Solar Energy Generation

The Mother's International School

Starting from 6th October, 2016, the environment club took up the task of the recording and analyzing the Solar Energy Generation – input and output – from the newly installed solar panels in the school.

Following are the various data and analysis of the daily readings taken by students of Class 9, 10, and 11.

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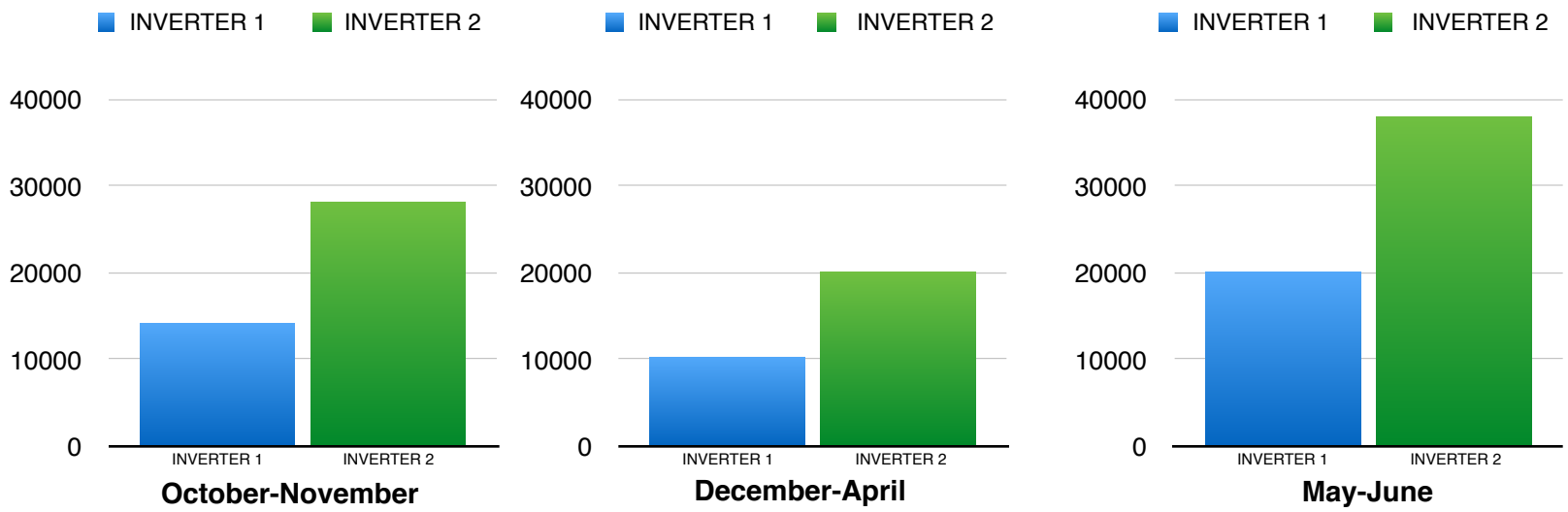
12 PM Data

Regular Difference in Energy Generation between the Two Inverters

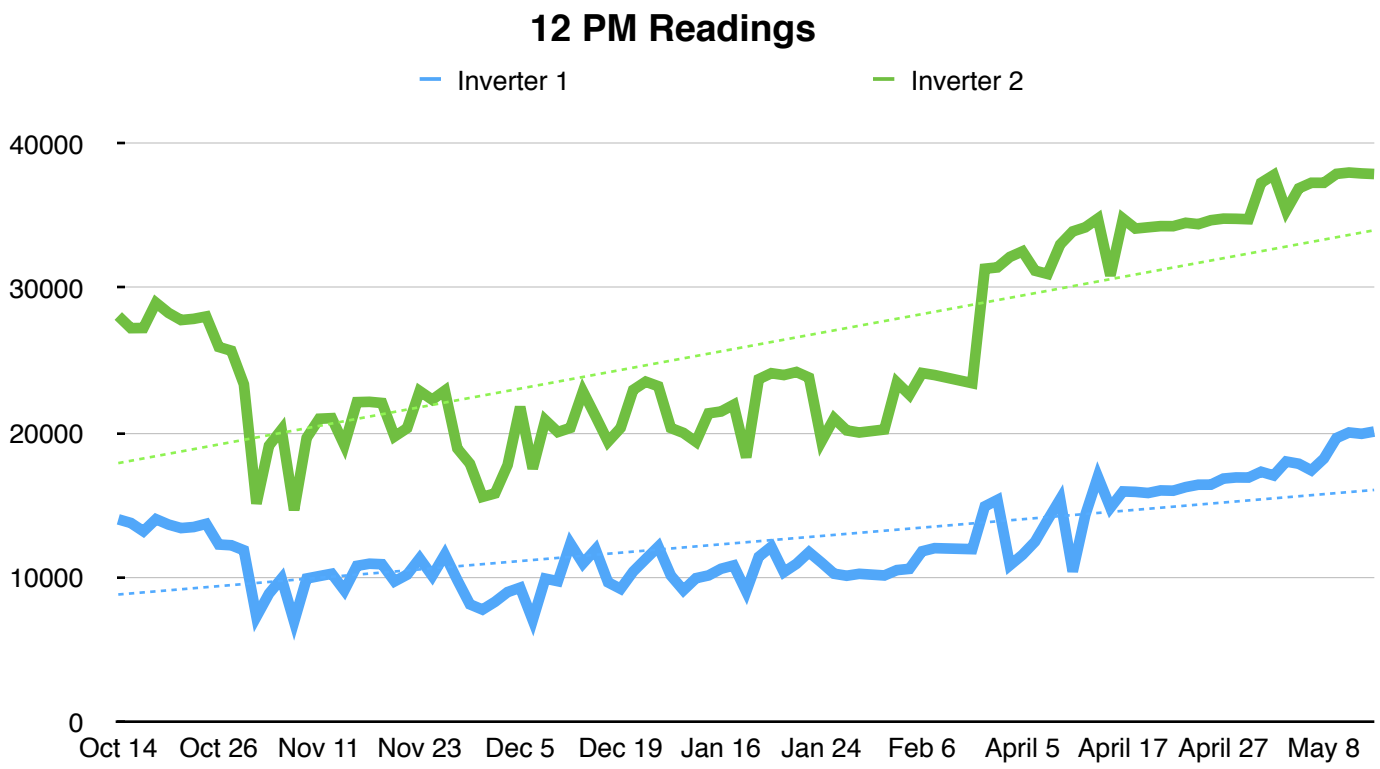


Observations

A. The energy recorded from Inverter 1 is roughly half the energy of Inverter 2.

B. The seasonal weather has a direct effect on the readings.

C. Energy generation is the highest during May-June and lowest during December-April.



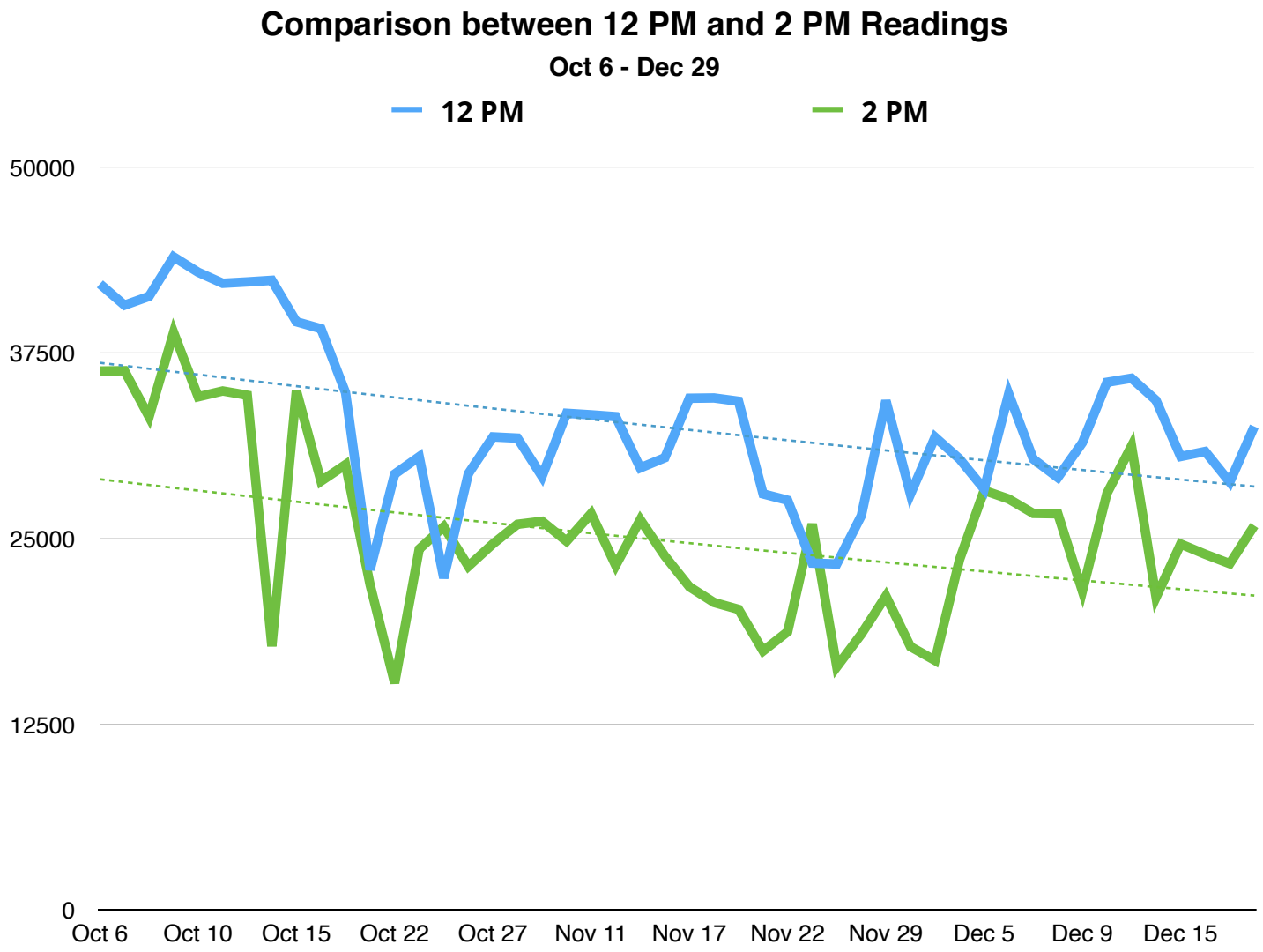
D. In November the temperatures decrease with increasing haze and mist, along with decreasing duration of daylight. The low angle of incidence of the sun rays also had a direct effect on the energy recordings.

E. With the onset of summer, energy recordings increased exponentially,
   Possible reasons
   (1) Clear
   (2) Direct sun rays
   (3) Longer duration of daylight

F. In December-April the power produced reaches a rockbottom due to:
   (1) Maximum haze and smog during December-January
   (2) Mild but frequent rainfalls
   (3) Shorter duration of daylight
   (4) Oblique sun rays

G. Energy produced steadily increases with clearer skies as summer approaches

H. With the onset of summer, energy production increased exponentially.



I. On an average, the 12 PM readings were approximately 30% higher than the 2 PM readings, which states that the intensity of the insolation was more during noon than afternoon.

J. There were small errors in the correlation due to
   a) Daily change in weather conditions
   b) Cloud cover and smog in winters

Predicted Annual Energy Generation

Daily Average Reading	26000 units (kWh)
Annual Average Sunshine	2700 hours
Predicted Annual Energy Generation	7,20,00,000 units (kWh)

The Daily Average Reading was calculated by obtaining the average of all 8 AM, 12 PM, and 2 PM readings recorded throughout the task.

The Annual Average Sunshine in New Delhi, India was obtained from the official websites of India Meteorological Department and World Meteorological Organization, respectively.

It is clear that the predicted annual energy generation is approximately **7.2×10^7 units**.

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