Solar Energy — putting power back into the hands of ordinary Gazans

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New residential rooftop solar system in Gaza
Photo: Engineer Hussein Al-Nabih

"We have electricity for two hours every 24 hours," says a high-ranking energy official in Gaza.

Up to just 10 years ago, Gaza enjoyed full, round-the-clock electricity supply 24 hours a day. But by 2016, this was reduced to 12 hours per day due to severe power shortages — and the situation has declined rapidly since.

Gaza typically imports 120 Megawatts (MW) of power from Israel and 20MW from Egypt, while generating 60MW domestically at the Gaza Power Plant (GPP). Together, this supply is only enough to meet half of Gaza's power demand, resulting in the rationing of electricity in which eight hours of power supply is followed by eight hours of power cuts.

To make matters worse, recent political disagreements have led to the shut-down of GPP due to increased fuel costs, and a 30% reduction of electricity imports from Israel. In the sweltering heat of

summer, this reduced supply covers only a small fraction of overall demand, resulting in only two hours of electricity per day. For a population blocked on one side by land and on the other by sea, this is a severe blow to the already miserable quality of life.

In addition, the electricity infrastructure is extremely vulnerable due to frequent armed conflict in Gaza. During the 2014 conflict, GPP and numerous power lines from Israel and Egypt were damaged, leaving hundreds of thousands of people, as well as critical facilities such as hospitals, without power.

With few options and a bleak outlook, Gazans have searched for alternatives, looking to take power back into their own hands. In particular, there has been a strong, widespread effort to increase solar system installations. The international community has also jumped onboard. Between 2012 and 2014, 300 Kilowatts of solar rooftop installations were provided by donors. But post-2014 this increased more than 10-fold to over 3,500 Kilowatts.

Rooftop solar systems are becoming popular for supporting critical infrastructure. Many intensive care, neonatal and surgical departments of hospitals have adopted hybrid solar systems, which switch between the grid, solar system, a backup generator and a battery bank to ensure 24/7 electricity supply for life saving activities. Water and sewage networks are also increasingly looking at options for integrating solar power.

For the past four years, the UN has delivered emergency fuel supply for generators of over 150 critical facilities in Gaza including hospitals and public water and sewage facilities. According to the Office for the Coordination of Humanitarian Affairs (OCHA), the cost of this emergency fuel typically comes to approximately US$ 6 million per year. But with GPP shut down since April this year, generators have had to run longer hours, requiring additional emergency fuel supply. The resulting price tag for emergency fuel has crept upwards of US$ 10 million per year. Seeing no end in sight, donors are increasingly looking for more sustainable alternatives.

As of May 2017, approximately 310 Kilowatts of rooftop solar systems had been, or were in the process of being installed on rooftops of health facilities in Gaza. According to the Gaza Ministry of Health (MOH) and the World Health Organization (WHO), a total of 1MW (1,000 Kilowatts) of additional rooftop solar generation could be installed at 34 critical units within 10 hospitals in Gaza. The price tag would be approximately US$ 4 million dollars. To put that in perspective, fuel supply to the same facilities at current prices would cost US$ 1 million every year indefinitely.

Solar systems are becoming wildly popular for residential and business consumers, as well, although few can afford to pay the full upfront cost in one installment. The Gaza Electricity Distribution Company (GEDCO)’s new innovative solar program sells solar systems to residential and business consumers with payment in monthly installments over 18-24 months, making the systems more affordable to the average consumer. All payments made by consumers in the program go into a revolving fund that is used to install more systems on more people’s roofs. The US$ 1 million program, fully funded by GEDCO’s own funds, sold out in record time.

For an embattled company such as GEDCO, this is an opportunity to improve their services and customer relations by providing additional power — independent of political uncertainties. In addition, the program helps strengthen utility performance by encouraging good payment behavior through the monthly installments.

Following the same business model, with additional modifications and streamlining, the World Bank is teaming up with GEDCO and the Palestinian Energy Authority (PEA) to launch a pilot US$ 2.5 million program, funded by the Bank and the Partners In Development Multi-Donor Trust Fund, to install 1MW of rooftop solar systems for up to 1000 consumers. The pilot project is designed to be rapidly scalable and plans call for the mobilization of the private sector in subsequent phases of the project.

A new study by the World Bank, titled 'Securing Energy for Development (SED) in West Bank and Gaza,' states that over 150MW of solar energy could be generated in Gaza. To put that in perspective, GPP has a maximum generation capacity of 140MW; however, it rarely operates above 60MW due to the high cost of diesel fuel.

Although rooftop solar will not quench the greater energy thirst of Gaza, with peak demand forecasted to reach 900MW by 2030 according to the SED study, solar energy will go a long way in increasing daily power supply. At the same time it will help ensure life-saving health treatments, link telecommunication systems, improve water supply, bring adequate sewage treatment, enable business development, and most importantly, ensure consumers remain connected to electricity even if a sub-section of the grid is damaged during armed conflict. Overall, adoption of solar energy should be maximized — to not only improve quality of life, but put power back into the hands of ordinary Gazans.