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# Cross border seminar: Accelerating energy retrofitting investments in Mediterranean university buildings

## Local workshop - Tunisia

### Workshop Report

**Date: 18<sup>th</sup> June 2021**

**Venue: Hotel Novotel, Avenue Mohamed V, Tunis, Tunisia**



Med-EcoSuRe



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## DISCLAIMER

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## Med-EcoSuRe Project

<b>Project Title</b>	Mediterranean University as Catalyst for Eco-Sustainable Renovation
<b>Project acronym</b>	Med-EcoSuRe
<b>Funding scheme</b>	European Union under the ENI CBC Mediterranean Sea Basin Programme 2014-2020
<b>Start date</b>	September 1st, 2019
<b>Duration</b>	36 months

Med-EcoSuRe is a project funded by the European Union, under the ENI CBC MED programme 2014-2020. The programme is managed by the Autonomous Region of Sardinia (Italy) and aims to promote cross-border cooperation in the Mediterranean region.

The main objective of the project is to propose and implement innovative and eco-sustainable energy renovation solutions for Mediterranean university buildings and introduce an active collaborating approach for decision support, among key actors involved, in the framework of a Living Laboratory: MED beX.Live (Live the eXperience of university building environment).

## Scope of the Event

In the framework of Med-EcoSuRe, a cross order seminar was organized with the aim to propose innovative financing schemes, business models, organizational structures and partnerships to accelerate the energy retrofitting of the university building stock in the Mediterranean.

The seminar included:

- **National workshops** organized to investigate opportunities, innovative tools and financing schemes in Tunisia, Palestine, Italy and Spain. These workshops targeted local and regional authorities, national energy agencies, ministries and fund managers, organisations providing training to cities and regions, banks and financing institutions.
- **A cross border conference** in which each partner of the project presented the outputs of the local workshops, with the aim to trigger a debate about local specificities on existing financing schemes and opportunities to accelerate the energy renovation of universities buildings.

This report summarizes the outputs of the local workshop organized in Tunisia on the 18<sup>th</sup> of June 2021, by the Mediterranean Renewable Energy Centre (MEDREC) and the National Engineering School of Tunis (ENIT).

## I. National context

The Tunisian energy system is not isolated from the global one and is today at a crossroads. Current universal energy production and consumption patterns trends are unsustainable for economic growth, social progress and environmental protection. Thus, a change of focus is needed worldwide, in particular, through the energy transition to ensure a low-carbon energy future.

The global transition towards low-energy socio-economic development is urgently needed, as recommended by the Paris climate agreement of December 12<sup>th</sup>, 2015, which was ratified by Tunisia on October 31<sup>st</sup>, 2016.

Today, the international community is challenged mainly by:

- An energy challenge which consists in ensuring energy security
- A climate challenge which consists in decarbonizing energy systems in order to limit the temperature increase to 1.5 degrees by 2050.

It is essential to change the patterns of energy consumption and production, and be engaged in a Sustainable Energy Transition that makes it possible to:

- Reduce economic vulnerability to energy prices;
- Ensure energy security;
- Improve economic competitiveness;
- Guarantee access to modern energy services at affordable prices;
- Reduce the concentration of greenhouse gas emissions.
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Regarding Tunisia, the energy landscape is marked by a continuous increase in energy demand in the face of natural resources depletion.

This results in a structural energy deficit of more than 45% currently and which will increase to probably reach 80% in 2030, if the current situation persists.

During the past few years, the buildings sector has experienced strong growth which has resulted in a notable increase in comfort needs, expressed in particular through the acquisition of heating and air conditioning equipments, by the tertiary sector as well as the residential sector.

This situation had an impact on the increase in the load curve of electricity demand in summer, which will imply additional investment needs by the Tunisian Company of Electricity and Gas (STEG) to deal with the growing demand for air conditioning in the building sector in Tunisia.

The building sector will become, by 2030, the first consumer of final energy, with 5,200 Ktep, if no strategy is put in place.

The Energy Efficiency of Buildings has become, over the years, a major concern of energy and climate policies. Many States are committed to improving the Energy Efficiency of their Buildings as part of national action plans.

The integration of renewable energies presents also an opportunity to construct high energy performance buildings or positive energy buildings, given the favorable local climate and the solar potential existing in Tunisia.

Aware of the future development of national resources and national energy consumption, the Tunisian state has created since 1985 a basic structure through the creation of the National Energy Management Agency (ANME) with the aim to set up a national strategy for energy management in Tunisia in the economic sectors and in particular the building sector.

Several activities have been identified in the building sector targeting the improvement of energy performance, the building envelope as well as the equipment used inside the building and the integration of renewable energies through the implementation of several financing mechanisms adapted to the development of each technology.

These funding mechanisms are implemented with the support of the National Fund for Energy Management (FNME) and funds from international technical cooperation.

The analysis of the evolution of the Tunisian energy system and the challenges it will face over the next two decades has highlighted the need for an effective management of national energy demand, particularly in the building sector, and for a greater integration of renewable energies in this sector to ensure sustainable development.

In order to accelerate the national energy management strategy, Tunisia has implemented a new energy transition strategy with a new Energy Transition Fund (FTE) including grants which are already provided by the former Fund, FNME, and which have been extended to other activities and other sectors and areas that were not eligible.

The expected results planned for the energy sector, by 2030, are

- Increasing electricity production from renewable sources to 30%
- Reducing energy demand by 30%.
- Lowering the carbon intensity across all sectors by 41%

In framework of the university's involvement in the process of implementing the national energy transition strategy in Tunisia, the role of scientific research consists in:

- Carrying out research and development resulting in a regulatory framework and technological solutions adapted to the Tunisian climatic, socio-cultural and economic context with the aim to guarantee the success of the national energy transition strategy.
- Leading by example in the implementation of the strategy, for the other economic sectors

It is against this background that the Euro-Mediterranean project Med-EcoSuRe was launched in 2019. It has the objective to demonstrate that the Mediterranean university could act as a catalyst for eco-sustainable renovation in the Mediterranean basin.

### **Med-EcoSuRe project**

The project offers an innovative approach to the definition and diffusion of cost-effective energy renovation within university buildings, with the perspective of extending results to the whole

public buildings sector in the long term. A Mediterranean cross-border living lab – bringing together researchers, building managers, companies, public organizations and students – will be established to develop energy efficiency and renewable energy solutions as well as retrofitting schemes to be implemented in 9 university buildings. The final aim behind the project is to turn university managers into active players contributing to the co-creation and experimentation of emerging ideas, breakthrough scenarios and innovative concepts.

This project is funded by the European Union within the framework of the ENI CBC MED programme for an overall budget of 2.9MEuros and with a duration of three years starting from September 2019.

The Tunisian partners selected for the implementation of this project in Tunisia are the Mediterranean Renewable Energies Centre (MEDREC) and the National Engineering School of Tunis (ENIT) - University of Tunis El Manar.

The expected outputs of the project are:

- 6 toolkits of passive solutions design for higher education buildings retrofitting
- 2 policy tools for energy efficiency retrofit in higher education buildings
- 6 cross-border strategic plans for university building retrofitting
- 6 energy audits performed in selected higher education institutions
- 9 energy efficiency retrofitting pilot actions
- 2 Technologies transfer for higher education retrofitting building

## II. Comprehensive baseline mapping study for the energy situation/use/consumption of the building sector in Tunisia

In order to properly adapt the energy transition strategy to the specificities of the building sector, a mapping study of this sector in Tunisia was conducted and co-financed by:

- KfW, covering public buildings in the governorates of Tunis;
- GIZ's PEEB project covering public buildings in governorates outside Tunis
- ESCWA, covering private buildings in the entire Tunisian territory

This study aims to assess the situation of the energy use in the building sector in Tunisia in order to develop the necessary tools for the effective implementation of large-scale programmes aimed at

- Improving the thermal performance of existing buildings;
- Making available devices and equipments with higher energy efficiency;
- Integrating renewable energies in buildings

This study must be regularly updated to be able to follow the evolution of the energy consumption in the building sector and enrich it with specific relevant indicators. This will allow

assessing the degree of success of the national energy transition strategy and if necessary readapt it in the case of certain economic sectors in order to be able to achieve the expected results.

### III. National funding programmes and mechanisms

#### 1. Energy Transition programme in Public Institutions (TEEP)

In order to get public institutions actively involved in the implementation of the national energy transition strategy, a specific programme has been set up which is co-financed by KfW and the National Agency for Energy Management (ANME) through the Energy Transition Fund (FTE).

The objective of the energy transition programme in public institutions (TEEP) is to contribute to the rationalization of the state's expenditure, the revitalization of the role of public institutions in the energy transition policy, participation in Tunisia's efforts in the fight against climate change and getting the state to lead by example to further disseminate the energy management approaches/strategies in other sectors.

This programme foresees the installation of electricity self-production systems from renewable energy sources in public buildings, in particular the ministries of health, education, higher education and of youth and sports.

The total cost of the programme is 195 MTD, including the resources of the government budget in the form of external loans, the contribution of the Energy Transition Fund (FTE), a donation from the German bank KfW and an in kind contribution from ANME. The implementation of the programme is based on two main actions:

- Implementation of energy efficiency measures in public establishments (efficient lighting, efficient air conditioning, centralized technical management, solar water heating, etc.). The budget allocated for the realization of this action is estimated at 55 MTD which will allow savings in primary energy consumption of 5,000 toe / year, an annual reduction in GHG emissions of 13,000 CO<sub>2</sub> and a reduction in the energy bill of 30%
- Installation of solar PV systems for self-production of electricity in public buildings connected to the low voltage and medium voltage grid. The budget allocated for the realization of this action is estimated at 140 MTD which will allow a self-production of 48 GWh / year of electricity, savings in primary energy consumption of 10,000 toe / year, an annual reduction in GHG emissions of 21,000 CO<sub>2</sub> and a 20% reduction in the energy bill.

The programme started in 2021 for and has a duration of four years. The year 2021 was dedicated to finalizing the preparatory phase for the effective start of the programme through the development of a procedure manual and various standard documents as well as information and awareness raising materials. This phase included also the implementation of pilot projects and launching the first calls for projects. The period 2022 - 2024 will be dedicated exclusively to the implementation of projects and the achievement of the programme objectives.

#### 2. Alliance of Towns for Energy Transition (ACTE)

A second ambitious programme, the Alliance of Towns for Energy Transition (ACTE), was launched by ANME in the framework of the Swiss cooperation through the State Secretariat for Economic Affairs (SECO) and the German cooperation, through GIZ's support programme for the promotion of energy efficiency in Tunisia (APEET).

The budget allocated by the Swiss cooperation for the implementation of this project is estimated at more than 11.3 MTD over 3 years (9 MTD donations financed by the State Secretariat for Economic Affairs SECO-Swiss Cooperation, and 2.3 MDT as a Tunisian contribution through the FTE).

The ACTE programme aims to strengthen the capacity of Tunisian municipalities to contribute, at their levels, to the national energy transition strategy, through the implementation of local energy strategies.

A national steering committee has been set up to ensure the implementation of the programme which includes:

- Ministry of Energy and Mines;
- Ministry of Environment;
- Local Government Loans and Support Fund (CPSCL);
- Center for Training and Support for Decentralization (CFAD).

This programme was launched in 1991 in Switzerland and reached 450 municipalities to cover a population of 4.5 million. It has been extended to Europe since 2003 to reach 8 countries on a permanent basis and 8 other countries as pilot projects covering a total population of 48 million people. At the international level and since 2012, this programme has reached 1,500 municipalities in 20 countries for a total population of 52 million people. In Tunisia, the programme has reached 14 municipalities for a population of 1.2 million people.

The areas of intervention of the ACTE programme are:

- Area No. 1: urban planning and construction (urban planning and building permits).
- Area N ° 2: municipal buildings and infrastructure (public lighting, green spaces and rolling stock).
- Area N ° 3: diversification of energy sources (energy production and distribution, waste recovery).
- Area No. 4: urban mobility
- Area N ° 5: organization management and governance (budget, human resources and public contracts).
- Area N ° 6: cooperation and communication (inter-administration cooperation, cooperation with other sectors and communication).

The project aims to introduce an adapted version of the European Energy Award (EEA) label in Tunisia, which encourages municipalities to develop an integrated energy policy with the aim to obtain a certification.

The certification process for municipalities is as follows:

- Membership of the municipalities in the ACTE programme.
- Recruitment of “relay expert” (main contact for the coordinator of the municipal energy team).
- Participatory diagnosis workshop (territorial): Energy audit of municipal assets.
- Energy planning workshop (territorial): Action plan linked to municipal assets.
- Support for setting up, accessing funding and carrying out projects: Internal evaluation workshop.
- External evaluation (ACTE-MEA / eea audit).
- Certification and official recognition.

The expected results of the ACTE programme are:

- 1) 350 municipalities of Tunisia able to carry out energy accounting of their water, electricity and fuel consumption through conducting energy audits on all the municipal assets in Tunisia
- 2) Building an efficient and motivated structure at the municipal level. Support the municipalities technically and financially for the implementation of their local strategies.
- 3) 10 selected pilot municipalities to start implementing their priority actions for the energy transition and are able and motivated to implement actions and share their experiences with their counterparts in Tunisia and in the MENA region.
- 4) Introduction of the ACTE / MEA label (variation of the European label eea ©) in Tunisia

### **3. Other cooperation projects**

Within the framework of the German cooperation, GIZ, which is a German international cooperation company operating in Tunisia on behalf of the German government, supports Tunisia, among other countries, to implement its energy transition strategy in the fields of renewable energies, energy efficiency and climate mitigation and adaptation

GIZ has been implementing programmes and projects in several areas, including the building sector:

#### **❖ Energy efficiency :**

- Support for the Promotion of Energy Efficiency "APEET" which aims at improving the conditions necessary for the promotion of Energy Efficiency services and technologies which will allow the rational use of energy in Tunisia.
- Global Energy Efficiency Programme in the building sector "PEEB" which aims at improving the conditions for the implementation of big scale projects in order to enhance the energy efficiency of buildings.

#### ❖ Renewable energies:

- Strengthening of the "RMS" solar market, which aims at targeting the growth of small and medium-sized photovoltaic installations' market, while respecting sustainability criteria.

#### ❖ Sectoral projects:

- NAMA Support Project "NSP" which aims at raising awareness among decision-makers, through which Tunisia's "NAMA Bâtiment" demonstrates that climate finance can effectively support transformation in the building sector, reduce GHG emissions and accelerate low carbon development.

#### ❖ Cross-cutting/cross functional projects/transversal projects

Support for the implementation of the "NDC" climate objectives, which aims at providing Tunisia with the necessary means to assess and communicate the progress of the implementation of its NDC and manage mitigation measures.

## IV. Policies promoting energy retrofitting investments in buildings

### 1. Energy Efficiency opportunities in the buildings sector

- The buildings sector represents 28% of primary energy needs (21% of final energy consumed) in the Arab region: CCG (Gulf Cooperation Council): 15%; Machrek: 29%; Maghreb: 18%; LDCs (Least developed country) in the Arab region: 15%;
- Building energy intensity in the Arab region growing;
- Growing demand for cooling needs: Increased energy consumption and peak demand;
- Potential in buildings, in the Arab region, to reduce energy consumption by over 30% by 2050;
- Strengthening Energy Efficiency can be a major factor in achieving INDCs (Intended Nationally Determined Contributions) and SDG 7 (Sustainable Development Goal 7);
- Policies and programmes must address the energy renovation of existing buildings as well as new buildings;
- Adequate financing instruments are needed to unlock investment flows

### 2. Barriers to financing Energy Efficiency in buildings

- Small size of projects;
- High transaction costs;
- Lack of a revenue stream - savings are not actually seen;
- Performance gap – real and perceived;
- Split incentives between landlords and tenants;
- Distributed decision making eg. in apartment blocks;

- Low energy costs;
- Lack of capacity within the finance sector.

### Specific barriers to financing Energy Efficiency in buildings in the MENA region

- Distorted energy prices;
- Public Sector Monopoly (costs associated with inefficiency are hidden);
- Energy efficiency policies still under development;
- Governance and enforcement issues;
- The choice of the lowest initial cost often results in poor energy performance in buildings and equipments;
- Priority to improving access to energy;
- Problems specific to conflict zones.

### 3. Main instruments and financing mechanisms dedicated to Energy Efficiency

Pourvoyeurs de capitaux	Intermédiaires financiers	Instruments de Capital	Outils de Mitigation des risques	Facilitateurs de transactions
Gouvernement	Banques	Dette	Mécanismes de paiement	Standardization
Banques multilatérales de développement (BMD)	Fonds dédiés d'EE	Quasi fonds propres	Contrats de performance	Aide au développement de projets
	Fournisseurs de dons	Fonds propres	Assurance	Unité de développement de projet
Investisseurs institutionnels		Dons	Guaranties	Cadre(s) de passation des marchés
Autres			Subordination	Super-ESCO
			Titrisation	Aggregation

*Figure. M. Mongi Bida , Juin 2021, Atelier de réflexion : Quels mécanismes de financement pour l'accélération de la rénovation énergétique des bâtiments publics en Tunisie ? les politiques à mettre en œuvre pour la promotion du financement de l'accélération de la rénovation énergétique des bâtiments*

## Conclusions and recommendations

1. The results of energy management policy studies, including the mapping study of the energy use situation in the buildings sector, carried out by the Economic and Social Commission for Western Asia (ESCWA) in around thirty Arab countries in West Asia and North Africa, are the following:

- There are now enough models in several countries to demonstrate that the acceleration of EE in buildings is possible.
- Blended finance models and mixed financing mechanisms can serve as models and build capacity within the financial sector.
- Local institutions are important (eg. Municipalities) and therefore a high level of stakeholder engagement is required.
- Capacity building within clients / supply chain / financial sector is a key action to be undertaken for the acceleration of EE in buildings.
- Standardization of procedures, contracts, etc. are needed to reduce transaction costs and risks.

2. It should be noted that, in Tunisia, the national energy transition strategy in general and particularly in the building sector is exemplary (Tunisia was ranked 20th internationally among 130 countries). This strategy and the financing schemes have evolved over time while facing challenges for the implementation of energy efficiency.

Initially, Tunisia set up an incentive regulatory framework through the National Energy Management Fund (FNME) which grants financial incentives for the implementation of energy management actions.

After evaluation, the incentives of this programme turned out to be insufficient to achieve very ambitious goals. Consequently, a new Energy Transition fund has been set up with more financial means which consists entails a complete financing mechanism including grants and supplemented by credits.

To date, the available means of the FTE remains insufficient to cover all the economic sectors planned actions. Hence, the need for additional financial means through international opportunities for funding, targeting the public sector as a priority, which must lead by example to support ANME in achieving its energy transition strategy.

Restructuring the ANME and strengthening its human resources and the capacities of the public sector are necessary to guarantee the success of the implementation of the national energy transition strategy with support of the funding agencies.

3. Identifying additional financial means, through international cooperation, is necessary to be able to cover the different areas of activities in the building sector as the energy load, the thermal comfort, and the indoor environment differs from one building type to another.

## Agenda

## Atelier de réflexion

### Quels mécanismes de financement pour l'accélération de la rénovation énergétique des bâtiments publics en Tunisie ?

Date : Vendredi 18 Juin 2021, à partir de 9h00,  
Lieu : Hôtel Novotel, Avenue Mohamed V

Modérateur : M. Mounir Bahri, Consultant Efficacité Énergétique - Energies Renouvelables

#### Programme

09:00 - 09:10	M. Hassen El Agrebi & M. Marco Polverari Directeurs du MEDREC Mot de bienvenue
09:10 - 09:30	M. Hassen El Agrebi Chargé de coopération à l'ANME - Directeur du MEDREC Aperçu sur le programme de transition énergétique dans le secteur public en Tunisie
09:30 - 09:45	M. Chiheb Bouden Professeur à l'ENIT Présentation du projet Med-EcoSuRe Rôle de l'ENIT dans l'accompagnement de la stratégie nationale de maîtrise de l'énergie
<b>Conférences</b>	
09:45 - 10:15	M. Oussema Nagati Chargé de Direction de l'Utilisation Rationnelle de l'Energie - DURE de l'ANME Programme « Alliance des Communes à la Transition Énergétique » (ACTE) Fonds de transition énergétique (FTE): Programmes/ Incitations dédiés au secteur du bâtiment
10:15 - 10:30	<b>Pause café</b>
10:30 - 11:00	M. Mohamed Zied Gannar Consultant UN-ESCWA Analyse de la situation de l'utilisation de l'énergie dans les bâtiments à usage d'enseignement supérieur en Tunisie
11:00 - 11:15	Mme Rym Nafti Responsable développement de compétences dans le domaine de la Maîtrise de l'Energie-GIZ Appui à la Promotion de l'Efficacité Énergétique en Tunisie (APEET) Programme globale d'efficacité énergétique dans le secteur du bâtiment (PEEB)
<b>Table Ronde</b>	
11:15 - 12:15	Avec la participation de M. Mongi Bida, Responsable des Affaires Economiques à l'ESCWA et Chef du Projet du Compte de l'ONU pour le Développement, sur le "Changement d'échelle de l'efficacité énergétique dans les secteurs résidentiel et tertiaire dans la région Arabe" <ul style="list-style-type: none"> <li>o Opportunités de partenariats, instruments et programmes de financement adaptés au contexte tunisien</li> <li>o Barrières au déploiement des actions de maîtrise de l'énergie dans le secteur public en Tunisie</li> <li>o Recommandations stratégiques: comment saisir les opportunités et surmonter les barrières pour accélérer la rénovation énergétique des bâtiments publics ?</li> </ul>
12:30 - 13:30	<b>Déjeuner</b>