

Artificial Intelligence (AI): Reshaping the PV Industry with Smart Inverters

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Speaker:
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AGENDA



- About Yellow Door Energy
- Data Analytics
- AI Applied to Solar
- Case Studies



OUR VISION

To power emerging economies
reliably, efficiently and sustainably



OUR STORY

2015

founded in the
UAE and Jordan



110+ MW

of commercial &
industrial solar
projects



**UAE
Jordan
Pakistan
Saudi Arabia
Bahrain**



**Your
Sustainable
Energy
Partner**

INTERNATIONAL SHAREHOLDERS



\$112 billion
of assets in 2020



\$22 billion
invested in 2020



\$9.3 billion
of net operating income in 2019



\$7.4 billion
of assets in 2019

Sources:

https://www.ifc.org/wps/wcm/connect/corp_ext_content/ifc_external_corporate_site/annual+report/financials

<https://www.apicorp.org/investor-relations>

<https://www.simcorp.com/en/client-stories/equinor-asset-management>

<https://www.mitsui.com/jp/en/ir/data/highlight/index.html>

BACKGROUND | THE PROJECT LIFE CYCLE



Follow a well defined:

- ✓ Timeline
- ✓ Budget
- ✓ Scope of Works
- ✓ Technical Specifications
- ✓ HSE Requirements

Development

Construction

Operation



How much we pay / Cost
When we pay / Cashflow
How much we generate / Energy Production



Get the best of the asset by achieving

- ✓ Maximum Performance
- ✓ Maximum Availability

Improve the Project efficiency
Analyze and adjust the Maintenance Plan

DATA ANALYTICS | IMPORTANCE OF ACCURACY

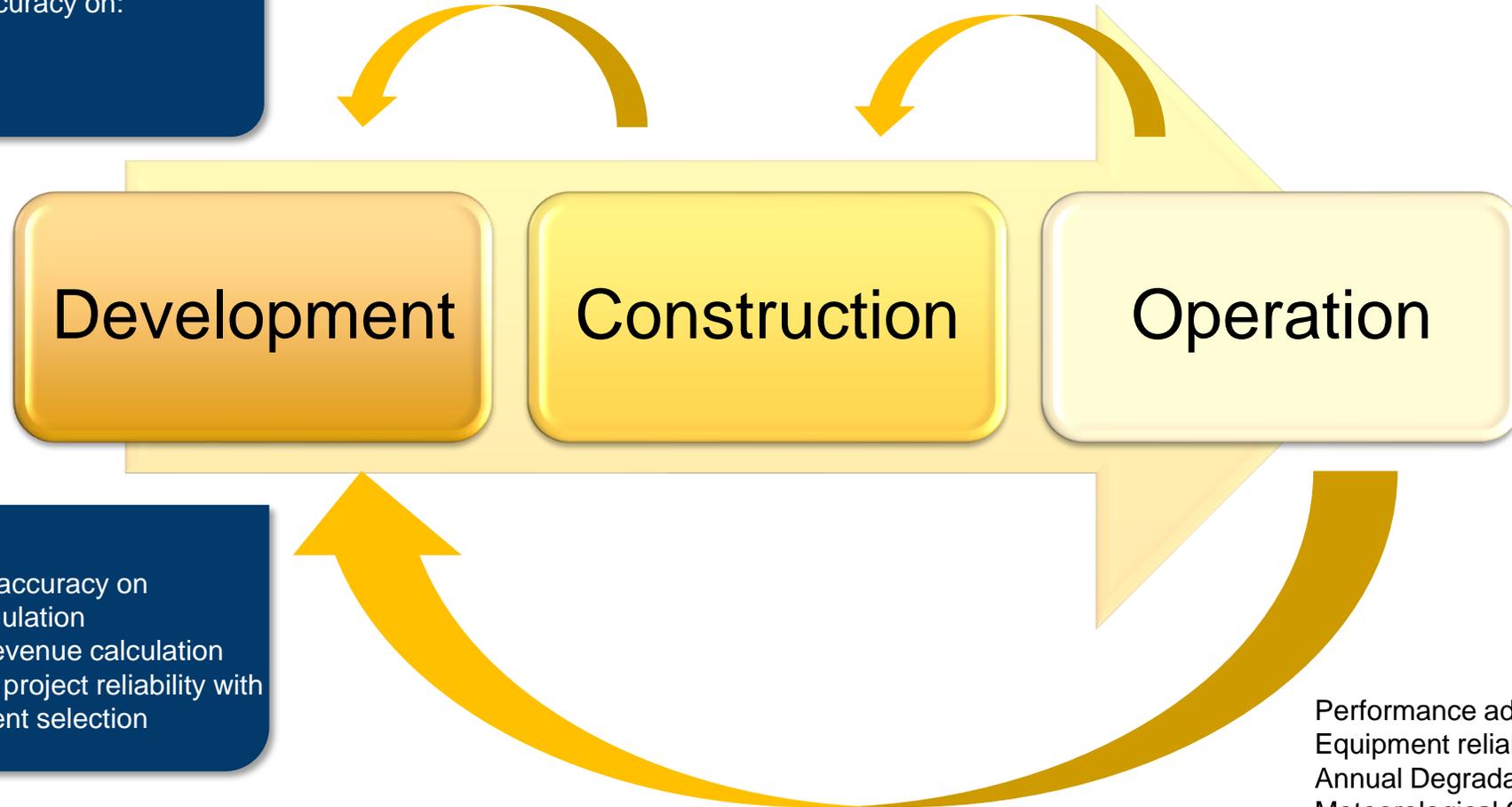
RESULTS

Improvement of accuracy on:

- ✓ Cost estimation
- ✓ Project timelines
- ✓ Cashflow

Costs
Timelines
Obstacles
Optimizations

Installation tips;
O&M working conditions;



RESULTS

- ✓ Improvement of accuracy on performance simulation
- ✓ More accurate revenue calculation
- ✓ Improvement on project reliability with efficient equipment selection

Performance adjustments
Equipment reliability
Annual Degradation
Meteorological Conditions

DATA ANALYTICS | COMPETITIVENESS

Why just a **Cost** driven competitiveness?

What about **Revenue**? Can we do anything about it?



The Asset Manager

is a Key stakeholder on Project's Performance and profitability.

Is it just monitoring the Power Plant and see if we are above the promised?

NOT AT ALL, is much more than that, with the support of Data Analytics!

- ✓ Understanding its behaviour, feel it;
- ✓ Know it inside out: weakness and strong aspects;
- ✓ Get the maximum of it, through revamping or optimization, or adjust maintenance plans to reduce downtimes, increasing the availability;
- ✓ Predict potential problems;
- ✓ Analyze and reset meteorological data sets

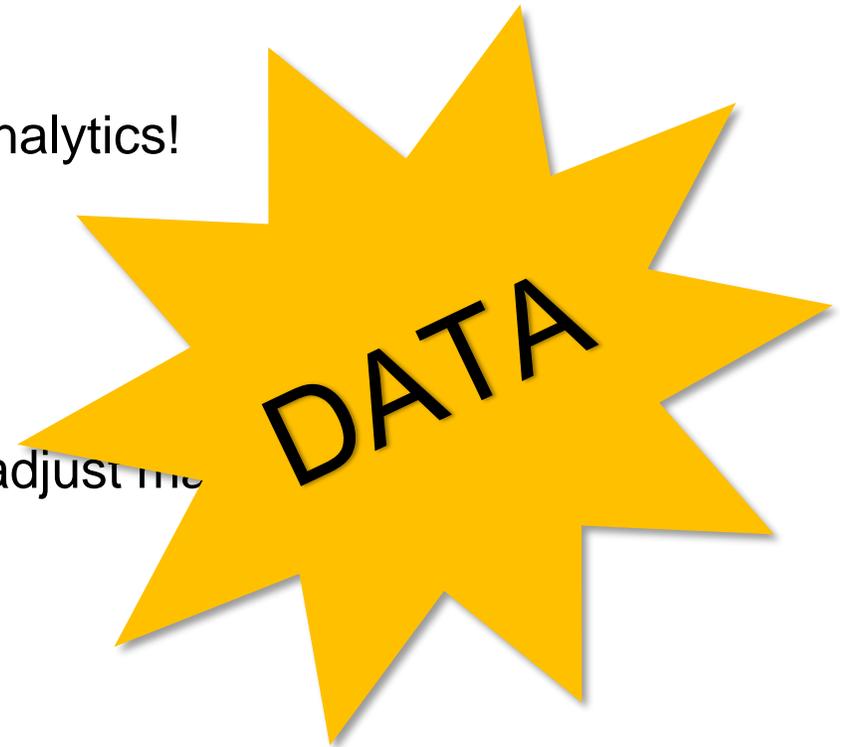
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WHAT CAN ARTIFICIAL INTELLIGENCE GIVE US?



5.5 MWp | Classic Fashion | Al Mafraq, Jordan

- Today we can manually do all the data analytics to optimize plant performance
- However, that would take a lot of time and resources
- Artificial intelligence can do it for us in a more efficient way, with less time and resources

EXAMPLES OF AI APPLICATIONS



1.2 MWp | Jabri Restaurant | Al-Satf, Jordan

- ✓ Trigger the cleanings based on soiling levels, meteorological conditions, cost and past results;
- ✓ Identify potential problems that had occurred in the past, based on internal or external conditions;
- ✓ Define the most efficient Maintenance Plans to reduce energy curtailment;
- ✓ Adjust and offset meteorological data sets;
- ✓ Energy forecasting (hour/day/week)

CASE STUDIES | PROJECT PERFORMANCE



105%



Unilever Middle East
1.0 MWp
Dubai, UAE
Ground Mount PV
2 Years of Operation
105% actual performance vs.
expectation



101%



All YDE UAE Projects
Rooftop PV
Solar carport
Ground Mount PV
1-2 Years of Operation
101% actual performance vs.
expectation

IN SUMMARY



DATA ANALYTICS with ARTIFICIAL INTELLIGENCE allow us to:

- ✓ Get better and more accurate performance guarantees;
- ✓ Get the maximum of the asset, generating more clean and cheaper energy to our customers
- ✓ Add of a second layer of monitoring, with strict supervision of our O&M providers
- ✓ Increase the efficiency of our assets and consequently improve competitiveness



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Thank you!

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