Solar photovoltaic (PV) system with battery backup for a residential building in Saudi Arabia

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Throughout the whole world, there are isolated areas where access to an electricity grid is too expensive. Diesel generators have been widely used for a long time because of the low initial cost but at the same time, they have high running and maintenance cost. As a matter of fact, the diesel generator has many impact factors towards the environment such as producing of CO_2 gas. Therefore, to avoid environmental pollution, global warming and ozone layer damage renewable energy sources are the appropriate alternative sources. With all renewable energy sources such as wind, solar and geothermal, solar photovoltaic energy is primarily used because of its clean, pollution-free and inexhaustible nature. In the Middle East, especially in Saudi Arabia, the hot outdoor climate induces a necessity for cooling inside the buildings. Particularly, the solar radiations are significant throughout the whole year. Using air conditioning is very common in Saudi Arabia and sometimes overused, leading to high peak loads for the electricity grid. Hence, the idea is to use the energy from the solar radiations to run the appliances and air conditioning system to reduce the peak demand on the electrical grid. In addition, when using solar panels, it is preferable to immediately use the solar energy than to keep it for later. Therefore, as to avoid using much electricity from the grid at night to run the chillers, the idea is to produce and store during the day by having the battery backup system.

Biography

Belqasem Aljafari has completed his MS from Northern Illinois University School of Engineering. He is pursuing his PhD degree from School of Engineering.

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