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Fuzzy Logic Controlled System For Utilization Of Renewable Energy Sources Of Industry And Home Aplliances

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Abstract

The per capita of power in India is insufficient compared to other developed countries in the world. Hence, the only way is the optimal utilization of available energy sources but the difference between production and consumption of electrical energy, during summer is very high, due to large utilization of cooling machines like Air conditioner, Air coolers in such case a software industry, like BPO call center or any office with large server and many systems need to have a 24 hours working Air conditioner. This leads to huge power consumption. Conservative measures need to be initiated and implement to decrease this gap to restrain this situation the concert of DSM has begun in power system planning and management. Therefore this paper included Fuzzy logic applied to Ac which results to calculate the actual hourly turn off period and reduction in energy consumption. By the optimal consumption of electrical power results increase saving by reducing the electricity bill and reduce the over load on live grid during peak hours and also calculate the cost of savings and playback period for the return of investment. In this paper, solar energy is used to run air conditioner. The cost of saving and playback period is calculated by considering only photo voltaic (PV) and photo voltaic with fuzzy controller, Results proved that usage of PV with fuzzy controller has better annual savings and lower pay back period compared with only considering PV.

Introduction

Electrical energy is a necessary element for the improvement of a nation. To meet the emergent electrical energy demand, all types of power generating plants are being installed. Due to growing concern like global warming, volatility of oil price, vanishing fossil fuels and energy security the public interest have increased in clean and sustainable energy sources. Renewable energy is a one of the best cost effective solution for new grid connected capacity in areas with good resources. Renewable energy technologies are getting economical, through technological change and through the benefits of mass production and market competition. As the cost of renewable power falls, the scope of economically practical applications increases.

As this trend continuous, utility companies may inevitably adopt a real time pricing strategy, where customers will pay more for electrical power they use during high demand periods and less during low demand periods. As new model (direct load control) based on fuzzy logic techniques, which shows saving in electrical energy consumption and playback period. Air conditioning system in residential buildings can be monitored and controlled by fuzzy system. For BMS and other systems, energy consumption of air conditioners at

different set points can be managed. Some of the research scholars proposed neutral inverse optimal controller for air conditioning system. For distribution system cost benefit analysis was carried out for different domestic loads.

This paper describes fuzzy logic controller based on DSM strategy, to increase the average turn off period of an air conditioner per day. For the optimal consumption of electrical power results increase saving by reducing the electricity bill and reduce the over load on live grid during peak hours. Calculate the cost of savings and payback period for the return of investment. In this paper, solar energy is used to run air conditioner. The cost of saving ad payback period is calculated by considering only PV and PV with fuzzy controller.

Renewable Energy source

Due to advance technologies and increasing size of RES, which play a considerable and relevant phenomenon in power system, there is as yet no universal agreement on the definition of DGs. current definition of DG is assorted and range from 1 kw PV installation, 1 MW engine generators to 1000 MW offshore wind farms or more. A few of the popular DG technologies are photovoltaic (PV) system, wind turbines and fuel cells.

Photo voltaic

The fundamental unit of PV is a cell that may be round in shape or square, made of doped silicon crystal. Cells are connected to form a module or panel and modules are connected to form an array to generate the required power. cells absorb solar energy from the sunlight , where the light photons force cell electrons to flow, and convert it to dc electricity. Practically, each cell provides 2-4 A according to its size with an output voltage of 0.5v. Normally an array, cells connected in series, provides 12v to charge batteries.

DSM techniques

DSM, also known as energy demand management or demand side response (DSR) is the curtailing of the client's energy demand by numerous strategies, including behavioral changes (through awareness) and financial benefits. The objective of DSM is to inhibit consumers from depleting less energy during the peak time frame or from shifting the energy use to an off-peak time frame such as weekends or nighttime. This does not necessarily reduce overall energy usage. On the contrary, it focuses on reducing the need for investing in power plants or network excessively for meeting the optimal demands, for example, conserving the energy storage during off peak hours and discharge it during peak hours. The latest strategy of DSM to overcome power consumption is to assist the grid operators in stsssabilizing intermittent generation from solar and wind sources, especially when the amount and timing of energy demand do not coincide with the renewable energy production.

Fuzzy logic theory

Fuzzy set theory is also known as fuzzy logic which is a method based on "degree of truth" rather than the usual binary "true or false" (i.e. ,the 1 or 0 Boolean logic) of a thing or system.

Conclusion

we have seen the large difference between production and consumption of electrical energy, during the summer season we required more power because of air cooling, fan, air conditioner etc. these paper leads to more power consumption. So in this paper solar energy is used to run the air conditioner. As compare to other power supply solar use is very helpful for us. Because it is very cheap and reliable.

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