Smart bay

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ASK THE EXPERTS

Plant inspections on the fly

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Thanks to the DigiSky SmartBay® technology, Wesii is able to capture high quality images to perform our Al driven analysis. Move over drones, could airplanes be the next big thing for site inspections? PES had a conversation with Wesii CEO, Mauro Migliazzi to find out why he believes the advantages of this solution will forever change the way the solar industry inspects PV plants.

PES: A very warm welcome back to PES Solar Mauro, it's great to catch up with you. I trust business has been good since we last spoke?

Mauro Migliazzi: Yes, it's always a pleasure. Thanks for having me. I'm happy to report back and say that business has been great and we have a lot of exciting things happening at Wesii this year.

PES: When we spoke last year you were preparing for the exciting launch of your first fly-it-yourself PV plant inspections. Could you just give us a recap on this for readers who might have missed it?

MM: Absolutely. Earlier this year we launched our newest product, EliosField Dronino, which allows clients to perform what we like to call, Fly-lt-Yourself inspections. These inspections aren't intended to inspect the entire plant, but instead to utilize it as an add-on tool in between the routine yearly inspections, to check up on already identified anomalies and maintenance controls. An added benefit of this tool is that the client is able to collect more data than has ever been possible before and aid in our progress towards predictive analysis, which requires big data.

PES: Great, thanks for the recap. Furthermore, you published a dedicated article earlier this year on your new method of photovoltaic plant inspections by airplane. In terms of MWs, can you give us an idea of how much you have flown with airplane inspections to date? MM: Yes, exactly, after conducting our research and tests in 2020, we decided to move forward this year by bringing the airplane inspections to the European market, launching it in a new direction. By June we had already flown and inspected 0.6GW and we are continuing to fly in Europe for the remainder of the summer.

PES: What are the main advantages of this type of inspection for the solar industry do you think, compared to the alternatives?

MM: There are so many advantages to these inspections, which is why we have decided to utilize it as our main service moving forward. I think the main advantage of airplane inspections is the type of hardware we can carry compared to the drone. With the sensors we are able to use with airplane inspections, the spatial resolution is more than enough to identify anomalies and the thermal sensitivity and accuracy is better, which allows us to detect narrower temperature differences and we are even more confident in our data's accuracy.

Other inspection changing benefits are firstly, that there are no HSE documents required as with the drone. This cuts out a lot of the process in the planning stages, which helps the inspections move along smoothly. Secondly, there is no in-field personnel needed directly on the plant, whereas with the drone the technician needs to be in direct line of sight. Thirdly, with the airplane conducted inspections we can capture up to 300MW per day, instead of spacing out the inspection over



Mauro Migliazzi

a period of a few days to a week.

Also, the inspection accuracy by drone can decrease due to external conditions and requires a high solar irradiance. Luckily airplane inspections are a bit more forgiving and allow the irradiance to be lower and still collect accurate results, as well as maintain the same irradiance throughout the whole inspection, because we are able to capture data within a shorter time frame. It's not to say that we can collect data in any condition of course, but that we have a higher percentage of being able to fly and inspect even in conditions unacceptable for standard drone inspections.

THERMAL SENSOR TYPE	UNCOOLED	COOLED
THERMAL SENSITIVITY (NETD)	< 50 mK	< 40 mK
THERMAL SENSOR FRAME RATE	Up to 30 Hz	Up to 60 Hz
THERMAL SENSOR ACCURACY	±5°C	±1°C
PERMISSION TIME (Notam, HSE)	Binding, up to 45 days	Easy, HSE not required
CLIENT EFFORT	In-field technicians required, HSE, etc	None
THERMAL SENSOR COST (€)	<10.000	>100.000

This table shows the radiometric advantages of inspecting solar PV plants by plane with a cooled camera.



ALL ANOMALIES DETECTED - SAME QUALITY

Drone capture vs. airplane capture. The results from the airplane inspections provide adequate data to perform the same analysis as done with drone inspections to detect the same anomalies.

Lastly, a huge advantage of conducting these inspections by plane, is that it costs our clients less money to get their plants' data. As you can imagine, we can cover larger areas in less time and group together plants in the same vicinity in order to both reduce our carbon footprint and also lower the costs for our clients.

PES: Have plant owners, managers and O&M companies found the technology easy enough to use? Has it thrown up any challenges you hadn't perceived?

MM: Well in reality nothing really changes on the client's end, so I would have to say yes. We still collect the data, just with the new method, create the same orthomosaic as we've always offered, process the data using our artificial intelligence algorithm and present the data in a digital format, in a clean and easy to understand way. This allows our clients to visualize the anomalies in their plant, create reports on the information they find valuable and take immediate action. Our existing clients are already familiar with our digital platform and how to extract the most from the data presented, while our new clients learn rather quickly with the help of our customer care experts.

As for challenges, nothing we hadn't already imagined. Of course, when you change directions and bring on a new service there are always challenges in adapting to the new product or business. In this case there were two challenges that come to mind, one being the influx of data, which our team prepared for during the off season and are handling it well and in full force now that we are in full production season.

In the end this increased volume of data has aided in teaching our module, as you know with machine learning; the more you teach it, the more it learns! In addition, we are on a mission to collect as much data for our clients as possible over the years to be able to perform predictive analysis on their plants.

The second challenge was getting clients on board with a new type of service. Our existing clients and prospective clients alike were both hesitant to do airplane inspections, because drone inspections have already become the norm of the industry and clients are comfortable and happy with the service and results. Why not? PV plant inspections by drone and analysis have been our core business for the past five years, but as I mentioned earlier, we are always looking to innovate and push the industry forward. That being said, we were prepared for a bit of pushback and set up many different types of communication to our clients to explain the benefits of the change and explain the difference between the two. I'd say our efforts paid off, as we've seen companies giving airplanes a shot.

PES: Do you think this is likely to change the way we do solar plant inspections for good now?

MM: Oh, 100% yes. Clients want what is best for their business, which is running and maintaining efficient plants. This industry is still evolving and ever so rapidly, so we are all still learning the best ways to achieve those goals. Airplane is the next step in the evolution of PV plant inspections, just as drones were one step up from manual inspections. We are an innovative group, meaning all of us in this industry, and we are on a mission to play our part in making the world a greener place by producing more solar power for the world.

With thermography inspections conducted by plane, clients are saving time and money,

and getting the results needed to conduct the proper analysis on their entire portfolios.

PES: Do you have plans for any improvements or advancements with this technology from here?

MM: We are currently using the best technology available to conduct our inspections. Naturally, as things evolve and new technologies arise, we will enquire and test, choosing the best for our inspections. We are constantly evaluating our services and how we can improve them.

PES: You mentioned previously that you had plans to go global and offer Wesii technology further afield than Europe. Has this happened yet with your airplane inspections or will there be a global approach in the future do you think?

MM: That's right. This season we have entered other European markets, offering thermography by airplane, therefore widening our reach. As the season comes to an end in Europe, we have plans to conduct our inspections in various countries in South America. The vast plants will benefit from having a quick and consistent inspection method, since we can collect data in a shorter period of time compared to drone and manual inspections.

PES: Is there anything else you would like to add about airplane inspections that haven't been touched on yet?

MM: Sure, one important thing to reiterate about airplane inspections is that they are planned in groups in order to cover as many plants in one area as possible to keep our carbon footprint and prices down. Thanks again for having me.

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