimation of USD 342.82 billion underscores the ambitious scale of investment needed annually to comprehensively tackle Indonesia's climate challenges. This disparity between available resources and the financial requirements for climate action underscores the formidable task Indonesia faces in mobilising adequate funding to safeguard its environmental future (Figure 33).

In assessing the need for climate action in Indonesia's pilot cities, it is essential to consider the estimated costs and the accessibility of financing options available to them. The provided data offers insights into the annual mitigation costs, total climate action costs, and the financial landscape of these cities. Cities in Indonesia rely significantly on domestic resources, impacting their ability to achieve ambitious climate targets, particularly concerning adaptation measures. While there may be some adequacy in addressing mitigation efforts, the situation becomes more challenging when considering adaptation strategies.



Mitigation actions primarily focus on reducing greenhouse gas (GHG) emissions and transitioning towards sustainable practices, utilising existing infrastructure and resources where feasible. However, adaptation measures, which involve building resilience to climate impacts such as sea-level rise, extreme weather events, and changing precipitation patterns, often require substantial investments in infrastructure, technology, and community resilience programmes.

Given the challenges in accessing external funding sources as well as the limited fiscal capacity at both national and city levels, Indonesian cities may struggle to mobilise the resources necessary to implement comprehensive adaptation strategies. This limitation is particularly concerning as the impacts of climate change continue to intensify, posing significant risks to vulnerable communities and ecosystems.

During the period from 2024 to 2030, the total annual mitigation costs for the nine pilot cities are estimated at USD 65.54 million, covering the essential expenses required to effectively mitigate climate change impacts within these urban centres. To put into perspective, the range of total climate action costs presents a more comprehensive view, with the lower bound estimated at USD 99.06 billion and the upper bound at a substantial USD 180.06 billion. These projections reflect the varying degrees of investment necessary to implement comprehensive climate action strategies, tailored to the specific needs and challenges of each pilot city.

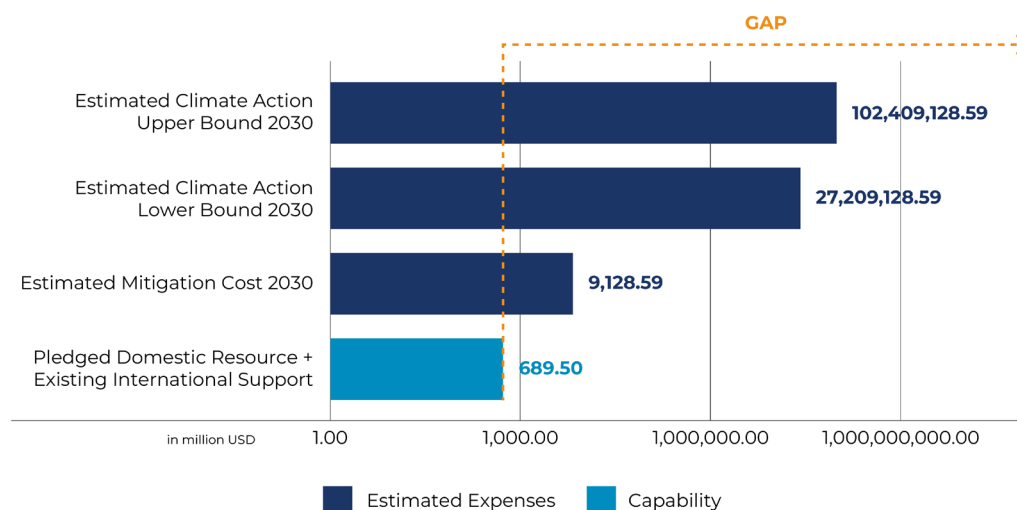
The average annual mitigation cost for each city in Indonesia stands at USD 7.28 million, reflecting the financial burden borne by local authorities in tackling climate change. This figure serves as a baseline for understanding the financial requirements unique to each city. Moreover, the estimated total climate action costs provide a broader perspective, with the lower bound set at USD 11 billion and the upper bound at a formidable USD 20 billion. These figures underscore the substantial investment needed to comprehensively address climate challenges at the city level, including mitigation, adaptation, and resilience-building efforts.

**Table 11: Number of Financing Schemes and Their Status in Indonesia**

Status	Number of Financing Scheme
Yes	3
Need National-level Authorities' Involvement	5
Not Accessible	2
Still in Grey Area/Policy is Not Yet Developed/Policy is Still Under Development	2

As a result, there is a critical need for enhanced collaboration and support mechanisms between the national and local governments, as well as engagement with international partners and stakeholders. However, the accessibility of climate finance remains a critical factor influencing the implementation of climate action initiatives in Indonesia’s pilot cities. While certain financing options, such as technical assistance (TA) and national grants, are readily accessible, others, such as loans and designated climate funds, require coordination with national-level authorities. The status of financing schemes also varies across cities, while some already benefiting from existing mechanisms, others are still navigating a landscape of uncertainty and policy development (Table 11).

## 6.2 Malaysia



**Figure 34: Gap between Estimated Cost of Climate Action 2030 and Current Resources and Support in Malaysia**

In Malaysia's pursuit of its 2030 climate targets, a comprehensive understanding of the country's capabilities and needs is essential. Malaysia demonstrates a commendable commitment to climate action, with domestic resources pledged for climate initiatives in 2030 amounting to USD 453.26 million. Additionally, the country has received international support amounting to USD 236.24 million until 2021. These pledges result in a substantial sum of USD 689.50 million, representing Malaysia's existing capability to finance climate initiatives (Figure 34).

However, the magnitude of Malaysia's climate action needs is substantial. The estimation of mitigation costs for 2030 alone stands at USD 9,128.59 million, signifying the substantial investment required to reduce emissions and combat climate change impacts effectively. The lower bound estimation for total climate action needs in 2030 amounts to a formidable USD 27.21 trillion, while the upper bound reaches USD 102.41 trillion.

This contrast between capability and necessity underscores the significant gap Malaysia faces in mobilising resources to achieve its climate targets. While the nation exhibits a commendable commitment to climate action, the scale of investment required far exceeds the current capacity. Bridging this gap requires innovative financing mechanisms, enhanced international cooperation, and strategic resource allocation (Figure 34).

Malaysia's economic strength, reflected in its GDP of USD 407 billion, underscores its capacity to engage in climate action. However, when examining the allocation for climate initiatives, the average government climate action budget accounts for 5.12% of the national fiscal budget, equating to USD 4.13 billion. This highlights the portion of the national budget specifically allocated for addressing climate challenges, derived from the overall fiscal allocation of USD 80.7 billion (Figure 35).

Conversely, the pressing needs for climate action reveal the substantial investments required. The estimated average annual mitigation cost from 2016 to 2030 amounts to USD 652.04 million, highlighting the financial commitment needed to effectively mitigate Malaysia’s GHG emissions. The annual climate action lower bound is projected at USD 160.65 billion, representing the minimum annual investment essential for comprehensive climate action. Meanwhile, the upper bound estimation reaches a substantial USD 340.65 billion, reflecting the ambitious scale of investment required each year to fully address Malaysia’s climate challenges (Figure 35).

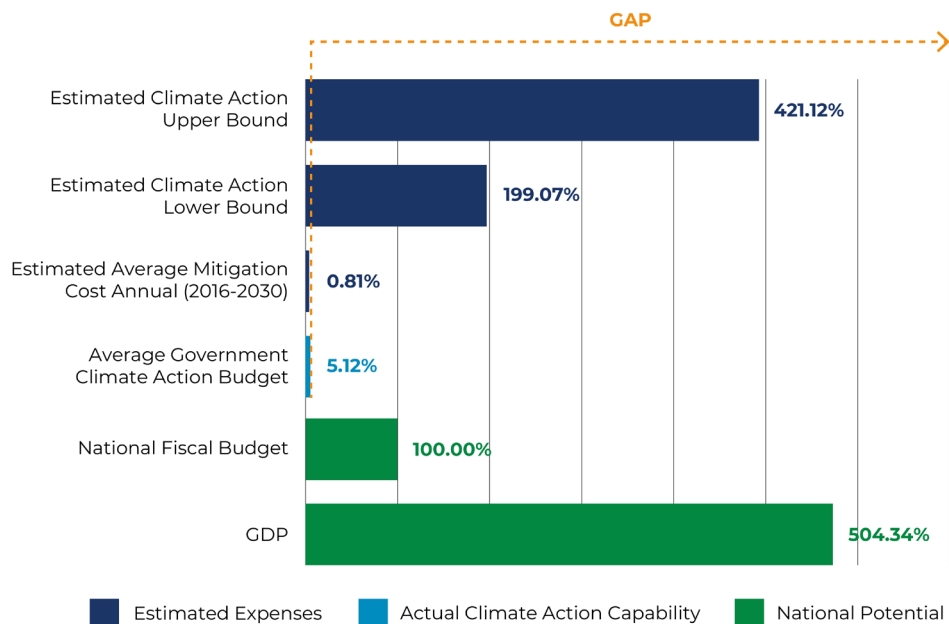


Figure 35: Gap between Climate Action Costs and Country's Annual Capability in Malaysia

Malaysia’s commitment to climate action is commendable, evidenced by its dedicated budget allocations. However, the scale of investment necessary to meet its climate action needs far surpasses its current capacity. In assessing the climate action needs of cities in Malaysia, it is essential to consider both the estimated costs and the accessibility of financing options available to them. The data provided offers insights into the annual mitigation costs and the financial landscape of these cities.

The total estimation of annual mitigation costs for the eight pilot cities from 2024 to 2030 amount to USD 69.69 million covering the essential expenses required to mitigate climate change impacts effectively within these cities. However, the total climate action costs provide a more comprehensive view, with the lower bound estimated at USD 88.06 billion and the upper bound at a substantial USD 160.06 million. These projections encompass the varying degrees of investment necessary to implement comprehensive climate action strategies tailored to the specific needs and challenges of each city.

Individually, the average annual mitigation cost for each city in Malaysia stands at USD 8.71 million, reflecting the financial burden on local authorities in tackling climate change. This figure serves as a baseline for understanding the financial requirements unique to each city. Moreover, the estimated total climate action costs provide a broader perspective, with the lower bound set at USD 11 billion and the upper bound at a formidable USD 20 billion. These figures underscore the scale of investment needed to comprehensively address climate challenges at the city level, including mitigation, adaptation, and resilience-building efforts.

Despite these identified needs, the accessibility of climate finance remains a critical factor influencing the implementation of climate action initiatives in Malaysian cities. While certain financing options, such as TA and national grants, are readily accessible, others, such as loans and access to designated climate funds, require coordination with national-level authorities. Additionally, the status of financing schemes varies across cities, while some already benefiting from existing mechanisms, others are still navigating a landscape of uncertainty and policy development (Table 12).

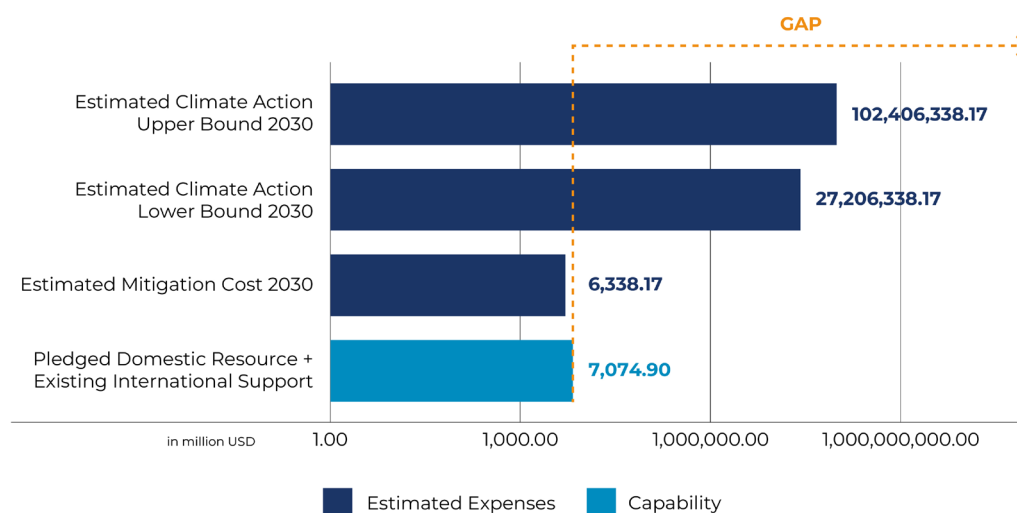
**Table 12: Number of Financing Schemes and Their Status in Malaysia**

Status	Number of Financing Scheme
Yes	5
Need National-level Authorities' Involvement	5
Not Accessible	1
Still in Grey Area/Policy is Not Yet Developed/Policy is Still Under Development	1

In navigating this complex financial terrain, Malaysian cities must leverage available financing options effectively, foster partnerships with national-level entities, advocate for policies that enhance accessibility to climate finance and collaborate with international stakeholders. Through concerted efforts and strategic coordination, these cities can mobilise the resources necessary to build climate-resilient communities and secure a sustainable future for their residents.

## 6.3 Thailand

Thailand has set ambitious goals to address climate change and has demonstrated its commitment through both domestic pledges and international support. The country has committed USD 439.90 million for climate actions by 2030. Additionally, the nation has received substantial international support totalling USD 6,635 million until 2021. Combining these resources, Thailand has a pledged capability of USD 7,074.9 million to finance climate initiatives (Figure 36).

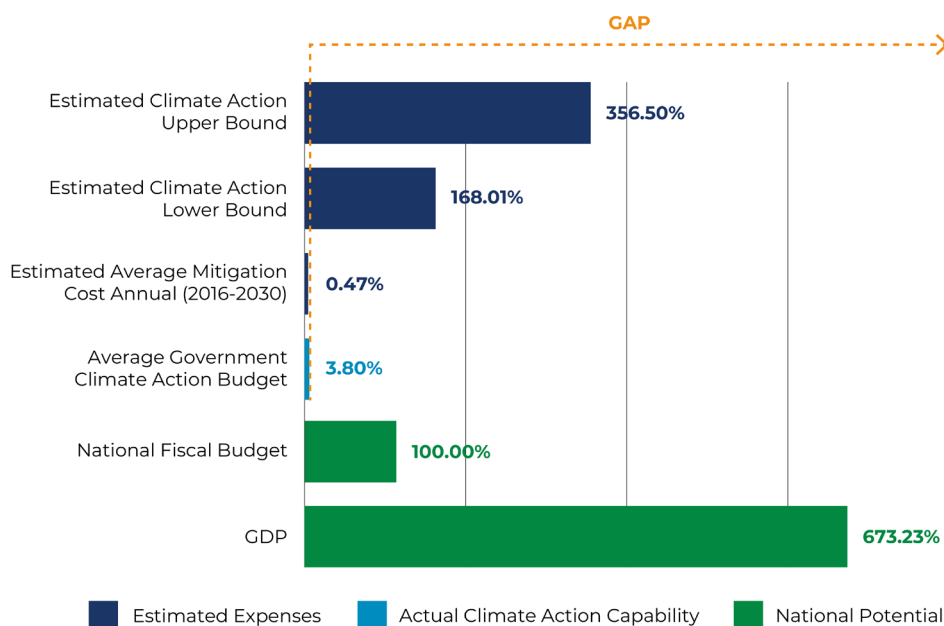


**Figure 36: Gap between Estimated Cost of Climate Action 2030 and Current Resources and Support in Thailand**

However, the scale of Thailand's climate action needs presents a significant challenge. The estimated mitigation costs for 2030 alone are projected at USD 6,338.17 million, indicating the substantial investments required to effectively reduce emissions and combat climate change impacts. The lower bound estimation for the total climate action needs in 2030 stands at around USD 27,21 trillion, with the upper bound reaching up to USD 102,41 trillion. These figures underscore the substantial financial resources needed to comprehensively address Thailand's climate challenges (Figure 36).

This disparity between Thailand's capability and the scale of its climate action needs presents a substantial gap. While the nation's commitment to climate action is evident, current resources fall short of what is required to meet ambitious targets. Addressing this gap will require innovative financing mechanisms, strengthened international collaboration, and strategic resource allocation to mobilise additional funding, ensuring effective climate action implementation.

Translating into annual terms, Thailand showcases a robust economy, with a GDP of USD 543.3 billion, reflecting its economic strength. However, when examining the allocation for climate action, the average government budget allocated for climate initiatives accounts for 3.80% of the national fiscal budget, equating to USD 3.62 billion. This allocation represents the share of the national budget directed towards climate initiatives out of the total fiscal allocation of USD 95.5 billion (Figure 37).



**Figure 37: Gap between Climate Action Costs and Country's Annual Capability in Thailand**

Thailand's climate action needs highlight a formidable challenge. The annual estimated average mitigation cost from 2016 to 2030 amounts to USD 452.72 million. This figure illustrates the annual investment required to effectively mitigate Thailand's GHG emissions and combat climate change impacts (Figure 37).

The annual climate action lower bound estimation is projected at USD 160.45 billion, representing the minimum annual investment essential for comprehensive climate action. Meanwhile, the upper bound estimation reaches a substantial USD 340.45 billion, reflecting the ambitious scale of investment needed each year to fully address Thailand's climate challenges (Figure 37).

This contrast between capability and needs underscores the significant gap Thailand faces in mobilising resources to achieve its climate targets. While the nation demonstrates a commitment to climate action through its annual budget allocations, the scale of investment required far exceeds its current capacity.

Expanding the analysis to the city level, the total estimation of annual mitigation costs for the four pilot cities from 2024 to 2030 amounts to USD 1,61 million. This figure represents the essential expenses required for these cities to effectively mitigate climate change impacts within their respective jurisdictions. However, when considering the broader context, the range of total climate action costs unveils a more comprehensive picture, with the lower bound estimation set at USD 44 billion and the upper bound reaching USD 80 billion. These projections illustrate the varying degrees of investment necessary for implementing comprehensive climate action strategies tailored to the specific needs and challenges of each city.

On average, each city in Thailand faces an annual climate action cost of USD 402.43 thousand. This baseline figure serves as a reference point for understanding the financial burden borne by local authorities in their efforts to address climate change. Moreover, the estimated total climate action costs provide a broader perspective, with the lower bound estimation set at USD 11 billion and the upper bound at USD 20 billion. These figures underscore the magnitude of investment needed to comprehensively address climate challenges at the city level, encompassing mitigation, adaptation, and resilience-building efforts.

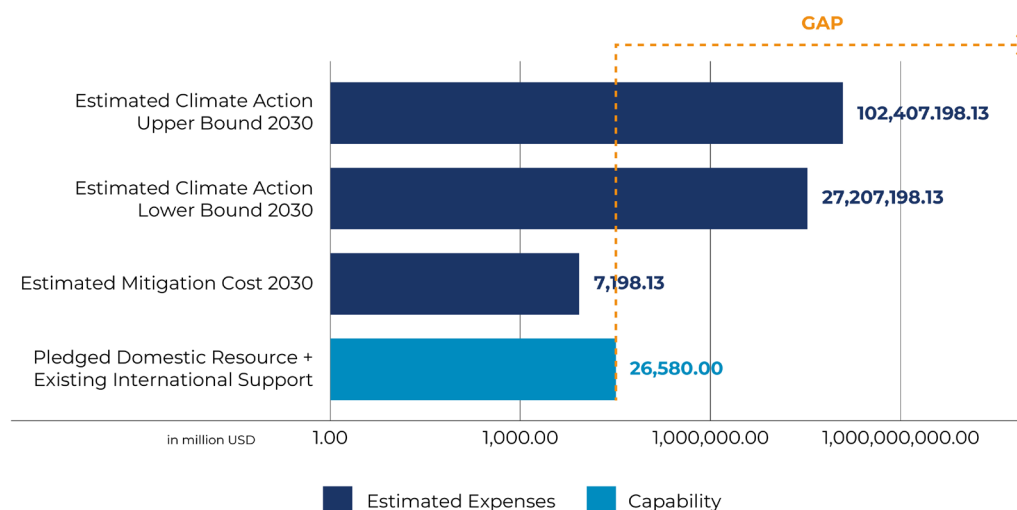
Despite the identified needs, the accessibility of climate finance remains a critical factor influencing the implementation of climate action initiatives in Thailand cities. While some financing options, such as TA and national grants, are readily accessible, others require coordination with national-level authorities or remain under development. The status of financing schemes varies across cities, while some already benefiting from existing mechanisms, others are still navigating a landscape of uncertainty and policy development (Table 13).

**Table 13: Number of Financing Schemes and Their Status in Thailand**

Status	Number of Financing Scheme
Yes	2
Need National-level Authorities' Involvement	6
Not Accessible	1
Still in Grey Area/Policy is Not Yet Developed/Policy is Still Under Development	3

Thailand faces a significant challenge in aligning its capability with the financial resources required to achieve its climate targets. Moreover, navigating this complex financial terrain requires collaboration and innovation at both the local and national levels. Thai cities must leverage available financing options effectively, foster partnerships with national-level entities, and advocate for policies that enhance accessibility to climate finance. By addressing these challenges and opportunities, Thailand cities can mobilise the resources necessary to build climate-resilient communities and secure a sustainable future for their residents in the face of climate change.

## 6.4 Vietnam



**Figure 38: Gap between Estimated Cost of Climate Action 2030 and Current Resources and Support in Vietnam**

Vietnam has demonstrated a commitment to addressing climate change through both domestic pledges and international support. Domestically, Vietnam has pledged USD 9,000 million for climate initiatives by 2030. The nation has also received substantial international support totalling USD 17,580 million until 2021. Combined, these pledges result in a sum of USD 26,580 million, representing Vietnam's existing capability to finance climate initiatives (Figure 38).

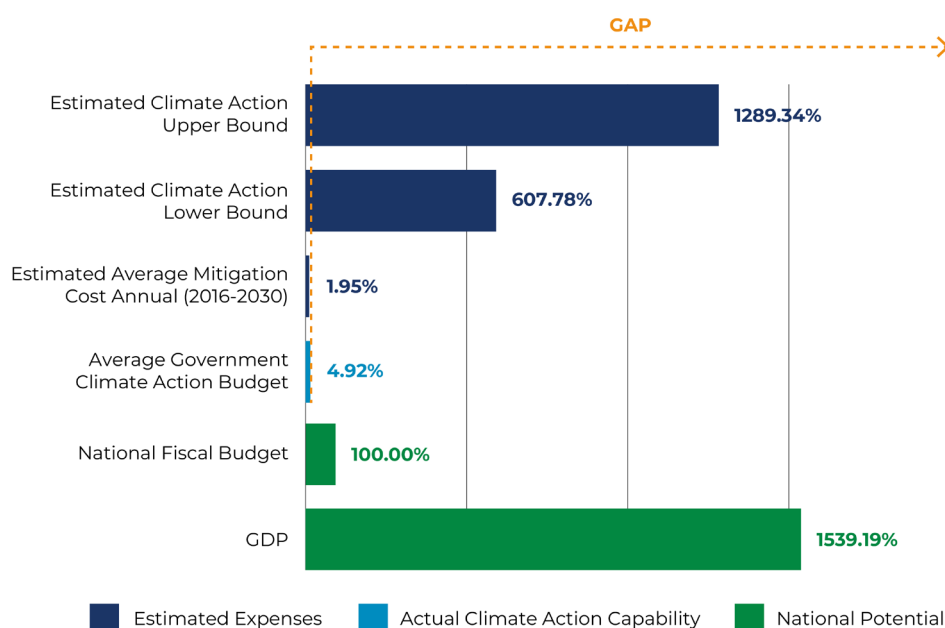
However, the scale of Vietnam's climate action needs presents a significant challenge. The estimated mitigation costs for 2030 alone stand at USD 7,198.13 million, indicating the substantial investment required to reduce emissions and effectively combat climate change impacts. The lower bound estimation for total climate action needs in 2030 is projected at more than USD 27,21 trillion, while the upper bound reaches USD 102,41 trillion. These projections underscore the ambitious scale of investment needed to fully address Vietnam's climate challenges (Figure 38).

This disparity between capability and necessity underscores the significant gap Vietnam faces in mobilising resources to achieve its climate targets. While the nation's commitment to climate action is evident, current resources fall short of what is required to meet ambitious targets. Addressing this gap will require innovative financing mechanisms, strengthened international collaboration, and strategic resource allocation.

Vietnam's economic strength is evident, with a GDP of USD 406.5 billion, representing a substantial figure relative to its climate action commitments. Within its national fiscal budget of USD 26.41 billion, the average government climate action budget stands at 4.92%, translating to USD 1.3 billion allocated for climate initiatives annually. This allocation underscores Vietnam's commitment to addressing climate change within its financial constraints (Figure 39).

Despite that, the estimated average annual mitigation cost from 2016 to 2030 amounts to USD 514.15 million, indicating the significant investment required to effectively reduce emissions and combat climate change impacts. The lower bound estimation for annual climate action needs in 2030 is projected at a substantial USD 160.51 billion, with the upper bound reaching an even more staggering USD 340.51 billion. These figures underscore the ambitious scale of investment needed each year to fully address Vietnam's climate challenges (Figure 39).





**Figure 39: Gap between Climate Action Costs and Country's Annual Capability in Vietnam**

The contrast between capability and necessity highlights the significant gap Vietnam faces in mobilising resources to achieve its climate targets. While the nation demonstrates a commitment to climate action through its annual budget allocations, the scale of investment required far exceeds its current capacity.

The total estimation of annual mitigation costs for the seven pilot cities from 2024 to 2030 amounts to USD 9.16 million. This figure represents the essential expenses required for these cities to effectively mitigate climate change impacts within their respective jurisdictions. However, when considering the broader context, the range of total climate action costs unveils a more comprehensive picture. The lower bound estimation is set at USD 77 billion, while the upper bound reaches USD 140 billion. These projections illustrate the varying degrees of investment necessary for implementing comprehensive climate action strategies tailored to the specific needs and challenges of each city.

Each city in Vietnam faces an annual climate action cost of USD 1.30 million on average. This baseline figure serves as a reference point for understanding the financial burden on local authorities in their efforts to address climate change. Moreover, the estimated total climate action costs provide a broader perspective, with the lower bound set at USD 11 billion and the upper bound at a formidable USD 20 billion. These figures underscore the magnitude of investment needed to comprehensively address climate challenges at the city level, including mitigation, adaptation, and resilience-building efforts.

**Table 14: Number of Financing Schemes and Their Status in Vietnam**

Status	Number of Financing Scheme
Yes	4
Need National-level Authorities' Involvement	6
Not Accessible	1
Still in Grey Area/Policy is Not Yet Developed/Policy is Still Under Development	1

Despite the identified needs, the accessibility of climate finance remains a critical factor influencing the implementation of climate action initiatives in Vietnamese cities. While some financing options, such as TA and national grants, are readily accessible, others require coordination with national-level authorities or remain under development. The status of financing schemes varies across cities, while some already benefiting from existing mechanisms, others are still navigating a landscape of uncertainty and policy development (Table 14).

Vietnam confronts a substantial challenge in aligning its capability with the financial resources required to achieve its climate targets. Navigating this complex financial terrain requires collaboration and innovation at both the local and national levels. Vietnamese cities must leverage available financing options effectively, foster partnerships with national-level entities, and advocate for policies that enhance accessibility to climate finance. Moreover, bridging this gap will necessitate innovative financing mechanisms, enhanced international collaboration, and strategic resource allocation. By addressing these challenges and opportunities, Vietnamese cities can mobilise the resources necessary to build climate-resilient communities and secure a sustainable future for their residents.

## 6.5 General Challenges

In the pursuit of sustainable development and resilience against the impacts of climate change, climate financing mechanisms are key to its realisation. Yet, as this study reveals, the path to securing adequate funding for climate action is fraught with challenges extending from the local to the national level. The dynamics between climate financing and action underscore the need for a comprehensive examination of the challenges that hinder progress in this critical domain.

This study identified the multifaceted challenges faced by stakeholders to mobilise resources for climate initiatives. From local-level governments grappling with limited access to funds and matchmaking opportunities to national governments contending with policy inconsistencies and a predominant focus on mitigation over adaptation, the landscape of climate financing is rife with complexities.

The challenges into the fundamental nexus between climate financing, action, and planning. It underscores the importance of addressing the identified challenges at both the city and national levels to establish effective climate action and sustainable development. The explanation below shows more details of the challenges faced at the national and city level.

### Challenges at the National Level

- 1. Dissemination of Financing Information:** The dissemination process of available financing to cities is inadequate, hampering cities' ability to access climate finance.
- 2. Policy Alignment and Stability:** National-level policies often create limitations in accessing financing schemes, and political instability affects the assurance of stable climate action and financing.
- 3. Focus on Mitigation over Adaptation:** National interest predominantly focuses on mitigation, making financing for adaptation measures challenging to secure.
- 4. Lack of Integrated Planning:** The absence of integrated planning between mitigation and adaptation efforts complicates the development of robust financing schemes that address both aspects of climate change.
- 5. Gap between Needs and Capacity:** The substantial gap between needs and capacity necessitates comprehensive planning and action involving multiple stakeholders, requiring co-financing or blended finance mechanisms.
- 6. Engagement Challenges:** Engagement at both national and city levels is challenging due to capacity gaps and uncertainties, requiring concerted efforts to bridge the divide.
- 7. Role as Gateway to Financing Schemes:** National governments serve as the primary gateway to financing schemes, yet they grapple with substantial capacity constraints in facilitating climate financing at the local level.
- 8. Capacity Constraints in Bridging the Gap:** Despite their pivotal role, national entities struggle to bridge the gap between financing schemes and cities due to capacity limitations, necessitating efforts to bolster capacity and streamline processes.

## Challenges at the City Level

- 1. Limited Direct Access to Funds:** Municipal councils face constraints in accessing funds directly from funding agencies, often requiring coordination with national-level authorities.
- 2. Restricted Access to Matchmaking Programmes:** Cities encounter difficulties in accessing matchmaking programmes for city climate finance unless specifically invited, limiting their opportunities for engagement.
- 3. Limited Flexibility Beyond Domestic Resources:** Cities struggle to access climate financing beyond domestic resources, leading to a lack of coordination and engagement with stakeholders beyond the government.
- 4. Insufficient Knowledge and Information:** Cities lack sufficient knowledge and information to assess needs, develop comprehensive plans, and align climate actions with local and national agendas.
- 5. Lack of Capacity for Pragmatic Planning:** Limited capacity in formulating pragmatic decisions in climate action, affecting the development of financing schemes and overall implementation.
- 6. Challenges in Developing Financing Schemes:** Cities grapple with prioritising financing schemes and often lack clarity in planning climate actions with the available financing options.
- 7. Needs Assessment and Comprehensive Studies:** Inadequate comprehensive needs assessments and studies hinder effective planning and decision-making in climate financing.
- 8. Political Will and Alignment with Economic Gain:** Political will in addressing climate change is insufficient, and there is a lack of alignment between climate action and economic incentives, complicating financing efforts.
- 9. Engagement with Development Partners:** Engaging with development partners becomes challenging due to shifts in focal points and uncertainties in engagement, particularly with funders.
- 10. Challenges in Identifying Capacities:** Cities face challenges in identifying their capacities and assets to pursue climate financing, hindering effective resource mobilisation.
- 11. Limited Access from Preliminary Stages:** Cities struggle to access climate programmes from their inception, hampering their ability to effectively align financing with climate goals.
- 12. Underutilisation of Municipal Bonds:** While municipal bonds offer the potential for financing climate initiatives, cities lag in their utilisation, resulting in the lack of capacity for robust climate action implementation.
- 13. Lack of Addressing Mutual Benefits and Risks:** Cities face challenges in articulating the mutual benefits and risks associated with climate investments, hindering collaboration with investors and other stakeholders.
- 14. Absence of Comprehensive Business Processes:** The absence of comprehensive business processes, models, and canvases impedes cities' ability to develop viable financing strategies aligned with climate objectives.

It becomes evident that bridging the gap between vision and reality demands concerted efforts, innovative solutions, and collaborative partnerships. By addressing these challenges and charting a course toward inclusive, resilient, and sustainable futures, cities can harness the power of climate financing to build a better world for generations to come. This study helps to provide insights as we navigate complexities, confront obstacles, and chart a course toward leveraging climate financing as a catalyst for more transformative climate change efforts on a global scale.

## 07. Strategies

Addressing the challenges of designing comprehensive climate action initiatives requires aligning project phases with suitable financing mechanisms. This entails identifying key stakeholders involved in climate action planning and implementation, such as government agencies, private sector entities, community organisations, and development partners. Early engagement with these stakeholders ensures well-coordinated climate action plans (CAPs) supported by a diverse range of resources. A strategic examination of project phases and corresponding financing schemes can enable cities to identify opportunities for collaboration, maximising the impact of their climate investments.

Climate financing is the key to driving meaningful progress in climate action. This study offers a comprehensive strategy for financing climate action initiatives, emphasising the importance of practicality and implementation feasibility. By breaking down each project phase, cities can determine the financing schemes most fitting to support their climate objectives. This approach ensures that resources are allocated efficiently and effectively, maximising the potential for success. Moreover, this study also acknowledges the need for innovative climate financing to offer cities more pathways to accessing funds. Through this systematic, diverse, and well-informed approach, cities can have the ability to navigate the complexities of funding allocation, fostering tangible progress towards sustainability and resilience.

## 7.1 Addressing the Challenge of Limited Access to Climate Finance: Leveraging Key Players in Climate Action

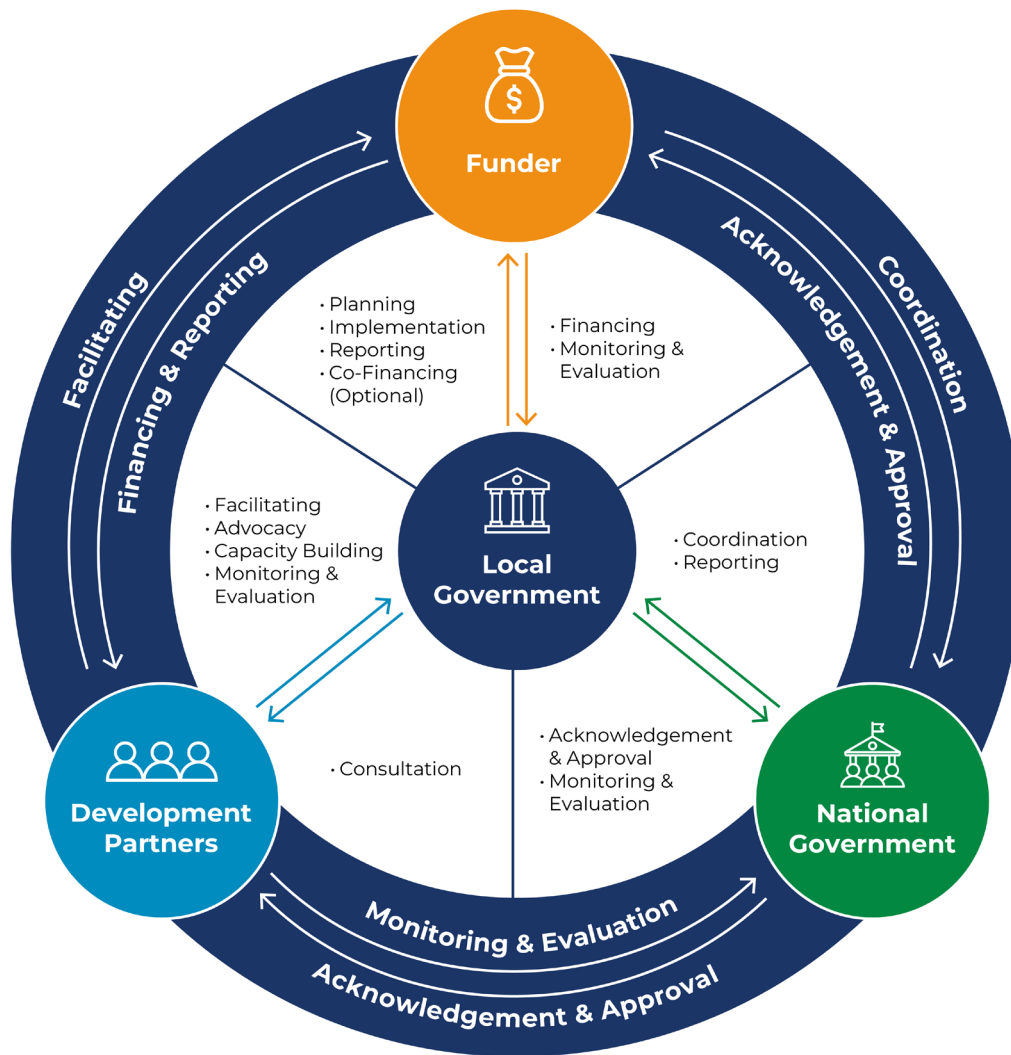


Figure 40: Framework of Key Players in Climate Action for Accessing Climate Finance

### Main Framework

The overarching challenge faced by cities lies in their unfamiliarity with accessing climate finance. To address this, it is crucial to identify and engage key players in climate action, particularly local governments, who play a central role in planning, implementing, monitoring, and evaluating climate action initiatives. By actively engaging with funders, local governments streamline the process of accessing climate finance and contribute to financing through co-financing arrangements. Funders also play a multifaceted role beyond financing, including monitoring and evaluation to ensure that climate action remains on the right trajectory. Through strategic collaboration and efforts with key stakeholders, cities can navigate the complexities of accessing climate finance and drive impactful climate action initiatives forward (Figure 40).

## Role of National Governments

Acknowledging the pivotal role of national governments as the primary gateway to accessing climate finance is essential. They provide valuable insights and additional safeguards to mitigate risks associated with city-led climate action initiatives. However, bridging the capacity gap between local and national governments is crucial. Consultation and coordination with the national level are essential to appropriately address financing schemes, ensuring alignment with national agendas and interests. National approval of proposed programmes, funders, and financing schemes further legitimise and facilitate the implementation of climate action initiatives at the local level.

National governments have the opportunity to enhance the impact of climate action by participating in co-financing arrangements. Apart from financing, they play a crucial role in overseeing climate action and financing through monitoring and evaluation processes, ensuring alignment with established goals. Moreover, national governments can utilise their role to expand the reach of local government programmes by facilitating connections with alternative funders or financing schemes.

Effective consultation and coordination with national governments can empower cities to overcome their challenges in accessing climate finance and tap into a broader range of resources and opportunities. Through collaborative efforts involving stakeholders, including local governments, funders, and national entities, the path towards resilient and sustainable climate action becomes more feasible and impactful.

## Leveraging Development Partners to Enhance Climate Finance Access

To address the challenge of limited knowledge and information among local governments regarding accessing climate finance and crafting robust proposals for funders, development partners play a pivotal role. Development partners, such as the United Cities and Local Governments Asia Pacific (UCLG ASPAC) as the Global Covenant of Mayors for Climate and Energy (GCoM) Southeast Asia Secretariat and a local government association, play a crucial role. They serve as valuable resources in facilitating cities' engagement with suitable funders through matchmaking processes. Acting as intermediaries, they bridge the gap between cities and funders, particularly in cases where direct engagement between cities and funders may be challenging.

Moreover, development partners advocate for the needs of both cities and funders, ensuring alignment between climate action objectives and available financing opportunities. Through capacity-building initiatives, they empower cities to enhance their preparedness in developing CAP and compelling proposals for funders. Additionally, development partners play a crucial role in monitoring and evaluating the progress of climate action initiatives, thereby preventing deviations from established objectives.

By leveraging the expertise and resources of development partners, cities can navigate the complexities of accessing climate finance more effectively. Through collaborative efforts and strategic partnerships, development partners contribute to ensuring that financing and implementation progress remains on track, ultimately advancing the collective goal of building resilient and sustainable communities.

## 7.2 Addressing the Challenge of Climate Action Grand Design: Matchmaking the Project Phase of Climate Action Project and Appropriate Climate Finance Scheme

Following the understanding of key players in climate action, it becomes imperative to delve into the strategy for financing climate action initiatives. Addressing the challenge of climate financing requires a systematic approach that begins with outlining the grand design of climate action through project phases. This involves breaking down the overarching CAP into manageable stages, each with its specific objectives and activities. By delineating each phase of the project, cities can gain a clear understanding of the sequential steps required to achieve their climate goals. Moreover, this structured approach enables cities to identify the most suitable financing schemes tailored to their specific needs and objectives. For instance, early-stage activities such as research and planning may benefit from grants or technical assistance (TA), while later-stage implementation may require loans or public-private partnerships (PPP) (Figure 41).

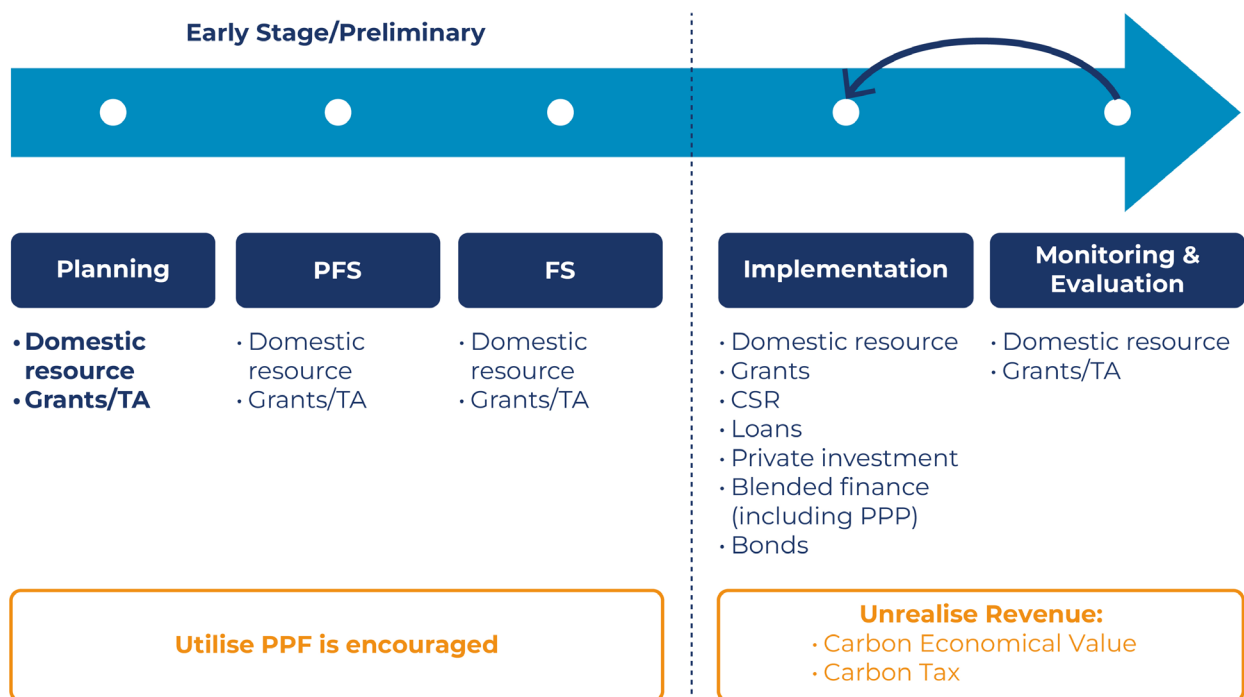


Figure 41: Strategizing Climate Action Financing at Different Project Stages





### Early Stage/Preliminary

This phase holds immense importance as it essentially determines the practicality of implementation and stands as the cornerstone of climate action, pivotal in shaping how smoothly the process unfolds. Our study emphasises the critical nature of this phase, offering insights into its key findings and how they relate to the financing scheme.



During the planning to feasibility study stage, this study has observed that the common practice for financing this phase involves leveraging domestic resources, such as local budgets and grants facilitated through TA mechanisms (Figure 41). It has been identified that cities utilising technical assistance tend to have more comprehensive and advanced preparations compared to those that do not. Moreover, TA contributes to enhancing the capacity of cities, providing an additional benefit.

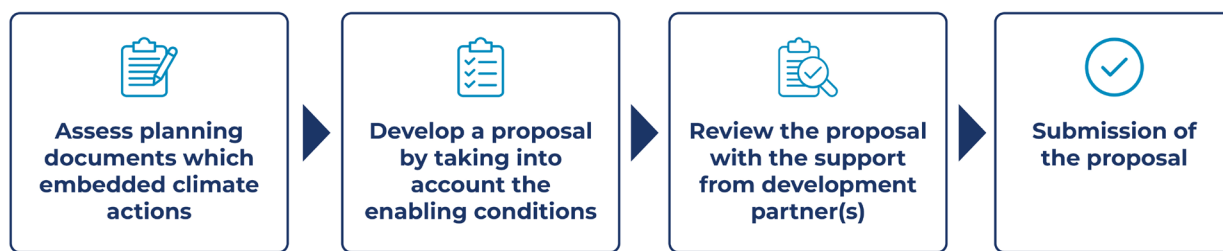
Therefore, this study advocates for cities to actively pursue financing opportunities in the preliminary stage by engaging with Project Preparation Facility (PPF) initiatives. To access financing through PPFs, cities are required to develop proposals or Expressions of Interest (EoI). PPFs typically offer forms or templates for proposing projects. Our study has identified at least three PPFs available for cities to pursue their climate projects, as illustrated below.<sup>1</sup>

	City Climate Finance Gap Fund	ICLEI Local Governments for Sustainability TAP Transformative Actions Program	Mitigation Action Facility
	<ul style="list-style-type: none"> <li>• Open All Year</li> <li>• No Deadline</li> </ul>	<ul style="list-style-type: none"> <li>• Open from Q1 – Q3</li> <li>• Deadline usually 31 October every year</li> </ul>	<ul style="list-style-type: none"> <li>• Open usually from Q4 to Q1 Next year</li> <li>• Deadline usually in Q1</li> </ul>
	Cover only Preliminary Phase: Strategic Planning to Pre-Feasibility Study	Cover only Preliminary Phase: Strategic Planning to Feasibility Study	Cover beyond the Preliminary Phase
	Financing through Technical Assistance	Financing through Technical Assistance	Financing through Technical Assistance and beyond including financial cooperation
	Simple proposal/brief proposal namely EoI needed as an application	Simple proposal but a little longer with ore explanation needed as an application	More Complex and comprehensive proposal needed as an application

**Figure 42: PPFs and Their Key Information**

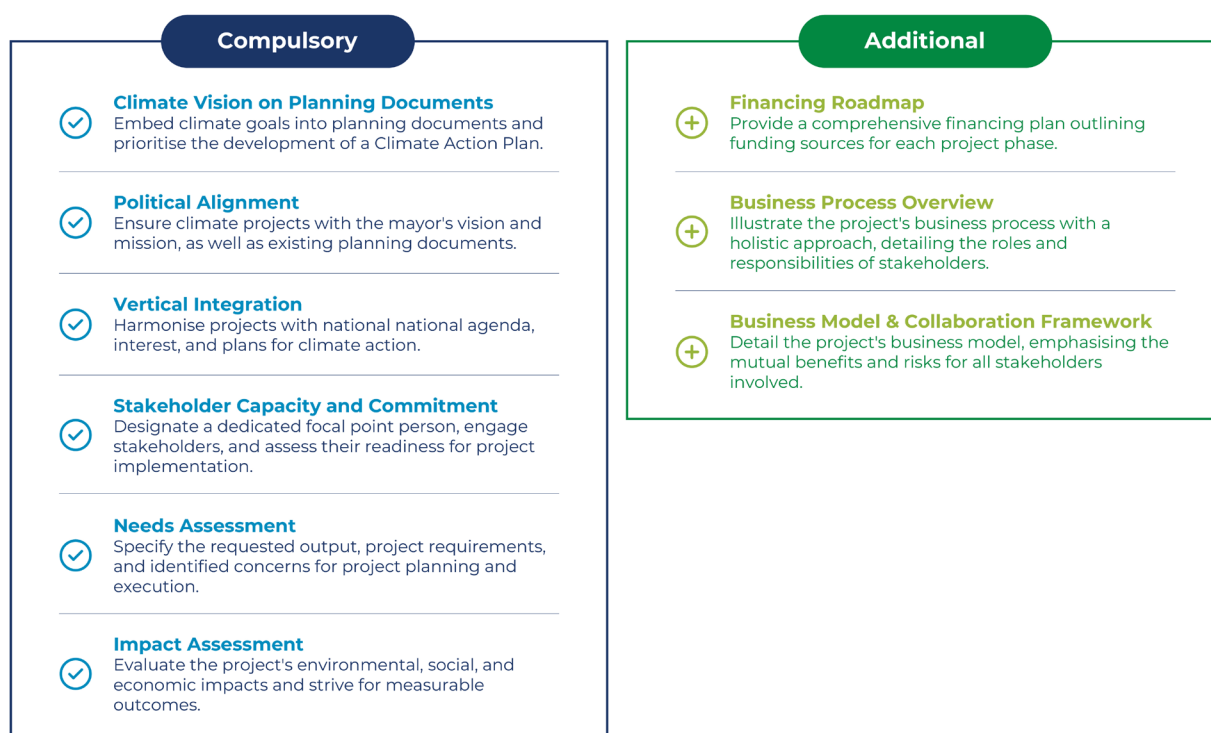
These three PPFs offer cities flexibility in selecting the most suitable option based on their specific needs. This study strongly encourages cities to explore and understand these facilities thoroughly. Cities are advised to seek assistance from development partners to navigate and grasp the intricacies of each PPF. With the guidance of development partners, cities can identify which PPF aligns best with their needs. As highlighted in the previous sub-chapter on key players, development partners are instrumental in facilitating access to this financing, from matchmaking with PPFs to enhancing the value of proposals.

1. To get Further Information Please refer to these links:  
 Gap Fund: <https://www.citygapfund.org/>  
 TAP: <https://tap-potential.org/>  
 Mitigation Action Facility: <https://mitigation-action.org>



**Figure 43: Steps to Pursue Climate Finance through PPF**

In pursuing climate finance through these facilities, it is crucial to develop a strong application. Figure 43 illustrates the steps required to access these financing facilities. It is recommended that cities collaborate closely with development partners to create a comprehensive application. This entails brainstorming ideas and refining them into a well-articulated application. Subsequently, intensive discussions between the city and development partners are vital to ensure that the application addresses all enabling environments and imperative points, as detailed in Figure 44. Following the review process with development partners, the finalised document should be submitted within the specified submission period.



**Figure 44: Enabling Conditions for City-Level Climate Financing**

City authorities should be aware that the application preparation process requires considerable time and effort. This study found that the best practice for application preparation typically spans approximately three months. The application process within the PPF itself also entails a significant timeframe, with the process taking up to six months until TA is provided to the city. Therefore, it is crucial for cities to allocate sufficient time and designate a person in charge to oversee and actively engage throughout the whole process. Maintaining consistent communication with the person in charge is essential to prevent any miscommunication or disruptions. Additionally, the appointed person in charge should demonstrate proactive involvement and possess expertise in the relevant field to facilitate seamless communication and coordination.

## Implementation

This phase represents the most complex aspect of climate action, demanding substantial funding from both capital expenditures (CAPEX) to operational expenditures (OPEX). Initially, the challenge lies in securing CAPEX, which can stem from various sources outlined in Figure 42. However, this study reveals that domestic resources and grants often fall short of meeting these needs. As a result, implementing actors must explore alternative avenues, such as utilising municipal bonds. Cities must navigate this terrain carefully, considering national policies and contexts, as some countries impose minimum requirements for the issuance of municipal bonds. Additionally, PPP emerges as a recommended approach, offering a collaborative financing scheme that shares risks and fosters mutual benefits from both public and private perspectives. Moreover, embracing blended financing systems can bolster investments, pooling resources for more ambitious climate actions.

On the other hand, addressing OPEX necessitates sustained funding mechanisms to ensure the continuity of climate actions. PPPs remain a viable option, enabling private entities to maintain business continuity through robust operational processes. Moreover, emerging financing schemes like carbon economic value (CEV) present opportunities for unrealised revenue in climate action. By quantifying greenhouse gas (GHG) emissions and engaging in carbon trading, cities can potentially finance OPEX over time, contingent upon observed reductions in emissions. However, it is imperative for actors to navigate the complexities of carbon markets diligently, as the verification process may extend up to two years, despite best practices suggesting a six-month timeline. Overall, city stakeholders must align their financing schemes with national-level policies to pre-empt conflicts and ensure seamless implementation.

## Monitoring and Evaluation

Within climate action projects, monitoring and evaluation (M&E) serve as critical components in guaranteeing the efficiency and success of implementation efforts. This phase functions as a control mechanism, allowing project managers to assess progress, identify challenges, and make informed decisions to guide the project towards its objectives. Essentially, it establishes a feedback loop back to the implementation phase, enabling adjustments and improvements based on real-time data and insights (Figure 42).

This study finds that financing for M&E is primarily sourced from domestic resources. This reliance on domestic funding underscores the importance of allocating adequate financial resources within the national budget to support ongoing M&E activities. However, while domestic funding is essential, it may not always be sufficient to cover the full scope of M&E needs. In such cases, external grants can provide supplementary funding to bolster M&E efforts, ensuring comprehensive data collection, analysis, and reporting throughout the project lifecycle. By combining domestic resources and external grants, cities can strengthen their capacity to effectively monitor and evaluate climate action initiatives, providing evidence-based decision-making and continuity.

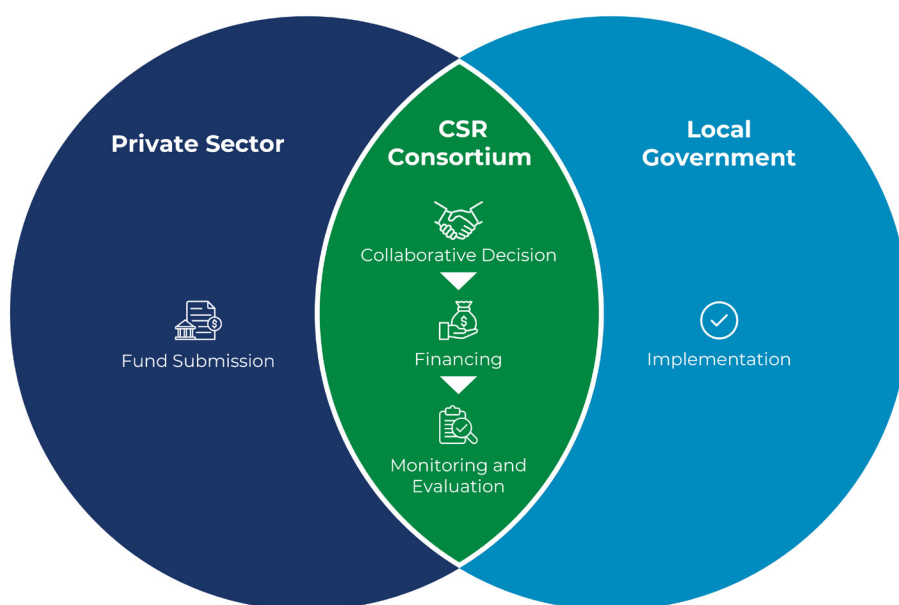
### 7.3 Innovative Financing

This study acknowledges the potential of innovative funding methods such as public-private partnership (PPP), municipal bonds, and blended finance in advancing climate action. However, this study also seeks to introduce a fresh perspective and propose a new concept for climate financing strategy. At the core of this innovative approach is the idea of involving diverse stakeholders in climate investment initiatives. This includes engaging not only government agencies and private sector entities but also civil society organisations, community groups, academic institutions, and development partners. By fostering multi-stakeholder collaboration, cities can access a broader range of perspectives, expertise, and financial resources to support their climate initiatives. By expanding participation beyond traditional financing mechanisms, cities can tap into a wider pool of resources and expertise, fostering greater collaboration and innovation in addressing climate challenges.

Innovative climate financing encourages the exploration of new funding mechanisms and investment models tailored to the specific needs and priorities of cities. This may involve exploring alternative revenue streams, such as green bonds, impact investing, crowdfunding, and social impact bonds. By diversifying funding sources and exploring creative financing solutions, cities can overcome financial barriers and unlock new opportunities for climate action.

Furthermore, innovative climate financing underscores the importance of building resilience and sustainability into financial mechanisms and investment strategies. This includes integrating climate risk assessments, sustainability criteria, and social impact metrics into investment decisions to ensure long-term viability and effectiveness. By aligning financial incentives with environmental and social objectives, cities can maximise the positive impact of climate investments while minimising risks and vulnerabilities.

In essence, the concept of innovative climate financing underscores the need for dynamic, inclusive, and forward-thinking approaches to mobilising resources and advancing climate action. By embracing innovation and collaboration, cities can accelerate progress towards their climate goals and create more resilient, equitable, and sustainable communities for future generations. This study offers more perspectives on climate financing strategies.



**Figure 45: CSR Pooling Fund**

In this framework (Figure 45) private sector companies allocate their CSR funds to the pooled fund managed by the CSR consortium, which oversees decision-making and project implementation in collaboration with local government agencies. Through this pooled resource, the consortium can finance larger-scale climate action initiatives, enhancing community resilience on a broader scale. Moreover, the consortium plays a vital role in monitoring and evaluating the outcomes of these projects to ensure accountability and effectiveness.

The CSR pooled fund not only aids in financing climate mitigation efforts but also serves as a critical funding source for adaptation actions aimed at bolstering community and city resilience. Furthermore, the fund can be utilised as part of a blended finance approach, combining public, private, and philanthropic resources to finance climate resilience projects that may require additional investment.

In summary, the CSR consortium model offers a collaborative and innovative approach to mobilising private sector resources to advance climate action, foster sustainable development, and fortify urban resilience. Through partnership with local government and other stakeholders, the private sector can play a transformative role in addressing the challenges of climate change and creating more resilient and sustainable urban environments.

## City as the Main Beneficiary

The study highlights a significant challenge faced by cities in accessing climate finance, particularly concerning grants or public funding. While may face constraints in directly accessing these resources, alternative pathways exist through philanthropic agencies and public funding channels accessible to other actors such as universities, civil society organisations (CSOs), non-governmental organisations (NGOs), and community groups.

In this model (Figure 46), cities have the opportunity to forge collaborations with academic institutions, CSOs, NGOs, or other entities possessing direct access to public or philanthropic funding. These partners can propose climate action projects that benefit the city, leveraging their access to external funding sources. However, cities should not remain passive in this process. Instead, they should actively support these partners by granting necessary permissions or providing resources, such as land, to facilitate the implementation of climate action projects.

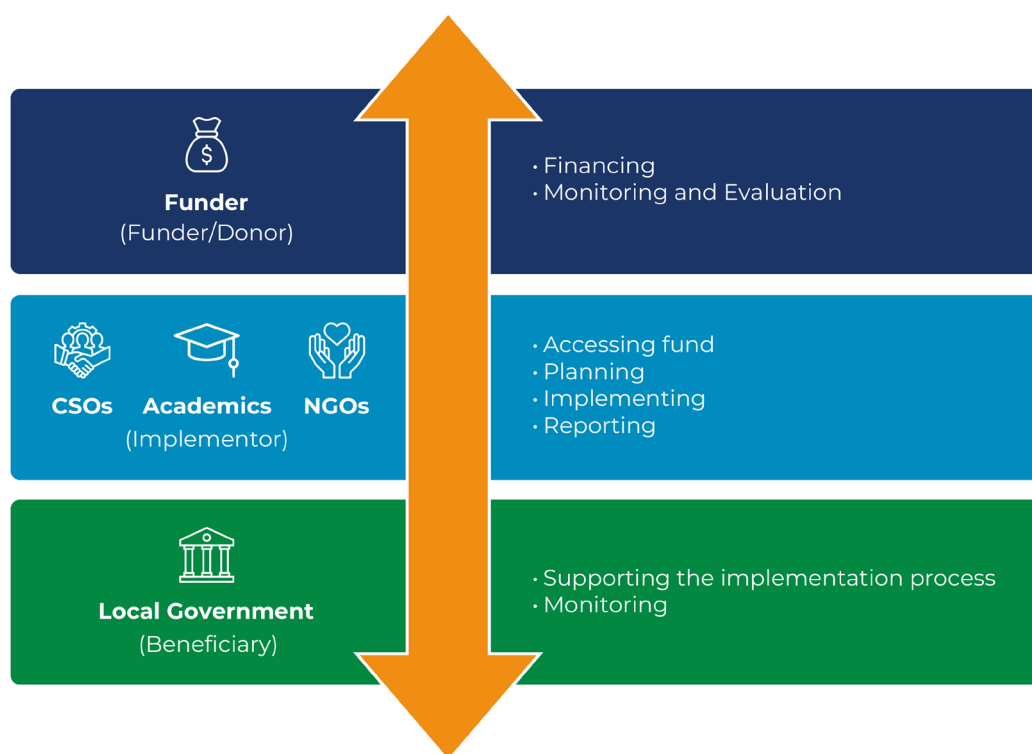


Figure 46: City as Main Beneficiary

Through engagement with external partners and leveraging their access to funding, cities can access climate finance without exclusively relying on their own domestic resources. Nonetheless, cities also have the chance to enhance the impact of these initiatives by contributing their own financing resources and engaging in blended finance arrangements. By combining various funding sources, cities can amplify the scale and effectiveness of climate action projects, resulting in more robust outcomes and broader community benefits. This collaborative approach to financing empowers cities to tackle climate challenges more comprehensively while leveraging the expertise and resources of diverse stakeholders.

## 08. Recommendations

The study has formulated recommendations derived from the analyses of the climate finance outlook, identified gaps, and proposed strategies to enhance access to climate finance. These recommendations are tailored to address specific contexts for the national and city levels as well as development partner.

### 8.1 Recommendations at The National Level

At the national level, recommendations are as follows:

- 1. Enhance Policy Frameworks:** Align national policies with climate action objectives to facilitate the mobilisation and allocation of climate finance.
- 2. Strengthen Coordination Mechanisms:** Improve coordination between government agencies involved in climate finance to streamline processes and prevent duplication of efforts.
- 3. Promote Transparency and Accountability:** Ensure transparency and accountability in climate finance management through clear reporting mechanisms and oversight.
- 4. Provide Capacity Building Support:** Provide training and support for local governments to enhance their capacity in accessing and utilising climate finance effectively.
- 5. Facilitate Engagement:** Foster engagement with international climate finance mechanisms and agreements to access additional funding opportunities.

### 8.2 Recommendations at The City Level

At the city level, recommendations are as follows:

- 1. Capacity Building:** Invest in training and support programmes aimed at enhancing the knowledge and skills of city officials in accessing and managing climate finance.
- 2. Streamline Administrative Procedures:** Streamline administrative processes for accessing funding opportunities to reduce barriers and facilitate the timely implementation of climate projects.
- 3. Promote Stakeholder Engagement:** Encourage active participation of local stakeholders, including community groups and private sector entities, in climate finance initiatives to leverage diverse expertise and resources.
- 4. Develop Clear Action Plans:** Establish clear action plans with measurable outputs to guide coordination efforts with national authorities and attract private sector investment.
- 5. Utilise Project Preparation Facility:** Utilise technical assistance (TA) programmes and funding mechanisms specifically designed to support city-level climate initiatives.

### 8.3 Recommendations for Development Partners

For development partners, recommendations are as follows:

- 1. Provide Technical Assistance:** Offer TA and capacity-building support for cities to enhance their ability to effectively access and utilise climate finance.
- 2. Facilitate Knowledge Sharing:** Promote knowledge and best practices sharing among cities and development partners to facilitate learning from successful experiences and approaches.
- 3. Establish Matchmaking Mechanisms:** Create matchmaking mechanisms between cities and funders to facilitate the identification of suitable funding opportunities and enhance access to climate finance.
- 4. Encourage Innovation:** Support innovative financing mechanisms and approaches tailored to the needs of cities, such as green bonds and public-private partnerships (PPP), to unlock additional sources of funding.
- 5. Advocate for Policy Changes:** Advocate for policy changes at the national and international levels to create an enabling environment for climate finance access and utilisation.

The main goal of these recommendations is to establish an enabling environment that empowers national and local stakeholders to effectively mobilise and utilise climate finance resources. With the implementation of these tailored recommendations, national governments, cities and local governments, as well as development partners, can collaborate more efficiently to address the challenges in accessing and utilising climate finance. This collective effort will advance climate action goals and enhance resilience to climate change impacts.



# References

- ADB. (2019). Transforming Ho Chi Minh City into a Climate-Resilient City. ADB.
- ADB. (2021). Climate Finance Landscape of Asia and the Pacific. Asian Development Bank. Manila: ADB.
- ADB. (2024). ADBBondOnline. Retrieved on 2024-02-15 from [asianbondonline.adb.org](https://asianbondonline.adb.org): [asianbondonline.adb.org](https://asianbondonline.adb.org)
- ADB. (2024). AsianbondOnline. Retrieved on 2024 02 15 from [asianbondonline.adb.org](https://asianbondonline.adb.org): [https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://asianbondsonline.adb.org/documents/abmg/abmf-tha-bmg2021-overview.pdf&ved=2ahUKEwj7\\_azY3r-FAXU-8jgGHeGQBaeQFnoECBUQAQ&usq=AOvVawIzKnGaKRURDsduFFLBijYy](https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://asianbondsonline.adb.org/documents/abmg/abmf-tha-bmg2021-overview.pdf&ved=2ahUKEwj7_azY3r-FAXU-8jgGHeGQBaeQFnoECBUQAQ&usq=AOvVawIzKnGaKRURDsduFFLBijYy)
- ADB. (2024). AsianBondOnline. Retrieved on 2024 02 15 from [asianbondonline.adb.org](https://asianbondonline.adb.org): <https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://www.adb.org/sites/default/files/publication/29702/abmf-background.pdf&ved=2ahUKEwjh8MWV3r-FAXX47jgGHS3uC50QFnoECBIQAQ&usq=AOvVaw20tAl8jqTYN-pebmBMJPpP>
- ADB. (2024). AsianBondOnline. Retrieved on 2024-02-15 from [asianbondonline.org](https://asianbondonline.org): [https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://asianbondsonline.adb.org/documents/abmg/abmf\\_vie\\_bmg2018-chp3.pdf&ved=2ahUKEwi8kKX63r-FAXVwIjgGHVZWAqEQFnoECB0QAQ&usq=AOvVaw2Vs7Lsw-DiEXSf8c0kMY-b](https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://asianbondsonline.adb.org/documents/abmg/abmf_vie_bmg2018-chp3.pdf&ved=2ahUKEwi8kKX63r-FAXVwIjgGHVZWAqEQFnoECB0QAQ&usq=AOvVaw2Vs7Lsw-DiEXSf8c0kMY-b)
- ADB. (2024). AsianBondsOnline. Retrieved on 2024-02-15 from [AsianBondsOnline.adb.org](https://AsianBondsOnline.adb.org): [https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://asianbondsonline.adb.org/documents/abmg/abmf-ino-bmg2021-overview.pdf&ved=2ahUKEwij7dGy3b-FAXUXxTgGHb\\_dAJ4QFnoECBcQAQ&usq=AOvVaw2Wf4\\_Q8asr6i64akbUIR\\_X](https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://asianbondsonline.adb.org/documents/abmg/abmf-ino-bmg2021-overview.pdf&ved=2ahUKEwij7dGy3b-FAXUXxTgGHb_dAJ4QFnoECBcQAQ&usq=AOvVaw2Wf4_Q8asr6i64akbUIR_X)
- Ashworth, J. (2022). NHM. Retrieved on 2023-12-29 from [nhm.ac.uk](https://www.nhm.ac.uk/discover/news/2022/september/cost-carbon-dioxide-four-times-higher-than-thought.html): <https://www.nhm.ac.uk/discover/news/2022/september/cost-carbon-dioxide-four-times-higher-than-thought.html>
- Budget Bureau. (2022). Thailand's Budget in Brief Fiscal Year 2022. Budget Bureau.
- Eckstein, D., Kunzel, V., Schafer, L., & Wings, M. (2020). Global Climate Risk Index 2020. Germanwatch e.V., Bonn. GermanWatch.
- Enkvist, P.-A., Naucner, T., & Rosander, J. (2007). A Cost Curve for Greenhouse Gas Reduction. The McKinsey Quarterly.
- EU. (2022). 45 Years of Relation EU-ASEAN Strategic Partnership Blue Book 2022. Jakarta: The European Union.
- Gillingham, K., & Stock, J. (2018). The Cost of Reducing Greenhouse Gas Emission. Journal of Economic Perspectives, 53-72.
- Government of Thailand. (2022). Thailand Fourth Biennial Update Report. Bangkok: Government of Thailand.
- IMF. (2019). The True Cost of Reducing Greenhouse Gas Emissions. Finance & Development. International Monetary Fund.
- IPCC. (2014). Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press.
- Martinus, M., & Qiu, J. (2022). Climate Finance in Southeast Asia: Trends and Opportunities. ISEAS Perspective. ISEAS Perspective.

- Ministry of Environment and Forestry Republic Indonesia. (2021). Indonesia, Third Biennial Update Report: Under the United Nations Framework Convention on Climate Change. Jakarta: Ministry of Environment and Forestry Republic Indonesia.
- Ministry of Finance. (2024). [belanjawan.mof.gov.m. Retrieved on 2024 02 20 from belanjawan.mof.gov.m: https://belanjawan.mof.gov.m.my/en/fiscal](https://belanjawan.mof.gov.m.my/en/fiscal)
- Ministry of Finance. (2024). [malaysiamadani.gov.my. Retrieved on 2024 02 25 from malaysiamadani.gov.my: https://malaysiamadani.gov.my/belanjawan-2024/](https://malaysiamadani.gov.my/belanjawan-2024/)
- Ministry of Natural Resources, Environment and Climate Change, Malaysia. (2022). Malaysia Fourth Biennial Update Report Under the United Nations Framework Convention on Climate Change. Ministry of Natural Resources, Environment and Climate Change, Malaysia.
- Mooney, L. (2014). [stanford.edu. Retrieved on 2024 02 15 from gsb.stanford.edu: https://www.gsb.stanford.edu/insights/what-would-it-really-cost-reduce-carbon-emissions](https://www.gsb.stanford.edu/insights/what-would-it-really-cost-reduce-carbon-emissions)
- OECD. (2021). Climate Finance Provided and Mobilised by Developed Countries in 2013-18. Organisation for Economic Co-operation and Development.
- OECD. (2021). Climate Finance Provided and Mobilised by Developed Countries in 2013-19. Paris: OECD Publishing.
- OECD. (2024). OECD. Retrieved on 2024 02 14 from [oecd.org: https://public.tableau.com/views/Climate-RelatedDevelopmentFinanceRecipient2021/CRDFRP?%3Alanguage=en-US&publish=yes&%3Adisplay\\_count=n&%3Aorigin=viz\\_share\\_link&%3AshowVizHome=no#1](https://public.tableau.com/views/Climate-RelatedDevelopmentFinanceRecipient2021/CRDFRP?%3Alanguage=en-US&publish=yes&%3Adisplay_count=n&%3Aorigin=viz_share_link&%3AshowVizHome=no#1)
- Socialist Republic of Vietnam Ministry of Natural Resources and Environment. (2020). Viet Nam Third Biennial Updated Report to The United Nations Framework Convention on Climate Change. Han Noi: Socialist Republic of Vietnam Ministry of Natural Resources and Environment.
- The Malaysian Reserve. (2022). The Malaysian Reserve. Retrieved on 2024 02 15 from [themalaysianreserve.com: https://themalaysianreserve.com/2023/10/26/budget-2024-more-practical-efforts-towards-conserving-biodiversity-mitigating-climate-change/](https://themalaysianreserve.com/2023/10/26/budget-2024-more-practical-efforts-towards-conserving-biodiversity-mitigating-climate-change/)
- UNDP. (2023). UNDP. Retrieved on 2024 01 16 from [undp.org: https://www.undp.org/indonesia/blog/indonesian-local-governments-participation-achieve-national-climate-target](https://www.undp.org/indonesia/blog/indonesian-local-governments-participation-achieve-national-climate-target)
- UNDP. (2024). UNDP. Retrieved on 2024 02 16 from [undp.org: https://www.undp.org/vietnam/press-releases/over-70-climate-budget-climate-change-adaptation-expenditure-vietnam-2016-2020](https://www.undp.org/vietnam/press-releases/over-70-climate-budget-climate-change-adaptation-expenditure-vietnam-2016-2020)
- UNEP. (2022). Adaptation Gap Report: Too Little, Too Slow - Climate Adaptation Failure Puts World at Risk. UNEP.
- UNESCAP. (2021). Climate Finance Assessment for the Philippines. UNESCAP.
- UNFCCC. (2022). Need-based Climate Finance Project - Technical Assessment of Climate Finance in South-East Asia: Annex to The South-East Asia Climate Finance Mobilization and Access Strategy. UNFCCC.
- World Bank. (2015). Bangkok's Resilience: A Tale of Three Cities. World Bank.

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