



Asia Clean Energy Forum Deep Dive Workshop

Regional Leadership on Sustainable Cooling
and the COP 28 Global Cooling Pledge

June 15, 2023



Agenda

1. **2:00- 3:30 - Session 1: Opening and Session on Technology and Business Model Innovation**
 - Welcome Address: Mr. Kee-Yung Nam, Principal Energy Economist, Asian Development Bank
 - Keynote Address and Panel Introduction: Dr. Peter Warren, Climate Innovation & Finance, Department of Energy Security and Net Zero, Government of the United Kingdom
 - Panel Discussion: Technology and Business Model Innovation
2. **4:00 – 5:30 - Session 2: Regional Leadership and the Global Cooling Pledge**
 - Opening Remarks: Mr. Hongpeng Liu, Director, Energy Division, United Nations Economic and Social Commission for Asia and the Pacific
 - Scene Setting Presentation on Progress on Regional Cooling Policy and Ambition: Ms. Anna Lobanova, Sustainable Energy Specialist, United Nations Economic and Social Commission for Asia and the Pacific
 - Roadmap to a Cool COP, and the Global Cooling Pledge: Ben Hartley, Principal Specialist, Energy Efficiency and Cooling, Sustainable Energy for All
 - Panel Discussion: Country Leadership and the Global Cooling Pledge



Welcome Remarks

Mr. Mr. Kee-Yung Nam, Principal Energy Economist
Asian Development Bank





Sustainable Cooling: Role of International Climate Finance

Dr. Peter Warren

Climate Innovation & Finance

Department for Energy Security & Net Zero

UK Government

UK International Climate Finance

- ❖ **Commitment:** £11.6bn ODA between 2021/2022 and 2025/2026 (with at least £3bn on nature and tripling adaptation finance to £1.5bn in 2025)

- ❖ **4 main areas-of-focus:**
 - Clean energy
 - Nature for climate and people
 - Adaptation and resilience
 - Sustainable cities, infrastructure and transport

- ❖ **Clean energy:**
 - Increasing renewable power investments of British International Investment (BII)
 - Working through partnerships under the Breakthrough Agenda
 - Delivering the Ayrton Fund RD&D commitment
 - Strengthening governance, policy and regulatory frameworks for clean energy, fossil fuel subsidy reform and coal phase-out, and mobilising private finance
 - Supporting strategic systems planning (NDCs)
 - Supporting deployment of high-quality clean energy



UK Sustainable Cooling International Assistance Offer



Examples of Existing International Climate Finance (ODA) Innovation Funding for Sustainable Cooling in ODA-Eligible Countries:

- £50m (~\$62m) **Clean Energy Innovation Facility (CEIF) 1.0**: Accelerates commercialisation of innovative clean energy technologies in developing countries (cooling, industry, smart energy, storage): 2019-2023
- £65.5m (~\$81m) **Accelerate-to-Demonstrate (A2D) Facility**: Accelerates commercialisation of innovative clean energy technologies in developing countries (critical minerals, hydrogen, cooling, EE, industry, smart energy, storage, transport): 2023-2029
- £18.4m (~\$23m) **Low Energy Inclusive Appliances (LEIA)**: Improves efficiency, performance, availability of super-efficient electrical appliances & solar-powered technologies in off-grid & weak-grid settings (£2m (~\$2.5m) for cooling): 2022-2025
- £225.4m (~\$280m) **Transforming Energy Access (TEA)**: Research & innovation platform supporting early-stage testing & scale-up of innovative technologies & business models for clean energy access in Indo-Pacific, Sub-Saharan Africa, South Asia
- £21m (~\$26m) **Sustainable Cooling & Cold Chains Solutions**: Focuses on early uptake of sustainable cooling & cold-chain solutions in developing countries with expert inputs at all stages (academics, industry, governments) – Africa Centre of Excellence for Sustainable Cooling & Cold Chain represents >80% of funding (reducing food/vaccine loss, training: engineers, farmers, healthcare)



Mission Innovation:

- ❖ Global initiative to catalyse action & investment in clean energy RD&D
- ❖ Affordable heating and cooling of buildings challenge: global 'innovation community' focused on strengthening the clean energy innovation ecosystem & facilitating new partnerships accelerating innovation & pathways to net zero

Montreal Protocol and Kigali Amendment:

- ❖ Global use of HFCs to be phased down by 85% between 2019-2036 (UK amongst first 20 parties to ratify)

Wider UK ODA Financing with links to Sustainable Cooling:

- ❖ *Market Accelerator for Green Construction (MAGC):* £102.9m (~\$129m)
- ❖ *Global Innovation Lab for Climate Finance:* £269k (\$334k), including to cooling-as-a-service
- ❖ *Clean Energy Fund Technical Assistance (CEF TA):* £19.5m (~\$25m) (includes cooling projects)



£1bn Ayrton Fund Commitment

Approach:

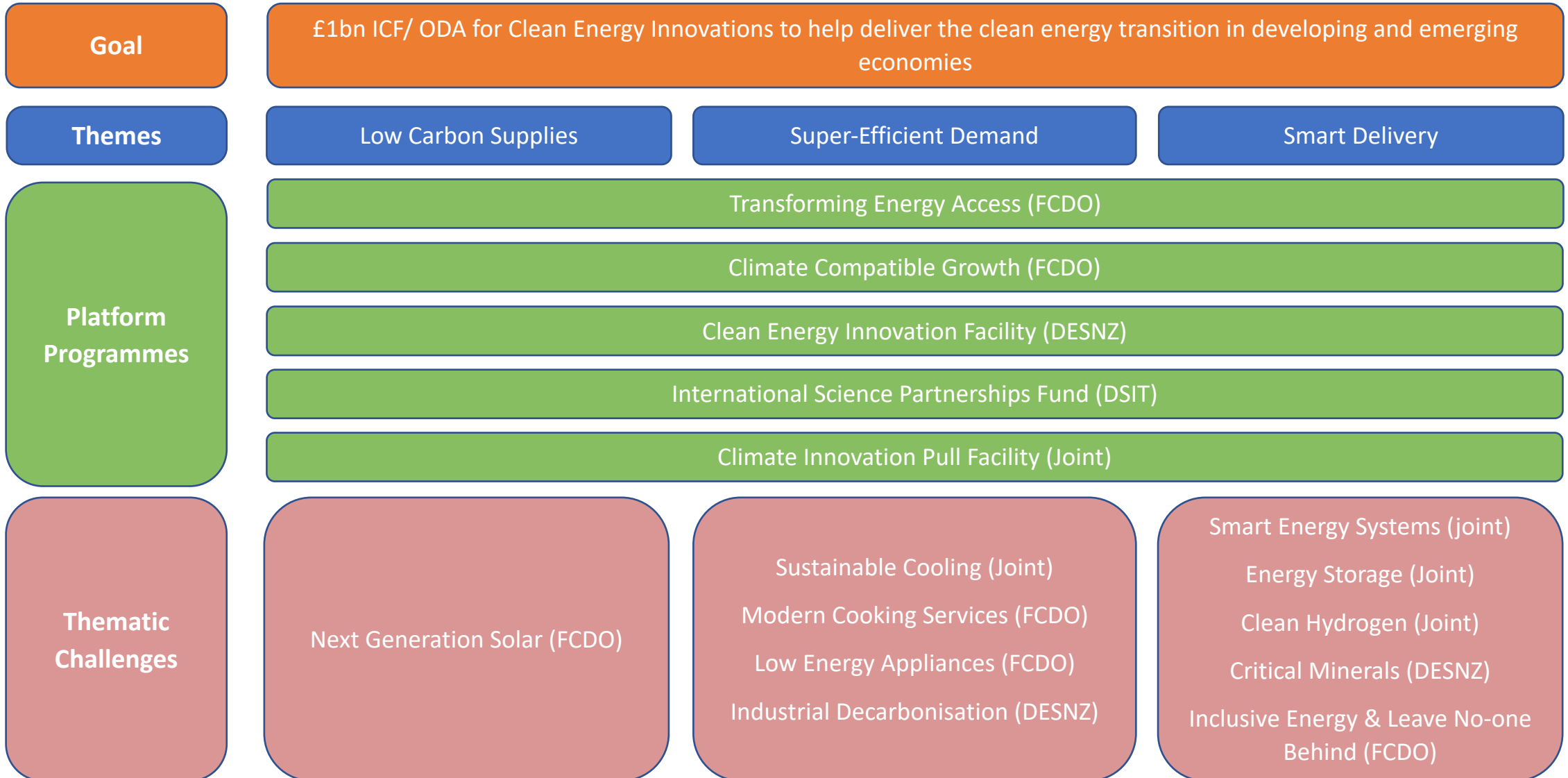
- Principle lever for UK ODA support for clean energy innovation: [£1bn Ayrton Fund](#)
- Announced in 2019 (part of UK's £11.6bn international climate finance commitment)
- Delivered 2021-2026 & aims to accelerate clean energy transitions in developing countries by making clean energy most affordable, accessible & attractive options

Focus:

- ❖ Off-track thematic areas for delivery of SDGs 7 & 13
- ❖ E.g. sustainable cooling, industrial decarbonisation, critical minerals, clean hydrogen, smart energy, energy storage, energy efficiency & clean transport

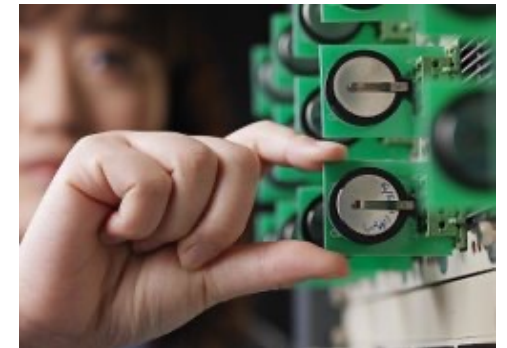


Ayrton Fund Platforms



Programme Case Study: £50m Clean Energy Innovation Facility (CEIF)

- ❖ Aim: to accelerate the commercialisation of innovative clean energy technologies in developing countries through advancing Technology Readiness Levels (TRLs 3-7)
- ❖ Timeframe: 2019-2024
- ❖ Four thematic Funds:
 - CEIF Sustainable Cooling Innovation Fund (£15m, IFC)
 - CEIF Industrial Decarbonisation Innovation Fund (£17.7m, World Bank)
 - CEIF AI & Digitalisation Innovation Fund (£10m, ADB)
 - CEIF Energy Storage Innovation Fund (£7.3m, Innovate UK)
- ❖ Impacts:
 - ❖ 87 projects have been supported to date
 - ❖ £44m of private finance has been leveraged
 - ❖ 211 knowledge-sharing and training-events have been held



Programme Case Study: £50m Clean Energy Innovation Facility (CEIF)



CEIF Sustainable Cooling Innovation Fund (£15m, IFC)

❖ Overview:

- Number of projects supported: **48 pilot projects** so far
- Examples of projects supported: Scaling and replicating **cold chains** technologies, **cooling energy efficiency**, piloting **space cooling** technologies in the hospitality sector and piloting cooling technologies in cold chains
- Geographies: **Asia (India)**, South America (Colombia & Mexico), Africa (Nigeria)

❖ Impacts (interim results show – March 2024 end-date):

- ❖ **75% of projects have advanced** at least one Technology Readiness Level towards commercialisation through in-country pilot-testing
- ❖ Projects have **leveraged >£45m (~\$56m)** of private finance so far
- ❖ **114 effective in-country capacity building activities** have been held globally
- ❖ Hospitality sector (India): most tech will meet/exceed target of minimum 15% energy saving



Project Case Study: Sustainable Cold Chains in India

❖ Context:

- *India's challenge:* to double cold chain capacity from 30mt to 60mt of food
- *Electricity (diesel gensets):* ~70% operating expenses for cold storage in hot, humid conditions

❖ Overview:

- *Cost:* \$900,000 to support increased cold storage capacity
- *Expected impacts:* reduced costs for retailers, reduced food waste & reduced emissions
- *Focus:* pilot switching to renewables (biomass) & natural refrigerants; lifecycle emissions data



New Programme: £65.5m Accelerate-to-Demonstrate (A2D) Facility

- ❖ Aim: to accelerate the commercialisation of innovative clean energy technologies in developing countries, particularly focusing on cross-cutting areas for energy transitions critical minerals and clean hydrogen
- ❖ Timeframe: 2023-2029
- ❖ Three thematic pillars delivered through UNIDO:
 - A2D Cross-Cutting Pillar (including sustainable cooling)
 - A2D Critical Minerals Pillar
 - A2D Clean Hydrogen Pillar
- ❖ Activities:
 - ❖ [Announced by UK Prime Minister at COP27 & launched in May 2023](#)
 - ❖ In set-up phase & due to be operational in early 2024
 - ❖ Further information to be announced towards the end of 2023



Session 1: Technology and Business Model Innovation for Sustainable Cooling

Panel:

- ❖ *Chair (Government):* Dr. Peter Warren, Climate Innovation & Finance, Department for Energy Security & Net Zero, UK
- ❖ *Innovator:* Dr. Beta Paramita, Program Manager, Cool Roofs Indonesia: The Power of Passive Cooling in Indonesia, Indonesia
- ❖ *Government:* Ms. Diane Marharjan, Chief of Innovation Staff, National Economic & Development Authority, Philippines
- ❖ *Innovator:* Dr. Prasanna Rao Dontula, Chief Technology Officer, A.T.E. Enterprises Private Limited, India
- ❖ *Government:* Ms. Maraida Santos Licerio, Senior Advisor on Climate Change Mitigation and National Coordinator, GIZ, Germany
- ❖ *Financier:* Ms. Clemencia Torres de Mastle, Senior Economist, ESMAP, World Bank

Deep Dive Workshop: Regional Leadership on Sustainable Cooling & the COP 28 Global Cooling Pledge





Opening Remarks

Mr. Hongpeng Liu, Director, Energy Division,
United Nations Economic and Social Commission
for Asia and the Pacific



ESCAP
Economic and Social Commission
for Asia and the Pacific



National Cooling Action Plans: Advancing sustainable cooling

Anna Lobanova

Specialist on Connectivity and Sustainable Energy, ESCAP

How do we bend the demand curve?

COOLING DEMAND

Energy efficient and climate-friendly cooling technologies

Urban heat island effect mitigation

Passive-cooling strategies for buildings



Climate change

Urbanization

Population

Incomes

- Lowered cooling-related energy demand and emissions
- Increased access to cooling services
- Increased climate resilience

Why develop a National Cooling Action Plan?

- Link, strengthen, and build on **national energy efficiency and climate policy goals** and **international NDC, refrigerant transition and SDG objectives**
- Realize multiple benefits:
 - **Reduce cooling's pressure** on the energy system and climate
 - Unlock **economic savings** through energy efficiency
 - Increase **heat resilience**, improve **comfort** and **productivity**, reduce **food and medicine losses**.



Cool Coalition NCAP Methodology

STAGE I:
CONTEXTUAL ASSESSMENT
& PLANNING

STAGE II:
COOLING DEMAND
ASSESSMENT

STAGE III:
SYNTHESIS & NCAP CREATION



STEP 1

COUNTRY-CONTEXT MAPPING

High-level mapping of cooling landscape using existing data & knowledge

STEP 2

NCAP PLANNING AND PRE-WORK

Establishing core guiding components of the development process, such as broad priorities, key stakeholders, and engagement and governance structures

STEP 3

SECTOR-WISE CURRENT AND FUTURE COOLING DEMAND ASSESSMENT

Conducting thorough data-driven assessments of the current and future cooling demand for each of the chosen cooling sectors

STEP 4

SECTOR-SPECIFIC RECOMMENDATIONS & SOLUTIONS

Identifying solutions and future pathways for each of the cooling sectors using the sector-wise analysis

STEP 5

INTEGRATION

Consolidating sector-specific assessments into a cohesive cooling assessment; identifying cross-sectoral synergies

STEP 6

DEVELOPMENT OF NCAP RECOMMENDATIONS

Developing and prioritising NCAP recommendations; mapping the expected impact of NCAP recommendations

STEP 7

NCAP REPORT & IMPLEMENTATION GUIDANCE

Creating an actionable NCAP report, embedded with an implementation and governance framework

National Cooling Action Plan (NCAP) Development Process

Cambodia's Cooling Context

- At least 45% of electricity consumed is for cooling
- The majority of households do not have air conditioners, but temperatures are rising and uptake is increasing rapidly
- Building space cooling represents the largest and cooling demand center
- Cooling is vital to expanding agriculture and fisheries, food and medicine storage. Food cold chains represent the fastest growing cooling sub-sector



Key Recommendations from Cambodia's NCAP



Introduce building energy performance standards



Promote of “not-in-kind” (NIK) technologies



Introduce standards and labelling for cooling equipment



Strengthen cold chains for food and medicine



Transition to low-GWP refrigerants



Create market enablers and financial delivery mechanisms



Develop a market monitoring mechanism



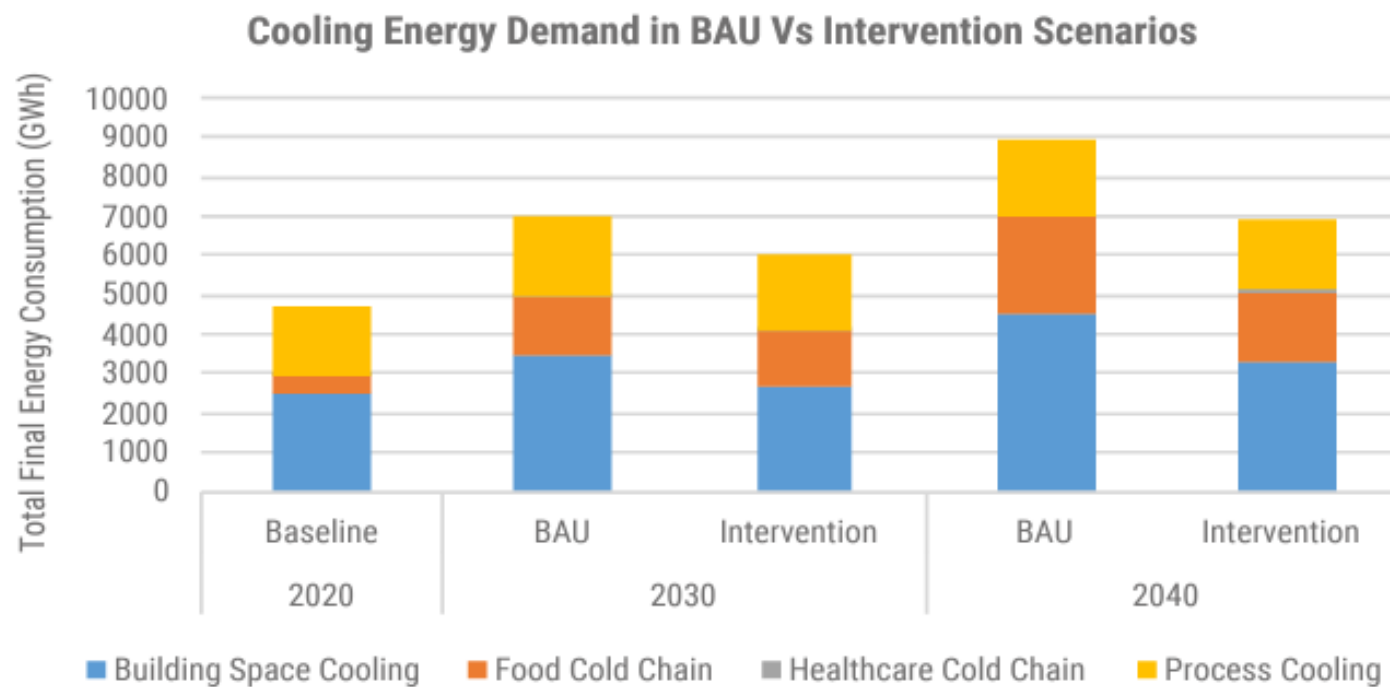
Unlock various financial sources



Strengthen international cooperation and partnerships

Potential savings

- Implementation of recommended NCAP measures in Cambodia could lead to a 14% electricity savings by 2030 and 23% by 2040.
- The interventions could help save up to 12% of emissions by 2030 and 17% by 2040

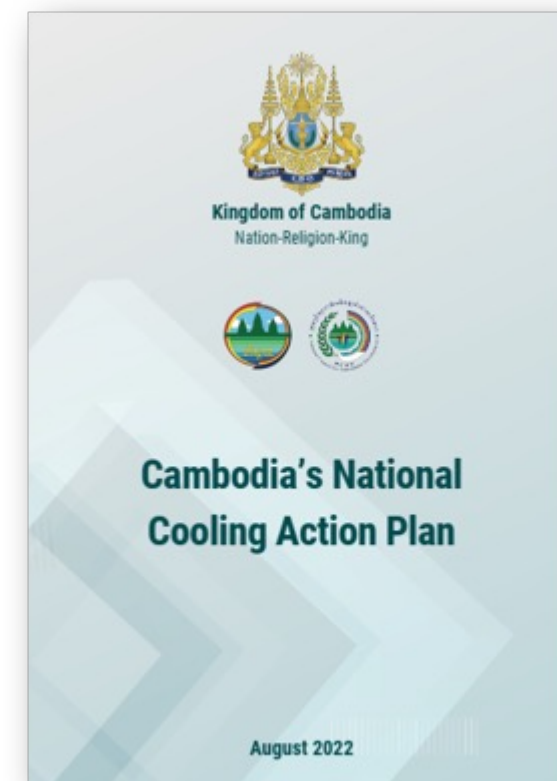


Next Step: Implementation of key recommendations

■ Passive Cooling Strategies (PCS) demonstration project

- Pilot passive cooling strategies in a project building
- Analyze the potential for PCS to lower energy consumption and emissions across different building typologies
- Produce recommendations for building energy regulations and guidelines
- Contribute to the next round of NDC updates.

■ Mobilizing technical and financial support to implement other key recommendations



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Sustainable Cooling Towards a Cool COP28

In a warming world, cooling is not a luxury but a necessity.

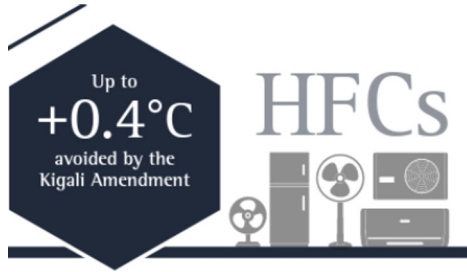
- Equitable access to cooling protects people against extreme heat, keeps food fresh, and vaccines stable.
- **Heat stress results in global economic losses:** ILO projects that heat stress could lead to 80m jobs being lost with losses of US\$2.3 trillion.
- **Extreme heat impacts health:** almost one-third of the world's population faces dangerous temperatures for more than 20 days a year.
- **Lack of cooling impacts food supply:** Lack of effective refrigeration results in losses amounting to 13% of total food production.

But the more we cool, the more we heat the planet.

- **Demand for space cooling is already straining the grids and this will escalate:** the energy requirement for space cooling is predicted to jump 300% – from 2,020 TWh in 2016 to 6,200 TWh in 2050.
- **Cooling is a top driver of electricity and peak demand:** the use of ACs and electric fans accounts for 10% of global electricity consumption (IEA 2022). By 2050, space cooling will account for 30-50% of the peak electricity load.
- **One of the biggest contributors to global warming:** accounting for 7-10% of global GHG emissions. This is expected to double by 2030 and triple by 2050 (IEA 2022).



The Cooling Opportunity

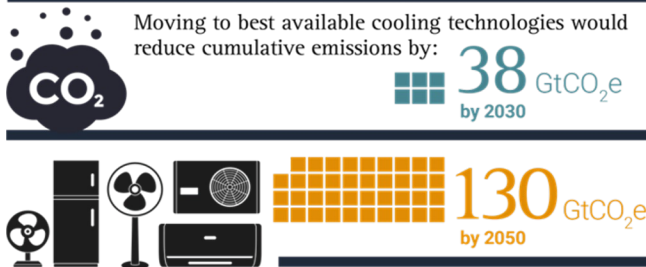


Action under the **Kigali Amendment to the Montreal Protocol** provides opportunity to phase down production and use of HFCs and could avoid up to 0.5 degrees Celsius of global warming

Adopting **higher efficiency standards** can more than double the efficiency of AC units on the market and reduce cooling energy demand by 45%

Doubling the efficiency of air cooling would reduce the need for

1,300 GW by 2050



Coordinated international action on energy-efficient and climate-friendly cooling could avoid as much as 460 billion tonnes of greenhouse gas emissions

Efficient cooling generates savings of nearly USD 3 trillion between now and 2050 with average cooling energy costs almost halving



COP28 UAE Presidency: Setting Priorities on Cooling at CEM 7 and COP27



John Kerry, US Special Presidential Envoy for Climate



Dane McQueen, Director, Programs and Partnerships, COP28 UAE



Rahma Alshamsi, Senior Specialist, COP28 UAE

13th Clean Energy Ministerial and the 7th Mission Innovation Ministerial Side Event –From Blindspot to Hotspot: Accelerating the Transition to Sustainable Cooling:

<https://www.youtube.com/watch?v=edf-AXcRwmo>

COP27 Official Side Event -Delivering on mitigation ambition Sustainable Cooling: A Multipurpose Tool to Deliver on Net-Zero, Adaptation, Food & Energy Security:

<https://youtu.be/I-lojNI7VKk?t=4299>

COP28 Presidency focus on raising ambition on cooling action as a key mitigation and adaptation priority in a warming world and blind spot in the energy transition

1. Cooling input in the Global Climate Stocktake : UNEP Cooling Spotlight Report led by Cool Coalition
2. Commitments to concrete measurable actions at COP28: **pledge and support announcements**
3. High-level moment at COP28: Cooling Leadership Segment (ministerial + non-state leaders), Technology demonstrations

- COP28 UAE team works with UNEP led Cool Coalition as delivery partner. **Building on existing initiatives linked to official climate processes rather than creating new platforms.**
- **The Cool Coalition one of the official outcomes** and “Transformation Initiatives” put forward by the SG at the UN Climate Action Summit, under the energy transition track.
- The Cool Coalition is joint effort of over 130 partners: governments, finance businesses, development organizations, and civil society groups.
- Collaborating on science and policy, knowledge exchange and joint action to accelerate the transition to sustainable cooling.



Global collaboration: enhancing ambition towards a Cool COP28

In January, at the Abu Dhabi Sustainability Week the UAE COP28 Presidency announced the development of the **Global Cooling Pledge and Cool COP Menu of Actions**. The Pledge has been drafted drawing on the technical expertise of the UNEP-led 'Cool Coalition'.



“
 We must move away from cooling systems that are inefficient and polluting and provide equitable access to climate-friendly cooling solutions. We will work with the Cool Coalition and UNEP to elevate this issue and look forward to showcasing solutions at COP28 this year.”

His Excellency, **Dr. Sultan Al Jaber**,
 COP28 President-Designate



“
 Expanding cooling will protect the most vulnerable communities from extreme heat, keep food fresh and vaccines safe, employees productive and digital economies viable. I am pleased that cooling has been put on the global agenda of the next UN Climate Change Conference”

Inger Anderson, Executive Director,
 UNEP



“
 We need to take cooling as a sectoral approach and bringing it to a main stage for our overall energy transition plans. We must ensure that the demand for cooling, which will increase dramatically, is converted to sustainable cooling and that our approach to the energy transition is optimised without compromising people's cooling aspirations.”

Abhay Bakre, Director General, Bureau of
 Energy Efficiency, Government of India



“
 Denmark decided to become a Cool Champion to promote global action on sustainable cooling and bring it to the 2.5 billion people in the global south who lack access. Sustainable cooling is not only the blind spot of the energy transition but can also bring critical co-benefits including food security and health.”

Dan Jørgensen, Minister for Development
 Cooperation and Global Climate Policy, Denmark

Cooling has recently been **included in COP28 Official Program.**



6 DEC

Just Energy Transition / Industry / Trade

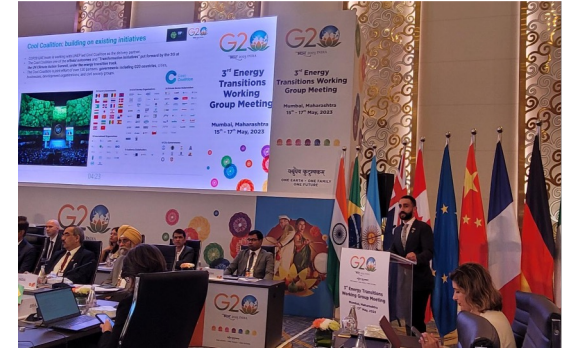
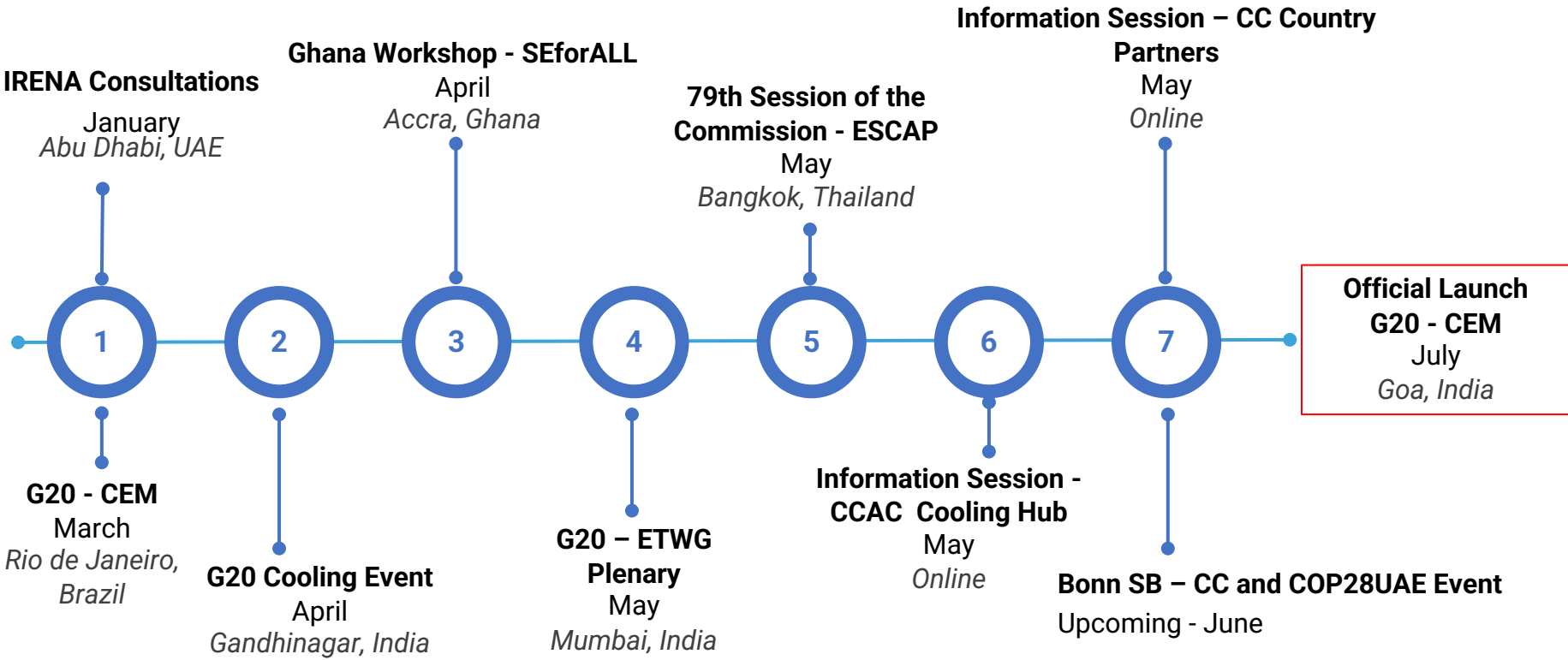
The day will additionally
have a special focus on cooling as a critical
mitigation and adaptation factor.

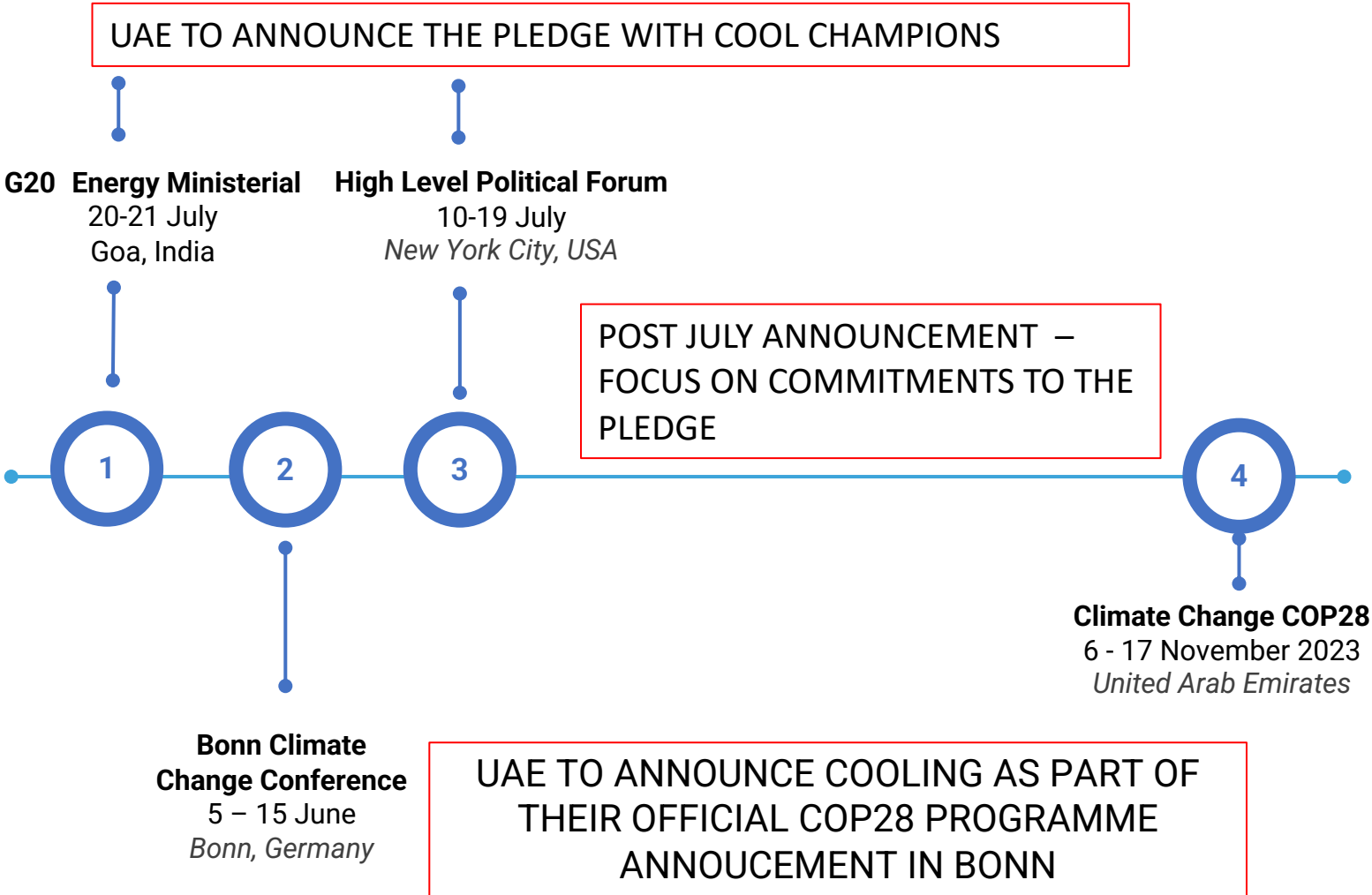
In January, at the Abu Dhabi Sustainability Week the UAE COP28 Presidency announced the development of the **Global Cooling Pledge**. The Pledge has been drafted drawing on the technical expertise of the UNEP-led 'Cool Coalition'.

The **Global Cooling Pledge**, under consultation now, offers state and non-state actors a **Menu of Options** to enhance their commitments to climate mitigation, adaptation, resilience and investments towards sustainable cooling.



The Pledge will continue to be fed with additional comments and contributions. It will be officially launched at the upcoming **CEM in Goa (India) in July** and will be followed by a **campaign to secure further commitments** from countries until COP28.





The Participants in the Global Cooling Pledge:

- *Commit to* work together to collectively increase access to sustainable cooling by 20% by 2030, support adaptation efforts towards increased resilience to extreme heat, and regarding mechanical cooling reduce global anthropogenic cooling emissions intensity across cooling applications by at least 50% below 2021 levels by 2030 as per the International Energy Agency’s Net-Zero by 2050 Scenario;
- *Commit to* support ambitious measures and provide financial resources under the Montreal Protocol Multilateral Fund to improve energy efficiency in the cooling sector while phasing out HCFC and phasing down HFC refrigerants;
- *Commit to* join with other pledge participants to establish MEPS ambition and progress in relation to global Best Available Technology (BAT) that can then be used as a normalized guide to a race to the top in line with the Net-Zero Emissions by 2050 Scenario;
- *Commit to* establish model building codes that incorporate market appropriate passive cooling and energy efficiency strategies by 2030;

- *Commit to* allocate resources, establish regulatory and incentive structures, and increase investment in order to increase the share of renewable energy sources by XX% in the total energy used for cooling;
- *Commit to* developing and releasing a national cooling action plan by 2025 with cross-sectoral domestic targets on cooling, and to reflect actions on sustainable cooling in revised development plans, climate strategies and as appropriate Nationally Determined Contributions to the Paris Agreement;
- *Commit to* procuring equipment of low-global warming potential (GWP) and high efficiency cooling technologies focused on lowest lifecycle cost across all government buildings by 2025 in order to help prime the private sector market;
- *Commit to* increase the proportion of nature-based solutions for cooling to include XX% of designated green or blue spaces, enhancing biological diversity and ecological connectivity;
- *Commit to* the establishment of national resources to aid states and cities in their evaluation and support for a transition to sustainable cooling to increase resilience against extreme heat including through the development of Heat Action Plans;
- *Commit to* allocate resources and/or legislative support to develop and deploy a sustainable cold chain, low GWP cooling solutions, district cooling, and other technologies in a scalable manner;
- *Commit to* integrating cooling in energy access planning and regulations to ensure incorporation of the impacts of growing cooling energy needs with plans for grid decarbonization;

- *Commit to* the ratification of the Kigali Amendment to the Montreal Protocol, if not already undertaken;
- *Commit to* maintaining up-to-date, transparent, and publicly available information on policies and commitments relevant to the Pledge;
- *Commit to* support existing international cooling emission reduction and cooling access initiatives, such as those of the Cool Coalition to advance global cooperation and domestic actions;
- *Commit to* support local and international collaborative research and innovation activities in clean cooling;
- *Welcome and encourage* further domestic actions by participating countries and contributions from the private sector, development banks, financial institutions, and philanthropies to support global cooling emissions abatement and increased access to sustainable cooling solutions;
- *Resolve to* review progress towards the target of the Global Cooling Pledge on an annual basis until 2030 by means of a dedicated ministerial meeting at the UNFCCC Conference of the Parties;
- *Call on* other states and actors to join the Global Cooling Pledge.

Further, the participants of the pledge agree to additionally implement two or more of the following commitments:

To complete the ratification of the Kigali Amendment to the Montreal Protocol by XX date, if not already undertaken;

To support ambitious measures and the provision of financial resources under the Montreal Protocol Multilateral Fund to improve energy efficiency in the cooling sector while phasing out HCFC and phasing down HFC refrigerants;

To integrate cooling in energy access planning and regulations to ensure incorporation of the impacts of growing cooling needs with plans for energy system decarbonization;

To invest in innovation and deployment of renewable energy based cooling technologies and applications along food, health, and building value chains in rural, remote and off-grid locations to broaden the range of affordable solutions;

To establish of national resources to aid states and cities in their evaluation and support for a transition to sustainable cooling to increase resilience against extreme heat including through the development of Heat Action Plans;

To allocate resources and/or legislative support to transition the cooling market towards low GWP cooling solutions, district cooling, passive cooling and other technologies in a scalable manner;

To allocate resources and/or legislative support to scale up the deployment of appropriate cold chain solutions to modernise connectivity in the food chain and mitigate food loss, in support of achieving a more sustainable and resilient food system, globally;

To increase the amount of international climate financing that supports a transition to sustainable, efficient, and climate-friendly cooling and cold chain;

To use the state’s bulk purchasing power to support phase down of HFCs and improvements in the energy efficiency of the cooling sector beginning in 2024, and to replace end of life equipment with low- GWP and high efficiency cooling technologies in government buildings.

For subnational governments participants of the pledge that do not have the authority to commit to all pledge components, they commit to at least one of the following:

To undertake an inclusive, multi-stakeholder process to create and adopt a jurisdictional Heat Action Plan to identify heat risk exposure, locally relevant solutions and policies, financing needs and implementation and performance metrics;

To increase or enhance the proportion of nature-based cooling solutions within built-up city surface area by 2030, and with demonstrable progress by 2025.



CONTACT US

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Cool Coalition Executive Committee: Graeme Maidment, graeme.maidment@beis.gov.uk; Axum Teferra, axum.teferra@climateworks.org; Brian Dean, rbrian.dean@seforall.org; Andrea Voigt, andrea.voigt@danfoss.com



FOR MORE INFORMATION, VISIT: coolcoalition.org





Panel Discussion

- **Mr. Ali Majid**, Deputy Minister, Environment, Climate, and Technology, Government of Maldives
- **Ms. Rithy Sileap**, Economist, Ministry of Economy and Finance, Government of Cambodia
- **Ms. Herlin Herlianika**, Advisor, CLASP
- **Mr. Alexander Ablaza**, Chief Executive Officer, Philippine Energy Efficiency Alliance



Thank you!

