

Technical Expert Meetings on Mitigation (TEM-M) 2020

**“Human settlements:
sustainable low-emission
housing and building
solutions.**

**Technologies and design
for buildings, housing
and construction”**



United Nations
Framework Convention on
Climate Change

TEC



CTCN
CLIMATE TECHNOLOGY CENTRE & NETWORK

Brief Meeting Report

The secretariat of the United Nations Framework Convention on Climate Change (UNFCCC) and the Global Alliance for Buildings and Construction (GlobalABC) organized the Technical Expert Meetings on Mitigation 2020 with three virtual sessions on 30 September, 7 October and 14 October. The objectives of TEM-M 2020 are to share low emission housing and building solutions, from technologies to policies and practices, and to continue to build a community that drives and implements an ambitious vision for the sector: Zero Carbon Buildings by 2050.

All relevant information on meetings (including programme, speakers, presentations, video recordings and background information) can be found here:

<https://unfccc.int/topics/adaptation-and-resilience/workstreams/tems-m-2020-background#eq-3>

Opening session:

The opening session of the TEM-M 2020 was launched with an introduction by the Master of Ceremonies, Martina Otto, Head of Cities Unit and Head of the Global Alliance for Buildings and Construction (GlobalABC) Secretariat.

- Ms. Otto set the stage for this year's theme with a reminder of the global climate context and need for broad-spectrum housing and building solutions. *"We are proposing 3 themes: first, cool building for all; second, mobilizing value chain toward circular economy; third, developing pathway for moving to scale. The first two constitute trends that require attention as they could undo energy efficiency efforts as we see floor space doubling by 2050 which comes demands for materials and related embodied carbon. And we see climate change induced heat waves driving up cooling demand and calling for more than energy efficiency of mechanical cooling. At the same time, both building energy efficiency renovation and local value-chain based on circularity approaches do have the potential to create more local jobs than most other sectors while improving living condition at the time covid-19 pandemic has led to economic downtown. The third session will look at how to get us scale through long-term strategies and effective roadmaps to put the sector on the Paris Agreement compliance path."*

Welcoming remarks were delivered by Roland Hunziker, Director Sustainable Buildings and Cities, World Business Council for Sustainable Development and GlobalABC Steering Committee co-chair, and James Grabert, Director of the UNFCCC Mitigation Division.

- Mr. Hunziker's remarks focused on the importance of pace and scale in the building sector's push towards greater sustainability – and the fact that all actors need to collaborate along the building sector value chain. *"We will need all solutions to change the building sector. And we need to move fast. Very importantly, especially with the experience of (the) covid-19 pandemic, we need to rethink what (we) need to do, what we need to reuse and how we use buildings more flexibly. Then, we need to improve energy efficiency and also build it lighter so that we reduce materials for the construction."*
- Mr. Grabert looked ahead to the expected outcomes of this year's TEM-M and their role in supporting the global effort to mitigate climate change. *"The UNFCCC secretariat looks forward to taking stock of the outcomes of this meeting with the aim of better supporting Parties' implementation efforts through our regional collaboration centres and through more targeted*

and intensive policy maker engagement. The outcomes of meetings can enable the support institutions of the UNFCCC, including those of the Financial and Technology Mechanisms to target their activities in support of countries needs and the highest impact mitigation actions."

The outcomes of the four Regional TEMs for Africa, Latin America and Caribbean, Asia-Pacific, and Eastern Europe and West Asia were reported by Mareer Mohamed Husny, Chair of the Technology Executive Committee (TEC).

- Mr. Husny highlighted the major takeaways from the Regional TEMs *"Factors for successful technology leapfrogging in cooling solutions include cost-efficient technical and financial support as well as establishing the right regional, national and municipal policy framework. Nonetheless, there also needs to be a long-term and continuous capacity building program accompanying every stakeholder in the chain."*

Keynote speech was made by Marianne Karlsen, Chair of the Subsidiary Body for Implementation (SBI).

- Ms. Karlsen made it clear that the global pandemic is no reason to pause in the battle against climate change, and that housing and building solutions play a key role in a recovery from the pandemic. *"While the COVID-19 rightfully takes our attention, the urgency of addressing climate change is as important as it was when 2020 started. The urgency of addressing climate change has not gone away. We cannot be complacent and (must) continue to pursue and ramp up ambition and actions on climate change. Recent studies confirm that recovery efforts must be aligned with Paris goals if we want to reach them. Infrastructure and buildings constitute a central part in many recovery packages. At the same time, infrastructure and buildings remain a key source of emissions. It is therefore of particular importance that this year TEM-M focuses on sustainable low emission housing and building solutions and how we can achieve the vision of zero carbon buildings by 2050."*

A. Session 1: Cool buildings for all

i. Key issues and challenges discussed during the session

- Reviewing trends: How have cooling trends developed and what is the status quo?
- Reviewing solutions: Which solutions have worked in which context (following the avoid-shift-improve approach and including passive buildings design, change in urban form to reduce cooling need, incentives for retrofits and district energy)? Which innovations are awaiting uptake? What are the game changers?
- Reviewing barriers: How have barriers been overcome?
- Going to scale: How can we bring solutions to scale? Which players need to be on board that are not yet involved?

ii. Solutions/opportunities discussed

- Cooling in buildings contributes greatly to global warming, and in a warming world, energy demand due to cooling is rising rapidly. Indeed, emissions from cooling could become as high as overall emissions from single countries, such as the US. In India, 70-80% of emissions will be due to space cooling by mid-century.

- **Addressing cooling demand requires a comprehensive approach in the form of avoid-shift-improve:** Reducing the need for mechanical cooling in the first place is a critical first step and to achieve this, we need to make use of passive designs, both for new buildings and for retrofits, and take solutions to scale such as cool roofs, nature-based solutions at city and buildings level, and promote sustainable construction material that naturally controls humidity.
- **Passive designs for example can reduce energy demand from cooling by 50-70% in buildings.** In addition to reducing energy demand, cooling strategies that include natural ventilation, filtration and fresh-air circulation also reduce health risks related to the spread of airborne illnesses.
- **Locally adapted and sustainable materials are part of the solution.** For example, certain types of agro waste can effectively reduce heat and absorb moisture. For this to work, local ecosystems and markets need to be developed, as well as a shift in perception as to which buildings materials are perceived as viable.
- **Nature-based solutions can be effective** at cooling entire neighborhoods and cities with added benefits to ecosystems, health and wellbeing. Urban canopy cover for instance reduces average ambient temperatures, increases livability and air quality for urban environments, and provides recreational spaces. Indeed, trees are some of the most viable options for natural cooling. To that end, the City of Melbourne has put in place a target of a 43% canopy cover, and the City of Riyadh has planned 3300 new parks and aims to green all major roads. For such solutions to work at scale, they need to be included in urban planning and design strategies.
- Once mechanical cooling load is reduced, remaining cooling demand can be met by sustainable means such as district cooling systems powered by renewable energy. Super-efficient appliances are viable sustainable technologies to close the remaining cooling gaps.
- Important enablers include buy-in from local and national governments, for instance through cooling/heat-reduction action plans and including cooling-related commitments into nationally-determined contributions.

iii. Take-away messages/recommendations for the Parties and non-Party stakeholders

- We need decrease cooling load in the first place and for this the right, efficient design of buildings is critical. Passive house design offers particular opportunities through heat and humidity loads, shading/keeping out the heat, appropriate glazing, insulation both on roofs and walls and mechanical ventilation with energy recovery ensuring higher air quality.
- Nature-based cooling solutions provide opportunities in both the public and private areas. Melbourne's urban forest strategy has a target of a 43% canopy cover of the city, which will help in reducing summer peak temps by several degrees. Such strategies offer sustainable cooling solutions for entire neighborhoods and consider the building surroundings
- **In summary, there is an urgent need to rethink how we use and cool buildings around the world, but technical, policy and financial solutions already exist, ready to be implemented at scale. Solutions need to be tailored to local physical and social circumstances and supported by buy-in from and awareness raising and technical capacity building of national and subnational policy makers.**

B. Session 2: Mobilising the value chain towards circular economy

i. Key issues and challenges discussed during the session

- Reviewing trends: How have building and construction value chains developed and what is the status quo?
- Reviewing solutions: Which solutions (policies, technologies) towards circularity have worked in which context? How do these address job creation and decent work? What are the game changers?
- Reviewing barriers: Which barriers towards circularity exist and how have these been overcome?
- Going to scale: How can we bring solutions to scale? Which players need to be on board that are not yet involved?

ii. Solutions/opportunities discussed

- We need to see waste as **a resource; we need to decouple economic development from resource use – this is key to a circular economy!** We need to leverage circular economy as this can lower risks and costs associated with resource use.
- We could drastically reduce our environmental impact by tackling building materials and by **focusing on where we can see the largest gains**, creating value and changing perspective and getting everyone on board to steer in the same direction with regard both to policy and business.
- We need to and can **re-shape our business models! Materials companies can and must become waste treatment and waste-use companies** that see waste as a resource such that waste becomes like virgin materials in value. **But we need all players along the value chain.**
- New models for circular enterprises also greatly benefit local growth and jobs, and there is a lot happening in Africa in that respect. The **advantage of circular enterprises is that they are relatively labor-intensive and are usually on-site, meaning that they provide local essential services such as energy etc. for buildings, which in turn promotes local growth** via services such as food production, waste recycling, water and building equipment.
- Circular economy approaches are also essential to address challenges coming with rapid urbanization. For instance, to **cater to its growing urban population, India needs to build the equivalent of a new city the size of Chicago every year until 2030!** Waste management and circularity approaches are essential to their urbanization strategy, for example, using fly-ash for low-carbon cements and using agricultural waste for building components. Linking to the previous session, avoiding resource use wherever possible is a key ingredient to circularity and the city of Medellin for example focuses on passive design and other resource-saving measures to become carbon neutral by 2050.

iii. Take-away messages/recommendations for the Parties and non-Party stakeholders

- Our world is only 9% circular, however, the remaining 91% provides a fantastic 4.5 trillion business opportunity. Some of the enablers for circular economy are:
 - Transforming the market: We need to scale via product innovation and illustrate the business case, raising awareness with investors.
 - Conducive policy: We need regulation/legislation enabling circular product!
 - Procurement: We need procurement that includes circular principles.
 - Culture: We need a shift in culture – recycled products need to be seen as valid as virgin products.
 - Education plays a key role.

- New models for circular enterprises also greatly benefit local growth and jobs.
- We can learn from those already applying measures especially in the wake of COVID-19. **The city of Medellin's development plan for addressing the economic crisis resulting from COVID-19** for instance **involves retrofitting almost 10,000 houses, with the positive benefits of creating employment** as well as new, sustainable housing complexes and promoting research and development on sustainable materials. The city has also introduced **tax incentives, credit systems for sustainable housing and awareness raising through certification.**

C. Session 3: Developing pathways for moving to scale

i. Key issues and challenges discussed during the session

- How are buildings reflected in NDCs?
- What is the status of different building standards related to climate change?
- How can we build effective pathways for ambitious building standards and NDCs? Which roadmaps exist and make a roadmap an effective tool for change?
- What type of cooperation is needed to effect change?

ii. Solutions/opportunities discussed

To transform buildings and construction we need

- **Tools for effecting change:** The GlobalABC regional roadmaps, together with the Marrakech Partnership for Global Climate Action's pathway on human settlements, help foster radical stakeholder collaboration along the value chain, raise ambition levels and set common goals. The GlobalABC regional roadmaps guide sectoral transformation through 8 key areas: urban planning, new buildings, existing buildings, operations, appliances, materials, resilience and clean energy. Each of the 8 categories highlights key policy and technology actions needed and key stakeholders. As these tools are stakeholder driven instruments with input from over 700 experts, they also outline data and ambition gaps – areas where more action is needed.
- **Ambitious commitments:** The current level of ambition expressed in buildings actions in NDCs needs to increase in:
 - Performance (toward zero net emissions).
 - Scope – Embodied and Operational Emissions, and residential and non-residential buildings must be covered – both new construction and renovation.
 - Integration – within and across levels of government and the private sector.
 - Buildings Actions in NDCs need to be supported by a coordinated and fundable implementation strategy. Governments can be well supported by guidance available in Global ABC Roadmaps, NDC guides and local expertise in implementation
- **Key regulatory measures:** Mandatory, performance-based building energy codes are key for pushing markets. Yet, ca. two-thirds of countries do not have such codes in place. Indeed, evidence shows that the right packaging of regulations, incentives and voluntary standards and obligations delivers cost-effective, energy savings emission reductions and significant co-benefits. The cost of inaction is far greater than the cost of action – and is eclipsed by the social and economic benefits available.

- **Alignment with Adaptation and Non-Climate Drivers:** Given the COVID-19 pandemic and increasing frequency and severity of climate change impacts, mitigation commitments in NDCs and by non-state actors need to be aligned with adaptation plans and post-COVID recovery strategies.
- The important role of certification to raise standards and transform buildings market through benchmarking and quality assurance was highlighted. Certification systems, even voluntary, help collect data on sustainable buildings and demonstrate what the market is already able to do, thereby inspiring policy makers to be more ambitious with national regulations.
- Technical and financial support to countries such as the type delivered by the Programme for Energy Efficiency in Buildings (PEEB – a French-German support Programme for Energy Efficiency in Buildings) is a catalyst to implement measures as outlined in roadmaps, with Morocco's national programme for social and mid-income housing as an example. Improvement of the buildings towards a green and zero carbon building stock is an investment for not only the sustainable future, but also economic stimulus in times of economic crisis.
- The development process of the sector-level NDC roadmap in Vietnam under purview of the Ministry of Construction with a view to achieving zero emissions from the construction industry by 2050 was presented. Based on the Global ABC Regional Roadmap, the NDC roadmap 1) translates the NDC targets into tangible targets and measurable actions, 2) identifies common goals, targets and timelines for key actions across 8 key activities, 3) will be used by the government to provide orientation and guidance to key stakeholders, and 4) will be a steering instrument, subject to regular revisions and updates.

iii. Take-away messages/recommendations for the Parties and non-Party stakeholders

- Ambitious Sector Specific Targets: The current level of ambition expressed in buildings actions in NDCs needs to increase.
- Key regulatory measures such as mandatory, performance-based building energy codes need to be put in place.
- Given the COVID-19 pandemic and the increasing frequency and severity of climate change impacts, mitigation commitments in NDCs and by non-state actors need to be aligned with adaptation plans and post-COVID recovery strategies.
- In summary, buildings and construction are responsible for almost 40% of energy-and-process-related emissions, 36% of final energy demand, and almost 50% of waste globally. If we are to achieve the Paris Agreement goals, and indeed many of the Sustainable Development Goals, we need to decarbonize this essential sector. We need to increase scale and pace of the available solutions. Tools such as regional roadmaps and pathways, which foster radical stakeholder collaboration, raise ambition levels, set common goals, and thus guide the way, are critical to achieving this.

Closing session:

The closing remarks were delivered by Mr. Ovais Sarmad, Deputy Executive Secretary of the UNFCCC and Mr. Gonzalo Muñoz, High-Level Champion of Chile.

- Mr. Ovais Sarmad, Deputy Executive Secretary of the UNFCCC, stated that, *"(The) building sector plays a critical role in meeting the Paris Agreement goal. We need to reach net zero emissions by mid-century. It is just 30 years away and the buildings built today will remain for 30 years. We need to act now... Our team at (the) UNFCCC certainly has been and is committed to working with all stakeholders to scale up efforts to ensure the rapid take-up of the solutions identified."*
- Mr. Gonzalo Muñoz, High-Level Champion of Chile, underlined that, *"We need to increase scale and pace in the Race to Zero together. This is fundamental change we are aiming for in the building environment. Radical collaboration is something as (that) we high-level champion(s) will keep promoting together with Marrakesh Partnership stakeholders. Our climate pathway is one of the tools that we believe help accelerate it, along with GlobalABC's regional roadmaps. Of course, at the end, Parties must increase ambitions. We, as non-Party stakeholders, are here to support. The role of everything we do must serve on the ambition loops."*

Key messages

- We cannot afford to overlook the building and construction sector, responsible for 40% of energy-related GHG emissions, 36% of final energy demand and almost 50% of extracted resources (for housing and infrastructure). In order to achieve the Paris Agreement goals and many of the Sustainable Development Goals, we need to decarbonize this essential sector.
- The level of ambition expressed in NDCs needs to increase toward zero net emissions. Commitments in NDCs need to be supported by a coordinated and fundable implementation strategy.
- We must find a way to build back better from the COVID-19 crisis by constructing and retrofitting more energy efficient, affordable and comfortable buildings. Investment in sustainable buildings boosts the economy and generates multiple synergies.
- Various solutions and pathways towards Zero Emission Buildings exist, such as passive building design, locally adapted, sustainable building materials, greening city landscapes for cooling, building certification, and regional, stakeholder-driven roadmaps. The right package of regulations, incentives, voluntary standards and obligations delivers cost-effective energy savings, emission reductions and significant co-benefits.
- Policies and finance instruments play an important role in scaling up solutions already implemented on the ground. Urban planning by local governments, along with policy incentives and awareness raising, makes an important contribution towards Zero Emissions Building.
- We need to focus on added value for all players along the value chain. We need to and can re-shape business models for circular economy where building material companies can become waste treatment and waste use companies.
- It is important that all levels of government work together with stakeholders in a coordinated manner based on common goals, targets and timelines for key actions.