

Regular dusting bolsters solar panel performance

September 23 2015, by Aaron Fernandes, Sciencenetwork Wa



“The impact of dust can vary with location, but for a large scale commercial program or even a regular household, it is important to maximise output,” he says. Credit: Duncan Rawlinson - @thelas

Perth residents who are the proud custodians of solar panels could boost

the amount of power that the arrays produce over an extended period of time by simply removing dust particles from the panels.

Murdoch University researchers recently set out to determine the contribution of [dust](#) to the decreasing performance over time of photovoltaic (PV) modules ([solar panels](#)), which have become increasingly popular features of Perth homes and businesses in recent years.

The team investigated a series of PV modules at Murdoch's Renewable Energy Outdoor Testing Area (ROTA), which had been in the field and gathering dust for 18 years.

Murdoch School of Engineering and Information Technology PhD student Julius Tanesab says the study results show the PV modules' power output decreases as dust density increases.

"We decided to try and find out what the contribution of dust to the performance of PV modules might be," he says.

"We found the contribution of dust to PV module degradation was between 8-12 per cent, which really shows the importance of maintenance for this infrastructure to ensure it keeps working effectively."

The study showed the total degradation of the PV modules' [power output](#) ranged from 19 to 33 per cent over their 18 years in the field.

The degradation is mostly due to non-dust related factors such as corrosion, delamination, and discolouration, which account for about 71–84 per cent of these losses, however dust collection remains a significant factor.

Surrounding soils contributes to dust consistency

School of Engineering and Information technology researcher David Parlevliet says the [dust particles](#) found on the PVs mostly consisted of silica from the surrounding soils.

"We aim to find out where the dust is coming from, and what the particles are made of and their subsequent impact," Dr Parlevliet says.

"You will find different kinds of deposits depending on where the PVs are located.

"We found that the minerals were mostly compounds of quartz, calcium oxide and some minor amounts of feldspars minerals, which are the main factors in transmittance losses that affect PV module performance."

Mr Tanesab says they now intend to work out the economic impact of dust and develop ways to boost solar technology performance.

"I think the results can become a reference for communities and households using PV modules and solar technology," he says.

"The impact of dust can vary with location, but for a large scale commercial program or even a regular household, it is important to maximise output."

More information: "The contribution of dust to performance degradation of PV modules in a temperate climate zone," *Solar Energy*, Volume 120, October 2015, Pages 147-157, ISSN 0038-092X, [dx.doi.org/10.1016/j.solener.2015.06.052](https://doi.org/10.1016/j.solener.2015.06.052)

This article first appeared on [ScienceNetwork Western Australia](#) a science news website based at Scitech.

Provided by Science Network WA

Citation: Regular dusting bolsters solar panel performance (2015, September 23) retrieved 13 March 2024 from <https://phys.org/news/2015-09-regular-bolsters-solar-panel.html>

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