



27 September 2024

**Report on the third global dialogue and investment-focused  
event under the Sharm el-Sheikh mitigation ambition and  
implementation work programme**

**Report by the secretariat**

## Abbreviations and acronyms

CMA	Conference of the Parties serving as the meeting of the Parties to the Paris Agreement
CO <sub>2</sub>	carbon dioxide
COP	Conference of the Parties
ETAF	Energy Transition Accelerator Financing Platform
GCF	Green Climate Fund
GHG	greenhouse gas
IRENA	International Renewable Energy Agency
NDC	nationally determined contribution
SB	sessions of the subsidiary bodies

## **I. Introduction**

### **A. Mandate**

1. CMA 3 decided to establish a work programme to urgently scale 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.<sup>1</sup>
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.<sup>2</sup>
3. At the same session, the CMA requested the secretariat to prepare, under the guidance of the co-chairs of the work programme, a report on each of the 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.<sup>3</sup> CMA 5 requested the secretariat to include, under the guidance of the co-chairs of the work programme, information on the investment-focused events in the report on each of the global dialogues.<sup>4</sup>

### **B. Appointment of co-chairs of the work programme**

4. The Chairs of the Subsidiary Body for Scientific and Technological Advice and the Subsidiary Body for Implementation were requested by CMA 4 to appoint, well in advance of SB 58 and every two years thereafter, in consultation with respective constituencies, two co-chairs for the Sharm el-Sheikh mitigation ambition and implementation work programme, one from a developed country Party and one from a developing country Party.<sup>5</sup>
5. The Chairs of the subsidiary bodies appointed Amr Osama Abdel-Aziz (Egypt) and Lola Vallejo (France) as the co-chairs for the work programme for 2023–2024.<sup>6</sup>

### **C. Topics for the global dialogues under the work programme in 2024**

6. CMA 4 invited Parties, observers and other non-Party stakeholders to submit via the submission portal<sup>7</sup> suggested topics in line with the scope of the work programme to be discussed under the dialogues every year. 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.<sup>8</sup>
7. The co-chairs decided that the dialogues taking place under the work programme in 2024 will focus on cities: buildings and urban systems.

### **D. Proceedings of the third global dialogue and investment-focused event**

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

<sup>2</sup> Decision 4/CMA.4, para. 8.

<sup>3</sup> Decision 4/CMA.4, para. 15.

<sup>4</sup> Decision 4/CMA.5, para. 12.

<sup>5</sup> Decision 4/CMA.4, para. 7.

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

<sup>7</sup> <https://www4.unfccc.int/sites/submissionsstaging/Pages/Home.aspx>

<sup>8</sup> Decision 4/CMA.4, paras. 12–13.

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.<sup>9</sup>

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 James Grabert, UNFCCC Mitigation Director; 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?
- (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?

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<sup>9</sup> <https://unfccc.int/event/third-global-dialogue-and-investment-focused-event-under-the-sharm-el-sheikh-mitigation-ambition-and-implementation-work-programme>.

## **II. Summary of discussions at the third global dialogue and key findings, opportunities and barriers**

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.

### **A. Reducing operational emissions (heating, cooling and appliances)**

#### **1. Introductory presentation**

15. The introductory presentation by Jan Rosenow, Principal and European Programme Director at 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 CO<sub>2</sub> emissions in 2022.<sup>10</sup> 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.

#### **2. Discussions and key findings**

17. The breakout group discussion was facilitated by Lucas Nassar Sousa, Executive Director at Lab da Cidade, and 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 efficiency, and are often constrained by financial limitations and the limited scalability of available technologies.

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<sup>10</sup> International Energy Agency. 2023. *Global CO<sub>2</sub> emissions from the operation of buildings in the Net Zero Scenario, 2010-2030*. Paris, International Energy Agency. Licence: CC BY 4.0. <https://www.iea.org/data-and-statistics/charts/global-co2-emissions-from-the-operation-of-buildings-in-the-net-zero-scenario-2010-2030>.

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.

### 3. 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) Enhancing skills related to clean technologies, including by providing training programmes and education to building professionals on best practices for deploying energy-efficient technologies;

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

(g) Leveraging 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.

## **B. Designing building envelopes for efficiency (retrofitting, new construction)**

### **1. Introductory presentation**

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.

### **2. Discussions and key findings**

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

### **3. Opportunities (including actionable solutions) and barriers**

32. The opportunities mentioned by some participants include:

(a) Reducing 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) Facilitating 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.

## C. Reducing embodied emissions (building materials)

### 1. Introductory presentation

34. Joseph Mwiti Marangu, Head of LC<sup>3</sup> 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 CO<sub>2</sub> emissions, with 27 per cent from operational emissions and 10 per cent from embodied emissions.<sup>11</sup> 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

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<sup>11</sup> 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. 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.

## 2. Discussions and key findings

36. The breakout group discussion was facilitated by Anna Zinnecker from the Global Alliance for Buildings and Construction, and 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 regularly updating and adapting 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 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, awareness-raising and for enhanced support on finance, technology development and transfer and capacity-building for developing countries was often underlined by participants.

### **3. 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) Demand aggregation platforms, specially for concrete and steel, to de-risk investment at scale;

(e) 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) Substitution of 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) Awareness-raising, 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) 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.

### **III. Summary of the third investment-focused event**

#### **A. 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 of 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 level 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 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 development finance institutions 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 multilateral development banks, 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 which 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 multilateral development banks 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 multilateral development bank finance, and quadrupling private sector investment;
- (e) Increasing very long-term, low-cost finance, especially from development finance institutions, 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) Inclusion of investment-friendly projects in the NDC, 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.

## **B. 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 NDC 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 Explorer<sup>12</sup> 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 like 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

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<sup>12</sup> <https://ndcpartnership.org/knowledge-portal/climate-funds-explorer>.

June 2024, ETAF has mobilized 13 partners providing various financial products. Erick Ruiz 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.

### C. 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,<sup>13</sup> to be presented at the pitch hub. Project proponents made pitches to investors and policymakers on their project proposals, selected through a pre-determined 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 the table below, 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.<sup>14</sup>

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

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<sup>13</sup> Project proposal template available at <https://unfccc.int/documents/636493>.

<sup>14</sup> As footnote 9 above.



achieving project objectives, and a pre-investment plan outlining potential investments over a horizon of 5–10 years, will provide more credibility;

(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 local manufacturers’ involvement;

(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 of projects, facilitators and advisory panel members

<i>Project Name</i>	<i>Advisory panel members</i>
<ul style="list-style-type: none"> <li>• Building-integrated photovoltaics Boots Building Green and Low-carbon Sustainable Development (China)</li> <li>• Implementing the extension of the first line of the metro from the new Almarg station to Shebein Al Qanater city and supervising the implementation (Egypt)</li> <li>• Phoenix Edison (Nigeria)</li> <li>• Oando Clean Energy Limited (Nigeria)</li> <li>• Mauritius Renewable Energy Revolving Fund (Mauritius)</li> </ul>	<ul style="list-style-type: none"> <li>• Hugh Garnett, Institutional Investors Group on Climate Change (facilitator)</li> <li>• Gareth Phillips, Manager, Climate and Environment Finance, African Development Bank</li> <li>• Jan-Willem van de Ven, Head of International Climate Policy and Engagement, Climate Strategy and Delivery, European Bank for Reconstruction and Development</li> </ul>
<ul style="list-style-type: none"> <li>• Battery Energy Storage System for Wind-dominated Grid Stations (Pakistan)</li> <li>• Green Buses: Deployment of Electric Buses in Lumbini Province (Nepal)</li> <li>• Carbon farming on post-mining hotspot areas of eastern Eurasia: verification of CO<sub>2</sub> emission and sequestration potential on the different age stages of eco-genetic successions (Russian Federation)</li> <li>• Pomega Prismatic Lithium-Ion Battery Cell (Türkiye)</li> </ul>	<ul style="list-style-type: none"> <li>• Amjad Abdulla, IRENA (facilitator)</li> <li>• Katherine Anne Hughes, Principal Climate Change Specialist, Climate Change and Sustainable Development Department, Asian Development Bank</li> <li>• Kishlaya Misra, Senior Investment Officer, Private Equity, Asian Infrastructure Investment Bank</li> </ul>
<ul style="list-style-type: none"> <li>• Reducing embodied carbon emissions related to concrete and cement (Colombia)</li> <li>• Standard for constructing sustainable and healthy rural housing in Colombia (dispersed and nucleated) and pilot projects (Colombia)</li> <li>• Accelerating of mitigation carbon emissions of buildings to reach 2053 net zero goals in Türkiye (Türkiye)</li> <li>• KontRenewable Generation Expansion San Cristobal Island – Galapagos (Ecuador)</li> </ul>	<ul style="list-style-type: none"> <li>• William Wild, Climate Champions Team (facilitator)</li> <li>• Erick Ruiz Araya, Deputy Director, Project Facilitation and Support Division, IRENA</li> <li>• Roxana Slavcheva, Global Lead for Built Environment, Cities, World Resources Institute</li> </ul>
<ul style="list-style-type: none"> <li>• Somali Renewable Energy Initiative: A Needs Assessment Study (Somalia)</li> <li>• Cities: Konza Smart City – Sustainable Urban Infrastructure Development (Kenya)</li> <li>• Low-Tonnage CO<sub>2</sub> Processing Plant Utilizing Compact Isothermal Universal Reactors for Methane Conversion (Russian Federation)</li> <li>• Sustainable Energy For Health Services (Sao Tome and Principe)</li> </ul>	<ul style="list-style-type: none"> <li>• Michelle Peña Nelz, German Agency for International Cooperation (facilitator)</li> <li>• Marcus Mayr, Senior Urban Development and Energy Efficiency Specialist, GCF</li> <li>• Sören David, Head of the Technical Support Unit, Mitigation Action Facility</li> <li>• Sara Lemniei, chief executive officer, SLK Capital</li> </ul>