Global Cooling Pledge Signatories Focal Points Meeting June 13 - 14 2025 | Bonn, Germany

09:05 - 11:15

14 June 2025

Session 1 Tackling Adaptation and Extreme Heat through sustainable cooling



Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety





Opening remarks

Switzerland's strategy on climate and resilience and the BeCool programme

David Beritault Program Officer - Energy Access, Federal Department of Foreign Affairs FDFA



Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety



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BeCool Programme

UN (i) environment programme

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Swiss Agency for Development and Cooperation SDC

Presentation

Extreme heat and its impacts on the built environment and on food systems: from challenge to solution

> **Benjamin Hickman Programme Manager** Cool Coalition, UNEP

UN (c) environment programme UNEP-convened initiative

Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety

Cool Coalition

Climate induced migration

In June 2024, Sindh province recorded temperatures as high as **52°C -** extreme heat caused **50% of banana crops** to perish due to heat stress.

Migration to Karachi: 4.3 million 2017-23

Karachi, Sindh Province, Pakistan

24 million population 55% in informal and unplanned settlements Less than 4% green space 22% of land for 62% of population 2015 heatwave 10-18 hours power outages Water outages 1200 deaths 65,000 heatstroke

- Tree planting in the city
- Urban forests effort
- Heatwave management plan
- Cooling stations
- Growth in quality social housing
- Demonstrations

Days per year that max temperature exceeds 35° C | 1995-2014 AVERAGE

Days per year that max temperature exceeds 35° C | 1.5° C WARMING

Days per year that max temperature exceeds 35° C 3° WARMING

The world's cities are heating up at twice the global average rate due to rapid urbanization and the urban heat island effect.

Heat and air quality – a vicious cycle

"Global food crisis wil worsen as heat waves increase"

Source: The Guardian, 2024

Global Heat Impact on Crops

Crop yields down 12–30%

Fresh produce highly vulnerable to heat stress

Extreme temperatures accelerate ripening and decay

Water loss and wilting reduce shelf life before harvest

Lack of cold chain leads to considerable food losses

Post Harvest Loss

30-40%

Of India's fresh produce is lost after harvest - lack of Cold-Chain (DFI Report)

5% of harvested

fruits and vegetables get precooled

Quality Damage and Sunburn at farm level

Tissue temps >38°C cause fruit scorching, browning & shriveling

Loss of firmness & texture reduces market appeal

Premature fruit-drop lowers farmer earnings

Climate change impacts on crop yields in 210 RCP 8.5 scenario

% change in crop yields using median of 21 GCMs Source: Sue Wing et al. 2021

UNSG's Call to Action on Extreme Heat urges us to...

Care for Vulnerable Populations

Countries and communities must protect the most vulnerable people from the impacts of extreme heat, reduce extreme heat risk and build their resilience

Protect Workers

Protect all workers in all sectors through appropriate occupational safety and health measures based on a rights-based approach

Economic and Societal Resilience

Sustainable multi-sectoral and multi-scalar partnerships for development and implementation of heat action plans, strategies and solutions for heat resilience

Limit Temperature Rise to 1.5°C

Accelerate the pace of the just transition away from fossil fuels and scale up investment in renewable energy

Extreme heat is having an extreme impact on people and planet. The world must rise to the challenge of rising temperatures."

Awareness

Preparedness

Re-design

Source: Eleni Myrivili

Beating the Heat in Cities

Assess and map urban heat – standard methodology

Singapore Views Cooling Singapore

Measures to Promote Heat Resilient Urban Cities are warmer than surrounding areas Design because Reduce the amount of High share of hard Man made surfaces are Use of light-coloured solar gain or amount of surfaces, roofs in surfaces, reflect sunlight darker, absorb more sunlight falling on thus maintaining cooler comparison to natural sunlight and convert into surfaces. Example surfaces. surfaces. heat. shaded streets Reduce the amount of Dissipate Heat – plan heat produced through Street geometries, built open green spaces, water Anthropogenic heat from bodies between the built form trap heat by sustainable transport, air-conditioned buildings, reducing sky view and air reduce need to drive, environment, street factories, vehicles circulation mainstream passive geometries to enhance cooled buildings ventilation.

Beating the Heat in Cities

Integrate urban heat assessments into:

Urban climate and cooling plans to drive greening and heat reduction strategies like cool roofs, DCS

Urban masterplans

Heat Action Plans

Financing for better planning and for nature and cool roofs

Green in the city 3-30-300 rule

Source: Eleni Myrivili

Medellín, Colombia:

36 green corridors that are now 100 green/blue corridors and biodiversity hubs, part of a large strategic naturalization of the city of Medellin. Shading pedestrian walkways is a priority.

Delhi, India: SEEDS AI model forecasts heat exposure combining satellite imagery and hyperlocal weather data to create risk scores for every home based on roof material.

Singapore: Cheonggyecheon stream 5.8 km of water corridor has decreased temperature 3.3°C to 5.9°C compared to a parallel road a few blocks away.

Seoul, South Korea:

Cheonggyecheon stream 5.8 km of water corridor has decreased temperature 3.3°C to 5.9°C compared to a parallel road a few blocks away.

Freetown, Sierra Leone: Combining community stewardship, digital tools and carbon markets Freetown the Treetown is planting Imilion trees by 2024.

TRANSFORM

FREETOWN

Paris, France: Paris is a) using the Seine River water to provide "free district cooling," and b) co-designing its "school-yards oases"

Telangana, India: Cool Roof policy mandates for all

policy mandates for all the government, nonresidential, and commercial buildings. Residential buildings with a plot area of 600 sq. yds. or more are also required to have cool roofs.

Amsterdam,

Netherlands: 10,000m2 of roof-tops in social housing complexes are turned into smart blue/green roofs to increase raisnwater resilience, reduce urban heat effect and energy consumption or buildings.

Ahmedabad, India: The SEWA Extreme Heat Income Insurance a Microinsurance that replaces income lost to climate-driven extreme heat for women working in the informal sector.

Why Passive Cooling?

Passive cooling can curb the growth in demand for cooling capacity in 2050 by <u>24 per cent</u>, result in capital cost savings in avoided new cooling equipment of around <u>US\$1.5 trillion to US\$3</u> <u>trillion</u> and reduce emissions by <u>1.3 billion tons</u> of CO2e. (UNEP, Global Cooling Watch 2023)

Saving

electricity

cost

Saving energy Saving CO2

Passive cooling in buildings NCAPs and NDCs Integrate into national building codes Drive subnational implementation into planning and bye-laws Integrate into procurement norms for social housing and public buildings Passive cooling guidance and developer engagement

Incentives

PCS Financial benefits_ Indonesia

Affordable Housing:

 373 houses in 2,600 hectare development

Passive Cooling Strategies:

- WWR of 17.5%
- External shading
- Insulation of wall and roof
- Natural ventilation

Cost Performance:

- Incremental cost: 4.70%
- Payback period: 1.8 years
- Utility cost saving: 30% (equivalent to 41 low-income houses)

Low Income Multifamily Housing – Tamil Nadu

Wall insulation: 200 mm AAC block

Whole building

Top Floor Middle Floor

AC to Low Income Multifamily Housing

Tamil Nadu is now integrating into building regulations and byelaws and social housing norms

Avoid 31% increase in total annual electricity use from AC

BeCool India: Components and Implementation Approach

Objective of SDC contribution: Implementation of ICAP is supported by enabling **state** governments and **cities** drive **comprehensive action** on thermal comfort and space cooling (finance, policy) and benefit from coordinated and sustained **national** support programme

Component 1

Enhancing policy design & policy implementation

- Strengthening passive cooling and thermal comfort programs at nationallevel (ICAP; BEE-ECSBC; MoHUA-PMAY)
- Supporting integrated policy implementation on passive cooling and thermal comfort (e.g. ESCBC, PMAY) at state and city level.

Component 2

Accelerating finance

- Dedicated funding/finance mechanisms for state governments
- Bankable, investment ready pipeline prepared with public authorities

Component 3

Awareness and capacity of real estate sector.

Partnerships with real estate developers for PCS demonstration and decarbonization charters

• Communication, knowledge materials and training on tools

- 3 national policies/codes/guidelines accepted/integrated
- 2 'partner' states; 3 'light-touch'
- 5 cities; 15 replication cities
- 5 bankable project pipelines
- >\$100m funds allocated/invested
- 5000 people trained
- >20 real estate developers supported (4-5 deep support)

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Swiss Agency for Development and Cooperation SDC

Vietnam

Aim: Protect populations from extreme heat /achieve NDC mitigation targets

Enhancing national policy design

- NDC 2022 passive cooling for mitigation and adaptation
- National Climate Change Strategy 2050 passive cooling (building design, NbS)
- National Plan on Management of ODS & GHG in cooling- Roadmap to implement cooling NDCs, Pledge & Kigali

Subnational policy and investment pipelines

- Urban Heat/Cool Plans for Can Tho & Tam Ky
- Projects pipeline 10.000.000 sqm can reduce 10-45% energy from cooling
- Capacity building . local innovation and demonstrate business case

Accelerating financing

lool

Coalition

Cambodia

6 NATION

Aim: Pursue impactful measures to reduce cooling demand in buildings through **Passive Cooling Strategies**

Enhancing national policy design

- **Passive Cooling Guidelines to drive policy change b**uilding block for ASEAN Guidelines on Passive Cooling
- Cambodia's Climate Change Strategic Plan

Demonstrate to build the evidence base

- Collaborating with UrbanLand on demonstration
- Monitor impacts of PCS In real time conditions

Local capacity and supply chains for replication and scale up

- Community of Practice chaired by Institute of Technology of Cambodia launched in May 2024
- Compendium of PCS & material cost database developed
- Information Hub on PCS on Cambodia website

Cooling strategies address

HURSDAY, MAY 16, 2024 | WWW.KHMERTIMESK

Passive Cooling Roadmap in Cambodia

Cambodia Roadmap (2022, modelled by UNEP/GlobalABC) indicates the target about passive cooling - all buildings in Cambodia will aim to incorporate passive cooling strategies by 2050.

Key Actions	Baseline (2020)	Short Term (2030)	Medium Term (2040)	Long Term (2050)
Promote efficient and passive cooling in new public and commercial buildings ¹⁵	No standa r ds in place	2% of new public and comme r cial buildings	50% of public and comme r cial buildings	All public and commercial buildings
Enhance passive cooling solutions for <mark>residential</mark> buildings	Passive cooling solutions (PCS) not widely applied; no guidelines available	Develop and disseminate PCS guidelines based on traditional Khmer architecture	PCS are widely applied in residential buildings	All residential buildings apply PCS

Cambodian NDC actions supporting 'Low-Carbon, Climate Resilient Buildings and Construction' indicates the inclusion of passive cooling strategies.

NDC Actions

Inclusion of performance requirements of Passive Cooling Systems in Building Energy Code of Cambodia (lead MLMUPC) 20% of newly constructed buildings comply with the Building Energy Code Sectors: Commercial buildings

Inclusion of PCS into Building Energy Codes

Implementation of "passive cooling" measures in cities (addressing urban heat island effect [UHIE]), public buildings and commercial buildings (lead MLMUPC) Cities (Phnom Penh and Siem Reap) analysed for mitigating UHIE and projects are implemented - 2% of the existing public and commercial buildings are retrofitted with passive cooling measures Sectors: Commercial buildings Inclusion of PCS into <u>urban design, new and</u> <u>existing building</u> <u>design</u> comprehensively

Roadmap for Low-Carbon Climate-Resilient Buildings and Construction in Cambodia (2022)

Spoilage without cooling

Food Saved is as Important as Food Produced

Food saved is as important as food produced

Lack of cold chain leads to considerable food losses

But business-as-usual in cold chain development has implications for climate change

What is Cold Chain?

Cold chain is a climatecontrolled logistics chain, ensuring uninterrupted connectivity of perishables & products from source to consumer, consisting of preconditioning and distribution-related activities

Cold chain is about livelihood creation, increasing incomes for farmers/fishers, increasing nutrition and driving down food loss and waste

A typical Cold Chain process

Refrigeration in heatwaves

Lack of reliable refrigeration leads to greater food and vaccine waste in heatwaves At 35°C, perishable food spoils up to 3–5 times faster

Scale-up Roadmap and Policy Levers

Cold chain needs assessment: what and where. Cold chain into **NCAPs** & subnational plans and heat disaster frameworks Renewable energy, efficiency and low-GWP refrigrerants integration **Business models e.g. Cooperatives** packhouses piloting affordable cooling National funds as critical infrastructure

Sustainable Food Cold Chains: Opportunities, Challenges and the Way Forward

Cold-chain Support Programme in India

National programme supporting MoA&FW, MoEFCC and BEE:

- Support DFI and ICAP implementation with priority on packhouse development
- Integration with central policy frameworks and plans
- Cold-chain design guidelines (BEE)
- Investment and business incubation (SIDBI/NABARD)
- Awareness raising, training and knowledge sharing through CoEs and Resource Centres (Haryana CoE, NCCD)

Two states selected (*Bihar, Haryana*) for in-depth work & 1 additional pilot project (*Tamil Nadu*)

- Assess existing and required cold chain infrastructure and food loss.
- Assess and recommend improvement of state-level policies and financial support.
- Demonstration projects and investment pipeline for packhouses
- Awareness, training and capacity building,

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Alliance for an"

- Recognise cold chain, urban redesign and passive cooling as critical for heat adaptation, GHG mitigation and addressing urbanisation
- Link science on rising heat to ambition on sustainable cooling and access
- Cross-ministry coordination and national-subnational
- Unlock finance for cooling targeting heat-stress

Birmingham Energy Institute, 2017

Only

Confronting rising extreme heat in India through sustainable cooling: lessons from India

Ms. Mrinalini Shrivastava Director, policy and plans National Disaster Management Authority, Government of India

Mr. Safi Ahsan Rizvi Advisor (Mitigation) National Disaster Management Authority (NDMA), Government of India

Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety

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Presentation

Tackling Adaptation and Extreme Heat through sustainable cooling

Dr. Takuya Nomoto Director of Climate Change Negotiation Ministry of Environment, Japan

UN (f) environment programme UNEP-convened initiative

Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety

Presentation attached separately

Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety

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Presentation GIZ Cool White Program

UN (f) environment programme a UNEP-convend initiative

Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety MINISTERO DELL'AMBIENTE E DELLA SICUREZZA ENERGETICA

Presentation attached separately

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Presentation

Subnational action on passive cooling and urban heat – a case study of Tamil Nadu

Ms. Sudha Ramen Member Secretary Tamil Nadu State Planning Commission, India

Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety

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Open Discussion Prompts

Country Perspectives on Cooling Needs and Support

- 1. Perceived challenges to scaling up action in their countries on heat adaptation through passive cooling and cold chain
- 2. Current efforts and alignment with national priorities
- 3. Support needed / what's next

Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety

Session Wrap-up Aligning action and support for sustainable cooling

Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety

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Thank you!

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