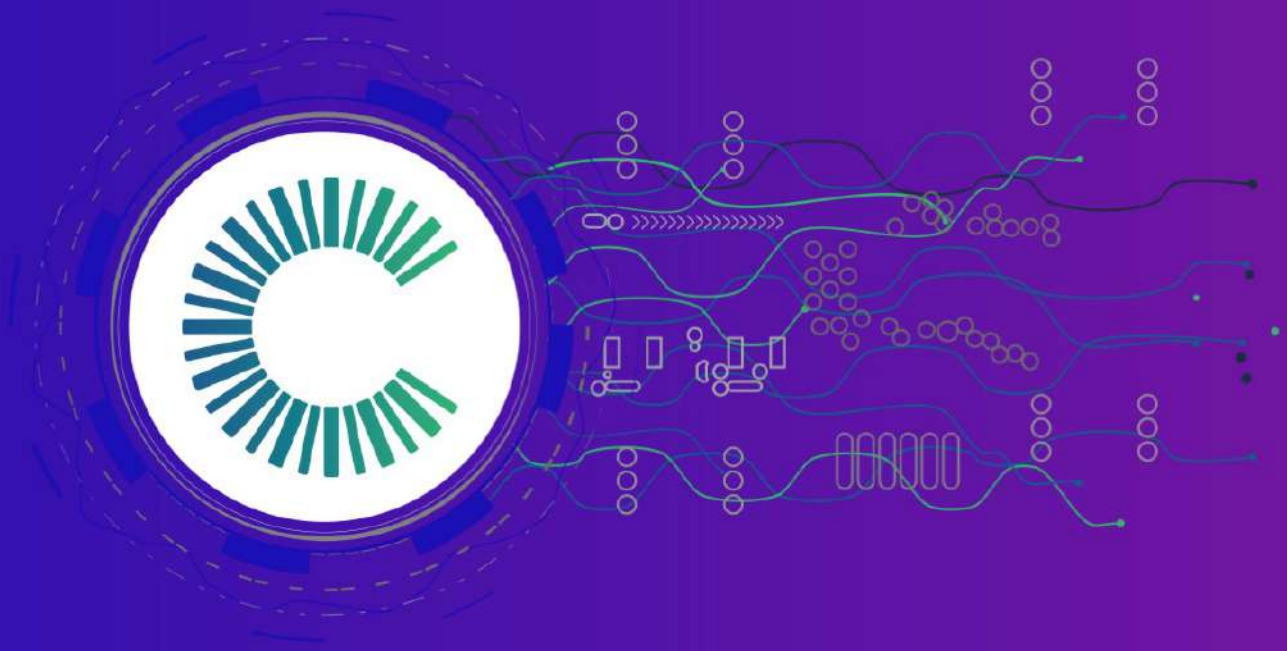


Clever solar devices **by the Numbers**

INNOVATIVE SME
Valid until Feb 16th 2024

cleversd.com
info@clevesd.com

Our Photovoltaics 4.0

We digitize the Photovoltaic Industry for a sustainable and safer energy for all contributing to a better planet with a MASSIVE COSTS REDUCTION up to 70%

Why a Total Cost of Ownership (TCO)?

The TCO is the cost to buy something plus the cost to operate it over its useful life.

Photovoltaics plants needs maintenance. at string or invertor level or are INDIRECT measurements that gives only an ESTIMATION on where the problems might be always requiring a manual check to identify the issue incurring into HIDDEN COSTS.

OUR SOLUTION: KNOW EXACTLY WHERE are the defective modules and WHAT is the problem automatically, in JUST 3-Clicks from your mobile device with NO HIDDEN COSTS.

What happens at the end of the Installation Life?

Cumulative costs in 30 years for a 700.000 modules installation (280MW) :

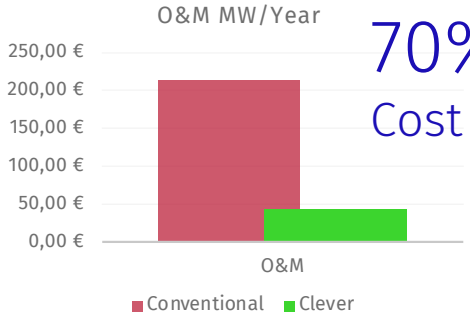
CONVENTIONAL

O&M Cost:		
Energy cost (50€/MWh)	€	4.235.986
Total labor cost	€	35.086.042
Total Drone flights	€	8.232.000
Opportunity Cost:		
Energy not produced by strings	€	132.650
Energy not produced by modules	€	268.333
Non diagnosed panels cost	€	24.741.394
Total Conventional	**€.**	**68.460.419**

CLEVER SOLAR DEVICES

CLEVER power	€	275.940
CLEVER HW	€	11.725.000
CLEVER SW	€	3.600.000
Non diagnosed panels cost	€	0 (we diagnose 100% of the panels)
TOTAL Clever SD	**€**	**15.600.940**

Comparing the total costs of using a conventional solution hidden costs Clever Dx save up to 70% costs



70%
Cost reduction

NOTE: This calculations have been made with 50€/KW cost, however CONVENTIONAL costs are highly dependent on electricity cost and rises exponentially when the price/KW goes up while Clever Solar Devices solutions remains unaffected.

Contact us for more details on our calculations and parameters and get to know the numbers for your specific business!
info@cleversd.com | +34 644 677 311

Behind the Numbers

The scenario is calculated for PV production plant that wants to maximize their production capability and improve their service by reducing costs.

The case study was done for 700.000 modules (280MW), if the number of modules is reduced or increased, the costs will change accordingly. (Note that this analysis doesn't include other extra maintenance tasks like grass cutting, mechanical inspections). Contact us if you wish us to analyze your specific case.

THE PARAMETERS:

We consider 3 different Failure Rate (FR) stages depending on the years of life of the installation. The FR is the frequency with which an engineered system or component fails. It has relation with the manufacturing procedure.

Environmental working conditions influence increasing the failure rate. It is divided into 3 different phases; installations requires more maintenances at the beginning and end of their life.
We consider:

- Early years – 2 maintenances/year (Infant mortality - 0 to 5 years)
- Maturity of the installation – 1 maintenance/year (constant random failures- 6 to 16 years)
- End of Life – 2 maintenances/year (wear out failures – 17 to 30 years).

Installation	
Number of Modules	700.000
Hour Solar Pick (HSP)	1.752 hours
Electricity Cost (€/MWh)	50
Number of Modules/String	20

Modules	Early years	Maturity	End of Life
Failure rate	0,44%	0,25%	0,88%
Power (W)			
Modules Power in Watts	400		

Maintenance	Early years	Maturity	End of Life
String coverage	100%	50%	80%
Modules Coverage	10%	5%	15%

CONVENTIONAL Costs	Early years	Maturity	End of Life
Drone flight		600€/MW	
String coverage	100%	50%	80%
Module's coverage	10%	5%	15%
Troubleshooting Time (Operator's average time to access and measure):			
Per String		15 min	
Per PV Module		10 min	
Technician hourly cost			
Cost per Hour		35€	

The theoretical string coverage is much higher during the first operating years and last operating years due to the greater possibility to incur in failures. In the same way with individual PV module inspection.

The Cost for conventional maintenance is composed of the energy lost due to troubleshooting, the troubleshooting time, and the required drone flights.

Other costs impact the conventional linked to the early years are not detecting in time manufacturing issues and losing component warranties.

CLEVER Dx Costs	
Hardware Investment (€/unit)	15€
Installation Time of the Hardware	2 min
Electricity Consumption of HW (mWh/unit)	300
Failure Rate (ppm)	100
Platform Fee	10.000€ /month
Technician hourly cost	
Cost per Hour	35€

The cost estimated for Clever Dx platform is composed of investment in the Hardware (measurement devices), the time needed for the installation, the power consumption of different measurement devices, and the platform subscription.

No other costs are required with Clever as we don't need extra work other than just connect the cable and read the QR code.

Get rid of Hidden Costs with Clever Dx

Compared to conventional processes, Clever Solar Devices provides HIGH EFFICIENCY and COST REDUCTION to Photovoltaic plants.

PV Plants today do maintenance in a conventional way : measuring some data points on the IV curve at string level and flying expensive drones a couple of times a year to get thermal and visual checks on the status of their plants. Those processes thought stationaries today creates a lot of inefficiencies and extra costs.

We redefine the diagnosis of PV systems by remote AI-powered digitalization.

Clever Dx is a DIAGNOSTIC PLATFORM to support operational decisions knowing exactly what is happening to each module in real-time with the most accurate data (automatically and remotely measuring the IV Curves of EACH and EVERY module in the installation) and AVOIDING MANUAL inspections to find the faulty modules.

Simplified and comprehensive information, reports, alarms and maps for you know exactly WHAT is going on and the most important WHERE EXACTLY is the problem in the installation.

Save money by knowing from your desk without having to send operators to the field to find the specific defective modules.

3 simple clicks to find WHERE the problem is and WHAT is happening (shadows, oxide, broken cell string, etc.).

You could see Pilot Power Plant performance using the FREE Demo access:
https://demo.cleversd.com/register.php

More about Us

Find more details in our website:

Clever solar devices

info@cleversd.com | +34 644 677 311