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Mitigation Enabling Energy Transition in the MEDiterranean region
Together We Switch to Clean Energy

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meetMED PROFESSIONAL TRAINING ON ENERGY EFFICIENCY and RENEWABLE ENERGY SOURCES IN BUILDINGS

Training report
24-28 February 2020 – Tunis, Tunisia

On 24- 28 February 2020, the meetMED training on Energy Efficiency and Renewable Energy Sources in Buildings was hosted by the Tunisian National Agency for Energy Conservation (ANME) at the Laico Hotel in Tunis, Tunisia. This meetMED activity was jointly led by ANME and the Greek Centre for Renewable Energy and Energy Saving (CRES). This meetMED training consisted in capacity building activities for the participating agencies, which shared theoretical and practical instruments to include energy efficiency and renewable energy in buildings.

Mr. Fathi HANCHI, Director of the Energy Rational Use (ANME), Mr. Matteo BARRA, meetMED Project Manager, and Mr Hassen EL AGREBI, Head of the International Cooperation (ANME) and co-leader of this meetMED activity, warmly welcomed the participants to Tunis and opened the event by wishing all of them a fruitful and successful training. Mr. HANCHI underlined the importance of the security of energy supply, he mentioned the technological innovations spreading all over the world that result in significant changes for the energy sector, and finally highlighted the importance of a legal framework for the whole Mediterranean region. Mr. BARRA continued by illustrating the professional training activities in the meetMED Project and Mr. El AGREBI concluded the session by presenting the program of the training week.

Energy experts from different public institutions participated in the training, such as the Ministry of Energy and Mineral Resources (Jordan), the Moroccan Agency for Energy Efficiency (AMEE), the Tunisian Ministry of Electricity, the Regional Center for Renewable Energy and Energy Efficiency (RCREEE), the New and Renewable Energy Authority (NREA) and the National Energy Corporation (NECE) from Egypt, the Renewable Energy Authority of Libya (REAoL) and the General Electricity Company of Libya (GECOL), ANME, the Ministry of Equipment, Housing and Territorial Development (MEHAT) and the Ministry of Industry and Small and Medium sized Enterprises of Tunisia (MIPME), the Technical Center for Mechanical and Electrical Industries (CETIME), the Port de Rades and municipalities of Sidi Hassine and Rades (Tunisia), the Lebanese Energy Management and Environment Association (ALMEE), the Algerian National Agency for the Promotion and Rationalisation of Energy Use (APRUE), the Municipality of Amman (Jordan). Representatives from Clima-MED and from the EU Technical Assistance to Renewable Energy and Energy Efficiency Programme in Tunisia also contributed to the training with their experience on professional capacity building.

During the training, participants were provided with the necessary skills and knowledge to improve energy efficiency and renewable energy sources in buildings as well as acquiring the methodology required for the completion of green buildings equivalent to almost zero or zero energy and respecting the measures put in place for the success of this sector. One of the most important parts of the training course was the exchange of national experiences in the region

among the participants, especially with respect to planning and implementing EE and RE plans and related measures for buildings. Proven best practices for optimizing energy-intensive equipment and systems have been also presented and met the interest of the participants as they could be replicable in their own countries.

The topics analyzed during the seminar concerned initially general information on energy conservation and energy efficiency, energy management and energy audit. Subsequently, the seminar focused on the specific parameters of energy issues (building energy consumption - both electric and thermal, thermal comfort, energy efficiency energy management systems). Also the commercial, institutional, regulatory, technical, financial and fiscal frameworks for energy audit, thermal regulation, labelling for appliances, the national programs and actions for RES generation, cogeneration, and management were illustrated. Furthermore, EE solutions for the envelope and for thermal comfort of buildings as well as lighting systems, tools for energy auditing, energy performance assessment of equipment, and the implementation of EE measures through professional training were presented. The seminar concluded by focusing on more logistic issues, such as the economic analysis and project financing, measurement and verification (M&V) methods and demand side management programs.

Vivid discussions enabled the exchange of experiences and best practices among the participants, thus creating a fruitful collaborating environment. Among the concrete outcomes of these discussions, are:

- the need and wish of the participants for the creation of an online group/platform, where they could continue their exchange, mutual support and collaboration even after the end of the seminar/ project;
- the importance of proper training on energy efficiency and renewable energy as the number of experts and well-trained professionals would increase, thus resulting in more efficient buildings and real energy savings.

Conclusions:

Recommendations on the structure of a future training scheme on Energy Efficiency and RES in Buildings

- It is very important that the training be combined with exercises, which will allow participants to apply what they have learnt from such modules of the training, as this will help them to be more active and involved in the training.
- E-Learning could be a solution, especially if it results in reducing the costs to the minimum (i.e. having a webinar for the theoretical part and *in situ* practical lessons). However, it has been strongly underlined that face-to-face trainings work better for such topics (i.e. energy in buildings).
- It is a common feature that cooling building (through design and AC) could be a proxy for social progress and comfort.
- Energy agencies play a role in convincing citizens and decision makers on its added environmental/economic/social value.

- Local public authorities play an important role for the implementation and dissemination of RE and EE measures, and capacity building is especially needed to support and finance EE and RE projects.
- Improve the use of information and the ability to choose appropriate methods and tools to assess, plan, evaluate and decide on the best policies, measures and strategies in order to reduce the environmental vulnerability through the reinforcement of new efficient technologies.
- It is recommended to use new tools, setting targets and steering portfolios and financing activities towards lower carbon emitting and higher rated energy efficient buildings, which are a core pillar for achieving the necessary energy efficiency improvements to avoid dangerous climate outcomes.

Financing the trainings

- The importance of financing the training is crucial to encourage the attendance not only of public institutions but also private companies. In particular, funding is needed from investors in buildings, or with other financing instruments (programs). Otherwise, the lack of resources can create a great barrier for the professionals.
- The crucial need for investments entails also the use of funding available through different mechanism of international cooperation and the participation of the private sector in financing and implementing projects, especially centralized projects for RE electricity production.
- Companies should be encouraged and persuaded to support their employees to participate in energy efficiency and renewable energies training.

Legislation Issues and Framework

- The importance of setting sustainable rules and legal frameworks and detecting the costs not only for energy efficiency measures was thoroughly underlined.
- The legislative framework can accelerate the process for granting the certification to energy managers. However, this alone has not increased the number of people asking/ supporting the training, thus it is necessary to receive support from the industry/ companies.
- A legislative framework on urban planning and management of the external temperature is needed.

Key messages on regional cooperation

- It is important to prepare a regional guide, which illustrates tools for the implementation of EE and RES solutions in the building sector;
- The exchange (via website) of good practices for financing EE/RE projects has a strong potential for raising awareness and building the capacity needed to disseminate good solutions at the regional level.
- The importance of national expertise in terms of human capacity on energy efficiency issues was raised.
- Energy agencies such as the members of the MEDENER network play a key role in supporting policy implementation since the work at the intersection of policy and social targets groups in society. They are able to identify real life obstacles that are not identified at the legislative and regulatory level to suggest and implement appropriate support measures. Further regional

cooperation at the Mediterranean level can help address common challenges such as the rise of energy consumption from air conditioning and share lessons learnt from practical experiences to devise effective and appropriate policy support measures.

Key messages on measurement and monitoring tools

- The importance of measuring energy consumption as well as other factors influencing energy performances, related for example to weather conditions, in order to control main energy uses and to be able to identify needs for energy efficiency measures implementation.
- The importance of monitoring energy data for operational efficiency purposes (such as maintenance optimization), was also highlighted.
- In order to facilitate the identification of energy efficiency opportunities and to select the most appropriate efficiency intervention for each case, it is nowadays a well-known (but not always implemented) best practice to monitor and control energy data to extract meaningful information and value from them.
- Planning the right strategy will set out a detailed future action plan focusing on the measures that are needed to scale up building renovation activities and identifying priorities. ISO 50001 was a good example of setting a plan and monitoring measures for continuous improvement of energy efficiency. The participants expressed questions regarding the setting of priorities and appropriate objectives targets with respect to energy performance indicators.
- Verification of the energy savings is always an important area in terms of determining and presenting the real performance of a retrofit building project, for instance.
- Need for developing effective mechanisms for measuring, controlling and monitoring the policy measures related to building sector, which must be accompanied by the development of the necessary tools and formats. Training, development of advanced certification systems and smooth market adaptation to the technical requirements are essential prerequisites for the effective planning and implementation of policy measures.

Key messages on energy audits

- The energy audits are undertaken to assess energy use and propose measures that might be taken to reduce consumption and energy costs. The participants were keen to know if the “utility cost analysis” energy audit can be combined with the “standard type energy audit” for auditing a building. It was clear to them that the analysis of the energy bills from the various utility services will help auditors to identify peak demands and dominant charges. It is important to establish thorough communications between the auditor and the energy manager/building operator in order for the auditor to have a clearer view of the building operation and its systems. The participants wanted to know if there is a time frame for the communication between auditor and energy manager as well as for the execution of the energy audit itself. To this extend specific examples have been given to the participants based on specific criteria (availability of given energy data, size of the building, complexity of systems) that may affect the time limit of the energy audit.
- Essential issues of energy audits were presented, and the participants were interested in who is responsible for carrying out such activities as well as their qualifications (e.g. qualified engineers, based only on experience on energy audits, etc.)
- The validity of energy audits was also an area of interest. The participants were interested in the way/mechanisms that the government monitors the conduction of energy audits
- Regarding to funding mechanisms for buildings renovation, the key challenges include the selection of cost-effective applications, the simplification of existing procedures, the absence of incentives to implement efficient measures and technologies and the difficulty in financing projects through energy performance contracts (EnPC).

- As for the EPC itself, the participants were keen to know the time and cost involved in conducting the energy audit and issuing the EPC.

Key messages on policy tools and technical measures for sustainable buildings

- The importance of the effect of the building sector on the energy demand as well as on the production of energy.
- It is highlighted that both methods (method of reference values and method of reference building) of buildings' asset rating raised questions regarding its individual elements (of the building envelope) and their relationship with the minimum energy performance requirements. The concept of NZEB and the determination of the cost optimal minimum performance requirements for buildings major retrofits was also an area of great interest.
- The presented example of the effect of thickness insulation (d) with respect to thermal conductivity (λ) on thermal transmittance (U value) was also a point of interest for the participants. Also, questions have been asked about the range of values that the thermal conductivity (λ) can have.
- The development of the Smart Readiness Indicator (SRI) as stated in the revised EPBD 2018/844 and its development for modern buildings (may be combined with "smart cities") was also an issue of interest.
- The discussion on thermal comfort included examples of solar cooling for district systems; environmental design (with the use of local materials); absorption chillers connected to solar thermal production; Lebanese energy certification label for buildings has positive impact on the market.
- Renewable energy source variability is one of the challenges that are addressed by grid operators. Renewable energy can suddenly produce high energy or no energy at all. This variability will cause grid instability and cannot be mitigated with usual measures. Four newly measures can help to stable the grid. Demand Response, Energy Storage, Interconnection, Flexible generation.
- E-mobility is a technology will emerge transportation sector with electricity sector. It can help to integrate renewable energy on large and small scale. It can help also in integrating RES in buildings. New concept, your car as power plant, can make dramatic change on how electricity is generated and transferred all over the world.
- Distributed generation is spreading nowadays. From biogas plants, roof top solar plant, small wind turbines, and small battery storage. Combining different distributed generation sources can add up to form Micro-grid.
- Micro-grid consists of distributed generation, loads, storage, controller, and point of common coupling. Micro-grid can result in substantial savings and emissions cuts and in the same time provide high quality and reliable energy supply to critical loads.
- It is noted that the Micro-grids have several advantages, but it has likewise several disadvantages. For instance, interconnection standards need to be developed to ensure consistency.
- Grid operators face huge challenges to match supply and demand and make the electricity grid stable. These challenges have been increased with the advent of renewable energy, such as the recent power outage in England caused by one conventional and one wind turbine plant malfunctioning and stopped operating.
- In case of calamity or grid instability, the grid operators have three type of reserves they can use. Primary reserve, secondary reserve, and tertiary reserve. Using these reserves helped the grid to be stable and functioning well.
- Micro-grids have two operating modes: grid connected mode and island mode. It is worth noting that although the Micro-grids have several advantages, they have also several

disadvantages. For instance, interconnection standards need to be developed to ensure consistency.

Key messages on national best practices

➢ France

The French experience with policy implementation illustrates a combination of mandatory measures (minimum performance standards in building codes to push market actors) and incentives (ambitious performance labels that drive innovation and demonstrate the technical and economic feasibility of more ambitious legislative measures over time). The white certificate scheme is another example of a combination of mandatory energy savings targets imposed on energy suppliers with a flexible market system to support implementation.

➢ Tunisia

The Tunisian Law No. 12 of 11 May 2015 ("New Law") relating to power generated from renewable energy sources includes three production goals: self-consumption; the total and exclusive sale of electricity to the National Company of Electricity and Gas "STEG" to meet national consumption needs and export.

The Tunisian government has decided to reinforce its strategy in the renewable energy field due to the following factors:

- The establishment of a regulatory framework relating to power generated from renewable energy sources;
- The high renewable potential and geographical location of Tunisia;
- The maturity of key players in the photovoltaic sector: institutions, private company of photovoltaic systems installation and consumers;
- The global fall in costs of photovoltaic technology especially photovoltaic panels and inverters.

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