Eilat Solar

Award Scheme	**Guangzhou Award**
Sustainable Development Goals	**Goal 11 - Make cities and human settlements inclusive, safe, resilient and sustainable**

Summary

The program deals with the development of a smart system to lower electricity costs for the residents of the city by using solar PV. There are two main barriers which the system answers in the process of installing PV systems on private homes: understanding the financial benefits and project costs, technological understanding and analysis of the specifications.

Background and Objective

Eilat Solar help the residents to understand the PV production potential from each roof-top in the city and making the data accessible for each resident about its own house. This is done by using advanced remote sensing methods as well as education. Residents that enroll to the system receive the aerial photograph of his specific roof top together with initial planning of the system and the financial feasibility. The software recognizes and presents automatically the residents roof-top from an aerial photograph as well as the potential of the production taking into consideration shading and facing. the city also assimilated a list of contractors that passed the city technical and financial specifications, as well as funding opportunities, form various banks in the city. BACKGROUND INFORMATION The Municipality of Eilat is working towards energy independence and helping residents reduce the cost of living. The application will help lower the electricity costs of city residents, hotels, malls and commercial buildings. No other authority's involvement is required for the project except the cooperation with theEngineering Department in the municipality under the supreme supervision of the Mayor and Deputy Mayor. https://www.youtube.com/watch?v=JIkdM_SXgP0 ORIGINS Today it is possible to obtain a fixed income for about 25 years by installing solar panels with a nice yield of over 15%. Despite this, most property owners in Israel and around the world do not install solar systems on most roofs. The main reason is a lack of understanding of the processes, necessary permits, tariffs, and technology. The following development project offers ONE-STOP-SHOP, which will enable residents of cities and towns worldwide and particularly in Israel, to install PV systems in a simple and fast manner way without getting up from the chair. The problem that the program is solving is the complexity of obtaining data, permits and installing solar systems on rooftops of condominiums, private homes, and commercial buildings. By using a smart system to identify the potential and provide a bundle for all the processes, it is possible to shorten and simplify the construction of private, common and commercial roofs in cities in Israel and abroad. The purpose of the project is to develop a smart system/application to encourage residents of Israel and later on a worldwide scale, to install solar panels on rooftops of private homes, condominiums, public buildings and commercial buildings. Goal (Stage) 1: Access to Information and the Engineering Data will help property owners examine the feasibility of the construction. The access to this information is built-in the smart system and so, demonstrates the technological feasibility of constructing photovoltaic facilities on rooftops in cities. The system will display the relevant roof by means of aerial photographs, with a preview of the design on display. This screen will also present the economic data of the property and the economic feasibility of its establishment. Goal (Stage) 2: Suppliers/Contractors Database - The Municipality will develop an Internet system that will be updated in real time in relation to price offers which can be received from contractors for the construction of private and commercial roofs. The system will present a contractors list and their quotes, in order to compare between the installation costs and the expected manufactured kilowatts. The access to the information presented in the contractors/suppliers database will help the property owners to receive attractive price offers. This will create a competition in the market which will promote prices reduction. Goal (Stage) 3: Assistance in obtaining financing - The system will operate simultaneously description of financing entities as described in the subject of suppliers. The goal is to simplify the processes and create urban acquisition groups while helping the financing bodies to close deals quickly and simply. Goal (Stage) 4: Monitoring, Improvements, and Distribution - The municipality will continue to monitor and measure the success of the project in order to improve the processes and systems and to encourage the continuation of the regulations in the city. That will assist to cover as many available roofs as possible. Further to the project, the municipality intends to assist other authorities in similar processes. No other authority's involvement is required for the project except the cooperation with the Engineering Department in the municipality under the supreme supervision of the Mayor and Deputy Mayor. In this project, Eilat cooperates with Sol-View, which was previously supported by the Capital Nature Fund. Sol-View's system enables the solar potential to be obtained from roofs of private homes based on aerial photography. The project uses some of the developments that have been done until this day, and further potential developments that will be applied in the future. The expected outcome is to expand the system to shared homes, public buildings and commercial buildings such as schools, apartment buildings, hotels, malls and more. Sol-View is a subcontractor in this project. Eilat municipality started this initiative as a"free of charge"service for its residents. The sources of financing are divided into two parts: A source of self-financing to build the application and to start the process. Eilat is negotiating the deployment of the application to several other cities in Israel and licanse the app. In the first stage, the municipality has invested approximately 200k Euros in order to build the applicatio and by that to start the process and initiate the work with households in Eilat. Along the first steps of the operation, the municipality continue to invest against expected

revenues for selling the app to other cities in israel and abroad. Details of the resources available to the bidder, including professional manpower and equipment: The Municipality of Eilat has decided to invest an initial sum of 200 thousand euros to prepare the infrastructure of the plan. There are additional amounts in consideration, those will be invested according to the planned schedule. The project's business plan is based on selling the licanse of the app to other local authorities in Israel. another finance scheme Eilat is investigating its to charge 6% overhead from the suppliers who will actually carry out the installation, which will help the municipality cover construction and operating costs and will allow continued improvement of the system. The manpower supporting the process, although not officially registered in the budget section, includes the office of Deputy Mayor, the GIS department, the Environment Unit, the Engineering Department and more.

Outcomes and Impacts

Expected benefits from the success of the program: Installation of private roofs in the city Installation on 1,000 roofs = 7.5 megawatts (about 4,500 private roofs in the city): Improving the value of the houses, reducing emissions and introducing the system to other authorities. Offsetting municipal electricity bills By installing the systems on public buildings it is possible to lower the authority's electricity payment by approximately 60%: The proposed technology enables the receipt of the estimates and plans for tenders in a quick and simple manner and can be implemented within a few months. Reduction of payments to residents An average house with a roof of 130 square meters can generate an annual income of over 13,000 NIS per year and cover the payments of electricity bills at 100%: The technology enables the execution of the installation quickly and qualitatively while receiving attractive price quotes both forinstallation and for financing. The technology works in private and shared homes and allows shortening and simplifying the processes. Payments reduction for businesses By installing on 600 square meters of a hotel rooftop (or other business), you can generate an annual income of more than 60 thousand NIS and return the system initial investment cost within a few years: Hotels, malls and shopping centers in Eilat are struggling to maintain the tourist's contentment and to reduce the operating expenses at the same time. The installation of solar rooftops can make a significant change to their business and create a stable and secure income from the property. The technology enables offsetting the electricity bills, and the development will enable the business owners to make an informed decision regarding the investment. A national advantage for the entire country Thanks to this innovative application, it will be possible to reach all the authorities in Israel and to implant it in their systems. Eilat will be willing to cooperate with other cities in order to assist and support the moves: With the completion of development and demonstration, it will be possible to implement the system in other local and international authorities in a simple and rapid way. Shortening schedules for the construction of roofs Today, the procedure of setting up a solar system on rooftops in Israel is long and somewhat complex, due to the individuated conduction with suppliers and financing entities. In addition, the bureaucratic processes with the authorities make the process more difficult. We expect that after the installation of the application the process will take only 3 to 6 months starting from the date of approval of the supplier's quotation to the starting date of electricity generation. Indicators: The number of subscriptions to the software, done by the engineering company. Actual PPA agreements approved in the city, done by the Israeli Electric Company. Actual contracts signed and systems connected, done by the contractor and by the Israeli Electric Company. Reduced electricity costs, by the residents. Achieve energy independence in Eilat, assessment by the Israeli Electric Company. Eilat-Solar provides new data for the city leadership as well as to the residents of the city. The data for the city is a detailed"heat-map"that shows the PV production potential from roofs in the city, this allows the city to help its residents to lower electricity costs. The data for the residents consist of specific details on the resident roof and financial feasibility of PV. Allowing residents to access the data helps them to understand how to use their assets to achieve a better life quality, reduce GHG emissions and improve the city public spaces. Also, the public involvement in the project helps achieve the goals of the projects, recruit more residents to use the program and thus reduce the prices offered to the residents. The city of Eilat has been recognized as a leading city in the field ofenergy. The city of Eilat received the highest commendation as a leading city inthe field of energy, in a competition of Green Authorities at the CleanTechConference 2016. Thanks to the wide deployment of solar energy systems, among otherthings, it is possible now to prepare for transformation into a city whichdoes not use energy from fossil fuels during the daytime. Energywise, saving and acting efficiently within the framework of"SmartCity", Eilat and Eilot Region (the region next to Eilat) aspire to achieveenergy independence by 2020, transforming Eilat into an energy importer and aninternational center for research and development. As of today, Eilat and theneighboring Eilot region have 9 solar fields covering an area of more than1,500 dunams (370 Acers). These lead to 75% self-production of electricity perday. To date, 160 megawatts out of 400 megawatts of clean electricity have beeninstalled and approved for production. The Eilat-Eilot Renewable EnergyAdministration, established by the Municipality of Eilat and the RegionalCouncil, leads the field. In Eilat, private institutions and homes promoterenewable energy with tens of thousands of square meters of solar panels onrooftops.

Innovative Initiative

The initiative should be considered Revolutionary for the reason it is combining several elements that have not been complexed before, all under the main goal- energy efficiency (Solar). Technological development and innovation are expressed in several ways: Continued development of the system for the purpose of assimilating the overall system to support shared homes Continued development of the system for the purpose of assimilating the overall system to support commercial properties (malls, hotels, etc.). Continued development of the system for its suitability for work in Israel. Continued development of the system for the purpose of assimilating the overall system to support the roofs of public buildings. Construction of a bundle that includes suppliers' databases, a pool of financing entities, and open access to the local licensing process. The system will be the first in the world to provide full support to residents of the authorities for the construction of private solar roofs at low cost and in short time periods. As a first step to examine

the practicability, technological feasibility, establishment potential, economic and business feasibility, a number of tests were carried out over the past six months: Meetings were held with solar companies to produce estimates and verify costs and potential production. A preliminary mapping of the roofs of the city was conducted to examine the potential for producing solar energy from private homes rooftops in Eilat. A meeting was held with the Housing Culture Association in Eilat to examine the feasibility of setting solar panels on rooftops of condominiums. An economic model was developed for feasibility, and sensitivity tests were performed (attached). A preliminary mapping of the possible public roofs in the city was conducted. The main conclusion of the tests and the meetings: There is a high feasibility for project implementation and continued development. There is a high interest by a large number of condominium committees and many private homeowners in setting up the system but have difficulty to manage it by themselves. Therefore, the application will provide a suitable management solution for those who seek an installation of a solar system. During the programming and operation of Eilat-Solar, one of the obstacles it's updating the database on a regular basis. Since there is a constant change in households ownership in the city, there is a constant need to update the database so any new homeowner will be able to receive the actual data on his/her home. currently, we are updating it manually but we are working on finding ways to do it automatically. Because of miss-conception regarding the financial benefits of PV, many residents show at first resistance to the program but after experiencing with it and seeing the actual feasibility, they recognize the advantages and its simple UI. Because of changes in the local PV market, there is a lack of contractors that install PV systems in Israel, this leads to higher prices and low competition. We expect this issue to resolve in the coming year because of a new regulation regarding the FIT of households PV systems.

Conclusion

The innovative application can contribute to many other cities in Israel and worldwide. There is a large number of municipalities and settlements in areas rich with sunlight, that can use the prototype of this application. Since it is based on a digital infrastructure, it is easy to implant it almost anywhere. Eilat, as an international point of interest (tourist wise), is very open for new interactions in the national and international spectrum in all fields: energy, environment, tourism etc. RELEVANCE TO SUSTAINABLE DEVELOPMENT GOALS Goal 3: Ensure healthy lives and promote well-being for all ages Goal 7: Ensure access to affordable, reliable, sustainable and modern energy for all Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable Target 1: Access for all to adequate, safe and affordable housing and basic services and upgrade slums Target 3: Participatory, integrated and sustainable human settlement planning and management Target 4: Safeguard cultural and natural heritage Target 6: Improve air quality and manage municipal and other wastes Target 8: Support positive economic, social and environmental links between urban, peri-urban and rural areas Target 9: Improving resource efficiency, mitigation and adaptation to climate change, resilience to disasters and implement holistic disaster risk management Target 10: Support least developed countries in building sustainable and resilient buildings utilizing local materials Goal 12: Ensure sustainable consumption and production patterns Goal 13: Take urgent action to combat climate change and its impacts Goal 16: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions for all Goal 17: Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development.