

WSN for Solar Panel Applications

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Abstract—The source of future energy production has to be and is undoubtedly renewable and environmentally friendly. Solar power is one of the most readily available energy sources in almost all parts of the world. Although Solar power is ubiquitous, certain physical and technological limitations allow for a maximum efficiency factor of 37% (And that's for commercially available high end solar cells). This implies that only 37% of the sun's energy that is captured by the solar cell can be converted to useful electrical energy. This paper focuses on using Wireless Sensor Networks (WSN) to utilise the maximum possible energy of the solar cells without any further losses.

I. INTRODUCTION

The energy generated by the solar panels is highly dependent on the angle of incidence of the sun's rays on the panel.

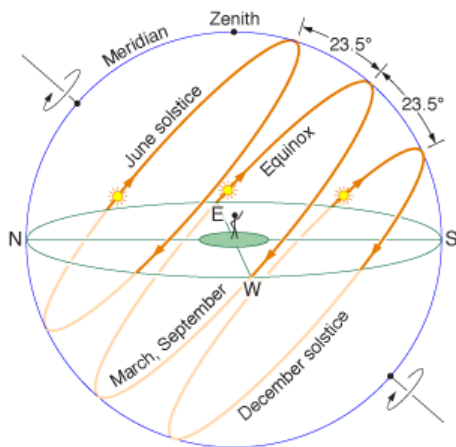


Fig. 1: Sun's path in Winter and Summer. Source: [?]

The sun's path in the horizon is dynamic and dependent on the time of the year. In the northern hemisphere, the sun is higher in the sky during summer and lower in the winter. The sun rises in the north east and sets in the north west in the summer whereas the sun rises and sets in the South east and South west respectively as it can be seen in Fig. 1

As we can see from Fig. 2, consequent of the sun's path in the sky the angle of incidence of the sun's rays on the panel changes during the day as well as during the different months.

In order to track the sun's rays so that the solar panel is always perpendicular to the sun's rays we need a dynamic

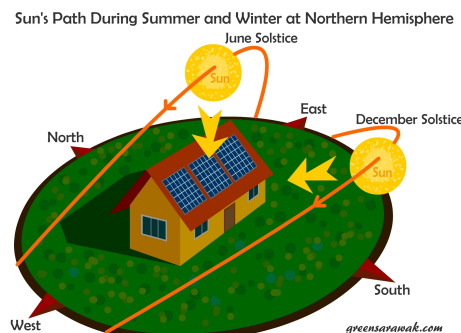


Fig. 2: Angle of incidence of the sun's rays on the panel
Source: [?]

system that adjusts to the E-W changes in the sun's angle during the different times of the day as well as the N-S tracking during the changes in the months.

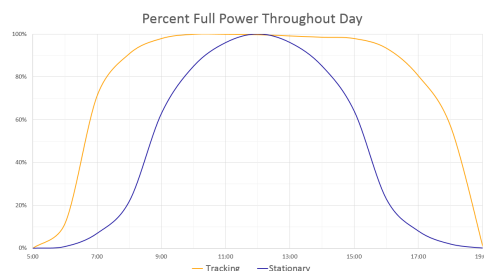


Fig. 3: Comparison of energy produced by a tracking vs non tracking system Source: [?]

mds

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1) Subsubsection Heading Here: Subsubsection text here [1].

II. CONCLUSION

The conclusion goes here [2].

REFERENCES

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- [2] A. Dunkels, "The contikimac radio duty cycling protocol," 2011.