



**Subsidiary Body for Scientific and
Technological Advice**

Sixty-first session

Baku, 11–16 November 2024

Item 7 of the provisional agenda

**Sharm el-Sheikh mitigation ambition and
implementation work programme**

Subsidiary Body for Implementation

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Annual report by the secretariat

Summary

This annual report, prepared under the guidance of the co-chairs of the Sharm el-Sheikh mitigation ambition and implementation work programme, comprises a compilation of the reports on the two global dialogues and investment-focused events held in 2024, which are the third and fourth under the work programme and focused on the topic of cities: buildings and urban systems. The report reflects in a comprehensive and balanced manner the discussions held and presents key findings and identified opportunities and barriers relevant to the topic.



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Abbreviations and acronyms

CCS	carbon dioxide capture and storage
CMA	Conference of the Parties serving as the meeting of the Parties to the Paris Agreement
CO ₂	carbon dioxide
COP	Conference of the Parties
DFI	development finance institution
ETAF	Energy Transition Accelerator Financing Platform
GCF	Green Climate Fund
GHG	greenhouse gas
IRENA	International Renewable Energy Agency
MDB	multilateral development bank
NDC	nationally determined contribution
REDD+	reducing emissions from deforestation; reducing emissions from forest degradation; conservation of forest carbon stocks; sustainable management of forests; and enhancement of forest carbon stocks (decision 1/CP.16, para. 70)
SB	sessions of the subsidiary bodies

I. Introduction

A. Mandate

1. CMA 3 decided to establish a work programme for urgently scaling up mitigation ambition and implementation in this critical decade and requested that the work programme be implemented in a manner that complements the global stocktake.¹
2. CMA 4 decided that at least two global dialogues shall be held each year as part of the Sharm el-Sheikh mitigation ambition and implementation work programme, with one to be held prior to the first regular sessions of the subsidiary bodies, starting at SB 58, and one prior to the second regular sessions of the subsidiary bodies, starting at SB 59, and that such dialogues should be conducted in hybrid format to allow both in-person and virtual participation.²
3. CMA 4 requested the secretariat to prepare, under the guidance of the co-chairs of the work programme, a report on each of the global dialogues, reflecting in a comprehensive and balanced manner the discussions held and including a summary, key findings, opportunities and barriers relevant to the topic, and to prepare an annual report comprising a compilation of the individual dialogue reports for consideration by the CMA and the subsidiary bodies.³ CMA 5 requested the secretariat to include, under the guidance of the co-chairs of the work programme, information on the investment-focused events held on the margins of the dialogues in the report on each of the dialogues.⁴

B. Co-chairs of the work programme

4. CMA 4 requested the Chairs of the subsidiary bodies to appoint, well in advance of SB 58 and every two years thereafter, in consultation with respective constituencies, two co-chairs of the Sharm el-Sheikh mitigation ambition and implementation work programme, one from a developed country Party and one from a developing country Party.⁵
5. They appointed Amr Osama Abdel-Aziz (Egypt) and Lola Vallejo (France) as the co-chairs of the work programme for 2023–2024.⁶

C. Topics for the global dialogues under the Sharm el-Sheikh mitigation ambition and implementation work programme in 2024

6. CMA 4 invited Parties, observers and other non-Party stakeholders to submit suggested topics in line with the scope of the Sharm el-Sheikh mitigation ambition and implementation work programme to be discussed at the global dialogues thereunder. Considering these submissions, the co-chairs of the work programme are to decide on the topics to be discussed at the dialogues in a given year.⁷
7. The co-chairs decided that the dialogues in 2024, the third and fourth under the work programme, would focus on the topic of cities: buildings and urban systems.

¹ Decision [1/CMA.3](#), para. 27. Information on the global stocktake is available at <https://unfccc.int/topics/global-stocktake>.

² Decision [4/CMA.4](#), para. 8.

³ Decision [4/CMA.4](#), para. 15.

⁴ Decision [4/CMA.5](#), para. 12.

⁵ Decision [4/CMA.4](#), para. 7.

⁶ Information on the co-chairs is available at <https://unfccc.int/co-chairs-of-the-mitigation-work-programme-2023-2024-0>.

⁷ Decision [4/CMA.4](#), paras. 12–13.

II. Third global dialogue and investment-focused event under the Sharm el-Sheikh mitigation ambition and implementation work programme

A. Proceedings

8. The third global dialogue under the Sharm el-Sheikh mitigation ambition and implementation work programme took place in Bonn on 27 May 2024, in hybrid format, with 80 registered in-person and 196 registered virtual participants. Participants discussed the following subtopics:

- (a) Reducing operational emissions (heating, cooling and appliances);
- (b) Designing building envelopes for efficiency (retrofitting, new construction);
- (c) Reducing embodied emissions (building materials).

9. The dialogue was followed by an investment-focused event, which was organized by the secretariat under the guidance of the co-chairs of the work programme and held over two mornings on 28 and 29 May in hybrid format. The event, which included panel discussion and a pitch hub, can be revisited via the webcast links on the event page.⁸

10. Opening remarks were provided by Iman Ustadi, Deputy Chief Negotiator, COP 28 Presidency, and Elchin Allahverdiyev, Senior Negotiator, incoming COP 29 Presidency. These were followed by welcoming remarks from a representative of the secretariat; introductory remarks from the co-chairs of the work programme; and a scene-setting presentation on findings from the buildings chapter of the contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, which focuses on mitigation of climate change, by Yamina Saheb, lead author of that chapter.

11. In her introductory presentation, Yamina Saheb emphasized that buildings contributed 21 per cent of global GHG emissions in 2019 and highlighted, in this context, the critical role of sufficiency policies in achieving climate-neutral buildings by 2050. Sufficiency policies are aimed at reducing demand for energy, materials, land, water and natural resources while ensuring human well-being within planetary boundaries. Sufficiency measures are not considered in the current International Energy Agency decarbonization scenarios, but decarbonization cannot be achieved without negative emissions unless sufficiency measures are taken into account. The current policy framework, focusing primarily on efficiency and renewable energy, appears insufficient for decarbonizing the global building stock. A shift towards a comprehensive approach that includes sufficiency measures is essential. Implementing these measures can help avoid carbon lock-in and make buildings carbon-neutral at no cost to end users in both developed and developing countries. Additionally, a climate-neutral building stock could significantly contribute to meeting at least 10 of the Sustainable Development Goals. Yamina Saheb stressed that achieving net zero emissions in the global building stock by 2050 is feasible if sufficiency measures are prioritized to avoid locking buildings in carbon-intensive systems, and existing buildings are renovated to zero emission standards. She further mentioned the importance of equity within countries in ensuring access to modern housing and equity between countries as the Global North contributed most to climate change and should be climate neutral by 2035.

12. Six technical experts delivered scene-setting presentations on the subtopics listed in paragraph 8 above.

13. Participants were then divided into three breakout groups, each addressing one of the subtopics. Guiding questions for the breakout groups were:

- (a) What are opportunities, best practices and actionable solutions related to urgently scaling up mitigation ambition and implementation in this critical decade in each of the subtopics?

⁸ <https://unfccc.int/event/third-global-dialogue-and-investment-focused-event-under-the-sharm-el-sheikh-mitigation-ambition-and-implementation-work-programme>.

(b) What are the challenges and barriers (e.g. policies, finance, technology and capacity, sustainable development and socioeconomic) related to urgently scaling up mitigation ambition and implementation in this critical decade in each of the subtopics?

B. Summary of the third global dialogue

14. This chapter captures views shared during the breakout group discussions at the dialogue, but may not represent an exhaustive summary of all comments made by participants.

1. Reducing operational emissions (heating, cooling and appliances)

(a) Introductory presentations

15. The introductory presentation by Jan Rosenow, Principal and European Programme Director at the Regulatory Assistance Project, explained that heating and cooling in buildings were long overlooked in energy debates, but have recently increased in importance owing to their significant contribution to energy demand and carbon emissions. The challenge is immense, with 600 million gas boilers and 120 million oil boilers needing replacement in the Global North, and rising cooling demand may lead to two thirds of households in the world having air-conditioning equipment by 2050. Solutions include passive cooling, efficient building designs, and enhanced cooling technologies, supported by policy instruments such as minimum energy performance standards. Future homes will need to combine electrified heating systems, capabilities for smart grid interaction, and energy storage. District heating offers both challenges and opportunities for decarbonization. Policy changes, especially in energy taxation, are crucial for incentivizing electrification. Addressing the diverse and often outdated heating systems in existing buildings is a key challenge, but worldwide examples of successful innovation provide hope that these issues can be resolved through policy actions and collaboration.

16. The introductory presentation by Shicong Zhang, Director of the Innovation Center at the Institute of Building Environment and Energy at the China Academy of Building Research, indicated that the operations of buildings accounted for 30 per cent of global final energy consumption and 26 per cent of global energy-related CO₂ emissions in 2022.⁹ He noted that between 2005 and 2020, gross energy consumption and carbon emissions from the building industry in China increased, but the annual growth rate of carbon emissions has significantly slowed down over time. High performance building envelopes, more efficient energy systems and increased use of renewable energy were indicated as potential measures for reducing operational emissions. His presentation described national efforts, including the road map towards nearly-zero- and zero-carbon buildings, building codes and voluntary standards, a national action plan, and inclusion of control of total building energy consumption and carbon emission intensity in the national development plan. He explained barriers and challenges, including the knowledge barrier on how to reduce life cycle emissions; financial barriers related to the incremental cost of individual projects and the required investment; and technological barriers for integrating carbon emissions in building design.

(b) Breakout group discussion and key findings

17. The breakout group discussion was facilitated by Lucas Nassar Sousa, Executive Director at City Laboratory, accompanied by Jan Rosenow and Zhang Shicong.

18. Participants emphasized that policy interventions need to be tailored to regional, national, climate, socioeconomic and energy system contexts. For example, many developing countries need to balance the urgent need for affordable housing with improving energy

⁹ International Energy Agency. 2023. *Global CO₂ emissions from the operation of buildings in the Net Zero Scenario, 2010-2030*. Paris: International Energy Agency. Available at <https://www.iea.org/data-and-statistics/charts/global-co2-emissions-from-the-operation-of-buildings-in-the-net-zero-scenario-2010-2030>.

efficiency, and are often constrained by financial limitations and the limited scalability of available technologies.

19. Upgrading building codes and standards, often referred to as a pivotal approach, can involve setting minimum requirements for building design and for heating, ventilation and air-conditioning systems and encouraging integration of renewable energy technologies into buildings. Participants highlighted efforts in their countries to upgrade these regulations and standards across different climatic zones and building types, including through the European Union energy performance of buildings directive.

20. Other strategies discussed for reducing operational emissions include electrification with renewable energy, and demand-side flexibility, when energy use is adjusted on the basis of price changes or carbon intensity signals from the grid, such as pre-cooling and pre-heating water when electricity is cheaper. It was noted that buildings connected to the electricity grid, gas and district heating are expected to increasingly integrate emerging technologies such as heat pumps, energy storage batteries and rooftop solar panels. This integration will enable buildings to manage energy demand more effectively, absorbing renewable energy when it is generated at a low cost compared with carbon-intensive energy. Implementing a mix of policies, rather than solely relying on carbon pricing, is essential for unlocking these solutions.

21. The discussions highlighted opportunities for cross-border learning and cooperation, such as technology transfer and capacity-building, in navigating regional realities while advancing global sustainability goals.

(c) Opportunities (including actionable solutions) and barriers

22. The opportunities mentioned by some participants include:

(a) Strategic interventions, such as renewable energy deployment, to yield substantial benefits, not only in terms of reducing emissions but also in terms of reducing urban air pollution, alleviating strain on power transmission networks and enhancing energy security;

(b) Electrification in buildings, supported by grid decarbonization and the increased deployment of renewable energy sources, which provides a cleaner and more resilient energy infrastructure, and creates potential for energy efficiency improvements;

(c) Creation of economic opportunities, notably through job creation, by technological advancement;

(d) A bottom-up and incentive-based approach suited to regional circumstances, and a holistic approach to mitigation across all sectors, leveraging indigenous materials, promoting sustainable solutions tailored to local contexts, and adopting contextual-based models;

(e) Enhancement of skills related to clean technologies, including by providing training programmes and education to building professionals on best practices for deploying energy-efficient technologies;

(f) Efforts to raise public awareness about energy efficiency benefits to promote behavioural changes;

(g) Tools to leverage financial mechanisms to drive investments in renewable energy and building efficiencies, including competitive tender bids; revenue stabilization schemes that involve setting a minimum floor and maximum ceiling amount of revenue; and public-private partnerships in mitigating investment risks and attracting private capital;

(h) Innovative financial options, including incentives with financial institutions, subsidies for home upgrades and renovation, and carbon pricing initiatives tackling emissions, especially from the building sector.

23. The barriers mentioned by some participants include:

(a) Regulatory and policy challenges, including policy complexity arising from diverse geographical considerations, the lack of a clear national-level strategy and emissions

accounting for imported materials, and intensified pressure on small and medium-sized enterprises to comply with unilateral trade measures imposed by some countries;

(b) Challenges in promoting renovation owing to old building stock that is heavily dependent on fossil fuels, heterogeneous ownership of building stock complicating renovation strategies, a shortage of skilled workers, and short planning cycles;

(c) Financial challenges such as high upfront costs for new technologies, budgetary constraints, limited financial resources and restricted access to capital;

(d) Technology challenges such as a lack of knowledge and technical expertise, limited scalability due to high costs, a technology access gap worsened by financial constraints, and a shortage of skilled workers;

(e) Diverse climate zones requiring solutions tailored to urban and rural contexts;

(f) Limited public awareness and a lack of information systems for assessing building energy performance.

2. Designing building envelopes for efficiency (retrofitting and new construction)

(a) Introductory presentations

24. The introductory presentation by Mohammed Aldubyan, Research Fellow at the King Abdullah Petroleum Studies and Research Center, emphasized the importance of building envelopes in enhancing energy efficiency. He explained that the building envelope, which includes walls, roofs and windows, plays a crucial role in reducing energy consumption by minimizing heat transfer and infiltration. Several barriers to improving energy efficiency were highlighted, including lack of expertise, immature infrastructure, initial and maintenance costs, lack of awareness, and behavioural and lifestyle factors. He also outlined potential enablers for overcoming these challenges, such as inclusive financing schemes, and awareness-raising and education. Socioeconomic considerations, such as national priorities, demographic changes and the need to enhance energy security, were also explored as critical factors in implementing effective energy efficiency measures in buildings.

25. The introductory presentation by Julie Emmrich, Sustainable Finance Lead at the World Green Building Council, focused on the role of sustainable finance in achieving global energy efficiency objectives. Her presentation underscored the importance of comparability, accountability, transparency and contextualization in developing and implementing effective energy efficiency measures. She stressed the need to elevate energy efficiency of the building sector within development agendas, especially in emerging and developing economies. Julie Emmrich emphasized prioritizing investments in energy efficiency, improving urban planning, optimizing building design, reducing energy demand and integrating renewable energy. She highlighted the significant risks associated with a failure to address energy efficiency, including the increasing difficulty in insuring buildings in disaster-prone areas and the potential destabilization of global real estate assets. She called for localized solutions and emphasized the need for a common set of principles that allow for context-specific strategies in decarbonizing the building sector.

(b) Breakout group discussion and key findings

26. The breakout group discussion was facilitated by Johanna Leissner from Fraunhofer and ICLEI – Local Governments for Sustainability, accompanied by Mohammed Aldubyan and Julie Emmrich.

27. Participants underlined the importance of reflecting regional and local context in the design of energy-efficient building envelopes, such as socioeconomic circumstances, workforce skills, green job opportunities, available finance, and climatic conditions, as there is no one-size-fits-all solution. Participants emphasized the role of collaboration among central governments, subnational authorities and community-based stakeholders, not only in designing policies, but also in accelerating implementation of policies. Well-defined roles and responsibilities across the building sector value chain were mentioned as key to effective implementation of policies, including in relation to spatial planning of municipalities aimed at defining where new building construction is allowed.

28. A systemic approach was considered crucial for the success of energy efficiency improvement in buildings because of its linkages with other issues of sustainable development, including poverty eradication, energy poverty, affordable housing, sustainable cities with an increasing urban population, gender, employment, sustainable consumption and production, thermal comfort, energy access and resilience to extreme climate events such as heat waves, storms, heavy rainfall and landslides.

29. Sharing comprehensive and reliable information about energy, technical performance and sustainability was seen as valuable and as key to ensuring effective collaboration between regulators, construction companies, developers and consumers.

30. Engaging with and training professionals in the building value chain was highlighted as crucial to facilitating retrofitting of existing buildings and construction of energy-efficient buildings.

31. Retrofitting of existing buildings is, in most cases, more climate friendly than demolition because demolition generates GHG emissions, landfill waste and, potentially, refrigerant gases.

(c) Opportunities (including actionable solutions) and barriers

32. The opportunities mentioned by some participants include:

(a) Reduction of building running costs, which can be a big incentive for investing in energy efficiency measures if operational costs are taken into account at the time of construction for new buildings;

(b) An economic opportunity from retrofitting existing buildings and building new sustainable, energy-efficient buildings;

(c) Provision of information on energy efficiency of buildings, including through labelling; energy rating systems for homes and local certification of buildings' energy efficiency, as climate situations vary by site, region and country; maintenance of comprehensive databases on buildings; information portals; provision of energy certificates to buyers and tenants of buildings; and a housing design catalogue that compiles pre-approved designs to speed up the administrative process;

(d) Policy efforts aimed at gradually simplifying administrative processes and at introducing and improving minimum energy efficiency standards; building standards and codes; and regulations on the demolition of buildings aimed at avoiding refrigerant gas leakages and on phasing out fossil fuel fired stand-alone boilers in developed countries;

(e) Facilitation of investment in building energy efficiency, including through tax incentives, preferential loans, labels and certificates on energy-efficient equipment, targeted support for social housing for energy upgrades, reverse mortgage schemes for homeowners to borrow against the value of their home without the need for immediate repayment, support from dedicated organizations to enhance the capacity of local financial institutions with assessment tools for calculating financial gains of retrofits;

(f) Technologies such as smart meters are expected to enable thermal efficiency ratings, better insulation is expected to reduce energy demand, certified prefabricated building materials are expected to speed up the construction process, helping to meet increasing housing demand, and renewable energy is expected to be integrated into district cooling;

(g) International cooperation is expected to facilitate capacity-building, knowledge transfer and awareness-raising through bilateral and multilateral engagement via platforms such as the Buildings and Climate Global Forum.

33. The barriers mentioned by some participants include:

(a) Lack of cooperation and collaboration between government and stakeholders such as those representing industry, cities and the private sector owing to weak institutional capacity with regard to policy design and implementation;

- (b) Lack of knowledge and awareness of instruments, technologies and data among stakeholders such as architects, construction companies, homeowners and banks, coupled with limited availability of accessible data, particularly at regional and local level;
- (c) Lack of sufficient financial support mechanisms for addressing the higher upfront cost of energy-efficient buildings, particularly at subnational and community level in developing countries, where many people still lack access to clean cooking and electricity;
- (d) Higher upfront cost of energy-efficient technologies as immediate concerns tend to take priority over long-term interests, particularly in developing countries;
- (e) Renovation by low-income older population, who tend to face difficulties in securing loans to retrofit their buildings;
- (f) Renovation of old buildings built before the introduction of building codes;
- (g) Shortage of skilled workers;
- (h) Limited access to supply chain of energy-efficient building materials;
- (i) Misalignment of incentives among stakeholders, such as a focus on initial cost by building developers, incremental renovation cost to building owners, and the benefit of lower running costs for building occupants;
- (j) Rapid urbanization, which is outpacing spatial planning capacity in growing cities, particularly in the Global South;
- (k) Outdated infrastructure and the need to preserve historic value of densely populated urban areas in established cities.

3. Reducing embodied emissions (building materials)

(a) Introductory presentations

34. Joseph Mwiti Marangu, Head of LC³ Technology Resource Centre for Africa, highlighted the urgent need for sustainable practices in the built environment, which has been responsible for large shares of global carbon emissions and, without policy interventions, is predicted to be a growing source. He emphasized that cement-based materials account for more than two thirds of all construction materials. With regard to addressing the growing environmental impact, particularly in developing countries, he stressed the necessity of adopting a holistic approach across the value chain of building materials. Joseph Mwiti Marangu outlined a strategy for mitigating carbon emissions that prioritizes using less material, adopting low-carbon materials such as limestone calcined clay cement, and implementing carbon capture and storage, as well as offsetting emissions from other materials. He noted that the industry faces significant barriers to decarbonization, including a lack of standards for low-carbon cement and concrete, fragmented industry coordination, insufficient incentives and policy support, low levels of public awareness, and an absence of clear life cycle assessments for building materials.

35. Anne Holsten, Senior Researcher at Bauhaus Earth, emphasized that in 2022, buildings accounted for 37 per cent of energy- and process-related CO₂ emissions, with 27 per cent from operational emissions and 10 per cent from embodied emissions.¹⁰ She highlighted the urgent need for strategic interventions owing to the increasing relevance of embodied emissions and the expected doubling of global floor area by 2050. She highlighted the ‘avoid, shift and improve’ strategy for reducing embodied emissions in building materials, which includes actions such as building with fewer materials, enhancing resource efficiency, using alternative building materials, standardizing and certifying products, decarbonizing conventional materials, increasing energy efficiency and using innovative processes. She highlighted initiatives such as expanding the use of bio-based materials owing to their carbon footprint, which is low compared with a higher footprint of mineral-based

¹⁰ United Nations Environment Programme. 2024. *The Global Status Report for Buildings and Construction: Beyond foundations: Mainstreaming sustainable solutions to cut emissions from the buildings sector*. Nairobi: United Nations Environment Programme. Available at <https://doi.org/10.59117/20.500.11822/45095>.

materials, synthetics and metallic materials. While examples of bio-based building construction in Brandenburg, Germany, and Bhutan have achieved GHG emission reductions of 50–60 per cent, she advocated looking beyond the lens of materials and construction, pointing towards a regenerative approach to the built environment based on principles such as nature-based and climate-positive solutions, circularity, energy efficiency, local and traditional methods, inclusivity, adaptability and multi-functionality.

(b) Breakout group discussion and key findings

36. The breakout group discussion was facilitated by Anna Zinnecker from the Global Alliance for Buildings and Construction, accompanied by experts Joseph Mwiti Marangu and Anne Holsten.

37. During the discussion, participants emphasized the importance of tailoring solutions targeting embodied emissions in the built environment to the unique needs and circumstances of different countries, regions and cities, with consideration given to local sociocultural, geographical and economic aspects, including the availability of existing infrastructure, and of acknowledging anticipated demand for new infrastructure. It was also mentioned that different countries have different starting points and capacities, and solutions should be tailored accordingly. Participants stressed that while no one solution is applicable to the range of challenges that will influence the feasibility and effectiveness of applied solutions, sharing experience of potential solutions can enhance the relevance, practicality and sustainability of these solutions in addressing common barriers such as regulatory frameworks, financial challenges and scaling of technologies.

38. Many participants mentioned the benefits of applying comprehensive policies and regulatory frameworks in terms of steering domestic action and providing clear objectives for the industry while ensuring coordination and harmonization between national and subnational policies and measures. Examples of policies and measures mentioned include emission reporting requirements; emission limits; the promotion and certification of new and existing green construction materials; more frequent use of local bio-based materials for concrete to replace cement, which creates a local green supply chain; the promotion of reuse and recycle of construction material based on circular economy approaches, combined with related training and awareness-raising for architects; the introduction of energy performance standards labels, including on energy efficiency of buildings and materials; and regular updates and adaptation of building codes and standards to reflect the latest advancements and best practices. The implementation of such policies and regulatory frameworks can facilitate continuous improvement in building performance and spur innovation in building materials and construction techniques.

39. Participants highlighted several areas where government leadership can play an important role in steering industries towards zero- and low-carbon practices, materials and technological advancements. These areas include the use of procurement policies and guidelines that address embodied emissions in government-funded infrastructure projects, promotion of and early-stage investment in new and emerging zero- or low-emission technologies and practices, implementation of pilot projects, and strategic use of public investment for mobilizing the private sector.

40. Data collection, reporting, processing and dissemination were cited by many participants as key enablers for scaling initiatives and well-informed policies aimed at reducing embodied emissions. This is because of the fragmentation of the industry in many countries, the multiple levels of the value chain, the life cycle of buildings, and the large number of relevant stakeholders. Participants emphasized that effective decarbonization requires a holistic approach across the life cycle of a building; from material extraction, processing, construction and use of the building to maintenance, repair, reuse, recycling and final disposal. It was stressed that life cycle assessments for buildings, construction practices, and materials can be a key tool for quantifying embodied emissions across the value chain. It was noted that consistent methodologies, costs, local contexts, capacities and regulations can impact the collection of data.

41. Many participants stressed that the provision of awareness-raising activities, education and training to the range of stakeholders involved in the buildings industry at the

local and regional level is important to ensuring successful uptake and scaling of green buildings and construction methodologies, practices and materials. Moreover, reskilling campaigns can support the transition to new and sustainable construction practices while ensuring no one is left behind.

42. Some participants emphasized the importance of considering linkages between adaptation, particularly resilience, and mitigation when designing and implementing initiatives aimed at addressing embodied emissions in buildings and materials, including when it comes to recovery from extreme weather events.

43. The need for international cooperation on information exchange, for awareness-raising and for enhanced support on finance, technology development and transfer and capacity-building for developing countries was often underlined by participants.

(c) Opportunities (including actionable solutions) and barriers

44. The opportunities mentioned by some participants include:

(a) Using long-term road maps and targets based on national and subnational development and emission reduction objectives to guide policies and investments effectively, combined with harmonizing regulations and standards, and establishing dedicated government offices, regular reviews and standardized reporting frameworks related to embodied carbon;

(b) Standardizing information systems and terminology within each level of government to enhance coordination and efficiency, and providing information through labelling and product- or facility-specific declarations, and by using a database of materials to facilitate informed decision-making among stakeholders;

(c) Increasing public sector support for innovation and low- and zero-carbon material technologies, including through public procurement, research and development and targeted investment, to facilitate private sector entry, drive down cost of new technologies and reduce embodied carbon in public sector infrastructure;

(d) Utilizing demand aggregation platforms, especially for concrete and steel, to de-risk investment at scale;

(e) Adopting circular economy approaches and resource efficiency are expected to reduce material production and consumption, and to increase reuse and recycling of materials, such as crushed concrete or recovered steel, supported by performance standards and insurance to provide incentives;

(f) Substituting conventional materials with low- or zero-carbon materials, including green metals, recycled materials, mineral wool, polyester bricks, glass fibre reinforced concrete, bio-based materials and local materials;

(g) Using low- or zero-carbon technologies such as reclaimed asphalt pavement, electric furnaces for producing steel, and green hydrogen;

(h) Leveraging biotechnology and quantum computing, which offer new opportunities for redesigning existing materials and designing new ones;

(i) Raising awareness, capacity-building, and education and training, including through certification and continuous professional development programmes provided to local business, and the creation and dissemination of clear and consistent guidelines and methodologies on the use of new materials and reuse of buildings materials;

(j) Increasing international cooperation for sharing knowledge and best practices, such as through the breakthroughs of the Marrakech Partnership for Global Climate Action on steel, cement and buildings.

45. The barriers mentioned by some participants include:

(a) A lack of accurate, high-quality data and of standardized accounting methods for embodied emissions in buildings and materials;

- (b) Challenges in data collection and tracking of emissions across the life cycle of buildings given the fragmented nature of the sector and its reliance on global supply chains;
- (c) Highly fragmented industry structure as numerous stakeholders are involved in design, construction, operation and ownership, together with a low level of awareness about reducing embodied emissions of materials;
- (d) A lack of market incentives for reducing embodied emissions in building construction, and high upfront costs for new technologies;
- (e) Budgetary constraints, limited financial resources and restricted access to capital, particularly in developing countries;
- (f) A lack of robust regulatory frameworks at the national and subnational level;
- (g) A lack of readily available and commercially viable green materials, coupled with high upfront costs for reducing emissions from embodied carbon;
- (h) Limited supply of and insurance options for reused materials, and certification for new materials;
- (i) Limited access to technology, incentives, and technical expertise.

C. Summary of the third investment-focused event

1. Addressing structural barriers to investment

46. Four experts discussed structural barriers related to mobilizing clean investments in a plenary session and shared their views on opportunities, good practices and potential solutions in relation to addressing barriers to investment. The experts who took part in the panel discussions were Amar Bhattacharya, Senior Fellow, Center for Sustainable Development, Brookings Institution; Mahmoud Mohieldin, COP 27 high-level champion; Daouda Sembene, Chief Executive Officer, AfriCatalyst; and Omar El-Arini, former GCF Board member. The panel discussion was moderated by co-chair Lola Vallejo, with four guiding questions.

47. The experts shared their views on the first guiding question, “What are the primary structural barriers related to fiscal constraints, hindering the mobilization of clean investment, and how do they vary across regions and sectors?” Examples of barriers included:

- (a) The concentration of clean investments in some advanced economies and China; the total share of African countries in global clean investment is around 1 per cent despite the continent’s solar power potential, which accounts for more than 50 per cent of global solar power potential;
- (b) High upfront costs of clean investments, which remain a significant barrier even though these are often offset by lower operating costs over the lifetime of equipment and assets;
- (c) High borrowing costs due to both actual and perceived risks, which are often inflated, contributing to higher costs of capital and making it difficult to attract clean energy investments;
- (d) The macroeconomic circumstances in many developing countries, which may include lending capacity constraints of finance suppliers in some middle-income countries, high risk perception, debt vulnerabilities, high borrowing costs, and limited fiscal space, financial market access and investment mobilization in developing countries;
- (e) Significant debt vulnerabilities and high levels of debt in many developing countries, leading to limited fiscal space for supporting clean energy investments;
- (f) High levels of debt due to the coronavirus disease 2019 pandemic, and associated high borrowing costs, in developing countries;
- (g) A lack of viable project programmes and the high cost of capital;

(h) Insufficient level of long-term, low-cost public financing from DFIs and inadequacy of current financial resources, such as those provided by the GCF, for meeting needs related to implementing NDCs, especially in middle-income countries;

(i) Political and institutional barriers preventing existing financial mechanisms from being fully utilized and expanded;

(j) Limited mobilization of private sector investment due to challenges in business environment, political credit risk, administrative red tape, crowding out of investment by public investments, and the high cost of capital;

(k) The challenging business environment, which, coupled with perceived and actual political and credit risks, makes it difficult for developing countries to mobilize private capital for clean energy investments;

(l) The gap in the provision of climate finance and development finance, which is amplified by data gaps;

(m) A lack of tax revenue to support broader development goals, combined with the lack of a comprehensive approach to addressing insufficient revenue supported by partners and developed countries;

(n) The complex tax systems in place in many developing countries, which are often due to legacy arrangements on the social contract, tax avoidance, tax evasion and institutional issues. These complex tax systems hinder private sector investment in climate projects. The ratio of tax revenues to gross domestic product ranges from 10 to 18 per cent in African countries, and is around 22 per cent in Latin American and Caribbean countries, and around 12 per cent in countries in the Middle East and North Africa;

(o) Lack of reliable data for identifying gaps at the national or local level.

48. Views shared by the experts on the second guiding question, “What fiscal policies and strategies can be implemented to manage debt while simultaneously investing in low carbon development?”, highlighted the importance of, inter alia:

(a) Country-led approaches, including in relation to clarity around goals and strategies on clean investment, strong policy and institutional frameworks, institutional structures for scaling up programmes and project pipelines, development of NDCs with a focus on investment, and the need for predictable, adequate and affordable finance at the country level;

(b) Domestic resource mobilization with significant potential for scaling up domestic finance in developing countries; however, limited fiscal space in developing countries limits the availability of domestic resources for use in financing climate projects;

(c) Stronger coordination among different agencies at the national level to enhance developmental impact, break silos and guide investments effectively;

(d) Strengthened international cooperation to reduce debt burdens, including South–South collaboration for clean technology and investment;

(e) Sound fiscal frameworks for accessing bond markets;

(f) Mobilizing affordable, predictable finance through MDBs, green bonds and innovative funding sources such as solidarity levies;

(g) Addressing immediate liquidity issues and implementing robust debt management policies, especially in low-income countries, including by revamping a common framework for tackling serious debt cases and debt service costs and by exploring debt-for-climate swaps to free up resources for green investments;

(h) Developing equity financing and risk-sharing mechanisms, addressing actual and perceived investment risk in developing countries by enhancing credit guarantees to reduce the cost of capital and correct biased credit ratings;

(i) Prioritizing investments in affordable, scalable clean technologies that offer high returns on investment and economic growth.

49. Ideas and examples mentioned by the experts in answer to the third guiding question, “What innovative financing mechanisms and debt instruments can be deployed, particularly in developing countries”, focused on, inter alia:

- (a) Dedicated guarantee providers, currency hedging products, and adequate liquidity support mechanisms;
- (b) Expanded use of debt-for-climate swaps among more countries to unlock additional resources for clean investments;
- (c) Green and sustainability-linked bonds for clean investment;
- (d) New financing approaches, such as solidarity levies and wealth-based taxes;
- (e) The importance of finding predictable revenues for debt-free financial support of climate projects in developing countries;
- (f) Optimizing energy subsidies through innovative targeting to free up funds for investment; this reform, however, requires high-level political commitment, social considerations, and thorough preparation. It is important to note that fossil fuel subsidies are used by both developed and developing countries and vary by region;
- (g) Decreasing tax breaks and incentives for fossil fuel industry in countries that provide such support;
- (h) Addressing the shortage of equity financing in developing countries;
- (i) International tax reforms, specifically targeting increased investment in clean and renewable energy;
- (j) Addressing risk perception informed by inaccurate risk assessments in order to promote a more realistic view of developing countries’ creditworthiness.

50. Discussion around the fourth guiding question, “In what ways can international cooperation and coordination among developed and developing countries, development partners, and private investors be strengthened”, focused on, inter alia:

- (a) Learning from countries with successful platforms on just energy transition in partnerships with development partners to improve access to new technologies, reduce costs and adopt rules;
- (b) Addressing negative spillover impacts of trade and industrial policies, especially those with green components, to enable investments in developing countries;
- (c) Increasing capital of MDBs to address funding gaps, enhance their efficiency, and mobilize private finance;
- (d) Substantially increasing financial support for developing countries, including by doubling bilateral finance, tripling MDB finance, and quadrupling private sector investment;
- (e) Increasing very long-term, low-cost finance, especially from DFIs, to facilitate investment in public infrastructure such as electricity grids and energy storage;
- (f) Addressing perceived risk among credit rating agencies to close the gap with actual risk;
- (g) Putting climate finance in the context of overall needs for development finance;
- (h) Encouraging the examination of bankable investable projects globally, with a focus on mitigation and adaptation projects for local impact;
- (i) Including investment-friendly projects in NDCs, with the coordination of the private sector;
- (j) A holistic approach to subsidy reform, considering the specific circumstances of each country;

- (k) A strategic approach leveraging international tax reform as a catalyst for accelerating clean energy investments;
- (l) Improving governance and reporting of climate finance to address the needs of beneficiaries;
- (m) Delivering on the commitment of developed countries to the goal of jointly mobilizing USD 100 billion per year;
- (n) The need to assess the implication of trade restrictions on business in developing countries already facing sociopolitical and socioeconomic constraints;
- (o) South–South cooperation, including on a regional basis, as more developing countries are becoming developers of technologies and have investment capabilities that are more suited to the developing world.

2. Pitch hub introduction

51. On the first day of the event, four experts made presentations on opportunities for mobilizing finance for climate-related projects, enhancing access to finance and support, and the process behind the development of project pipelines.

52. In his presentation, Joaquim Leite, Head of Climate Finance, NDC Partnership, described the organization’s approach to mobilizing and facilitating access to climate finance and supporting country members in achieving the goals of the Paris Agreement. The NDC Partnership, a global coalition, brings together 128 country members and 56 institutional members to deliver ambitious climate action. The Partnership employs a flexible, country-driven process for coordinated resource mobilization for and planning, implementation and tracking of climate actions. Key areas of support include raising ambition and quality of NDCs and long-term low-emission development strategies, mainstreaming climate across national and sectoral planning, and developing NDC implementation and investment plans. To date, the Partnership has supported 95 countries, mobilizing USD 9.5 billion aligned with partnership plans and USD 1.7 billion in technical assistance. The Climate Funds Explorer¹¹ was introduced as a tool for helping countries to access climate finance by providing information on international public climate financing options.

53. The presentation by Jaume Marques Colom, Innovative Finance Officer, ICLEI – Local Governments for Sustainability World Secretariat, outlined the Transformative Actions Program, aimed at supporting local and subnational governments in sustainable development. The Program focuses on accelerating sustainable development and progress towards net zero emissions, and enhancing resilience through local transformative infrastructure projects. It offers tailored project preparation support and advocacy instruments, and connects key actors to bridge the finance gap for sustainable projects. The Program’s mission includes enabling access to finance for scaling up local climate and Sustainable Development Goal action. The Program supports projects of all sizes and maturities, providing customized feedback and multiple financing options. Examples of projects under the Program include projects on sustainable mobility in Mérida, Mexico; waste management in Makindye, Uganda; and thermo-technical retrofitting in Ulaanbaatar, Mongolia. Program partners include a wide range of actors, and the Program offers additional services such as technical assistance and international visibility.

54. In his presentation, Erick Ruiz Araya, Deputy Director, Project Facilitation and Support Division, IRENA, explained the organization’s role in facilitating the global energy transition through project support. He stressed that the energy transition will require a cumulative investment of USD 150 trillion by 2050. IRENA supports this transition through platforms such as ETAF and the Climate Investment Platform. The latter, a joint initiative between IRENA, the United Nations Development Programme, and Sustainable Energy for All, increases capital mobilization and the impact of renewable energy, investing in developing countries. ETAF is aimed at mobilizing USD 5 billion for renewable energy projects by 2030, leveraging partners’ financing and project development expertise. As at June 2024, ETAF had mobilized 13 partners providing various financial products. Erick Ruiz

¹¹ Available at <https://ndcpartnership.org/knowledge-portal/climate-funds-explorer>.

Araya shared that 90 projects have been supported, with 64.8 MW of projects financially closed, amounting to USD 85 million. Both platforms facilitate project development and financing, supporting the energy transition in IRENA member countries.

55. In his presentation, Marcus Mayr, Senior Urban Development and Energy Efficiency Specialist, GCF, described the organization's efforts to mobilize finance for green and resilient buildings. The GCF invests in various sectors, including buildings, cities, industries, and infrastructure, aiming to reduce emissions and increase resilience. The presentation outlined the process of developing project pipelines, the importance of country ownership, climate rationale and the need for scalable solutions. The approach of the GCF involves, inter alia, identifying public and private sector developers, legal and regulatory changes, and project owners. The presentation highlighted the commitment of the GCF to ensuring balanced allocation between mitigation and adaptation, leveraging blended finance and supporting early-stage project development through risk-mitigating patient capital. The GCF has facilitated significant investments and project development through its extensive network of accredited entities and delivery partners.

3. Pitch hub

56. On the second day of the event, a pitch hub was held to provide an opportunity for interested Parties to share project ideas with investors, financiers, financial institutions and other policymakers with a view to facilitating the preparation of investment projects.

57. Interested Parties were requested to submit a project proposal,¹² to be presented at the pitch hub. Project proponents made pitches to investors and policymakers on their project proposals, selected through a predetermined process under the guidance of the co-chairs, under various thematic areas.

58. The pitch hub took place in a breakout session format. A total of 17 projects, listed in table 1, were presented in four breakout rooms. Each breakout room accommodated an advisory panel of two or three experts, who provided guidance and advice on the project proposals presented. A webcast of each breakout room is available on the event page.¹³

59. The feedback from the advisory panel emphasized the critical importance of clear communication, well-defined project scope, detailed financial information, robust data and planning, effective governance, and a strong commitment on sustainability and social impact in terms of improving the proposal and attracting investment. The feedback on the presentations can be summarized as follows:

(a) The importance of clarity in communication and a well-defined project concept with a narrow scope was highlighted; simplifying presentation slides by incorporating visuals and providing clear, non-technical explanations, especially for technologies with high innovation risk, is also key;

(b) Providing detailed financial information is essential, including explicit investment requests and clear statements of the amount to be raised, and clarity should be provided on monetization strategies, pricing, market reach, rates of return, payback periods, total estimated project costs, and availability of long-term power purchase agreements for energy supply projects;

(c) Aligning financial figures consistently and providing a clear breakdown of project costs is key;

(d) Presentations that highlight project traction and achievements should be organized early on;

(e) Integrating data and information on planning processes into the presentation, such as reliable product benchmarks, detailed actions and routes in the road map for achieving project objectives, and a pre-investment plan outlining potential investments over a horizon of 5–10 years, will provide more credibility;

¹² The project proposal template is available at <https://unfccc.int/documents/636493>.

¹³ <https://unfccc.int/event/third-global-dialogue-and-investment-focused-event-under-the-sharm-el-sheikh-mitigation-ambition-and>.

(f) Describing governance and institutional arrangements of the government, including sound regulatory frameworks to trigger private investment, procurement procedures and additional public benefits such as the involvement of local manufacturers;

(g) Providing risk management approaches including financial risk management products to mitigate overall risk and enhance project viability;

(h) An important aspect is ensuring sustainability, considering social impacts and environmental integrity, including by incorporating a just transition concept and e-waste tracking and monitoring plans, and considering impacts on tourism, biodiversity and energy security;

(i) Focus on measures with higher mitigation potential.

Table 1

Third investment-focused event: projects pitched, facilitators and advisory panel members

<i>Project name</i>	<i>Facilitators and advisory panel members</i>
<p>Room 1</p> <ul style="list-style-type: none"> • Building-Integrated Photovoltaics: boots building green and low-carbon sustainable development (China) • Implementing the extension of the first line of the metro from the new Almag station to Shebein Al Qanater city and supervising the implementation (Egypt) • Phoenix Edison (Nigeria) • Oando Clean Energy Limited (Nigeria) • Mauritius renewable energy revolving fund (Mauritius) 	<ul style="list-style-type: none"> • Hugh Garnett, Institutional Investors Group on Climate Change (facilitator) • Gareth Phillips, Manager, Climate and Environment Finance, African Development Bank • Jan-Willem van de Ven, Head of International Climate Policy and Engagement, Climate Strategy and Delivery, European Bank for Reconstruction and Development
<p>Room 2</p> <ul style="list-style-type: none"> • Battery energy storage system for wind-dominated grid stations (Pakistan) • Green buses: deployment of electric buses in Lumbini Province (Nepal) • Carbon farming on post-mining hotspot areas of eastern Eurasia: verification of CO2 emission and sequestration potential on the different age stages of eco-genetic successions (Russian Federation) • Pomega prismatic lithium-ion battery cell (Türkiye) 	<ul style="list-style-type: none"> • Amjad Abdulla, IRENA (facilitator) • Katherine Anne Hughes, Principal Climate Change Specialist, Climate Change and Sustainable Development Department, Asian Development Bank • Kishlaya Misra, Senior Investment Officer, Private Equity, Asian Infrastructure Investment Bank
<p>Room 3</p> <ul style="list-style-type: none"> • Reducing embodied carbon emissions related to concrete and cement (Colombia) • Standard for constructing sustainable and healthy rural housing in Colombia (dispersed and nucleated) and pilot projects (Colombia) • Accelerating of mitigation carbon emissions of buildings to reach 2053 net zero goals in Türkiye (Türkiye) • Renewable generation expansion San Cristobal Island – Galapagos (Ecuador) 	<ul style="list-style-type: none"> • William Wild, Climate Champions Team (facilitator) • Erick Ruiz Araya, Deputy Director, Project Facilitation and Support Division, IRENA • Roxana Slavcheva, Global Lead for Built Environment, Cities, World Resources Institute
<p>Room 4</p> <ul style="list-style-type: none"> • Somali renewable energy initiative: A needs assessment study (Somalia) • Cities: Konza Smart City – Sustainable urban infrastructure development (Kenya) • Low-tonnage CO2 processing plant utilizing compact isothermal universal reactors for methane conversion (Russian Federation) • Sustainable energy for health services (Sao Tome and Principe) 	<ul style="list-style-type: none"> • Michelle Peña Nelz, German Agency for International Cooperation (facilitator) • Marcus Mayr, Senior Urban Development and Energy Efficiency Specialist, GCF • Sören David, Head of the Technical Support Unit, Mitigation Action Facility • Sara Lemniei, Chief Executive Officer, SLK Capital

III. Fourth global dialogue and investment-focused event under the Sharm el-Sheikh mitigation ambition and implementation work programme

A. Proceedings

60. The fourth global dialogue under the Sharm el-Sheikh mitigation ambition and implementation work programme took place in Sharm el-Sheikh, Egypt, on 4 October 2024 in hybrid format, with 167 registered in-person and 166 registered virtual participants who were representatives of Parties and non-Party stakeholders.

61. Participants discussed opportunities, actionable solutions, challenges and barriers relevant to the topic of cities: buildings and urban systems, which was explored through discussions on the following subtopics:

- (a) Spatial planning and low-carbon infrastructure;
- (b) Electrification and switching to net zero emission resources;
- (c) Enhancing carbon storage through green and blue infrastructure.

62. Following welcoming remarks by Taghareed El Goweily, Director of the Environmental Affairs, Climate, Environment and Sustainable Development Department of the Ministry of Foreign Affairs of Egypt, opening remarks were provided by Iman Ustadi, Deputy Chief Negotiator for the COP 28 Presidency; Elchin Allahverdiyev, Senior Negotiator for the incoming COP 29 Presidency; and a representative of the secretariat. These were followed by an introductory presentation on the fourth global dialogue delivered by the co-chairs of the work programme.

63. Six technical experts delivered scene-setting presentations on the subtopics listed in paragraph 61 above, which are summarized in chapter III.B below.

64. The dialogue participants were then divided into three facilitated breakout groups, each addressing one of the subtopics guided by the following questions:

- (a) What are the opportunities, best practices and actionable solutions to urgently scale up mitigation ambition and implementation in this critical decade in each of the respective subtopics?
- (b) What are the challenges and barriers (e.g. policies, finance, technology and capacity, sustainable development and socioeconomic) to urgently scale up mitigation ambition and implementation in this critical decade in each of the respective subtopics?

65. The dialogue was followed by an investment-focused event, which was organized by the secretariat under the guidance of the co-chairs of the work programme and held on 5 October 2024 in hybrid format. The event, which included a panel discussion, a solutions hub and a pitch hub, can be revisited via the webcast links on the event page¹⁴ and is summarized in chapter III.C below.

B. Summary of the fourth global dialogue

66. This chapter captures introductory presentations and views shared during the breakout group discussions at the fourth global dialogue, but may not represent an exhaustive summary of all comments made by participants.

¹⁴ <https://unfccc.int/event/fourth-global-dialogue-and-investment-focused-event-under-the-sharm-el-sheikh-mitigation-ambition-and->

2. Spatial planning and low-carbon infrastructure

(a) Introductory presentations

67. Diana Urge-Vorsatz, Professor at Central European University and Vice Chair of the Intergovernmental Panel on Climate Change, emphasized the crucial role of spatial planning and low-carbon infrastructure in creating carbon-neutral cities given the growing share of urban emissions in global emissions. She warned that current urbanization patterns risk locking in induced demand for GHG emissions for decades or centuries, and constraining lifestyles to energy-intensive technologies, but highlighted how well-planned, higher-density and well-connected cities could enable low-carbon lifestyles. By fostering walkable subcentres with diverse destinations, urban areas can promote sustainable living. Four key characteristics that are essential for long-term low-carbon planning, namely higher density, mixed land use (residential, commercial, parks), improved connectivity and improved accessibility are outlined in the Fifth and Sixth Assessment Reports of the Intergovernmental Panel on Climate Change. These characteristics contribute to reducing emissions by shortening travel distances, promoting mixed land use and offering diverse transportation options (bicycles, walking, public transport or cars). Urban infrastructures can make a difference of up to a factor of 10 in energy use and induced GHG emissions. Overall, urban planning could result in a 25 per cent reduction in emissions by 2050 compared with a 'business as usual' scenario, underscoring the importance of integrated urban planning in sustainable development.

68. Tejal Kanitkar, Associate Professor at the National Institute of Advanced Studies in Bengaluru, India, examined the drivers of urban emissions, potential mitigation strategies and challenges, opportunities, responsibilities and capacities in the context of both developing and developed countries, noting that a significant share of global emissions is attributed to urban areas, which are particularly high in developed countries, while per capita emissions are slightly decreasing. She highlighted the strong link between urbanization and national income, with high-income regions having greater potential for reduction of existing emissions and low-income regions having a lower level of urbanization and greater potential for emissions avoidance. As urbanization increases, especially in developing countries, so does the opportunity to address infrastructure deficits and under-provisioning of services while pursuing low-carbon and climate-resilient development through efficient building design and the development of affordable mass-transit systems. In developed countries, in contrast, there is high potential for emission reductions and therefore stepped up efforts can focus on retrofitting, electrifying transport systems, implementing transport modal shifts, and encouraging compact city design and public transport. Challenges such as balancing costs, macroeconomic conditions, urgency, increasing numbers of informal settlements, trade-offs in provision of services, and material choices when addressing infrastructure needs in developing countries were also highlighted.

(b) Breakout group discussion and key findings

69. The breakout workshop group discussion was facilitated by Nadine Bitar, Executive Director of Baladiya Catalyst, accompanied by Diana Urge-Vorsatz and Tejal Kanitkar.

70. Participants underlined the importance of tailoring spatial planning and low-carbon infrastructure solutions to the unique challenges of diverse urban environments, including established, informal, rapidly expanding, new and emerging, and intermediary urban areas, with a view to facilitating emission reductions, sustainability and resilience in a manner that aligns with their specific contexts and developmental stages. Participants also emphasized that there is no one-size-fits-all approach to urban planning solutions, given the diversity of national and local circumstances and priorities. The importance of integrating climate action into spatial planning frameworks was also highlighted, aimed at proactively embedding resilience and low-carbon infrastructure into urban planning and development at an early stage to prevent 'infrastructure lock-in' and reduce emissions through long-term planning, with some participants pointing out the high costs and challenges associated with retrofitting. Participants also highlighted the importance of aligning spatial planning and low-carbon infrastructure with the Sustainable Development Goals with a view to addressing poverty eradication and inequality.

71. In the discussions on localized planning approaches, participants acknowledged that nuanced, place-based planning can better reflect the unique social, economic and environmental needs and priorities of different regions, countries, cities and districts. The importance of adapting national planning frameworks to local circumstances was noted, with several participants highlighting the key role of local authorities and community engagement in guiding urban development to address community-specific concerns.

72. The need for collaboration between national, regional, subnational and local governments for fostering comprehensive, holistic and inclusive planning approaches and cohesive policies while ensuring their aligned implementation was highlighted by many participants. Moreover, engaging multiple levels of governance (e.g. cities, national and regional governments, non-State actors and local stakeholders) was considered important in promoting urban transformations and facilitating the development and implementation of coordinated policy frameworks that recognize and address unique local needs.

73. Many participants highlighted the important role that regulatory frameworks and policies can play in supporting and incentivizing coordinated planning approaches across the national, subnational and local level. Supportive legal and regulatory frameworks for local governments were also noted as instrumental for facilitating climate-responsive urban infrastructure, energy-efficient buildings and low-carbon transit systems. Examples of such frameworks and policies include financial incentives for e-vehicles, guidelines on renewable energy or energy efficiency for the private sector, green procurement policies, regulations for reporting local-level data on the carbon footprint, minimum energy performance standards, building codes, evaluation standards for renewable energy building applications, and energy-saving design standards for residential buildings. Governments can also play an important leadership role in advancing public-private partnerships and driving demand for low-carbon infrastructure through strategic public investment.

74. Many participants stressed the need for a coordinated and multilevel approach to capacity-building, involving local engagement, education and training, skills development, and access to resources, in order to enhance the capacity of local stakeholders to plan and implement sustainable urban solutions. The need for international cooperation in relation to knowledge-sharing and awareness-raising and for enhanced support in the areas of finance, technology development and transfer, and capacity-building for developing countries was also underlined.

75. Many participants emphasized the importance of considering linkages and integration between adaptation efforts, particularly resilience, and mitigation efforts when developing spatial planning strategies, including in areas such as transport, energy and infrastructure.

76. The importance of equity and the principle of common but differentiated responsibilities and respective capabilities in the light of considering different national circumstances was discussed in the context of global climate action towards sustainable development.

(c) Opportunities (including actionable solutions) and barriers

77. The opportunities mentioned by some participants include:

(a) Embedding green principles into urban planning and infrastructure development. Strategies discussed include promoting solar panel installations at the household level, addressing waste management treatment needs affected by urban growth, and facilitating electrification efforts. Additional measures include promoting electric vehicles, low-carbon infrastructure, cycling and mass transit options, as well as using recycled materials in construction;

(b) Developing heritage-based, locally sourced solutions that are customized to specific geographies, materials and climatic conditions, using context-specific measures, traditional architectural approaches, local materials and nature-based solutions, and incorporating Indigenous local knowledge into spatial planning could enhance both the sustainability and acceptance of urban transformations;

(c) Facilitating knowledge-sharing initiatives, such as mentoring programmes between cities, sharing lessons learned from established cities and successful initiatives, and

promoting research collaborations between countries, can enable best practices to be exchanged across diverse urban contexts;

(d) Adopting integrated approaches to spatial planning, considering multiple sectors, such as energy, buildings, transport and waste, can simultaneously leverage the co-benefits and spillover effects of mitigation efforts;

(e) Strengthening collaboration between national- and local-level governments and actors in designing and implementing policies in consultation with the communities directly affected by them, including through collaboration agreements targeted to specific sectors or areas, and national schemes to support the development of local districts by local authorities; encouraging and supporting localities to develop innovative planning concepts and improve planning methods; and facilitating eco-labelling of districts to encourage the development of urban green projects. Additional measures include territorial climate and energy plans, and developing guidelines tailored to the local context;

(f) Designing cities in ways that can reduce transport demand, increase the resilience of the transport system and promote low-carbon public and private transportation options by creating integrated transportation options to meet specific needs, such as using e-buses or bicycles for last-mile connectivity to bridge the distance between central transportation hubs and the end user's destination, creating bicycle lanes or car-free zones and implementing 'avoid, shift, improve' approaches. Additional approaches include using existing public transport infrastructure to improve density, infilling to develop underutilized land within existing urban areas, and optimizing the use of existing infrastructure on the basis of usage patterns;

(g) Facilitating the increased deployment of renewable energy and supporting enhanced energy efficiency, including by developing '15-minute cities', which is a concept of cities where most daily services (work, shopping, education, healthcare) can be reached within 15 minutes of walking, cycling or public transit, introducing energy efficiency standards, promoting standards on building material use, promoting sustainable heating and cooling solutions, advancing low-carbon technologies and scaling up energy storage solutions;

(h) Implementing circular economy principles in planning and low-carbon infrastructure considerations;

(i) Using granular street- and building-level data, as well as localized data, for designing effective urban projects and urban renewal initiatives, developing comprehensive assessment frameworks and building capacities for data collection and reporting.

78. The barriers mentioned by some participants include:

(a) Challenges associated with transitioning existing emission-intensive legacy building stock and settlements to meet green standards, including the high costs of retrofitting and the particular challenges faced by intermediary cities and informal settlements;

(b) Limited capacity, particularly at the local level, including in accessing resources, as well as limited access to technologies, lack of institutional capacity, gaps in knowledge and expertise, shortages of qualified personnel, and the absence of a long-term vision in relation to urban development;

(c) The need for substantial capital investment to support low-carbon infrastructure, especially in rapidly urbanizing areas, which is further intensified by prevailing uncertainties, contributing to increasing capital costs. Challenges also exist in securing adequate funding and support for developing countries, as well as gaps in access to means of implementation and availability of cost-effective design solutions for low-carbon development;

(d) The disconnect between national-level policies and measures and their implementation at the local or individual level, along with challenges associated with the resistance these measures may encounter at the local level;

(e) The importance of involving local communities and strengthening local capacities is often overlooked in urban planning efforts;

(f) A lack of reliable, high-quality and sufficiently granular local-level data to aid spatial planning efforts;

(g) A lack of adequate regulation and fragmented policy frameworks, in addition to challenges in enforcing regulations relating to spatial planning and low-carbon infrastructure for sustainable development;

(h) In developing countries, where space and resources are constrained, balancing competing priorities, such as housing, infrastructure and sustainable transport, can prove challenging;

(i) The scalability of ongoing initiatives is a challenge;

(j) Many regions consist of communal lands with traditional ownership rights, which can present an additional barrier to urban planning and development;

(k) Cross-border trade restriction measures, particularly in the case of technology transfer and trends to monopolize technologies.

3. Electrification and switching to net zero emission resources

(a) Introductory presentations

79. The introductory presentation by Hua Wang, of the Chinese National Center of Technology Innovation for Green and Low-Carbon Building, described multiple options for electrifying energy end use in urban infrastructure for electrifying energy end use in cities and promoting energy-efficient heating, transport and cooking. She described actionable electrification solutions using flexible energy utilization technologies for buildings, including clean power sources, digital grids, optimized load management, expanded energy storage, electric vehicles and efficient energy usage. She provided examples of building-integrated photovoltaics and highlighted the benefits of timber buildings, which store significant quantities of atmospheric carbon in contrast to buildings constructed from steel and concrete. Barriers and challenges were mentioned, such as the need to establish a systematic way of thinking to reduce emissions, expanding current views on the energy-saving approach of buildings to the whole electrification chain of “source, grid, load, storage and use” ; transform the traditional understanding that is limited to single buildings and expand perspectives to parks, urban areas and cities; and channel investment and improve technology transfer to make electricity more affordable, stable and clean for households in developing countries.

80. The presentation by Vida Rozite, of the International Energy Agency, emphasized the critical role of electrification in clean energy transition, highlighting that current efforts are insufficient, and noted the need for significant changes in planning, data-sharing and system operations. She described various considerations including costs and the supply chain, as well as the need for coordinated action in multiple areas within a short time frame. She also highlighted challenges, including lack of access to basic energy services by millions of people, high upfront costs of clean technologies such as electric cars and heat pumps, shortage of skilled workforce, disruptions in the supply of materials, and slow uptake of circularity and recycling. The need for well-designed policies, innovation in business models and improved coordination was also highlighted. It was underlined that cities play a leading role in clean energy transitions, as more than 60 per cent of public investment occurs at the subnational level, and cities control significant infrastructure, public buildings and public transport systems. However, many cities face barriers such as a lack of mandates, resources, capacity and data needed to play a more active role. To maximize impact, improved coordination between government levels is essential, in addition to enhanced public-private partnerships and increased use of digital tools to identify opportunities for effective implementation and maximize value.

(b) Breakout group discussion and key findings

81. Participants underlined the importance of whole-of-society and multisectoral approaches to consider synergies, co-benefits, challenges and solutions that are fit for purpose at the national, city and municipality level. Participants also highlighted the need to combine

and balance bottom-up and top-down approaches for making informed decisions tailored to local contexts and ensuring the development and implementation of effective policies and investment environments with economies of scale.

82. The need for clean energy sources in electrification, particularly renewable energy, was highlighted by many participants, while the importance of specific local circumstances was emphasized for identifying fit-for-purpose technologies, particularly in developing countries, and ensuring access to affordable, reliable and sustainable energy. Participants emphasized that no one-size-fits-all solution exists owing to the diversity of national and local priorities and circumstances, including geographical and climatic conditions, socioeconomic contexts, access to energy and clean cooking, levels of economic development, fossil fuel resources, visions and capabilities.

83. The participation of local stakeholders in policy processes, such as local financial institutions, was highlighted as key to ensuring that no one is left behind, identifying sustainable solutions and adopting an integrated approach to avoid siloed solutions.

84. Several existing cost-effective technological solutions were also discussed. Participants highlighted the need for knowledge-sharing, awareness-raising and policy tools to ensure the use of the most efficient energy sources, while considering specific local contexts, life cycle emissions and relevant data in city planning. Examples of tools mentioned include renewable energy potential maps and real-time monitoring and simulation software to maximize the use of the existing power grid, ensuring full capacity at the district level.

85. The need for finance, technology and capacity-building for sustainable urban development in developing countries was discussed, along with the importance of socioeconomic context, including macroeconomic conditions, level of development and different stages of urbanization between developed and developing countries, in the context of equity and the principle of common but differentiated responsibilities and respective capabilities in the light of different national circumstances.

(c) Opportunities (including actionable solutions) and barriers

86. The opportunities mentioned by some participants include:

(a) Promoting city-level development of low-emission communities, including by developing local-level targets, establishing low-emission areas and zones, deploying cost-effective renewable energy, providing financial incentives, expanding energy efficiency efforts from individual buildings to entire districts, and promoting circular economy to reduce and reuse waste;

(b) Using financial incentives, including tax breaks, subsidies and preferential loans, to promote electrification and zero emission resources, including electric vehicles for personal use and use as taxis, electrified public transportation, heat pumps to replace gas water heaters, the gradual phase-out of fossil fuel fired boilers, and the installation of rooftop solar photovoltaics in residential buildings;

(c) Using regulations and standards to improve the energy efficiency of buildings and appliances, including building codes, minimum energy performance standards, energy performance labels and rating systems for buildings. Examples of regulations were mentioned for installing solar photovoltaics and electric vehicle charging points in new buildings, as well as parking regulations to promote the use of electric vehicles;

(d) Strengthened collaboration among diverse stakeholders, in particular with the private sector, in multiple areas including efforts to electrify transport, ensure access to clean electricity, especially for rural areas, and scale up CCS projects;

(e) The ongoing development of zero emission resource infrastructure, including utility- and small-scale renewable energy projects, waste-to-energy projects and green hydrogen projects;

(f) Ongoing efforts to electrify the government fleet, public transport and construction to encourage electrification to be undertaken by the private sector;

(g) Innovative technologies and practices for optimal power use, including scheduling consumption during periods of low-electricity demand and price, promoting power demand-side management through information-sharing and smart meters, using thinner and lighter solar photovoltaics to address current constraints such as limited space, and promoting circular carbon economy and new cooling systems;

(h) Strengthened international cooperation, including international power grid connections, knowledge-sharing, research, joint initiatives, financial, technical, capacity-building and technology development and transfer for developing countries, tailored to country contexts;

(i) The provision of subsidized training programmes supporting individuals to acquire the necessary skills within a sufficient time frame that enables them to benefit from just, clean and equitable energy transitions.

87. The barriers mentioned by some participants include:

(a) Structural barriers and competing policy priorities, especially in developing countries;

(b) A lack of adequate regulation and information, as well as fragmented policy frameworks, hindering the full potential of electrification and renewable energy in cities;

(c) A lack of infrastructure and supply chain constraints, including in relation to the power distribution network, to support widespread charging of the electric vehicle fleet;

(d) Disruption in the supply chain of critical minerals;

(e) Financial constraints on supporting energy transitions, including access to affordable finance options and the high cost of capital in developing countries, in particular limited financial returns on investment for the last mile of energy supply to rural households;

(f) A lack of investment and business plans, for example for clean cooking, CCS and other new technologies, since advanced technologies can be costly to consumers;

(g) A lack of training and skills among the workforce to benefit from new jobs in the clean energy sector;

(h) A lack of understanding of the complexity of electrification in certain sectors, including the infeasibility of electrification for high-heat temperature application such as heavy industrial processes using currently available technologies, and space constraints for installing rooftop solar photovoltaics and heat pumps in existing buildings;

(i) Electrification and energy efficiency improvements in old existing buildings with poor energy performance, especially in historical buildings whose structure is protected by legislation;

(j) A lack of data and metrics to measure the effectiveness of technologies and policies;

(k) Informal housing and energy poverty;

(l) Disruptions in hydroelectric power generation due to reduced rainfall levels;

(m) Intermittency of solar and wind power generation.

4. Enhancing carbon storage through green and blue infrastructure

(a) Introductory presentations

88. The introductory presentation by Nate Macmillan, Decarbonisation and Green Innovation Director at Ascon Energy Limited, discussed a multifaceted approach to decarbonization, involving industrial and transportation electrification, carbon capture technologies and alternative fuels. He mentioned the voluntary carbon marketplace and initiatives such as afforestation and REDD+, aimed at combating deforestation and enhancing carbon storage. Urban gardening and agroforestry were highlighted as solutions for sustainable food production in cities. The role of biogas as an alternative fuel source, particularly in developing countries, was also emphasized. The presenter advocated for

improved cookstoves in underserved communities to enhance energy efficiency and quality of life, and introduced the term ‘first exposure to human rights’, advocating for the human dignity of populations in urban environments affected by climate change. He then introduced the concept of ‘scope five’ emissions, which includes the contribution of waste to urban emissions. The potential of circular economy concepts, urban carbon sinks, biogas digesters and carbon capture technologies in helping to achieve the Sustainable Development Goals was also highlighted.

89. The introductory presentation by Firdaous Oussidhoum, Assistant Secretary General for Monitoring and Impact at the United Cities and Local Government World Secretariat, emphasized the important role of cities and urban governance in implementing green and blue infrastructure tools for urban climate resilience and climate mitigation. She called for a multilevel, whole-of-governance approach, engaging local and national governments, private sector actors and civil society. She also emphasized the need to balance urban growth with environmental preservation and ecosystem restoration, and highlighted the unique role of intermediary cities, or those not as large as megacities, which are nevertheless critical in supporting sustainable urbanization efforts. She highlighted that intermediary cities hold great potential for climate resilience and emissions reduction and that investing in green infrastructure within these cities can contribute significantly to global sustainability goals. The need for proactive, systemic urban planning, particularly in intermediary cities, to meet future climate goals was emphasized. The presenter proposed making such cities ‘emission-free nucleons’ by focusing on green and blue infrastructure development, highlighting that while significant challenges remain in sectors such as energy and transportation, sectors such as agriculture, forestry and land use provide hope that emissions will be reduced and sustainability goals achieved.

(b) Breakout group discussion and key findings

90. The breakout workshop group discussion was facilitated by Yunus Arikan, Director of Global Advocacy, ICLEI – Local Governments for Sustainability, and Local Governments and Municipal Authorities focal point, accompanied by Nate Macmillan and Firdaous Oussidhoum.

91. Participants highlighted the co-benefits of green and blue infrastructure, which can simultaneously address mitigation and adaptation concerns, while also benefiting the mental, physical and economic well-being of local communities. Synergies with global biodiversity objectives were also underlined.

92. Cities were highlighted as an impactful location for green and blue infrastructure interventions, and the importance of increasing urban green space was repeatedly emphasized. Additional frequently highlighted solutions include afforestation and reforestation efforts and the need to reclaim and restore land, including coastal ecosystems, as a means of enhancing natural carbon sinks.

93. A localized, context-specific approach was deemed vital to the successful implementation of green and blue infrastructure strategies. The coordination and capacity gaps between national or international policies and local implementation was frequently cited as a core challenge. The need to include, inform and empower stakeholders at every level of government and society was also underlined.

94. Representatives from the Global South pinpointed access to finance, technology and capacity-building as a key barrier to the deployment of green and blue infrastructure. Some participants highlighted the importance of international cooperation as a means of helping to overcome some of these challenges.

95. The need to consider different national circumstances was highlighted on the basis of the difference in urbanization processes between developed and developing countries.

(c) Opportunities (including actionable solutions) and barriers

96. The opportunities mentioned by some participants include:

(a) Recognizing the role of green and blue infrastructure in an integrated approach to both mitigation and adaptation in urban settings. National and subnational strategies,

including NDCs and long-term low-emission development strategies, emphasize the need to incorporate green and blue infrastructure to achieve climate and development goals;

(b) Expanding green urban spaces such as urban forests, parks, green corridors and vertical green spaces, which contributes to achieving net zero emissions and carbon neutrality, enhancing biodiversity and carbon sequestration. Initiatives such as planting millions of trees, creating green grids and integrating sustainable materials, such as green roofs and walls, in buildings help to reduce emissions and encourage active mobility, as that would make urban environments more walkable, pleasant and conducive to outdoor activities;

(c) Implementing nature-based solutions, such as ‘sponge cities’, which soak in rainwater and retain excess stormwater, then filter and release the water slowly, like a sponge, and urban flood prevention systems, which enhance urban resilience by addressing flooding and heat islands. These approaches not only strengthen flood governance but also improve energy efficiency in cities;

(d) Increasing biodiversity enhancement through green and blue infrastructure in order to contribute to improved urban environments through ecological resilience and improved air quality;

(e) Realizing the potential to develop green and blue infrastructure that can serve as a carbon sink, leveraging coastal ecosystems and ocean resources;

(f) Using strong partnerships and collaboration, including international collaboration and private sector financing, for advancing green and blue infrastructure, particularly in developing countries and the least developed countries;

(g) Implementing carbon sequestration and storage through green and blue infrastructure, contributing to reduced GHG emissions and socioeconomic development;

(h) Enhancing people’s mental and physical well-being and ecosystem health through better climate, humidity and temperature, leading to comfortable, stable and healthier living conditions for urban residents, and reduced noise and pollution;

(i) Using economic opportunities, including low-cost infrastructure, energy efficiency improvements, job creation and resource mobilization, to support vulnerable countries and foster a green economy;

(j) Integrating advanced technologies into urban planning, such as artificial intelligence and blockchain, to enhance carbon markets, ensure transparency and process data, alongside innovation and research on green construction financing solutions;

(k) Providing capacity-building for communities, local regulations and national governments, alongside community training initiatives for women and youth;

(l) Engaging various sectors of society, including academia and citizens, by fostering collaboration with local communities, subnational governments, and the public and private sectors;

(m) Knowledge-sharing and empowerment of local communities and municipalities by informing citizens, leveraging Indigenous traditional knowledge and engaging youth.

97. The barriers mentioned by some participants include:

(a) Lack of coordination and governance between different levels of government (national, regional and local), including municipalities and stakeholders, for aligning policies, breaking silos between authorities and communicating national policies at the local level;

(b) Lack of adequate financial resources for achieving mitigation goals and sustainable development plans in developing countries. International financial support is needed to overcome these challenges;

- (c) Premature technologies, barriers in relation to access to technology and resources, and a lack of human resources, highlighting the need for capacity-building and knowledge-sharing;
- (d) Lack of data availability and management;
- (e) High cost and time required to add green spaces in established urban areas, and difficulties in finding available space for expanding green areas, especially in low-income areas in cities;
- (f) The need for a stronger policy and more inclusive environment for international cooperation, avoiding protectionist policies, as well as recognition of existing policies rather than the creation of new ones;
- (g) Increased climate risks associated with green infrastructure in cities, such as heat waves and forest fires, as well as bushfires in drier conditions;
- (h) Lack of inclusion of diverse communities in urban settings.

C. Summary of the fourth investment-focused event

1. Addressing structural barriers to investment

98. In a scene-setting presentation on currency risk, Zeineb Ben Yahmed, Climate Finance Specialist at Climate Policy Initiative, emphasized the critical role of mitigating currency risk in unlocking climate investment in emerging markets and developing economies. She noted that factors such as domestic political and macroeconomic conditions, external economic factors and perception-based drivers significantly influence currency risk. A key challenge highlighted was the mismatch between domestic climate projects generating revenue in local currencies and inward foreign investments requiring hard foreign currencies widely accepted for international investment, which exposes projects to currency depreciation risks and affects their viability. There is a pressing need for international climate finance, but it is mostly provided in hard foreign currency, adding to long-term risks for projects due to underdeveloped domestic financial markets and capital constraints.

99. The presenter introduced innovative solutions for addressing these risks, beyond traditional mitigation tools such as forwards, futures and swaps. She noted the challenges faced by MDBs and DFIs in using long-term back-to-back funding mechanisms. Emerging solutions include a donor-funded guarantee facility, The Currency Exchange Fund, hedging instruments developed by Eco Invest Brazil for local institutions backstopped by credit lines from the Inter-American Development Bank, short-term local currency borrowing with back-to-back long-term DFI finance using an onshore DFI hedging platform (Delta), and the transfer of MDB private sector loans to domestic institutional investors through Financial Sector Deepening Africa aimed at strengthening local currency liquidity through increased engagement with DFIs. The presenter outlined a set of proposals for various actors in capital markets to support the mitigation of currency risk. She also highlighted the need for donors to enhance the affordability of hedging tools through subsidies, for MDBs and DFIs to pilot innovative tools and strengthen their engagement with local financial institutions, and for governments to focus on long-term efforts to strengthen domestic financial markets and implement regulatory reforms with a view to creating more conducive environments for sustainable investments.

100. A panel discussion followed, where four experts discussed currency risk as a structural barrier to mobilizing climate investment and shared views on opportunities, good practices and potential solutions in this context. The experts were Nicolas Picchiottino, Secretary General, International Development Finance Club; Neil Cole, Financing Manager, Just Energy Transition Projects Management Unit, The Presidency, South Africa; and Manfred Schepers, Founder and Chief Executive Officer, ILX Fund. The panel discussion was moderated by a co-chair of the work programme and guided by three questions.

101. The experts shared views on the factors that influence currency risk, how they differ across regions and sectors, and how the currency risk barrier affects clean investments:

- (a) Currency risk is a significant impediment to clean finance in developing countries and a key driver of higher costs of capital in some countries;
- (b) Currency risk is heightened in regions experiencing political and macroeconomic instability, including high inflation and public debt, inconsistent fiscal policies, underdeveloped local capital markets, and high dependence on commodity exports and remittances;
- (c) MDBs and DFIs often rely on loans denominated in foreign currency owing to lower interest rates, exposing borrowers to exchange rate fluctuations;
- (d) A currency mismatch between project revenue in domestic currency and debt servicing in foreign currency creates a currency risk;
- (e) Sectors with longer-term investment lifespans, such as infrastructure and energy utility, are particularly exposed to currency risk, while such projects require high investments to accommodate renewable energy supply, for example for upgrading the local transmission grid;
- (f) Limited access to affordable and accessible currency hedging tools in developing countries leads to higher currency risk;
- (g) Limited interconnectedness between financial systems in the Global North and Global South restricts investment flows and can exacerbate currency risk;
- (h) Lack of accessible, transparent and standardized data on currency risk across different regions can hinder investment decisions by institutional investors such as pension funds;
- (i) Pension funds in developed countries sometimes face regulatory barriers that limit their ability to invest in emerging markets and developing countries owing to currency risk;
- (j) Macro-level risks, including currency risk, usually increase the cost of capital more than micro-level risks in developing countries, where other challenges often hinder clean investment, such as off-taker risk for renewable energy projects, owing to limited sovereign guarantees.

102. The experts shared views on the policies, strategies and innovative tools that can be used, particularly in developing countries, to address this structural barrier:

- (a) A systemic approach is needed to unlock investment;
- (b) It is necessary to design solutions that consider the local context to address both macro- and micro-level challenges associated with currency risk;
- (c) Enhancing the availability of local currency financing is critical, including through partnerships between the public and private sectors, regulatory reforms to strengthen local capital markets, and the development of onshore currency hedging tools, as well as increased deployment of innovating hedging solutions, such as The Currency Exchange Fund, through providers of foreign exchange hedging;
- (d) Development of financial instruments, particularly by MDBs, to aggregate investment risk, sources of finance and portfolios will help to mitigate macro-level risks, including currency risk, given that currency risk is not uniformly correlated across regions;
- (e) Blended finance strategies, combining public, private and concessional finance, can be effective in lowering the cost of hedging and attracting investment, and can be an effective solution to microeconomic challenges to investment;
- (f) It is necessary to strengthen the capacity of domestic institutional investors to better understand the advantages of partnering with public development banks, with the aim of enhancing market liquidity and attracting favourable capital rates;
- (g) Providing capacity-building and technical assistance to financial institutions in developing countries can help to enhance their capacity to manage currency risk;

(h) Scaling up financing from MDBs in local currency can be achieved, including by shifting more risk from local financial institutions to MDBs, increasing onshore operations, and offering currency hedging options;

(i) Improving the transparency of and access to foreign exchange risk data will help reduce perceived currency risk;

(j) Diversifying financial institutions in developing countries is important, as the number of financial institutions in developing countries tends to be limited;

(k) Carbon credit instruments may offer innovative solutions to mobilizing finance in emerging markets and developing economies.

103. Finally, the experts shared views on how international cooperation among developed and developing countries, development partners and private investors can be used for implementing innovative tools for alleviating the currency risk barrier, highlighting the importance of, inter alia:

(a) Enhancing coordination between MDBs and other DFIs on data-sharing, information disclosure, foreign exchange risk management, and capacity-building initiatives;

(b) Increasing transparency and standardization between MDBs, including through data coordination;

(c) Scaling up blended finance initiatives through international cooperation to enable better support for solutions, including through risk-sharing mechanisms, such as liquidity pools of local currencies, to de-risk investments and attract private sector participation;

(d) Encouraging efforts to gather and share data related to foreign exchange risk to enable more informed decision-making by all actors in the financial system;

(e) Strengthening collaboration on capacity-building and knowledge-sharing, for example through Financial Innovation Labs, including on hedging strategies and risk management, to support public development banks and local financial institutions in managing currency risk.

104. Zeineb Ben Yahmed summarized the key solutions that emerged from the discussion during the session, while emphasizing the importance of considering the local contexts within which any solution may be applied. In the short and medium term, solutions that can lower the existing costs of hedging are needed, given that international private finance will be urgently required to close the financing gap, including creative and targeted deployment of public finance, capacity-building and raising awareness within national banks and local financial institutions, while strengthening collaboration between the different actors. In the longer term the focus should be towards strengthening and developing domestic financial markets in emerging markets and developing countries, by strengthening government policies, promoting blended finance, creating sector platforms and encouraging diversification. Longer-term solutions also include fostering local finance by enhancing cooperation with institutional investors and promoting onshore hedging solutions, supporting MDB reform to shift risk away from borrowers, and creating liquidity pools of local currencies.

2. Solution hub

105. Nicholas You, Executive Director, Guangzhou Institute for Urban Innovation, and a co-chair of Open Green City Lab, presented a case study of innovative climate mitigation in Guangzhou, China, as one of the best-performing examples cited in the *BRICS Urban Climate Agenda Report*,¹⁵ which analysed five key areas for tackling the climate challenge at the urban level, namely energy sources, energy consumption, transportation, green spaces, and waste management.

¹⁵ Sampene, A. K., Li, C., Agyeman, F. O., and Brenya, R. 2021. *Analysis of the BRICS countries' pathways towards a low-carbon environment*. Available at <https://doi.org/10.38050/2712-7508-2021-4-4>.

106. The solutions implemented in Guangzhou to address urban heat and energy efficiency include vertical greening, legislation that requires large buildings to introduce cool roofs, city designs that channel wind flows through urban spaces, and the integration of urban greening and wetlands conservation with co-benefits for biodiversity, recreation and local support for the local agriculture.

107. With regard to transportation, the presenter highlighted solutions for rapid transition to electric buses, including deploying the electric bus fleet over a condensed timeline to avoid the complexities of running parallel electric and non-electric systems. This initiative in Guangzhou was financed by pooling various subsidies as a guarantee for accessing approximately USD 1 million of green finance mobilized by the banking sector. This solution also involved upgrading the existing road infrastructure with demand management systems powered by artificial intelligence, real-time traffic analysis and optimal bus usage through mobile applications.

108. Regarding waste management, the presenter explained that a strategy based on circular economy was adopted in Guangzhou, which prioritized efforts to reduce per capita waste production. He emphasized that waste management strategies need to be tailored to individual cities, given the differences in waste composition among cities.

109. With regard to energy supply, the presenter highlighted that the Southern Grid of China is emerging as a leader in generating power from renewable energy sources, including solar, wind and nuclear. Moreover, Guangzhou's solar farms are yielding unexpected agricultural benefits, including in enhancing the productivity of crops and fisheries.

110. The following points were also discussed:

(a) Green finance in Guangzhou has grown following the introduction of a national carbon trading system in China, while the development of smart infrastructure has also helped in mobilizing private finance;

(b) Adopting a people-centric systems approach to urban development and greening helps to accelerate action towards the achievement of the Sustainable Development Goals by addressing multiple sectors simultaneously through public-private partnerships;

(c) Coherence and coordination across all levels of government is required to mobilize private finance through public-public partnerships and attract the private sector;

(d) Policy frameworks that combine both incentives and disincentives within an ecosystem approach, such as shorter registration times for electric vehicles, exemption from congestion charges for electric vehicles, and optimal use of public electric buses, are important;

(e) Various financial mechanisms are being put in place to support enhanced access to finance for the Global South through guarantee schemes, including bundling smaller-scale local bankable projects into a financing package to attract financial institutions;

(f) Solutions to urban climate challenges must be contextual; for example, while electrification has been widely promoted in China to address air pollution, some rural regions with low population density are not suitable for electrification;

(g) Education and capacity-building, such as separating waste into different waste disposal bins at source, are important for the effective participation of stakeholders, while education aimed at older people has proven particularly challenging.

3. Pitch hub

111. A pitch hub was held to provide an opportunity for interested Parties to share project ideas with investors, financiers, financial institutions and other policymakers with a view to facilitating the preparation of projects that support the implementation of their NDCs.

112. Interested Parties were requested to submit a project proposal,¹⁶ to be presented at the pitch hub. Project proponents made pitches to investors and policymakers on their project

¹⁶ See <https://unfccc.int/documents/638244>.

proposals, selected through a predetermined process under the guidance of the co-chairs of the work programme, under various thematic areas.

113. The pitch hub took place in breakout session format. A total of 13 projects, listed in table 2, were presented in four breakout rooms. Each breakout room was facilitated by a representative of the secretariat and accommodated advisory panel of two or three experts, who provided guidance and advice on the project proposals presented. A webcast of each breakout room is available on the event page.¹⁷

114. The feedback from the advisory panel emphasized the critical importance of clear communication, well-defined project scope, detailed financial information showing financial viability based on market analysis, stakeholder engagement and community involvement, public–private partnerships and collaboration, a strong commitment on sustainability and decreasing environmental impacts, and knowledge-sharing and capacity-building in terms of improving the proposal and attracting investment. The feedback on the presentations can be summarized as follows:

(a) The importance of clarity in communication and a well-defined project concept with a detailed overview of financing sources and repayment strategies aligned with national goals to attract investment was highlighted. Differentiating funding needs for grants versus investments, exploring blended financing options, and quantifying project impacts to enhance long-term sustainability were also identified as key;

(b) Highlighting the project’s replicability in various regions, and ensuring alignment with local needs through feasibility studies is essential, and target markets should be clearly defined, with a focus on medium-sized businesses and homeowners, and address technical challenges related to technology to assure stakeholders of the reliability and funding potential;

(c) The importance of establishing a comprehensive long-term vision that incorporates adaptability to climate change impacts and showcases infrastructure benefits was also highlighted, as well as the need to align the project with national resilience plans to ensure sustainability, job creation and skills development, while considering government ownership transfer and fostering long-term investments in energy and infrastructure;

(d) The project should be actively promoted to enhance visibility and secure support, emphasizing its role in improving energy accessibility and reliability. Bundling smaller projects to attract investors, integrating innovative approaches such as blockchain for scalability, and leveraging partnerships to amplify outreach efforts and strengthen backing are also key;

(e) Engaging political leaders and local authorities at an early stage to secure the necessary approvals and ensure alignment with national goals was also emphasized, and the importance of private sector involvement for project viability and economic returns should be highlighted. Fostering collaboration networks for access to climate funds and exploring public–private partnership opportunities for public–private partnerships to scale up projects is also key for ensuring sustainability and robust support through government partnerships;

(f) Identifying and mitigating risks associated with supply chain logistics while evaluating project feasibility within climate resilience and regulatory frameworks is essential. It is also important to address regulatory barriers impacting project execution, ensuring clarity on required authorizations and local support, and to incorporate capacity-building initiatives to effectively navigate such challenges;

(g) The project’s environmental benefits should be highlighted, including reduced methane emissions and improved sustainability through alternative fuel use and green building standards. Addressing potential risks to biodiversity while emphasizing positive impacts on local communities, job creation and enhanced access, particularly in public transport electrification, is also key;

¹⁷ <https://unfccc.int/event/fourth-global-dialogue-and-investment-focused-event-under-the-sharm-el-sheikh-mitigation-ambition-and>.

(h) Involving local communities and stakeholders in planning to enhance project legitimacy was highlighted, in addition to collaborating with the private sector to address job creation and equity, and developing a community engagement strategy emphasizing local ownership in renewable energy and prioritizing accessibility for marginalized groups;

(i) Promoting knowledge-sharing and regional collaboration to enhance project scalability is key. The importance of leveraging capacity-building programmes and funding to develop sustainable urbanization pipelines and equipping urban planners with tools and clear roll-out strategies while establishing cross-border exchanges to share best practices from successful projects was also highlighted.

Table 2

Fourth investment-focused event: projects pitched, facilitators and advisory panel members

<i>Room</i>	<i>Project name</i>	<i>Advisory panel members</i>
Room 1	<ul style="list-style-type: none"> • Re-circulating organic waste in the Gambia's food supply chain (Gambia) • Electrification of rubber-tired gantry cranes and tractor trailers at the Mauritius container terminal for sustainable port operations (Mauritius) • Armenia agrivoltaics project (Armenia) • Bhutan green transport project (Bhutan) 	<ul style="list-style-type: none"> • Gareth Phillips, Manager, Climate and Environment Finance, African Development Bank • Kirtika Challa, Managing Director and Head of Power and Infrastructure Advisory, CrossBoundary • Ahmed Badr, Director, Project Facilitation and Support, IRENA
Room 2	<ul style="list-style-type: none"> • Decarbonization of sanitation activity by setting up a collective solar photovoltaic plant connected to the medium voltage electricity grid to supply the ONAS (National Sanitation Office) wastewater treatment plants (Tunisia) • Transitioning towards a low-emission maritime transport sector in the Republic of Kiribati (Kiribati) • Technical standard for green and low-carbon urban construction in different climate zones of developing countries (planning guide/toolkit) (China) 	<ul style="list-style-type: none"> • Navina Sanchez, Senior Climate Change Specialist (Just Transition), Climate Change and Sustainable Development, Asian Development Bank • Bradley Todd Hiller, Lead Climate Change Specialist, Resilience and Climate Action Department, Islamic Development Bank • David Vieira Ferreira Levy, Country Engagement Finance Specialist, Support Unit, NDC Partnership
Room 3	<ul style="list-style-type: none"> • Amman bus rapid transit phase II electrification and terminal linkage (Jordan) • Development of the muscat light metro (Oman) • Renewable energy projects portfolio (Plurinational State of Bolivia) 	<ul style="list-style-type: none"> • Ahmed Elsaket, Project Finance Officer, European Investment Bank • Rosa-Stella Mbulu, Lead for Strategic Partnerships, Technical Support Unit, Mitigation Action Facility
Room 4	<ul style="list-style-type: none"> • Nature-Based Solutions For Urban Resilience In Cuba's Heritage Cities (Cuba) • Electrification Of Small-Scale Public Transport For Small Cities With A Focus On Equity, Vulnerability And Just Transition (Chile) • Geothermal heating (Russian Federation) 	<ul style="list-style-type: none"> • Zeineb Ben Yahmed, Climate Finance Specialist, Climate Policy Initiative • Moubarak Moukaila, Head of Financing Sustainable Development, West African Development Bank • Ahmed Badr, Director, Project Facilitation and Support. IRENA • Roxana Slavcheva, Global Lead for Built Environment (Cities), World Resources Institute