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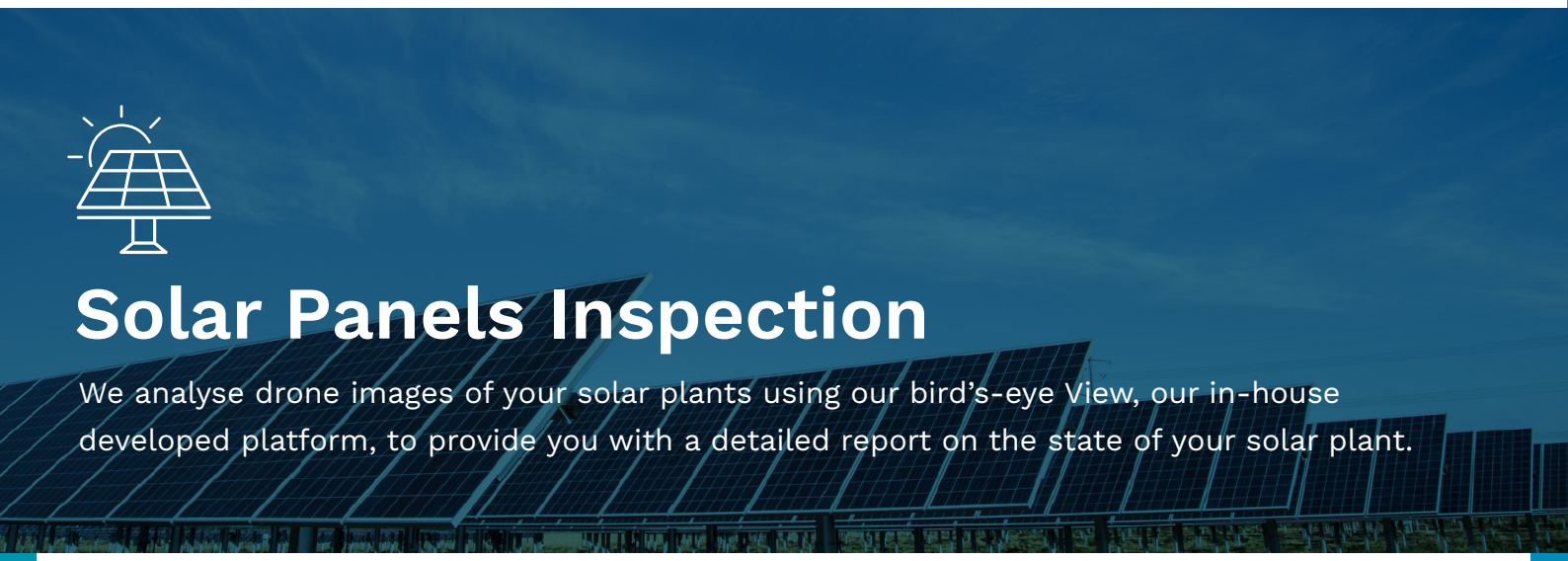

Solar Panels Inspection

We analyse drone images of your solar plants using our bird's-eye View, our in-house developed platform, to provide you with a detailed report on the state of your solar plant.

Many countries have plugged solar energy into their electrical grids in an effort to address the growing demand for energy, and the issues that come along with relying on conventional sources (e.g fossil fuels). By 2016, around 1,8 % of the world's total electricity consumption was solar sourced. Increasing the reliance on clean solar energy however is met with challenges that require innovative solutions.

Problem

Harnessing solar energy is mainly done via solar plants. A solar plant can be the size of (multiple) football field(s), with thousands of mounted panels on a field or a rooftop. Over time, these panels become prone to both internal defects (e.g. diode malfunctioning) and external factors (e.g. dirt, bird droppings, and grass overgrowing) which cause a substantial loss in their energy output.

The conventional way of maintaining these fields is to have a technician visit each string (a set of panels wired onto a power inverter) on foot and manually check the panels for possible defects. This method is slow, costly and labor intensive - not to mention inefficient as many defects get overlooked.

As for assessing performance output, the usual practice is to carry out the measurement on an inverter level, or even sometimes on a solar plant level, rather than on a panel level since the latter incur very high costs. This results in performance charts of the fields that are not detailed enough when trying to track down defects that have a significant impact on the energy output.

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Solution

At Birds.ai we address these problems in three simple steps:

1. Data Collection
We hire external drone operators to fly according to our protocol over the solar plant, and collect both RGB and thermal images.

Thermal images help in revealing (parts of) panels that are overheated due to internal defects or external factors. Whereas RGB images reveal external factors that are the root cause of some issues (e.g. dirt causing a hot spot) or that could potentially lead to issues in the future (e.g. glass damage or foreign objects on the panel's surface).

The combination of these two types of images provide a comprehensive data set that will aid in identifying most of the current and potential issues in the field.

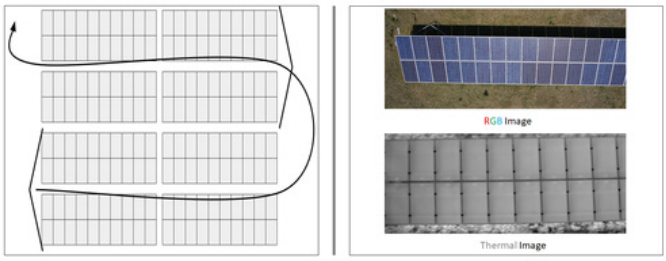
2. Data Analysis
This step is initiated by creating a digital representation of the field that gives a general overview of how the field looks like. This is called a field overview.

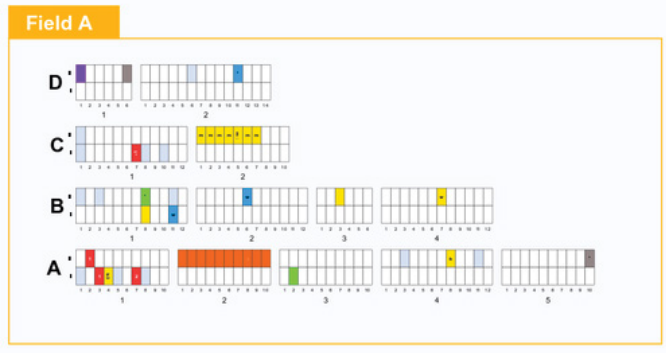
Subsequently, the pictures collected in step one are analysed on our AI-powered platform to detect and annotate defects.

Any identified defect is positioned on the field overview on the exact panel, with a specific color and icon that match the defect.

3. Reporting the results and presenting them in a clear and comprehensible manner
Based on the analysis, we provide the asset owner with a detailed report that shows all the defects found in the field.

These defects are categorized according to their impact on safety and on energy output. In addition to that, we provide an overview that summaries the current status of the field where all the faulty panels are singled out, making it easy to send the right people to the right panels.





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Empowering smart maintenance

Our solution enables asset owners to plan maintenance of their solar assets more efficiently. By performing a cost benefit analysis based on the findings in our report, the asset owner/manager can identify panels that require immediate action and the ones that may require attention in the near future.

For example:
We have found 9 sub-string defects (diode is activated or broken) in a 1 year old solar plant with 330 Wp panels. The energy and money loss this accumulates is as follows:

	Hourly	Annual	Lifetime
Energy Loss	0,99 kWh	1.386 kWh	26.334 kWh
Money Loss	€0,05	€69,30	€1.316,70

Given this information the asset manager can decide on the actions that need to be carried out taking into consideration the contractual status of the solar plant. If the loss is substantial, the manager can contact the EPC company (Engineering, Procurement and Construction) for replacement while the plant is under warranty, or allocate a maintenance budget if the warranty is over. Contrarily, if the loss is negligible or lower than maintenance costs, it won't be worth it to take action right away. The defective panels however can be kept under observation for future potential problems.

Get in Touch

If you are interested in how our solutions can help your specific needs, please contact us through our email or visit our website.

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