



A solution from the future to a present day problem

PES thought it was time to catch up on the latest news from Ecoppia. We had a very interesting interview with Oscar Aira Zunzunegui, VP Sales. This go-ahead company is a top player in automation and robotics for large-scale solar and their cloud-based, connected platform and an array of robotic solutions allow smart management of solar plants. Even during this global pandemic, Ecoppia successfully managed to keep an optimal production as always.

PES: Welcome to PES Solar/PV Oscar, it's great to have this opportunity to speak with Ecoppia again. Would you like to begin by giving us a brief overview of Ecoppia?

Oscar Aira: Thank you for having me. In the past 7 years, since late 2013, Ecoppia has been a pioneer and world leader in automation and robotics in the solar industry, offering robotic cleaning solutions for PV modules, keeping them clean, at a year-round peak performance.

Our cloud-based, autonomous robotic systems remove dust and soiling from solar panels, typically, on a nightly basis, while leveraging advanced machine learning. Managed and controlled remotely, our platform allows solar projects to maintain maximum performance with a minimal cost and no human intervention.

We offer the Ecoppia E4 solution to fixed tilt installations, mainly in Asia and the Middle East, while the T4 was designed specifically for sites using Single Axis Trackers, and is mainly relevant for North and Latin America. Both solutions are completely water-free and solar powered.

From just a 5 MW project in 2014, we are now deploying sites of over 500MW, working side by side with the leading energy players in the industry.

Compared to when we started, when we had to explain why robotic cleaning makes sense, these days the industry fully realizes the liability of cleaning manually, and how expensive and unsustainable it is.

Last, but not least, Ecoppia is made of extremely passionate team of professionals, that are committed to take an active role in the transformation to a cleaner and truly green energy.

PES: Would you say the Solar/PV market is currently expanding, even during the current global situation?

OA: That is actually a very interesting question. Currently, as we see the powerful impact Covid-19 has on the global industry, we can definitely indicate that the need for renewables is stronger than ever. Although many projects have suffered delays and obstacles in the past few months, due to the pandemic, such as tighter restrictions at customs, or delays in supply-chain due to social distancing, there was no substantial setback in the solar industry.

On the contrary, investors are fully interested, installations are growing every day and expanding globally. In fact, numerous countries such as Spain are putting great effort and confidence on the renewable market to speed up the economy's recovery process during this global crisis.

I have no doubt that solar sites are heading towards full automation, as this is a global need. Automated robots and efficient management based on AI predictions are inevitable. I'm confident that Ecoppia will lead the solar industry forward to a smart automated future.

PES: How and why has automated cleaning become so important to our industry?

OA: This topic is widely spoken about these days. The vast majority of large scaled solar sites are geographically located in arid areas, enjoying the benefits of optimal radiation, however suffering from excessive soiling, dust storms and a lack of water resources. Although the solar industry is growing rapidly, the cleaning maintenance was



Oscar Aira Zunzunegui

staying far behind, operating manually, non-frequently and less independently.

Today, the solar industry is shifting towards large scaled installations, hundreds of GWs rather than MWs, making manual cleaning an impossible solution to implement both from economic and operational perspective. An automated solution is the only solution that can meet up with this vastly growing industry's needs.

The fact that tariffs keep on getting lower and lower with record low tariffs introduced every couple of months, emphasize even further the need to focus on improved and sophisticated O&M to remain profitable. In this highly competitive industry, O&M excellency became necessary to win auctions.

Answering this burning market demand,



Ecoppia created its fully autonomous, water-free, low maintenance robotic cleaning solution, ensuring solar power plants worldwide can reach their full potential.

PES: Can you tell us about any interesting projects and news that you would like to share with us?

OA: This is definitely an exciting time for Ecoppia. We had expanded our global reach with projects in Mexico, Chile and the US, and we are soon to announce some interesting projects in Spain, Portugal and Brazil.

We have just announced a \$40 Million investment round by CIM Group, significantly strengthening our balance sheet. This brings Ecoppia in line with the expectations of its major tier-1 energy clients, such as ENGIE, EDF, Fortum, Actis, Brookfield and others.

Finally, having recently joined Ecoppia, I am now busy opening our new offices in Madrid, as well as leveraging my deep experience in the LATAM solar market to expand our global reach.

PES: We would be interested to know where your main markets are and if these have changed over the years?

OA: We do see a shift in robotic cleaning, expanding to other geographic areas outside of AIPAC, the first major region to adopt such technologies. Ecoppia's success, specifically in India, where the manual cleaning cost is of the lowest in the world, demonstrates what significant added value Ecoppia brings to the table.

Until one or two years ago, our prime markets were the Middle East and India. Today, we are expanding our global reach with projects in the US, Central America and South America.

We also sense a great shift in Spain and Portugal, two booming markets that are looking for ways to lower O&M costs in order to cope with the low tariffs, as margins are getting smaller. I really cannot specify but we have some very exciting projects coming up in those new markets.

PES: You mentioned data driven cleaning systems. Can you elaborate on how these work and the benefits they offer?

OA: Certainly. Our solutions are cloud based, and as such, we are able to collect millions of data points related to cleaning performance, weather conditions and the correlation between them, using both a physical input from the actual site and external data sources such as APIs. Our robust AI platform integrates these multiple data sources, and by applying machine-learning layers, is able to offer an optimal operation while constantly improving our offering and services.

Since the early days, we believed in the conversion of data and automation to really make the shift in the way solar sites are managed and operated, as a key for reducing LCOE.

PES: The normal solar project PPA is for 25 years, are your cleaning solutions built to last that long?

OA: The fact is, Ecoppia's solutions are designed to last longer than 25 years.

In addition to prescheduled by-annual maintenance windows, Ecoppia utilizes advanced predictive maintenance that ensures all robots are fully functional at all times, exhausted components are replaced way before they wear and tear.

While some components are replaced based on a preset schedule, once every 4-5 years typically, the robots themselves are resilient and designed to remain operational for at least 25 years.

As we insist on using components coming from tier-1 vendors, our solutions passed rigorous stress and destruction tests, as well as extensive acceleration testing with independent laboratories.

Bottom line - the robots are proven not only to outlast the project's lifetime, but also to remain safe on the modules for more than 25 years of daily cleaning.

We are proud of our first commercial robots now celebrating their 7th year anniversary and are still as new.

PES: We know you've already deployed over 2 GW of worldwide projects; can you perhaps elaborate on the benefits you provide your clients with?

OA: Sure. This question is actually very important in understanding the dilemma site owners are facing. Since this industry is relatively new, the main focus in its early

stages was to figure out how to create a well-functioning solar site.

Today, as solar sites become larger and sophisticated, while tariffs become lower, we know just how crucial lowering O&M costs can be. That is why nowadays, Tier 1 energy players turn to advanced O&M to allow them to remain profitable. It is just as important to know how to manage your assets as much as to make them work.

With that in mind, the value we offer to our customer is enormous. Not only do we displace manual and water cost, we also hedge these costs that are likely to escalate through 20-30 years of operation, and most importantly generate more energy, daily.

Ecoppia's solutions ensure its clients full visibility of the project's entire cleaning expenses through its lifetime, no risk of water and labor availability, guaranteeing a fast ROI.

Ecoppia's clients enjoy the benefits of a year-round peak performance while lowering their O&M expenses and overall, their LCOE, mitigating the great risk of water availability, water costs and labor costs over time. Lucky for all of us, robots also do not go on strikes and keep the same consistent and effective cleaning for 25 years.

Finally, yet importantly, Ecoppia's effective and reliable solutions enables Tier-1 energy players to hold up to their environmental



goals and social responsibilities, achieving zero water waste, and solar powered technology for its own operation.

PES: How has the current coronavirus situation affected your business? How do you see this developing over the next 6-12 months?

OA: COVID-19 struck the world with its ability to shut down the entire economy worldwide. Without any warning, our entire lives, in every aspect, needed to be conducted remotely.

The Covid-19 pandemic made it even clearer to the industry that utility scale solar sites should be maintained autonomously. Not only our



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work was not negatively affected by the pandemic, but actually, we are now evaluating new projects and markets in light of the extremely high market interest in our solutions.

Geographically, despite the challenging time, Ecoppia has secured new projects for more than 4GW in the last three quarters, maintaining a compound annual growth rate (CAGR) of more than 200% in the last six years.

Without any physical presence, Ecoppia enabled its clients to keep an optimal production while avoiding soiling losses and potential damage.

Now more than ever, the need for a fully autonomous cleaning solution seems almost inevitable. We built and brought a solution from the future to fix on time a present problem.

PES: What do you think will be the greatest opportunities and the greatest challenges,

for solar/PV in general and Ecoppia in particular, over the next few years, and where do you see yourselves in 5 years’ time?

OA: In light of the constantly declining tariffs and the margins narrowing down to the bear minimum, we believe the industry will now focus more and more on optimizing O&M activities, adopting new advanced technologies both for cost reduction and for scalability purpose.

We believe the transition to robotics, drones and other autonomous technologies are inevitable and this is clearly a great opportunity for Ecoppia.

Aside from that, the number of deployed projects Ecoppia has secured, although significant, is but a spec in potential projects exciting today in the solar industry worldwide. It is defiantly one of the most promising opportunities Ecoppia is facing in

the foreseeable future.

The challenges for Ecoppia remain as before – maintaining the highest customer satisfaction while growing exponentially and collaborating with more and more market players such as module makers, tracker providers and of course local IPPs.

www.ecoppia.com

About Ecoppia

Founded in 2013

Offices in Asia, Europe and Middle East

+25 Utility scale projects in 5 continents

+2,400 MW Deployed projects

>10GW of secured projects

+2.2 Billion panels cleaned