2. Plans to establish centres of excellence for sustainable cooling and/or testing centres for energy efficiency

Burkina Faso

Stage II of the Hydrochlorofluorocarbon Phase-out Management Plan includes the establishment of two centres of excellence for certification. Feasibility studies were conducted, leading to the identification and selection of the two beneficiary centres. The equipment intended for these centres has already been procured and is currently being shipped to Burkina Faso. The remaining implementation steps will continue according to the established schedule. At this stage, there are no plans to establish energy efficiency testing centres.

China

The Hefei General Machinery and Electrical Products Inspection Institute currently serves as the established national-level testing centre. While no specific new centre construction is reported at this time, the Institute continuously upgrades its facilities to maintain global leadership, including the expansion of capabilities for low-global-warming-potential refrigerants and data centre liquid cooling technologies.

Colombia

It is in the interest of Colombia's National Ozone Unit to establish a Regional Thematic Centre joining the function of the different centres described above, to coordinate the activities of each centre as a service network for the entire region. Colombia has implemented initiatives related to some of the activities that would be offered by such a Thematic Centre. For example, the Colombian Association of Air Conditioning and Refrigeration has launched training initiatives for several ozone units in the region and offers a comprehensive academic programme in which engineers from across Latin America participate. The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), through its Proklima programme, has expressed interest in establishing Colombia as a regional hub for training in natural refrigerants. To this end, and in coordination with the national vocational training agency (SENA), steps have been taken to identify the main barriers and define solutions to overcome them. Proklima recently conducted a survey with the national ozone units in the region to assess potential demand in the event of the launch of training programmes in the country, yielding highly positive results. With support from the United Nations Development Programme, the Centre for Research and Development in Air Conditioning and Refrigeration (CIDARE) has received technical assistance through the provision of a mobile carbon dioxide training unit and has developed several consultancies for project preparation.

Ecuador

Ecuador is currently working on the expansion and strengthening of the Refrigerant Regeneration Pilot Centre at the Escuela Superior Politécnica del Litoral (ESPOL) in Guayaquil, as part of its efforts to support the transition towards sustainable cooling and the implementation of the Kigali Amendment to the Montreal Protocol. The planned expansion seeks to consolidate the centre as a national reference facility for refrigerant management and sustainable cooling practices. Ongoing efforts include the enhancement of technical infrastructure and equipment, as well as the strengthening of institutional and human capacities.

Key areas of focus include:

- Expanding training opportunities for refrigeration and air-conditioning technicians;
- Strengthening capacities in refrigerant recovery, recycling, regeneration, and reuse;

- Building technical expertise on low-global-warming-potential and climate-friendly refrigerants;
- Promoting best practices for reducing refrigerant emissions and improving system efficiency.

Haiti

There are no plans, in the short term, to set up a centre of excellence for sustainable cooling and/or testing centres in Haiti. However, a regional centre of these characteristics would be very beneficial for the country in terms of generating experience exchange and sharing knowledge, as well as testing pilots related to cooling and energy efficiency.

Jordan

The testing centres have already been established, and it is hoped that they will be expanded to cover other sectors.

Kenya

The National Industrial Training Authority is a national and regional centre for refrigeration and air-conditioning education, equipped with energy-efficient and hydrocarbon technologies, that institutionalizes advanced on-the-job training for servicing companies, field technicians, and regional partners. This facility could be upgraded to serve as a testing centre for energy efficiency.

Liberia

There are no confirmed plans yet for setting up a centre of excellence for sustainable cooling or a specialized energy efficiency testing centre in Liberia, particularly one focused on cooling technologies. However, several developments suggest that Liberia is moving in that direction through broader energy, climate, and institutional-strengthening initiatives. For instance, the Government of Liberia and partners such as the European Union, the African Development Bank, and the Economic Community of West African States are investing in energy efficiency capacity building and institutional strengthening through projects such as the Liberia Energy Efficiency and Access Project (LEEAP). Liberia's Environmental Protection Agency has announced plans for regional environmental research and laboratory facilities as part of its 2025–2029 strategic plan. These laboratories could potentially support future testing and certification activities related to energy efficiency and cooling technologies. Liberia is also increasingly participating in regional Economic Community of West African States energy initiatives, including collaboration with the Economic Community of West African States Centre for Renewable Energy and Energy Efficiency (ECREEE), which already promotes energy efficiency standards and renewable energy programmes across West Africa.

Mali

The National Agency for Renewable Energies and Bioenergies (ANERB), formerly the Mali Renewable Energy Agency (AER-Mali), houses an energy efficiency laboratory established with support from the West African Economic and Monetary Union (WAEMU) through its Programme régional de promotion de l'efficacité énergétique (PREE program). There is also the National Research and Experimentation Centre for Building and Public Works (CNREX-BTP).

Regarding the situation of the energy efficiency testing laboratory at ANERB, formerly AER-Mali, energy performance testing equipment for lamps and refrigerators has been provided to four laboratories, in Benin, Burkina Faso, Mali, and Senegal, and to one laboratory in Côte d'Ivoire for testing construction materials. In Mali, this initiative falls under the auspices of AER-Mali and

focuses specifically on testing the energy performance of lamps. The testing equipment is not yet fully operational because the software installation has reportedly not yet been completed. This initiative is largely unknown to the public and should receive appropriate attention from AER-Mali. Furthermore, to establish the necessary legal and regulatory framework for the development of these projects (EEA and EEB), the Council of Ministers of the member States adopted two directives on 26 June 2020: Directive No. 04/2020/CM/UEMOA, concerning energy labelling of new electric lamps and household appliances in the WAEMU member States; and Directive No. 05/2020/CM/UEMOA, establishing energy efficiency measures in building construction in the WAEMU member States.

The planned activities for 2020–2021 under the regional programme in each member state are:

- Establishment of national legal and regulatory tools to ensure the transposition of the two directives;
- Capacity building for key national stakeholders in the implementation of the two projects;
- Awareness-raising among the population, public institutions, and the private sector.

Nigeria

Nigeria is proposing a regional testing centre for energy efficiency.

Slovak Republic

At this stage, the Slovak Republic has not formally adopted a specific plan to establish a dedicated centre of excellence for sustainable cooling or a dedicated testing centre for energy efficiency in relation to the implementation of the Kigali Amendment. Nevertheless, Slovakia continues to support the development of professional capacities in the refrigeration, air-conditioning, and heat pump sector through the existing certification and training system, including training and examination activities related to fluorinated greenhouse gases and, increasingly, the need to address alternative refrigerants and new technical requirements stemming from updated European Union legislation. Future development of such capacities may be considered in the context of the implementation of Regulation (EU) 2024/573 on fluorinated greenhouse gases, the transition to lower-global-warming-potential and natural refrigerants, and the need to ensure sufficient technical knowledge, safety awareness, and professional competence in the sector.

Somalia

Somalia is actively exploring the establishment of centres of excellence for sustainable cooling and energy efficiency testing, in line with its obligations under the Montreal Protocol, including the Kigali Amendment, and national climate priorities. There is no fully operational national centre at the moment, but concrete steps and partnerships are under way. Somalia is also a participating member of the East African Centre of Excellence for Renewable Energy and Efficiency at the regional level, which acts as a hub to promote renewable energy and energy efficiency in East Africa. Through this platform, Somalia is involved in initiatives that include capacity building, policy harmonization, and the promotion of energy-efficient cooling technologies and standards. These regional efforts are particularly relevant for the development of Minimum Energy Performance Standards and future testing infrastructure.

South Africa

The Africa Centre of Excellence for Sustainable Cooling and Cold Chain, headquartered in Kigali, Rwanda, is designed as a pan-African network.

Turkiye

The establishment of a centre of excellence for sustainable cooling and/or related testing capacity is under consideration as part of Türkiye's Kigali Implementation Plan, approved in 2024. The process is still at an early stage, and further work is under way to define the most appropriate institutional and operational model. Current considerations include whether the centre should operate as a regional facility, be hosted by a university or an existing research or testing institution or be developed through another suitable partnership model. Issues such as governance, business model, staffing, financial sustainability, technical scope, and long-term operation are still being assessed. The planned component is expected to support sustainable cooling technologies, energy efficiency testing, technical assessment, capacity building, and knowledge-sharing, but its exact scope and implementation arrangements remain under development.

Tuvalu

At present, there are no national plans to establish such a centre in Tuvalu. However, at the regional level, discussions held during meetings in Papua New Guinea in March 2026 highlighted the role of the Pacific Centre for Renewable Energy and Energy Efficiency (PCREEE), already established in Tonga. PCREEE currently provides technical support for Minimum Energy Performance Standards and presents an important opportunity for Pacific member countries to collaborate on the development of a regional energy efficiency testing centre.

United Kingdom

The Department for Environment, Food and Rural Affairs' current focus is on supporting delivery of existing activities under the Sustainable Cooling and Cold Chain Solutions programme through the United Nations Environment Programme and delivery partners, as well as relevant opportunities to scale up activities.

Zimbabwe

The Ministry of Environment, Climate and Wildlife is working with the Ministry of Energy and Power Development, together with implementing agencies and other stakeholders, to set up testing centres for energy efficiency in different cities as well as at ports of entry.

3. Policies supporting the establishment and operation of centres of excellence for sustainable cooling and testing centres for energy efficiency

Burkina Faso

To support the establishment of the centres of excellence, an inclusive and participatory approach was adopted in order to ensure the involvement of all relevant stakeholders. With a view to the future certification of refrigeration and air-conditioning technicians, several working sessions were organized with professional technicians' associations, the National Ozone Unit, refrigeration and air-conditioning experts, and resource persons. These consultations led to the development of a provisional synoptic certification scheme for technicians. This document will be further reviewed and enriched with additional stakeholders in order to establish a national certification mechanism.

China

The Chinese government supports the Hefei General Machinery and Electrical Products Inspection Institute through the National Quality Infrastructure initiative. Policies include: (1) standardization leadership, designating the Institute as the national technical authority for the refrigeration and air-conditioning sector; (2) certification and compliance, authorizing the Institute as the official registered laboratory for China's Energy Efficiency Labeling scheme and the China Energy Conservation Certification; and (3) international alignment, supporting the Institute in obtaining international accreditations from authoritative bodies such as the Air-Conditioning, Heating, and Refrigeration Institute (AHRI), Keymark, and the Saudi Standards, Metrology and Quality Organization (SASO), thereby helping domestic manufacturers meet export compliance requirements under the Kigali Amendment.

Colombia

To establish a research and development centre in Colombia, it must be legally incorporated, have a scientific staff in place, and be accredited by the Ministry of Science, Technology, and Innovation (MinCiencias). The Colombian regulatory framework allows for the creation of autonomous centres, which have their own legal personality, or dependent centres, which are affiliated with entities or universities. Key steps and requirements for establishing a research and development centre include:

- Bylaws and constitution: the centre must be formally established through a private document or public deed if it is autonomous, or through an administrative act or internal bylaw if it is dependent;
- Human capital and research: it is mandatory to demonstrate the participation of at least one research group categorized as A1, A, or B by the Ministry of Science, Technology, and Innovation;
- Infrastructure: the centre must have physical facilities, technological equipment, and demonstrate financial stability, including funding projections, to execute projects; and
- Prior experience: the centre must have been in operation for at least two years before applying for official recognition.

Policies to support these centres include research and development tax benefits, under which companies that invest in or establish research and development centres in the country are eligible for income tax deductions and tax credits, and project funding, under which entities can apply for

co-financing calls and submit eligible projects through the Ministry of Science, Technology, and Innovation.

Ecuador

Ecuador has implemented several policy and capacity-building measures that support the establishment and long-term operation of centres of excellence for sustainable cooling, particularly through the strengthening of technical education, workforce development, and institutional capacity under the framework of the Montreal Protocol and the Kigali Amendment. A key achievement has been the development and formal recognition of two occupational competency profiles for the refrigeration and air-conditioning sector, which provide a standardized framework for workforce qualification and skills development. These competency profiles support the professionalization of technicians and facilitate the design of training, certification, and capacity-building programmes aligned with the evolving needs of sustainable cooling technologies and refrigerant management. In addition, Ecuador has promoted the institutionalization of permanent training programmes and technical courses within the country's leading engineering universities, namely the Escuela Politécnica Nacional (EPN) in Quito and the Escuela Superior Politécnica del Litoral (ESPOL) in Guayaquil. Through this approach, sustainable cooling and refrigerant management are no longer addressed through isolated projects but are incorporated into the regular academic and extension activities of these institutions.

Georgia

National legislation in the field of energy efficiency does not, at this stage, give sufficient motivation for sustainable cooling and/or testing centres. The Law on Energy Labelling, adopted in 2019, mandates clear labelling and product information sheets for energy-consuming appliances, including key refrigeration, air-conditioning, and heat-pump-related products such as refrigeration equipment, air conditioners, and space heaters, in line with the European Union's energy labelling framework. Fourteen technical regulations covering these products have been approved and entered into force on 1 January 2026. In addition, an Ecodesign Law and nine associated regulations are under development to restrict inefficient, high-energy-consuming devices. These requirements, once adopted, will establish the need for sustainable cooling and/or testing centres.

Haiti

Haiti is currently implementing Stage II of the Hydrochlorofluorocarbon Phase-out Management Plan, along with a pilot project on energy efficiency, in line with the elimination of hydrochlorofluorocarbons. Public policy is expected to be generated during implementation.

Jordan

Ratification of the Kigali Amendment; development of the National Cooling Strategy and the National Cooling Action Plan; and development of the labelling system and Minimum Energy Performance Standards for the residential sector, in response to the Jordan Standards and Metrology Organization's (JSMO) issuance of energy label technical rules and eco-design requirements for household appliances.

Kenya

Kenya's sustainable cooling and energy efficiency initiatives are anchored in a robust national regulatory framework. The operationalization of these centres of excellence and testing hubs is legally mandated and sustained by the Energy Act, 2019, the Energy Management Regulations, and the Appliance Energy Performance and Labelling Regulations, which collectively enforce

strict Minimum Energy Performance Standards and mandatory equipment testing. Furthermore, these facilities serve as the direct implementation vehicles for the Kenya National Cooling Action Plan (NCAP) and the country's climate commitments under the Kigali Amendment to the Montreal Protocol.

Liberia

Liberia has not yet established many fully operational specialized centres of excellence for sustainable cooling or nationally accredited energy efficiency testing laboratories at the scale seen in some larger economies. Nevertheless, there are several national policies, climate commitments, and regulatory frameworks already providing a strong policy foundation for creating and operating such centres, including: the Liberia National Energy Policy; the National Energy Efficiency Action Plan; Liberia's Nationally Determined Contributions; the Environmental Protection and Management Law of Liberia; the Montreal Protocol Controlled Substances Regulations, 2023; and climate and green growth integration under the Government's Agenda for Reconstruction, Economic Stabilization, and Transformation (AREST).

Mali

The National Energy Policy and a National Energy Efficiency Development Strategy, at the government level. Within the framework of the ROCA Project (*Refroidissement Respectueux de l'Ozone et du Climat en Afrique de l'Ouest et Centrale),* the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) in Mali has developed a strategy on minimum energy performance standards for air conditioners and a draft regulation on energy efficiency development in Mali. There is also an energy information system for the country, for the West African Economic and Monetary Union (WAEMU), and for the Economic Community of West African States (ECOWAS), particularly concerning energy balances. With the support of UNEP/CRTC, ongoing technical assistance to the network of experts for the promotion of energy efficiency aims to help it develop into a SUPER ESCO in the country.

Nigeria

Minimum Energy Performance Standards; Nigeria Cooling Action Plan.

Slovak Republic

Although Slovakia does not currently have a formally designated centre of excellence for sustainable cooling, several policy and regulatory measures support the development of professional and technical capacities relevant to sustainable cooling and the implementation of the Kigali Amendment. At the European Union level, Slovakia implements the requirements of Regulation (EU) 2024/573 on fluorinated greenhouse gases, which strengthens the framework for the phase-down of hydrofluorocarbons, leakage prevention, certification, training, and the transition to alternatives. The Regulation is directly applicable in all EU member States and provides an important legal basis for improving competence and environmental performance in the refrigeration, air-conditioning, and heat pump sector. At the national level, professional competence, certification, and related obligations are currently supported by the national legal framework for fluorinated greenhouse gases and ozone-depleting substances. The existing system includes training, examinations, and certification for persons and companies handling fluorinated greenhouse gases, provided by the Slovak Association for Cooling, Air Conditioning and Heat Pumps (SZ CHKT) and the Certification Body for Refrigeration and Air Conditioning Technology (CO CHKT) under the applicable Slovak legal framework. These policies and activities contribute to the safe handling of refrigerants, the prevention of emissions, support for proper

installation and servicing practices, and preparation of the sector for the wider use of lower-global-warming-potential and alternative refrigerants.

Somalia

Somalia's policy context for the establishment and functioning of centres of excellence for sustainable cooling and energy efficiency testing is largely based on its obligations under the Montreal Protocol and the Kigali Amendment, complemented by emerging national structures for environmental and energy governance. At the national level, the following policy and regulatory measures are contributing to an enabling environment:

(1) Somalia is strengthening its regulatory and institutional frameworks to phase out ozone-depleting substances and phase down hydrofluorocarbons as part of the Hydrochlorofluorocarbon Phase-out Management Plan and the Kigali Implementation Plan. These programmes promote the transition to climate-friendly and energy-efficient cooling technologies and also include capacity-building components that establish technical training centres and future centres of excellence;

(2) Ozone regulation for refrigerant licensing and control. The Government of Somalia, through the National Ozone Office, has established and is strengthening licensing and quota systems for controlled substances, consistent with the requirements of the Montreal Protocol. These types of regulation are essential for creating an organized market space, allowing for standardization, testing, and, ultimately, certification of training and testing centres;

(3) Capacity building and certification frameworks for refrigeration and air-conditioning technicians. Somalia is promoting technician training and certification schemes in the refrigeration and air-conditioning sector through the National Ozone Office. These policies will ensure the availability of skilled personnel and form a critical building block for the operationalization of centres of excellence and testing laboratories;

(4) Institutional strengthening of the National Ozone Office. The Office, under the Ministry of Environment and Climate Change (MoECC), is the central point for ozone policy and regulatory development, stakeholder engagement, and the implementation of Montreal Protocol obligations in the country. It has built close partnerships with vocational institutions, refrigeration and air-conditioning workshops, academia, and international implementing agencies to discuss the criticality of developing centres of excellence and testing infrastructure; and

(5) Current regional and international cooperation. Somalia is actively engaged in regional ozone networks and knowledge-sharing platforms to advance best practices and gain exposure to models such as the Africa Centre of Excellence for Sustainable Cooling. These collaborations influence the development of national policy and facilitate the gradual establishment of similar facilities in Somalia.

South Africa

National Cooling Plan; Kigali Amendment Plan; Energy Efficiency Strategy.

Türkiye

Türkiye's policy framework for sustainable cooling, energy efficiency testing, and related centre-of-excellence capacity is being further developed within the context of the Kigali Implementation Plan. Since the establishment and/or strengthening of sustainable cooling testing capacity is included among the planned activities under the Plan, related policy development, institutional

coordination, and integration processes are ongoing. The implementation of the Kigali Amendment provides the main policy basis for strengthening testing, verification, training, and institutional capacity for energy-efficient and climate-friendly cooling technologies. This process is also supported by Türkiye's broader energy efficiency policies, eco-design and energy labelling alignment processes, and the existing standards, testing, certification, and accreditation infrastructure. In this context, the Turkish Standards Institution (TSE) and the Turkish Accreditation Agency (TÜRKAK) have important roles in standards implementation, testing, certification, conformity assessment, and laboratory accreditation. The detailed institutional and operational model for the planned sustainable cooling testing and centre-of-excellence capacity remains under development.

Tuvalu

Tuvalu has implemented several policies and legislative measures that support energy efficiency initiatives, including the Energy Efficiency Act 2016 and the Tuvalu National Energy Policy, which promote energy efficiency and conservation across all sectors while encouraging the use of energy-efficient appliances and technologies, including the implementation of Minimum Energy Performance Standards.

United Kingdom

Through the Sustainable Cooling and Cold Chain Solutions programme (SCCCS), UK funding supported the United Nations Environment Programme's United for Efficiency (U4E) team with complementary policy activities. These are not directly linked to the Centre of Excellence approach but could support the establishment and operation of a centre of excellence. The programme has supported the development and dissemination of the U4E Model Regulation Guidelines and associated tools, which provide countries with frameworks to implement standards, labelling, and market controls that promote energy-efficient and low-global-warming-potential technologies. The programme also supported U4E regional policy harmonization processes, for example in the East African Community and the Southern African Development Community, which aim to align regulatory approaches across countries. In parallel, the programme supported U4E technical assistance for national implementation of these frameworks, including the application of policy tools such as sustainable public procurement and related financial and regulatory measures. Together, these frameworks aim to create an enabling environment in which the SCCCS Centre of Excellence Hub and SPOKE approach can operate as a practical delivery mechanism.

Vanuatu

There are few policies that would support the establishment and operation of such centres of excellence if one were to be established. These would include the Ozone Layer Protection Act, in relation to the implementation of Montreal Protocol projects such as the Kigali Implementation Plan and the Hydrochlorofluorocarbon Phase-out Management Plan, which promote the adoption of climate-friendly, energy-efficient cooling equipment and strengthen the technician training and certification system for refrigeration and air-conditioning systems. These efforts can also be further supported by the National Road Map, 2016–2030, which prioritizes energy-efficient and sustainable energy use, and the National Sustainable Development Plan, 2016–2030, which emphasizes climate resilience and human capacity development.

Zimbabwe

The Government of Zimbabwe has formulated and is implementing the following policies to support the establishment and operation of centres of excellence for sustainable cooling and

testing centres for energy efficiency: the Low Emission Development Strategy; the Climate Change Management Policy; the Renewable Energy Efficiency Policy; and the Energy Efficiency Policy.