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

# **Session 0** Bringing it all together

Lily Riahi Global Coordinator Cool Coalition, UNEP



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





#### 14 June 2025





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

MINISTERO DELL'AMBIENTE E DELLA SICUREZZA ENERGETICA



#### 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



وزارة الطاقــــة والبنيــــة التحتيــــة MINISTRY OF ENERGY & INFRASTRUCTURE







Canva Pro/ Jayakesavan

Brit ma triat

TTALATL

100

Ш

BI.

010

I

Ι

I







Canva Pro/ ePhotocorp

Canva Pro/ Mathess

Y

1









# **BeCool Programme**

UN (i) environment programme



Schweizerische Eidgenossenschaft Confédération suisse Confederazione Svizzera Confederaziun svizra

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)





Schweizerische Eidgenossenschaft Confédération suisse Confederazione Svizzera Confederaziun svizra

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 <sup>15</sup>	No standa <b>r</b> ds in place	2% of new public and comme <b>r</b> cial buildings	50% of public and comme <b>r</b> 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,





environmen

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



يزارة الطاقـــة والبنيـــة التحتيـــة MINISTRY OF ENERGY & INFRASTRUCTURI

# 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



وزارة الطاقــــة والبنيـــة التحتي 2\_\_\_\_ MINISTRY OF ENERGY & INFRASTRUCTURE

# **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



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



وزارة الطاقــــة والبنيـــة التحتي 2\_\_\_\_ MINISTRY OF ENERGY & INFRASTRUCTURE

# 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



وزارة الطاقــــة والبنيــــة التحتيــــة MINISTRY OF ENERGY & INFRASTRUCTURE

### Presentation attached separately



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



وزارة الطاقــــة والبنيـــة التحتي 2\_\_\_\_ MINISTRY OF ENERGY & INFRASTRUCTURE

# **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



وزارة الطاقة والبنية التحتيسة MINISTRY OF ENERGY & INFRASTRUCTURE


11:30 - 12:15

14 June 2025

# Session 2 MEPS and Product Registration



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



وزارة الطاقـــة والبنيـــة التحتيـــة MINISTRY OF ENERGY & INFRASTRUCTURE

# **Opening remarks** Presentation on Energy efficiency in cooling and the U4E initiative





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





## **Energy Efficiency: A fundamental role within Climate Action**

Global cooling pledge: Reduce cooling-related emissions by 68% relative to 2022 by 2050.



#### **Commitments related to energy efficiency**

- (#6) Commit to work together to support increased market penetration of highly efficient air-conditioning equipment and innovative technologies and collectively increase the global average efficiency rating of new air-conditioning equipment sold by 50% by at the latest 2030 from global 2022 installed baseline.
- (#7) Commit to establish Minimum Energy Performance Standards
  (MEPS) by at the latest 2030 and aim to routinely raise ambition and progress consistent with respective national laws with a view to achieve net-zero emissions by 2050 and noting best available technology and available model regulation guidelines.
- (#8) Commit to establish or update public procurement policies and guidance for low-GWP and high efficiency cooling technologies and innovative solutions where feasible or ensure broader arrangements are in place that drive such approaches in public procurement at the latest by 2030.
- (#3) Commit to support robust action through the Montreal Protocol Multilateral Fund [MLF] for early action to **reduce HFC consumption and to promote improved energy efficiency** for the hydrochlorofluorocarbon (HCFC) phase-out and the HFC phase-down



## **The U4E Initiative**



### Supporting Countries to Save 20% of their Electricity

By accelerating the Global Transition to <u>much more energy efficient lighting and appliance</u> <u>technologies</u> by strengthening country capacities around the world, as well as ensuring environmentally sound management practices. Building synergies among stakeholders, sharing knowledge and information, helping create strategic policy and regulatory frameworks, and addressing technical and quality issues.





### How to promote energy efficiency in Cooling appliances and equipment?

#### **U4E Integrated Policy Approach**

- Implementation of **Policies, Regulations and Standards**, such as Minimum Energy Performance Standards and Sustainable Public Procurement and dedicated policies for refrigerants.
- **Supporting Policies**, which includes Labelling schemes and communication campaigns.
- Strengthening of a National **Monitoring, Verification and Enforcement** (**MVE**) capabilities, infrastructure and tools for cooling appliances.
- Development and implementation Financial Mechanisms.
- Waste Management for proper disposal of obsolete products and sound treatment/recycling/destruction of refrigerants and foam blowing agents.





### How to promote energy efficiency in Cooling appliances and equipment?





Minimum Energy **Performance Standards** (MEPS) ban the worst products



Monitor the market for MEPS compliance, test the products and enforce the rules

ESM for Recycle & dispose old products in a sustainable way





### **Policy Matters: MEPS and Labels, the framework**

#### **RAISE THE FLOOR!**

MEPS eliminate products that are obsolete or inefficient from the market and "PUSHES" manufactures to produce more efficient lighting, appliances and equipment.



#### **RAISE THE CEILING!**

Stimualte consumer demand for energy efficiency products by provideing information to the end user to make informed purchasing decisions.

#### RAISE THE CEILING FURTHER!

Ambitious performance and eco-design to leverage public purchasing power to drive the national market.



### How to promote energy efficiency in Cooling appliances and equipment?





### **Policy Matters: MEPS, HEPS and Labels, the framework**

Establishing appropiate levels of MEPS is critically important – these should be **realist and appliacable** at the same time. Thus, countries face several challenges:

- Lack of knowledge of own local and regional market and normative status/level of regulations among countries.
- Unawareness of the products/technologies yet globally available in the market.
- Absence of harmonized regulations among countries and lack of framework that foster it.
- **No reference** to update policies regularly.
- **Technical limitations** to respond to common questions, such as:
  - What is the **scope of products** that need to be included in the norm/regulation?
  - What **parameters and metrics** should be used to assess the energy efficiency of products?
  - What **test methods** should be used or referenced to measure energy consumption?
  - What is an **appropriate efficiency level to set for MEPS** and Public Procurement?
  - What efficiency levels should define the efficiency classes on the label?

The U4E Model Regulation Guidelines and SPG Technical Specifications can help regulatory authorities and policy makers with some of these questions and concerns



### **U4E Tools & Resources – Model Regulation and Public Procurement**



- Provide guidance on establishing MEPS and Labels for countries considering a voluntary, regulatory or legislative framework
- Provide a **benchmark for proven best practices** and leverage global technological and policy trends.
- **Promote the harmonization of requirements** to reduce trade barriers, unlock economies of scale and make products more affordable.



- Higher ambition technical specifications and guidance to leverage public purchasing power and help define the bidding process/requirements for public procurement.
- Reference for technical specifications for the procurement of cooling equipment in pilot projects

*MR Guideline on the following products: General Service Lamps and Linear Lighting, Commercial and Domestic Refrigerators, Room Air Conditioners and Fans, Electric Motors and Transformers.* 



### U4E Tools & Resources – Country and Regional Savings Assessment



- Report **detailing the potential financial, environmental, energy, and social benefits** that can be achieved through the transition to energy-efficient products.
- Assessment of the impact of adopting the levels recommended in the MRG and SPG, comparing three scenarios:
  - BAU scenarios: without policy intervention
  - Low Ambition scenario: where the MRG MEPS levels are applied
  - *High Ambition scenario: a higher efficiency level is applied in line with the Public Procurement Guidelines.*
- Available for more than **156 developing countries and emerging economies**.
- **Global assessments of the savings potential** of implementing energy efficiency standards for ceiling fans and heat pumps.
- Regional assessments for Asia and Africa.
- Available in **multiple languages** (English, Spanish, Portuguese, French, and Arabic)





### **Potential Impacts of MEPS in Developing & Emerging Economies**

- Energy savings and avoided indirect emissions if U4E Model Regs adopted and enforced
- Additional direct emissions could be avoided by regulating the GWP of refrigerants





### U4E Tools & Resources – Product Registration System



- The PRS is a system for loading products, which must be registered before entering a specific market. This allows for the creation of a database with product and market information for proper monitoring of compliance with current regulations.
- It also allows for the **generation of a regional product database that facilitates the exchange of market information** and regulatory compliance.
- The U4E PRS prototype is a ready-to-use, open-source tool that is easy to adapt to each country's individual needs.



• Additional guides provide guidelines and guidance on the PRS for countries in creating their own system.





 $\langle \overline{a} \rangle$ 

MVE

records









### The importance of a Multi-country Approach

### **Benefits from a Regional Energy Efficient efforts**

- Integrated, common and transboundary energy efficient policies, strategies, instruments and business models allow for a **more effective and sustainable market transformation**;
- - 2. Correct mapping of activities in the Region: **avoidance of isolated or stand-alone efforts or their duplication** to address common challenges/barriers among neighboring countries;
    - Efficient use of limited resources through economies of scale and from spreading the market 3. transformation costs:
      - **4**. Greater impact and achievements from the **engagement of a wider net of national and regional** stakeholders to secure political willingness and commitment;
- - **5** Knowledge/information exchange and peer collaboration. Fostering intelligent agreements for countries to share capacities, tools, methods and infrastructure otherwise excluded
    - **6 Reduction of commercial barriers** that impede a much bigger regional market demand for higher efficiency products that are already widely available on the international market: larger markets make products more affordable and attractive for investments, for consumers and institutional procurers



### **Regional Project Examples**

#### **Regional Harmonization and National Implementation in SADC and EAC**

#### **Main Components**

- Development of regionally harmonized Minimum Energy Performance Standards and Labelling for the East African Community (EAC) and Southern African Development Community (SADC) → Total of 21 countries (16 SADC & 6 EAC).
- Facilitate **stakeholder engagements** including technical committee meetings and public enquiry.
- **National adoption** (on a voluntary basis) of the MEPS by 4 country members (Eswatini, Mozambique, Zambia, and Zimbabwe)
- **Public awareness** including preparation of public sensitisation materials.
- **Capacity building** for customs agencies, standards organizations, and other important stakeholders







Clean Cooling COLLABORATIVE







## **Presentation** Ghana's Sustainable / Green Public Procurement to transform its Cooling Market.



#### **Hubert Nsoh Zan**

Assistant Manager, Energy Efficiency Regulation/ Energy Transformation Expert, Ghana



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







To equip Administrators, procurement officers, and facility managers with the knowledge and tools to implement Green Public Procurement (GPP) for cooling appliances, reducing energy consumption, costs, and carbon footprints while advancing sustainable development goals (SDGs 7, 12, and 13)



### **Background 1/5**

#### **Drivers**

#### 1. Climate

- I. Increasing ambient temperatures
- II. Level of humidity

### 2. Demographic factors

- I. Increasing population;
- II. Growing middle-class population; and
- III. High urbanization rates (about 59.5% in Ghana). GSS 2024 Pop. Projs.

•Globally, energy demand for space cooling (2,000 TWh) accounts for nearly 50-55% of the total electricity used in buildings in 2023, especially in tropical and subtropical areas.

### •About 1 GtCO<sub>2eq</sub> emission in 2023.

•Without serious interventions, electricity demand for space cooling in buildings could triple by 2050. Source: The Future of Cooling (2018, updated in 2023 analyses)



### **Background 2/5**



#### ACs Statistics Globally:

•2016: ≈ 1.6 billion AC units installed globally.

•2020: ≈ 1.9 billion AC units.

•2030: Projected  $\approx$  4.5 billion units (aligned with SDG timeline).

•2050: Projected  $\approx$  5.6 billion units (under current policies – Net-zero

economy).

Making space cooling the leading driver of electricity demand in buildings.

Source: UNEP & IEA – Cooling Emissions and Policy Synthesis Report (2020, 2023 Updates)

### 8

### ACs Statistics in Ghana:

Currently, about **4 million installed ACs**, accounting for **60 – 80%** of **electricity consumed** in offices of **public and commercial buildings** Consuming in the range of **3,000 – 5,400 kWh/yr** due to their **low energy efficiency ratings (EERs)**. About **88%** of **Ghana's AC market** is **dominated** by **non-ducted single-split ACs** Cooling capacities between **12,000 and 18,000 BTU/hr** (3.5 kW - 5.3 kW or **1.5 – 2.0 HP**).

Source: Energy Commission



### **Background 3/5**

• The **2023 Regulated Appliance Market Performance Report** indicated that **3 in 4 (75%)** of the ACs imported and used in Ghana **exist in the lowest EER categories (1 and 2 stars). Source: EC** 

• Shifting the AC market into higher EER categories (3- to 5-star equivalent) having refrigerants with low GWP and ODP of zero (0) has a saving potential of 10,400 GWh by 2030, resulting in energy cost savings of about US\$ 1.96 billion. Source: https://doi.org/10.1016/j.jclepro.2019.05.067

• The **Public Procurement Act 2003**, (Act 663) as amended in 2016 with Act 914 has **laid down procedures and guidelines** for the **procurement of goods and services, including air conditioners**, by public entities.

• No consideration of the energy use or life cycle cost or environmental implications of refrigerant in electrical appliances such as Refrigerators and ACs in the Act.

- The Act considers only the first or purchase cost which does not give an indication of the cost of operation.
- The Act allows officials to set the technical characteristics of the equipment to be purchased.
- Yet, Regulations on the EE of ACs, passed in 2005 (LI 1815), have been in operation since 2006.



### Fortunately, we now have Public Procurement Regulations, 2022.

### **General Provisions on Procurement:**

- Environmentally compliant sustainable procurement.
- The head of the entity shall ensure that a tenderer complies with Section 2 of the Act with regard to environmentally and socially sustainable procurement.

**Public Procurement Regulations, 2022** 



This training is intended to provide technical specifications/parameters regarding procuring cooling appliances that meet life cycle cost (LCC) and the lowest global warming potential (GWP) criteria and builds capacity for participants to implement these practices in their organisation.

Technical Specifications will include:

1. Energy efficiency ratio (EER) and energy efficiency index (EEI)

2. Energy guide label

3. Types of refrigerant

4. Global warming potential (GWP) of the refrigerant

5. Ozone depletion potential (ODP) of the refrigerant

6. Energy consumption (kWh/y)

7. Life Cycle Cost Analysis (LCCA)



### **HCFC PHASE-OUT SCHEDULE UNDER MP**

Developed countries; Freeze from 1996, 35% reduction by 2004, 75% reduction by 2010, 90% reduction by 2015, Total phase-out by 2020

Developing Countries; Freeze in 2013 at a base level calculated as the average of 2009 and 2010 consumption levels, 10% reduction by 2015, 35% reduction by 2020, 67.5% reduction by 2025, Total phase-out by 2030

Establishment of a licensing and quota system to regulate the import and exportation of HCFCs and HCFC-based equipment



### Hydrochlorofluorocarbon Phase-Out Management Plan (HPMP)



#### PUBLIC NOTICE

PN.038022022



#### PHASING OUT OF THE IMPORTATION OF HYDROCHLOROFLUOROCARBON-BASED AIR CONDITIONERS IN GHANA

In partial fulfilment of Ghana's obligations to phase out the consumption of Hydrochlorofluorocarbon (HCFCs), mainly R22 under the Montreal Protocol, a Hydrochlorofluorocarbon Phase-out Management Plan (HPMP) was developed to guide the implementation of the phasing out process.

As part of measures to fulfil this obligation, controls on the importation of R22 and R22 based equipment including air conditioners (ACs) was incorporated into the legislative instrument (L.I 1812) in tandem with the phase-out reduction scenario. Furthermore, in view of the need to take necessary measures to avoid dumping on our markets as the phase-out date approaches, the EPA in collaboration with the Energy Commission, hereinafter referred to as the implementing institutions held a stakeholder meeting with importers of air conditioners and reached an understanding to enforce an implementation of a quota system to control the volumes of R22 based ACs imported into the country starting January 1, 2022. The quota allocation was based on historical importation data of importers for the years 2018-2021

All importers who have been allocated importation quotas will be written to and are expected to heed to the quantities approved effective January 2022.

The Energy Commission will from same date (January 2022) reject applications for import from non-quota beneficiaries.

For further information please contact, Mr. Emmanuel Osae-Quansah on 0501301418; Mr. Joseph Baffoe on 0501301478 or Mr. Hubert Zan on 0242867902.

Please take note and comply accordingly.



### **Ghana's ac equipment refrigerants transformation**





### **Ghana's refrigerator equipment refrigerants transformation**





### **HFC Phase-down schedule under KIGALI AMENDMENT**

TABLE 1. HFC phase-down schedule under Kigali Amendment<sup>5</sup>

	Non-A5 (developed countries)	A5 (developing countries) Group 1	A5 (developing countries) Group 2
Baseline HFC component	2011-2013 (average consumption)	2020-2022 (average consumption)	2024-2026 (average consumption)
Baseline HCFC component	15% of baseline	65% of baseline	65% of baseline
Freeze	-	2024	2028
1st step	2019 - 10%	2029 - 10%	2032 - 10%
2nd step	2024 - 40%	2035 - 30%	2037 - 20%
3rd step	2029 - 70%	2040 - 50%	2042 - 30%
4th step	2034 - 80%	-	-
Plateau	2036 - 85%	2045 - 80%	2047 - 85%
Notes	Belarus, Russian Federation, Kazakhstan, Tajikistan, Uzbekistan, 25% HCFC component and 1st two steps are later: 5% in 2020, 35% in 2025	Article 5 countries not part of Group 2	GCC (Saudi Arabia, Kuwait, United Arab Emirates, Qatar, Bahrain, Oman), India, Iran, Iraq, Pakistan

Source EIA Briefing to the COP22



### **Ghana's Current Refrigerator Market**

#### Energy Guide for Refrigerators (Old)



#### Energy Guide for Refrigerators (New)



**New EEI Scale** 

New Star Rating	New EEI - Ref
7 – Star	EEI<22
6 – Star	22≤EEI<33
5 – Star	33≤EEI<40
4 – Star	40 ≤ EEI< 45
3 – Star	45 ≤ EEI<55
2 – Star	55 ≤ EEI<70
1 – Star	70 ≤ EEI<85



### **Ghana's Current Air condition Market**



\*ER (Energy Efficiency Ratio) is the measure of energy efficiency for Air Conditioners, expressed as Wait of cooling per Wait of electric al power hput. Only models between 2.5 and 11.5 kW/hr cooling capacity and with the same features are used for this scale. The given data are a coording to Ghana Energy Efficiency Labelling requirements for non-ducted air conditioners under Ghana Standard Number G S62. \*\*Based on 2,000 hours use. Actual consumption may vary depending on actual use of the product.

Removal of this label before first retail purchase is an offence under LI 1541

#### Energy Guide for Aircondition (New)

#### \* THE MORE STARS ン HE MORE ENERGY EFFICIENT guide Air Conditioner Type: Split/Multi split/portable Trademark: name/logo Model Identifier Indoor Unit: abc123 Model Identifier Outdoor Unit: abc 123 Cooling Capacity: XY, kW/hr Compressor Type: Fixed/Variable Speed Noise Level Indoor/Outdoor: XY/xy, dB AEER: 123 TCSPF: 123 Refrigerant: RXXXX **Global Wartming Potential:** XXX Country of Origin: xyz Total Energy Consumption of this Unit is 123 kWh/year

Person located in account datases with DB INC SERIES Actual Energy Constant plane will depend on how the applicance in the definition of its account Product of the product is a actual of the Dependence Energy and whether the actual the applicance is not

#### **New EEI Scale**

Star rating	TCSPF value		
7	11.5 ≤	TCSF	
6	10.0 ≤	TCSPF	< 11.5
5	8.5≤	TCSPF	< 10.0
4	7.0 ≤	TCSPF	< 8.5
3	5.5≤	TCSPF	< 7.0
2	<b>4.0</b> ≤	TCSPF	< 5.5
1	2.6 ≤	TCSPF	< 4.0



### **F-gas schedules for refrigerants**

#### **Product bans and hfc phase-out**

	CAPACITY	BAN	YEAR
	SINGLE SPLIT < 3 kg charge	≥750 GWP	2025
	SPLIT AIR-WATER ≤ 12kW	≥150 GWP	2027
SPLIT AIR CONDITIONERS	SPLT AIR-AIR ≤ 12kW	≥150 GWP	2029
	SPLIT ≤ 12 kW	NO F-GAS	2035
		≥750 GWP	2029
	SPLIT >12 Kw 2.6 ≤	≥150 GWP	2033



#### What is Public Sector Procurement?

Acquisition of goods, services and work by governments or public sector organizations through a public contract" (Witjes & Lozano, 2016). It is a key economic activity of governments and public institutions.

It represents between **12 and 20%** of national gross domestic product (**GDP**) in OECD countries and up to **30% in developing countries.** 

#### What is Sustainable Public Procurement (SPP)?

Public procurement takes into account the environmental, economic and social impacts of goods, services and works throughout their life cycle.

#### What is Green Public Procurement (GPP)?

A process whereby **public and semi-public authorities meet their needs for goods, services, works and utilities by choosing solutions** that have a **reduced impact on the environment throughout their life-cycle**, as compared to **alternative products/solutions**.



## **Green public procurement (GPP)**

- If environmental criteria obtain extensive focus during the procurement procedure, it is Green Public Procurement (GPP).
- GPP is a public procurement that takes into account the environmental impact of goods, services and works throughout their life cycle.
- Green Cooling Appliances must conform to low-GWP refrigerants and high energy efficiency ratios.
- The aim of GPP is to reduce the impact of procurements on the environment and human health.



## **Relationship between the Three Pillars of SPP**





### **Three Sustainability Aspects of AC procurement**

		Assessment areas within each aspect					
"Green"	Environmental	Ozone depletion	Direct GHG emissions (refrigerant)	Ind er (e ge	irect GHG nissions electricity eneration)	Hazardous substances	Waste minimisation
<b>(</b>	Social	Effect of lighting and cooling on quality of life		Worker rights			
<b>€</b> \$	Economic	Budget implications		Local job creation			



### **Products and Services covered under S/GPP**



- IT equipment computers, displays, imaging equipment
- Vehicles and transport services
- Lighting (indoor and outdoor)
- Data centre services
- Medical and catering equipment, etc.



## **GPP Barriers and Enablers (1/2)**

Types of Barriers	Enablers		
Financial barriers	1. Consider life cycle cost		
Higher initial investment or upfront costs	2. Eliminate financial hurdles		
Perception of higher cost	Egs: On-wage		
Return on investment may take longer	On-bill		
Institutional barriers	1. Buy-in mgt support (Bring		
Lack of management support	leadership in support of GPP		
Lack of cooporation between institutions	2. Increase collaboration within		
Resistance to change	and between institutions		
Perception of low quality	3. Persue joint/bulk public		
	procurement		
Technical barriers	1. Establish clear policies and		
Lack of established criteria for	guidelines for GPP		
environmentally friendly products	2. Establish clear definition of		
Limited product availability meet the	GPP		
environmental criteria	3. Increase availability of green		
	products.		


### **GPP Barriers and Enablers (2/2)**

Types of Barriers		Enablers
Information and capacity-related barries		1. Increase awareness on GPP
Lack of practical tools		issues among procurement
Lack of knowledge and legal expertise		officials
		2. Build capacity and increase
		legal expertise
		3. Develop applicable tools
		4. Interact and consult the market
		players and invest in R&D
	1	
Regulatory and political barriers		1. Develop common
Lack of stronge policy commitment		understanding of best practices in
Lack of regulatory action plans		policies
Lack of monitoring policies		2. Inprove planning, strategies
		and goat-setting
Structural barriers		Use LCC to demonstrate the
GPP is unrecognised tool		enormuos economic and
It splits incentive		environmental benefits (savings).
GPP is not a priority for support		
Fear of complexity and increased costs		
GPP is new for many countris		



### **Benefits of GPP**

- Environmental benefits: Lowest negative impact on the environment throughout their life cycle: Reducing the electricity cost, mitigating the carbon footprint, and relieving the demand on the power sector.
- **Political benefits:** Demonstration of a public authority's commitment to environmental protection.
- Social and health-related benefits: (In)directly improve quality of life due to high environmental standards.
- Economic benefits: Provides incentives for the industry to innovate, promote green products and save money. Innovative products are cheaper through economies of scale, shifting the entire market towards greener products. i.e. a tool to help shift the low EER RAC categories to higher ratios (3 – 5 star ratings).
- Achieve SDGs 7, 12, and 13 by 2030.
- Net-zero Agenda by 2050



### **Selection & Award Criteria**

### There are two possible ways of choosing the winner(s)

#### 1. Lowest Price Criteria

The **cheapest bid is awarded** the contract (**bid with the lowest price**) on basis of the purchase price. <u>But, purchase price only accounts</u> <u>for a portion of the total cost generated by a public purchase</u>. There are **other costs too**.



#### Direct and indirect costs in public procurement

# 2. "Most economically advantageous tender" (MEAT) award criterion

- Proposed to be introduced in procurement regulation.
- MEAT takes both TCO and environmental considerations into account in the competition.
- The approach used most frequently considers various dimensions of economic and environmental quality as award criteria (such as EER/EEI, refrigerant, GWP, ODP, energy consumption & noise level).
- The contract is awarded to the bidder that achieves the highest overall "score," i.e. weighted average between the purchase price and environmental dimensions.
- It is recommended that the maximum weighting share of environmental criteria should be 55%.

Reducing the weight of the purchase price and increasing the weight of quality and environmental dimensions, results in more economical projects over their lifetime.

### Move away from Lowest Price to Best Economic Criteria (MEAT).



## **Proposed admissibility criteria for single split ACs (1/3)**

Criteria	Feature	Metric	Description	Max Points
	Technical Specifications		Must be an inverter type split AC	Minimum Criteria
Technical	Energy Efficiency	Star Rating	<ul> <li>3-stars minimum</li> <li>Bidder must provide product description/documentation of EER and results from a third-party accredited laboratory.</li> <li>Example of metric evaluation:</li> <li>3-star: 5 points</li> <li>4-star: 15 points</li> <li>5-star or above: 20 points</li> </ul>	20
Performance	Reliability	Warranty	Minimum 1 year. Example of metric evaluation: 1 year – 2 points 2 years – 4 points 3 years – 6 points 4 years – 8 points 5 years or more – 10 points	10
	Air filter		Indoor units must be fitted with air filters that can be easily cleaned	Minimum Criteria
	Control functions	Scheduling	"Manual on – Auto off" schedule option available	Minimum Criteria



## **Proposed admissibility criteria for single split ACs (2/3)**

Criteria	Feature	Metric	Description	Max Points
Life Cycle-Cost (LCC) Performance	LCC	LCC (GHS)	Including the cost of purchase, installation, repair and maintenance, operation (including energy) and uninstallation.Calculation performed by the procuring entity, using the following estimations: Total installation cost, composed of the equipment price, as submitted in the bid and installation/maintenance costs borne by the procuring entity. Equivalent full load hours of operation: 2,000 hours p.a. 	40



# **Proposed admissibility criteria for single split ACs (3/3)**

	Label		Label must be nationally recognized	Minimum Requirement
Environmental Performance	Refrigerant used	GWP of Refrigerant	AC systems are to be procured, if possible with natural refrigerants. Bidder must provide information on GWP and ODP of contained refrigerant. Refrigerants restricted under the Montreal Protocol (CFCs & HCFCs) are forbidden. Example of assessment points: GWP > 700 = 0 point 10 < GWP < 700 = 10 points GWP < 10 = 20 points	20
	Noise emissions	Decibel	Noise emissions must be stated in the product documentation. Lower than 60 dB for internal unit and 65 dB for external unit and = 10 points Otherwise = 0 points	10
TOTAL	·			100%



### **UNEP SPP Tool customized to Ghana (1/2)**

			BASELINE					
GENERAL SETTINGS			Units	Capacity	Efficiency	Refrigerant	Estimated AC cost	Manual AC cost
			<mark>150</mark>	3.5 kW	1-star - fixed spe	e R410A	2300	
Country	Ghana		200	5.3 kW	3-star - fixed spe	e R410A	3900	
Electricity cost	1.344	GHS/kWh						
Maintenance labor cost	52.1	GHS/h						
Emission factor	370	kg CO2/MWh						
Energy & CO2 price escalation rate	5.0%	p.a.	SPP PROJ	ECT				
Equipment escalation rate	10.0%	p.a.	Units	Capacity	Efficiency	Refrigerant	Estimated unit cost	Manual unit
Labor escalation rate	10.0%	p.a.	<mark>150</mark>	3.5 kW	4-star - inverter	R32	4301	
Estimated equipment lifetime	12	years	200	5.3 kW	4-star - inverter	R32	5610	
Discount rate	20%							
EXTERNALITIES COSTS								
Carbon price	45	GHS/CO2t	UN®ISO					
Capital cost per kW to grid	9000	GHS/kW	programmer	SUSTAINABLE PUBLIC P	ROCUREMENT			
Costs of non or poor Occupational Safety & Health Assumed value added by project to raw cost of	4%	GDP (value added)						
materials/services	20%				5			
Refrigerant leakage during operation	5%	p.a.						
Refrigerant recovered end-of-life	40%				4			
Assumptions:								
All loan models assume equal monthly repayments over loan tenor.			AF	PPLIANCES A	ND			
Recycling costs considered in product purchase cost (extended producer responsibility)			EC	QUIPMENT				
Cost of grid/generation expansion concurrent con project (immediate increase in demand)					ABS Dis Carrieronant Procession & Resear Arthéries			
Negligible residual value of product at end of lifetime.			Autobalistic Presentation and incident international	rogramme clottel traditionenential tradition.	nonen ander Of ETERNING			



### **UNEP SPP Tool customized to Ghana (2/2)**

CASE 2: Air Conditioning New installation. Standard project development, own resources.

RESULTS	BASELINE	SPP PROJECT	
Project costs	GHS 1,197,917	GHS 1,840,067	
Initial investment	GHS 1,197,917	GHS 1,840,067	
Nominal lifetime costs (excluding externalities)	GHS 25,687,196	GHS 20,277,703	
Nominal lifetime externalities costs	GHS 4,562,730	GHS 2,868,004	
Simple payback (net positive cummulative cash flow excl externalities)		1.6	years
IRR SPP PROJECT vs BASELINE (excl. externalities)		66.8%	
Discounted lifecycle cost excluding externalities (LCC)	GHS 7,730,927	GHS 6,539,697	
Discounted lifecycle cost including externalities (LCC)	GHS 11,325,754	GHS 8,822,057	

CASE 2: Air Conditioning New installation. Standard project development, own resources.





### Conclusion





**ENERGY COMMISSION** 

Securing Ghana's Energy Future Today

### **Open Discussion** Country Perspectives on U4E activities and impact



Moderator:

#### **Hubert Nsoh Zan**

Assistant Manager, Energy Efficiency Regulation/ Energy Transformation Expert, Ghana



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



وزارة الطاقــــة والبنيــــة التحتيــــة MINISTRY OF ENERGY & INFRASTRUCTURE

### **Open Discussion** Country Perspectives on U4E activities and impact

- What are the current national plans or strategies in place to support the commitment to MEPS (Minimum Energy Performance Standards)?
- 2. What key barriers or challenges are countries encountering in implementing or meeting their MEPS commitments?
- 3. What types of support do countries require to effectively fulfill their MEPS commitments?

### **Session Wrap-up** Towards sustainable cooling with U4E initiative



#### **Rocio Soledad Garcia**

Project Coordinator and Energy Efficiency Specialist UNEP, United for Efficiency (#7) Commit to establish Minimum Energy Performance Standards (MEPS) by at the latest 2030 and aim to routinely raise ambition and progress consistent with respective national laws with a view to achieve net-zero emissions by 2050 and noting best available technology and available model regulation guidelines.



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



زارة الطاقة والبنية التحتيية MINISTRY OF ENERGY & INFRASTRUCTUR

# WE NEED MORE ENERGY EFFICIENCY TO COOL THE WORLD





### Contact TRANSFORMING MARKETS TO ENERGY-EFFICIENT PRODUCTS

# Thank you

() EMAIL

Soledad Garcia – soledad.garcia@un.org



united4efficiency.org

# 12:15 – 13:15 **Lunch Break**

13:15 - 14:45

14 June 2025

# **Session 3.1 Finance Mechanisms and Business Models**



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





### **Opening remarks** Unlocking Finance to tackle extreme heat

**Gennai Kamata Associate Officer, Buildings and Cooling** Cool Coalition, UNEP



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



وزارة الطاقــــة والبنيــــة التحتيـــة MINISTRY OF ENERGY & INFRASTRUCTURE

### **Setting the scene** Frameworks and Sources of Finance for Cooling

Myriem Touhami Head, UNEP Finance Unit



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





#### **Unlocking opportunities**

### \$4 trillion

annual funding gap for the Sustainable Development Goals.

### \$2.2 trillion

investment shortfall for clean energy in emerging and developing economies annually.\*

### \$1 trillion

fossil fuel subsidies globally in 2022. Redirecting these funds could dramatically accelerate clean energy adoption.\*



\*Source: https://unctad.org/news/investing-energy-transition-countries-need-more-balanced-policies

### The finance gap for climate action

#### **Unlocking opportunities**



### \$4 trillion

### \$2.2 trillion

### \$1 trillion

annual funding gap for the Sustainable Development Goals.

investment shortfall for clean energy in emerging and developing economies annually.\* fossil fuel subsidies globally in 2022. Redirecting these funds could dramatically accelerate clean energy adoption.\* Private finance: the missing link to the SDGs

Private finance remains the biggest challenge, consistently highlighted in nearly every UN global conference and by Member States.



\*Source: https://unctad.org/news/investing-energy-transition-countries-need-more-balanced-policies

#### Our unique approach







#### Our unique approach

Stakeholders	Obstacles	Our goals
Investors, Development Banks & Financial Institutions	Limited investment in small-scale projects	To ensure <b>a just &amp; inclusive</b> energy transition for all
Technology Providers & Energy Companies	<b>High perceived risks</b> in specific sectors, communities, and regions	To mobilize private investments for <b>low-carbon and climate resilient solutions</b>
Government & Public Institutions	Limited <b>field-proven data</b> Inadequate <b>regulatory</b>	To support countries shift to <b>a</b> low-carbon & inclusive development pathway
	frameworks	





### Our unique approach

Stakeholders	UNEP Finance Unit		Our goals
Investors, Development Banks & Financial Institutions	<b>Reduce cost of capital</b> for underserved communities	Obstacles Limited investment in	To ensure <b>a just &amp; inclusive</b> energy transition for all
Technology Providers & Energy Companies	Finance project development in high-risk markets	High perceived risks in specific sectors, communities, and	To mobilize private investments for <b>low-carbon and climate resilient solutions</b>
Government & Public Institutions	Technical assistance for policy development, public-private	regions Limited <b>field-proven data</b>	To support countries shift to <b>a</b> low-carbon & inclusive development pathway
	parmersnips	Inadequate <b>regulatory</b> frameworks	

#### **Domestic Solar Water Heating Systems**

Budget	Scope	Objective and methodology	impact
<b>2.5M</b> USD	Tunisia	PROSOL aims <b>to upscale the Market for</b> <b>Residential Solar Water Heaters.</b> PROSOL <b>helps local banks build loan portfolios</b> in RE solutions.	<b>\$ USD 425 M</b> (2023) <b>(2023)</b>
		Costs are reduced through a combination of <b>interest rate subsidy</b> which is gradually phased out within 18 months and the <b>reallocation of existing gas subsidy to solar</b> .	<ul> <li><b>135,000 tCO₂e</b> avoided (2005-2010)</li> <li>→ Scalability (COLLECTIE ELEC.</li> </ul>
		To minimize the risk of non-payment, <b>bank</b> <b>loans are repaid through electricity bills</b> , creating a more secure and convenient repayment mechanism for users and financial institutions alike.	INDUSTRY)







GEF

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

UNITED NATIONS





### The state utility model

A mechanismIt helps localto facilitatebanks offer moreconsumersloans foraccess torenewable energycreditby keeping costsand risks low.

Customers don't feel the cost – loan repayments are made through already-lower electricity bills.







From the end-user perspective





Who pays what





#### Opportunities for all





### Hipoteca verde

Green Mortgage Programme | Mexico

#### Implemented by

INFONAVIT (Institute for the National Workers' Housing Fund)

#### Goal

to support low-income families in accessing energy-efficient solutions



### Hipoteca verde How it works

### An extra credit to add to your mortgage...

- ... for Solar Water Heaters (SWH) and efficient appliances.
- ... repayable over 20 years
- ... that covers up to US\$1,250
- ... only +US\$6/month, but saves families ~US\$17/month on bills
- ... payroll-based repayment = minimal non-payment risk



#### **Women for climate-resilient societies**

Budget	Scope	Objective	Projected Impact
<b>21.3M</b> USD 5 years	Bangladesh, Cambodia, Indonesia, the Philippines, and Viet Nam ; regional component	Accelerating gender responsive climate action through policy implementation, mobilizing investment and enterprise development, strengthening capacities and fostering regional and national collaboration	<ul> <li>\$ USD 20 M mobilized</li> <li>2 600 MtCO2e avoided</li> <li>\$ 2000 + women entrepreneurs</li> <li>\$ 110,000 beneficiaries</li> </ul>



Federal Ministry for Economic Cooperation and Development





Schweizerische Eidgenossenschaft Confédération suisse Confederazione Svizzera Confederaziun svizra

> Swiss Agency for Development and Cooperation SDC





### **EmPower**

#### **Women for climate-resilient societies**









Schweizerische Eidgenossenschaft Confédération suisse Confederazione Svizzera Confederaziun svizra

> Swiss Agency for Development and Cooperation SDC



environment programme

#### **Seed Capital Assistance Facility II**

Budget	Scope	Objective	Projected Impact
<b>34.5M</b> USD	Sub-Saharan Africa and South-East Asia	Addresses <b>early-stage financing</b> <b>gap</b> through repayable and non- repayable grants to develop <b>strong project pipelines</b> and fully develop <b>promising projects in</b> <b>clean energy</b>	<ul> <li>\$ USD 4.7 B mobilized</li> <li>29 MtCO<sub>2</sub>e avoided</li> <li>25,478 jobs created</li> <li>3,478 MW co-financed</li> </ul>





Federal Ministry for Economic Affairs and Climate Action







#### Seed Capital Assistance Facility II



Foreign, Commonwealth & Development Office

Federal Ministry for Economic Affairs and Climate Action





### **Innovative Models**

#### and much more

- 1. The leasing model
- 2. The fee for service scheme
- 3. Direct and indirect fiscal incentives
- 4. Interest Rate Subsidy
- 5. Guarantee Funds 1<sup>st</sup> and 2<sup>nd</sup> loss

- **6.** Dedicated lines of credit
- 7. Junior and senior debt provided by banks
- 8. Equity funds
- 9. The Feed in tariff
- **10**. The net metering


# What we don't do

Safeguarding UNEP's neutrality, integrity, and reputation

# **O** Take on fiduciary duty

No direct financial transactions, investments, or fund management.

# **O** Hold debt or equity positions

UNEP does not own stakes in financial mechanisms.

# **O** Compromise on safeguards

All supported projects must meet rigorous ESG standards.



# The impact of our work



## Our projects empower marginalized communities, drive innovation, and foster climate action







### **Q&A** Session

1. What types of support are needed at the national and sub-national levels to accelerate financing for sustainable cooling?

 What is the best practice on finance mechanisms and business models to accelerate sustainable cooling in your countries? And is it replicable to other countries?

# **Case Study Session** Introduction to panelists

**Gennai Kamata Associate Officer, Buildings and Cooling** Cool Coalition, UNEP



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



وزارة الطاقـــة والبنيـــة التحتيـــة MINISTRY OF ENERGY & INFRASTRUCTURE

# **Case Study** Ghana



Hubert Nsoh Zan Assistant Manager, Energy Efficiency Regulation/ Energy Transformation Expert, Ghana



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





### **Introduction : ECOFRIDGES GO Project**









# **ECOFRIDGES GO : Project Structure**





### **ECOFRIDGES GO : Key Stakeholders and Responsibilities**



#### Vendors

1. Certified vendors offer high energy efficient systems

Properly dispose
 the replaced systems
 with authorised
 E-Waste Management
 Companies.



#### Efficient systems

3. Customers apply through certified vendors to acquire any registered system.

4. Customers receive a pro-forma invoice and contact certified banks to lodge credit applications.



#### Banks

5. Certified banks offer credits to customers at competitive conditions.

6. Banks transfer the cost of the cooling systems to vendors minus a negotiated rebate.



#### Employers

7. Bank-Employers sign collaboration agreements

8. Employers become the guarantors of employees' repayments.



#### Repayment options:

9. Customers make repayments. Employers guarantee credits.

10. Customers authorize deduction of repayments from month payrolls.

11. Employers make bulk repayments on behalf of employees that requested credits.



### **ECOFRIDGES GO : Main Components**





# **ECOFRIDGES GO : Eligibility Criteria**

Criteria	ACs	Refrigerators
Type of products:	Ductless Split Air Conditioners	Household refrigerators and refrigerator-freezers -freezers- are only excluded
Age:	Only new products	Only new products
Product Size:	Nominal Cooling Capacity upto 5.3 kW	Between 901 to 5001
Refrigerants and	GWP limit of 750	GWP limit of 20, maximum charge of 0.15kg
Foam Blowing Agents	N/A	GWP limit of 20
Warranty:	Minimum 2-years	Minimum 2-years
Safety Certification:	Conform to safety regulations of both the manufacturing country and Ghana (e.g. IEC 60335-2-40)	Conform to safety regulations of both the manufacturing country and Ghana (e.g. IEC 60335-2-24:2002 / AMD:2017, or a subsequent revision)
Energy Efficiency:	Interim criteria until introduction of new MEPS & labels regulation: - 3-star equipment as per current Ghanaian regulation:EER>3.45 Criteria following introduction of new MEPS & labels regulation: - TCSPF>7 (see notes on evaluation below)	<ul> <li>Interim criteria until introduction of new MEPS &amp; labels regulation:</li> <li>5-star equipment as per current Ghanaian regulation:</li> <li>Climate Class ST: I&lt;30</li> <li>Climate Class T: I&lt;42</li> <li>Criteria following introduction of new MEPS &amp; labels regulation:</li> <li>EEI&lt;22 (see notes on evaluation below)</li> </ul>



### **ECOFRIDGES GO : Partner Vendors**

- Sun Electronic
- Ederick
- NESSTRA GH LTD
- Service Merchantile Ltd
- Novotec

















## **ECOFRIDGES GO : Benefits**

•Introduced high efficient cooling products into the Ghanaian market

•Provided flexible financing scheme for purchase of these appliances

• Consumers can save money on their bills

•Eco-friendly refrigerants





## **ECOFRIDGES GO : Summary of Achievements**





# **ECOFRIDGES GO : Key Challenges**

### **Products Availability** :

Low stock levels for eligible products

### Difficult Communication Campaign:

Due to limited budget, the work plan had to be amended to focus on Social media platform as a low hanging fruit.

# Prevailing high Market interest rate:

The prevailing high market interest made the zero-interest rate unattractive to the Banks

### Limited beneficiary experience:

People don't want others to know that, they benefitted from a loan scheme to purchase their appliances.

### **Application through WebApp**:

The response rate of the participating vendors and banks on the WebApp not encouraging. Consumers skeptical about filling online details.

# ECOFRIDGES GO Take back scheme :

The take-back scheme delayed pending advise from EPA.





# **ECOFRIDGES GO : Key lessons for replication**

- The price myth is busted. African market is ready for high energy efficient appliances.
- A strong **collaboration** between the NOU and Energy is key to success.
- The culture of the people should inform the choice of financing mechanism -On-bill or On-Wage (less than 100 people applied for the loan)

 Proper Institutional framework.

System leadership

 The propagation of the Green Agenda is key in getting the buy in of vendors and Banks





# Why pay attention to cooling appliances in Africa?

•Africa leads in urbanization, globally.

•The incidence of climate change-rising temperatures.

•Efforts to strengthen the cold chain to reduce hunger and diseases.

•Need to give attention to EE, refrigerants and installation & maintenance





# **Case Study** Cooling in Maldives



Fathmath Usra International Relations Officer, Ministry of Tourism and Environment, Maldives



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



وزارة الطاقــــة والبنيــــة التحتيـــة MINISTRY OF ENERGY & INFRASTRUCTURE

# COOLING IN MALDIVES

14 June 2025



**Ministry of Tourism and Environment** 

- 1,190 coral islands grouped into 27 atolls.
- Average elevation of 1-1.5 meters above sea level
- Approximately 90,000 km2, only 298 km2 is dry land.
- 187 Inhabited Islands.
- Population of **515,132 people**.
- Dependent on Tourism and Fisheries Sector.





# **Need for Sustainable Cooling**

- Climate impacts are lived realities
- •Tourism, Fisheries and Construction Sector continue to grow- increasing the demand for cooling
- Fuel imports amounted to 21% of total imports
- Annual fuel expenses amounted to 11% of GDP
- Air-conditioning accounts for 40% of the electricity bills of ordinary households in Capital
- In **Tourism Sector, Cooling is the most energy intense** operation
- Residential Housing is the sector with most cooling demand





# **Energy Efficiency**

•Hakathari Program – an energy efficiency labeling program for appliances and equipment.

•Minimum energy performance standards (MEPS) and assigns star-rated labels.

• Provides consumers with a simple and clear **indication of the energy-saving potential**.

• Approved Models of appliances includes 44 Air-conditioners and 25 Refrigerators, runs in all low GWP refrigerants.

### יעצי שרתת ינער הגר הגא WHAT IS THE **HAKATHARI LABEL?** The label is an **indicator** of the appliance's energy efficiency level. \*\* 31828 2225 2255 The label is set under 1 22.55 2555 1234 international energy 2222 2223 2223 222 223 efficiency standards. enviroment.gov.my ىغىر قار دشترشتردشغ، تتربذغ ترشغ دش غائكت 6 enviroment.gov.mv UN® Ministry of Environment, Climate Change & Technology MoEnvmv



• Phased out the use of CFCs, an ozone-depleting substance, **in 2008**.

• First developing country to successfully and completely phase out the production and consumption of HCFCs, in 2020.

• Kigali Implementation Plan is to be finalised, looking into:

- Increasing Natural Refrigerants and low GWP.
- Works to increase Energy Efficiency.





### **Need for Passive Cooling**

- Increasing Urban Heat Effect.
- Rising Energy Use for Cooling.
- Nature-Based Solutions.
- To recognize Cooling across Sectors.
- For Planning and Designing Cities.





# **Challenges in Adopting Passive Cooling**

- Financing Dependent on Donor Funds.
- Geographic Distribution of the islands
- Rapidly developing construction industry.
- Synergies between the policy makers in different sectors.
- Establishing incentive programs to promote adopt green building codes
- Capacity building in all sectors
- Scarcity of land, allocating green spaces is a challenge





# **Q&A Session**

# **Session Wrap-Up** Taking the lessons forward

**Gennai Kamata Associate Officer, Buildings and Cooling** Cool Coalition, UNEP



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







15:00 - 16:30

14 June 2025

# **Session 3.2** Accessing Climate Finance



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



وزارة الطاقة والبنية التحتيية MINISTRY OF ENERGY & INFRASTRUCTURE

# **Opening remarks** Accessing Climate Finance

**Gennai Kamata Associate Officer, Buildings and Cooling** Cool Coalition, UNEP



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



وزارة الطاقة والبنية التحتيسة MINISTRY OF ENERGY & INFRASTRUCTURE

# **Presentation** Accessing Climate Finance



Jessica Troni Head, Climate Change Adaptation Unit UN Environment Programme



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





# **Key details about the Green Climate Fund**

#### Strategic plan targets 2024-2027

- Mitigation of 1.5 to 2.4 gigatonnes of CO2 equivalent
- Enhanced resilience of 570 to 900 million people

Lower level targets for infrastructure, clean energy, transport, buildings and industry, private sector early stage ventures, MSMEs, banking sector

- Should deliver balanced funding across mitigation and adaptation over time.
- 50 % adaptation allocation to developing countries that are particularly vulnerable to the adverse effects of climate change, including SIDS, LDCs and African States



Impact potential: Core indicators:

- GHG emissions reduced, avoided or removed/sequestered
- Direct and indirect beneficiaries reached.

Paradigm shift: Scale, replicability, sustainability.

Country ownership, Sustainable development, Needs of the recipient, Efficiency and effectiveness.



# 'Projectising' the cooling solution matrix

Solution	Type of project intervention	Project execution entity	Longer-term investment
1. Passive cooling Building design Urban planning Nature-based solutions	Enabling Enabling Investment	Government Government Government	Private sector Private sector Government
2. Super-efficient cooling solutions	Enabling	Government	Private sector
3. Phase out high-emitting refrigerants	Enabling	Government	Private sector



100% concessionality = grants. Used in cases where:

- Investing in public goods
- TA, capacity building
- Investing in people whose ability to pay is low
- No direct reflow/repayment mechanism.
- Limited ability of country to borrow, e.g IMF restrictions.

#### Grants, loans, equity, guarantees

• The level of concessionality provided by GCF will be the minimum amount necessary to make a proposal viable. Minimum concessionality an assessment criteria in the effectiveness and efficiency investment principle.

Accreditation scope


# **GCF performance indicators for a cooling programme**

### Impact indicators

- GHG emissions reduced, avoided or removed/sequestered
- Direct and indirect beneficiaries reached.

### **Outcome indicators**

- Annual energy savings (MWh); Installed RE capacity(MWH); RE generated(MWh);
- Beneficiaries adopting innovations that strengthen climate change resilience; Beneficiaries living in buildings that have increased resilience against climate hazards

### **Enabling environment:**

- 1. Contribution to strengthening institutional and regulatory frameworks for low-emission climate-resilient development pathways;
- 2. Contribution to technology deployment, dissemination, development or transfer and innovation;
- 3. Contribution to market development/transformation at the sectoral, local or national level; and
- 4. Contribution to effective knowledge generation and learning processes, and use of good practices, methodologies and standards.



# Is GCF for you?

### Negative

Long project development timeframes:

- 1 year for CN development and approval
- 6 months for PPFA approval
- 2 years for Funding Proposal development
- 6 months for review

Total minimum: 4 years.

### Positive

- Larger investment scale than other grant finance
- Programme scale and visibility; implementation 'model' integration;
- Potential to create blue-prints for scale-up



# **Q&A Session**

### Presentation

# Guidance on Investment Assessment for the Cooling Sector



Mehul Jain Senior Disaster Risk Management Specialist World Bank



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





# WB's evolution of work on heat stress & cooling in India



### **Ongoing engagements informed by report findings**

### **Expand Domestic Manufacturing**

### Enhancing Domestic Manufacture of Sustainable Cooling Technologies

### Department for Promotion of Industry and Internal Trade

• Program to enhance domestic manufacture, research and development of sustainable cooling technologies.

### **Key Findings**

- \$1.6 trillion investment potential
- Space cooling is the largest impact area and investment opportunity
- Potential to create 1.7 million jobs through targeted interventions in sustainable agriculture and cold chains
- •Need for an integrated implementation approach encompassing institutions and sectors to achieve goals of the ICAP

### **Enhance resilience of affordable housing**

### Mainstreaming Thermal Comfort in PMAY Grameen

#### Ministry of Rural Development

• Program to integrate passive design and disaster resilience into PMAY Grameen (rural), and enhanced monitoring and evaluation for improved beneficiary outcomes.











# **Cooling Finance Framework : A collaborative effort**

### A collaborative effort for actionable implementation of UNEP Cool Coalition and World Bank

### Evidence-Based Design

Built on proven World Bank Group experience (India ICAP, ASC facility) and comprehensive country case studies

#### Adaptive Framework

Flexible methodology accommodating diverse national contexts from SIDS to rapidly industrializing economies

### Action-Oriented

A roadmap translating strategies into bankable project pipelines with robust MRV frameworks

### Global Integration

Aligned with Paris Agreement, Kigali Amendment, SDGs, and NDC 3.0 enhancement requirements













# **Guiding Integrated Framework**

### A systemic framework from Assessment to Prioritization to Implementation



- **Baseline Assessment**
- Evidenced based design based on Built on proven World Bank Group experience (India ICAP)
- Sectoral Focus
- Mapping of available financing mechanisms

- considering feasibility & viability
- Finance Strategy combining Public & Private, National & international Funds & Investments

- Country Roadmaps
- Capacity Building & MRV
- Plan to Action













### **Indicator Based Country Classification**

**Objective:** Categorizing the country based on indicators to develop a cooling action plan depending on their needs and capacity.

Category	Indicator		
Climate	% GDP from climate-sensitive sectors, (Agriculture, Forest and Tourism)		
Vulnerability	Existing Cooling Action Plan		
	Climate Risk Level		
Development	Development Category		
Status	Poverty rate (% population below poverty line)		
	HDI Index		
	Dominant climate type		
Agro-ecological zones	Location (Tropical or non-tropical)		
	Forest Cover and Urban Forests		
	Emission reduction targets (NDC)		
Policy	NCAP		
Commitments	Kigali Pledge CC		
	Clarity of investment/financing mechanisms		















# **Understanding cooling needs**

**Objective** Gain a clear understanding of the national cooling landscape to establish a solid foundation for the National Cooling Action Plan (NCAP).















### **Multi-Criteria Sectoral Prioritization Framework**

### **Objective:**

Enable countries to prioritize interventions using robust decision framework by ranking them.

# A two-step multi-criteria prioritization framework to be developed

- First level of prioritization will cover the criteria of climate and development benefits, and ease of implementation
- Second level of prioritization will focus on evaluating the potential of concessional financing and private sector investments.
- Scoring scale and rationale used for selection to be provided.
- Countries to assign weightages to the criteria based on specific contexts and priorities

Criteria	Sub-Criteria	Description		
Benefits	Climate Mitigation Benefits	<ul> <li>GHG mitigation potential for the sustainable cooling opportunity</li> </ul>		
	Development Benefits	<ul> <li>Job creation potential, SDGs, Number of people impacted</li> </ul>		
Implementation	Technical feasibility	<ul> <li>Ease of technology access – includes access to associated technologies and knowledge, with no restrictions in terms of IPR;</li> <li>Market preparedness and adaptability of technologies</li> </ul>		
	Likelihood of large- scale adoption	<ul> <li>Sustainable cooling is a key driver in ensuring adoption;</li> <li>Potential for scalability and replicability of opportunity</li> </ul>		
	Administrative feasibility	<ul> <li>Policy feasibility: Supportive laws, regulations and policies in place; ongoing programmes &amp; schemes in place for convergence</li> <li>Level of stakeholder participation needed to plan &amp; implement the opportunity</li> </ul>		
Financing		<ul> <li>CAPEX per unit delivered</li> <li>Need and potential for leveraging various concessional finance instruments and/or private sector investment</li> </ul>		

**(** 







### **Assessment Toolkit**

### **Objective: Adopt-Multi-Criteria Toolkit to Identify Priority Sectors for Climate Financing and Implementation Assessment Toolkit builds on Country Assessment Data**

### INTERVENTION ASSESSMENT: e.g. Efficient ACs **GHG** Mitigation 100 Financial Development Viability & NDC 3 Co-benefits Alignment Policy Feasibility Scalability

### SECTORAL PRIORITY RANKING

#### **Ranked Interventions**

1	Passive Cooling (Cool Roofs) Utilizing reflective materials and designs to reduce heat ab	320.9
2	Efficient Air Conditioning Promoting high-efficiency AC units through standards and inc	310.6
3	Cold Chain Infrastructure Developing and improving refrigerated storage and transport	307.9
4	District Cooling System Centralized cooling production and distribution network for	301.7
5	R290 Natural Refrigerants for Split AC Transitioning to low-GWP natural refrigerants like R290 in s	301.6
6	MAC Efficiency Standards Implementing and enforcing Minimum Energy Performance Standa	281.0
7	Rail HVAC Modernization Upgrading existing rail HVAC systems and setting standards f	256.4











# **Cost Framework and Financing Strategy**

### **Finance Investment Toolkit**

From public and concessional funds to market-based instruments like Green Bonds for large-scale projects tailored to country needs and classification

### **Financing Framework**













**Cooling-as-a-Service** 

**PAYG/On-bill Financing** 

upfront costs

households

Pay-per-use model removing

Expanding access flexibility to

\*\*

Ð١



# **Strategic Approach for Financing**

Financing sectoral cooling needs through assessment, projections, interventions and investing through viable financing mechanism. Illustrative example of financing cold chain



- **Population Growth & Urbanization**
- **Disposable Income & Consumer Spending**
- **Organized Retail Growth**

- **Domestic Perishable Production**
- Existing Cold Storage Capacity & Utilization
- Refrigerated Transportation Fleet Size & Technology













### **Implementation Framework and Governance**

- The framework provides a roadmap to embed sustainable cooling within national systems
- **Continuous cycle:** Integrating cooling into policy, developing a pipeline of projects, actively mobilizing finance, and crucially, monitoring and reporting on progress
- Align with Paris Agreement's Enhanced Transparency Framework and to deliver a robust, quantified, and finance-ready cooling component for your NDC, NCAP and the Implementation of the Global Cooling Pledge















### **Q&A Session**

1. What are the **cooling priorities** (sectors, sections of population, etc.) for your country?

2. What is your **single biggest barrier** to financing sustainable cooling projects?

3. Which **data points for cooling assessment** are most difficult for your country to obtain?

4. How can this framework **best support your NDCs and Global Cooling Pledge** implementation?

# **Presentation** Cooler Finance Report

**Gennai Kamata Associate Officer, Buildings and Cooling** Cool Coalition, UNEP



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





# **Action on Sustainable Space Cooling**

### Why Sustainable Cooling?

- Cooling needs are expected to grow rapidly due to rising temperatures, especially in developing economies mostly located in hot/tropical climate.
- Space cooling is the most dominant area in the cooling sector and is growing rapidly as floor space increases due to population growth.
- Inefficient cooling system needs more energy and emit more GHG than sustainable cooling systems such as passive cooling & invertercontrolled air-conditioners.





Global Alliance for Buildings and Construction







International Finance Corporation WORLD BANK GROUP

# **Growing Population & Growing Floor Area**

Global Buildings construction markets are exponentially emerging:

Growing opportunity to address energy efficiency (EE) in buildings and construction sector



Source: Global Status Report (GABC) 2017,

http://www.oneplanetnetwork.org/sites/default/files/gabc global status report 2017 en.p





**Global Alliance** Construction







# Energy Consumption and GHG Emissions in the Building Sector

In 2023, **One-Third** of the global energy consumption and CO2 emissions is attributed to the Building Sector.

**Operational emissions reached a record** 9.8 gigatonnes, while embodied carbon around 2.9 gigatonnes, which was suggests more reduction for the space cooling is needed.



Residential (direct)

Residential (indirect)

Non-residential (direct)

Non-residential (indirect)

Buildings construction industry

Buildings construction other

Other construction industry

Share of the CO2 emissions in 2023

Source: Buildings Global Status Report 2024/2025





**Global Alliance** for Buildings and Construction







# **UNEP Buildings-GSR**

**Cooling remains the fastest-growing end-use** in the buildings sector, particularly driven by the Asia-Pacific region, having increased at an average rate of four per cent per year since 2000.

The Global Status Report for Buildings and Construction (Buildings-GSR), provides an annual snapshot of the progress of the buildings and construction sector on a global scale. It reviews the status of policies, finance, technologies and solutions to monitor whether the sector is aligned with the Paris Agreement goals.



Source: Buildings Global Status Report 2024/2025.





**Global Alliance** for Buildings and Construction







# **UNEP Cool Coalition Global Cooling Watch**

Passive cooling can reduce cooling demand by 24% by 2050, saving up to \$3T in equipment costs and 1.3T tons of CO2e.

*The Report* demonstrates the pathway to achieve near-zero emissions from cooling through joint action in three areas: passive cooling, higher-energy efficiency, and a faster phase down of climate-warming refrigerants. The report was released in support of the Global Cooling Pledge at COP28.

Source: Global Cooling Watch Report 2023

















# **UNEP Cool Coalition Global Cooling Watch**

If the world follows the best measure pathway we can **achieve 60%** reduction below projected 2050 emissions – 3.8 billion tons of C02e

**Grid decarbonization leads** 

to 96%- additional 2 billion tons of CO<sub>2</sub>e



Figure ES-1: Global pathway and key steps to achieve near-zero GHG emissions from cooling, 2022-2050

Note: Blue bars show emissions in 2022 and 2050. Purple bars indicate growth. Yellow bars indicate BAU Cooling Measure emission reductions. Orange bars indicate Best Cooling Measure emission reductions. Green bars indicate emission reduction due to electricity grid decarbonisation.





**Global Alliance** for Buildings and Construction







Source: Global Cooling Watch Report 2023

# **UNEP Cool Coalition IFC Cooler Finance**

•Size the market opportunity that sustainable cooling represents across EMDEs

•Bring attention to challenges and opportunities to financing sustainable cooling in the context of **EMDEs** 

•Provide a blueprint on how to finance sustainable cooling



Source: Cooler Finance 2024 (IFC/UNEP)















# **Total Cooling Market Growth**

The cooling market in developing economies is expected to grow from about \$300 billion to \$600 **billion**, or more, by 2050.

South Asia grows 4 times and Africa 7 timers larger than today

The total cooling market size in developing economies

Source: Cooler Finance 2024 (IFC/UNEP)





Construction









poration

# **Cooling Market Growth - Space Cooling**

Space cooling accounts for about **half of the total cooling market** and driving the most growth.



Source: <u>Cooler Finance 2024 (IFC/UNEP)</u>



UN () environment programme

Global Alliance for Buildings and Construction







# **Space Cooling Market Breakdown - Passive & Active**

Passive cooling market is estimated at **\$30 billion**, but can grow further with the right incentives.



Current passive cooling capital investments across developing economies:

- New builds: \$15-\$25 billion per year
- Retrofit: \$10-\$15 billion per year

By 2050, the new builds market could reach \$150 billion per year.











# **Saving Electricity Cost**

Accelerating the transition to sustainable cooling will help developing economy consumers spend \$6.4 trillion less by 2050.

Changes in cumulative electricity consumption costs and spending on cooling equipment for consumers from accelerating adoption of sustainable cooling 2025 to 2050 (\$ Trillion)

Spending on active cooling Electricity consumption costs

\$4.6 trillion avoided costs \$1.8 trillion net savings -2.18 -3.46 19.2 13.6 12.1 -2.4 11.3 1.64 Baseline (mid efficiency) High efficiency & passive High efficiency & passive strategies Passivestrategies aseline (nid efficiency) Passive strategies Highefficiency Highefficiency strategies

Source: Global Cooling Emissions and Investment Model

equipment



I IN G

programme







### What is Passive Cooling?

**Passive cooling** is the practice of using non-mechanical technology, design elements and nature-based solutions to keep a space cool by reducing the dependence on airconditioners.







**Global Alliance** for Buildings and Construction





ce Corporation

# **Early Design Decision Matters**



Source: Building life cycle optimization tools for early design phases, https://www.sciencedirect.com/science/article/abs/pii/S0360544215003217



Global Alliance for Buildings and

Construction

Cool

Coalition

International

**Finance Corporation** 

# **IFC's EDGE - EE and Cost Simulation**

•Quick resource efficiency assessment: Allows developers and designers to immediately evaluate a building's energy, water, and material usage efficiency compared to conventional buildings.

•Financial ROI calculator: Calculates utility savings and payback periods for green building investments, making the business case for sustainability clear to stakeholders.

• Evaluate different settings: A variety of parameters can be entered, ranging from building typologies, floor areas and stories, occupancy patterns and densities, climate zones, etc.

Homes DASHBOA	RD PRELIMI	NARY VERSION 3.0.0	• FILE •	CALCULATE AND SAVE
Auto-Calculate: Off Subproject Floor Area Final Energy Use 1,450,00 585,00 w' Nith March Hause		Final Water Use 16.00 mitMonth/House	Final Operational COL Emissions 0.21 s00/Month House	Final Embodied Carbon 460.00 Kg CO.elm*
⊘ ⊘ ⊘ ⊘ Design Energy 28.14% Water 34.30% Materials 22.00%	Operations			HIDE RESULTS
Energy Efficiency Measures Choose energy efficiency measures to achieve savings of at least 20%.		28.14% Meets EDGE En	ergy Standard	08
EEM01* Window-to-Wall Ratio: 24% Base Case Value: 20% WWR (%)	: 	Base Virtu Case for 0 70	al Energy Improved Virtual E Comfort" Case for Com	nergy fort*
EEM02 Reflective Roof: Solar Reflectance Index 85				
EEM03 Reflective Exterior Walls: Solar Reflectance Index 85	50 - 2.28 40 - 11.17	6.39		
EEM04 External Shading Devices: Annual Average Shading Factor (AASF Base Case Value: No Shading AASF	)0.11	30 - <b>3.09</b> 20 - <b>15.64</b> 10 - <b>0.94</b>	11.17 2.25 10.1	
EEM05* Insulation of Roof: U-value 0.46 W/m <sup>2</sup> -K Base Case Value: 1.91 W/m <sup>2</sup> -K U-Value	 		Heating Fans     Cooling Fans     Home Appliances Amenities     Lighting	Heating Pumps     Cooling Dumps     Colling & Vent, Fans     Hot Water
EEM06* Insulation of Ground/Raised Floor Slab: U-Value 0.55 W/m <sup>2</sup> -K Base Case Value: 0.49 W/m <sup>2</sup> -K U-Value Edge In Vertical	I	Water Pu	mps   Cooking ENERGY (kWh/m5Year)	
EEM07 Green Roof		<ul> <li>Show the Carbon Em "Virtual energy is the amount of e install air conditioning or heating.</li> </ul>	<b>hissions/Offset</b>	assumption that the office will eventually
EEM08* Insulation of Exterior Walls: U-Value 0.5 W/m <sup>2</sup> ·K Base Case Value: 1.86 W/m <sup>2</sup> ·K U-Value	1	Disclaimer: EDGE is designed as o water and materials may vary from	omparative software and is not a design t n actuals.	ool. Therefore predicted results for energy,











# **Simulation example 1**

**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 Simulation:**

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



#### Source: Cooler Finance, P85, IFC EDGE











COMPARED TO A TYPICAL HOUSE

# **Simulation example 2**

Service Housing:19 premier serviced houses

Passive Cooling Strategies:
WWR of 17%
External shading
Insulation of wall and roof
Natural ventilation

### **Cost Performance:**

- Incremental cost: 3.58%
- Payback period: 2.4 years
- Utility cost saving: 80% (equivalent to 68 low-income houses)



- Alex Buechi, Partner/Country Head Indonesia, Asia Green Real Estate

#### Source: Cooler Finance, P85, IFC EDGE



Global Alliance for Buildings and Construction







# **UNEP/UNESCAP - PCS demonstration project in Cambodia**

### **Measurement of the ceiling** surface temperature

### **Design Workshop**



**Cool Roof Paint** 









### **PCS Pilot in Cambodia**















# **UNEP/UNESCAP - PCS demonstration project in Cambodia**



**UNEP & UNESCAP Passive Cooling Strategies Compendium** was published in November 2024. It introduces a variety of passive cooling measures for the Cambodian context.

Frame Type	Image	U-Value
Wooden frame		1.2 and 2.4 W/m <sup>2</sup> .K
Unplasticized Poly V Chloride (UPVC) frame	inyl	1.2 and 1.6 W/m².K
Aluminium frame		6.0 to 7.0 W/m <sup>2</sup> .K

Compendium For Passive Cooling Strategies in Cambodia (2024)





**Global Alliance** for Buildings and Construction





# **Webinars & Guidelines Development**





#### 01: PROVIDING THERMAL SECURITY THROUGH ENERGY EFFICIENT METHODS IS A MATTER OF SURVIVAL FOR MANY REGIONS

#### **Passive Cooling WG 03**





#### 03: ACCELERATING NATURE-BASED SOLUTIONS FOR BUILDING ENERGY-EFFICIENCY AND THERMAL COMFORT



#### 02: PASSIVE COOLING STRATEGIES FOR SUSTAINABLE DEVELOPMENT IN CAMBODIA (UNEP&UNESCAP)



04: COOLING PEOPLE WITH AIR MOVEMENT

# **Webinars & Guidelines Development**





# 05: HEAT MITIGATION WITH COOL SURFACES FOR THE SUSTAINABLE BUILT ENVIRONMENT
# **Q&A Session**

# **Session Wrap-up** Towards effective financing for Sustainable Cooling

**Gennai Kamata Associate Officer, Buildings and Cooling** Cool Coalition, UNEP



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



المحمد المحمد والبنيسة التحتيسة وزارة الطاقسة والبنيسة التحتيسة MINISTRY OF ENERGY & INFRASTRUCTURE



14 June 2025

# **Session 4** NDCs Cooling and NCAPs Guidelines



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





# Welcome and Introduction Cooling in NDCs and NCAP methodology



Amr Seleem Country Engagement and Climate Policy Lead Cool Coalition Secretariat, UNEP



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





# **Presentation** NDC Cooling Guide Structure



**Ben Hartley Programme Manager, Cooling for All** SEforALL



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

MINISTERO DELL'AMBIENTE E DELLA SICUREZZA ENERGETICA



# **Cooling and Climate: A Vicious Cycle**



### **The Vicious Cooling Cycle**



Breaking this cycle with sustainable cooling is urgent.



# **Cooling and SDGs: A Development Imperative**



Sustainable cooling enables **economic growth** for those in poverty



Cooling **reduces food waste** and **increases nutritional value of food** that reaches people



Cooling **reduces heat stress** and improves sleep, increasing physical and mental well-being



Cool schools **improve learning outcomes** and reduce fatigue



Cool cities, buildings and homes support **equal opportunity for women and men** 





10 REDUCED INEQUALITIES

access

Cooling **increases worker productivity** and increases profits

Sustainable cooling **reduces energy use** and peak

demand, while enabling more reliable energy





Cool cities **support urban populations** by improving their health and productivity



Cooling reduces **food waste, cuts emissions**, and supports **cleaner production**.



Sustainable cooling **emits no or minimal** energyrelated and refrigerant **emissions** 

# Why are mitigation targets important?



- Implementing 3 key actions passive cooling, best practices could avoid up to 60% of projected cooling-related greenhouse gas emissions
- Equivalent to 3.8 billion tons of CO<sub>2</sub>eq emissions 10% of project 2050 emissions

### Examples Indonesia NCAP aims to avoid 128 MtCO2e by 2030 India NCAP aims to reduce 118 MtCO2e by 2040 **European Union** F-gas regulations aim to cut emissions by 310 MtCO2e by 2050 Kenya NCAP aims to cut 23 MtCO2e by 2050



### Why are adaptation targets important?





#### Food, Nutrition and Agriculture

Cold chains for transportation and storage of perishable, nutritious crops to prevent food waste.



#### **Health Services**

Cold chains for transportation and storage of vaccines and blood products. Space cooling of health facilities to support better overall care and patient recovery.

#### **Human Comfort and Safety**

Cooling of homes and workplaces for health and wellbeing, leading to improved economic and social outcomes.

#### Cities



Reducing the urban heat island effect (UHIE), which can cause temperatures to be 1°C to 4°C higher than surrounding areas.



## Who is at risk due to the lack of cooling?



# In a warming world, access to cooling is not a luxury. It is an issue of equity, necessary to adapt and thrive.



People at high risk for the lack of cooling

Do you know the cooling access gap in your country?



### **Part 1: Mitigation Measures into NDCs**



The cooling sector is <u>multi-dimensional</u>. Starting with key guiding questions can help surface the suitable leverage points and priorities for the country.

- What are the unique drivers and/or needs in your country? For example:
- UAE: Driven by the need to reduce building sector energy consumption and emissions
- Nigeria: Driven by need for adaptation to rising temperatures
- Grenada: Bold national vision (world's first HFC-free island nation)
- How can your country balance the need for increased cooling access with emission reduction goals?
- What existing governance structures could be leveraged to integrate cooling into your NDC?
- What data gaps exist in your country regarding cooling demand and access?

# **Translate cooling targets into NDCs Commitments**



#### ESTABLISHED PROCESS

#### **KIGALI AMENDMENT**

HFC production and consumption reduction Step-wise reduction schedule for production and consumption of HFCs, measured in CO<sub>2</sub>eq

#### RECOMMENDED

#### NATIONAL COOLING ACTION PLAN

### Cooling sector targets affecting several sectors:

MITIGATION: Energy and Industrial Processes and Product Use/HFCs ADAPTATION: Health, food, cities and sustainable development

#### GLOBAL COOLING PLEDGE

Collective reduction of 68% of cooling-related emissions by individual measures targeting refrigerant transition, appliance efficiency, buildings and research



- Align assumptions for business-as-usual and mitigation scenarios
- Define contribution to national targets

#### PARIS AGREEMENT

GHG emissions mitigation and adaptation

#### REQUIRED

- National GHG emission mitigation target
- National scenarios
- HFC emission reporting (in t CO<sub>2</sub>eq) only mandatory for industrialized countries
- Plan of policies and measures to achieve target
- MRV system to track progress

#### OPTIONAL

- National energy efficiency targets/ambitious and mandatory MEPS and labels for key cooling appliances
- HFC phase-out targets for sectors with established alternatives
- Reporting on adaptation measures

## **Methodology Guide for Mitigation**





Intense cross-governmental cooperation (NOU, energy efficiency, climate, housing, etc.)

# **Stage 1: Baseline definition (1/3)**



### STEP 1: TAKING STOCK OF DATA



- KIP focuses on reducing HFC emissions in line with the Kigali Amendment
- NCAP addresses both direct (HFCs) and indirect (energy use) emissions and includes broader goals like equitable access to cooling.

# **Stage 1: Baseline definition (2/3)**



### STEP 1: BASELINE DEFINITION (DIRECT)

Emissions from HFCs					
NCAP data is not available		NCAP data is available			
Use Article 7 data to report on HFC emissions		Ensure that NCAP assumptions are aligned with national scenario assumptions			
Include KIP targets in NDC		Ensure NCAP data is updated regularly			
Track progress using KIP reporting		Use the same data base for NDC cooling targets			
Work on NCAP data to have a disaggregated data set Start the process again with next NDC update		Ensure integration of NCAP data with Hydrofluorocarbons Phase Out Management Plan (HPMP)/KIP/Article 7 data			
		Maintain MRV system to track progress based on the same data set Regularly revisit and improve data system			

### **KEY CONSIDERATIONS:**

- Align with national targets: Use the same baseline year and assumptions as your NDC and GHG inventory.
- Leverage Kigali data: Article 7 HFC reports are a primary source for setting baselines.
- **Report non-cooling HFCs separately:** Include uses like firefighting and foams; some may count toward NDC mitigation via KIP.

# **Stage 1: Baseline definition (3/3)**



### STEP 1: BASELINE DEFINITION (INDIRECT)



### **KEY CONSIDERATIONS:**

- **Ensure consistency:** Align cooling energy data with national scenarios to support accurate emissions tracking.
- Use existing sector analysis: Build on any available studies of energy demand (e.g. for lighting, refrigeration, AC) to improve the baseline.

### **Stage 3: Target Formulation**





# **Stage 3: MRV of Implementation and Ambition Review**







Starting with key **GUIDING QUESTIONS** can help surface the suitable leverage points and priorities for the country.

- How well understood is the lack of access to cooling in your country? What data gaps exist?
- What are the most vulnerable sectors in your country that would benefit from cooling adaptation measures?
- How can your country balance the need for advancing cooling access for *tomorrow* with the urgency of providing adaptation solutions *today*?
- What resources, networks and innovative models can be leveraged to achieve the necessary speed and scale for advancing adaptation solutions where they are needed the most: the poorest of the poor

# **Methodology Guide for Adaptation**

Quantify cooling

needs and populations at

risk.



reduce heat risk.

Taking stock of available data

 Assess existing risks, data, and vulnerabilities.

### **Stage 1: Baseline definition**



### STEP 1: TAKING STOCK OF DATA



Use this as starting point for defining adaptation targets and tracking improved adaptive capacity

### **Stage 1: Baseline definition**



### **STEP 2: DEFINING THE BASELINE**

			Č	<u>eet</u>
Adaptation baseline	Population Group/Cooling needs	Comfort & Safety	Food & Nutrition	Health & Care
	Rural Poor (high risk)	No fans or insulation	No cold chains for crops or livestock	No cold chains for vaccines or medicines
	Urban Poor (high risk)	Poor housing, intermittent power	Inadequate food preservation infrastructure	Poorly equipped and built urban clinics
	Lower-Middle Income (medium risk)	Low-cost, inefficient cooling devices	Variable quality and efficiency of cold chain access	Variable quality and efficiency of cold chain access

### **Stage 2: Target Formulation**





# **Stage 3: MRV of Implementation and Ambition Review**





#### STEP 6: Analysing progress



Prioritize gender-disaggregated indicators to track equitable access to cooling and adaptation benefits.

### **Support Package**



Are you a Global Cooling Pledge Signatory? If yes, then please reach out to the Cool Coalition Secretariat to schedule a call to arrange the NDC support to help you integrate cooling measures into the upcoming NDC submission.

Our support package for Global Cooling Pledge Signatories include:

- Support to compile and **collect** high-level cooling sub-sectoral data.
- Assess the GHG impact of sustainable cooling and develop long-term scenarios to provide recommendations for relevant NDC areas and assisting in formulating both qualitative and quantitative NDC targets for mitigation and adaptation.
- Support coordination among sectoral technical lead agencies (as per IPCC sectors, including Energy, IP, etc.)
- The NDC Cooling Working Group members can provide guidance and advisory support

Means of support are as per country requirement and resource availability can include local and international expert support to provide technical and coordination assistance.

### **Panel Discussion**

Integrating Cooling into NDCs: Assessing Readiness and Next Steps





Leslie Smith Director, Ministry of Climate Resilience, the Environment and Renewable Energy Grenada



Uboho Ekpo Principal Scientific Officer, National Council on Climate Change Secretariat Nigeria



Le Ngoc Tuan Deputy Director General Department of Climate Change Ministry of Agriculture and Environment Vietnam





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

MINISTERO DELL'AMBIENTE E DELLA SICUREZZA ENERGETICA



### **Global Scale Up:**

Applying NCAP methodology and Introduction to NCAP Working Group



Mr. Amr Seleem Country Engagement & Climate Policy Lead Cool Coalition – UN Environment Programme



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





# The National Cooling Action Plan Methodology



A great example of global cooperation, the development of a holistic NCAP methodology offers a standardized yet **adaptable framework that any country can apply** to guide the creation of comprehensive NCAPs.

Over 10 countries are already using the methodology, supported by a strong network of international partners.



### **Key Role of NCAP**

Establish a strong **political will** and meaningful **nationwide directives** 

Drives governance and market signals for investment

Drive a synergistic approach leveraging inter-linkages with other government agendas, aligning cooling policies across multiple sectors and dimensions



Set **actionable targets** to improve cooling **access**, while reducing environmentally harmful impacts maximizing the socio-economic benefits

> Bring together the actors required to coordinate **energy efficiency** and conservation with the **refrigerant transition** incl. HFC phase down

Evidence base for increasing climate ambition and to integrate cooling in NDCs and climate change policies



# NCAP Methodology: Supporting Cooling Action at a 'National' Level

**PURPOSE:** A holistic but modular 'guidemap' for the development of NCAPs that –

- Drives integrative action across multiple sectors of cooling and considers access to cooling for all
- Sets direction and actionable targets for addressing access to cooling while reducing its environmentally harmful impacts & maximizing the socio-economic benefits

**DESIGN:** Recognizing the **diverse needs and context** across countries, the Methodology is:

- Highly customizable to a country's priorities and capacities
- A process that is within the reach of most countries TODAY and can enable immediate and prioritized action towards climate-friendly cooling
  - Not a prescriptive approach; not a modeling framework



NGALI 🗻 giz a 🚃 (pan) 📲 💁 🔄 🕬 🚛

> NCAPs establish sectoral baseline and long-term policy scenarios with policy, finance and technology recommendations



# **Underlying Principles of the Methodology**

To support its objectives, three fundamental characteristics are present in every step of the Methodology:

### **1. Adaptability is critical.**

 Methodology provides guidance while affording NCAP development teams high levels of discretion and flexibility to adapt to countries' unique context and needs

### 2. Simplification and prioritization are important.

- The methodology has to be simple and logical; enabling countries to prioritize (and/or phase out) the steps based on their resource availability/constraints
- Data collection has to be kept simple; excessive data requests can overwhelm the stakeholders and add unnecessary complexity (even resistance!)

### 3. Multi-stakeholder and collaborative development right from the start

- Mechanisms for effective inter-government and triple-sector engagement
- Importance of a nodal/coordinating entity that owns and drives the process









NCAP development team

Government entities

**Researchers & analysts** 

Private sector & industry



programme



### **Integrated Approach to Addressing Cooling**

- First, **reduce** the **cooling loads** to the extent possible
  - Such as, through thermally efficient building design and construction, and passive cooling practices in case of the building sector
- Then, serve the cooling loads **efficiently** & with **low-climate impact** 
  - Such as, with appropriate and efficient cooling equipment and solutions that use environment-friendly refrigerants to deliver the required amount of cooling with less energy and lower overall emissions
- And, **optimize** the cooling operations and behaviors
  - Such as, through good O&M practices, user adaptations etc. to ensure that cooling is delivered only to where and when it is needed

Right-size the demand for cooling and optimize the supply of cooling; apply both strategies in conjunction



# **Underlying Characteristics of the Methodology**



MULTI-STAKEHOLDER COLLABORATION



### **Current and Future Cooling Demand Assessment**

STAGE I: CONTEXTUAL ASSESSMENT & PLANNING STAGE II: COOLING DEMAND ASSESSMENT STAGE III: SYNTHESIS & NCAP CREATION

- Utilization of Data Assessment Frameworks to identify and collect key data indicators for quantifying the current and future cooling demand for each sector
- Key analytical steps:
  - Establish **Baseline**: provides a baseline for the Country's cooling demand (and impacts)
  - Determine **BAU growth**: gives an informed view onto the impacts of the future growth and the 'cost of doing nothing'
  - Determine Intervention scenario: gives an informed view into the impact of readily accessible interventions, and the gaps and opportunities to consider
- This analysis is pivotal for identifying and developing the NCAP recommendations and pathways to accelerate the country's transition towards low climate-impact cooling

### Intended outcome:

- Baseline cooling energy demand for each cooling sector; related emissions
- Energy saving potential and emission reduction potential through readily accessible interventions
- Identification of priority interventions & critical gaps to address



### **NCAP Report and Implementation Guidance**

STAGE I: CONTEXTUAL ASSESSMENT & PLANNING STAGE II: COOLING DEMAND ASSESSMENT CREATION

- Key expected outcomes of the NCAP & how they support the country's climate commitments and development priorities
  - Impacts in terms of: energy savings, emissions reduction, supporting access to cooling, other socio-economic co-benefits aligned with the country's priorities and/or SDGs (example: jobs required in the future servicing sector)
- Embedding 'implementation guidance' into the NCAP important considerations:
  - Establish an institutional framework to monitor the progress of NCAP implementation such as, an 'NCAP Cell' within the nodal government entity
  - Identify a recalibration protocol Provision to review and update NCAP at interim milestones of 3-5 years to review implementation progress and to update NCAP using latest information
  - To the extent possible, provide a ballpark estimate of the cost of implementing the NCAP to inform the distribution of government budget

### Intended outcome:

An actionable document that has the 'ownership' and a governance structure in place for guiding and monitoring future actions (and as-needed calibration) towards sustainable cooling



### **NCAP Methodology Regional Approach**

### Why a Regional Approach?

- o Similar ambient temperature conditions
- o Developing economies
- Potential similar interventions (passive cooling, alternative refrigerants, energy efficiency options)
- o Culture perspective

### Regional contextualization of NCAP methodology

- UNEP and RCREEE within the Cool Coalition framework are developing a regional NCAP methodology for the MENA region jointly with SEforALL, UNDP, AfDB, and Cool Up, supported by CCAC
- The methodology is being guided by a Regional Technical Advisory Group for NCAP, constituted with MENA countries as members
- > Building regional partnerships to accelerate NCAP adoption
  - Established Regional Technical Advisory Group for NCAP for the MENA region joined by 12 member states
  - Forged partnerships among UNEP, AfDB and RCREEE to support 5 NCAPs in Africa



This map is without prejudice to the status of or the sovereignty over any territory, to the delimitation of international frontiers and boundaries, and to the name of any territory, city, or area Source: Moniur Mourshed. 2016


# **Strategic Support We Provide**

#### The NCAP working group:

- Co-chaired by UNDP and Cool Up, with members from international organizations, financial institutions, development agencies, and CSOs.
- Facilitate countries in **developing and implementing holistic NCAPs** using the NCAP Methodology.
- Promote alignment of NCAPs with broader climate and energy frameworks, including KIPs, NDCs, energy efficiency strategies, and net-zero plans.
- Foster capacity-building, knowledge-exchange, and technical guidance for stakeholders involved in cooling policy.
- Advance access to sustainable cooling by **integrating unmet cooling needs into national planning**.
- Facilitate **matchmaking** and guidance on resource opportunities e.g. MDBs, partners, etc.





### **Case Study**

Cambodia - from piloting the methodology to lessons learned from NCAP implementation

#### H.E. Pak Sokharavuth Under Secretary of State Ministry of Environment, Cambodia



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



رزارة الطاقـــــة والبنيـــــة التحتيــــة MINISTRY OF ENERGY & INFRASTRUCTURI

# **Cambodia's National Cooling Action Plan**

- Cambodia has been strong advocate for promoting sustainable cooling globally and being a part of 71 signatories of the Global Cooling Pledge at the COP 28 in 2023.
- Cambodia is the first country to adopt NCAP methodology and launched its National Cooling Action Plan with vision to tackle extreme heat and handle the cooling challenge comprehensively in an integrated manner.
- National Cooling Action Plan (NCAP) supports Cambodia's long-term development vision in building a sustainable, clean, green, and low-carbon society based on climate-friendly strategy and energy-efficient technology in the cooling sector.

**NCAP focuses on five main areas:** (1) Building Space Cooling, (2) Food Cold Chain, (3) Healthcare Cold Chain, (4) Mobile Air Conditioning, and (5) Process Cooling.





# **Cambodia's Leadership on Passive Cooling**

Since early 2023, Cambodia has been implementing its NCAP through the project '*Passive Cooling Strategies for Sustainable Development*,' aiming to integrate passive cooling into national policies and practices in collaboration with ESCAP & UNEP within the Cool Coalition framework

#### **Outputs:**

- **1. Policy recommendations incorporating PCS in building energy regulations** 
  - Typology technical analysis + Compendium of Passive Cooling Strategies (PCS) + Abridged Guidebook on PCS + Guidelines for PCS (under review)

#### 2. Demonstration of PCS applications in a pilot building

- Design Charrette in Borey Chankiri (two days)
- Local data building with baseline & strategies, on site monitoring (1 year)

#### 3. Awareness and capacity building for large-scale replication

- Launch of a Community of Practice, provision of a series of workshops and technical trainings, including training of trainers
- Regional knowledge exchange with Governments & Technical peers
- **4. Support for integration** of NCAP to Cambodia's CCSP 2024-2033 and the inclusion of GHG emission reductions from PCS in the target for Cambodia's Nationally Determined Contributions (NDC 3.0).



MINISTRY OF ENVIRONMENT

How is the government of Cambodia ensuring cross-sectoral coordination and institutional alignment in the implementation of NCAP?

### **Cambodia's Strategy for Cross-Sectoral Coordination in NCAP Implementation**

- The Ministry of Environment (MoE) is leading the coordination with Inter-ministerial such as NCSD, MLMUPC, MME, MISTI, and strategic engagement with development partners;
- Integration with national Policies, Strategy, and Plan
  - Cambodia's Long-Term Strategy for Carbon Neutrality (LTS4CN)
  - ✓ Cambodia Climate Change Strategic Plan (CCCSP) 2024−2033
  - Cambodia's Nationally Determined Contributions (NDC 3.0)
- Inter-Ministerial Consultations and Workshops: hosted a series of inter-ministerial workshops to gather inputs, build consensus, and validate the NCAP and related guidance documents;
- **Capacity Building and Sectoral studies**: worked with ITC University, and national and international experts to conduct cross-sectoral technical studies on passive cooling strategies, at building level (building efficiency and resilience) and city level (to tackle urban heat island effect (UHIE);
- **Partnership with the Private Sector and Development partners** such as UNEP's Cool Coalition, UN-ESCAP, Energy Foundation China, GlobalABC, Climateworks Foundation, and Urbanland.
- **Monitoring and Reporting**: The MoE will play a coordinating role in tracking progress and facilitating regular inter-agency dialogue.





# **Case Study** Morocco's NCAP development and vision for implementation



Head of Gas Emissions Service - Department of Sustainable Development Ministry of Energy Transition & Sustainable Development



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



يزارة الطاقــــة والبنيــــة التحتيــــة MINISTRY OF ENERGY & INFRASTRUCTURI

# **National Cooling Action Plan (NCAP)**

#### Introduction

- The National Cooling Action Plan (NCAP) is a vital operational framework designed to implement sustainable cooling measures through targeted policies, programs, and technologies, aiming to address the country's growing cooling demands in a sustainable, equitable, and climate-resilient manner.
- The project is implemented by the UN Environment Programme (UNEP) Cool Coalition and the Regional Centre for Renewable Energy and Energy Efficiency (RCREEE), with the support of the Climate & Clean Air Coalition (CCAC).
- <u>Cool Coalition</u> is establishing a methodological framework that adopts global NCAP Methodology to the region's specific cooling context of the MENA region.







#### Morocco Context

- Growing cooling demands across multiple sectors (space, healthcare, food, industrial processes) are driven by increasing temperatures due to climate change and rapid urbanization.
- The NCAP perfectly aligns with Morocco's national priorities and its international commitments, including the Global Cooling Pledge, the Kigali Amendment, and its engagements with CCAC.
- Tackling environmental challenges and advancing a sustainable energy future, positioning the NCAP as a crucial tool to achieve these broader national development and climate objectives.
- Continuing of the implementation process for the action plan targeting shortlived climate pollutants (CH4, HFCs, BC, O3) that was developed in 2021 with technical and financial support from the CCAC.
- Morocco NDC: A set of energy-saving measures, including the implementation of MEPS for refrigerators and air conditioners.



# **NCAP Kick-Off in Morocco**

- The kick-off meeting for Morocco's NCAP was successfully launched on May 27, 2025, in Rabat, Morocco.
- The event convened key stakeholders, including representatives from Moroccan Ministries, the private sector, agencies, sustainable development organizations, and national experts, to mark the pivotal start of the NCAP's development.
- Opening speeches (UNEP Cool Coalition, Moroccan ministries, and CCAC) emphasized the global importance of NCAPs, Morocco's commitment to environmental sustainability, and the integration of the plan within national energy and climate goals, followed by an overview of the NCAP development process and interactive discussions.

#### • Objectives of the meeting:

- i. to present the different components of the project,
- ii. to lay the foundations for a concrete action plan for sustainable cooling,
- iii. to share the expectations and priorities of the various stakeholders,
- iv. to initiate a participatory process.









### **Morocco NCAP Inter-Ministerial Meeting**

- The high-level meeting of the National Steering Committee for the NCAP project was held on **May 28, 2025**, at the Ministry of Energy Transition and Sustainable Development in **Rabat, Morocco**.
- Attended by key national stakeholders and consultant teams, the primary objectives were to establish a clear governance framework, define roles and responsibilities for committee members, and outline robust coordination mechanisms for the NCAP.
- Discussions focused on the Steering Committee's mandate, stakeholder identification and composition, clear role definitions for members, and the coordination mechanisms necessary for effective project oversight and seamless collaboration among all involved entities.











### **Morocco NCAP Consultation Mission**

On **May 29, 2025**, a consultation mission took place **in Casablanca, Morocco**, which included three visits focused on collecting crucial data for the National Cooling Action Plan (NCAP).

- 1. <u>1st visit to Moroccan Association of Refrigeration Professionals (AMPF):</u> A key organization promoting sustainable practices, collaborating on the Refrigair Expo, and actively supporting NCAP development through a focus on energy efficiency, climate-friendly refrigerants, and training.
- <u>2<sup>nd</sup> visit to Ventec Maroc:</u> A company with a significant history in Morocco's cooling sector since 1949. Initially focused on industrial ventilation, then, Ventec evolved into a major HVAC presence, representing Carrier and demonstrating expertise in advanced cooling systems like evaporative cooling.
- **3.** <u>**3**<sup>rd</sup> visit to FROIDEL S.A.</u>: A leading Moroccan company with over 44 years of experience in refrigeration and air conditioning. Recognized for its innovative and energy-efficient solutions, particularly in decarbonization, serving diverse sectors and manufacturing its own brand alongside international representations.







### Vision of Morocco NCAP

Scale up and mobilize all stakeholders—public authorities, industry, experts, civil society—to build a concrete and integrated roadmap for sustainable, socially, technologically advanced, and environmentally friendly cooling through:

- Satisfaction of cooling demand.
- Improving energy efficiency.
- Promoting eco-friendly refrigeration and air conditioning technologies.
- Training for professionals in the cooling sector: skills in system maintenance and also in the design and development of new technologies.
- Developing standards and regulations to encourage both the use of more efficient technologies and the promotion of research and development of energy-efficient technologies.







# **Open Discussion** Advancing NCAPs : Strategies for Implementation, Financing, and Monitoring



Moderator: **Mr. Amr Seleem Country Engagement & Policy Lead** Cool Coalition – UN Environment Programme



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



يزارة الطاقـــــة والينيـــــة التحتيــــة MINISTRY OF ENERGY & INFRASTRUCTURI

### **Q&A** Session

1. What is your status on NCAP? *a) Exploring/preparation phase b) Development phase c) Implementation phase* 

2. What are the challenges in developing comprehensive NCAPs (e.g. data availability, integrated assessment, inter-sectoral coordination) And what strategies can governments adopt to effectively address these obstacles?

3. How can we translate NCAPs into an effective finance mobilization tool?

4. How can governments ensure effective implementation and monitoring of NCAPs? Please share mechanisms that may have proved to be successful (in your experience).

# **Session Wrap-up**

Sustainable Cooling in focus: Priorities for the road ahead



Mr. Amr Seleem Country Engagement & Policy Lead Cool Coalition – UN Environment Programme



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



رزارة الطاقــــة والبنيــــة التحتيــــة MINISTRY OF ENERGY & INFRASTRUCTURI

# **Day 2 Closing Remarks** Moving Ahead Together on Sustainable Cooling



Lily Riahi Global Coordinator Cool Coalition, UNEP



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



وزارة الطاقـــة والبنيـــة التحتيـــة MINISTRY OF ENERGY & INFRASTRUCTURE

# Thank you!

### **Global Cooling Pledge Signatories Focal Points Meeting**

June 13 - 14 2025 | Bonn, Germany