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## Too early to optimize your PV assets? The key to PV asset optimization in 2019 – and when it makes sense to get started

New year, new goals and for most of us, both professionally and personally, improvement is the aim.

Early improvement measures in the area of PV asset operational management can result in:

- 2.5-3.75% discounts on the usual 5% negotiated with the EPC for the PAC to FAC period
- time and cost reductions through shorter start-up phases and early failure identification
- data accuracy – enabling performance to be measured correctly

As a PV asset owner, manager or O&M provider it is essential to focus on areas for improvement as a priority and as early as possible.

### If it's not broken, don't fix it?

Advanced data analysis is slowly but surely becoming an essential element in the PV asset management structure. However, at what point should it be introduced? As a standard, a warranty and punch list guarantee with the EPC provider and an operations and maintenance (O&M) contract are set-up on commencement of plant operations. However, a general premise for performance improvement measures, at this stage, seems to follow the old adage of "if it's not broken, don't fix it". The plant is just up and running so wait for losses to have something to analyze.

## In practice

Using the three examples mentioned above, we present three real cases providing proof of the benefit of early optimization measures.

### Cut the period between PAC to FAC by "buying out" warranty

Cut the period between PAC to FAC by "buying out" the warranty bond obligation - EPC warranties are usually in place for the first two years of a plant's operation. Performance, within a defined framework, is guaranteed during this period. Approximately 5% of the contract price for the EPC is held back by the owner during this period.

We receive numerous requests for applying our PEAK advanced data analysis for the purpose of reducing the period between PAC to FAC. The deferred payment of e.g. 5% (or similar warranty and punch list guarantee) is the EPC's profit margin and it has a very strong interest in reducing the period between PAC and FAC and receiving the deferred payment as soon as possible, for this reason it is even prepared to discount on the usual 5% in order to secure at least a part of the profit margin.



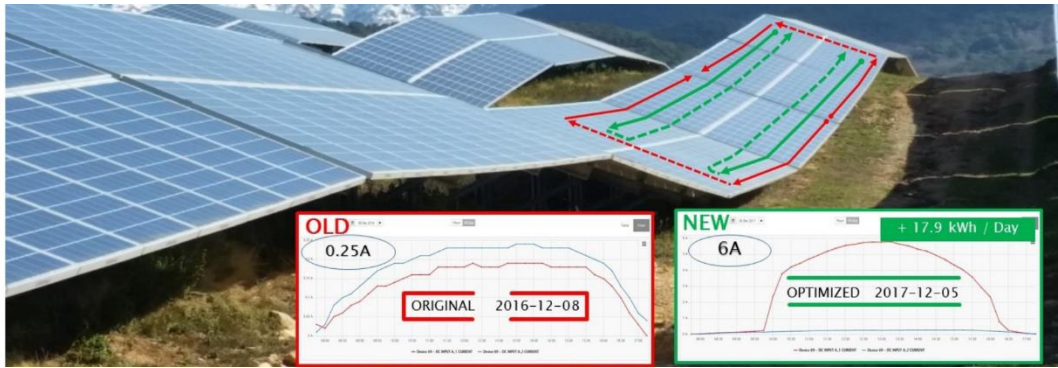
PEAK analysis makes this possible through the identification of potential hidden issues/losses and/or confirmation of no issues or only minor issues, which can easily be fixed in-house. Based on the analysis results the owner can make the decision to buy out the EPC 5% deferred payment by reducing the period between PAC and FAC to 6-12 months and by obtaining a discount of between 2.5-3.75% from the EPC. The EPC walks away with a 1.25-2.5% "guaranteed" profit margin and improves its cash flow by reducing the two years significantly.

### Shorter start-up phase

Start-up phases can be reduced significantly through early failure identification. The most common issues are:

- Incomplete installation
- Improper installation
- Infant component breakdown
- Construction mismatch
  - Wiring
  - Load balance
  - Peak shaving
  - Local shadowing

In the example below, the optimization of 30 strings resulted in a +€11,000 p.A. for a 2MW plant. This equates to a 20.4% improvement for these strings.

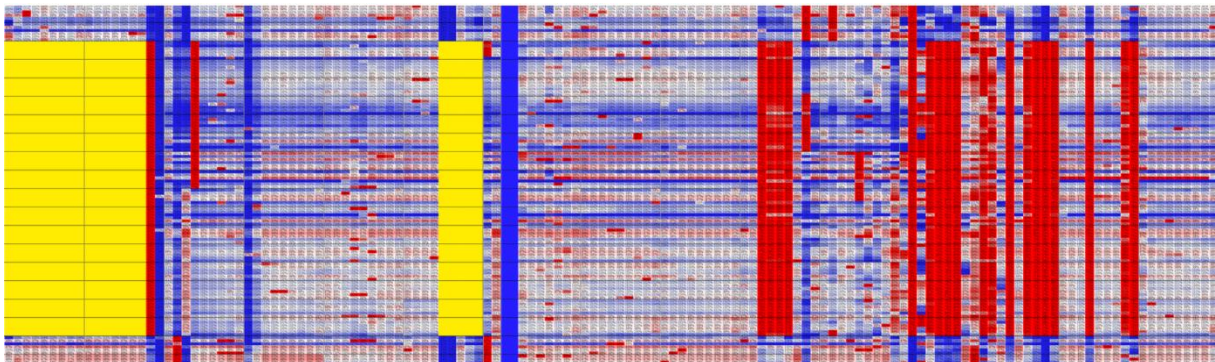


A plant and/or portfolio of a larger size could result in far higher performance and profit increases, which could be detected and improved from day one.

### Data accuracy review

Advanced data analysis relies on accurate data from the monitoring system of a PV plant. Beneficial analysis for plant improvement can still be provided without complete data; however, the extent of the data loss itself could be identified as being the main area for improvement. If identified early enough, and corrected, potential performance losses can subsequently be detected and rectified to avoid losses of a significant nature.

Our most recent example is for a 25MW plant where 15 of the 73 inverters were not being monitored, leaving 20.5% of the plant unsupervised. The yellow area in the graphic below indicates total data loss for prolonged periods and the deep red areas indicate partial data loss over extended periods. Through PEAK analysis we were able to detect the data problems within days and alert the O&M team to the issue, which was immediately rectified by them and subsequently verified by PEAK.



A problem of this nature and scale can result in prolonged losses if left to the standard monitoring systems. The cooperation between the data analytics provider and the O&M teams is usually mutually supportive; however, we have also been brought in by clients to quality check O&M and the area of data loss is a key area highlighting O&M response times. A responsive O&M team and data accuracy from the start of operations is essential. Otherwise the plant is flying blind!

Our customers will be starting 2019 by preventing losses, improving operations for increased profit and ensuring their data is providing them with a reliable overview of their PV portfolios. Will you be joining them? It is never too early to optimize!

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