Improving Efficiency of Solar Cells
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Abstract:
The most vital concern of today’s society is proper utilisation of energy. The philosophy of nature is defined as “The energy is neither created or destroyed” but the pace of utilisation is dependent on the availability of resources. We cannot deny the fact of having an improper pace in production and utilisation of resources due to lack of technical skills. Hence, we have to take major steps to boom up the technical development of our nation.

I. INTERDICTION

BACKGROUND
Presently, majority of energy generating sector is dependent on non-renewable sources of energy. Overexploitation of these resources hampers sustainable development of the nation. Solar energy plays an important role among the ocean of renewable energy resources. We can easily convert solar energy into electrical energy by using PV cells. It is eco-friendly and a clean source of energy. This form of energy signifies the concept of 3A’s i.e., Availability, Affordability, Accessibility. It is economical than other forms of energy and can be a more reliable option than other forms. The fall in solar PV tariff is Rs 2.44 per KWh in May 2017 which seems to be lower than other power generation source of India.

II. WORKING PRINCIPLE OF PV CELLS
PV cells is a device which is used to convert solar energy into an electrical energy. We see the application of photo voltaic effect in PV cells. Doping of semiconducting materials is done in order to achieve a junction known as P-NJunction. Photon excites the electron due to the incidence of sunlight over the surface of PV module.

III. CONSTRUCTION
Above diagram is representing the heliostat model to bring modification in the orientation of PV cell. PV cell is placed in tilted orientation in order to achieve maximum radiation. Thermostat is placed near to the surface of the cell.

IV. WORKING
Incident ray falls on the mirror and reflected towards the inclined orientation of PV cell. Cell Is inclined in such a manner that it receives maximum radiation. This will increase the temperature near the surrounding of the cell which will excite the electron more easily. Hence, it will prove more efficient than the conventional method. We can use thermostat to control the temperature near the surrounding which will prevent the surface from overheating.

Calculations
Heat Transfer (Radiation) = \( \text{SiAT}^4 \)
Where,
\( \text{Si} = \text{Stefan Boltzmann constant} \)
e = emissivity
T = temperature of the surface

For conventional model

Heat transfer between surface and surrounding
Q = eσA(T₁⁴ - T₂⁴)

SieA is constant, so we can replace it by constant K
Q = K(T₁⁴ - T₂⁴)

For new model
Q₁ = K(T₁(new)⁴ - T₂⁴)

Comparison
Q₁ - Q = K(T₁(new)⁴ - T₁⁴)
T₁(new) > T₁ (Because of heliostats)
Q₁ - Q > 0
Q₁ > Q

V. CONCLUSION

Hence, rate of heat transfer is more in new model. This will excite the electron more easily because kinetic energy of electron dependent on temperature. Hence, it will prove more efficient than the current model that we are opting. It will also contribute towards the technological development of the nation. SO, We can accept this technology with a wide scope of future generation.

VI. REFERENCES

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