

HYBRID ENERGY GENERATION WITH AUTO PLANT IRRIGATION AND SMART STREET LIGHT

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Abstract:

All conventional energy resources are being exhausted. Hence it is necessary to move from traditional to non-traditional energy resources. In the proposed work we have done. Combination of two power sources for streetlight system. It processes wastes unsustainable energy resource harming nature. Basically, it is a hybrid system which involves the integration of two energy systems which will give constant power. Solar panels are used for converting solar energy and wind turbines are used for converting wind energy into electricity. This electrical power can utilize for various purpose. The purpose of this proposed system is generation of electricity at affordable cost. Agriculture is primary occupation in India and is called India's backbone. Water scarcity is one of the biggest problems. According to surveys, about 20 percent of agriculture. Due to lack of water, the land gets ruined and becomes barren land. Thus, this research gives an idea of smart irrigation system.

INTRODUCTION:

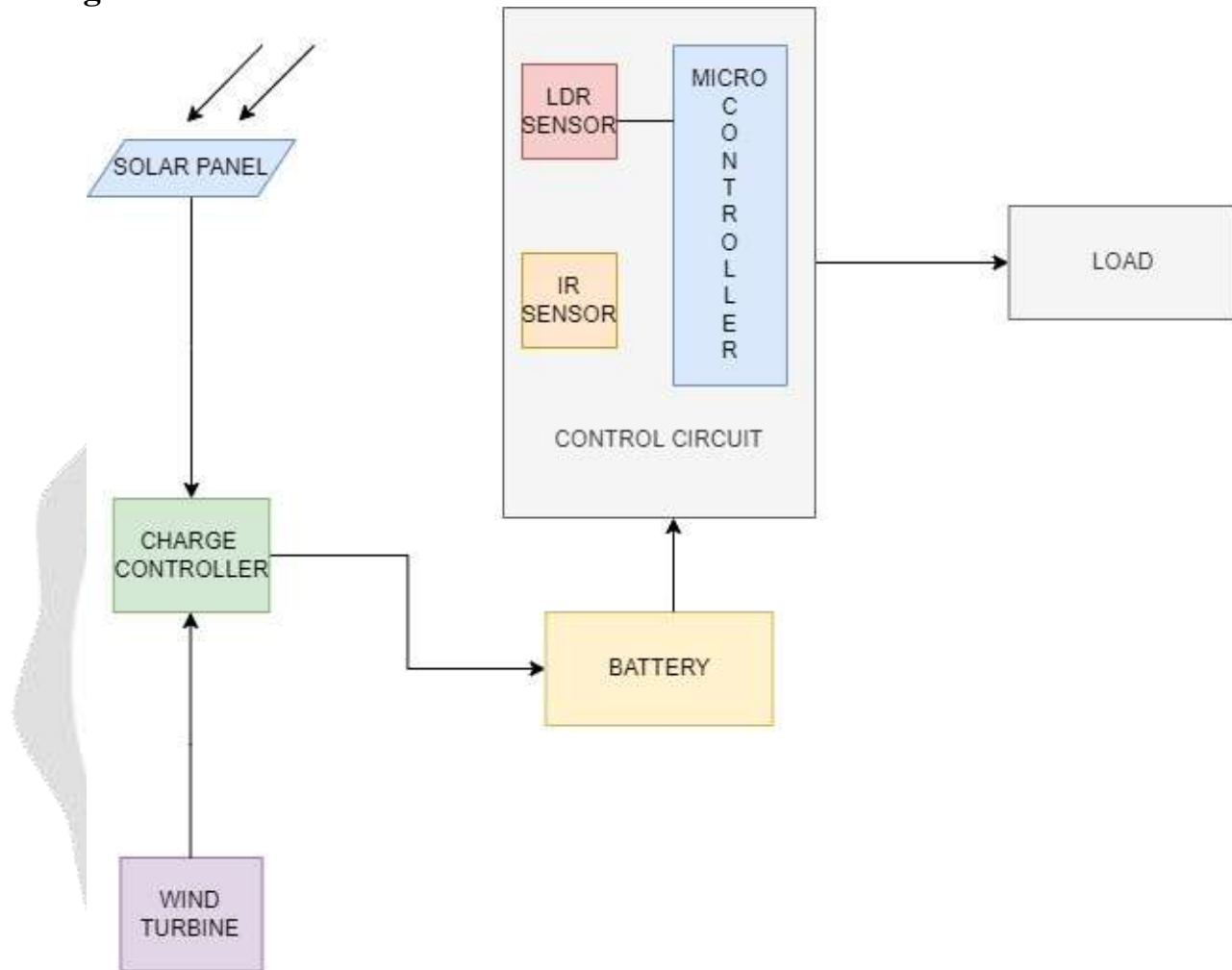
Renewable energy-based irrigation system to avoid the disadvantages and limitations of the present irrigation systems where the main problem is disproportionate distribution of water to crops, and hence the consumption of street lights standby power. This proposed system is designed to increase water and electricity efficiency by solar panels make it eco-friendly. This work shows that the correct operating conditions public street lighting is essential to avoid unsafe driving. Conditions and public areas that can lead to fatal accidents and crime. It turns into a big responsibility. Power system operator and turn on the utility in turn. today's day. Fault reporting systems are completely manual and depend on a to report passing by pedestrian, driver or maintenance officer back the blame to the operator. street health inspection. The lighting involves regular monitoring by the maintenance officer, says once a month, which is expensive and even includes the probability of the lamp failing immediately after exposure Inspect or fail only during specific operating conditions.

Lamps fail due to wear or other failures in operation and control circuits and they fail prematurely due to incorrect power. A distributed network of sensors is used to detect soil moisture. These sensors are connected. For a control unit which is responsible

for monitoring as well as controlling the entire irrigation process. depending on the weather conditions will be decided on the basis of vague reasoning regarding the need for irrigation of the soil.

PROPOSED SYSTEM

Block/System Diagram:



I. Fig.1. Block diagram of proposed system.

Solar Panel:

Solar panel / PV panel are used to convert the renewable power coming from the sun into electrical energy. The principle of working solar panel is with semiconductors. Since, the whole eco-system on planet earth is dependent on sun energy and it's a huge source of never-ending energy. Due to ace of availability, easily interpretation, amount of source and popularity it is preferred for project. Solar panels are photovoltaic which, generates electrical energy using sun light radiations. Depending on the position and intensity of the sun radiation the amount of electrical DC energy will produced. For the proposed project specifications and design, a18V, 5 watts off grid solar panel is required. The standard size of the panel, available in the market, 6inch x 6inch x 2inches is most suitable however, other sizes can be considered.

Wind Turbine:

Air is available 24 hours a day in the Earth's ecosystem. Wind turbines have large blades that are attached to the rotor of the generator leading to produce electrical energy as the air moves by the flow. Wind power is also renewable, never an energy source and is easily available in the environment. Wind turbine power plants are more popular and provide greater efficiency place of

implementation. A wind turbine is a mechanical system/machine that generates electrical energy from a renewable wind power source.

A wind turbine is a mechanical system/machine that generates electrical energy from a renewable wind power source. The amount of electrical AC energy will be produced depending on the wind speed. For the project, a 500 Watt, with 3 blades of K1 meter radius, will require a wind turbine generator. The height of the wind turbine should be 18 meters. 2 x 2 for its foundation x 4 meters of space is required.

Batteries:

The electrical energy produced by the system either needs to be fully utilized or stored. full use of all. The energy produced by the system at all times is not possible. Therefore, it should be stored rather than wasted unnecessarily. electric battery. The most relevant is the low cost, maximum efficient storage of electrical energy in the form of a chemical reaction. Therefore, the batteries are Favorite.

The energy generated from the proposed project needs to be stored. So, two batteries are needed. connected to an air The turbine which would require a 120AmpH battery would sufficiently meet the storage capacity for the target price. The second battery is preferred for storing 80AmpH solar power. But, the battery capacity can be as per the application/storage and demand variable.

IR Sensor:

An infrared sensor (IR sensor) is a radiation-sensitive optoelectronic component with a spectral sensitivity in the infrared wavelength range 780 nm .50 μm . IR sensors are now widely used in motion detectors, which are used in building services for switching on lamps or alarm systems to detect unwanted guests.

LDR Sensor:

Light dependent resistor (LDR) is also called photoresistor or cadmium sulfide (CdS) cell. It is also called photoconductor. ... This optoelectronic device is mostly used in light varying sensor circuits, and light and dark active switching circuits.

Microcontroller:

The AT89C52 is a low-power, high-performance CMOS 8-bit microcomputer with 8K bytes of Flash programmable and erasable read only memory (PEROM). The device is manufactured using Atmel's high-density nonvolatile memory technology and is compatible with the industry-standard 80C51 and 80C52 instruction set and pinout. The on-chip Flash allows the program memory to be reprogrammed in-system or by a conventional nonvolatile memory programmer. By combining a versatile 8-bit CPU with Flash on a monolithic chip, the Atmel AT89C52 is a powerful microcomputer which provides a highly-flexible and cost-effective solution to many embedded controls.

Literature Survey and Methodology Used:

Referring, Ugur FESLI, Raif BAYIR, Mahmut OZER has proposed project on, "Design & Implementation of Domestic Solar- Wind Hybrid Energy System".

It states that, the demand for more energy is full filled by using renewable source like wind power, solar power. This can be archived by using hybrid energy system connected to grid i.e. wind power energy generation and solar energy generation produces energy without fluctuations.

The system proposed uses a designed circuit consist of transistor and relay. This circuits added in the inverter, while input is taken from batteries. As, any one battery get fully charged, the circuit gets activated, due to fully charge battery triggers the transistor. The activated circuit is making the poles of relay for contact and the charge battery gets selected to provide the DC supply to inverter.

Existing System:

Completely Renewable Hybrid Power Plant (solar, wind, biomass, hydrogen) a hybrid power plant consisting of these four renewable energy sources can be made into operation by proper utilization of these resources in a completely controlled manner. Hybrid Energy Europe - USA. Caffese in Europe introduce hybridizing HVDC transmission with Marine hydro pumped Energy

Storage via elpipes. The project of Caffese is 3 marine big lakes producing 1800 GW and transmission with elpipes. A part 1200 GW produce wind fuels-solar fuels 210 billion liter year. (IEEE Power and Engineering Society-General Meeting Feb.9.2011, Arpa-E, DoE USA, MSE Italy, European Commission-Energy-Caffese plan and Consortium)

The Hassi R'Mel power station in Algeria, is an example of combining concentrating solar power (CSP) with a gas turbine, where a 25-megawatt (MW) CSP parabolic trough array supplements a much larger 130 MW combined cycle gas turbine plant. Another such integrated solar combined cycle power station is the Yazd power station in Iran (*also see ISCC*).

Advantages:

The advantages covered by the propose system are listed as,

- Overcoming disadvantages of standalone renewable electrical energy generation system.
- Producing much more efficiency as two or more renewable energy generation system working together in the terms of electrical energy generation.
- System maintains is remarkably reduced and becomes easy.
- Renewable energy sources like, sun, wind are utilized so, no waste production.
- Producing clean, friendly to environment, renewable energy.
- Once the system is designed and developed or manufactured, the installation of system is easy.
- Within certain time period the installation cost gets covered.
- If the system gets damaged in case, no need of changing entire system or subsystem. Just, changing a damage component will work out.

Disadvantages:

- The first-time installation cost is huge in terms of finance.
- The circuit designing complexity.

Application:

Some of the applications for the purpose system are listed follow,

- The system is used for domestic purpose.
- Street lighting, Traffic signals.
- Various monitoring systems.
- Powering up for communication system.
- Pump irrigation Systems.
- As per requirement of electrical energy the system can be either designed or updated for higher energy requirement.
- When ac mains supply is not available, the proposed system can be used as emergency system with only few changes.
- So, it can be used for almost every electronic, mechanic, viz. system needing/ require electric energy to work on.
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Future Scope:

Since the awareness about non-renewable sources and the pollution caused by them, clean energy generation with renewable sources is widely preferred and such sources are being implemented day by day, hence the need for such plants and projects Research and resources are also increasing.

As the installation cost is high from the point of view of design and manufacture for the first time. The system can be monetized using graphical user interface on the computer. So, complete information will be available to the user and/or stored in connection with further applications and development.

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