

Robot with brush, water, wiper tackles solar panel cleaning

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Credit: Sinfonia Technology/via TechOn

(Phys.org) —At large-scale solar plants, keeping the surfaces of solar panels free from dust, sand and bird droppings is not just a matter of finicky housekeeping. It can be a matter of plant profitability. Dirty panels lower power generation efficiencies. Bird droppings on panels, for example, block the sunlight. A Tokyo-based company has a solution. Sinfonia Technology announced late last month that it has developed a

robot with camera and sensors that can move autonomously and clean solar panels at large-scale solar power plants. Sinfonia's robot has a distinction in being "autonomous" in that, rather than tethered to rails, the robot is able to move from panel to panel, to tackle the panels' dirt and debris. The robot is equipped with scrub brush, wiper and detergent; and also sprinkles water stored in its tank. The robot can work in the dark; it has LEDs, having wavelengths in the infrared range.

Aside from autonomy, another key distinction is that Sinfonia's robot can handle the fact that not all [solar panels](#) are alike; the robot is designed to tackle panels that tilt in different ways. To clean tilted solar panels on a mounting system, the robot can move on a planes tilted at 5-30°. If there is a gap between panels, the robot can go over a gap of 50cm or less and can deal with a height difference of 30cm or less.

The robot is powered by a battery and is capable of [wireless data transmission](#). A tablet can be used to check the [robot](#)'s status—to check if, for example, it has enough water or to check the battery charge remaining.

Sinfonia Technology, in promoting the benefits of its panel-cleaning robots, also noted cost advantages over using manpower for cleaning panels.

Generally, experts say that, for large-scale solar panel installations, attention to keeping the panels clean makes sense. Earlier this year, however, a study out of the Jacobs School of Engineering at University of California San Diego, in [quantifying](#) losses of electricity output due to dirty solar panels, found panels that hadn't been cleaned, or rained on, for 145 days during a summer drought in California lost on average a little less than 0.05 percent of their overall efficiency per day. Cleaning the panels often was not worth the cost, found the study's engineers. They cautioned, though, that their study focused on smaller systems and

that, for very large installations, economies of scale may mean that washing panels was worth it.

Sharp, meanwhile, is another Japan-based company showing interest in devising automatic ways to clean solar panels. Last month, IDG News Service reported that Sharp, manufacturers of solar panels and generation systems, placed on show at the Ceatec [expo](#) in Tokyo an automatic cleaner to latch on to the top of a bank of solar panels and clean them. According to the report, Sharp is working toward commercializing the cleaner, which will first work on the company's own panels.

More information: www.sinfo-t.jp/eng/index_a.htm

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