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| Country: | <i>Regional proposal</i> <i>Ghana</i> <i>Kenya</i> <i>Mauritius</i> <i>Namibia</i> | Request identification number: | <i>2014-010/REG-01</i> |
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| Title: | <i>Green Cooling Africa Initiative (GCAI)</i> |
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1. Project Summary

Provide a brief description of the assistance that will be provided by the CTCN, including its main outcome, outputs, and expected impacts in the national context. The summary should also include an indication of the assistance duration, as well as the main country partners who will be directly involved in project implementation.

The Green Cooling Africa Initiative (GCAI) request put forward by Ghana and supported by Kenya, Mauritius and Namibia, represents a regional initiative aimed to prepare for a transformational change towards sustainable cooling appliances. The assistance provided by the Climate Technology Centre and Network (CTCN) is foreseen to focus on addressing the objectives of Phase I of the request (Figure 1), which lays the foundations for an actual transition to a sustainable cooling equipment base in the respective countries. Activities defined within the framework of this project aim to support the development of inventories for the refrigeration and air conditioning (RAC) sector, which includes stationary and mobile air conditioning as well as domestic, commercial, industrial and transport refrigeration. These inventories will be based on Tier 2¹ methodology, determining business as usual (BAU) and mitigation emission paths, assessing technology needs through gap analysis between currently used technologies and internationally available best technology options. Both, inventories and gap analysis will serve as a base for suitable recommendations on the appropriate policy and legislative measures to be undertaken in order to promote green cooling sector. Furthermore, region and country specific technology roadmap proposals that will be defined are expected to form the basis for (a) developing Nationally Appropriate Mitigation Actions (NAMAs) or similar bankable project proposals funded by other UNFCCC²-related funding mechanisms; and (b) the implementation of technology partnerships and co-operations to effectively mitigate ozone depletion and greenhouse gas (GHG) emissions in the cooling sector.

As a result, the involved countries will develop a clear understanding on how the cooling sector contributes to their national energy consumption and total GHG emissions (including emission related to the use of hydrofluorocarbons' (HFCs)) and where appropriate policy measures are required.

¹ Tier 2 refers to an intermediate level of details and methodological complexity for inventories, according to the Intergovernmental Panel on Climate Change (IPCC) Guidelines.

² United Nations Framework Convention on Climate Change (UNFCCC)

In consequence, the outcomes of this project are expected to help define the appropriate actions on how to reduce the consumption of ozone depleting substances (ODSs), reduce energy demand and related GHG emissions as compared to BAU pathway. This will be supported by suitable policy measures.

This regional initiative goes beyond what has been addressed and practiced in many developing countries. It takes advantage of the economies of scale to facilitate sustainable industrial development in the RAC sector in the respective countries. Both the cost advantage that arises from such approach as well as the strategy proposed here are expected to increase project effectiveness (by facilitating the exchange of information, expertise and know-how) and the potential for mobilizing further financial resources for the relevant follow up actions, increasing the opportunities for partnerships and the expansion of activities to other countries in Africa. In addition, the project is expected to draw on a wide range of public and private partners and international experts.

The CTCN assistance will take 18 months and is expected to start in the second quarter of 2015.

1.1 Strategy

The assistance provided by the CTCN is foreseen to focus on addressing the objectives of Phase I of the request (Figure 1), which lays the foundations for an actual transition to a sustainable cooling equipment base in the respective countries. The other two phases (Phase II and Phase III) presented below and described in the request will not be covered by this project. The outline of activities to support the anchoring of the project beyond Phase I is outlined in the “Post-CTCN project scenario under 2.4”.

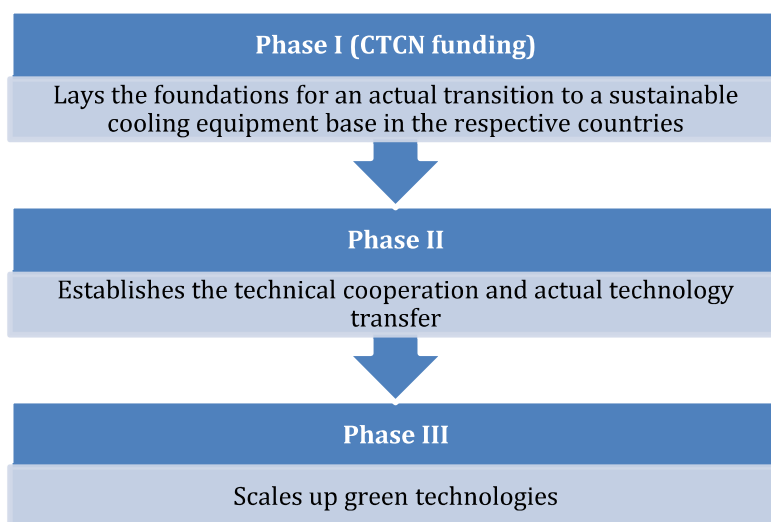


Figure 1. Project context.

2. Overview of the assistance

2.1 Outcome (objective of the assistance)

Describe the expected outcome (likely short term effects) of the CTCN assistance in the country and/or sector. This outcome should be directly attributed to the activities of CTCN technical assistance.

The objective of the Green Cooling Africa Initiative is to enable participating countries to have the necessary information (i.e. inventory) and tools (i.e. policy options), to create a shift from BAU scenario in the cooling sector to more sustainable technology options. This is expected to be achieved not only through country specific initiatives, but through a constructive utilization of a regional approach, as a mean not to duplicate the efforts undertaken in each country but to complement the efforts to achieve the objectives. Some of the activities that are planned include exchange of tools being developed, know-how and expertise, as well as the exchange of experiences between the countries involved. Furthermore, project methodology and foreseen results are expected to be easily replicated in other countries of the region, thus creating an overall impetus for a shift towards green cooling sector in Africa.

2.2 Outputs (results of the assistance)

Describe the expected outputs (services or products) of the CTCN technical assistance in the country and/or sector. These outputs should be directly attributed to the activities of CTCN technical assistance.

Four main outputs are foreseen within this project. These are presented in Figure 2 and described below.

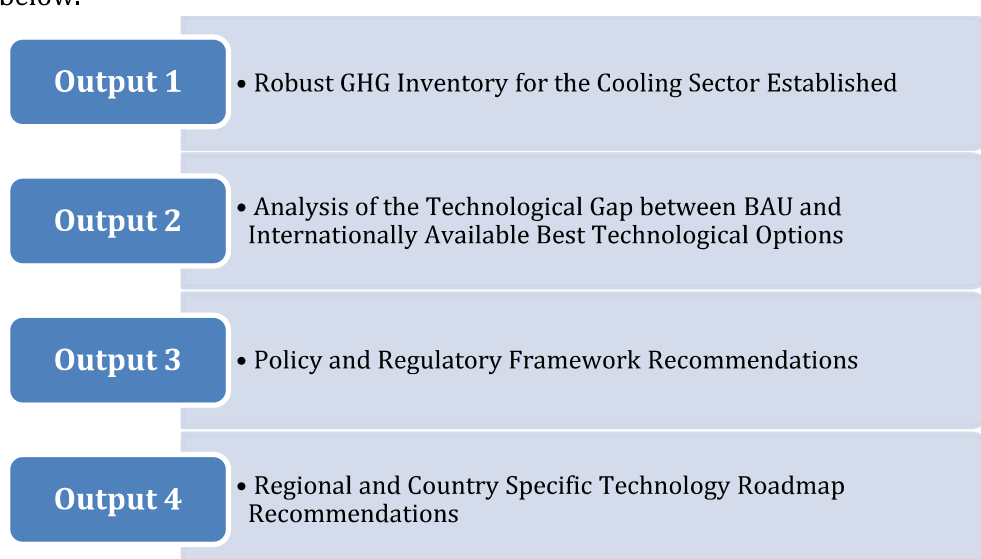


Figure 2. Project outputs

Output 1: Robust GHG Inventory for the Cooling Sector Established

Inventories established according to the Tier 2 methodology for the RAC sector of each country will serve as a base for making the projections on the future RAC stock, the energy use and GHG emissions. These inventories will include country specific appliance data and refrigerants leakage rates for the following sub-sectors: (a) stationary and mobile air conditioning and (b) domestic, commercial, industrial and transport refrigeration. Basing on that information, the impact on energy consumption and GHG emissions for each sub-sector will be reported, the possible emission mitigation potential will be assessed and priority cooling sub-sectors will be identified. Further, inventories will enable countries to report their emissions (including those HFC-based³) related to the cooling sector more accurately. As a result, countries will be able to establish NAMAs or other bankable project proposals covering the relevant sub-sectors and an equipment based monitoring, reporting and verification (MRV) strategies. Further, basing on MRV, the stock inventory is expected to be formed for each country.

Output 2: Analysis of the Technological Gap between BAU and Internationally Available Best Technological Options

Existing technologies are compared with internationally available green cooling technologies suitable for the respective countries to mitigate emissions. Air conditioning and refrigeration equipment with low global warming potential (GWP) refrigerants, including, in particular natural refrigerants, inverter technologies, and, other design considerations to lower the energy consumption of the appliances will serve as a reference for this comparison. An in-depth analysis will be provided for each priority sub-sector along with a barrier analysis report, which will identify key issues to be addressed in order to allow for a wider dissemination of climate friendly green cooling solutions.

Output 3: Policy and Regulatory Framework Recommendations

Existing policies and policy options are assessed and reviewed. Further, the national policies, regulations and standards are compared with respective international best practices. Recommendations for best policy options in terms of RAC energy efficiency, refrigerant leakage, refrigerants safety standards and labelling are provided.

Output 4: Regional and Country Specific Technology Roadmap Recommendations

Roadmap recommendations include milestone for the introduction of green cooling technologies both at the country and regional level (including possible mitigation targets and measures) and serves as basis for developing future proposals for actions in the RAC sector. The

³ It is noted that as non-Annex I Parties, the participating countries in this project are encouraged, but not required, to provide information on HFC emissions. The establishment of a Tier 2 inventory is therefore not compliance driven but an additional effort by the countries. At the same time the Tier 2 approach also allows the countries to develop a better understanding for the energy consumption in cooling and measures to reduce the related energy consumption and emissions.

technology roadmaps shall follow the guidance of the Technology Executive Committee (TEC) brief on “Using roadmapping to facilitate the planning and implementation of technologies for mitigation and adaptation”⁴.

At the country level: Recommendations for a national green cooling roadmap are established through a national process involving stakeholders that represent the relevant ministries, industry, national and international experts. In order to make recommendation for national roadmaps, these stakeholders are provided with the relevant information that highlights (a) milestone based mitigation targets, (b) the appropriate enabling environments such as the staged introduction of target technologies, (c) the removal of key barriers, (d) funding requirements and (e) the establishment of supporting technology standards and policies. The green cooling roadmap is foreseen to serve as a basis for the countries to establish NAMA or similar bankable proposals aiming for the actual transition to a sustainable cooling equipment base and seek financing options for these.

At the regional level: Recommendations for a regional green cooling roadmap are established. The regional roadmap will summarize the experiences made in the four target countries. Based on this experience, recommendations will be made for other neighbouring countries in the Sub Saharan region. The regional approach brings additional value to the countries by means of synergetic use of information and resources. Network linkages with existing regional networks (i.e. the Ozone Officers’ Network for Africa, ODSNET⁵ meeting of UNEP⁶) and forums, existing trade blocks and customs arrangements (i.e. EAC⁷, ECOWAS⁸, SADC⁹, SACU¹⁰, COMESA¹¹) will be established which have the potential to sustainably support the implementation of the green cooling roadmap in the region. Further, linkages with the respective sub-regions of the participating countries (i.e. between West African countries and Ghana, between East African countries and Kenya, between Southern African countries and Namibia and between Mauritius and Small Island Development States¹²) are expected to be made. Ideally elements of the roadmap will be taken over into their agendas and work streams. The same data collection tools will be used for all participating countries and could also be applied to any other country interested in creating a detailed data basis on RAC equipment.

⁴ TEC Brief – Using roadmapping to facilitate the planning and implementation of technologies for mitigation and adaptation (October 2013):

http://unfccc.int/ttclear/misc_/StaticFiles/gnwoerk_static/TEC_column_L/3aaf07d4cf1d4d51998b57771759880a/f427db90b3c54f2d979f984db5af18ce.pdf

⁵ Ozone Depleting Substance Officers' Network (ODSONET)

⁶ United Nations Environment Program (UNEP)

⁷ East African Community (EAC): the regional intergovernmental organisation of the Republics of Burundi, Kenya, Rwanda, the United Republic of Tanzania, and the Republic of Uganda.

⁸ Economic Community of West African States (ECOWAS): the regional group of 15 Western African countries.

⁹ Southern African Development Community (SADC): an inter-governmental organization of 15 southern African states.

¹⁰ Southern African Customs Union (SACU): consists of 5 countries: Botswana, Lesotho, Namibia, South Africa and Swaziland

¹¹ Common Market for Eastern and Southern Africa (COMESA): represents free trade of 20 African states

¹² Relevant representatives from neighbouring countries and other relevant African organisations will be invited to the regional workshop (these representatives will be invited to travel on their own costs and budgets)

2.3 Technological focus

Provide a brief description of the climate technology(ies) promoted through the CTCN technical assistance, and explain how it will assist in identifying, adapting, developing, transferring and/or deploying the specific adaptation or mitigation technology(ies).

The CTCN assistance under this project targets the support in decision making in the countries, for identifying technology choices that are appropriate to meet the climate mitigation targets of the respective countries.

Technologies considered within the framework of this project include air conditioning (stationary and mobile) and refrigeration (domestic, commercial, industrial and transport) equipment with low GWP refrigerants, including, in particular natural refrigerants, as well as inverter technologies, and, other design considerations that contribute to lower energy consumption of these appliances. The technology options considered are to be assessed in regard to their climate and environmental effects.

Further, policy and regulatory framework recommendations are expected to assist the countries to develop detailed plans for technology interventions that bring about a tangible change in the formation of the cooling equipment basis. The technology choices need to meet the requirements of the specific countries that are based on a tailored technology need assessment.

Description of the Assistance

2.4 Activities

Define in Annex 1 the planned activities and sub-activities to be conducted, as well as their corresponding deliverables for the respective outputs.

For each activity, provide below a brief description, also indicating how it will contribute to the output and overarching objective.

The following outputs and corresponding activities planned within the framework of this project are listed below. Additionally, a more detailed list of sub-activities as well as deliverables for respective outputs can be found in Annex 1.

- Output 1:** Robust GHG inventory for the cooling sector established;
- Output 2:** Analysis of the technological gap between BAU and internationally available best technological options;
- Output 3:** Policy and regulatory framework recommendations;
- Output 4:** Regional and country specific technology roadmap recommendations.
- Post-CTCN Project Scenario: Outline of post-project activities to ensure the sustainable anchoring and impact of the project

Output 1: Robust GHG inventory for the cooling sector established

Activity 1.1: Data collection

The project and the inventory development activity will be started through a regional workshop in Kenya and will be assisted by international experts.

To establish a broad consensus a stakeholder action within each country and a steering committee to identify the ranking for mitigation action will be established. On a per country basis the activities should be led by a focal point (ideally being an authority with a government ministry which is related to the establishing of GHG inventories and/or the industry specifics of the cooling sector).

The GHG inventory will be established through data collection (using primarily industry and other secondary sources; surveys and questionnaires) according to Tier 2 standards. The GHG inventory will be established on a country basis covering both the current and future stock of cooling equipment, and by including all main cooling sub-sectors (industrial, commercial, transport and domestic refrigeration and domestic, commercial and mobile air conditioning). The inventory will be equipment-based and will cover key parameters such as energy efficiency in terms of coefficient of performance (COP), energy consumption, refrigerant type and consumption (filling, refilling, leakage rates).

As a result, countries will gain a clear understanding of their current and projected cooling based GHG emission and energy consumption. The information on a sub-sector level will be available.

Activity 1.2: Identification of the priority sub-sectors for each country to target a transition to green cooling technologies

Inventories will be assessed in a national workshop, during which the stakeholders are expected to agree on the criteria to rank sub-sectors. Based on the available information countries can identify priority technologies and cooling sub-sectors for mitigation action. The aim of the activity is to enable the countries to independently maintain the cooling appliance inventory database to gain experience, for the effective replication of the inventory stock taking measures in other countries of the region.

Timeframe: first two quarters (Q1, Q2; Section 2.8)

Key stakeholders: relevant ministries, NOUs, key representatives of the cooling industry.

Output 2: Analysis of the technological gap between BAU and internationally available best technological options

Activity 2.1: Analysis of cooling equipment in selected sub-sectors for possible transition to low emission technologies

This activity covers the comparison of deployed technologies (both for in stock equipment and new sales) on a national and regional level which will be further compared with international best practice technologies suitable to be deployed in the respective countries. A database of nationally used technologies will be established. Recommendations will be made to identify the sub-sectors and related appliance technologies that are most suitable and environmentally sound to save energy, mitigate GHG emissions, avoid persistent waste, preserve resources and to become widely adopted. The information will be shared across the involved countries.

Activity 2.2: Comparative analysis of local equipment against internationally available best practice technologies

A performance comparison will serve as a base to develop suitable recommendations technologies that are most appropriate for particular country and sub-sector in terms of energy efficiency and GHG emission reduction.

Timeframe: third and fourth quarters (Q3, Q4).

Key stakeholders: relevant ministries, the NOUs, key representatives of the cooling industries.

Output 3: Policy and regulatory framework recommendations

Activity 3.1: Support policy development that promotes adoption of low emission technologies in the cooling sector

This activity focuses on the review of current policies and standards related to cooling equipment (and their procurement). The analysis will include the identification of key regulatory barriers to be removed for the promotion of green cooling technologies and the potential to reach higher market dissemination through the recommendation of state-of-the-art standards, improved government procurement policies and improved industry standards for the deployment of equipment.

Stakeholders are involved through national workshops in each country. Across the four countries comparative policy information will be shared in a regional policy recommendations workshop.

Activity 3.2: Recommendation on regulatory amendments (if required).

National and regional policy recommendations and standards to promote green cooling technologies will be developed. The ministries will be supported in developing and establishing guidelines for the key selected sectors.

Activity 3.3: Recommendation on fiscal measures and green financing support which can be adopted to promote low emission technologies

Recommendations on fiscal measures and green financing support (tax incentives, variable import duty structures) which can be adopted to promote low emission and environmentally sound technologies will be made.

Timeframe: third, fourth and fifth quarters (Q3, Q4, Q5).

Key stakeholders: the relevant ministries, legal experts in drafting policies, the NOUs, key representatives of the cooling industries, testing institutes, local and regional bureaus of standards, local universities.

Output 4: Regional and country specific technology roadmap recommendations

Activity 4.1: Development of milestone based action plan to bring about a systematic change in technology applied to the cooling sector.

This activity covers the establishment of national roadmaps for green cooling technologies and will be based on the outcomes of the activities undertaken to achieve outputs 1-3. The roadmap is a detailed action plan outlining how green cooling technologies will gain market share, how related policy environments will be enabled, financing sought, and other supporting activities such as the establishment of refrigerant standards, minimum energy efficiency standards, capacity building measures such as trainings or the support for establishing adequate equipment testing capabilities. The roadmap will include milestones and related emission reduction targets (relative to the BAU and based on the MRV and Tier 2 inventory data). The roadmap targets and milestones will be established through a consensus targeting broad stakeholder support. For the agreement on the national roadmaps stakeholder workshops are planned in each of the countries.

Activity 4.2: Explore possible funding options for the actual implementation activities.

The roadmap will serve as a basis for the countries to formulate action proposals in the RAC sector and seek funding for the implementation of such NAMAs or related proposals. For these NAMA proposals expert recommendations will be provided for possible technology transfer agreements and technology partnerships.

Activity 4.3: Support replication of project deliverables at a regional scale

Across, the four countries information on an overarching regional roadmap will be shared in a regional workshop. Here, also the outreach and linkages will be sought to relevant regional networks and the neighbouring countries in the respective sub-regions for the countries. For

the funding of NAMAs or similar proposals, representatives of funding organisations, such as the Green Climate Fund (GCF), regional development banks, etc. will be invited. The aim is to establish a sustainable regional network for green cooling technologies, where regional policy and technology standards will be established and continuously improved.

Timeframe: fifth and sixth quarters (Q5, Q6).

Key stakeholders: the relevant ministries, legal experts in drafting policies, the NOUs, key representatives of the cooling industry, testing institutions, local and regional bureaus of standards, and local universities involved in the benchmarking and testing of cooling equipment, as well as financial institutions.

Outline of post-CTCN project activities to ensure the sustainable anchoring and impact of the project

The activities described under Output 1-4 target will serve to provide the basis for sustained and continued action towards low carbon-based technologies in the air conditioning and refrigeration sector in the four countries. This includes the Phase II which “Establishes the technical cooperation and actual technology transfer” and Phase III which “Scales up green technologies”

Required post-CTCN project activities:

The activities of the Phase I of the project see to establish lasting linkages to activities planned beyond Phase I to ensure the sustainable anchoring and continuation of the project towards the Phases II and III.

- Linkages to GIZ related projects

Through the Green Cooling Initiative project, sponsored by the International Climate Initiative (IKI) of the German Federal Ministry of the Environment, Nature Conservation, Building and Nuclear Safety, GIZ seeks to establish technology cooperation and technology transfer between technology partners in developing countries to promote the dissemination of green cooling technologies. The CTCN project will provide an excellent foundation to actively create and promote a network of government and private entities for promotion of green cooling technologies. In the next step, the network shall demonstrate, through pilot projects, the viability of green cooling technologies and build capacity through training of technical personnel.

- Linkages to Hydrochlorofluorocarbon Phase-out Management Plans (HPMPs)

There is an intense discussion within the Montreal Protocol on an agreement to phase down HFCs following the model and framework of the existing phase down of HCFCs. The phase down of HFC is expected to have a significant impact on the air conditioning and refrigeration

industries in the target countries, where many appliances shall be changed to low GWP refrigerants. Very often such changes cannot be undertaken with mere drop-in solutions but new refrigeration and air conditioning system changes will be required. The project will seek direct linkages to the activities under the Montreal Protocol to maximise the output of targeted system changes in order to seek benefits both for the migration to low carbon refrigerants and high energy efficiencies. The latter will be central to lower the carbon footprint of refrigeration and air conditioning systems in the region over the long term. Countries are already in the process of conducting demonstrations and pilot initiatives in the field of energy efficient cooling through their ongoing projects under the Montreal Protocol. These initiatives will be further boosted through the CTCN project which would provide tools for intervention. These are foreseen to be incorporated into the ongoing and future projects to be implemented under the Montreal Protocol.

- NAMA Linkages

With carrying out the Phase I of the project, the countries will be in a position to set up and compile NAMA (and similar) proposals with supported funding. NAMA proposals could be developed with the participating countries either on an individual or regional basis. The NAMA proposals can be registered under the UNFCCC and submitted for funding to e.g. the German-UK NAMA Facility the Global Environmental Facility (GEF) or the Green Climate Fund (GCF).

- Linkages to regional energy efficiency activities

There are several UN funded energy efficiency initiatives in Africa including the target countries. The project will seek close active linkages with these initiatives. The objective here is to actively try to find synergies and to establish institutionalized networks with the relevant industry associations, institutes and governmental ministries and organisations in the respective countries. Ghana for example has been implementing a refrigerator turn-in and rebate scheme where incentives are given to consumers to hand in their old inefficient refrigerators and in return receive discounted energy efficient refrigerators. Such a scheme could be expanded to include other cooling equipment as well as also replicated in other countries. Appliance labelling has been initiated in the participating countries which can also be linked to green cooling technologies.

Roles and responsibilities for post-CTCN project activities:

- Countries

Countries of the Green Cooling Africa Initiative will take a key role in carrying the project beyond Phase I. The project will seek to strengthen the collaboration and the institutionalisation of the cooperation between the four countries and other countries in the region. Through the sustained cooperation the countries will have a greater impact to carry forward the regional initiative and to successfully implement the activities and linkages beyond Phase I as described above.

- Implementation agencies

UN organisations, GIZ and other multi-lateral and bilateral implementing organisations can play an important role for the sustained implementation of the project. Their role includes technical assistance and advice in setting up networks, technology cooperation projects and advising the ministries on the implementation of the response plan and follow up activities. Furthermore their engagement shall ensure that the activities of the CTCN-project will be in line with ongoing activities in the sector under the HPMP and other sector related multilateral and bilateral projects.

A lead implementer for the project will seek synergies with related, projects in the countries and the region. This will be mainly done with a focus on energy efficiency and climate protection related projects as well as ongoing MP projects in the countries which include aspects of climate change, environmental protection and energy efficiency. Ongoing projects implemented by the GIZ with a related focus are HPMP in Kenya, Mauritius and Namibia; Green Cooling Initiative (IKI) in Ghana, Kenya and Namibia.

- UN Initiatives

Similar related initiatives with possible synergies are the UN SE4ALL initiative which targets specifically the energy efficiency of appliances, including particularly, refrigeration and air conditioning equipment with its cooperation with GEF and others under its “Global efficient appliance and equipment partnership”. The Green Cooling Africa Initiative will seek to establish an active cooperation between the countries and the UNF SE4ALL initiative for an exchange of information and sustained anchoring of the Green Cooling Africa Initiative itself.

Outline of post-CTCN project funding sources:

The project will seek the sustained funding and co-funding for Phase II and III activities. The following non-exhaustive list of potential sources of funding may include:

- UK-German NAMA Facility

The potential for funding under the UK – German NAMA Facility has been outlined under the NAMA Linkages. Possible funding under the facility will be typically in the range between 5 – 15 Mio USD per project.

- Global Environmental Facility

Support is particularly needed in Least Developed Countries (LDCs), given their specific situation and high vulnerability to climate change. The GEF is requested to support the operationalization and activities of the CTCN (decision 2/CP.17, para 140) and can provide grant funding to projects or programs provided they achieve concrete and estimated climate change benefits. At the COP 21 GEF reported its progress on the first item of its 'Long-Term

Program on Technology Transfer,' which includes supporting the Climate Technology Centres and a Climate Technology Network as GEF-5 and GEF-6 projects¹³.

- **Green Climate Fund**

The recent meetings of the parties to the UNFCCC, have indicated increased willingness to provide the requested funding for the Green Climate Fund. African countries were outlined as one the main beneficiaries, among others, for mitigation action to be funded from the Green Climate Fund. With increased funding the CTCN Green Cooling Africa Initiative will seek funding for technology cooperation or NAMA proposals.

- **Development Bank Financing and Private Funds**

The Green Cooling Africa initiative will seek to promote cooperation between public and private institutions i.e. within Public Private Partnerships. Such partnerships will target the active promotion and marketing of green cooling technologies on commercial basis. The Green Cooling Africa Initiative will seek cooperation with these stakeholders and provide data and institutional linkages for the funding of such Public Private Partnerships which are to be developed during Phase II and III and under a possible NAMA or similar funded project.

¹³ <http://unfccc.int/resource/docs/2014/cop20/eng/02a01.pdf>

2.5 Expertise required

The response team will provide the following expertise to implement the project

International experts that will carry out tasks defined within this project should have previous experience in:

- Working on emission reduction projects and sector plans in the RAC sector in the respective countries;
- Establishing GHG inventories for RAC inventories according to Tier 2 standards, including HFC emissions;
- Assessing RAC appliances in various cooling sectors against international best practice examples, focusing on various aspects such as refrigerant use, energy efficiency standards, safety standards and labelling;
- Assessing policies and standards for RAC appliances and providing policy recommendations;
- Preparing NAMA and other bankable project proposals in the cooling sector in other countries.

Terms of reference (ToR) for service providers containing a more detailed description can be found in Annex 3.

2.6 Main partners

List and describe the role of in-country partners who will be involved in the implementation of the assistance in the country.

| Stakeholder | Role |
|--|---|
| GHANA | |
| Environment Protection Agency (EPA) through the National Designated Entity (NDE) and National Ozone Unit (NOU) | The EPA includes the NDE and the NOU for Ghana and will take on the role of leading, coordinating and implementing the activities on the country level. It will also coordinate the communications with CTCN on behalf of the participating countries. Responsible for the national communication/ GHG inventory/MRV. |
| Ghana Standards Authority | To provide information on energy efficiency testing of RAC equipment and to support the project with recommending future RAC equipment labelling standards or improving existing standards. |

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|---|--|
| Ministry of Trade and Industry | Support with legislative measures for RAC sector. |
| Refrigeration and Air conditioning Engineers association of Ghana | Liaising with the RAC industry and supporting with data collection, general sector information on equipment, trends, and know-how. |
| Ghana energy commission | Involved in the consultative process for expanding on the minimum energy performance indicators established for domestic refrigerators to include other RAC equipment. |
| National Air conditioners and Refrigerators workshop owners association | Assist with developing the GHG inventory for the RAC sector. |
| Private sector stakeholders (to be identified) | Support project implementation. |
| Other government ministries (to be identified) | Support project implementation. |
| Financial institutes | Support the financing of green cooling technologies (roadmap recommendations) |
| KENYA | |
| Kenya industrial research and development institute (KIRDI) | NDE will coordinate project implementation |
| Ministry of Environment: Climate Change Secretariat GHG Inventory Team and the Ozone Unit | Support and promote project objectives through the government institutions and other ministries. |
| Ministry of Energy | Support and promote project objectives and implementation, particular with regard to energy efficiency aspects |
| Energy Regulatory Commission (ERC) | Support and promote project objectives and implementation, particular with regard to energy efficiency aspects |
| Kenya Bureau of Standards | Support with information on testing standards for RAC equipment. |
| Ministry of Industrialization and Enterprise development | Policy formulation which is in keeping with the objective of low emission economy. |
| Kenya power and Lighting company | Is currently involved with EE initiatives in the country and would assist with implementation. |
| Private sector stakeholders (to be identified) | Support project implementation. |
| Various other Ministries (to be identified) | Support project implementation. |
| Financial institutes | Support the financing of green cooling technologies (roadmap recommendations) |

| MAURITIUS | |
|--|---|
| Ministry of Environment, Sustainable Development and Disaster and Beach Management including NDE and NOU | Responsible for the national communication/ GHG inventory/MRV, management, coordination and implementation of the project |
| Energy Efficiency Management office under the Ministry of Energy and Public Utilities | Assist with recommendations for the EE labelling of RAC equipment. |
| Mauritius Bureau of standards | Is currently responsible for conducting tests on appliances and these testing facilities will be supported in order to serve the objectives of the project. |
| University des Mascareignes | Mechanical department has been conducting tests of RAC equipment related to efficiency and could assist with similar tasks during the project. |
| Private sector stakeholder (to be identified) | Support project implementation. |
| Other government institutions and ministries (to be identified) | Support project implementation. |
| Financial institutes | Support the financing of green cooling technologies (roadmap recommendations) |
| NAMIBIA | |
| Ministry of Environment and Tourism through department of Environmental affairs | NDE will support and coordinate the project activities on the country level. Responsible for the national communication/ GHG inventory/MRV management. |
| Ministry of Trade and Industry | Ozone unit to support efforts of the NDE given the historical track record of working with RAC sector over 2 decades. |
| The Renewable energy and Energy Efficiency institute | Support project activities in respect to EE labelling of appliances. |
| Namibian Institute for Refrigeration and Air conditioning (NIRAC) | Liaise with the RAC sector in the country, support with data collection and policy development for the sector. |
| Private sector | Support project Implementation. |
| Other government ministries | Support project implementation. |
| Financial institutes | Support the financing of green cooling technologies (roadmap recommendations) |

On the regional level, UNEP's Regional Network of Ozone Officers in Africa will be a key partner, particular with regard to the regional dissemination. Next to the phase out of ozone depleting substances, the transition to climate friendly refrigerants is a key concern to the network.

2.7 Synergies

Identify past and ongoing public and private sector initiatives at the local, national or regional level that the response will specifically build on and/or link to.

2.7.1 Activities implemented under the Montreal Protocol in the RAC sector

All four countries participating in this project have ongoing activities in the RAC sector under the Multilateral Fund for the Implementation of the Montreal Protocol (MLF). The RAC sector and stakeholders are all known to the National Ozone unit (NOU) of the country, and therefore the activities planned under this project i.e. data collection, working with various government ministries, changes in legislation, In-country experience exists on how such a project can be realized within the CTCN. The NOU will work closely with the NDE and other stakeholders in implementing the activities planned under this project.

Accordingly, the NOUs are familiar with the type and nature of the activities proposed in this project. This includes the data collection on RAC equipment, working with the relevant government ministries and the relevant policies.

2.7.2 Green Cooling Initiative (www.green-cooling-initiative.org)

The four countries have indicated their interest as prospectus members of the Green Cooling Initiative. The initiative is a global network of countries, organizations and companies who commit to support green cooling technologies, i.e. the most advanced and appropriate cooling technologies with regards to energy efficiencies and the use of sustainable low global warming potential (GWP) refrigerants. The Green Cooling Initiative seeks to share experiences on technologies and standards to ultimately support mitigating GHG emissions and to save energy. The Green Cooling Initiative was sponsored through the International Climate Initiative (IKI) of the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB).

2.7.3 Additional synergies with ongoing country initiatives

GHANA

Climate change has been a topic of national development priorities in Ghana to the extent that it is reflected in the Ghana Shared Growth and Development agenda. The government of Ghana has therefore demonstrated its commitment to contribute to national and global solutions to stop climate change. Ghana ensures that its policies provide strategic directions on mitigation actions while accessing low carbon pathways that are sustainable and ensure energy efficiency for all sectors of the economy.

The following policies are to ensure that these goals are reached:

- National Climate Change Policy (2012)
- National Environment Policy (Part I) (2012)
- National Energy Policy (2010)

- Energy Sector Strategy and Development Plan (2010)
- National Transport Policy (2008)

The ongoing project Climate Change Mitigation funded by Ghanaian government and Global Environment Facility (GEF) aimed to improve the energy efficiency of appliances marketed and used in Ghana mainly related to domestic refrigerators. This project comes to a close in Dec 2014 mainly leading to replacement of old ozone depleting substance (ODS) based inefficient refrigerators to new energy efficient refrigerators.

KENYA

The government of Kenya is highly committed to foster strategies toward tackling climate change and mitigation of GHGs in order to initiate a low carbon development.

To reach this objective the government has issued a number of relevant policies, in particular:

- Vision 2030
- National Climate Change Response Strategy “NCCRS” (2010)
- Kenya National Climate Change Action Plan 2013 – 2017
- The Energy Management Regulation and Kenya National Energy Policy 2012.

To promote energy efficiency Kenya has made initiatives carrying out labelling or MEPS in some subsectors

- Appliances’ Energy Performance and Labelling, Regulation 2014
- The UNDP/GEF project document on “Development and Implementation of a Standards and Labelling Programme in Kenya

The policies so far have not been specific to individual RAC sectors. The GCAI would therefore deepen and support the climate action pathways Kenya has already initiated. The proposed GCAI supports specific objectives of the national policies, in particular the NCCRS.

MAURITIUS

Mauritius as a small island developing state is highly vulnerable to the impacts of climate change. Thus the Government of the Republic of Mauritius has placed the issues of climate change high on its agenda, and is highly committed to come up with strategies toward tackling climate change and mitigation of GHGs, in order to initiate a low carbon development strategy.

To reach this objective the government has undertaken the following efforts:

- Disaster Risk Reduction (DRR) Strategy and Action Plan under the Africa Adaptation Programme funded by the Government of Japan. The Action Plan contains nine specific

areas of intervention and 25 actions, which are meant to significantly reduce the annual damage due to natural hazard and produce additional (ancillary) benefits in economic, social and environmental terms.

- A National Climate Change Adaptation Policy Framework, which is the first report for the Republic of Mauritius. The key objectives of this framework are to foster the development of policies, strategies, plans and processes to avoid, minimise and adapt to the negative impacts of climate change on the key sectors. Besides, the framework aims to integrate and mainstream climate change into core development policies, strategies and plans of Mauritius.
- A multi-pronged approach is also being developed to address impacts of climate change and enhance the resilience of Mauritius. Several priority sectors like disaster risk reduction and management, renewable energy, water, coastal zones, fisheries, tourism, public infrastructure, health and agriculture have been targeted and actions are being taken at different levels to reduce the vulnerability and increase the resilience.

Guidelines and a vulnerability toolkit are being developed with a view to strengthen preparedness vis-à-vis climate change risks and to empower the local authorities

- A Technology Needs Assessment and Action Plan have been developed. 12 technologies have been prioritized following a thorough consultative process and assessment from an initial list of 128 technologies for enhanced climate change mitigation in the energy sector and adaptation in agriculture, water and coastal zone sectors.
- A Low Carbon Development Strategy and Nationally Appropriate Mitigation Action (NAMA) with a view to mainstream climate change mitigation in the institutional framework and into core development plans, policy, and strategies for Mauritius are presently being developed.
- A Climate Change Bill is being finalised. This will be a major step forward and Mauritius would be amongst the very few countries to have such a law.

Mauritius has established an Energy Efficiency Management Office which has as one of its tasks to establish EE labels for appliances, as it is mandatory from December 2014 that all appliances have EE labelling. The CTCN project will build and further support this initiative of the Energy Management office especially with reference to the RAC equipment.

NAMIBIA

The government of Namibia, through its National Climate Change and Action Plan seeks to put measures in place to tackle climate change and to act against it. The aim is to follow a low carbon development path.

Supporting policies and initiatives to reach this objective include:

- Vision 2030
- National Climate Change Strategy and Action Plan (NCCSAP, 2013-2020)
- Sector- specific initiatives like the Namibia Renewable Energy Programme (NAMREP)

have managed to eliminate some of the barriers to the adoption and nationwide promotion of renewable energy

- Recent launch of Renewable Energy and Energy Efficiency Institute (REEI)
- Carbon Neutral Policy
- Namibia Energy Efficiency Programme (NEEP) which is aimed at improving the energy efficiency of all buildings government and private offices, hospitals, schools and hotels.

The CTCN project would complement these efforts with giving specific emphasis on the RAC sector which thus far has not been covered under the NEEP programme.

2.8 Timeline

Provide a timeline for the CTCN technical assistance and list specific milestones for each activity. The timeline show the roll out of the activities and sub-activities to be conducted, throughout the whole duration of the assistance. Please adapt the size of the table to the duration of the assistance.

A more detailed description can be found in Annex 1.

| Activity | Timeframe | | | | | |
|--|-----------|----|----|----|----|----|
| | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 |
| Output 1: Robust GHG inventory for cooling sector established | | | | | | |
| Activity 1.1: Data collection | | | | | | |
| Sub activity 1.1.1 | | | | | | |
| Sub activity 1.1.2 | | | | | | |
| Sub activity 1.1.3 | | | | | | |
| Sub activity 1.1.4 | | | | | | |
| Sub activity 1.1.5 | | | | | | |
| Sub activity 1.1.6 | | | | | | |
| Activity 1.2 Identification of the priority sub-sectors for each country to target a transition to green cooling technologies | | | | | | |
| Sub activity 1.2.1 | | | | | | |
| Sub activity 1.2.2 | | | | | | |
| Output 2: Analysis of the technological gap between BAU and internationally available best technological options | | | | | | |
| Activity 2.1 Analysis of cooling equipment in selected sub-sectors for possible transition to low emission technologies | | | | | | |
| Sub activity 2.1.1 | | | | | | |
| Sub activity 2.1.2 | | | | | | |
| Activity 2.2 Comparative analysis of local equipment against internationally available best practice technologies | | | | | | |
| Sub activity 2.2.1 | | | | | | |
| Output 3: Policy and regulatory framework recommendations | | | | | | |
| Activity 3.1 Support policy development that promotes adoption of low emission technologies in the cooling sector | | | | | | |
| Sub activity 3.1.1 | | | | | | |
| Sub activity 3.1.2. | | | | | | |
| Sub activity 3.1.3 | | | | | | |
| Sub activity 3.1.4 | | | | | | |
| Sub activity 3.1.5 | | | | | | |

| | | | | | | |
|---|--|--|--|--|--|--|
| Sub activity 3.1.6 | | | | | | |
| Sub activity 3.1.7 | | | | | | |
| Activity 3.2 Recommendation on regulatory amendments | | | | | | |
| Activity 3.3 Recommendation on fiscal measures and green financing support which can be adopted to promote low emission technologies | | | | | | |
| Output 4: Regional and country specific technology roadmap recommendations | | | | | | |
| Activity 4.1 Development of milestone based action plan to bring about a systematic change in technology applied to the cooling sector | | | | | | |
| Sub activity 4.1.1 | | | | | | |
| Activity 4.2 Explore possible funding options for the actual implementation activities. | | | | | | |
| Sub activity 4.2.1 | | | | | | |
| Sub activity 4.2.2 | | | | | | |
| Sub activity 4.2.3 | | | | | | |
| Activity 4.3 Support replication of project deliverables at a regional scale | | | | | | |
| Sub activity 4.3.1 | | | | | | |
| Sub activity 4.3.2 | | | | | | |
| Sub activity 4.3.3 | | | | | | |
| Sub activity 4.3.4 | | | | | | |

2.9 Indicative budget

Provide an indication on the maximum amount of resources required to implement the assistance.

The table below provides an overview on the indicative budget which is detailed in Annex 2.

| | | | |
|---|----------------|----------------|-------------|
| Total CTCN Budget [in USD] | | 599,350 | 66% |
| Country Budgets | | 444,350 | |
| Kenya | 118,700 | | |
| Ghana | 115,400 | | |
| Mauritius | 99,100 | | |
| Namibia | 111,100 | | |
| International Consultant | | 155,000 | |
| Co-Funding by BMUB¹⁴ | | 313,194 | 34% |
| International Consultant | 90,150 | | |
| General in-kind Contributions (GIZ staff, overheads, etc.) | 223,044 | | |
| Total | | 912,544 | 100% |

¹⁴ German Ministry of Environment, Nature Conservation, Building and Nuclear Safety (BMUB)

The overall budget is 912,544 USD of which a funding of 66 percent or 599,350 USD will be requested from CTCN. 34 percent or 313,194 USD may be co-funded by the BMUB (subject to approval)¹⁵.

2.10 Risk assessment

| Risks | Consequence | Probability | Mitigation |
|---|--|-------------|--|
| Missing stakeholder participation for establishment of sound inventories | The inventory for cooling appliances is not complete or comprehensive | Medium | <ul style="list-style-type: none"> - Nomination of a competent national focal point in each of the countries - Establishment of a steering committee in each of the countries - Stakeholder involvement in project through workshop and communication |
| Insufficient information on locally deployed technologies; | Unreliable data for comparing current with best practice technologies | Medium | Provide technical support to the countries for assessing technologies |
| Lack of cooperation (by key stakeholders from industry, government etc.) on assessing current standards, regulations, labelling | Proposal for new standards, regulations, labelling cannot be appropriately addressed | Medium | As above: Steering committees and workshops to involve all relevant and key stakeholders |

¹⁵ The Green Cooling Initiative is a project under the International Climate Initiative of the German Ministry of the Environment, Nature Conservation, Building and Nuclear Safety to support the UNFCCC related technology mechanism.

2.11 Monitoring and Reporting

Provide information on how the monitoring and reporting for the project will be carried out.

Due to the regional approach of this project, monitoring activities will be conducted on two levels. On the country level, monitoring will be undertaken by the NDE together with the international expert and established steering committee. Respective reports presenting achievements and results as listed in the project document during the specified time period will be provided to the response team. Further, the response team will collate and coordinate reports obtained from the involved countries and will report back to the CTCN.

3 Long-term impacts of the assistance

3.1 Expected climate benefits

Based on an initial top-down cooling GHG emissions of the green cooling initiative¹⁶ in the four countries will triple in the next 15 years until 2030 from currently about 10mt CO₂eq to over 35mt CO₂eq per annum. With the appropriate mitigation measures as indicated in this proposal, the increase of emissions could be limited to below 25mt CO₂eq per annum, resulting in potential GHG mitigation against BAU of some 30%. It is estimated that a phase of five years will be required, until the measures will be fully implemented and green cooling technologies will have reached a critical amount of market penetration. The implementation of measures will not be part of this project, but could be realized through supporting green cooling NAMAs or similar initiatives funded by other UNFCCC-related funding mechanisms. The work carried out under this project will establish the basis for the countries to develop green cooling NAMA proposals or bankable project proposals.

On a per country basis the emission reduction potential against BAU will be the highest in Kenya, followed by Ghana, Namibia and Mauritius (until 2030 respectively some 11 and 1mt CO₂eq).

It needs to be noted that the estimated emissions are based on key statistical data, such as projected population growth, development of the gross domestic product (GDP), urbanization, electrification etc. It is one important purpose of the suggested measures to verify and refine this data with each of the countries and the relevant stakeholders in the countries.

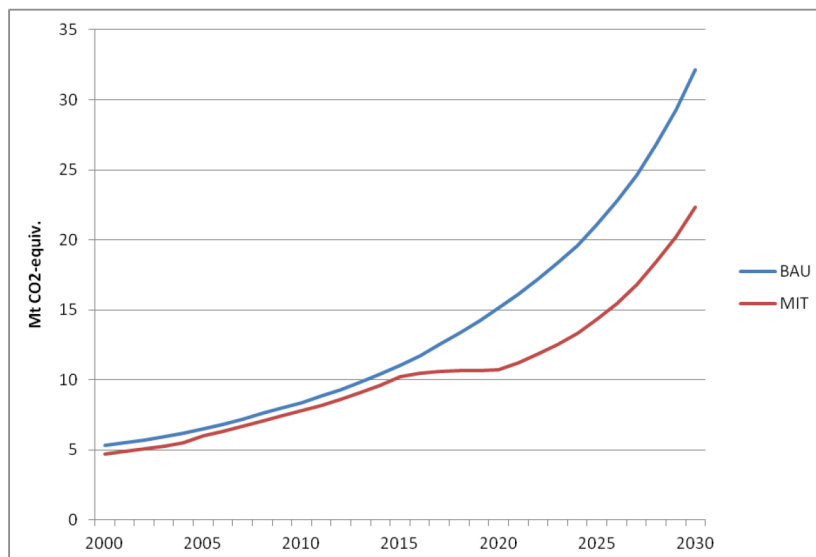


Figure 3. Total estimated BAU CO₂-equiv. GHG emissions in comparison with emission development under a mitigation scenario to 2030, for countries Ghana, Kenya, Mauritius and Namibia¹⁷.

¹⁶ Source: GIZ, Database (www.green-cooling-initiative.org)

¹⁷ Source: GIZ, Database (www.green-cooling-initiative.org)

On a sub-sectoral basis the data analysis suggests that for both energy consumption and GHG emissions, the most dominant subsectors are unitary AC, mobile AC, commercial refrigeration and industrial refrigeration.

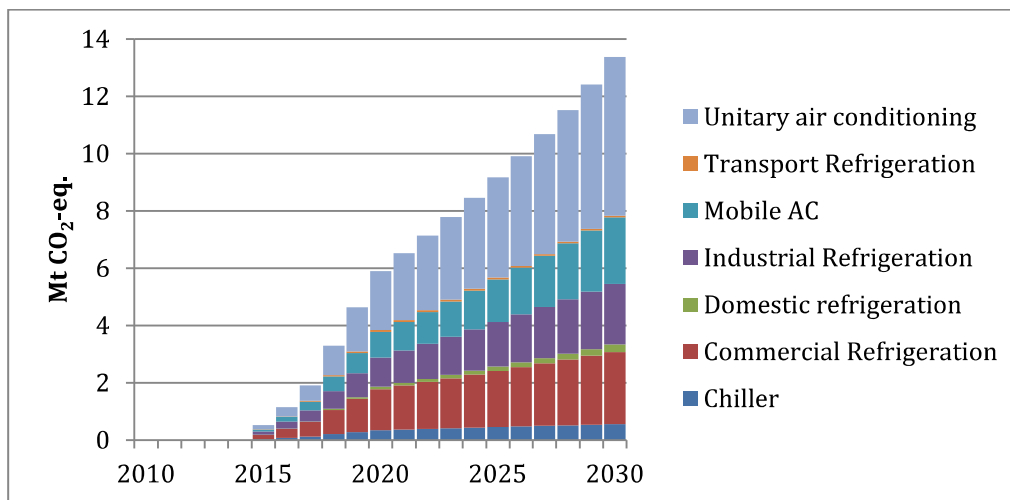


Figure 4. Total estimated CO₂-equiv. GHG emissions mitigation potential in for Ghana, Kenya, Mauritius and Namibia for key cooling sub-sectors¹⁸.

We estimate that there is a substantial emission reduction potential by changing from high to low GWP refrigerants. The possible emission reduction potential could be about 10mt CO₂eq per annum by 2030 for the four countries. Improvements for the energy efficiency of the equipment could result in another about 4mt CO₂ emission by 2030eq. These estimates need further evaluation with the stakeholders in the countries. The selected mitigation action needs to meet the specific technology needs of the countries.

3.2 Co-benefits

Describe the anticipated economic, social, and environmental co-benefits of the assistance.

- **Environmental protection:** Green cooling technologies protect natural resources and avoid the use of fluorinated and chemical substances which use limited resources and produce persistent wastes in the atmosphere.
- **Income and employment generation:** New employments would be created with green cooling technologies for the installation, the planning, construction, maintenance and servicing of the technologies. Innovative technologies contribute to the economic development and the local economies of the countries.
- **Increased energy security:** Through improving the energy efficiency of the equipment and reducing the energy needs, electricity consumption will be saved and less fossil fuels will be

¹⁸ Source: GIZ, Database (www.green-cooling-initiative.org)

imported;

- **Foreign exchange savings:** With the implementation of measures, fossil fuel based energy imports would be reduced with consequential saving on imported energies.
- **Mobilisation of additional funds** aimed for development and implementation of Nationally Appropriate Mitigation Actions (NAMAs) or similar bankable project proposals: Ultimately the project will support the countries with capacity building for submitting respective proposal and seeking for financing.
- **Health:** A reliable cooling chain avoids foods waste and ensures both safe, healthy food and medical supplies in urban and rural areas of Africa, contributing to people's healthy nutrition and food security.

3.3. Post-assistance plans and actions

If possible, provide indications on specific actions and plans that the country can implement, to make use of the assistance outputs, and to ensure that it will create the expected climate benefits described above.

- The **GHG inventory database** for the RAC sector, the creation of standards and labelling of equipment together with the policy and legislative initiatives, will enable each of the countries to work towards specific action plans. The countries will be encouraged to include the HFC emission inventory (from the Tier 2 stock taking) into their National Communication on GHG emissions to the UNFCCC.
- Through proposing best practice technologies, introducing **technology transfer options and technology co-operations**, the project will provide the ground for possible technology demonstration projects for various technology options (Phase II). Concrete proposals for technology partnerships and priority areas for technology transfers will be identified within the country roadmaps.
- The **collaborative policy work** will encourage the countries to continue their cooperation on joint and comparative works towards the enhancements of minimum energy efficiency standards, safety standards for the handling of refrigerants, labelling, standards on the treatment of leakages and old equipment. Further the countries will be encouraged to extent their network on wider regional basis in Africa, including additional countries into this network.
- The **roadmaps** will provide the framework for the countries to establish the maximum mitigation benefit short term until 2020 and long term until 2030, ideally, by enabling them to widely mitigate direct emissions from high GWP refrigerants and entering on a path to continuously improve energy efficiency.
- The above activities will serve as a base for **scaling up of green technologies** (Phase III), ideally to reach significant penetration rates (>50%).

4 Formal agreement and signatures

Signatures of the requesting countries

NDE Ghana

Name:

Title:

Date:

Signature: see page enclosed

NDE Kenya

Name:

Title:

Date:

Signature: see page enclosed

NDE Mauritius

Name:

Title:

Date:

Signature: see page enclosed

NDE Namibia

Name:

Title:

Date:

Signature: see page enclosed

Signatures of the CTCN

CTCN Director

Name: Jukka Uosukainen

Title: CTCN Director

Date:

Signature:

Climate Technology Manager

Name: Patrick Nussbaumer

Title: CTCN Climate Technology Manager

Date: 27 February 2015

Signature:



Annex 1: Request Response Logical Framework

| Output | Indicator | Activity | Sub-activity | Deliverables | Expected delivery date | Responsibility |
|--|--|---------------------|--|--|------------------------|---|
| 1. Robust GHG inventory for the cooling sector established | Country wide unit based invention according to Tier 2 standards is established | 1.1 Data collection | 1.1.1 Introduce the project to stakeholders: <ul style="list-style-type: none"> regional meeting for project introduction among the participating countries national meeting to facilitate data collection; 1.1.2 Identify of government focal point for data collection and coordination; 1.1.3 Administer questionnaire for data collection through existing network of equipment owners, service providers, importers; 1.1.4 Collate and analyse collected data; 1.1.5 Collect and collate data available from secondary sources | Stakeholders introduced to the project; A basis for information exchange among the participating countries established; National focal point identified; Tools for data collection provided and database created; Questionnaires prepared and delivered to stakeholders/ subsectors; Data collected; | Q1 - Q2 | NDE; Ministry of Environment Climate Change Division; NOU; Cooling industry; Stakeholders; International experts |

| Output | Indicator | Activity | Sub-activity | Deliverables | Expected delivery date | Responsibility |
|---|--|--|---|--|------------------------|---|
| | | | and other sources (HPMP surveys, CACC surveys); 1.1.6 Quality checks and verification of data | Aggregated data compiled; Data checked and confirmed; | | |
| | | 1.2 Identification of the priority sub-sectors for each country to target a transition to green cooling i.e. sector/s, appliance type, application, etc. | 1.2.1 Organize workshop for stakeholders to present collected data; 1.2.2 Establish criteria for identifying priority sub-sector i.e. strategic relevance, GHG emission reductions, economic and technical feasibility | National stakeholder workshop held in each country; Criteria for prioritisation of sub-sectors agreed upon; | Q2 | NDE; Ministry of Environment Climate Change Division; NOU; Cooling industry; Stakeholders; International experts |
| 2. Analysis of the technological gap between BAU and internationally available best technological options | Established regional (Ghana, Mauritius, Kenya, Namibia) technology stock database that compares energy consumption, energy efficiency and emissions on a national, | 2.1 Analysis of cooling equipment in selected subsectors for possible transition to low emissions technology by the country | 2.1.1 Undertake analysis that includes parameters of energy efficiency, COP, refrigerant use and refrigerant leakage rates 2.1.2 Foster regional collaboration | Database on local equipment and its associated performance based on available data established; Technology data regional level exchanged; | Q2 – Q3 | Local and regional bureau of standards; Local Universities; International experts |

| Output | Indicator | Activity | Sub-activity | Deliverables | Expected delivery date | Responsibility |
|--|---|--|--|--|------------------------|---|
| | regional (four countries) and international basis, including at least four key cooling sub-sectors and for each sub-sector the three most important appliance types | | | | | |
| | | 2.2 Comparative analysis of local equipment against internationally available best practice technologies | 2.2.1 Compare performance of local equipment against international equipment norms | List of low GHG emission technology options available for the priority sector/application/appliance prepared | Q3 – Q4 | Local and regional bureau of standards; Local Universities; International experts |
| 3. Policy and regulatory framework recommendations | Upgraded policies and equipment standards for identified key priority subsectors | 3.1 Support policy development that promotes adoption of low emission technologies in the cooling sector | 3.1.1 Assess existing standards to amend or change as required; 3.1.2 Provide support with technical expertise on state-of-the-art standards from other relevant countries; | Report comparing existing regulation with best practice international regulation prepared | Q3 – Q4 | NDE; Ministry of Environment Climate Change Division; NOU; Bureau of standards; Universities; Institutes; Technical experts; International experts; |
| | | | 3.1.3 Amend (if necessary) | Recommendatio | Q4 – Q5 | NDE; |

| Output | Indicator | Activity | Sub-activity | Deliverables | Expected delivery date | Responsibility |
|--------|-----------|--|---|--|------------------------|---|
| | | | general government procurement policy, where relevant 3.1.4 Establish guidelines for practice for the chosen sector by the ministries; 3.1.5 Support relevant private associations (i.e. RAC association, industrial associations) to incorporate low emission technologies as technology of choice in their guideline; 3.1.6 Organize national workshops to derive national policy recommendations; 3.1.7 Organize regional workshop to compare national policy recommendations and recommend regional policy action | n for appropriate policy forwarded to relevant government/ private bodies under whose jurisdiction the policy would need to be affected. | | NOU; Ministry of Environment Climate Change Division; Government ministries i.e. industry and trade, health, tourism, public works, etc. RAC associations; Industry; Chambers/associations; International experts |
| | | 3.2 Recommend regulatory amendments, if required | | As above | Q4 – Q5 | |
| | | 3.3 Recommend | | As above | Q4 – Q5 | International experts |

| Output | Indicator | Activity | Sub-activity | Deliverables | Expected delivery date | Responsibility |
|---|---|---|--|---|------------------------|---|
| | | fiscal measures and green financing support (tax incentives, variable import duty structures) which can be adopted for promoting use of low emission technologies | | | | |
| 4. Regional and country specific technology roadmap recommendations | Milestones with time based targets for: - green cooling technology penetration targets - GHG emission mitigation - Barrier removal/ introduction of new regulations, standards | 4.1 Develop milestone based action plan to bring about a systematic change in technology applied to the cooling sector | 4.1.1 Develop the action plan that includes: technological choices, time frame for adoption, existence or creation of conducive factors to facilitate change | Detailed action plan on how to implement technical transformation developed; Concrete projects identified, including stakeholders and letter of intention/MoU | Q5 – Q6 | National Ministries; NOUs; Industry stakeholders; International experts |
| | | 4.2 Explore possible funding options | 4.2.1 Asses funding opportunities of intentional | Report on funding options and | Q5 – Q6 | CTCN; International experts; |

| Output | Indicator | Activity | Sub-activity | Deliverables | Expected delivery date | Responsibility |
|--------|-----------|---|--|--|------------------------|--|
| | | for bringing about such a change | organization/institutions; 4.2.2 Explore funds available through local or regional initiatives including local banks; 4.2.3 Explore public – private partnerships; | recommendation prepared; Countries able to develop (supported) NAM A proposals for the RAC sector | | |
| | | 4.3 Support replication and application of project deliverables at a regional scale | 4.3.1 Create awareness on the Green Cooling Africa Initiative at relevant regional meetings; 4.3.2 Create information and know-how exchange between NDEs of the region on the project, its methodologies and deliverables; 4.3.3 Target effort to inform and involve regional trading partners where possible and feasible in replicating the project efforts; 4.3.4 Involve/ lobby with companies that have regional presence (hotel chains; supermarket chains; | Presentation of the Green Cooling project at the UNEP organized; ODSONET meeting for African countries; Meetings organized by CTCN; Representatives of regional initiatives invited to the regional workshop; | Q5 – Q6 | NDE; NOU; Ministry of Environment Climate Change Division; CTCN; International experts |

| Output | Indicator | Activity | Sub-activity | Deliverables | Expected delivery date | Responsibility |
|--------|-----------|----------|--|---|------------------------|----------------|
| | | | equipment importers) in promoting project objectives; 4.3.4 Organize regional workshop. | SACU, SADC, EAC, ECOWAS, COMESA, Africa Free Trade Zone be approached at their regional meetings; Possible change in favour of green cooling practiced by a company with regional operations | | |

Annex 2: Indicative budget

The budget template is based on the format required for legal agreements with the CTCN. It is indicative in nature as the services are to be sub-contracted on a competitive basis.

It should be prepared in excel and inserted in Annex 2 when finalized.

Indicative budget is provided in the attached excel file.

Annex 3: Terms of Reference for service provider(s) *(in case of tendering process, and in line with UNOPS template/requirements TBD)*

Terms of Reference for service provider(s) is provided in the attached word document.

4 Formal agreement and signatures

Signatures of the requesting countries

NDE Ghana

Name: *Ebenezer Appah-Sampong*

Title: *Deputy Exec Director/Tech*

Date: *12th February 2015*

Signature: *[Signature]*

DEPUTY EXECUTIVE DIRECTOR

ENVIRONMENTAL PROTECTION AGENCY

P.O. BOX 328

ACCRA

NDE Kenya

Name:

Title:

Date:

Signature:

NDE Mauritius

Name:

Title:

Date:

Signature:

NDE Namibia

Name:

Title:

Date:

Signature:

Signatures of the CTCN

CTCN Director

Name: Jukka Uosukainen

Title: CTCN Director

Date:

Signature:

Climate Technology Manager

Name: Patrick Nussbaumer

Title: CTCN Climate Technology Manager

Date:

Signature:

4 Formal agreement and signatures

Signatures of the requesting countries

NDE Ghana

Name:

Title:

Date:

Signature:

NDE Kenya

Name: **DR. M. C. Z. MOTURI**

Title: **DIRECTOR**

Date: **12th Feb 2015**

Signature:

KENYA INDUSTRIAL RESEARCH AND DEVELOPMENT INSTITUTE
P.O. BOX 30650, NAIROBI

NDE Mauritius

Name:

Title:

Date:

Signature:

NDE Namibia

Name:

Title:

Date:

Signature:

Signatures of the CTCN

CTCN Director

Name: Jukka Uosukainen

Title: CTCN Director

Date:

Signature:

Climate Technology Manager

Name: Patrick Nussbaumer

Title: CTCN Climate Technology Manager

Date:

Signature:

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NDE Ghana

Name:

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Date:

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NDE Kenya

Name:

Title:

Date:

Signature:

NDE Mauritius

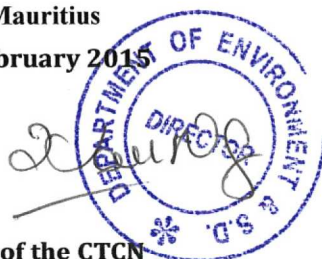
Name: S.L. Ng Yun Wing (Mrs)

Title: Director of Environment

NDE Mauritius

Date: 12 February 2015

Signature:



NDE Namibia

Name:

Title:

Date:

Signature:

Signatures of the CTCN

CTCN Director

Name: Jukka Uosukainen

Title: CTCN Director

Date:

Signature:

Climate Technology Manager

Name: Patrick Nussbaumer

Title: CTCN Climate Technology Manager

Date:

Signature:

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Name:

Title:

Date:

Signature:

NDE Kenya

Name:

Title:

Date:

Signature:

NDE Mauritius

Name:

Title:

Date:

Signature:

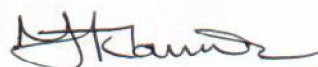
NDE Namibia

Name: JONATHAN M. KAMWI

Title: CHIEF CONSERVATION SCIENTIST

Date: 12-02-2015

Signature:



Signatures of the CTCN

CTCN Director

Name: Jukka Uosukainen

Title: CTCN Director

Date: 18 Mar 2015

Signature:



Climate Technology Manager

Name: Patrick Nussbaumer

Title: CTCN Climate Technology Manager

Date:

Signature: