



United Nations Environment Assembly Background Guide 2026

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NATIONAL MODEL UNITED NATIONS

Dear Delegates,

Welcome to the 2026 National Model United Nations Spain Conference (NMUN•Spain)! We are pleased to introduce to you our committee, the United Nations Environment Assembly (UNEA). Your committee's work is facilitated by volunteer staffers. This year's committee staff are: Director Adam Wolf and Assistant Director Maja Kozłowska. Adam holds a BA in International Studies from the University of Wisconsin Oshkosh and currently lives in Washington, DC, where he works in strategic communications in the biotechnology sector. In addition to his passion for basketball, he enjoys reading about geography, history, and economics, and is a current Board Member of the United Nations Association of the National Capital Area. Maja was born in Warsaw, Poland, where she lived until I was 12 before moving to Stavanger, Norway. She later completed high school in Bydgoszcz, earned her Bachelor's degree in Architecture in Barcelona, and is now pursuing her Master's degree. The preparation of these materials was supported by Deputy Secretary-General Caitlin Hopper.

The topics on the agenda for this committee are:

1. Implementing Target 12, Enhance Green Spaces and Urban Planning, of the Kunming-Montreal Global Biodiversity Framework
2. Sustainable Cooling and Energy Efficiency

This Background Guide serves as an introduction to the topics for this committee. However, it is not intended to replace individual research. We encourage you to explore your Member State's policies in depth and use the bibliography to further your knowledge on these topics. In preparation for the conference, each delegation should submit a Position Paper by 11:59 p.m. ET on 1 November 2026 in accordance with the guidelines in the [Position Paper Guide](#) and the [NMUN•Spain Position Papers website](#).

Two resources, available to download from the NMUN website, serve as essential instruments in preparing for the Conference and as a reference during committee sessions:

- The [NMUN Delegate Preparation Guide](#), which explains each step in the delegate process, from pre-conference research to the committee debate and resolution drafting processes. Please take note of the information on plagiarism, and the prohibition on pre-written working papers and resolutions.
- The [NMUN Rules of Procedure](#), which includes the long and short form of the rules, as well as an explanatory narrative and example script of the flow of procedure.

In addition, please review the mandatory [NMUN Conduct Expectations](#) on the NMUN website. They include the conference dress code and other expectations of all attendees. We want to emphasize that any instances of sexual harassment or discrimination based on race, gender, sexual orientation, national origin, religion, age, or disability will not be tolerated. If you have any questions concerning your preparation for this committee, please contact the Deputy Secretary-General at dsg.spain@nmunstaff.org.

We wish you all the best in your preparations and look forward to seeing you at the Conference!

Adam Wolf, Director
Maja Kozłowska, Assistant Director

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Committee Overview

Introduction

The United Nations Environment Assembly (UNEA) is the primary governing body of the United Nations Environment Programme (UNEP) and is the international community's highest-level decision-making body on environmental matters.¹ In partnership with other United Nations institutions, it outlines the international environmental agenda and sets priorities for the international community.² Although its resolutions are not binding, UNEA brings together relevant international actors to address global environmental issues and shape environmental governance.³

Mandate, Function and Powers

Twenty years after the adoption of the Rio Declaration on Environment and Development (1992), the United Nations Conference on Sustainable Development called for the strengthening and upgrading of UNEP so it could better execute its mandate.⁴ UNEA was created in 2012 as the successor to UNEP's Governing Council.⁵ Whereas the Governing Council was composed of 58 Member States and sat within UNEP, UNEA is structured as a distinct entity and enjoys universal membership with 193 Member States.⁶ As a high-level governance body, UNEA reviews and coordinates the work of the international community on environmental matters while serving as a forum for and initiator of debates to be continued by other, more specialized bodies.⁷ While the following list is not exhaustive, the mandate of UNEA can be summarized as:

- **UNEA will generally:** set broad priorities for global environmental policy; identify emerging themes in environmental governance; progressively develop international environment law and begin negotiations on environmental treaties; define the work and priorities of UNEP; create ad-hoc committees and subsidiary bodies to further discussions on specific areas of environmental concern when necessary; make recommendations to Member States and other international organizations.⁸
- **UNEA will not generally:** engage in operational projects; complete negotiations on environmental treaties, but rather identify emerging issues and promote an architecture for future environmental governance.⁹

¹ United Nations Environment Assembly. *About the United Nations Environment Assembly*. N.d.

² Ibid.

³ United Nations Environment Programme. *Q&A: UN Environment Assembly*. 2024.

⁴ United Nations, General Assembly. *The future we want (A/RES/66/288)*. 2012. p. 18.

⁵ United Nations Environment Assembly. *About the United Nations Environment Assembly*. N.d.

⁶ Ibid; United Nations Environment Programme, Governing Council. *Proceedings of the Governing Council at its Nineteenth Session (UNEP/GC.19/34)*. 1997.

⁷ International Institute for Sustainable Development. *The United Nations Environment Assembly's Role as a Governance Architect*. 2022.

⁸ United Nations Environment Programme. *What you need to know about the United Nations Environment Assembly*. 2024.

⁹ Ibid; International Institute for Sustainable Development. *The United Nations Environment Assembly's Role as a Governance Architect*. 2022.

UNEA and UNEP are distinct entities. UNEA is the primary governing body and priority-setting mechanism of UNEP and does not operationalize these priorities itself.¹⁰ In contrast, UNEP undertakes programs, projects, and awareness campaigns and provides support to national governments to achieve environmental obligations in line with the priorities set out by UNEA.¹¹

Governance, Funding and Structure

All 193 United Nations Member States are represented in UNEA.¹² The Assembly meets every two years to set priorities for global environmental policy, discuss developments in the area of environmental legislation, and assist in the implementation of the *2030 Agenda for Sustainable Development* (2030 Agenda) (2015).¹³

Consisting of ten Ministers who each serve a two-year term and are selected based on geographical rotations, UNEA's Bureau is responsible for the general conduct of business.¹⁴ UNEA also has a Committee of Permanent Representatives (CPR), a subsidiary inter-sessional organ of UNEA that meets at least four times a year.¹⁵ The CPR contributes to the preparation of the UNEA agenda, holds an advisory role in policy matters, and monitors the implementation of decisions.¹⁶ The CPR also holds discussions on key issues, promotes the inclusion of non-resident members of the Committee, and performs other tasks given by UNEA.¹⁷ The CPR consists of all accredited Permanent Representatives to UNEP and is led by a five-member Bureau that is elected for two years.¹⁸

UNEP relies on three main financial sources: earmarked funds, the Environment Fund, and the United Nations's regular budget.¹⁹ Earmarked funds, also known as earmarked or ring-fenced contributions, are funds appropriated for specific projects, themes, or countries.²⁰ These funds aim to expand and/or replicate the results of United Nations Environment's work in more countries and in cooperation with more partners.²¹ The Environment Fund aids in maintaining the capacity, balance, and efficiency needed for UNEP to function.²² Earmarked contributions and the Environment Fund are voluntary contributions; hence, 95% of UNEP's income is received on a voluntary basis from Member States.²³ The United Nations' regular budget supports the regular work of UNEA and the UNEP Secretariat.²⁴

¹⁰ Office of the United Nations Secretary-General's Envoy on Youth. *UNEP: United Nations Environment Programme*. N.d.

¹¹ Ibid.

¹² United Nations Environment Assembly. *About the United Nations Environment Assembly*. N.d.

¹³ Ibid.

¹⁴ Ibid.

¹⁵ United Nations Environment Programme. *Committee of Permanent Representatives*. 2024.

¹⁶ Ibid.

¹⁷ Ibid.

¹⁸ Ibid.

¹⁹ United Nations Environment Programme. *How is UNEP funded*. 2024.

²⁰ Ibid.; United Nations Environment Programme. *Earmarked Contributions*. 2024.

²¹ Ibid.

²² United Nations Environment Programme. *How is UNEP funded*. 2024.

²³ Ibid.

²⁴ Ibid.

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United Nations Environment Programme. *What you need to know about the United Nations Environment Assembly*. 2024. Retrieved 24 October 2025 from:

<https://www.unep.org/news-and-stories/story/what-you-need-know-about-un-environment-assembly>

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https://wedocs.unep.org/bitstream/handle/20.500.11822/17274/97_GC19_proceedings.pdf

United Nations, General Assembly. *Institutional and financial arrangements for international environmental cooperation (A/RES/2997 (XXVII))*. 1972. Retrieved 24 October 2025 from:

[https://docs.un.org/en/A/RES/2997\(XXVII\)](https://docs.un.org/en/A/RES/2997(XXVII))

United Nations, General Assembly. *The future we want (A/RES/66/288)*. 2012. Retrieved 24 October 2025 from: <http://docs.un.org/en/A/RES/66/288>

2. Sustainable Cooling and Energy Efficiency

“Cooling is essential to human health, food security, and economic productivity, and is becoming increasingly important due to rising global temperatures and more frequent extreme heat waves.”¹²⁹

Introduction

Cooling is an essential service that supports human health, food security, economic productivity, and resilience to rising temperatures.¹³⁰ However, increasing demand for mechanical cooling is placing significant strain on global energy systems and has emerged as a major sustainability challenge.¹³¹ This demand results from rapid urbanization, population growth, increased incomes, expanded electricity access, and higher global temperatures linked to climate change.¹³² As cities grow and living standards rise, more households and businesses adopt air-conditioning technologies, while elevated urban temperatures and frequent heatwaves further increase cooling requirements.¹³³ According to the Intergovernmental Panel on Climate Change (IPCC), anthropogenic climate change is increasing the frequency and severity of extreme heat events, thereby heightening the need for cooling in urban areas and buildings.¹³⁴ These combined trends have made space cooling one of the fastest-growing sources of energy demand in the building sector worldwide.¹³⁵ Between 1990 and 2016, the share of total energy use in buildings dedicated to cooling increased from approximately 2.5% to 6%.¹³⁶ Demand is expected to continue rising as the expansion of digital infrastructure, particularly Artificial Intelligence (AI)-related data centers, adds substantial electricity and cooling requirements.¹³⁷ According to the International Energy Agency (IEA), electricity demand from data centers is projected to double by 2030, while consumption from AI-focused data centers is projected to triple.¹³⁸ The IEA estimates that, if current policy and efficiency trends persist, air conditioning demand could more than triple by 2050.¹³⁹ As a result, cooling now accounts for a significant share of global electricity consumption.¹⁴⁰

This growing reliance on cooling services, particularly in hotter and rapidly urbanizing regions, highlights the urgency of developing more sustainable and energy-efficient cooling strategies to meet future demand while limiting environmental impacts.¹⁴¹ Despite their growing importance, existing cooling systems

¹²⁹ United Nations Development Programme. *GPN Service Offer: Sustainable Cooling and Energy Efficiency*. 2025. p. 1.

¹³⁰ Cranfield University. *Cooling Must Be Seen as Critical National Infrastructure, New Report Says*. 2024.

¹³¹ United Nations Environment Programme. *Cooling and Climate Change*. 2021.

¹³² International Energy Agency. *The Future of Cooling: Opportunities for Energy-Efficient Air Conditioning*. 2018. p. 11.

¹³³ Ibid. p. 3.

¹³⁴ Intergovernmental Panel on Climate Change. *AR6 Working Group I: The Physical Science Basis*. 2021.

¹³⁵ International Energy Agency. *The Future of Cooling: Opportunities for Energy-Efficient Air Conditioning*. 2018. p. 23.

¹³⁶ Ibid.

¹³⁷ International Energy Agency. *Data Centre Electricity Use Surged in 2025, Even with Tightening Bottlenecks Driving a Scramble for Solutions*. 2026.

¹³⁸ Ibid.

¹³⁹ International Energy Agency. *The Future of Cooling: Opportunities for Energy-Efficient Air Conditioning*. 2018.

¹⁴⁰ Ibid.

¹⁴¹ Ibid. pp. 30-31.

present considerable sustainability challenges.¹⁴² Many conventional technologies are energy-intensive and rely on refrigerants such as hydrofluorocarbons (HFCs), which have high global warming potential.¹⁴³ As cooling demand grows, cooling places additional pressure on electricity systems and contributes to higher greenhouse gas emissions, especially in regions reliant on fossil fuel-based electricity generation.¹⁴⁴

According to the United Nations Environment Programme (UNEP), without stronger policy measures, the continued growth in cooling demand will lead to substantial increases in both energy consumption and greenhouse gas emissions in the coming decades.¹⁴⁵ The United Nations Environment Assembly (UNEA) serves as a central platform for establishing global environmental priorities and guiding international responses to emerging environmental challenges.¹⁴⁶ Sustainable cooling is relevant to UNEA discussions due to its links with climate change mitigation, energy efficiency, pollution reduction, resilience to extreme heat, and sustainable development.¹⁴⁷ It also contributes to sustainable development by supporting key sectors such as health, food systems, and economic productivity while reducing environmental impacts.¹⁴⁸ The United Nations Development Programme (UNDP) highlights that “sustainable cooling is crucial for health, food preservation, comfort, productivity, and industrial processes.”¹⁴⁹ The IEA, UNEP, and other United Nations agencies stress the need to improve energy efficiency, enforce stringent minimum performance standards, and expand access to low-carbon cooling technologies as essential strategies for reducing emissions while meeting the rising global demand for cooling in a warming climate.¹⁵⁰

International and Regional Framework

The 1992 *United Nations Framework Convention on Climate Change* (UNFCCC) serves as the primary institutional framework for international climate cooperation and has established the Conference of the Parties (COP) as its main decision-making body.¹⁵¹ The convention aims to stabilize greenhouse gas concentrations at levels that prevent dangerous anthropogenic interference with the climate system while supporting sustainable economic development.¹⁵² It established key principles that continue to shape international climate policy, including common but differentiated responsibilities, sustainable development, international cooperation, and technology transfer.¹⁵³ Within this broader framework, sustainable cooling governance is embedded within a comprehensive system of international climate, energy, and environmental agreements that collectively establish the legal and policy foundation for global action.¹⁵⁴

¹⁴² International Energy Agency. *The Future of Cooling: Opportunities for Energy-Efficient Air Conditioning*. 2018. pp. 30-31.

¹⁴³ United Nations Environment Programme. *The Kigali Amendment: An Overview*. 2026.

¹⁴⁴ International Energy Agency. *The Future of Cooling: Opportunities for Energy-Efficient Air Conditioning*. 2018. pp. 30-31.

¹⁴⁵ United Nations Environment Programme. *About Cooling*. 2026.

¹⁴⁶ United Nations Environment Programme. *Fifth session of the United Nations Environment Assembly*. 2021.

¹⁴⁷ Ibid.

¹⁴⁸ United Nations Environment Programme. *Cooling and Climate: A Global Opportunity*. 2018. p. 1.

¹⁴⁹ United Nations Development Programme. *Sustainable Cooling and Energy Efficiency*. N.d.

¹⁵⁰ United Nations Environment Programme. *About Cooling*. 2026.

¹⁵¹ United Nations Conference on Environment and Development. *United Nations Framework Convention on Climate Change*. 1992.

¹⁵² Ibid. p.4

¹⁵³ Ibid. pp. 4-6.

¹⁵⁴ United Nations, General Assembly. *Transforming our world: the 2030 Agenda for Sustainable Development* (A/RES/70/1). 2015.

Subsequent international treaties have further reinforced global climate governance and incorporated sector-specific priorities, such as energy efficiency and cooling demand.¹⁵⁵

The 2015 *Paris Agreement* provides an international framework for addressing climate change, encompassing strategies to reduce greenhouse gas emissions and strengthen climate resilience.¹⁵⁶ Adopted at COP21 in Paris, the agreement establishes a global commitment to limit the increase in average global temperatures to well below 2°C above preindustrial levels while pursuing efforts to limit warming to 1.5°C.¹⁵⁷ Achieving these goals requires transformative changes across all sectors of the economy, particularly through substantial reductions in greenhouse gas emissions.¹⁵⁸ To achieve this objective, the agreement urges countries to expedite the transition to low-carbon and energy-efficient systems.¹⁵⁹ States parties aim to reach global peaking of greenhouse gas emissions “as soon as possible and to undertake rapid reductions thereafter in accordance with best available science.”¹⁶⁰ This commitment underscores the necessity of enhancing energy efficiency and broadening access to sustainable cooling solutions, both of which support climate change mitigation and adaptation.¹⁶¹ By reducing energy demand, lowering emissions, and protecting vulnerable populations from extreme heat, sustainable cooling strategies can strengthen the resilience of communities and infrastructure in a warming climate.¹⁶² These priorities are further reinforced through Nationally Determined Contributions (NDCs), which require countries to regularly define and update their climate action targets and implementation strategies.¹⁶³

The 1987 *Montreal Protocol on Substances That Deplete the Ozone Layer* (Montreal Protocol) is a global environmental protocol established to phase out substances that deplete the ozone layer and is widely regarded as one of the most successful international environmental agreements.¹⁶⁴ Its original focus was protecting the stratospheric ozone layer by regulating ozone-depleting substances.¹⁶⁵ The protocol has also delivered significant climate co-benefits because many controlled gases have high global warming potential.¹⁶⁶ Building on this framework, the 2016 *Kigali Amendment to the Montreal Protocol on Substances That Deplete the Ozone Layer* (Kigali Amendment) addresses HFCs, which were introduced as substitutes for ozone-depleting substances but are potent greenhouse gases widely used in refrigeration, air-conditioning, aerosols, and foam applications.¹⁶⁷ Although HFCs do not deplete the ozone layer, many have extremely high global warming potentials, making their uncontrolled growth a significant driver of future climate change.¹⁶⁸ The Amendment mandates a global phasedown of HFC production and consumption by approximately 80-85% by mid-century, with a distinct timeline for

¹⁵⁵ Conference of the Parties to the United Nations Framework Convention on Climate Change. *Paris Agreement*. 2015. pp. 4-5.

¹⁵⁶ Ibid. pp. 4-5, pp. 9-11.

¹⁵⁷ Ibid.

¹⁵⁸ Ibid.

¹⁵⁹ Ibid. p. 5.

¹⁶⁰ Ibid.

¹⁶¹ United Nations Framework Convention on Climate Change, *Key Aspects of the Paris Agreement*. 2023.

¹⁶² Conference of the Parties to the United Nations Framework Convention on Climate Change. *Paris Agreement*. 2015.

¹⁶³ Ibid.

¹⁶⁴ United Nations Environment Programme. *About the Montreal Protocol*. N.d.

¹⁶⁵ Ibid.

¹⁶⁶ Ibid.

¹⁶⁷ United Nations Environment Programme, *The Kigali Amendment to the Montreal Protocol*. 2016.

¹⁶⁸ Ibid.

developed and developing countries.¹⁶⁹ According to UNEP's Ozone Secretariat, full implementation of the Kigali Amendment could prevent up to 0.5°C of global warming by the end of the century.¹⁷⁰

The 1985 *Vienna Convention for the Protection of the Ozone Layer* (Vienna Convention) established a framework for international cooperation, operationalized through the Montreal Protocol system.¹⁷¹ Although the Vienna Convention does not explicitly address sustainable cooling, it provides the legal and institutional foundation for subsequent agreements, such as the Kigali Amendment, which targets refrigerants used in cooling systems.¹⁷² The Vienna Convention, Montreal Protocol, and Kigali Amendment collectively constitute the primary international framework for regulating ozone protection and addressing the climate impacts of refrigerants.¹⁷³ The Kigali Amendment enhances this framework by facilitating the global phase-down of HFCs, which are prevalent in cooling technologies.¹⁷⁴

The *2030 Agenda for Sustainable Development* (2030 Agenda) (2015) establishes a comprehensive framework for promoting sustainable cooling by prioritizing sustainable energy, resilient urban environments, and climate action.¹⁷⁵ This approach is embodied in Sustainable Development Goal (SDG) 7 (affordable and clean energy), SDG 11 (sustainable cities and communities), and SDG 13 (climate action), each of which is directly associated with enhancing access to sustainable cooling and minimizing environmental impacts.¹⁷⁶ The urgency and untapped potential of sustainable cooling led to the launch of the Global Cooling Pledge at COP28 in Dubai in 2023, where participating countries committed to reducing the climate impact of the cooling sector while expanding access to sustainable solutions.¹⁷⁷ The initiative aims to reduce projected cooling-related emissions by at least 60% by 2050 and improve access to sustainable cooling for billions of people.¹⁷⁸

Regional frameworks demonstrate how international commitments are implemented through regulatory measures, particularly in the area of energy efficiency for buildings and appliances.¹⁷⁹ European Union (EU) policy demonstrates that building codes, product standards, and refrigerant regulations can effectively promote sustainable cooling.¹⁸⁰ The European Union's Energy Performance of Buildings Directive establishes a unified framework to enhance building energy performance throughout the European Union.¹⁸¹ This is achieved through initiatives such as National Building Renovation Plans, Minimum Energy Performance Standards (MEPS), Energy Performance Certificates (EPCs), and a

¹⁶⁹ United Nations Environment Programme, *The Kigali Amendment to the Montreal Protocol*. 2016.

¹⁷⁰ Energetski Portal. *Kigali Amendment Hits Milestone: 100th Ratification Boosting Climate Action*. 2021.

¹⁷¹ United Nations Environment Programme. *Vienna Convention for the Protection of the Ozone Layer*. 1985.

¹⁷² United Nations Environment Programme. *The Kigali Amendment: An Overview*. 2026.

¹⁷³ United Nations Environment Programme. *About the Montreal Protocol*. N.d.

¹⁷⁴ United Nations Environment Programme. *Kigali Amendment Implementation Begins*. 2019.

¹⁷⁵ United Nations, General Assembly. *Transforming our world: the 2030 Agenda for Sustainable Development* (A/RES/70/1). 2015.

¹⁷⁶ Ibid. pp. 23, 26-28.

¹⁷⁷ Environmental Investigation Agency. *COP28: Global Cooling Pledge Launched as 63 Countries Commit to Cut Emissions from Refrigeration and Air Conditioning*. 2023.

¹⁷⁸ United Nations Environment Programme. *Enabling Pledge Implementation: Cooling*. 2024.

¹⁷⁹ International Energy Agency. *The Future of Cooling: Opportunities for Energy-Efficient Air Conditioning*. 2018.

¹⁸⁰ European Environment Agency. *Cooling Buildings Sustainably in Europe: Exploring the Links Between Climate Change Mitigation and Adaptation and Their Social Impacts*. 2021.

¹⁸¹ European Commission. *Energy Performance of Buildings Directive*. 2024.

long-term strategy for transitioning to a zero-emission building stock.¹⁸² Concurrently, the EU's Ecodesign for Sustainable Products Regulation sets minimum environmental and energy performance standards for energy-related products, including cooling appliances and equipment.¹⁸³

Within the African Union, the *2025 African Energy Efficiency Strategy and Roadmap* (AfEES) and Action Plan, developed under the African Energy Commission, establish a regional framework to improve energy efficiency across sectors, including buildings, industry, agriculture, transport, power systems, appliances and devices, and households, while aiming to increase Africa's energy productivity by 50% by 2050.¹⁸⁴ The strategy also supports sustainable energy access and reducing energy demand.¹⁸⁵ In Southeast Asia, the Association of Southeast Asian Nations (ASEAN) has adopted the *2025 ASEAN Plan of Action for Energy Cooperation* (APAEC), which sets regional targets to reduce energy intensity and enhance energy-efficiency measures.¹⁸⁶

Role of the International System

The UNEP Ozone Secretariat acts as the administrative body that supports the implementation of the Vienna Convention and Montreal Protocol by facilitating meetings between the States parties, coordinating reporting and compliance processes, and promoting cooperation among Member States.¹⁸⁷ The Ozone Secretariat plays a central role in integrating ozone protection objectives with climate mitigation strategies by facilitating the global phase-down of HFCs and promoting sustainable cooling technologies.¹⁸⁸

UNEP advances sustainable cooling through the Ozone Secretariat and OzonAction, which assist developing countries with refrigerant management, national ozone units, technical training, licensing systems, and policy guidance under the Montreal Protocol.¹⁸⁹ The UNEP-led Cool Coalition convenes governments, businesses, and financial institutions to accelerate sustainable cooling and has become a key platform for advancing action in the cooling sector through policy coordination, knowledge sharing, and international cooperation.¹⁹⁰ In conjunction with initiatives such as Sustainable Energy for All (SEforALL), United for Efficiency (U4E), and UN-Energy, these efforts connect HFC phasedown commitments to broaden objectives related to energy efficiency, climate resilience, and equitable access to cooling.¹⁹¹

Several United Nations programs and bodies contribute to sustainable cooling initiatives through technical assistance, capacity-building, and policy implementation.¹⁹² The UNDP, through its Sustainable Energy

¹⁸² Climate Council. *Energy Performance of Buildings Directive (EPBD) Factsheet*. 2025.

¹⁸³ European Commission. *Sustainable Products to Be the Norm for Consumers as new law enters into force*. 2024.

¹⁸⁴ African Energy Commission. *The African Energy Efficiency Strategy and Roadmap*. 2025.

¹⁸⁵ African Union Commission. *African Energy Efficiency Strategy and Action Plan*. 2022.

¹⁸⁶ Association of Southeast Asian Nations. ASEAN Secretariat. *ASEAN Plan of Action for Energy Cooperation (APAEC) Phase II: 2021-2025*. 2021.

¹⁸⁷ United Nations Environment Programme, Ozone Secretariat. *About the Ozone Secretariat*. 2025.

¹⁸⁸ United Nations Environment Programme. *The Kigali Amendment: An Overview*. 2026.

¹⁸⁹ United Nations Environment Programme, Ozone Secretariat. *Kigali Amendment Implementation Begins*. 2019.

¹⁹⁰ United Nations Environment Programme. 2025.; Sustainable Energy for All. *Cooling for All*. 2024; United Nations Environment Programme. *United for Efficiency*. 2024.

¹⁹¹ Ibid.

¹⁹² United Nations Development Programme. *Sustainable Cooling and Energy Efficiency*. 2025.

Hub and Montreal Protocol portfolio, assists countries in enhancing energy efficiency, adopting sustainable cooling technologies, and implementing hydrofluorocarbon HFC phase-down strategies in accordance with the Kigali Amendment.¹⁹³ UN-Habitat advances sustainable cooling by implementing programs focused on promoting climate-responsive urban development, sustainable building practices, and heat-resilient cities, recognizing the growing importance of cooling in rapidly urbanizing regions.¹⁹⁴

The United Nations Children's Fund (UNICEF) and the World Health Organization (WHO) highlight the importance of cooling and cold-chain infrastructure in schools, healthcare facilities, vaccine storage, and protection from extreme heat, particularly in vulnerable communities.¹⁹⁵ The IEA provides research, policy recommendations, and technical guidance on cooling demand, energy efficiency standards, and emission-reduction pathways in the cooling sector.¹⁹⁶ The United Nations Industrial Development Organization (UNIDO) promotes sustainable cooling by facilitating industrial energy-efficiency improvements, technology transfer, capacity-building, and supporting the implementation of obligations under the Montreal Protocol and Kigali Amendment.¹⁹⁷ Collectively, these organizations support UNEP's efforts by addressing the technological development, urban, health, and energy dimensions for sustainable cooling.¹⁹⁸

Urban Heat Islands as a Barrier to Sustainable Cooling

Urban heat islands (UHIs) form in regions characterized by extensive infrastructure, concrete, and asphalt, which absorb and retain heat.¹⁹⁹ These areas exhibit higher temperatures than adjacent rural regions.²⁰⁰ UNEP states that “cities are heating up at twice the global average rate” due to rapid urbanization and the urban heat island effect.²⁰¹ Furthermore, transportation emissions, high building density, limited vegetation, and waste heat generated by air conditioning systems exacerbate the UHI effect.²⁰² These factors contribute to the development of localized microclimates, reducing thermal comfort and increasing urban vulnerability to extreme heat events.²⁰³ Elevated urban temperatures are associated with increased risks of cardiovascular and respiratory diseases, as well as higher mortality rates during heatwaves.²⁰⁴ Additionally, higher temperatures lead to greater demand for air conditioning, which increases electricity consumption and greenhouse gas emissions.²⁰⁵ Although the international community has proposed strategies such as urban greening, water-based cooling, and the use of reflective materials,

¹⁹³ United Nations Development Programme. *Sustainable Cooling and Energy Efficiency*. 2025.

¹⁹⁴ United Nations Human Settlements Programme. *Climate Change and Urban Environment*. 2024.

¹⁹⁵ United Nations Children's Fund. *Beat the Heat: Child Health Amid Heatwaves in Europe and Central Asia*. 2024.; World Health Organization. World Health Organization. *Temperature-Sensitive Health Products in the Expanded Programme on Immunization Cold Chain*. 2020.

¹⁹⁶ International Energy Agency. *The Future of Cooling*. 2018.

¹⁹⁷ United Nations Industrial Development Organization. *Some Like It Cool: UNIDO and the Montreal Protocol*. Vienna: UNIDO. 2017. pp. 14–15, 59–63.

¹⁹⁸ United Nations Environment Programme. *Cool Coalition*. 2026.

¹⁹⁹ United Nations Environment Programme. *Beating the Heat: A Sustainable Cooling Handbook for Cities*. 2021.

²⁰⁰ Ibid.

²⁰¹ United Nations Environment Programme. *Urban Cooling and Extreme Heat*. 2024.

²⁰² Intergovernmental Panel on Climate Change. *Climate Change 2022: Impacts, Adaptation and Vulnerability*. 2022.

²⁰³ Ibid.

²⁰⁴ World Health Organization. *Climate Change: Heat and Health*. 2026.

²⁰⁵ International Energy Agency. *The Future of Cooling: Opportunities for Energy-Efficient Air Conditioning*. 2018.

implementation remains inconsistent.²⁰⁶ This inconsistency is particularly evident in rapidly growing cities, where financial and spatial constraints limit the feasibility of large-scale interventions.²⁰⁷

UHIs are now addressed within major international frameworks focused on climate adaptation and sustainable urban development, such as the 2030 Agenda and the 2016 *New Urban Agenda*.²⁰⁸ Building on these broader frameworks, multiple international initiatives assist cities in reducing urban temperatures and enhancing resilience to extreme heat.²⁰⁹ The UNEP-led Cool Coalition advances climate-friendly cooling policies.²¹⁰ The *Sustainable Urban Cooling Handbook for Cities* provides practical guidance on passive cooling strategies, climate-sensitive urban design, and heat mitigation.²¹¹ UN-Habitat's *Handbook on Urban Heat Management in the Global South* supports cities in identifying heat hotspots and implementing locally adapted solutions.²¹² Effective interventions include reflective roofing and paving materials, district cooling systems, and urban planning measures that enhance ventilation and limit heat accumulation.²¹³ For instance, Paris has expanded its district cooling network by utilizing renewable electricity and water from the Seine River to deliver low-carbon cooling by chilling secondary water circuits.²¹⁴ Despite financial, infrastructural, and social barriers, cities and international organizations are developing policies and tools to support sustainable cooling in practice.²¹⁵ Ahmedabad, India, has implemented its *2013 Ahmedabad Heat Action Plan* that integrates early warning systems, public awareness initiatives, and targeted protective measures for vulnerable populations to mitigate the impacts of extreme heat.²¹⁶ Despite the ongoing challenges such as limited financing, outdated infrastructure, rapid urbanization, and socioeconomic disparities, international organizations, governments, and urban networks are developing tools, policy frameworks, and financing mechanisms to facilitate the broader adoption of sustainable cooling solutions.²¹⁷ In Medellín, Colombia, green corridors have been developed along roads and waterways to expand vegetation, provide shade, and reduce urban temperatures.²¹⁸ Similarly, in Seoul, Republic of Korea, the restoration of the Cheonggyecheon stream replaced an

²⁰⁶ United Nations Environment Programme. *Beating the Heat: A Sustainable Cooling Handbook for Cities*. 2021.

²⁰⁷ Ibid.

²⁰⁸ United Nations, General Assembly. *Transforming our World: the 2030 Agenda for Sustainable Development* (A/RES/70/1). 2015.; United Nations, General Assembly. *New Urban Agenda* (A/RES/71/256). 2016.

²⁰⁹ United Nations Environment Programme. *Cool Coalition*. 2026.

²¹⁰ United Nations Environment Programme. *Beating the Heat: A Sustainable Cooling Handbook for Cities*. 2021.

²¹¹ Ibid.

²¹² United Nations Human Settlements Programme. *Handbook on Urban Heat Management in the Global South*. 2024.; European Urban Initiative. *Paris: District Cooling and Urban Climate Resilience*. 2024.

²¹³ United Nations Environment Programme. *Beating the Heat: A Sustainable Cooling Handbook for Cities*. 2021.

²¹⁴ International District Energy Association. *Water from the Seine instead of air conditions: Paris expands on the world's largest cooling systems*. 2026.

²¹⁵ United Nations Environment Programme. *Five ways cities can keep it chill while cutting emissions*. 2023.

²¹⁶ Ahmedabad Municipal Corporation, Natural Resources Defense Council, and Indian Institute of Public Health Gandhinagar. *Ahmedabad Heat Action Plan*.

²¹⁷ United Nations Environment Programme. *Beating the Heat: A Sustainable Cooling Handbook for Cities*. 2021.

²¹⁸ United Nations Environment Programme, *Medellín Shows How Nature-Based Solutions Can Keep People and Planet Cool*. 2019.

elevated roadway with a green urban corridor, which improves ventilation and contributes to local cooling.²¹⁹

Gaps in Energy-Efficient and Passive Cooling Systems

The adoption of energy-efficient and passive cooling systems is constrained by inconsistent policy coverage, gaps in technical capacity, and ongoing dependence on mechanical cooling.²²⁰ Passive cooling strategies, such as shading, natural ventilation, reflective surfaces, and climate-responsive building design, can reduce indoor temperatures and cooling loads before mechanical air conditioning is required.²²¹ Such measures limit solar heat gain, improve airflow, and reduce heat absorption through locally adapted building design and materials.²²² Passive cooling, high-efficiency equipment, and accelerated refrigerant transition are essential components of sustainable cooling pathways.²²³ Reducing the use of high-global-warming-potential refrigerants is also necessary to limit emissions resulting from refrigerant leakage.²²⁴ UNEP and the Global Alliance for Building Construction identify the building sector as a major contributor to global energy demand and emissions, underscoring the importance of building design and energy efficiency in achieving sustainable cooling objectives.²²⁵

While many countries have developed cooling-related commitments and strategies, the adoption of passive cooling, energy efficiency standards, and refrigerant transition policies remains inconsistent.²²⁶ 72 countries have joined the Global Cooling Pledge, committing to reducing cooling-related emissions by 68% by 2050, and 134 countries have incorporated cooling considerations into climate and development strategies.²²⁷ However, according to UNEP, “only 54 countries have comprehensive policies across all three priority areas for cooling: passive cooling in building energy codes, minimum energy performance standards, and refrigerant transition.”²²⁸ Furthermore, UNEP identifies the most significant policy gaps in African and Asia-Pacific countries, where cooling demand is expected to grow most rapidly due to urbanization, population growth, rising temperatures, and expanding access to cooling technologies.²²⁹ In many lower-income countries, these gaps arise not only from the result of policy choices but also reflect limited technical expertise, institutional capacity, financing, and resources for implementation and

²¹⁹ United Nations Environment Programme. *Five ways cities can keep it chill while cutting emissions*. 2023.

²²⁰ Ahmedabad Municipal Corporation, Natural Resources Defense Council, and Indian Institute of Public Health Gandhinagar. *Ahmedabad Heat Action Plan*.

²²¹ Ibid.

²²² United Nations Human Settlements Programme. *Handbook on Urban Heat Management in the Global South*. 2025.

²²³ United Nations Environment Programme. *Global Cooling Watch 2025*. 2025.

²²⁴ United Nations Environment Programme. *The Kigali Amendment: An Overview*. 2026.

²²⁵ United Nations Environment Programme. *Global Status Report for Buildings and Construction 2024/2025*. 2025.

²²⁶ United Nations Environment Programme. *Global Cooling Watch 2025*. 2025.

²²⁷ Ibid; United Nations Environment Programme. *Brazil, Italy Announce New Push and Funding on Cooling Action Ahead of COP30*. 2025.

²²⁸ United Nations Environment Programme. *Amid Rising Heat, Sustainable Cooling Can Slash Emissions and Save Trillions of Dollars*. 2024.

²²⁹ International Energy Agency. *The Future of Cooling: Opportunities for Energy-Efficient Air Conditioning*. 2018.

enforcement.²³⁰ Addressing these challenges requires targeted capacity-building, financial support, and technical assistance in conjunction with strengthened national policy frameworks.²³¹

In response to these challenges, the international community has increasingly advocated for integrated policy approaches that incorporate passive cooling measures, energy-efficiency standards, refrigerant transition strategies, and climate-responsive urban planning.²³² Enhancing passive cooling measures in building codes, energy performance standards, product labeling, and urban design can reduce cooling loads before the deployment of mechanical systems and improve access to safe, efficient cooling.²³³ The Global Cooling Pledge seeks to improve the average efficiency of new air-conditioning equipment by 50% by 2030 and to reduce cooling-related emissions by 68% by 2050.²³⁴ Organizations such as the UNEP, the Cool Coalition, and related initiatives promote passive cooling measures, energy-efficient building standards, and climate-responsive design strategies.²³⁵ Although implementation remains uneven, international organizations, governments, and urban networks are increasingly supporting countries through technical assistance, policy guidance, and financing mechanisms to accelerate the adoption of sustainable cooling solutions, particularly in countries with limited institutional and financial resources.²³⁶

Conclusion

Sustainable cooling has transitioned from primarily technical and energy-sector issues to a multidimensional challenge that includes climate change mitigation, adaptation, public health, sustainable development, and energy security.²³⁷ The international framework established by the UNFCCC, the Paris Agreement, the Kigali Amendment to the Montreal Protocol, and the 2030 Agenda increasingly recognizes sustainable cooling and energy efficiency as essential elements of global climate action.²³⁸ Further initiatives, including the Global Cooling Pledge, the Cool Coalition, and the activities of UNEP, UNDP, WHO, UNICEF, and other organizations, have advanced efforts to reduce cooling-related emissions, improve energy efficiency, and expand access to sustainable cooling solutions.²³⁹ Despite these advancements, significant implementation gaps remain.²⁴⁰ Persistent challenges include rapid urbanization, rising cooling demand, the urban heat island effect, infrastructure limitations, financing constraints, and disparities in technical capacity, particularly in developing countries and regions expected to experience the greatest future growth in cooling demand.²⁴¹

²³⁰ World Bank. *New Program to Scale Up Efficient, Clean Cooling in Developing Countries*. 2019.

²³¹ United Nations Environment Programme. *National Cooling Action Plans: Lessons Learned and the Way Forward*. 2023.

²³² Cool Coalition. *About the Cool Coalition*. 2019.

²³³ United Nations Environment Programme. *Beating the Heat: A Sustainable Cooling Handbook for Cities*. 2021.

²³⁴ United Nations Environment Programme. United Nations Environment Programme. *Amid Rising Heat, Sustainable Cooling Can Slash Emissions and Save Trillions of Dollars*. 2024.

²³⁵ Cool Coalition. *About the Cool Coalition*. 2019.

²³⁶ United Nations Environment Programme. United Nations Environment Programme. *Global Cooling Watch 2025*. 2025.

²³⁷ United Nations Development Programme. *Sustainable Cooling and Energy Efficiency*. 2025.

²³⁸ United Nations Framework Convention on Climate Change. *Paris Agreement*; United Nations, General Assembly. *Transforming Our World: The 2030 Agenda for Sustainable Development (A/RES/70/1)*; United Nations Environment Programme. *The Kigali Amendment: An Overview*. 2026.

²³⁹ Cool Coalition. *Global Cooling Pledge*; UNDP. *Sustainable Cooling and Energy Efficiency*. 2023.

²⁴⁰ United Nations Environment Programme. *Global Cooling Watch 2025*. 2025.

²⁴¹ International Energy Agency. *The Future of Cooling: Opportunities for Energy-Efficient Air Conditioning*. 2018.

As global temperatures rise and cooling demand expands, Member States will be required to address several interconnected challenges, including strengthening policy frameworks for sustainable cooling, expanding access to energy-efficient and passive cooling technologies, reducing the impacts of urban heat islands, and improving implementation capacity and financing mechanisms.²⁴² Upcoming international meetings present opportunities to advance discussions on sustainable cooling.²⁴³ The Thirty-Eighth Meeting of the Parties to the Montreal Protocol, scheduled for 2026 in Kigali, Rwanda, will provide a relevant forum for advancing implementation of the Kigali Amendment, including the phasedown of hydrofluorocarbons and associated energy-efficiency considerations.²⁴⁴ COP31, to be held in 2026 in Antalya, Türkiye, may provide an opportunity to connect sustainable cooling with broader discussions on climate change mitigation, adaptation, finance, and resilient urban development.²⁴⁵ Additionally, UNEA-8, scheduled for 2027 at the headquarters of the United Nations Environment Programme in Nairobi, Kenya, may enable Member States to consider sustainable cooling within wider discussions on environmental sustainability and resilience.²⁴⁶ These issues will remain significant considerations for UNEA and other international forums focused on sustainable cooling, as they underscore the interconnectedness of climate resilience, energy efficiency, sustainable urban development, and environmental sustainability.²⁴⁷

Further Research

In what ways do Member States expand access to sustainable cooling while minimizing increases in greenhouse gas emissions and energy demand? To what extent can passive cooling strategies, climate-responsive building design, and urban planning reduce reliance on mechanical cooling systems? How can international corporations facilitate the implementation of the Kigali Amendment and the adoption of energy-efficient cooling technologies in developing countries? Which financial, technical, and institutional barriers hinder the widespread adoption of sustainable cooling solutions, and what strategies can effectively address these challenges? What approaches can cities employ to mitigate the impacts of urban heat islands and enhance resilience to extreme heat events? Which policies and standards can promote the integration of passive cooling measures, energy-efficiency requirements, and refrigerant transition strategies within national cooling frameworks? In what ways can the international community ensure equitable access to cooling for vulnerable populations while advancing climate mitigation and adaptation objectives?

²⁴² Sustainable Energy for All. *Chilling Prospects 2025. Tracking Sustainable Cooling for All 2025*. 2025.

²⁴³ United Nations Environment Programme. *Thirty-Eighth Meeting of the Parties*. 2026.

²⁴⁴ United Nations Environment Programme. *Kigali Amendment to the Montreal Protocol*. 2016.

²⁴⁵ United Nations Framework Convention on Climate Change. *UN Climate Change Conference-Antalya, November 2026*. N.d.

²⁴⁶ United Nations Environment Programme. *Seventh UN Environment Assembly Commits to Multilateral Solutions for a More Resilient Planet*. 2025.

²⁴⁷ United Nations Environment Programme. *Medium-Term Strategy 2026–2029*. 2024.

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<https://www.au-afrec.org/sites/default/files/2025-12/WEB%20Afees%20Strategy%20and%20roadmap.pdf>

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