

## RENEP: Renewable Energy for Palestine



**Recipients:** PMSP • Palestinian Municipality Support Program

**Duration:** 20 months

**Partner:** Hebron Municipality Torino Municipality AI Engineering Province of Torino

**Description:** The RENEP project arose from the need to develop the energy sector in the city of Hebron, in Palestine, bringing know-how at local level and helping creating innovative entrepreneurship and new jobs in the market of renewable energy in the Middle East.

At the same time there is an interesting opportunity to demonstrate, through a real implementation, the advantages offered by new technologies that can be also exported in other Middle East countries.

Starting from Energy, the City of Hebron aims at an effective integration of all utilities (energy, water, telecommunications), creating smart ICT infrastructures for e-governance, attracting external investors and enabling funding by international organizations.

The project allows therefore the development of a "smart grid approach" consisting of an experimental production of energy from renewable sources (with special focus on PhotoVoltaic • PV panel) that is optimized in economic and environmental terms. The role of energy storage capacity will be also thoroughly investigated.

International donors may be interested in being involved in order to fund project implementation, since the experience made in Hebron can be at the basis of further activities in the Middle East.

The main project activities can be summarized as:

**Data collection:** Through a strict cooperation with HEPCo (Hebron Electrical Power Company) and site visits, specific information on the grid and currently installed RES plants will be collected. The process will help to better identify the buildings that will be part of the project pilot site

**Legislative framework analysis.** In cooperation with the Palestinian Energy Authority, information regarding the current legislative framework will be collected, to understand which actions can be done. On the basis of pilot site results, suggestions to improve regulations can be defined.

**Building of pilot site.** Technical and organizational criteria on building and installation of generation systems from renewable sources will be defined. New and existing plants will be connected to each other and managed through a Virtual Power Plant approach, in order to build a site able to attract foreign companies to test innovative products and solutions in the smart grid and smart city context. The pilot site will be designed accordingly to an approach replicable in other Middle-East areas

**Preparation of TOR and tender documents.** Following the pilot site results and proper software simulations, technical criteria to define Term of Reference (TOR) and tender documents will be prepared, in order to install RES plants in the remaining territory of Hebron.

**Training.** Training activities on local personnel will be carried out, with reference to integrated energy management and renewable sources technologies, in order to create local qualified expertise and promote new business opportunities in the renewable energy field.

**Objectives:** The strategic objective is to enable an effective Energy Governance Capacity by the City of Hebron, improving environmental quality of the metropolitan area, increasing energy availability to citizens and creating new qualified jobs related to "smart technology".

The specific objectives that RENEP aims to achieve are:

- to demonstrate at technical, scientific and entrepreneurial level that a "smart energy policy" is possible for Hebron and Palestine;
- to identify a suitable test site, where a living demonstrator can be built;
- to collect reliable data on existing energy facilities and to define a sustainable action plan for renewable energies, smart grids and smart cities;
- to analyze and give advice on the legislation in renewable energies and the tariff system
- to define sustainable business model and energy policy for the City of Hebron and for the Governorate;
- to train local trainers and local people;
- to enable a strategic vision able to create new qualified jobs;
- to prepare tender documents and Terms of Reference (TOR) in order to implement this "smart energy approach" to the entire Hebron area

**Methods:** Analysis of the existing infrastructure in the Municipality of Hebron (RES existing power plants, energy distribution network, control systems), also through site visits

Modeling and simulation of the integrated system through a Virtual Power Plant approach

Definition of integrated energy management policies, including possible actions to improve building energy efficiency

Analysis of the possible energy accumulation systems that could be installed on the territory

Definition of sustainable business models to attract foreign investors and create new business opportunities.

- Skills:**
- Energy systems analysis (storage systems, mechanisms of distributed generation, distribution networks)
  - Control systems security
  - Simulation of complex systems
  - Economic evaluations of possible system optimizations

**Innovative content:** Through the integrated analysis of the energy generation systems, the Municipality of Hebron will enhance its capability to produce clean energy, reducing the need of conventional energy sources. The study will be carried on following a Virtual Power Plant approach that will allow the Municipality of Hebron to become a pilot site where innovative solutions in the smart energy management field can be tested on real data. Moreover, the applied approach will be designed in a way that can be replicated in other Palestinian urban areas or Middle East countries.

In addition, RENEP is not only a mere research project, but it is strongly business-oriented, as one of the main goals is to promote the creation of local expertise and to pave the way for innovative business opportunities for installation and management of energy technologies. Such approach is highly innovative compared with current initiatives in the area, which are mainly based on subsidiarity.

**Results:** The expected results of the project are:

Photovoltaic building roofs as a distributed generation for smart cities. The installation of photovoltaic systems on Hebron's roofs can become part of the City urban planning strategies; at the same time can offer new opportunities for qualified jobs in installation, management and maintenance.

Building of a Demonstrative Pilot Site based upon photovoltaic panels above some mayor Hebron buildings, in order to better show the potentialities of adopting a smart grid approach in energy management

Business models to attract investors to build city e-infrastructures: financial analyses will be carried out in order to define a suitable business plan for Hebron Municipality.

Empowering energy independence and self governance by a smart use of renewable energy sources in urban contexts and by training tools, courses and materials for a selected group of Hebron's young technicians with special reference to the installation and management of solar panels and their connection with the Smart Grid



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Creation of a living context where energy storage, energy production and data transmission technologies can be effectively tested.

