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Renewable Energy Resources: Case Studies

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Retraction

Retraction: Renewable Energy Resources: Case Studies (*IOP Conf. Ser.: Mater. Sci. Eng.* **1145** 012026)

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This article (and all articles in the proceedings volume relating to the same conference) has been retracted by IOP Publishing following an extensive investigation in line with the COPE guidelines. This investigation has uncovered evidence of systematic manipulation of the publication process and considerable citation manipulation.

IOP Publishing respectfully requests that readers consider all work within this volume potentially unreliable, as the volume has not been through a credible peer review process.

IOP Publishing regrets that our usual quality checks did not identify these issues before publication, and have since put additional measures in place to try to prevent these issues from reoccurring. IOP Publishing wishes to credit anonymous whistleblowers and the Problematic Paper Screener [1] for bringing some of the above issues to our attention, prompting us to investigate further.

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Renewable Energy Resources: Case Studies

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Abstract. The energy need is the only demand which wouldn't have seen negative trend since the origin of this universe. Its requirement keeps demanding the usage of energy, during this urge people around globe working with many energy production techniques. Amongst most of them act as a resource including fossil fuel, coal and others are polluting vicinity to larger extend. The other alternative is renewable energy resources (RERs) which quite natural gift to the mankind owing to its vicinity aiding resource. The energy harvesting by utilising these RERs also have limitation that, can't provide huge in quantity due to many reasons including seasonal, inadequate equipment, larger storage so on and so forth. The focus herein is that, by considering its limitations to which extend it can be utilised. It is obvious that production industries require enormous quantity of power, therein it may not be utilised as such. So, the house as well as small industries whose power requirement is minimum thereby this RERs can be effectively utilised. That is considered as a primary factor for consolidating of this survey in the form of various test cases.

Keywords: RER Case study; RER for House

1. Introduction

1.1. Power generation - Decentralized

The planet is heading through energy production and saving. The impediment for energy with both energy production and saving. In almost all of instances, this is being depleted by several ways. Is the industry which is the one wasting the resources? The response may be slightly true, now most of the industries by some management concepts they have minimized it. To conflicting, overall energy loss requires in homes and residential buildings. In several apartments' effective utilization is 365 days a year X 24 hours a day X 7 days a week. The scenario is considered herein, wherever feasible the clean power can be substituted. Some of these scenarios are integrated for future conservation of electricity. This one in turn should save world in broader perspective. Many of them seem to be including, the numerous testimonials are examined linked to usage of electricity in village areas, impacts of decentralised energy production, hybrid clean renewable energy grid to satisfy domestic needs, to brighten up village lives including off-grid energy production and job prospects for local youth, and so on, which are tailored with the help of different technology like LINDO, VIPOR, HOMER, HYPORA, and so on [1-5].

1.2. Prosumer-based energy management

The architecture for such a 2-stage optimization procedure for optimum scheduling of smart home (RERs - renewable energy resources) and storage incorporation with prosumer-based energy regulation. During the 1st-stage of optimization, the optimum sizing issue of in-house RERs and storage is discussed with the aim function of RERs and storage of the life cycle cost is completely limiting. In the second stage, the smart home regular energy activity issue is formulated using multiobject home energy management (MOHEM) [6].

1.3. Home Energy Management Systems (HEMS)

The explanation for evaluating a society as a single energy consumption system is that a community at large consolidated energy production or utilization is far more consistent compared to a household power usage unit, even as arbitrary activity of independent power users has very little effect also on community total power usage mode. Thus, app roaching an entire population as just a single unit would enhance the predictability of overall power usage, as statistical information is much more accurate and consistent in representing the population 's exact electricity needs. More significantly, coping towards a community's request is further realistic in the resource conservation framework than coping with private homes' demands. [7-9]. The following images reveals the proposed system. Figure 1 shows the Home power management.

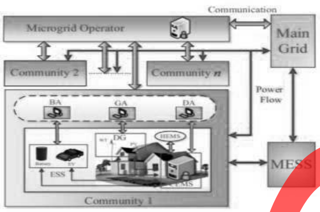

Figure 1. Home power management

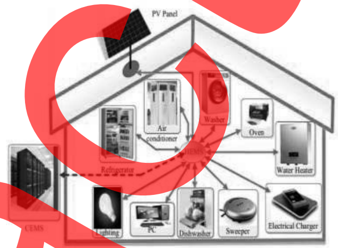

Figure 2. HEMS outline and linking

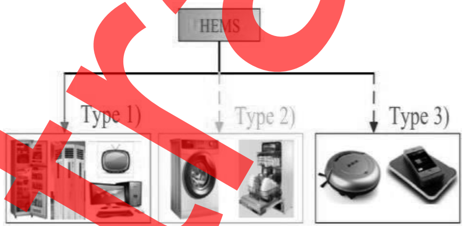

Figure 3. HEMS regulator

With introduction of technological advancements in the area of sustainable energy and storage, growing number of buildings are being fitted via renewable energy sources (RES) and energy storage systems (ESS) to minimize home power consumption price. Figure 2 shows the HEMS outline and linking. These households typically have HEMS to monitor and plan each electrical unit. Numerous studies were performed on HEMS and efficiency algorithms for power expense and peak-to-average ratio (PAR) mitigation. Figure 3 shows the HEMS regulator. Even so, many of papers offer an enough study on the usage of main grid 's electricity and selling electricity [10-13]. Figure 4 shows the HEMS architecture.

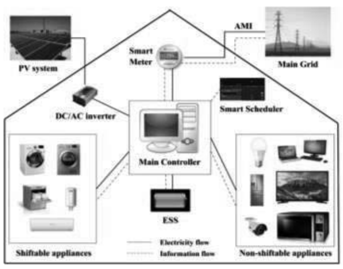

Figure 4. HEMS architecture

1.4 Smart building

Thomas et al. presented a design for efficient process of an Energy Management System in a residential home with the help of RERs, battery energy storage (BES) method, as well as Plugin Electric Vehicles (PHEVs) under static and dynamic techniques. The issue was fixed with CPLEX optimization method herein [14,15]. Figure 5 shows the Configuration of smart building EMS. Figure 6 shows the hardware design.

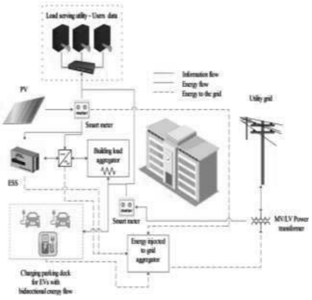

Figure 5. Configuration of smart building EMS

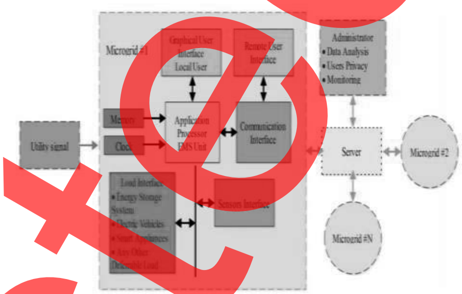

Figure 6. hardware design

1.5 Demand Side Management (DSM)

Implementing proper energy conservation strategies and using RERs improve future grid systems' energy stability and security. This research suggested a framework for residential energy management comprising of microgrid structure and DSM - Demand Side Management method. To decrease peak load, peak to average, and energy cost, loads of residences were moved dependent on price-based tariff including such adjustable and moment-of-use tariffs. Renewable energy incorporation with DSM can become a fruitful solution to reducing households' overall power costs by paying very little for buying electricity and exporting the excess power to the grid. The latest investigation tends to reduce financial expenses of residential electricity use among moving loads to periods with smaller electricity costs and using renewable energy. A domestic load management framework was suggested dependent on cost-based demand response and RER integration. Computation and scenario were performed in various households to evaluate the efficiency of the suggested framework under versatile and billing practices by utilizing BPSO algorithm through MATLAB. [16-18].

1.6 Vehicle to home

Electric vehicle (EV) has been one of the potential ways to fix emissions and environmental warming [19,20]. EV also utilizes on-board energy storage device for power to run the motor. The super capacitors and lithium-ion battery are typical refillable modules on the EVs [21]. Fuel cell electric vehicle (FCEV) is often known as EVs. The FCEV is driven by hydrogen, along with its on-board motor utilizes fuel cells. The Hybrid EV incorporates both rechargeable storage device as well as fuel cell energy [22]. Perhaps one EV's good features should be to perform as vehicle-to -grid (V2G) [23]. In this process, the EV can indeed be disposed to transfer energy to its grid. The V2G process helps EVs can provide peak load and diminishes the energy costs. The V2 G may indeed charge and discharge renewable energy surplus to smooth intermittent renewables. Under uncertainty, certain vehicles may be the right backup power source [24]. Vehicle-to-home (V2H) would be the same as V2G. In V2H, the EV is attached to the house, and the property owner optimises its charging as well as discharge regime. V2H will provide residential energy requirements when energy costs like peakhours. After emergency events, V2H can act as battery backup resource [25]. V2H could be a potential solution for improving energy savings in home energy management (HEMS) [26]. HEMS is a model that handles residential energy consumption [27] by different techniques such as process optimization [28], energy device to store [29] and renewable deployment [30], and demand-based response programs [31]. HEMS may be operated on grid-connected premises or removed from the electricity network, i.e., NZEB - Net Zero Energy Building. HEMS frequently uses different renewables including wind, sun energy, hydro, power cell [19]. It also operates various Energy Storage Systems (ESSs) [32], capacitor, heat and ice storage systems [33]. Resilience and self-healing are the latest principles of building energy management [34]. In recent times, the problems facing electrical grid systems are substantially different from that of a decade earlier. As a consequence, electronic components developed novel concepts like resilience [35] and self-healing [36]. More so than ever, a robust network that can withstand hazardous incidents and disruptions like cyber threats and adverse weather is important. At same time, unit's operation is drastically different by integrating emerging technology such as renewable energy, ESSs, and demand response programmes. Resilience is described as "the ability to anticipate, plan and adjust to changing conditions and recover quickly from disturbances [37]. Resilience in power grids and networks has been already established and several app roaches are being suggested to enhance resilience such as grid reconfiguration [38], power storage integration and decentralized source of energy use [39]. Self-healing is channel's way to recognise and detach failures and reorganise the network to mitigate consumers. Multi-agent optimization is among the popular solutions for self-healing network [40]. Many electrical grid controller actions in electrical systems include stress and pressure accompanying unusual high-impact (HR) events. Consequently, a detailed image of network status is vital. As a consequence, an adequate framework is required to define the model's various states and draw informed choices from a resilience-oriented perspective [41]. Renewable technologies are among the successful solutions that meet device resilience criteria. To model a robust microgrid, stochastic programming will model natural disasters [30]. Microgrid facilities will boost network reliability to tackle daily outages [42]. Hasan Mehrjerdi et. al., presents a novel version for HEMS like demand response programme, electric car, diesel generator and wind turbine. The aim is to reduce regular operating value of the construction. The EV functions on V2H and this can provide the peak load of both the house. The power generation software designs a deflectable load and gets involved throughout the energy efficiency system. The diesel generating system and V2H act as backup supp ly for both the house. The statistical modelling increases the stability of the structure during deficiencies and incidents like power production or wind system outage. [43].

1.7 Hybrid Microgrids

The hybrid AC / DC smart grid is regarded as rising loads in energy systems. I n this research, it has been shown that the hybrid AC / DC smart grid is constructed in the customer's home with certain RES (e.g., solar energy, wind energy) to remain competitive. Strom production and utilization undergo a major transition. One tendency is to incorporate smart grids with increasing capacity of renewable energies into the distribution channel. [44]. At device level, energy consumption is designed to maintain balance of power within different circumstances of production and demand. Coordinated management of integrated smart grids with RERs also demonstrates the efficacy of this methodology to provide continuous services to customers through different controller designs. Proposed control MPP T technique is often implemented for both solar cells and wind turbines to obtain full power from either the hybrid energy storage system. [45].

1.8 Smart home energy management system (SHEMS)

Current SHEMS is inherently vulnerable to cyber-attack, so it needs robust cyber-attack strategies. Currently SHEMS situation can lead to increased charging and discharge cycles degrading battery capacity. Consequently, request planning formulations must also compensate for the impact of battery discharge costs alongside user convenience. The present work aims to devise a detailed scheduling issue in terms of minimising electricity prices, given battery depletion costs. This study also suggests a cyber-attack resilient scheduling scheme. This article discusses the impact of request scheduling on battery life and energy costs. Furthermore, False Data Injection Attack (FDIA) was designed by utilizing machine learning [46].

1.9 Stochastic renewable energy resources

Renewable energy and transportation modernisation are becoming critical components of current and future delivery planning. Even after the momentum of environmental and economic benefits, the complexity presents challenges. It introduces an interconnected growth planning system refers to a multi-objective variational mixed-integer programme. The goal is to reduce the current value of expenditures including feeder distribution, substation changes and building, while optimising the usage of suggested charging points. [47].

1.10 AI in renewable energy home system
This study constructs a feasibility analysis to describe the energy efficiency house issue and house automation system deployment. Consequently, the options were extensively examined to decide the critical things required for this kind of work. Energy efficiency may play a prominent part in lowering electrical costs, and Smart Energy House's extension enabled it much more special and difficult to introduce. In addition, the suggestions were analysed and clearly argued to reduce the temperature effect and minimise the effect in the source of power by regulating the linked load further into device. A basic working capital modelling was completed, and that was clear that the system becomes viable to incorporate, along with all material costs and placing the board operating costs. Could not only this work play a significant role in sustainable house with automation framework. The Levelized power cost became determined according to output by the system's overall initial investment [48-51].

1.11 Integrated GWSS – (grey wolf with shark smell) algorithms
This research explores the impact of microgrid (MG) sensitive load integration. 3 scenarios were evaluated for detailed description of the issues. Outcomes indicated that better the degree of smart load infiltration will affect system reliability, voltage variance, and load waveform. This analysis also introduces a mixture of GWSS algorithms to optimise fitness function within multiple boundaries restrictions, and the suggested technique does have a high consistency to global minimum. An updated 33-bus MG involves wind, PV and energy storage systems. Using hybrid GWSS integration, the impacts of green energy and energy storage integration were also studied. [52-56].

1.12 Renewable energy integration
Renewables also rose to prominence owing to conservation and less effects on the environment. With rising power consumption and replenishing carbon fuels, emphasis was placed towards creating eco - friendly energy solutions as well as widening the utilization of renewable energy. Energy integration solutions, which would satisfy energy requirements in varied forms, are deemed a viable solution to rising the use of RERs and improving production performance. In recent times, integrated power and heat solutions are being linked to energy performance and fewer impact on the environment. [57,58].

1.13 Geopolitical Perspective
This analysis examined the importance of clean energy in forming resource protection amid world economic, societal, and technical uncertainty. At first, the evolving definition of resource preservation even during 20th and initial 21st centuries being explored. Parameters, features and indicators of energy security being tested, except 4A definition of energy security comprising availability; financial affordability; socio-political ease of access; and ecological app ropriateness. [59].

1.14 Modelling and simulation
This study demonstrates trying to model and simulating a renewable power smart-grid structure. It developed with the aid of a wind turbine (WT) installed on a dual-fed generator (DFIG), a PV, a fuel cell (FC) generating system, a hydrogen reservoir, a long-term storage of water electrolyser as well as a short-term storage system. These authors propose a strategy for global regulation and total energy conservation of devices. [60].

2. Conclusion
These kinds of case study analysis clearly provide vision towards the selection of optimal method of renewable energy resources for home. The test cases are taken from the perspective by considering parameters like smart house management, simulation-based systems, hybrid RERs and vehicle to home connectivity.

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