Leaving the cleaning to the robots

Keeping solar panels clean is crucial to maximizing their efficiency and ensuring optimal energy production. Dirty solar panels can reduce energy output by up to 30%, which can have a significant impact on a system's overall performance and profitability. We thought it would be useful to learn more about some of the latest cleaning techniques available, from Oded Fruchtman, CEO of Bladeranger.

Oded Fruchtman

PES: Welcome to PES Solar Oded. I'm looking forward to finding out more about how things are for Bladeranger and getting your thoughts on all things solar generally. For background, you make solar panel cleaning robots, correct?

Oded Fruchtman: Yes, but it's more than that. Bladeranger specializes in solar energy solutions. We focus on developing AI and robotics Operations & Maintenance technologies to help the solar industry generate cleaner, sustainable, and profitable solar energy. Our Solar O&M platform consists of two main products, the Deep Solar Platform and Pleco-Solar, that help maximize solar asset profitability through remote AI-based performance diagnostics and autonomous waterless cleaning robots. Pleco-Solar, is the world's lightest autonomous waterless solar panel cleaning robot.

PES: Are these robots fully autonomous, or are they required to be operated/ deployed manually?

OF: Yes, Pleco-Solar is fully autonomous and does not require human intervention to operate, but it does have the option to be controlled through a mobile app. It can autonomously clean up to 200 square meters of solar panels per hour. This translates to cleaning between 100 KW to 200 KW on one fully charged battery, with only the press of a button to begin cleaning. This means that no operators or joysticks are needed to operate the robot.

In addition, Pleco-Solar is ultra-lightweight, weighing only 20kg, and can be carried and mounted by a single person. This feature frees up the crew to focus on other tasks, making the cleaning process more efficient.

Our users, which mainly include cleaning companies for commercial and industrial businesses, reap numerous benefits from our autonomous and lightweight robot, including maximized investment and a safe, efficient, and sustainable method to optimize their solar energy yields, even in hard-to-reach and challenging installations.

PES: What are the main benefits of this technology?

OF: It is much safer to use robots instead of humans in tough working environments such as high, tilted roofs. It is also safer for the solar panels since in some installations cleaners need to stand on the solar panels in order to clean them. Robots maintain the same level of cleaning unlike human labor.

In general, adding a robot to a human cleaning team is like adding another member that can add 100 KW per day to the cleaning crew. Pleco's benefits are being lightweight (only 20 kg), being waterless and fully autonomous.

PES: What are the challenges around the cleaning of solar panels?

OF: The challenges vary, depending on many factors, including the location of the panels, weather conditions, and the type of soiling. Dust, debris, bird droppings, and other contaminants can accumulate on the panels over time, reducing their efficiency. Panels located in areas with high levels of pollution, such as industrial areas or near busy roads, are particularly prone to becoming dirty.

Another challenge around cleaning solar panels is accessibility. Some solar panels are located in hard-to-reach areas, such as rooftops or steep hills, making it challenging and dangerous for human operators to clean them. This is where our autonomous cleaning robot, Pleco-Solar, can provide a safe and efficient solution to keeping solar panels clean.

PES: The waterless cleaning feature feels essential, given BladeRanger's overall objectives in sustainability, but how is this achieved?

OF: Pleco-Solar's waterless cleaning feature is achieved through the use of special brushes, these brushes are designed to effectively remove dirt and debris from solar panels without the need for water, which makes the cleaning process more sustainable and environmentally friendly.

Our waterless cleaning technology also helps to minimize the amount of water used in the cleaning process, which is particularly important in water-scarce regions. This technology also helps to reduce the need for additional cleaning equipment, such as water tanks and hoses, which can be costly and require additional maintenance.

Waterless cleaning technology is an important part of our commitment to sustainability and reducing environmental impact. By utilizing this technology, we are able to provide an efficient and effective cleaning solution for solar panels while also minimizing their water usage and reducing their carbon footprint.

PES: Artificial intelligence is increasingly being employed across all sectors, including renewable energy and solar. How is the technology being used currently, and what are the future prospects?

OF: Currently, AI technology is being used in DeepSolar to analyze solar sites' performance. AI can be used to analyze soiling patterns, inverters and string performance, energy production data, and other variables to predict future energy production and adjust solar panel positioning accordingly.

In the future, we expect AI's role in the solar sector to be much bigger. For instance, AI could be used to develop smart grids that optimize energy distribution and storage based on supply and demand. It could also be used to develop intelligent energy management systems that use machine learning algorithms to analyze energy usage patterns and suggest ways to reduce consumption and costs.

Overall, AI technology holds great promise for the renewable energy and solar sectors, and its continued development and implementation are expected to play a significant role in the transition to a more sustainable, clean energy future.

PES: What's next for this type of technology? Could PLECO be combined with drone technology to cover an even wider area?

OF: Pleco-Solar V3, our future panel cleaning robot will live on the roof with its own recharging docking station and modular bridges will enable it to move between tables to clean the entire roof. Alternatively when regulation permits, drones will move it between tables and roofs in order to cover even wider areas of solar installations. Bladeranger has already developed three different drones and holds patents in that domain.

PES: In the field of sustainability technology and innovation, how do world affairs, such as the war in Ukraine, politics and global warming influence and trigger new ideas?

OF: Global warming and other environmental issues have led to increased awareness and concern about the impact of human activities on the planet. This has spurred innovation in areas such as renewable energy, energy efficiency, waste reduction, and sustainable agriculture. The urgency to address these issues has led to increased investment in research and development, and a greater focus on finding practical solutions.

Political factors can also influence innovation in the sustainability field. For example, government policies and regulations can encourage or discourage certain types of sustainable technologies or practices. Tax incentives, subsidies, and other forms of government support can also help to drive innovation in sustainability.

Conflicts and crises such as the war in Ukraine, can have indirect impacts on sustainability innovation. These events can disrupt supply chains, increase geopolitical tensions, and affect economic growth and stability. In turn, these factors can create new challenges and opportunities for sustainability innovation.

Overall, world affairs can play a significant role in driving innovation in sustainability technology and innovation. By creating new challenges and opportunities, they can spur creativity and innovation in finding solutions to pressing environmental and social issues.

PES: Are there plans for more Blade Ranger robots in the pipeline?

OF: Pleco-Solar V3 is under development. It's going to be half the size and will live on the roof. It will include inspection capabilities to analyze the panel's surface and check for cracks and hot spots.

www.bladeranger.com

About Bladeranger

Bladeranger is an award-winning pioneer in the provision of sustainable, cutting-edge robotic cleaning and diagnostic solutions for the solar sector.

Founded in 2015, Bladeranger created PLECO™, the world's lightest autonomous waterless solar panel cleaning robot, to increase the operational life and yield performance of solar panels.

Founded by robotics experts, the company wants to make every ray count in the mission to a sustainable future.

Bladeranger is based in Israel and employs 20 people.