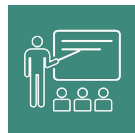


Making low-emission strategies work: GOOD PRACTICE EXAMPLES



Energy



Capacity
Building



Policy



Financing



Research



JORDAN

Climate-neutral buildings



IRAN

Strategies for the cooling sector



TUNISIA

Sustainable waste management



REGIONAL

Green transformation of the building sector



NILE BASIN

Climate-proof infrastructure



SENEGAL

Climate financing solutions



TUNISIA

Low-emission production of nitric acid



UGANDA

Market mechanisms for mitigation



WEST AFRICA

Climate finance and carbon markets



REGIONAL

Research for low-carbon policy-making



JORDAN

Carbon market readiness



JORDAN

Smart solutions for climate-neutral buildings

PROJECT	BUILD_ME – Accelerating zero-emission building sector ambitions in the MENA region
GOAL	Achieve climate-neutral building standards by supporting pilot projects and policy dialogue
COUNTRIES	Egypt, Jordan, Lebanon
OVERALL TERM	October 2016 to June 2022
PARTNER INSTITUTION	Jordan Ministry of Energy and Mineral Resources (MEMR)
IMPLEMENTING ORGANISATIONS	Guidehouse Germany GmbH, local partners: Royal Scientific Society, National Energy Research Centre
CONTACT	Sven Schimschar, sven.schimschar@guidehouse.com Riadh Bhar, riadh.bhar@guidehouse.com

GOAL

The project aims to achieve climate-neutral building standards in the Middle East and North Africa (MENA) region by supporting pilot projects and facilitating policy dialogue. BUILD_ME provides technical support for specific building projects and advises partner countries on energy efficiency building codes, energy classification schemes for buildings, national strategies for the building sector and incorporation of building sector-specific targets into nationally determined contributions (NDCs). The project is funded by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU), as part of the German International Climate Initiative (IKI), and implemented by Guidehouse Germany GmbH.

CHALLENGE

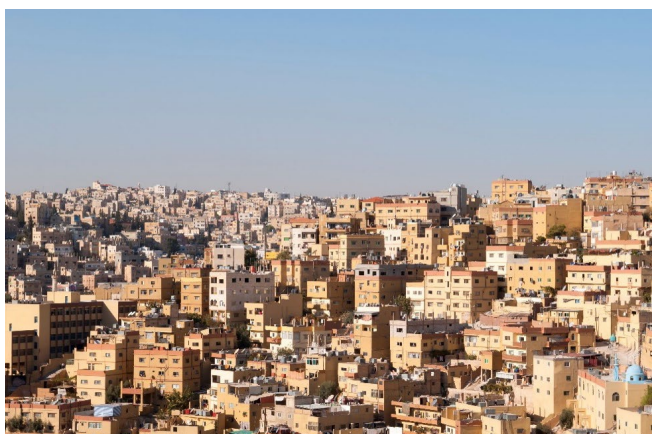
Globally, the building sector accounts for more than 30 per cent of energy consumption and more than 20 per cent of greenhouse gas (GHG) emissions. By 2050, the global building sector needs to cut emissions by 80 per cent to meet mitigation targets under the Paris Agreement. Throughout the MENA region, population and economic growth and improved living standards have resulted in increased energy demand, threatening the region’s transition towards a low-carbon society. By 2030, energy demand in the sector is expected to grow by 40 per cent in a business-as-usual scenario.

In Jordan, the residential sector consumes 45 per cent of the electricity generated in the country and accounts for roughly 7 per cent of the country’s GHG emissions, according to the International Energy Agency (IEA). This makes the building sector an important one for GHG mitigation and for meeting the country’s NDC goals. At the same time, energy efficiency in existing and newly constructed buildings can create economic opportunities and contribute to the response to Jordan’s insufficient energy generation capacity and dependence on energy imports.

Technologies for energy efficiency and climate-friendly construction already exist but are not applied consistently, even when they are cost-effective. For homeowners in Jordan, spending on energy efficiency and waiting for the investment to pay off is not a priority in their household budget. Although a promising financing mechanism was created in 2012 to provide funding for energy efficiency and renewable energy measures on the end-user side ([JREEEF](#)), it is still hard for homeowners and project developers to access cheap

loans or grants to offset the additional cost of investing in energy-efficient appliances.

Since energy efficiency building codes (EEBCs) are not sufficiently applied to new buildings, there is unsatisfactory transparency about energy consumption. This is a major barrier to international donors financing low-energy buildings.



View of the residential quarter of Amman, Jordan
Copyright: iStock.com/Joel Carillet

Another significant barrier to low-carbon building in Jordan is the partial limited knowledge about energy efficiency among technicians, project developers and architects and the lack of resources and capacities for monitoring compliance with new standards. Through its National Building Council, the Jordanian Government has issued regulations on insulation, energy efficiency and solar power and has published a Green Building Manual. Most of these standards are legally binding, implementing and enforcing them remains a challenge.

APPROACH

During the project's first phase from 2016 to 2018, extensive analyses were conducted on the building sector in the MENA region to develop an understanding of the barriers to investing in energy efficiency and renewable energy. The project team initiated a policy dialogue with all relevant stakeholder groups and provided recommendations on improving the

policy framework for energy efficiency in the building sector. They also organised workshops and technical training for project developers, financial institutions and bankers. A group of approximately 20 trainers from the region have been trained in energy efficiency in the built environment, with a specific focus on climate change, policy instruments, technical measures, economic assessment methodology. Six pilot projects in the six partner countries (Algeria, Egypt, Jordan, Lebanon, Morocco and Tunisia) were supported during the first phase to increase the use of efficient heating and cooling systems in new buildings.

The second phase of the project started in 2019 and focuses on three of the six original partner countries (Egypt, Jordan and Lebanon) for the implementation and upscaling of the recommendations formulated during the first phase. In the second phase, there was a focus on the development of an energy classification scheme for buildings, which transparently determines a baseline for the energy performance of new buildings and creates a labelling system to indicate good or poor performance. This makes it easier to assess low-energy buildings and helps financial institutions select sustainable buildings to be financed. The project has developed a [building typology database](#) with energy performance reference values, providing the baseline values for each country, and a [demonstration projects database](#), which showcases examples of energy-efficient buildings throughout the MENA region. A total of eight projects involving recently constructed and refurbished buildings in Jordan have been included in the database. In addition, a [Building Energy Performance](#) (BEP) Tool has been developed, tested and published on the website. The tool assists project developers in measuring energy demand, potential energy savings and the cost-effectiveness of energy efficiency measures in new constructions. It is based on the up-to-date international ISO 52016 standard and provides robust results that can be used to apply for financial support from banks. In the second phase, 13 pilot projects are being supported to promote the uptake of energy efficiency and renewable energy measures.



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In Jordan, three building projects in Amman have been selected as pilot projects: one as an example of low-cost housing, one for high-end buildings and the third for buildings combining traditional Arabic architecture with state-of-the-art renewable energy measures. The BUILD_ME team is providing demand-oriented technical assistance to the developers of these projects to encourage the incorporation of energy efficiency and renewable energy measures. This includes a cost-benefit analysis, a dynamic thermal simulation and implementation support on site. During this process, the classification scheme developed by the project is being tested.

A first national workshop in Jordan was organised in 2020 with around 50 participants, including ministries, project developers, NGOs and representatives from industry and financial institutions. A second virtual workshop followed in 2021, and smaller round-table meetings were also held with project developers. In addition, training courses on the principles of climate-friendly buildings and how to use the BEP Tool are offered to project developers and bankers, thereby facilitating access to financing. The BUILD_ME website offers the opportunity for project developers to market and disseminate their sustainable projects and share their experiences with other developers through a database of demonstration projects.

SUCCESS FACTORS FOR REPLICATION

THE PROJECT TEAM HAS IDENTIFIED FOUR SUCCESS FACTORS FOR REPLICATION

1. Developing a baseline to accelerate financing:

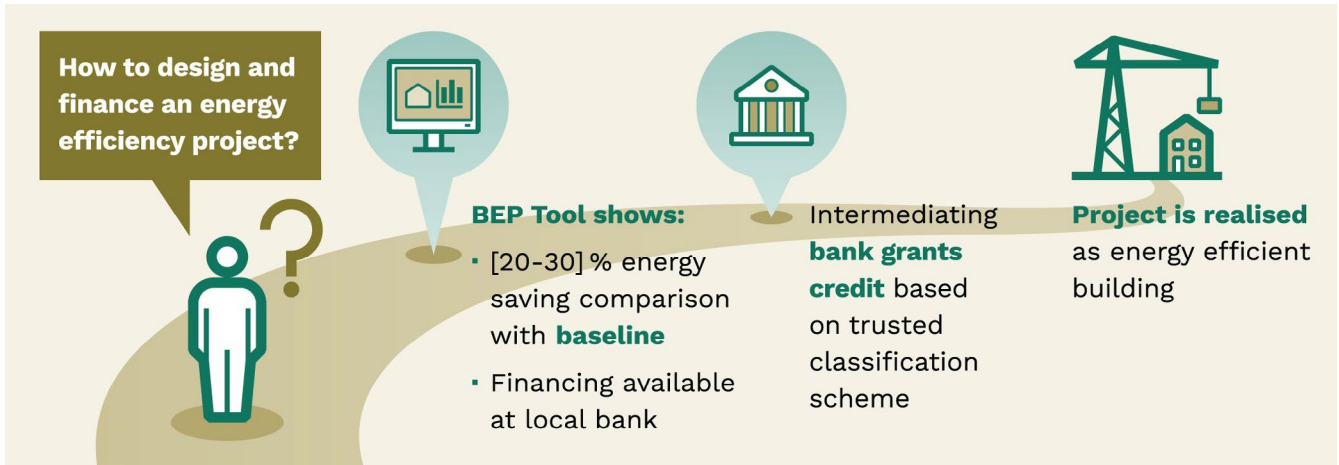
The project team developed a baseline for energy standards and consumption for different building types. This had been identified as one of the main barriers to international donors accelerating the financing of low-energy buildings and served as the basis for further activities.

2. Enabling quick building energy assessments:

Using the established baseline, an easy-to-read and use classification scheme was developed, allowing non-engineers, such as bankers, to conduct a quick low-energy building assessment. An energy performance certificate, comparable to well-known labels for electrical appliances (A to F and green to red), will be created. The energy classification scheme could also be replicated in other countries by adapting it to their framework conditions. Involving all relevant decision-makers in the design of the national classification scheme is vital to ensuring the sustainable use and further development of the scheme.



The Amman Baccaalaureate School



Copyright: Guidehouse Germany GmbH

3. Defining a robust building typology: The project analysed the most relevant reference buildings (including their geometry, building envelope and heating, ventilation and air-conditioning specifications). The methodology for developing a building typology can be adapted to other national contexts. Sufficient time needs to be planned for this time-consuming task, and regular quality control should be incorporated to ensure a high-quality outcome.

4. Providing a free tool for energy performance calculations: The project created a robust and user-friendly BEP Tool that is freely available and enables users to calculate the energy and economic performance of their buildings. The BEP Tool calculation engine was converted into a user-friendly web-based tool and includes climate data from other MENA countries. For replication in other countries, the national building typology should be adapted, by using reference buildings in the country in question to calculate a national baseline.

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This project has been selected as a good practice by the GIZ project Policy dialogue and knowledge management on low-emission strategies (DIAPOL-CE).



IRAN

Developing sustainable strategies for the cooling sector

PROJECT	Cool Contributions fighting Climate Change (C4)
GOAL	Promote and advance the control of F-gases and encourage their inclusion in the NDC of Iran
COUNTRIES	Iran
OVERALL TERM	January 2016 to June 2021
PARTNER INSTITUTION	Department of Environment of the Islamic Republic of Iran
IMPLEMENTING ORGANISATIONS	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
CONTACT	Philipp Munzinger, philipp.munzinger@giz.de

GOAL

The project supports the Iranian Government in formulating a mitigation strategy for the refrigeration, air conditioning and foam (RAC&F) sector and advancing an ambitious formulation of its nationally determined contribution (NDC). By improving framework conditions, the project aims to encourage the use of energy-efficient RAC&F equipment and environmentally friendly natural refrigerants and blowing agents. Iran is one of six key partner countries in the global project Cool Contributions fighting Climate Change (C4) which promotes the international control of fluorinated gases (F gases). The project was commissioned by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) as part of the International Climate Initiative (IKI).

CHALLENGE

The RAC&F sector is increasingly contributing to global greenhouse gas (GHG) emissions. The bulk of GHGs in the sector are indirect emissions resulting from energy consumption by inefficient RAC appliances, with approximately 30 per cent caused by the release of F-gases, which are frequently used as refrigerants in cooling appliances and blowing agents in the foam sector. F-gases, such as hydrochlorofluorocarbons (HCFCs) and hydrofluorocarbons (HFCs), are among the most climate-damaging GHGs with a global warming potential (GWP) up to 12,000 times higher than CO₂. According to projections, the global consumption of climate-damaging F-gases for refrigeration and air conditioning (RAC) will have quadrupled by 2030. This makes the RAC&F sector a significant target for effective mitigation action and a source for which further ambitious national mitigation targets should be developed.

United Nations member states have agreed under the Montreal Protocol to phase out HCFCs by 2030 for developed countries and by 2040 for developing countries. Many international initiatives and bilateral agreements are pushing for a faster and more stringent phase-out. The global HFC phase-down, which is regulated under the Kigali Amendment to the Montreal Protocol, started in 2019 in the United States and the European Union, while most other countries will freeze the use of HFCs by 2024. The process is expected to be practically completed by 2047.

In Iran, the RAC&F sector is increasingly contributing to the country's GHG emissions. Due to a

warming climate and a growing population, RAC&F emissions are expected to rise in a business-as-usual scenario from 49 million tonnes of CO₂ equivalent in 2015 to 99 million in 2050. At the same time, Iran is one of the countries with the lowest energy efficiency ratios and highest dependence on fossil fuels worldwide.



Stakeholder workshop, Iran 2017
© Alireza Saadatfar/GIZ Proklim

Iran's intended nationally determined contribution (INDC), which was published in 2015, contains an emission reduction pledge of 4 per cent compared to a business-as-usual scenario in 2030, which could be increased to 12 per cent with international support. In the phase-down schedule for HFCs under the Kigali Amendment, Iran, along with a small group of the world's hottest countries, belongs to Group 2 of the A5 countries that can phase out HFCs with a further delay. Iran will freeze HFC use by 2028 and then begin to phase them out, with an 85 per cent reduction by 2047 compared to the baseline (average amount consumed in the years 2024 to 2026).

The country lacks financial incentives for manufacturers and end users to encourage the production and purchase of more efficient appliances using natural refrigerants. End-of-life management of refrigerants is inefficient, and they are often released into the atmosphere due to a lack of collection points and recovery or destruction facilities.

APPROACH

The C4 project works at the international and national level to achieve climate-friendly solutions in the RAC&F sector. It seeks to engage decision-makers by promoting collaborative structures and processes between national and international initiatives and organisations. This is done by delivering policy advice, methods and tools and by providing reliable channels for communication, such as expert review groups and regular dialogues. Partner countries are supported in framing their F-gas policy, initiating transformative processes and translating these efforts into active participation in international panels and forums. This support includes RAC&F sector inventories, analyses of existing RAC&F policies and regulations and barrier analyses to design appropriate mitigation strategies to advance INDCs and NDCs. The project helps to reduce market barriers to the introduction of more energy-efficient technologies with F-gas alternatives, enhance coherence between national institutional structures concerned with ozone protection and climate change mitigation and assess suitable finance mechanisms.

In Iran, the lifting of sanctions offers a good opportunity for technological advances and the deployment of energy-efficient and climate-friendly RAC appliances and for mitigation actions to be supported by non-state initiatives.

A GHG inventory for the RAC&F sector has been developed as part of technical assistance for the Iranian Department of Environment (DOE). It provides a detailed survey of GHG emissions resulting from RAC in the country and will serve as groundwork for further planning of Iran's NDC and HFC phase-down in accordance with the Kigali Amendment to the Montreal Protocol. Political and private sector consultations have been carried out on the results of the RAC inventory, which have been published in a report.

The inventory revealed that air conditioning is the sector with the highest mitigation potential in Iran. Mitigation outcomes can be achieved by switching to highly efficient, low-GWP technologies, such as R290 split air conditioners (ACs). The project has developed an R290 split AC resource guide and translated it into Farsi. The guide fills knowledge gaps and provides information on the factors deemed crucial for a successful market transition to energy-efficient R290 split ACs, which are currently the most climate-friendly option on the market. In addition, Iran received targeted support through an analysis of the cost, energy consumption and climate impacts of split air conditioning systems.

Iran was one of the country cases selected in the study Non-state action towards climate-friendly and energy-efficient cooling, which seeks to inform policy-makers about the potential of both top-down and bottom-up approaches to promote action on HFCs and energy efficiency in key RAC subsectors. In it, specific recommendations are made on how to drive non-state action and form partnerships in Iran.



Stakeholder workshop, Iran 2017
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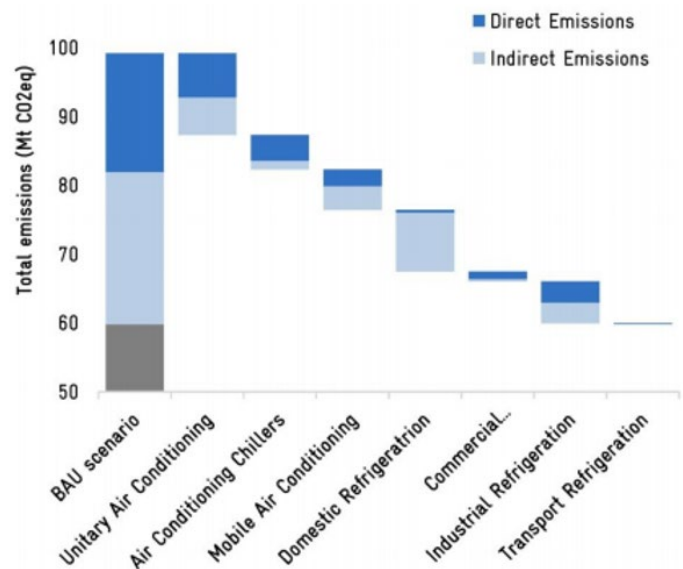


Figure 4. Mitigation potential of the Iranian RAC sector in the year 2050
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The country has also been part of an assessment on common procurement practices, barriers and enablers of green public procurement (GPP) and the potential of green cooling in public procurement. The assessment was based on structured interviews with facility managers, procurement units and regulatory authorities in Iran, Bangladesh, Grenada, Costa Rica, India and the Philippines. The study was shared with partners in Iran, and the results were presented to relevant stakeholders during an online webinar at the end of 2020.

MITIGATION POTENTIAL

By implementing the project's recommendations on deploying climate-friendly and energy-efficient RAC appliances using natural refrigerants, an estimated 39 million tonnes of CO₂ equivalent can be avoided annually by 2050.

SUCCESS FACTORS FOR REPLICATION

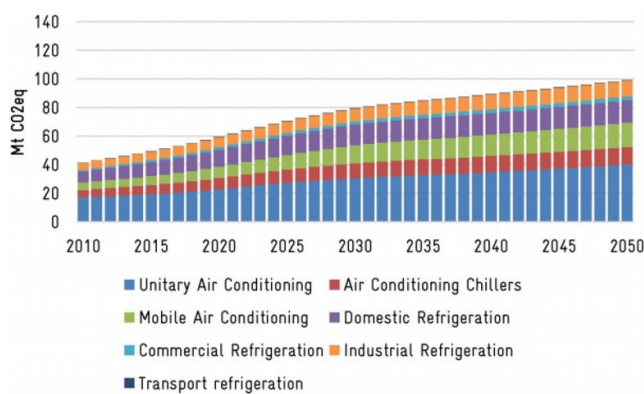
THE PROJECT TEAM HAS IDENTIFIED THREE SUCCESS FACTORS FOR REPLICATION

1. Fostering a sustainable transformation with Proklima's three-fold approach: By following GIZ Proklima's three-fold approach of promoting ozone protection, climate protection and energy efficiency, exchanges between the different private and public sector actors in these three fields and a holistic and sustainable transformation of the RAC sector are being encouraged. Workshops, webinars and discussion forums always address all three areas, highlight synergies and promote effective cooperation among the different actors to build the basis for a sustainable market transformation. This successful approach, the experience gained and the best practices developed in the partner countries will be replicated in other interested countries as part of a follow-up project (C4II).

2. Target-oriented policy-making for each RAC subsector: The RAC sector GHG inventory for Iran is based on the Intergovernmental Panel on Climate Change (IPCC) Tier 2 approach, showing mitigation potential at a subsectoral level. The inventory, together with a thorough baseline analysis, forms the basis for specific mitigation strategies for Iran. This enables target-oriented policy-making for each RAC subsector. For example, as Iran suffers from water shortages, the issue of evaporative coolers, using 200 litres of water per day to cool the air, is considered under this project. These units are produced locally and only work properly under dry air and high ambient temperature conditions, such as those in Iran. They are included in the inventory to show the impact

and saving potential of shifting to efficient split ACs or smaller sized evaporative coolers in combination with improved building insulation.

3. Introducing the most sustainable cooling technologies: One important strength of the C4 project is that it does not attempt to promote the best available RAC technologies in Iran, which are often still climate-damaging. Instead, the project tries to introduce green cooling technologies as the most sustainable technology option. Among the most sustainable and environmentally friendly refrigerants are R290 and R600 (propane), which are used worldwide for RAC. Iran is a producer of propane, so there is great potential for the local production of propane as a refrigerant. The study was shared and discussed with producers and lays the foundations for promoting local industry and preparing for future developments in the RAC industry.



Projected business-as-usual (BAU) scenario for GHG emissions in the RAC sector in Iran up to 2050

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This project has been selected as a good practice by the GIZ project Policy dialogue and knowledge management on low-emission strategies (DIAPOL-CE).



TUNISIA

Towards sustainable waste management of refrigeration and air conditioning (RAC) appliances

PROJECT	Management and destruction of ozone-depleting substances in ODS banks
GOAL	Reduce emissions from ozone-depleting substances (ODS) by promoting sustainable approaches for the environmentally sound management and disposal of waste containing ODS banks in Tunisia
COUNTRIES	Tunisia
OVERALL TERM	November 2013 to January 2020
PARTNER INSTITUTION	Tunisian National Agency for Energy Conservation (ANME), Tunisian National Agency for Environmental Protection (ANPE), Tunisian National Agency for Waste Management (ANGed)
IMPLEMENTING ORGANISATIONS	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
CONTACT	Franziska Schmittner, franziska.schmittner@giz.de

GOAL

The project supports the Tunisian Government in establishing an integrated system for the environmentally sound management and disposal of ODSs and waste containing them, known as ODS banks. Through policy advice, capacity building measures and technical cooperation, the project assists in creating national strategies aimed at reducing emissions from ODS banks in Tunisia and four other countries. It is supported by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH as part of a global project on emission reduction strategies for

ODS banks funded by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) through the International Climate Initiative (IKI).

CHALLENGE

ODSs such as hydrochlorofluorocarbons (HCFCs) and chlorofluorocarbons (CFCs) have a very high ozone-depleting potential and global warming potential. In fact, the global warming potential of these fluorinated gases can be up to 10,900 times higher than that of carbon dioxide, according to the Intergovernmental Panel on Climate Change (IPCC). The excessive use of ODSs has led to the accumulation of large ODS banks globally. It is estimated that the current global ODS bank is equivalent to somewhere between 16 and 18 billion tonnes of CO₂ equivalent (2016).

The Montreal Protocol has successfully regulated the production and consumption of ODSs. However, the management and destruction of ODS banks has not yet been adequately addressed by any international agreement. The proper collection, recovery and destruction of these ODS banks is a challenge, in particular for developing countries, which often lack the institutional framework and regulations, an adequate waste management planning system and the specific technologies and infrastructure needed.

In many developing countries and emerging economies, including Tunisia, refrigerants used in most old refrigerators and air conditioners are still ODSs. Tunisia's national ODS stock is estimated to amount to 2,386 tonnes, of which 89 per cent is from unitary

air conditioning equipment. If these appliances are not disposed of properly, the substances contained in them are released into the environment, contributing to the depletion of the ozone layer and accelerating climate change.

APPROACH

The project started with a detailed gap analysis of the framework conditions in Tunisia, including legislation and policy instruments, and existing ODS waste management infrastructure, planning and practices. A first national inventory of ODS banks in Tunisia was carried out for the year 2015 by GIZ and ANPE's National Ozone Unit (NOU). It quantified the amount of ODS contained in RAC equipment for domestic refrigeration, central and individual air



Theoretical and practical training on ODS bank management in Tunisia
© GIZ Proklima

conditioning, commercial and industrial refrigeration and refrigerated transport. This inventory now serves as a basis for any action and policy decisions in the field of ODS bank management.

Based on the gap analysis and inventory results, advice was provided to existing national initiatives in order to increase their sustainability and contribute to reducing emissions from ODS banks. A study on the economic feasibility of recycling facilities for cooling devices in Tunisia was conducted in cooperation with

ANGED for the recovery, recycling and destruction of ODS refrigerants.



RAC waste at a dumping ground
© Shutterstock / Mikhail P.

In addition, the project assisted ANME in revising the measurement, reporting and verification (MRV) system of the refrigerator replacement programme PROMO-FRIGO, which is aimed at promoting the replacement of domestic refrigerators over 10 years old with energy class 1 refrigerators. The MRV system monitors and tracks various programme indicators, increasing its chances of being eligible for international climate finance.

Based on the project's findings and identified gaps, a national ODS bank roadmap was developed for Tunisia. It provides recommendations on reliable framework conditions for ODS management, including suitable policy measures, sustainable financial mechanisms and an environmentally sound ODS bank recycling and destruction infrastructure. Responsibilities and next steps to implement the roadmap were discussed during a stakeholder workshop with representatives of the public and private sectors.

MITIGATION POTENTIAL

Globally, yearly emissions from ODS banks amount to 1.5 billion tonnes of CO₂ equivalent, representing a huge mitigation potential.

SUCCESS FACTORS FOR REPLICATION

Tunisia's approach to the establishment of a national strategy for ODS banks can serve as a good practice example for other countries. The project team has identified four success factors for replication:

1. Analysis of status quo and inventories: A detailed analysis of existing regulations, initiatives and technological infrastructure and the development of an ODS bank inventory are essential to identifying gaps and formulating policies and actions with sustainable impacts.

2. Establishing a suitable set of policy measures: Regulations, standards and laws and an effective collection mechanism have to first be established or improved in order to ensure that a critical quantity of ODSs are collected. Only when this is achieved will investment in technologies to destroy ODS be reasonable and result in significant mitigation of ODS bank emissions.

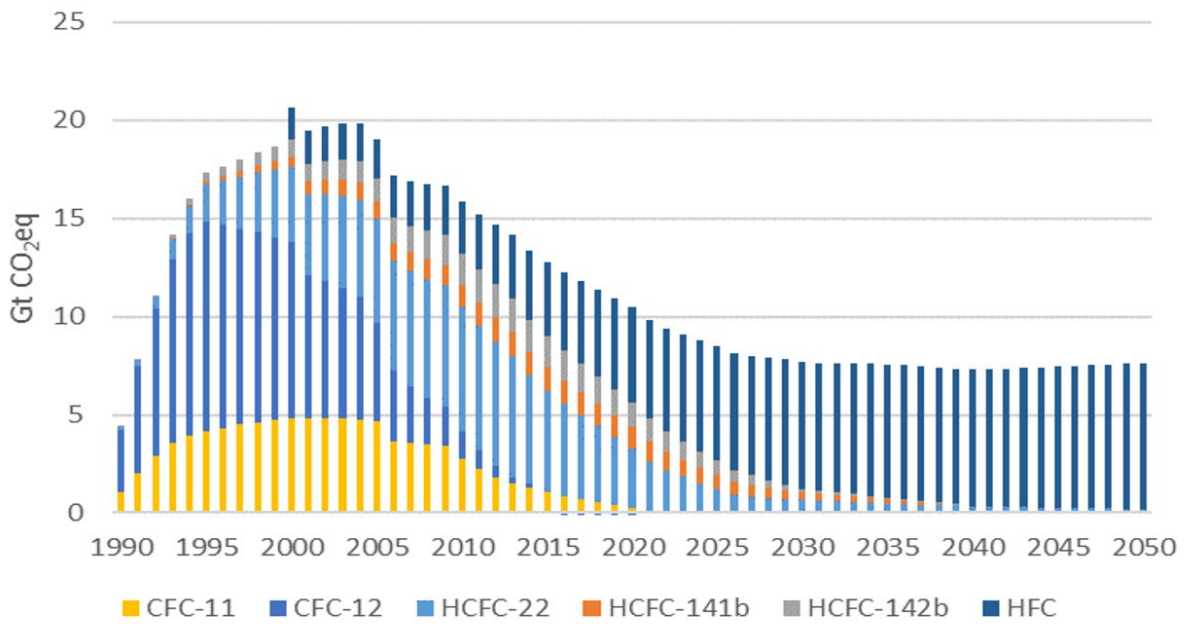
3. Broad stakeholder involvement: Since ODS bank management involves many stages and cross-cutting fields, it is important to inform and involve all relevant public and private sector stakeholders, for example, NOU decision-makers, climate change, energy efficiency and e-waste departments, RAC producers and importers, RAC industry associations and e-waste companies. Only by involving all stakeholders will ODS bank management activities be sustainable and have high mitigation potential.

4. Providing a sustainable finance mechanism:

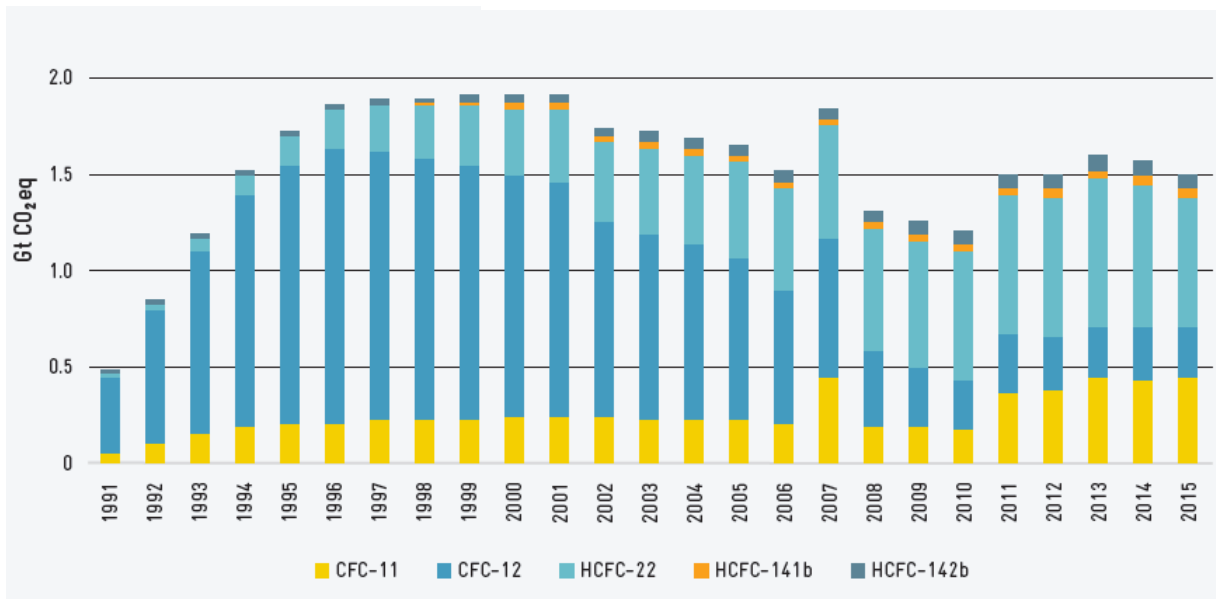
ODS bank management needs to be based on a sustainable financing mechanism. Financing is not only necessary for the destruction of ODSs but also for other activities, such as providing the infrastructure for a collection scheme and its operation, including the transportation of ODSs and equipment containing ODSs.



Stakeholder workshop in Tunisia
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Global ODS and HFC banks.
 Source: Global banks of ozone depleting substances (version 2.0), GIZ, 2018



Emissions of ODS banks.
 Source: Global roadmap on ODS bank management, GIZ, 2017

More information: www.green-cooling-initiative.org

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This project has been selected as a good practice by the GIZ project Policy dialogue and knowledge management on low-emission strategies (DIAPOL-CE).



REGIONAL

Supporting a green transformation of the building sector

PROJECT	Programme for Energy Efficiency in Buildings (PEEB)
GOAL	Transform the building sector by promoting sustainable building design and construction
COUNTRIES	Mexico, Morocco, Senegal, Tunisia, Viet Nam
OVERALL TERM	October 2017 to December 2021
PARTNER INSTITUTION	Environmental, construction and urban development and housing ministries in partner countries
IMPLEMENTING ORGANISATIONS	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
CONTACT	Christiana Hageneder, christiana.hageneder@giz.de Anna Zinecker, anna.zinecker@giz.de

GOAL

The Programme for Energy Efficiency in Buildings (PEEB) aims to transform the building sector in partner countries by promoting sustainable building design and construction. The programme combines financing for energy efficiency in large-scale projects with technical assistance through policy advice and capacity development. PEEB was initiated by the governments of France and Germany at the 22nd Conference of the Parties to the United Nations Framework Convention on Climate Change (COP22). It is financed in part by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) and is implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. The German contribution to

the programme is part of the Corona Response Package of the International Climate Initiative (IKI).

CHALLENGE

According to International Energy Agency (IEA) estimates, the floor area of buildings worldwide is expected to increase by 75 per cent between 2020 and 2050. A large part of these buildings will be constructed in countries which do not yet have energy efficiency and thermal regulations for buildings. Emerging and developing economies in hot climates will experience the biggest increase in floor area. As a result, energy demand for appliances and cooling systems is expected to triple by 2050, according to the IEA. This makes the building sector a sleeping giant for climate mitigation and adaptation. Already, 38 per cent of all energy-related global greenhouse gas (GHG) emissions are from buildings. Energy demand in the sector is expected to have grown by 50 per cent by 2050. To be on track to achieve a net-zero-carbon building stock by 2050, the IEA estimates that building sector emissions need to fall by around 6 per cent annually from 2020 to 2030.

The buildings and construction sector faces a number of challenges on the path to zero carbon. The sector is highly fragmented and lacks climate action coordination and clearly articulated nationally determined contribution (NDC) targets. Green building codes are insufficient, and compliance is poor. In addition, there is a general lack of knowledge about green building design and innovative business models among developers, builders and banks. Although climate action

in buildings tends to be very cost-effective and small investments can result in substantial savings, many investors still lack the required knowledge and readiness



Construction worker
© Pixabay

to tackle more sustainable building projects. Another challenge is that policy framework conditions favourable to climate-friendly construction are not yet in place in many countries.

The IEA estimates that realising the potential of sustainable buildings could save approximately USD 1.1 trillion by 2050.

APPROACH

At COP21 in Paris, the Global Alliance for Buildings and Construction (GlobalABC) was launched in recognition of the essential role of the building sector in meeting climate goals. France and Germany, as two of its founding members, announced at COP22 in Marrakech the establishment of the PEEB programme to support countries in the buildings and construction sector in reaching the zero-carbon goal. The implementation of PEEB started in early 2018. A joint secretariat was set up by the French Development Agency (AFD) and GIZ.

On the German side, GIZ implements funds from the BMU (via IKI) to support partner countries with technical assistance. On the French side, financial assistance for large transformative projects in part-

ner countries is provided by AFD. Furthermore, the French Agency for Ecological Transition (ADEME) supports pilot projects in two countries.

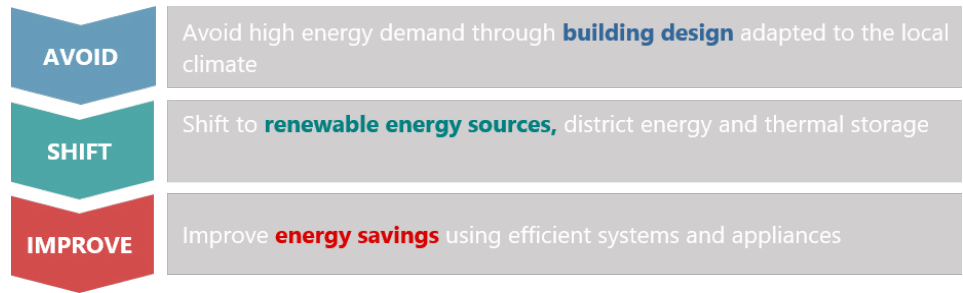
PEEB combines financial and technical support to make the energy efficiency policies and NDCs of partner countries more ambitious and effective. Partner countries receive advice on setting up programmes that stimulate private investment in energy-efficient buildings, for example, housing programmes with attractive loans and grants for projects with higher energy-efficient standards. Technical assistance is given to the partner ministry on the macroeconomic and microeconomic effects of such a programme, options for programme schemes, etc.

PEEB also supports transformative building and renovation projects. Residential buildings, hospitals, schools and commercial buildings, in particular, are receiving support from the feasibility study stage up to the point where they are ready for financing. During this process, PEEB trains professionals from the public and private sectors on state-of-the-art low-carbon building technologies and provides advice on sustainable building materials, efficient appliances, sustainable energy supply and digital tools for energy saving.

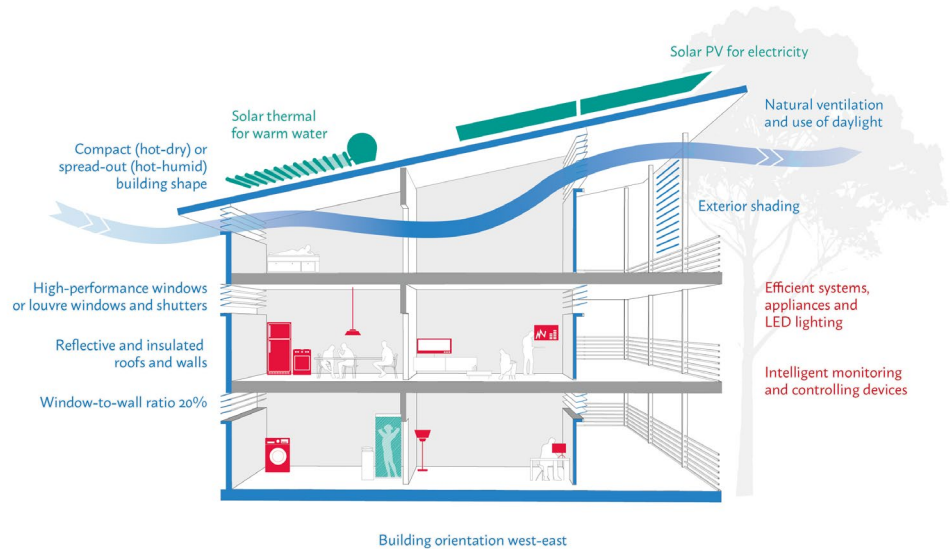
The programme follows an avoid-shift-improve approach to reduce energy consumption in buildings. It promotes building designs adapted to local climates to reduce energy demand for cooling, heating and lighting, for example, through building compactness, natural ventilation and external shading, and the application of low-carbon technologies and low-carbon building materials. The results of the project development processes are disseminated as practical examples through GlobalABC and other networks.

PEEB mobilises innovative financial solutions for construction and renovation projects from international and national sources and helps create incentive programmes to drive private investment and boost market development. By setting ambitious conditions for financing, policy standards are reinforced and even exceeded.

To achieve a transformative effect, PEEB supports partner countries in setting up green stimulus programmes in the building sector. This also helps to set the economic recovery from the Corona crisis on a green and low-carbon development track. The construction sector can rapidly create large numbers of jobs and involves far-reaching value chains of small and large businesses. It also presents a massive opportunity to reduce energy consumption and GHG emissions through retrofits and energy efficiency measures in new buildings. Currently, green housing programmes are under development in Morocco and Viet Nam, where highly efficient residential projects and equipment will be incentivised through a financing scheme implemented by a financial intermediary.



PEEB's avoid-shift-improve approach



many countries. The project team has identified four success factors for replication:

1. Combination of technical and financial support to countries: PEEB's integrated approach of providing financing for large transformative projects and policy support to ensure energy efficiency becomes a

MITIGATION POTENTIAL

The green housing programme implemented in Morocco is estimated to achieve direct emission reductions of about 955,000 tCO₂e and indirect reductions of around 3,580,000 tCO₂e over the lifetime of the building.

SUCCESS FACTORS FOR REPLICATION

PEEB acts as a multiplier or catalyst for green transformation in the building sector. Its approach, methodologies and tools are highly replicable and scalable. There is strong demand for further PEEB support in

requirement in the legislative framework in the long run allows it to go to scale from projects to sector-wide transformation (see, for example, [health sector transformation in Tunisia](#)). The programme builds on AFD's financing operations and GIZ's existing policy dialogue with partner countries and extensive networks. This combination should be replicated further and explored for other contexts to avoid creating 'stand-alone' pilot projects without follow-up and regulations that are developed but not implemented and enforced.

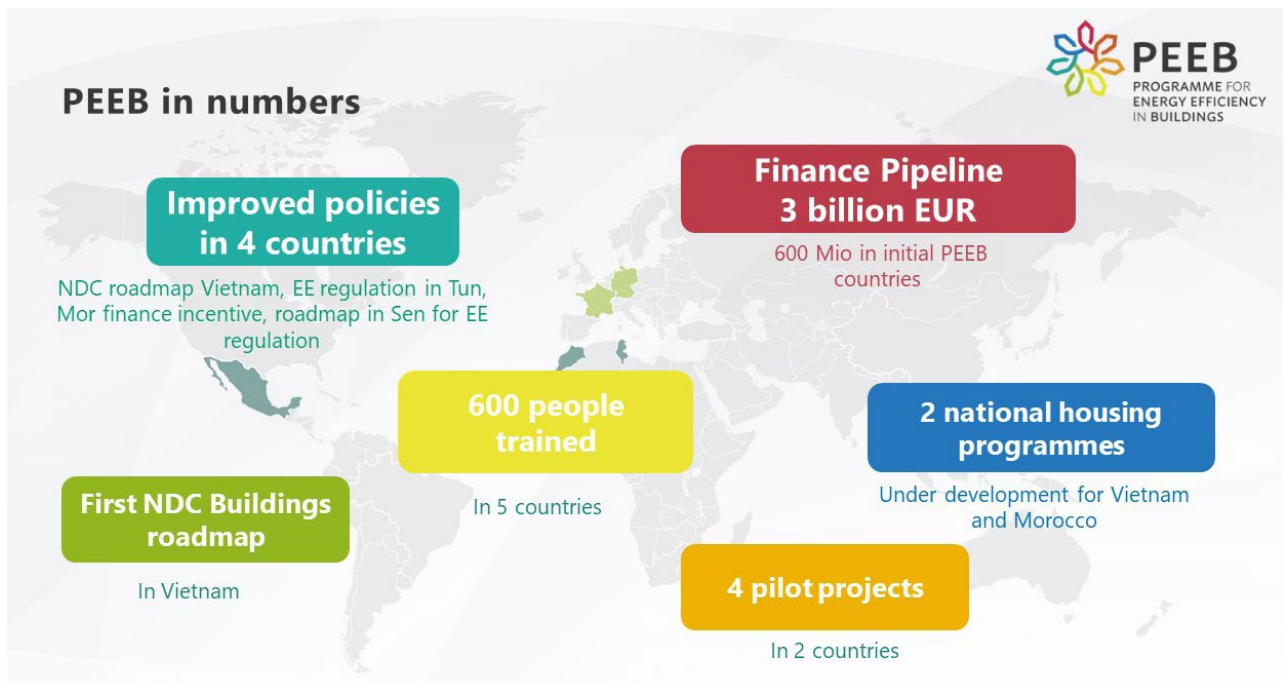
2. Catalyst for building sector action: PEEB uses its funding to kick-start major new national programmes in partner countries. National incentive programmes

have been developed (for example in Morocco and Viet Nam) through active dialogue with government country partners, combined with the potential to bring in financing through AFD as a development bank. A major obstacle for such programmes is often defining criteria for funding and project assessments. By combining financing with policy advice and guidance on green building regulations and with the possibility to transfer approaches and experiences developed under PEEB, the programme makes it possible to swiftly develop and implement green building programmes.

3. Cooperation with international development and climate financiers: Embedding green building projects in the portfolio of international and national (development) banks has a long-lasting effect on the actions of financiers globally and supports the shift towards Paris-aligned portfolios. For example, AFD

has achieved EUR 400 million in climate co-benefits in 2019 and 2020 with PEEB. Through cooperation with AFD and close dialogue with other financiers (International Development Finance Club) and donors (Green Climate Fund, NAMA Facility), PEEB works to share methodologies and approaches to increase the amount of development and climate finance going to buildings.

4. International advocacy to drive global efforts on building sector decarbonisation: PEEB shares best practices from implementation internationally and advocates for climate action on green buildings with GlobalABC, highlighting the potential of solutions ranging from [passive cooling](#) to [Green Recovery](#). PEEB's country support for ambitious NDCs and long-term strategies for buildings further contributes to raising the level of ambition and long-term impacts.



PEEB results for 2021 (PEEB)

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This project has been selected as a good practice by the GIZ project Policy dialogue and knowledge management on low-emission strategies (DIAPOL-CE).

NILE BASIN

Enabling climate-proof infrastructure planning in the Nile Basin

PROJECT	Enhancing Climate Services for Infrastructure Investments (CSI)
GOAL	Integrate climate services (targeted climate information and risk assessments) into investment planning for more resilient infrastructure
COUNTRIES	Nine Nile Basin countries (including Uganda and Rwanda)
OVERALL TERM	March 2017 to March 2022
PARTNER INSTITUTION	Nile Basin Initiative (NBI)
IMPLEMENTING ORGANISATIONS	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
CONTACT	Niklas Baumert, niklas.baumert@giz.de

GOAL

The global project Enhancing Climate Services for Infrastructure Investments (CSI) aims to integrate climate services (targeted climate information and risk assessments) into investment planning to create more resilient infrastructure and avoid misinvestment and the ensuing economic and social consequences. In Africa, the global project is partnering with the Nile Basin Initiative (NBI) to advise decision-makers and representatives of NBI member states on enhancing the climate resilience of water infrastructure and related services, such as irrigation, hydropower and flood management. CSI was commissioned by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU), through the International Climate Initiative (IKI), and implemen-

ted by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.

CHALLENGE

Changing climate conditions put existing and future infrastructure projects under increasing pressure. Rising sea levels, higher temperatures and extreme weather events need to be considered in existing infrastructure and in the planning of new infrastructure to avoid misinvestment and social and economic consequences. Developing and emerging countries have an increasing need to improve physical infrastructure to supply their growing populations with energy and water and design sustainable transport systems. It is estimated that global infrastructure investments will amount to USD 90 trillion between 2015 and 2030. However, climate risks and their associated costs often fail to be addressed at the planning stage of such infrastructure projects. Making these investments climate-proof will be a future challenge for nations worldwide. Moreover, existing infrastructure, which has been planned for past climate conditions, needs to be rebuilt or retrofitted to withstand the new level of risk. In the planning of future infrastructure projects, scientifically backed and customised climate data need to be considered when conducting risk assessment studies and taking climate-smart risk management decisions.

In the Nile Basin, extreme weather events, such as floods and droughts, can lead to the destruction of water-related infrastructure and the key services

it provides, including the electrification of rural households and a reliable water supply for food security. Particularly extreme run-off events, such as low-flow and high-flow conditions, might increase in intensity and frequency as a result of climate change and impact this infrastructure and the related services. At the same time, the Nile Basin is on the brink of facing severe water scarcity due to the rising population and climate change, putting food and energy security in the region at risk. It is estimated that, by 2030, the demand for water will exceed supply, and by 2080 water shortages could affect around 250 million people living in the upper Nile Basin in years when the weather is hot and dry. Hot and dry years are predicted to occur up to three times more frequently. Poor crop yields in hot years have already become a reality. Ultimately, water scarcity may also increase tensions among the 10 Nile Basin states reliant on Nile water.

Climate information and climate service products, such as risk and vulnerability analyses, are urgently required to enable public and private decision-makers to create more resilient public infrastructure. Many countries in the Nile Basin region still lack the institutional and technical capacities required to set up climate services and mainstream them into their planning procedures and regulations for water infrastructure investment. The national meteorological and hydrological services do not have the capacity or funding available to compile sophisticated climatological statistics, such as climate indices, and tailored user-specific information products.

APPROACH

CSI is advising government agencies and decision-makers in partner countries on the integration of climate services (ranging from global and regional climate model outputs to local impact and vulnerability assessments) into investment planning. It aims to establish institutionalised value chains and

knowledge management systems for the delivery of climate services, by piloting infrastructure-specific climate risk assessments and facilitating the identifi-



Climate Risk Working Group workshop in Uganda
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cation and selection of sustainable adaptation options, a process also termed climate proofing. The project brings together all relevant private and public sector actors along the climate service value chain to carry out climate risk assessments and engage in climate proofing. This includes climate data providers, hydrologists and infrastructure planners, owners and operators, who work with such data and need to take informed decisions when making risk judgements. As part of cooperation with the NBI, CSI supports the implementation of its climate strategy, which was published in 2013, to strengthen basin-wide resilience to climate change and ensure climate-compatible water resource management and development. The NBI climate strategy aims to strengthen the capacity of the initiative and the country to assess the transboundary, environmental and socioeconomic implications of climate change for water resource management and overall developments. CSI focuses on multipurpose water infrastructure, including hydropower, irrigation and flood control facilities at the transboundary level, to arrive at climate-resilient investments. It provides tools and instruments to climate proof the entire lifecycle of such infrastructure, ranging from project identification through to design, construction and operation.

With a view to scaling up and piloting climate proofing-related tools and instruments and reaching out to the diverse stakeholders and all the riparian countries of the Nile, CSI is advising the NBI on establishing a Climate Service Knowledge Management Hub (CSKM), hosted on the NBI's website. The hub allows for networking and knowledge sharing among a community of practice (public and private sector stakeholders) and provides access to interactive climate proofing guidance, a self-paced e-learning system and a climate service help desk that gives users access to customised climate information. As an integrated platform and a standing resource, the CSKM contributes to promoting climate-resilient water infrastructure throughout the entire Nile Basin and for all interested stakeholders. The hub is a final milestone of cooperation between the CSI project and the NBI, based on five years of stakeholder collaboration.

By sharing experience and best practices with national and international forums, CSI fosters climate-sensitive infrastructure planning methods and contributes to more resilient infrastructure in the Nile Basin and worldwide.

SUCCESS FACTORS FOR REPLICATION

The project is well suited to replication in other regions with transboundary issues in infrastructure planning, especially other regions of Africa which have formed river commissions, such as the Okavango River Basin Water Commission. The project team has identified four success factors for replication:



The CSI approach
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1. Piloting climate risk assessments as a human capacity development measure, using real life case studies, creates awareness on methodologies and an



Field work investigations
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understanding of real risks, which in turn increases engagement in this area and commitment to addressing the issue.

2. Maximising the use of available or established climate information is of utmost importance whenever climate change adaptation measures are to be developed. It ensures the effectiveness and efficiency of climate-resilient investments. Such customised climate information can only be developed in a multistakeholder dialogue process, where climate service providers and users ‘negotiate’ the appropriate climate service product.

3. Communication methods for developing a common language: During activities such as technical consultations, advisory sessions and human capacity development with stakeholders from different disciplines (including engineers, climatologists and infrastructure operators), effective communication methods need to be employed to allow for the development of a common language and avoid conflicts.

4. Using and rolling out virtual and digital integrated formats: Knowledge management hubs and other formats can bring together diverse stakeholders of different nationalities that share similar interests. They help to upscale and increase the sustainability

of the concepts, mechanisms and tools introduced. Moreover, knowledge hubs enable decision-makers and practitioners to access required resources independently 24/7.



Classical multipurpose dam infrastructure system

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SENEGAL

Developing innovative climate financing solutions for Senegal

PROJECT	Linking Market Mechanisms and Climate Finance in Africa (Climate Finance Innovators)
GOAL	Harness the potential of various climate financing mechanisms in Senegal
COUNTRIES	Senegal
OVERALL TERM	April 2018 to March 2022
PARTNER INSTITUTION	Senegalese Ministry for Environment and Sustainable Development (MEDD), Senegalese Rural Electrification Agency (ASER), West African Development Bank (BOAD)
IMPLEMENTING ORGANISATIONS	Perspectives Climate Group, Climate Focus, Afrique Énergie Environnement, AERA Group
CONTACT	Stephan Hoch, hoch@perspectives.cc Sandra Greiner, s.greiner@climatefocus.com

communities. The project, which operates under the name Climate Finance Innovators (CFI), is funded by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU), as part of the International Climate Initiative (IKI), and implemented by Perspectives Climate Group, Climate Focus, Afrique Énergie Environnement, AERA Group, Carbon Africa and South South North Africa. Perspectives Climate Group is the leading implementing partner of the CFI project, while Climate Focus, AERA Group and Afrique Énergie Environnement lead its implementation in Senegal.

GOAL

The project Linking Market Mechanisms and Climate Finance in Africa aims to contribute to achieving the NDC goals of Ethiopia, Senegal and Uganda by working towards synergies between United Nations Framework Convention on Climate Change (UNFCCC) market mechanisms and international climate financing institutions, particularly the Green Climate Fund (GCF). It develops replicable climate financing models that are based on the Clean Development Mechanism (CDM) and formulates funding proposals to scale up pilot mitigation activities and bring sustainable development impacts to local

CHALLENGE

In its intended nationally determined contribution (INDC), published in 2015, Senegal committed to curbing emissions by 21 per cent by 2030 compared to a business-as-usual scenario. The unconditional part of the commitment amounted to a 5 per cent reduction, while the remaining 16 per cent was conditional on international support. For the energy sector, the unconditional target involved the electrification of 392 villages with solar-powered mini-grids, while the conditional target was for up to 5,000 more, dependent on support received from the international community. In 2020, Senegal submitted its NDC with updated targets. The electricity production sector now has a new unconditional target that entails installing 6.18 MWp through off-grid solar systems as well as a new conditional target involving the electrification of 2,292 localities via mini-grids and 4,356 localities through solar home systems.

While almost all of Senegal's urban areas have access to electricity, about 58 per cent of the rural population do not. For basic energy needs, these households



Solar mini-grids installed in a rural area, Senegal,
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mainly rely on fuelwood for cooking and kerosene lamps for lighting. This is expensive and causes health and environmental hazards.

Barriers to accessing finance and a lack of technical expertise have limited the implementation of decentralised solar photovoltaic mini-grids as a sustainable source of energy, especially in rural areas. The Senegalese authorities are prioritising solar power installation in rural areas as a way to mitigate emissions while at the same time contributing to the achievement of the Sustainable Development Goals (SDGs).

Like other African countries, Senegal has not yet fully benefited from the potential of financing mechanisms for climate change mitigation. The main reasons include the lack of institutional and technical capacity to navigate the requirements set by these mechanisms and other sector-specific barriers.

APPROACH

CFI prepares replicable climate finance proposals for submission to GCF for mitigation activities in Ethiopia, Senegal and Uganda, in partnership with national

institutions and GCF Accredited Entities. The project team supports government partners and the private sector in formulating tailored funding proposals from concept note to submission.

In Senegal, CFI carried out a thorough scoping of high-quality mitigation projects to identify those able to meet GCF investment criteria. The programme proposed by the Senegalese Rural Electrification Agency (ASER) was selected, and CFI supported ASER in preparing a climate finance proposal for GCF. The proposal went through several rounds of feedback from GCF until it was finally approved in August 2020. CFI successfully matched ASER with the West African Development Bank (BOAD), which serves as a regional GCF Accredited Entity. BOAD submitted ASER's final financing proposal and will manage the approved funds.

The ASER programme will deploy 100 per cent solar mini-grids in 1,000 isolated villages across Senegal, with almost 39,000 rural households, over five years through private rural electrification concessionaires. This will boost the country's NDC ambition and is also part of the government's efforts to achieve universal access to sustainable electricity services by 2025. There is a special focus on vulnerable and isolated communities that remain outside the boundaries of the areas covered by the Rural Electrification Priority Plan and Senelec (National Electricity Company of Senegal). By expanding sustainable energy generation, improving the reliability of water and food chains and supporting economic growth in rural areas, among other measures, the programme strengthens the resilience of rural livelihoods to climate variability and promotes sustainable development, thus creating measurable adaptation co-benefits.

In addition to supporting the development of the proposal, CFI carried out national capacity building workshops focused on carbon market and climate finance support for NDC implementation and made available methodological concepts to generate multiplier effects to contribute to achieving NDC goals.

CFI is also supporting the development of a state-of-the-art monitoring, reporting and verification (MRV) tool based on a UNFCCC-approved CDM baseline and monitoring methodology. The tool will monitor mitigation outcomes and contributions to the SDGs. It will help to make the ASER project a showcase for supporting action to achieve NDC targets and development goals and will strengthen readiness preparations for the next generation of carbon markets under Article 6 of the Paris Agreement.

MITIGATION POTENTIAL

By bringing electricity to 38,917 rural households in 1,000 villages in Senegal, the solar mini-grid project will result in an estimated reduction of 1.13 million tonnes of CO₂ equivalent over its technical lifetime.

SUCCESS FACTORS FOR REPLICATION

The project team has identified five success factors for replication:

1. UNFCCC-approved methodology for MRV: By adopting a CDM methodology for calculating emission reductions, CFI ensured the use of a UNFCCC-approved tool for MRV, successfully offering a solution for the lack of standardised GCF methodologies. This enhances the transparency and comparability of ASER's mitigation benefits, which makes it easier



Productive use of energy in a rural area ,
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for Senegal to count emission reductions towards its NDC target. The same approach could be adopted by other projects seeking GCF funding.



Ongoing works to install solar mini-grids,
© by Ousmane Fall Sarr

2. Energising the process through continuous interaction: Before CFI became involved, the proposal preparation process had struggled to gain momentum. CFI energised the process and facilitated close collaboration with all the actors involved (BOAD, ASER, MEDD, GCF) through in-person workshops and continuous interactions. In addition, CFI provided sustained technical support, ensuring sometimes extremely tight deadlines were met.

3. Enhancing capacities for smooth implementation: The CFI project enhanced the capacity of the project's key stakeholders to implement a solar mini-grid deployment framework by increasing the awareness of end-user beneficiaries about the project's benefits, strengthening the ability of the ASER-hosted Project Management Unit to take into account social and gender aspects and reinforcing the environmental expertise and knowledge management skills of all the actors involved through technical knowledge sharing. This will ensure smooth implementation of the project.

4. Knowledge and experience sharing and peer-to-peer learning: The CFI project not only operates in Senegal, but also develops similar funding proposals

for sustainable energy and water access in Ethiopia and Uganda. Moreover, the project team supports the West and Eastern Africa Alliances on Carbon Markets and Climate Finance at the subregional level. This stakeholder constellation allows for significant mutual learning and experience sharing across countries and subregions with similar needs in terms of access to climate finance.

5. Developing and sharing high-quality knowledge products: The CFI team produces high-quality knowledge products and supports African stakeholders in feeding regional experiences into multilateral negotiations and other relevant climate policy forums so that the climate finance and carbon market architecture of the Paris Agreement better reflects Africa's specific circumstances.

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TUNISIA

Enabling low-emission production of nitric acid in Tunisia

PROJECT	Supporting the Nitric Acid Climate Action Group (NACAG)
GOAL	Create incentives for the permanent reduction of nitrous oxide (N ₂ O) emissions in Tunisia
COUNTRIES	Tunisia
OVERALL TERM	November 2016 to December 2025
PARTNER INSTITUTION	Tunisian Ministry of Environment, Tunisian National Agency for Energy Conservation (ANME)
IMPLEMENTING ORGANISATIONS	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
CONTACT	Volker Schmidt, volker.schmidt@giz.de Akram Hamza, akram.hamza@giz.de

GOAL

The project aims to reduce the nitrous oxide (N₂O) emissions from nitric acid production in Tunisia by providing technical and financial support to national partners. In addition, it monitors N₂O emissions to support the country in achieving its nationally determined contribution (NDC) and mobilises national actors to implement mitigation measures in the chemical sector in Tunisia. The project is part of the global Nitric Acid Climate Action Group (NACAG) initiated by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU), which aims to incentivise the installation of effective N₂O abatement technology in nitric acid plants worldwide.

CHALLENGE

Nitric acid is an important raw material in the chemical industry, especially in the production of fertilisers. However, the nitric acid production process releases N₂O into the atmosphere, which has a global warming potential 265 times higher than that of carbon dioxide (CO₂). The technology needed to reduce N₂O emissions during the production process is relatively inexpensive, making it a low-cost mitigation measure.

In Tunisia, nitric acid is produced by a single publicly owned plant in Gabès, in the south of the country. It is mainly used by the government-financed Groupe Chimique Tunisien (GCT) as raw material for manufacturing artificial fertilisers for agriculture. The



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plant in Gabès is not yet equipped with low-carbon technology and releases high amounts of N₂O into the atmosphere. According to Tunisia's 2012 greenhouse gas (GHG) inventories, N₂O emissions are the

third biggest contributor to emissions in the Tunisian industrial sector, amounting to 279 ktonnes of CO₂ per year.

In 2015, Tunisia submitted an ambitious NDC setting the target of reducing its carbon intensity by 41 per cent by 2030 compared to the 2010 level. The measures intended to achieve this target are mainly in the energy sector and, to a lesser degree, in the mineral industries. The Tunisian NDC, like those of most countries, does not yet contain measures for the chemical industry, even though it has a high reduction potential which could be unlocked by implementing low-cost technology in the Gabès production plant.

APPROACH

The Tunisian NACAG project started in 2016 through bilateral consultations with stakeholders at the national level, in particular the Tunisian Ministry of Environment and the National Agency for Energy Conservation (ANME). These consultations were concluded with the signing in 2018 of a statement of undertaking by the Ministry of Environment aimed at reducing the long-term N₂O emissions resulting from the production of nitric acid in Tunisia.



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In return for the funding that will be granted until 2024 to equip GCT with state-of-the-art, low-carbon



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technology, Tunisia is expected to implement a policy to reduce N₂O emissions from nitric acid production and to include the reductions generated in its revised NDC. The NACAG project provides the necessary support and facilitates dialogue at the national level for the development of the required N₂O emission reduction policy and inclusion of the reductions in the NDC.

Technical support for the project consists in determining the most efficient technological equipment for the nitric acid production process at the Gabès plant and subsequently setting up the catalyst and monitoring system for the mitigation and continuous monitoring of N₂O emissions. The reductions achieved will be independently verified.

In addition, the project will support the development of an investment plan for the maintenance of the equipment that will be installed at the Gabès plant on the basis of a wider GHG mitigation strategy, including energy efficiency and renewable energy measures, which will help to reduce energy costs and therefore offset maintenance costs.

With the signing of a grant agreement, the project will continue supporting the company and national stakeholders for the purchase and operationalisation of the equipment, providing technical advice on its operation and maintenance.

MITIGATION POTENTIAL

The project aims to reduce between 450 and 500 ktonnes of CO₂ equivalent per year. This represents a 9 per cent average annual reduction in emissions in the Tunisian industrial sector.

SUCCESS FACTORS FOR REPLICATION

The project's approach has a strong replication potential because it successfully engaged Tunisia from the start in supporting the NACAG initiative goals of reducing N₂O emissions and integrating them into the revised NDC. The project team has identified four success factors for replication:

1. High-level involvement for a broad buy-in: High-ranking representatives of the Tunisian Ministry of Environment, ANME and several other national institutions have been involved since the preparatory phase of the project. A national dialogue has been



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conducted with a wide range of national institutions, including four ministries and national agencies, to approve the implementation of the project and ensure a broad buy-in.

2. Emphasising responsibilities through dialogue:

Regular activities to raise the awareness of GCT, which runs the nitric acid plant in Gabès, and dialogue with the national government on the roles of the different entities in the N₂O emission reduction process and NDC implementation turned out to be a critical factor for the effective implementation and sustainable continuation of the project.

3. Developing an investment plan to ensure sustainability:

One of the obstacles to the sustainability of the project is the long-term maintenance of the equipment, which has a lifecycle of four to five years. To overcome this obstacle, an investment plan for GCT will be developed, including several energy efficiency



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and renewable energy measures. The implementation of these measures will generate high potential for GHG reduction and energy savings, which will offset the cost of maintaining the equipment in the long run. A regular dialogue between the company and the government has been encouraged so that an agreement can be reached on this long-term solution, in which other financial actors, such as international development banks, will be involved.

4. Supporting reconciliation with the regional community through real commitment: High-ranking representatives of the Tunisian Ministry of Environment, ANME and several other national institutions have been involved since the preparatory phase of the project. A national dialogue has been conducted with a wide range of national institutions, including four ministries and national agencies, to approve the implementation of the project and ensure a road buy-in.



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UGANDA

Supporting market mechanisms for mitigation in East Africa

PROJECT	Global Carbon Market
GOAL	Support East African countries in utilising market mechanisms for reducing greenhouse gas emissions and implementing nationally determined contributions (NDCs)
COUNTRIES	Uganda
OVERALL TERM	July 2018 to September 2022
PARTNER INSTITUTION	Climate Change Department of the Uganda Ministry of Water and Environment
IMPLEMENTING ORGANISATIONS	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
CONTACT	Lydia Ondraczek, lydia.ondraczek@giz.de

GOAL

The Global Carbon Market (GCM) project supports partner countries in utilising existing and new carbon market instruments for reducing greenhouse gas emissions. It focuses on novel forms of cooperation that may arise under Article 6 of the Paris Agreement, the voluntary carbon market and dedicated carbon pricing instruments. The project is implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH in Chile, India, Tunisia and Uganda. GCM is funded by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU).

CHALLENGE

Market-based approaches, such as emissions trading systems (ETs), are an effective way to mitigate emissions, lowering the cost of reductions and incentivising climate-friendly investment. The parties to the Paris Agreement have asserted their intention to install market mechanisms as a fixed component of the new climate regime. Their use is gaining traction globally. Across jurisdictions, decision-makers are beginning to factor in the ‘true cost of emissions’ in the form of carbon taxes, offset mechanisms and ETs. This is a pivotal step in decarbonising the global economy and achieving climate goals under the Paris Agreement.

However, there is a lack of institutional capacity to set up carbon pricing mechanisms. Many countries are missing strategic approaches when engaging with international market mechanisms. In addition, there is resistance to the concept in both the private and the public sector which needs to be addressed.

Least developed countries have been especially underrepresented in global carbon markets. In East Africa, the lack of institutional capacity has impeded substantive participation. To change this and get the region Article 6-ready, six countries (Burundi, Ethiopia, Kenya, Rwanda, Tanzania and Uganda) have established the Eastern Africa Alliance on

Carbon Markets and Climate Finance as a platform to foster a regional approach to carbon markets and strengthen their capacities to access climate finance for NDC implementation and ambition raising.

APPROACH

The GCM project enables partner countries to build a carbon market architecture at the national and international level. It was originally launched in 2008 with the aim of supporting partner countries in using flexible mechanisms under the Kyoto Protocol and other types of market-based instruments on a national and regional scale. Since 2018, the GCM project, now in its fifth phase, has been focusing on novel forms of cooperation that may arise under Article 6 of the Paris Agreement, the voluntary carbon market and dedicated carbon pricing instruments. It helps partner countries to get Article 6-ready, enabling the public and private sectors to engage in this new generation of market-based mechanisms.

The project follows a threefold approach. Firstly, it supports the development and advancement of market-based climate policy instruments in close collaboration with partners. Secondly, it builds capacities, knowledge and skills among stakeholders from the public and private sectors to enable them to make the best use of existing instruments and increase readiness for a new generation of market mechanisms through workshops, training and high-level meetings. Thirdly, it increases the participation and visibility of partner country representatives in international conferences and negotiations.

In Uganda, the GCM project provides public sector decision-makers with policy advice on carbon market instruments and provides capacity building to the Ugandan private sector to increase market readiness. The GCM team, in collaboration with the United Nations Development Programme (UNDP), have merged support for Uganda's NDC and Long-Term, Low-Carbon Development Strategy (LTS) process in Uganda. It supported regional stakeholder consultations for the development of the LTS, reaching 450 different partners from government, the private sector and civil society.

In addition to providing national support, GCM promotes regional cooperation on carbon markets and climate finance in East Africa. To develop a wider regional impact, GCM, in collaboration with the United Nations Framework Convention on Climate Change (UNFCCC) Regional Collaboration Centre Kampala, supported Uganda and five other countries (Burundi, Ethiopia, Kenya, Rwanda and Tanzania) in establishing the Eastern Africa Alliance on Carbon Markets and Climate Finance in 2019.



Eastern Africa Alliance (EAA) negotiators workshop on Article 6 negotiations in preparation for COP25 in Dar es Salaam
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The Alliance has become the institutional basis for the effective participation of East African countries in the global carbon market and UNFCCC negotiations on market mechanisms and climate finance. It actively supports readiness for implementation of Article 6 of the Paris Agreement in East Africa and encourages other countries in the extended region to seek membership.

GCM is supporting the Alliance in building capacities through workshops, webinars and dialogue formats which have reached more than 2,000 public and private stakeholders. For example, it supported the Alliance in offering [tailored training on carbon taxes](#) for East African stakeholders and policy-makers in all seven of the Alliance's member countries and conducted [training on demystifying climate and carbon finance for Rwanda](#). GCM recently also developed a [handbook for Article 6 negotiators](#) and a [synthesis report](#) on the institutional and legal framework assessment in East Africa for Article 6 engagement.

Furthermore, the Eastern Africa Alliance on Carbon Markets and Climate Finance and the GCM project work collaboratively on improving access to climate finance to expand innovative technologies, such as renewable energy systems, and prevent a lock-in of fossil fuel infrastructure.

SUCCESS FACTORS FOR REPLICATION

THE PROJECT TEAM HAS IDENTIFIED THREE SUCCESS FACTORS FOR REPLICATION

1. Co-learning and joining forces through collaboration: In Uganda and East Africa, the GCM pro-



Eastern Africa Alliance (EAA) negotiators workshop on Article 6 negotiations in preparation for COP25 in Dar es Salaam
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ject has set up the Eastern Africa Alliance as a kind of 'carbon club' to develop capacities, achieve lower transaction costs and build institutional readiness at the regional level. Through intensive collaboration via the Alliance, countries with similar challenges and difficulties can learn from each other and join forces for carbon market participation. The formation of the Alliance has created synergies and an open channel of communication among the member states to discuss practical strategies for participation in carbon markets, for example, by taking part in pilot activities. Having adopted a similar model to the West Africa Alliance, the Eastern Africa Alliance can be replicated in other regions globally, tailored to the needs of each region.

2. Actively engaging private sector stakeholders:

The GCM project supports the private sector, with a focus on providing local enterprises with information about opportunities for the new generation of carbon markets under Article 6 of the Paris Agreement and access to carbon finance. This is done through annual stakeholder engagement activities with practical input from various experts in the region and globally. This

model is easily replicable in other projects by identifying relevant private sector stakeholders to be engaged.

3. Tailored technical support on carbon markets:

The GCM project provides regulatory bodies and ministries with technical advice on integrating carbon markets into national policy processes and on using the carbon market for financing and implementing measures to meet the national mitigation targets established in NDCs. The replication of such tailored support is highly feasible considering its great success in the East Africa region.

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WEST AFRICA

Enhancing access to climate finance and carbon markets in West Africa

PROJECT	West Africa Alliance on Carbon Markets and Climate Finance
GOAL	Strengthen the Article 6 implementation capacities of Alliance member countries and improve opportunities for their long-term participation in carbon markets and international climate finance
COUNTRIES	16 countries in West Africa
OVERALL TERM	August 2020 to July 2023
PARTNER INSTITUTION	AEE Power, AERA Group, Climate Focus, Perspectives Climate Group
IMPLEMENTING ORGANISATIONS	West African Development Bank (BOAD)
CONTACT	Lydia Ondraczek, lydia.ondraczek.extern@bmu.bund.de

GOAL

The West Africa Alliance on Carbon Markets and Climate Finance project aims to mobilise technical support for its member countries to strengthen their capacities in accessing international climate finance and participating in carbon markets under the Paris Agreement. With the creation of a subregional support and coordination framework, the Alliance aims to deepen cooperation in West Africa to enhance institutional capacities for implementing Article 6 of the Paris Agreement. It raises the visibility of its members and strengthens their voices in United Nations Framework Convention on Climate Change (UNFCCC) events. It helps member countries build a broader interagency buy-in to Article 6 mechanisms in a way that supports linkages between sectoral low-

carbon development strategies, carbon markets and climate finance. The Alliance is supported by the International Climate Initiative (IKI) of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) and implemented by the West African Development Bank (BOAD).

CHALLENGE

In the West African region, financing sustainable development is a major challenge. The ambition to achieve sustainable development and minimise the emission of greenhouse gases is laid out in the nationally determined contributions (NDCs) of West African countries. However, West African NDCs have a large funding gap, which is exacerbated by low institutional capacity for accessing international climate



Figure 1: Phase 1 of the Alliance project. Market mechanisms and NDC implementation (Hôtel Les Filaos, Saly, Senegal), 30 January 2018

and carbon finance. Additionally, the scale and pace of advances in carbon markets and climate finance opportunities in the region are insufficient.

Both the Kyoto Protocol and the Paris Agreement allow for international cooperation between countries to reduce emissions and mitigate climate change. While the West African region had relatively little success in participating in the Clean Development Mechanism (CDM) under the Kyoto Protocol, due to limited human resources and weak institutional infrastructure, West African countries intend to be well prepared to harness the benefits of Article 6 to finance mitigation activities and meet their NDC targets. However, using Article 6 will require them to enhance their domestic capacities and be proactive in identifying opportunities.

The lack of capacity in the area of carbon market mechanisms is likely to undermine the ability of member countries to authorise and account for internationally

Due to logistical challenges, including limited internet access owing in part to financial difficulties faced by members in paying for these services and poor connections, the participation of country focal points and other key Alliance members in the recently concluded 52nd UNFCCC Subsidiary Body for Implementation session was limited.

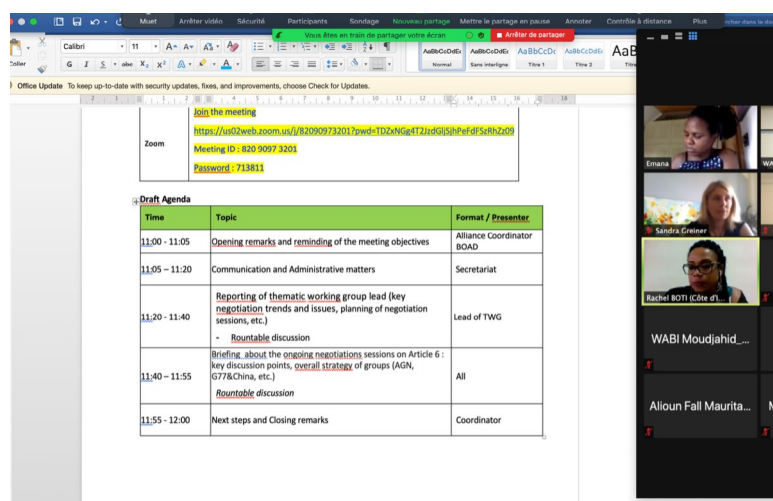


Figure 3: West Africa Alliance, Subsidiary Body (SB) 52, briefing meeting, 4 June 2021, with the coordinator of the East Africa Alliance

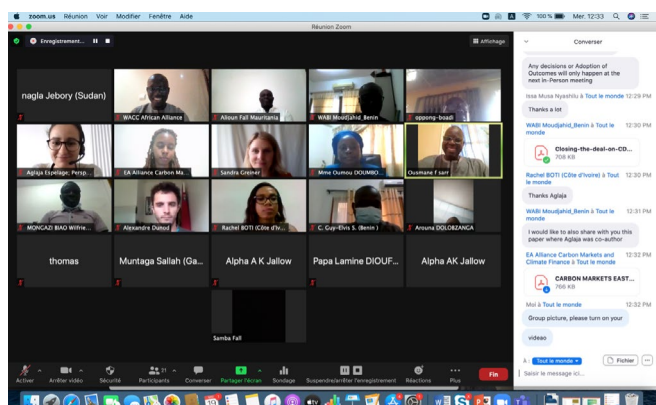


Figure 2: West Africa Alliance workshop – CDM transition, 19 May 2021

transferred mitigation outcomes (ITMOs). Under the Article 6 mechanism, countries have to ensure that authorised ITMOs do not impact the country's ability to achieve their own unconditional NDC pledges. This new responsibility under Article 6 places an additional burden on Alliance member countries and requires institutional capacities to be strengthened and relevant policy frameworks to be reviewed. It also requires member countries to improve and leverage capacities acquired under the CDM to participate in Article 6 cooperative market-based mechanisms.

Another challenge faced by Alliance member countries relating to carbon markets is weak stakeholder interaction at country level, particularly between the private and public sectors, project developers and civil society organisations. This has brought West African delegates to realise that these new market approaches require improvements in institutional coordination to promote synergies between intersectoral mitigation strategies to facilitate coordinated NDC implementation.

APPROACH

Since it officially started operating in September 2017, the Alliance has ambitiously engaged with carbon markets and climate finance using a cooperative model. The Alliance resulted from the initial idea of a handful of West African UNFCCC country delegates from Togo and Senegal at the 22nd Conference of the Parties (COP22) to kick-start a joint, subregional engagement with Article 6 mechanisms. This idea soon

advanced and evolved into a formal launch, which led to the accession of 15 Economic Community of West African States (ECOWAS) member countries plus Mauritania. Since then, the project has successfully

countries in Article 6 implementation. This includes the ITMO roundtables aimed at bringing together ITMO buyer and seller countries for discussions. It also complements peer-to-peer learning and the exchange of ideas and best practices through national virtual workshops.

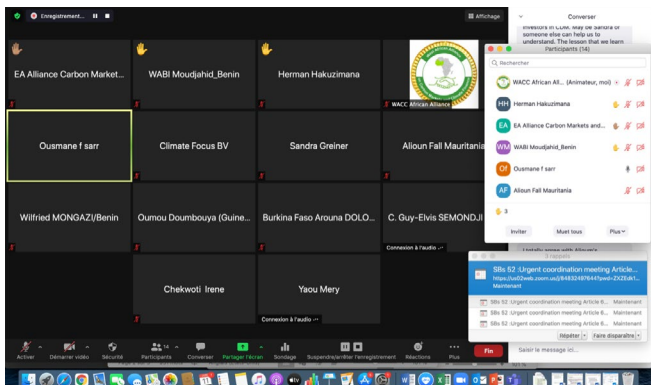


Figure 4: West Africa Alliance, SB 52, meetings 2021

established an operating structure in the subregion with a secretariat. The institutionalisation of the Alliance as a subregional structure helps sustain momentum on technical support required to address the four conceptual clusters of the Article 6 implementation process. It also encourages improvements in the knowledge and capacities of West African lead negotiators on relevant themes, such as carbon markets and pricing, transparency and technology transfer, which in turn leverages their unified positions in international negotiations.

Other approaches used by the Alliance include the promotion of partnerships between member countries and strategic stakeholders, such as financial institutions, project developers and policy-makers. The purpose of these partnerships is to galvanise private sector engagement in carbon markets and improve access to international climate finance.

Although the scope of its goal and membership make it an exclusively geographical functional platform, the Alliance's work and objective are shared and supported by a consortium of technical partners. Technical support is based on specific requests from members to ensure that it suits the country's needs and context. Elaborate technical assistance is now being provided to other member countries in the subregion in an attempt to institutionalise capacity support on Article 6 after the pilot projects with Togo and Nigeria.



Figure 5: Plenary session , Day 1, in-person meeting of the West Africa Alliance, Abuja, 14-17 September 2021

As the approach based on capacity strengthening is yielding positive results, the Alliance is now using other strategies to leverage opportunities for its member

The Alliance project has a strong replication potential. The experience of the Alliance can be used by other countries and subregions to create their own structures for engagement with carbon markets. The Alliance has already inspired the establishment of the Eastern Africa Alliance on Carbon Markets and Climate Finance. Additionally, countries in northern and southern Africa and in Latin America are considering similar initiatives. The project team has identified five essential success factors for replication:

SUCCESS FACTORS FOR REPLICATION

1. Need-driven support: The project is a member-driven, need-based and subregionally focused initiative. Technical capacity development and advisory support are provided both as generic and targeted activities. This gives all countries a similar opportunity to receive support to develop at least the most fundamental capacities needed to access carbon markets and climate finance. It also promotes more horizontal and participatory delivery than a top-down approach. The cooperative structure of the Alliance is linked to its modus operandi. It operates within its member countries and with other strategic regional institutions and stakeholders, for example, ECOWAS and the African Development Bank, making its work visible and strategically placed in the development agenda of sub-Saharan Africa.

2. Subregional embeddedness: The Alliance structure is embedded in the existing political and economic integration frameworks in the subregion, such as ECOWAS. It also cooperates closely with the African Development Bank in facilitating knowledge on carbon markets and climate finance. Its embeddedness in these strategic structures provides expanded opportunities for member countries to engage.

3. Institutional affiliation for legitimacy: The GCM project provides regulatory bodies and ministries with technical advice on integrating carbon markets into national policy processes and on using the carbon market for financing and implementing measures to meet the national mitigation targets established in

NDCs. The replication of such tailored support is highly feasible considering its great success in the East Africa region.

4. Reliability through permanent structures: The Alliance has established a permanent subregional secretariat structure in Dakar for knowledge management. It is in charge of strategic communications



Figure 6: Break-out session, Day 2, in-person meeting, Abuja, 14-17 September 2021, moderated by Nsikan-George Emana, Climate Focus

within the Alliance and between the Alliance and other strategic partner institutions.

5. Bi-weekly meetings: The Alliance has instituted a bi-weekly steering committee meeting to facilitate exchanges and updates. Important issues related to the implementation of Article 6 activities and matters of political significance are discussed at this meeting to ensure effective coordination. A management tool is used for the implementation of this activity.

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This project has been selected as a good practice by the GIZ project Policy dialogue and knowledge management on low-emission strategies (DIAPOL-CE).



REGIONAL

Using research results for efficient low-carbon policy-making

PROJECT	Policy dialogue and knowledge management on low-emission development strategies (DIAPOL-CE) / Supporting the implementation of the Tunisian Solar Plan (APST)
GOAL	Strengthen capacities for model design and scenario development for evidence-based climate and energy policy-making Carbon market, emissions trading
COUNTRIES	Tunisia and other countries in western Asia and Africa
OVERALL TERM	2017 to 2021 (APST), 2014 to 2022 (DIAPOL-CE)
PARTNER INSTITUTIONS	Tunisian Ministry of Industry, Mines and Energy, National Engineering School of Tunis (ENIT), Tunisian Electricity and Gas Company (STEG) and National Agency for Energy Conservation (ANME)
IMPLEMENTING ORGANISATIONS	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
CONTACT	Anita Richter, anita.richter@giz.de (DIAPOL-CE) Tanja Faller, tanja.faller@giz.de (APST)

GOAL

In order to assist policy-makers in building their energy and low-emission strategies on the best available knowledge, the project Policy dialogue and knowledge management on low-emission development strategies (DIAPOL-CE) aims to strengthen the link between decision-makers and academia in several countries in western Asia and Africa. It provides political partners with tools for conducting quantitative analyses to optimise development pathways and assess the expected

impacts of selected low-emission policy options, creating a sound basis for evidence-based decision-making in the process. It also gives researchers an opportunity to feed their expertise into strategy development processes and opens the field for a well-informed discussion of policy options and development paths with the broader public, thus enhancing transparency and accountability.

In Tunisia, DIAPOL-CE is continuing the work of the project Supporting the implementation of the Tunisian Solar Plan (APST), which ended in 2021. It assisted the country in implementing the Tunisian Solar Plan (PST), the country's official long-term strategy for increasing the share of renewables in the energy mix. APST was commissioned by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU), as part of the German International Climate Initiative (IKI), and implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.

CHALLENGE

Tunisia's energy deficit is increasing, and the country still relies heavily on fossil fuels, with 97 per cent of its electricity generated from natural gas and only 3 per cent from renewable energy. Consequently, the energy sector was responsible for more than half of Tunisia's total greenhouse gas (GHG) emissions in 2012. A diversification of the sources of electricity production is urgently required in Tunisia, both for environmental and economic reasons. The PST, the country's programme for renewable energy development, the current version of which was approved in 2015, envisages an increase in electricity production

from renewable energy to 30 per cent by 2030. The PST will contribute to meeting Tunisia's nationally determined contribution (NDC) pledge to lower GHG emissions by 41 per cent by 2030 and will also decrease the country's energy dependence and the financial burden of subsidies for conventional energy. To ensure the successful implementation of the PST, a number of crucial questions must be addressed. Can all the objectives of the PST be achieved simultaneously? In what way and at what cost? How does PST implementation influence electricity prices for the final consumer? And what are the broader economic and social consequences? Numerical models that simulate the functioning of the national economy or the energy system can help to find answers to such complex questions. Depending on the specific model, the scenarios generated provide example suggestions for cost-optimal development trajectories for the expansion of renewable energy or offer insights into the potential impact of different policy measures on economic, environmental and social variables. They are therefore an effective approach for finetuning climate and energy policy design.

APPROACH

With the aim of enabling the Tunisian government to base strategy development processes on quantitative research results, the APST project supported the creation of a consortium for energy economy modelling which includes the Tunisian Ministry of Industry, Mines and Energy, the National Agency for Energy Conservation (ANME), the energy utility STEG and the National Engineering School of Tunis (ENIT). All four parties signed a memorandum of understanding in autumn of 2020, formalising their commitment and clearly defining the rights and responsibilities of each partner institution. Together, the consortium members identified pressing research questions relevant to policy-making, the answers to which would be facilitated by the modelling efforts.

ENIT, as the representative of the scientific community, was in charge of model development and use.

To this end, APST provided a grant agreement for the creation of a research team involving experienced researchers and post-docs as well as PhD candidates and master's students. This approach ensures the training of future generations of modelling experts



Caption: Signature of the memorandum of understanding by the members of the consortium
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in the country. By also involving the Swedish KTH Royal Institute of Technology, APST made additional technical expertise available to build capacities for independent model and scenario development at ENIT and support the model development process.

In close cooperation with KTH, the research team at ENIT developed a set of national energy system models to assist Tunisian policy-makers in making strategic decisions. The tools are based on OSeMO-SYS, an open-source optimisation modelling framework for long-run integrated assessment and energy planning. In addition to these energy system models, a simple macroeconomic add-on module allows basic conclusions to be drawn on the job effects of selected renewable energy and energy efficiency measures. The research team carried out analyses focusing on different thematic aspects, such as self-supply of energy, power-to-X strategies and the integration of renewable energy sources into the system. To maintain quality assurance and alignment between the partners, critical modelling assumptions, required input data and preliminary results were frequently discussed with all members of the consortium. After revision and com-

pletion, the analyses were presented to the consortium and provided to decision-makers for further use in the policy-making process. The models developed through this collaboration are owned by ENIT and the rest of the consortium. Depending on current policy needs, they can therefore be adapted and advanced in the long term to answer pressing questions with the help of new scenarios.

Drawing on these models and scenarios, several research papers have been developed and submitted for publication in scientific journals. The preprints can be found online: integrated input-output and systems analysis modelling on energy technology input-output multipliers, systems model with input-output multipliers and scenario analysis of potential long-term impacts of COVID-19 on the Tunisian electricity sector.

Since the APST project ended in June 2021, the support to ENIT and the consortium has continued via the project DIAPOL-CE. A second grant agreement will allow the research team to further pursue the modelling work and produce quantitative analyses catering to the needs of Tunisian policy-makers.

DIAPOL-CE has been supporting the development and use of different types of models for low-carbon policy-making for several years already. The project activities include the creation of country-specific and open-source macroeconomic models to analyse the effects of selected energy and climate policy measures on the labour market and economic growth in Algeria, Rwanda and Uganda. Most recently, DIAPOL-CE has been preparing the development of a macroeconomic model for assessing the socioeconomic impacts of selected green transport strategies in Jordan, in cooperation with the Jordanian Ministry of Environment. The project also created and supports the Climate-Economy-Energy Modelling Network (CliEEN), a professional network for researchers from Africa and western Asia who work with mathematical models combining climate, energy and economic aspects.

MITIGATION POTENTIAL

While they do not directly contribute to reducing GHG emissions, model-based scenarios provide decision-makers with a sound knowledge base and enable them, for example, to find cost-effective development pathways that meet their climate goals or to better understand the expected impacts of a certain policy measure on the economy, people and the environment, depending on the specific context and tool at hand. They can therefore be used to design climate-friendly policies that are well-aligned with other policy objectives and prioritise measures that benefit people and the economy at the same time.



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SUCCESS FACTORS FOR REPLICATION

The potential to support modelling efforts for evidence-based energy and low-emission policy-making is significant, and the approach chosen for Tunisia can serve as a best practice example for other countries. The project team has identified four success factors for replication:

1. Closely involving all relevant institutions and their key experts in the model and scenario

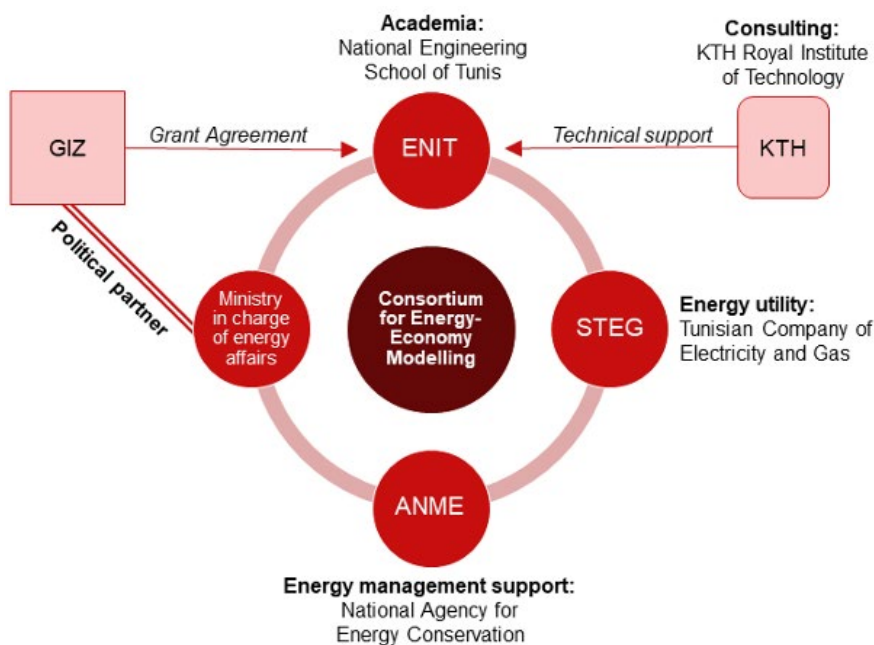
development process: Involving all stakeholders with an interest in the work from the start ensures national ownership and acceptance of the tools introduced and their results. It also raises awareness among political decision-makers about the underlying data and critical modelling assumptions, fostering technical discussions early on and facilitating approval.

2. Using open-source models: Making use of an open-source framework such as the OSeMOSYS modelling system increases transparency and allows all the stakeholders involved to both understand the mechanism of the model and the implicit and explicit modelling assumptions. Model users can independently modify and advance the model, as required by the evolving national context, increasing the sustainability of the efforts. Such models are therefore well-suited for the training of national experts in academia and beyond. Furthermore, researchers working with OSeMOSYS can seek additional support from an on-

line community of energy modellers, who actively discuss different model characteristics and provide support to overcome problems.

3. Critical size of the academic partner institution: The academic partner institution should have a minimum level of experience in working with modelling tools and be of a minimum size to help ensure the sustainability of the capacity development measures.

4. Careful steering of the consortium: Details matter in the development and use of models, and small changes in data and other assumptions can have a big effect on the results. The model design process is a therefore a politically sensitive endeavour, and clear, yet diplomatic, communication among the members of the consortium, especially between researchers and policy-makers, is crucial to ensuring trust and acceptance of the efforts of all the experts involved.



Caption: Creating a consortium for energy economy modelling in Tunisia © GIZ

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This project has been selected as a good practice by the GIZ project Policy dialogue and knowledge management on low-emission strategies (DIAPOL-CE).



JORDAN

Creating innovative instruments for carbon market readiness

PROJECT	Partnership for Market Readiness (PMR)
GOAL	Preparing and implementing innovative carbon market instruments for the development of a global carbon market
COUNTRY	Jordan
OVERALL TERM	2016 until 2020
PARTNER INSTITUTION	Jordanian Ministry of Environment and different line ministries
IMPLEMENTING ORGANISATION	World Bank Group
CONTACT	Harikumar Gadde, hgadde@worldbank.org Monali Ranade, mrnade@worldbank.org

GOAL

The Partnership for Market Readiness (PMR) is driving the development of a global carbon market as a cost-effective way to reduce GHG emissions through financial and technical support. It supports Jordan in preparing and implementing innovative carbon market instruments by piloting an integrated Monitoring, Reporting and Verification (MRV) framework in targeted sectors and developing the necessary technical capacity of public and private sector stakeholders. The Partnership is funded by the German Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety (BMU) as part of the German Climate Technology Initiative (IKI) along with 12 other contributing partners and implemented by the World Bank Group, which holds its Secretariat.

CHALLENGE

In recent years, Jordan has prioritized adaptation to climate change and mitigation of greenhouse gas emissions. As stated in the National Climate Change Policy and Sector Strategic Guidance Framework in 2013, Jordan seeks to achieve “a pro-active, climate risk-resilient Jordan, to remain with a low carbon but growing economy, with healthy, sustainable, resilient communities, sustainable water and agricultural resources, and thriving and productive ecosystems in the path towards sustainable development.” The countries’ Nationally Determined Contribution contains an emission reduction pledge of 1,5 percent versus a business-as-usual scenario in 2030, and 14 percent including international support.

Jordan has established a Climate Change Directorate (CCD) in 2009 to address climate change issues and establish appropriate policies. A lack of data and robust institutionalised MRV frameworks poses a barrier to enable an informed climate change policy design, implementation and evaluation. Within key ministries, there are insufficient technical, human, and financial resources to develop robust MRV Frameworks for tracking the GHG savings of mitigation activities and emission reductions.

Although Jordanian stakeholders strongly recognise the role of market mechanisms, the existing lack of GHG data and MRV frameworks as well as limited capacity also poses a major barrier to the introduction of market-based instrument suitable for Jordan.

In the private sector, project developers face financial, technical, and legal challenges. There is an insufficient pool of market actors capable of implementing renewable energy and energy efficiency projects. The market of energy service providers (ESPs) is small but growing. Financiers similarly face technical and legal challenges to providing financing. Access to finance is particularly poor for SMEs, hindering the growth of potential new players.

APPROACH

The Partnership for Market Readiness (PMR) was launched as a World Bank initiative at the climate talks in Cancún in 2010. It provides financial and technical support to developing, emerging and transitional countries on the development of carbon market instruments and serves as a dialogue forum to share experience between the countries. As a trust fund, the PMR also provides the financial means for the development, piloting and implementation of market instruments.

In 2020, the Partnership for Market Implementation (PMI) program was announced to provide countries with further support in implementing their domestic carbon pricing programmes designed under the PMR and facilitating their participation in the international carbon markets. The PMI was officially launched in February 2021.

Of the more than 30 countries participating in the PMR, 23 have prepared and endorsed final Market Readiness Proposals (MRPs) for the planning, design, and piloting of a carbon pricing instrument to reduce GHG emissions cost effectively. These MRPs list deficits of and measures for the development and implementation of carbon pricing instruments and build on comprehensive analysis and stakeholder consultation processes.

Jordan has formulated a MRP focussed on three target areas: renewable energy and energy efficiency,

water efficiency and wastewater management, and a city-wide GHG emission management in Amman. The PMR conducted analytical studies to identify potential market-based instruments, for example on energy efficiency and green building certification as a market opportunity in Jordan, on sectoral GHG baselines, mitigation potentials, policy options and market readiness. It also assisted the government of Jordan in piloting and fully implementing an integrated Monitoring, Reporting and Verification (MRV) framework for GHG emissions in the targeted sectors and a national web-based project registry to enhance the coordination and transparency of climate change related funding and projects.



MRV system launch workshop, 5th of Feb 2019

The multi-tier MRV framework housed at the Ministry of Environment, tracks GHG emissions and emission reductions at national, sectoral, ministry, and project levels and is expected to support a better understanding of the emissions profile and the emission reduction potential. It will facilitate access to different financing sources including carbon markets and

support the assessment of progress towards Jordan's commitments under the Paris Agreement. In addition, the PMR support for the Amman municipality is expected to help the city to achieve its 2050 carbon neutrality goal.



Training session on the MRV system for MEMR, NEPCO and EMRC at MEMR's Building

Private sector involvement has been fostered by strengthening the capacity of key stakeholders including financial institutions and SMEs working on energy efficiency and renewable energies. The PMR also helped implement a capacity-building plan, which combines practical and participative workshops, meetings for knowledge transfer during piloting activities, and study trips. Furthermore, the PMR supported the drafting and submission of the Climate Change Bylaw, which consolidates and encourages efforts of the Government of Jordan to pursue climate action and achieve the commitments under the Paris Agreement.

SUCCESS FACTORS FOR REPLICATION

The PMR project for Jordan can serve as a best practice example for other countries in the region and worldwide. The project team has identified five success factors for replication:

1. Relying on a strong champion: The Jordanian Ministry of Environment, despite multiple changes, remained committed to the project at the highest level and demonstrated ownership and leadership throughout project implementation. Participation in the PMR significantly enhanced their knowledge about MRV and the potential policy options available, as well as their capacity to implement carbon markets. In addition, the requirements under the Paris Agreement, mandates under relevant climate change policies and strong encouragement from different local and development partners enhanced the cooperation and engagement from the Ministry of Environment.

2. Building effective partnerships: The World Bank, including different global practices, International Finance Corporation (IFC), and the PMR Secretariat, along with various development partners in Jordan, agencies, industry associations, and multiple ministries provided strong technical assistance and support for project implementation. This partnership turned out to be highly effective arrangement for the successful implementation of the Program and with a potential to replicate this model.

3. Effective stakeholder engagement and capacity building: This is critical for confidence building, data collection and policy design. From the inception to the implementation of the project, the Ministry of

Environment engaged the relevant ministries, government agencies, the industry associations, and enterprises at every step, requested feedback from them, and made efforts to address their concerns. It also actively participated in PMR technical events and workshops, learned from other partners, shared experience, and adopted knowledge gained at the domestic level. Effective engagement of all stakeholders along with capacity building made it possible to collaborate willingly and enthusiastically in providing data, attending workshops and meeting, providing feedback, and training members of the different agencies. This is supported by the knowledge and experience sharing from PMR's global experience during the project design and implementation phases.

4. A flexible project design: PMR project design offered a needed flexibility and phasing of activities. Project design and project teams were able to adapt to changing circumstances and stay relevant and open to new scope of activities and policy instruments. This enabled the project to achieve its multiple objectives most effectively and enhanced Jordan's ability to get prepared for participation in carbon markets in the future by implementing additional activities necessary

for this to happen. Flexibility and adaptation capacity is key to support deviance in project outcomes.

5. Thinking big and creating replicable models:

Jordan developed, first-of-its-kind, multi-level MRV framework and a GHG National Registry system. The designs of both systems offer huge adaptability and scalability beyond the Jordan context. Currently, the MRV system is being offered to other World Bank clients. For example, Palestine is moving ahead with the establishment of an MRV system and Guinea is adapting the system for its own MRV process.



Training session on the MRV system for MWI, JVA and WAJ at MWI's Building

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