

The Design of Smart Power Distribution Network Using New Energy Resources and Iran Electricity Market Considerations

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As we can see the title of this paper, it may seem as common survey which is about using solar energy by solar panels. Of course, this response is part of the complete response to this question, but it's not the full answer. The main difference between this study and the similar one, as described in the description, in short, is " In short, "smart decision making by the system to provide energy for the building complex through solar panels, power grids or electric vehicles Given the online prices of electricity in the electricity market. " In other side, the output of this research is a smart microgrid that can be used as a pioneer of distribution networks in the future. In this regard, and based on the necessity of providing a scientific and practical solution, after much research on the existing smart home system and the mutual needs of customers and power distribution companies in Iran, it was decided to perform this research with aimed to design a smart grid and as responsive load to the Electricity Market". So that its output results can be used as a pilot for the practical example of the concept of intelligence and the use of solar energy. This is a serious concept as the Demand Response in the intelligence of the electricity grids, which based on this concept, the output of this research is responsive to the electricity market prices. In the current study, it is assumed that to provide energy for an office building, it requires 15 kilowatts of electricity (without intelligence), and it requires 7 smart coolers cool gas coolers for refrigeration needs, and 12 heating radiators equipped with electric valves for heating, as well as electric curtains for lighting daylight. The source of energy needed for the smart grid and accountable to the electricity market is ed a combination of solar energy and power grids. The main focus of the study is that the system will decide, smartly and on the basis of instantaneous prices in the electricity market, whether to connect the load to the

solar system or, in off-peak electricity usage time in the market, receive energy the global network and store it in batteries, and in on-peak electricity usage time, connect the load to a solar system or battery bank or sell electricity stored in batteries or an electric vehicle to the network. The components of this research are as follows, including solar panels, solar inverters connected to the network, bilateral solar inverter, AMI dual-sided power meters, static energy storage vehicle as an electric vehicle, internal building management systems, Power distribution network, heat and light sensors, battery bank, solar lifts and related software. In addition, all interactions and the flow path of building energy in various pillars above can be displayed on a screen online. Furthermore, in the present study, the remnant of the roof and alongside the solar panels can be transformed into a beautiful roof garden in order to increase the attractiveness and value to the environment. The most important challenge in this study is to set up inverter systems to respond to the electricity market and coordinate the internal energy management system (BMS) with each other. **Keywords: Smart Power Distribution Network, New Energy Resources, Iran Electricity Market**

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