

# Analysis of Effective Novel Approach for Reducing Load Demand for Real Time Applications Using Wireless Communication

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**Abstract** - Executions of a wireless smart grid power system are one of the most trending technologies across the world and also reduce electrical demand. Wireless smart grid technology delivers electricity to the consumers through the renewable and non-renewable producers using a wireless communication technology and smart meter service, which allows to control appliances in various houses of consumers and machines used in industries to save energy, cost reduction and increase in reliability. Such an enhanced electricity network has to be promoted by the government as a way of handling electrical demand, reduction of electrical loss consumption and global warming. Smart meters also the part of wireless smart grid technology which includes an adaptive intelligent of system monitoring that keeps the track of all electricity which flows in the consumer system, integrate the utilization of conduction of transmission lines for reduction of losses and also merge electricity from the alternative renewable sources such as wind and solar energy which reduces demand.

**Keywords:** Wireless Smart grid, Solar power system, Wind power system, Wireless communication station.

## 1. Introduction

To enhance a novel concept for handling electrical demand, transmission losses, reducing cost of productivity and global warming using wireless smart grid technology a study on wireless smart grid technology system using renewable and non-renewable power generation using smart meter.

- To study the primary issues related to the reduction of electrical demand and proper usage of electricity.
- To develop an efficient smart energy system and smart meter communication system to control appliances in various houses of consumers machines used in industries to save energy.

- To study the achievability and enhance the proposed methodology for wireless – smart grid power system under profitable condition.

In 21<sup>st</sup> century there is a rapid demand in energy and the government has taken measures to use the renewable energy to a greater extent to meet the energy crisis.

This paper was designed to differentiate the electricity system as it enters a phase of potentially transformative change. Wireless - Smart grid technologies can be deployed across the nation at varying rates depending largely on decision making at utility, state, and local levels. The funding may provide a strong incentive for deployment, and noticeable impacts that respect to attain an efficiency, consumer involvement and reliability. Proposed wireless smart grid technology are trending to provide major information streams that are improvement utility of the operation and business process, residential consumers, industrial consumers and commercial consumers in management of electricity and also renewable energy production. Disruptive challenges and electrical demand across the country as the amount of wireless – smart grid connected renewable and non-renewable energy distribution should be rises. The improved technology cost and benefits are being determined and will constrain decision of the deployment. By outlining these challenges, this paper may help inform decision-making. Many of these electrical demands are ongoing challenges that we will address again in the next wireless - smart Grid System Report, which will be submitted in upcoming period.

## 2. Literature Review

### 2.1. International status

**Maria Lorena Tuballa** enhanced the Smart Grid idea developed from visualization into an objective that is gradually being figured it out. As innovation developed, devices and frameworks can support the arrangement of a more smart grid. Concrete energy arrangements encourage Smart Grid activities around the world. Smart Grid reviews in various locales scarcely show rivalry yet rather an un bordered group of comparative goals and shared lessons. He has followed the development of the Smart Grid out of the need to modernize the electric grid. Finally the modern grid became inadequate and needed more types.

**D.Stimoniaris** proposed an enhanced energy storage administration procedure and a KNX framework being founded on an interest side administration methodology are consolidated to enhance the dependability execution of the power supply in a test micro grid. The operation of

the grid with the SCU's control framework and the iterative control calculation are contrasted and a micro grid network including SCUs and KNX devices, by considering the supply unwavering quality execution. The trial results incorporate the usage of KNX-controlled loads for performing essential control activities because of voltage deviations, with and without building up correspondence with the micro grid control application and for the execution of an energy efficient strategy. The outcomes demonstrate that by enacting transport mechanization device, the lengths of time of voltage plunges are shorter and get shallower, while vitality energy storage is much more efficiently utilized.

**Ihhami Colak** briefly emphasizes the abilities of smart grid networks concerning the limitations of power grids and smart grid framework ventures in Europe in term their number, stage, budget fixture, multinational consortia and type of organization. A while later, numerous basic issues in smart grid advances are classified and examined comprehensively. At first, the issues rising in electrical cable correspondence, remote correspondence, cell correspondence, virtual private systems and data security are talked about. Steering conventions, transport conventions and QoS backing are still considered as the significant examination challenges. Other essential obstruction in the sending of new advancements is the correspondence in flexibility. Jittering, separation, bundle debasement, parcel misfortune, bundle re-requesting and time delay properties of correspondence systems ought to be advanced for relentless and convenient response of smart grid segments. However, DoS assault location and moderation, key administration, validation encryption still stay as trying security dangers. Especially, the fine-grained security arrangements ought to be intended for particular system applications.

**Haider TarishHaider** presents an overview of the latest advancements in DR frameworks, scheduling load, and network system advances. A few components are tended to enhance the effectivity of DR framework. Moreover, distinctive arrangements have been given in the examined studies to beat the difficulties of load scheduling. Additionally, different correspondence system innovations of DR applications have been compared. The surveyed examines demonstrate that cost and saving energy can be accomplished through the participation in the middle of utilities and clients while adjusting the benefits between them. As appeared by the writing survey, a quantities of difficulties must be overcome before DR can be considered as an across the board technique to commercial and industrial customers. The fundamental issue is the externality issue or mutual dependence of energy utilization cost among customers.

**YasinKabalci** survey is exhaustively centered on smart metering considering as meter and smart grid specialized techniques the related advances, applications, and difficulties. Along these lines, the review is composed in four primary areas that are SG and smart energy foundation, smart estimation and metering, correspondence innovations utilized as a part of smart grid framework, and security on smart grid. The actual circumstances of every framework are delineated and future examination headings are presented in a few subsections. Also, the latest themes, for example, smaller scale matrix, electric vehicles, and DG mixes are reviewed as far as SG cooperation. The SG and keen vitality foundation is presented in three parts of the whole framework that they are power generation, transmission, distribution, and client utilities. The shrewd estimation and metering applications are overviewed alluding to management of energy and control frameworks, and reference principles. The smart metering framework is looked into as indicated by equipment and programming foundation that are specifically identified with correspondence and security issues. The specialized techniques utilized as a part of SG casing work are examined as wire line and remote advances where the administration and control necessities are studied in point of interest. In this manner, an extensive table is introduced including the norms, information rates, conceivable separations, system sorts, point of interest, and detriments of every correspondence innovation.

**Sung Tai Kim** estimated the impact of the Smart Grid endeavor utilizing review information from the Jeju Smart Grid test-bed. The fundamental findings are as per the following. To begin with, the experimental consequences of the DID estimation demonstrate that the Smart Grid venture prompts a decrease in power utilization. Second, male householders, all the more relatives, and higher wage level are demonstrated to bring about more power utilization, which corresponds with the normal suspicion. Third, the higher the level of comprehension of the Smart Grid is, the more power utilization is reduced. Based on these outcomes, we can infer the accompanying approach suggestions. To begin with, since we have confirmed the Smart Grid's impact of a lessening in power use, it is important to develop a dynamic strategy arrangement for the dispersal of the Smart Grid. The critical thing is that since a lot of venture is required in the Smart Grid, and customers need to spend a specific measure of cash to purchase and set up Smart Grid-related items, and makers and wholesalers to build up creation offices, it is crucial to set up important motivation arrangements to advance the interest of the private segment. Second, it is important to change current electric charge frameworks all

together for the Smart Grid to prompt a decline in power utilization. Third, a solid plan for reputation and data on the Smart Grid is important to augment the lessening impact of the Smart Grid on power utilization.

**C. Gouveia** reviewed the advancement of SG related items and advances are developing, upgrading the significance of exploratory shows which think about genuine conditions. The improvement of laboratorial facilities, assumes a vital part in the union of imaginative arrangements that are the key for an effective advancement of the SG worldview. The Micro matrices and Electric Vehicles research facility is committed to the improvement and show exercises, and additionally to bolster the innovation exchange to the business, by growing new models of cutting edge interfaces for EV, small scale era units and for the dispersion system administration. The testing capacities incorporate the SG principle ranges of learning, in particular: power frameworks, power hardware and data and interchanges advancements. Results appeared in this paper strengthen the way that the coordination between the MG brought together and nearby control techniques, gives to framework administrators extra answers for manage the expansion of DER and EV. Besides, the conveyed control plans permits the MG to respond notwithstanding when the instability presented by correspondences frameworks is considered. The future work of this paper is centered around the improvement of new programming modules for the MG controllers, which will work as a team with the devices introduced in field.

**M.N.Q. Macedo** analyzed the sending of the smart grid in a worldwide pattern, and on account of complex electrical frameworks, such as consideration must be paid to the difficulties and chances of this arrangement around the world. Subsequently, it is essential to have a vital arrangement that organizes frameworks that can give the best answers for the necessities of unwavering quality, progression and efficiency for sending of the smart grid. The technique proposed in this work utilizes fuzzy logic for the estimation of a need element, which empowers the assessment of frameworks to accomplish the best cost-benefit investigation in the usage of the smart grid. This technique organizes the frameworks that present the best exposures, have more noteworthy potential for conveyed era and power efficiency, and present higher business misfortunes and in addition other vital factors. The utilization of fuzzy logic for making the file turned out to be suitable because of the capacity to adapt to instabilities and ambiguities, which is impractical utilizing customary rationale approaches.

**Pedro Crespo Del Granado** examined the logical benefits of on location hybrid DG sources for heat and energy frameworks from the perspective of an extensive end-client in a shrewd lattice. The paper estimated the estimation of energy storage units from interest reaction alternatives and DG sources. Results demonstrate that capacity arbitrage choices to vitality costs pairs the estimation of power stockpiling to 5–7% in costs investment funds contrasted with a fixed retail cost. Likewise, capacity units assume a key part on bigger DG limits, coming about into a battery estimation of 9–15% diminishment in power costs and around 15% in gas costs from coupling a vast CHP with storage of thermal power. Going about as a store source that backings the framework basic supply periods, the battery reaction to the STOR signals yields reserve funds of around 5%. This showcases a first solid study on the most proficient method to join request side stockpiling to adjusting market standard as a first-hand quantification on the estimation of batteries for an existing request reaction program. Watch that in these outcomes no behavioral changes popular are inflicted to the end client, everything is managed between the smart meter and the battery.

**Alexandre Lucas** actualized various capacities, both administrative and competitive, to empower most extreme benefit for speculators. It is clear that radical changes should be made to current administrative and power market courses of action by autonomous authorities and controllers to advance the reconciliation of such frameworks. Given the predicted commitment of RES sooner rather than later and an expanding level framework, ESS are relied upon to assume a noteworthy part in supplying administrations to the grid and making it smarter. This study shows the improvement of a capacity framework model in a distribution of grid, which can give recurrence regulation and power supply administrations in the meantime. The model considers a VRFB, which because of its reaction time and inborn qualities can give numerous administrations in a successful way. Both capacities were exhibited to work at the same time demonstrating the created control rationale to work. Natural amicability and material plenitude makes VRFB a promising innovation to perform these sorts of administrations both in an incorporated and conveyed way. Expanding attention to this innovation might push forward its arrangement. However absence of showing undertakings and holes in institutionalization, and misty business sector opportunities under current game plans are still an issue. How multi DESS in the same lattice collaborate with the DSO while giving their administrations, interoperability with the DSO and with each other or check for institutionalization conflicts, are a percentage of the ranges for future exploration.

## 2.2 National status

**Jagruti Thakur** proposed the headway in renewable energy technology and additionally its accomplishment in granting reasonable electrical energy has made ready for vast scale era of power through renewable vitality assets. The investigation of information gives bits of knowledge into varieties in the fare of produced green force and instability in use design. The unmistakable conduct of the customer's demands somewhere down into the information examination before planning a solid structure for food in taxes in India. The situation investigation shows that surely financial funds can be harvested if efficient administration of vitality can be utilized at homes. Likewise it is seen that levy structure assumes a vital part in acknowledging benefits of speculation made in sun oriented boards. The biggest gathering of populace (very nearly 77%) fits in with low level income, which would speak to purchasers like shopper Hence imperative information ought to be dispersed to customers in regards to their use design and benefit that, can be acknowledged from net metering. A man is required to settle on net metering just when the additions from offering environmentally friendly power efficiency can surpass the speculation made. As it is in the underlying stage, such investigation would be of enormous help in reconsidering the strategy fittingly and picking up confidence of the financial specialists. Continuous changes in the arrangement would be hurtful to the acknowledgment of this innovation. Financial funds for clients are clear from the situation investigation, which should be outfit reasonably, offering benefit to all. The arrangement ought to have intrinsic property of giving TLC (straightforwardness, life span and conviction) to financial specialists. A watchful examination of the information would give a stage to concocting the arrangement and system which would incorporate day by day and occasional varieties in era and utilization of power.

**Akhil Joseph** proposed a smart grid framework is a noteworthy worry in execution of retail rivalry in India. In specialized angles a power framework environment for the wide organization of brilliant network is being prepared with different activities. Inclination of WAMS over SCADA is an illustration. Effective culmination of ISGTF started 14 smart grid pilot activities will advantage in picking up experience and it will bolster in conquering the wide usage challenges. Renewable vitality coordination to the smart grid is a test in present situation. Technical maintenance like transmission base is a negative on one side and on the other side administrative system likewise exacerbates circumstance. In power bill 2014 there is no

procurement for exchange of power from local renewable vitality source to smart grid. This ought to be taken consideration by suitable state administrative commissions through their up and coming renewable energy approaches. This will give a reasonable open door for the state utility to meet their Renewable Purchase Obligation targets. Taking everything into account, selection of retail rivalry would be a titanic undertaking with regards to the across the nation usage. Bringing a circumstance among every one of the partners makes the business structure fruitful. Contrasting with the present structure, retail rivalry model will yield more productive force exchange, and in addition monetary exchange. All partners would be demanded to be more productive and moderate to expand their benefit.

**M. MuthamizhSelvam** explained the need for Smart Grid usage and the progressions required by the utilities have been discussed about in subtle element. He enhanced activity taken by different nations around the globe and their visions towards future smart grid are looked into. The AMI and other propelled advances in savvy network will empower us to shape the vitality utilization conduct by clustering systems, so that different vitality efficient projects can be executed. The issues identified with renewable vitality combination with savvy matrix and idea of micro grid.

**S. Zahurul** has compared different wireless communication technologies and their conventions, topologies, models, and advantages and disadvantages to find an enhanced system answer for coordinating DRG to the future SG in Malaysia. As indicated by our examination, lower information rate and loose throughput based wireless innovation can meet the information correspondence prerequisite for observing and controlling of DRG. Thusly, low power and low information rate inserted ZigBee PRO innovation is suggested for TNB SG arrangement at the circulation level correspondence. In addition, ZigBee PRO has other influential highlights over high-information rate Wi-Fi and wired-line PLC innovations, for example, helpful sensor combination, underpins longer scope, lower force utilization, extensive number of tyke hub mix, and better information encryption. Conversely, understanding the DRG base utilizing ZigBee PRO innovation has a few deficiencies, for example, obstruction, little memory, low preparing ability, longer transmission time, and others which are highlighted and determined taking into account past surveys. Regardless, this study recommends the utilization of fiber-spine possessed by telecom Malaysia with ZigBee PRO system which can decrease extra infrastructural cost, impedance, low information rate, or range confinement issue. A standout amongst the most predominant finding to rise up out of the SG examination study is that administration



assemblages of creating nations, including Malaysia have huge investments and underpins for moving towards SG execution. It could be beneficial for local advancement in modernizing the lattices if the creating countries work together as far as their encounters, endeavors, and far reaching methodology on coordinating DRG

**P. Acharjee** explained the accessibility of very qualify cheap manpower alongside quickly developing industrialization , higher economic development potential has without a doubt changed India into one of the biggest potential markets on the planet. The power division needs extraordinary regard for advance the improvement goals as far as innovative refinement and limit expansion. As the power division experiences shortcoming and supply limitations, India ought to accentuation on a booked procedure to pivot the area from insolvency to bankability. India has the considerable favorable position of having a shoddy and efficient human asset. Utilizing progressed Flexible AC Transmission System (FACTS) device, outfitting correspondence and data innovations, exact regulation and shrewd meter, the transmission line misfortunes and influence robbery can be decreased in India. The vulnerability and non-unwavering quality nature of Indian power framework can be overcome by enhancing examination, control and observing framework with abnormal state of correspondence and coordination. Tremendous Indo-U.S. vitality collaboration conceivable outcomes exist in the range of power efficiency, atomic energy , the use of biotechnology in biomass gasification, geophysical investigation, renewables, and other clean vitality advancements. The change encounters of the United States would be of incredible significance in choosing the path forward for force part change in India despite the fact that the arrangement must be perfectly customized to the Indian power area. It would likewise be feasible for Indian associations to do innovative work programs in a joint effort with U.S. research substances on developing innovations.

**KonarkSharma.SM** proposed a territory of exploration in SG foundation that has pulled in quickly developing consideration in the administration, business and the educated community. Distinctive nations and service organizations are attempting to set up better correspondence innovations and control over their power assets, oversee crest interest, work all the more efficiently, and oblige enormous measures of DER frameworks. In this paper, we introduced a far reaching overview of smart metering for SG base, beginning from talking about the potential benefits and past advancement stages to giving bearings of future SMs foundation. SG foundation incorporates high efficiency power devices parts, protected insulated bipolar transistors (IGBTs) and diodes) with power evaluations from couple of watts to megawatts to

empower very efficient and power consumption transformation for wind energy collecting applications, where low power utilization is key necessity. In future PV establishment based vitality supply could be achievable. Financially an artificial clever meter (AIM) based AMI system and vitality administration plans will diminishes the crest hour use of apparatuses, and abatements the buyers' carbon impression. In this manner AIM in future to quicken take off of SGs. So we have to steady, moderate, low-carbon SMM arrangements. Sounds estimation and their minimization at each level of SG applications build the force quality region and convey green innovation (GT) to purchasers. For this most recent metrological arrangements are checked on, which are perfect to accomplish higher force densities, voltages and efficiency levels that will be required later on. They likewise guarantee a cutting edge mix of equipment and programming security for existing and progressing SMs, brilliant sensors and renewable vitality and capacity frameworks. SG correspondence system components, for example, heterogeneous gadgets and system engineering/model and topologies, delay requirements on various time scales in the middle of AMI and SCADA frameworks adaptability, and diversified abilities of inserted gadgets, make it in fact illogical to consistently send solid security approaches over SG frameworks. Thus, there is no single and extreme answer for security concerns including power systems. Prior days SM security was just centered around setting principles for protection and the counteractive action of information robbery. Presently the SMs security dangers are fluctuated and advancing. Along these lines we investigated SM security (i.e. equipment and programming) through contextual investigations, and talked about different assault avoidance plans. As we have evaluated, SM security is exceptionally productive and testing research zone and still being worked on for another law based and economical SG environment, particularly in light of the fact that data security must be brought into record with different estimation frameworks, for example, PMUs We wish to highlight the significance of SMs for SG by most recent protection safeguarding/security plots that has been all inclusive regarded as a specialized issue. In spite of the fact that this work is continuous and enormous endeavors are still expected to perform this errand, however the examination is made as far as suitable metrology ICs choice, vitality administration plans and shopper security assurance plans, and the obstacles to be overcome for acknowledgment of SG operation.

**Kartikeya Singh** made an overview and the field work led to conduct the more extensive study on variables influencing the scaling up (or not) of off-grid sun oriented innovations in India, a few conclusions might be drawn from these information. The factual investigation

bolsters the cases by a few specialists that the business sector for off-grid solar technology innovations is for sure dictated by the merchant. End clients are not ready to expressive what they require, especially those users in zones without grid access who might require the innovation alternatives the most. Moreover, modularization of items might accomplish unit scale as the firms offering the most astounding volume of items are giving reduced solar based items. While multi-usefulness of an item did not appear to effect unit scaling, the way that organizations see their user as requiring the items for more than lighting is an indication that the entry of optimistic low-watt machines, for example, TVs might really serve as the driver of the dispersion of solar based advances. On financing, the sponsorship administration built up by the legislature might not have helped the eco arrangement of administrations and advances around off-grid solar powered advances to flourish. Results propose that disappointment and difficulty in working with the administration in this procedure drove numerous players to work outside the sponsorship administration. While it is easy to refute whether end-user need financing keeping in mind the end goal to buy off-network sun oriented items, it is clear that much business is as yet being led with a great many users in various quantity without endowments or financing gave by the firm. Business advancement in this manner might have figured out how to work in a domain that still needs access to formal keeping money frameworks and requires solid supply chains and after deals systems with the end goal advances should be kept up post sending. At last, giving a more extensive exhibit of innovation choices might really negatively affect unit scaling. A more intensive take a gander at a percentage of the individual firms that emerge in unit scaling coordinates these outcomes. The estimation of scaling must obviously be addressed in an industry that ought to be attempting to move from giving advancements to quality vitality administrations. Finding a harmony between basically accomplishing scale in numbers and guaranteeing that quality, defined by sufficient vitality and a biological community of bolster structures for the innovation post organization, is vital if one is to truly give access to energy to enhancing the occupations of the individuals who need it most. In conclusion, business developments will keep on advancing to meet the developing vitality needs of those living with absence of guaranteed concentrated grid power supply and in this way drive the dispersion of off-grid solar system advancements.

**Dhananjay Bhor** presented a co-simulation structure, in view of Open DSS and OMNETpp, for assessing execution of Smart Grid wide-region observing applications. Diverse applications including a hybrid state estimation calculation and a renewable energy mix

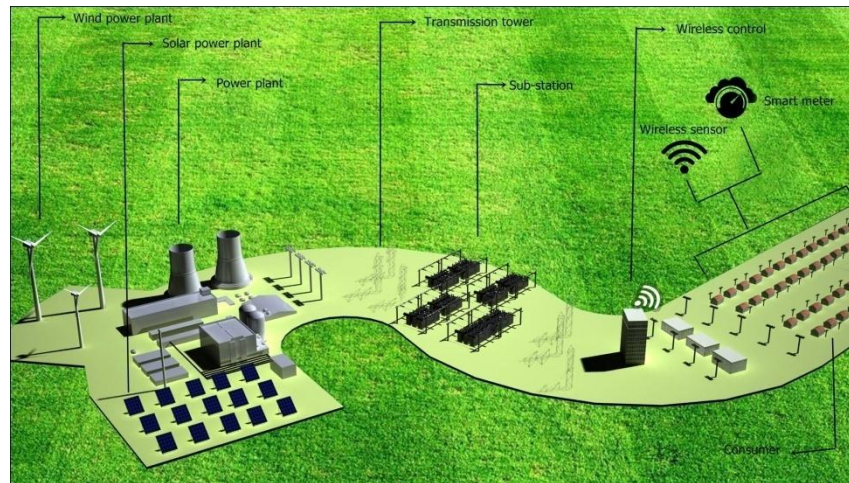
application for solar based and wind situations have been shown with the co-recreation system. The casing work has been made openly accessible on sourceforge.net. The shortcomings as far as provable versatility for extensive scale grid and of high recreation execution times will be tended to in future work. Future work can likewise incorporate amassing mistake correlation examination. Distribute subscribe worldview over the PGs. More unpredictable Smart Grid applications with learning capacities can be actualized over this structure and assessed for its execution. A framework with distributed controller can likewise be reenacted utilizing this.

**S. SofanaReka** proposed a new method has been adjusted making a working model between the user and the utility for decrease of the traffic utilizing the investigation of PAR as a part of each user communication furthermore scheduling so as to consider the adjustment in top burden hours the apparatuses utilizing diversion hypothesis technique among the users. Subsequently the new request reaction calculation works for multi users in an area, showing its dynamic conduct. The outcomes have been broke down utilizing a specific arrangement of purchasers as contextual investigation and the work is more settled by assessing the outcomes with routine strategies. This system represents the diminishment of cost, minimizes PAR and demonstrates its dynamic nature by considering DR clog case. The work can be stretched out in an alternate methodology by presenting the same calculation in various delicate figuring procedures with the expansion of renewable vitality sources. In this manner a complete DSM tool stash for home zone administration can be produced utilizing the present day systems, for example, big information calculation and Cloud Computing procedures.

### **3. Methodology**

#### **3.1 Smart grid system**

A typical component to most definitions is the use of computerized handling/digital processing and interchanges to the power grid, making information stream and data administration key to the smart grid. Different capacities result from the deeply integrated utilization of advanced innovation with power grid. Reconciliation of the new grid data is one of the key issues in the outline of smart grid.



### Reliability

The smart grid will make utilization of innovations, such as, state inference, that enhance fault detection and permit self-healing of the system without the intercession of professionals. This will guarantee more dependable supply of power, and diminished weakness to disasters or assault.

### Efficiency

Various contributions to general change of the efficiency of energy infrastructure from the arrangement of smart grid innovation, specifically including request side management and cooling systems during short period in power value, reducing the voltage when conceivable on circulation lines through Voltage/VAR Optimization (VVO), dispensing with moves for meter interpretation, and lessening truck-rolls by enhanced outage management utilizing information from Advanced Metering Infrastructure system. The general impact is less repetition in transmission and circulation lines, and more noteworthy use of generators, prompting lower power costs.

### Load adjustment/Load balancing

The entire load linked to the power grid can differ significantly concluded time. Although the entire load is the sum of many separate choices of the clients, the overall load is not a stable, slow varying, increment of the load.

### Sustainability

The enhanced flexibility of the smart grid authorizations greater infiltration of extremely variable renewable energy sources such as solar and wind power, even without the addition

of energy storage. Current network infrastructure is not built to allow for many distributed feed-in points, and typically even if some feed-in is allowed at the local level; the transmission-level infrastructure cannot accommodate it. Rapid fluctuations in distributed generation, such as due to cloudy or gusty weather, present significant challenges to power engineers who need to ensure stable power levels through varying the output of the more controllable generators such as gas turbines and hydroelectric generators. Smart grid technology is a necessary condition for very large amounts of renewable electricity on the grid for this reason.

### **Demand response support**

Demand response maintenance/permits generators and loads to interact in a computerized technology in real time. Removing the demand that occurs in these disadvantages removes the cost of calculation reserve generators, cuts wear and tear and extends the life of equipment, and allows users to cut their energy bills by telling low priority devices to use energy only when it is cheapest. Currently, power grid systems have varying degrees of communication within control systems for their high value assets, such as in generating plants, transmission lines, substations and major energy users. In general information flows one way, from the users and the loads they control back to the utilities.

### **Smart meter**

A smart meter is an electronic device that records consumption of electric energy and communicates the information to the electricity supplier for monitoring and billing. Smart meters typically record energy hourly or more frequently, and report at least daily.

### **Smart grid using Wireless network**

Mostly, WSN-based smart grid applications are divided into three clusters: consumer side, transmission and distribution (T&D) side, and generation side WSN-based smart grid applications.

### **Consumer Side WSN-Based Smart Grid Applications**

Consumer side WSN-based smart grid applications have a straight association with different types of clients. Consumer side applications contain progressive metering infrastructure, residential energy management, automated panels management, building

automation, demand-side load management, process control monitoring, and equipment management and control monitoring.

### **Transmission and Distribution (T&D) Side WSN Based Smart Grid Applications**

T&D side covers overhead power lines, underground power lines, and substations, and the applications planned for this sideways play a key role in smart grid, since these schemes are responsible for positive power transmission. Some of the transmission and distribution side WSN based smart grid applications are overhead transmission line monitoring, outage detection, conductor temperature rating systems, underground cable system monitoring, fault diagnostics, overhead and underground fault circuit indicators, cable, conductor and lattice theft, fault detection, and location.

### **Generation Side WSN-Based Smart Grid Applications**

These applications are normally based on monitoring task. Some of them are real-time generation monitoring, remote monitoring of wind farms, remote monitoring of solar farms, power quality monitoring, and distributed generation. Communication and network requirements of smart grid applications play an important role in implementation of WSN technologies for energy distribution infrastructures.

### **3.2. Suggested Plan of action for utilization of research outcome expected from the project.**

A detailed study on primary issues related to the reduction of electrical demand and proper usage of electricity.

This study helps to develop an efficient wireless smart grid system to control the appliances used by the consumers and machinery in industry.

To achievement for,

- Gives you control over your power bill
- Reduces expenses to energy producers
- Makes renewable power feasible
- Maintains our global competitiveness
- Facilitates real-time troubleshooting

### **4. Conclusion**

Implementations of a wireless smart grid power system are one of the furthestmost trending technologies through worldwide and also lessen electrical demand. Wireless smart grid

technology distributes electricity to consumers over the renewable and non-renewable producers using a smart meter service controlled through wireless communication technology, which permits to control appliances in numerous consumers house and machineries used in industries to save energy, reduction of cost and reliability. Smart meters also the portion of wireless smart grid technology which contains an adaptive intelligent systems which monitor the track of all electricity which flows in the system of consumer and also merge electricity from the alternative renewable sources such as wind and solar energy which reduces demand. Such a proposed electricity network has to be sponsored by the government as a way of handing demand in electrical, reduction of electrical loss consumption and global warming.

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