

A RELIABLE METHOD

TO IMPROVE
THE PERFORMANCE
OF YOUR RENOUEWABLE
ENERGY FARMS

SCADA DATA ANALYSIS

With the aim of detecting underperformances, anomalies and deviations of your assets, 4Op has developed a reliable method of SCADA Data Analysis, now widely recognized based on an Artificial Neural Network core.

SOME EXAMPLES OF KEY FINDINGS

Application of a new transfer curve by the manufacturer that suspiciously improved performance

Unappropriated shift between triangle and star generator configuration

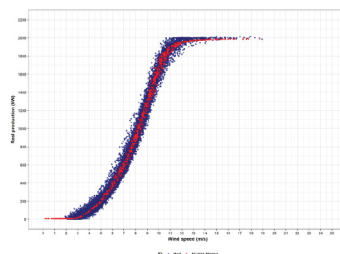
Proof of a better power stability after the correction of an aerodynamic imbalance

Detection of a failure in the pitch regulation system, causing a blade fall

Detection of a curtailment with wrong settings

Detection and evaluation of the impact of ice on the production

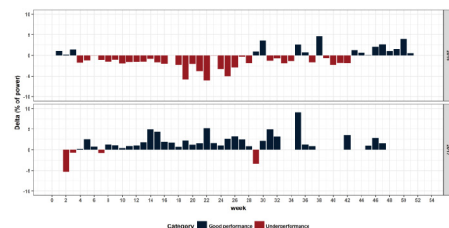
Integration of records from **manufacturer monitoring system**, meteorological towers, SoDAR or LiDAR.



Concatenation of the deviations to conduct a **root cause analysis**.

date	device	power	wind_speed	temp_tower	temp_hub	temp_nacelle	temp_terrain	temp_ambient	temp_ice
2012-01-18 00:00:00	1	0	1	7.0	254	335	15.94	-41	9
2012-01-18 00:10:00	1	0	1	7.0	253	340	15.93	-41	9
2012-01-18 00:20:00	1	0	1	7.2	244	341	16.89	-44	9
2012-01-18 00:30:00	1	0	1	7.1	244	341	15.90	-41	9
2012-01-18 00:40:00	1	0	1	7.2	235	322	16.20	-27	10
2012-01-18 00:50:00	1	0	1	7.9	236	337	17.00	-31	10
2012-01-18 01:00:00	1	0	1	7.6	236	334	17.05	-18	10
2012-01-18 01:10:00	1	0	1	7.4	238	342	16.45	-35	10
2012-01-18 01:20:00	1	0	1	7.3	322	350	15.45	-25	10
2012-01-18 01:30:00	1	0	1	7.7	321	335	16.89	-27	10
2012-01-18 01:40:00	1	0	1	7.8	322	332	17.25	-18	11
2012-01-18 01:50:00	1	0	1	8.1	322	334	16.20	-9	11
2012-01-18 02:00:00	1	0	1	8.1	324	333	16.45	-2	11
2012-01-18 02:10:00	1	0	1	7.8	254	323	17.00	-14	11

Modelling of the **real production** using recommended parameters crossing variables with the real output flagged according **running states** (curtailed wind turbine, underperforming WTG, etc.).



Our first clients:



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4Op is an **expert in SCADA data analysis and EYA** aiming to optimize and monitor production and return on investment

