

# ***THE COMING BOOM OF FLEET LEVEL MONITORING***

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Georgia Power 24 MWp – Alectris



## Current Status of Monitoring – MORE!

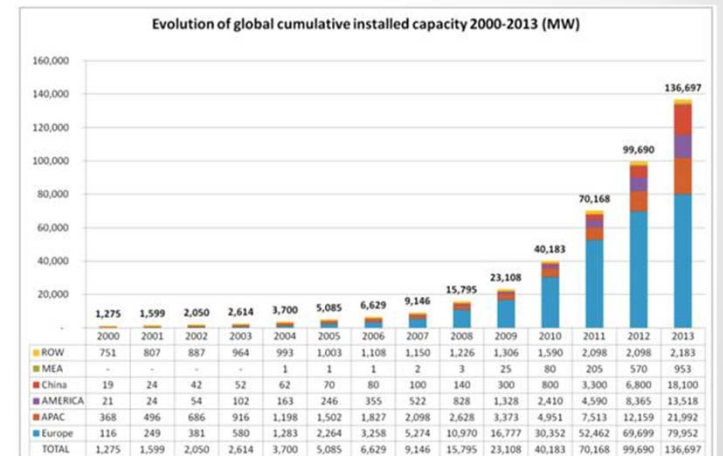
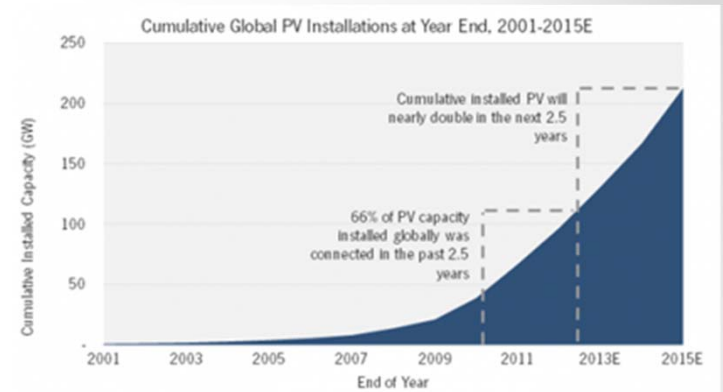
- More GW, more plants, even more plants per investor:
  - PV Is getting more geographically distributed. 79 countries with policy targets for renewables in 2008, 138 in 2012.
  - Secondary market is active -> investors are acquiring / enhancing their portfolios rapidly. 187MW of plant have been sold in Italy in the secondary market.

Source: Polytecnino Milan

- Leads to more monitoring:
  - Global PV Monitoring Deployments Outpace PV Plant Installations in 2013
    - Driven by new installations and retrofits, the **PV monitoring market grew by more than 90 percent between 2012 and 2013.**
  - 2013: 39.7 GW of monitored systems versus 37 GW of new installations.

Source: Greentech Media, May 21, 2104

Source: GTM Research/SoliChamba Consulting  
Global PV Monitoring Technologies, Markets, and Leading Players, 2014 – 2018



Source: EPIA



## Investor Challenges

- **Plant Level:**
  - Underperforming PV Plants
  - Poorly planned and executed preventive maintenance
  - Poorly engineered and delayed corrective maintenance
  - Security more challenging than expected





## Investor Challenges

- **Portfolio Level – O&M:**

- More GW, more plants, even more plants per investor
- Geographically dispersed assets
- Incongruent original plant monitoring systems
- Lack of integrated approach to global fleet management
- Simple tasks to be managed for large fleet of PV Plants in several countries lead to dramatic operational complexity



Source: *Solar Power World*, Solar OM Tools for the Solar Investor, June 28, 2014



## Investor Challenges

- **Portfolio Level – Asset Management:**
  - Lack of transparency into operations and financial reports for the funding partner
  - No standard method for keeping financial or operational records
  - Cash flows and margins under continuous pressure



Source: *Solar Power World*, Solar OM Tools for the Solar Investor, June 28, 2014





## Investor Challenges

- **Policy Level:**

- Fluctuating incentive, legal and fiscal environment
- Lack of standardized processes and procedures
- FiT schemes abandoned (Spain, Greece, Italy cuts, Romania GC revision..)
- Several market close to grid parity or close to be bankable PPA markets (Italy, Chile, US..)





## Investor Challenges

- **Margin Protection:**

- Fluctuating incentive landscape puts increased pressure on margin protection
- Missing important deadlines can pose a potential risk to the investment
- Inefficient management can substantially increase the costs





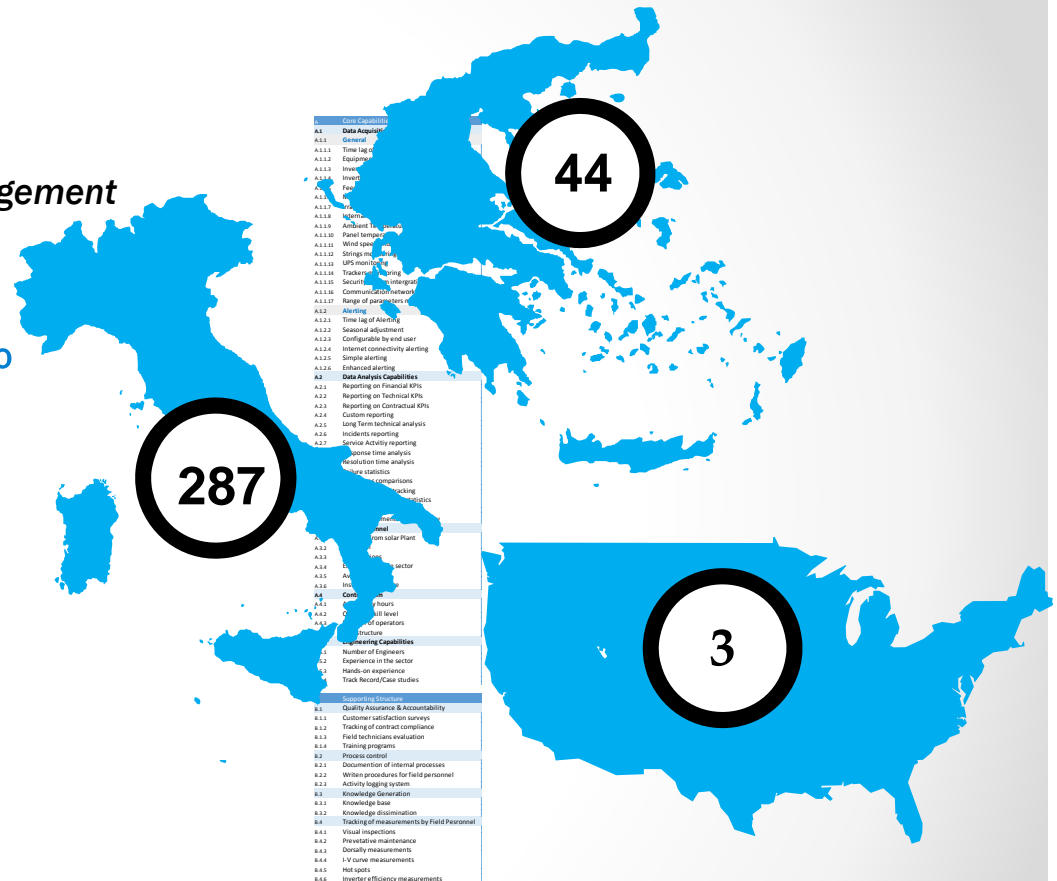


## Investor Challenges

*The increasing complexity in large portfolio management*

- A full Asset Management and O&M package requires more than **96 single (simple) tasks to be performed (excluding accounting)**
- **Example:** A 40 PV plant geographically distributed portfolio result will result in **40x96=3840 tasks!!!**

*Scaling requires evolved and suitable tools and an efficient organization*



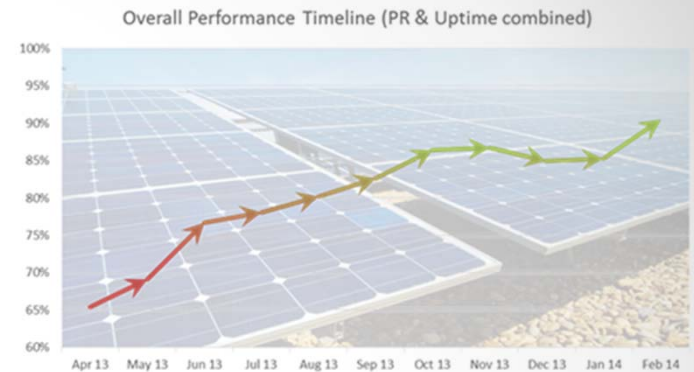


## *Evolution of Fleet Level Monitoring*



### ***THE PV MARKET PROMISES***

...a PV Plant is a Financial Investment...



### ***THE PV MARKET REALITY***

...a PV Plant is an Industrial Investment!



## Evolution of Fleet Level Monitoring

### THE REAL NEED

- An industrial investment must rely on an evolved and fully integrated Business Management Software (commonly known as an ERP<sup>(\*)</sup>) that:
  - Facilitates information flow between all the business functions
  - Shares data across various locations or fleets
  - Manages connections to all the outside stakeholders



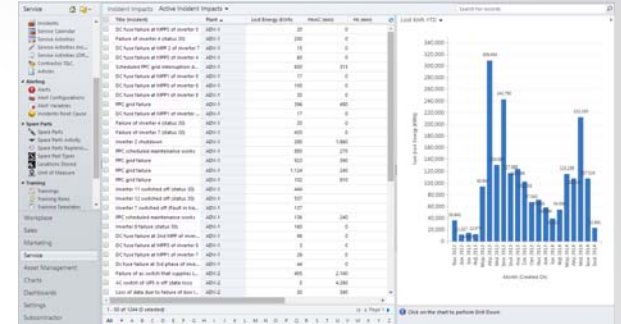
(\*) ERP: Enterprise Resource Planning



## Evolution of Fleet Level Monitoring



### REDEFINING MONITORING...



...Instead of monitoring the outcome (measured produced energy) monitoring and managing the operations (technical and financial asset management) that lead to the outcome...



### ...TO THE ERP EVOLUTION

...Simple monitoring must evolve towards full Solar ERP Systems allowing full Fleet Level Management

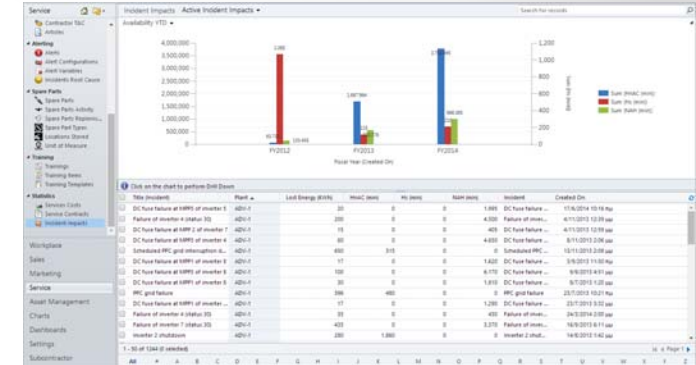
and Operational Monitoring



## Evolution of Fleet Level Monitoring

### Solar ERP Systems for Fleet Level Management

- Provide the best possible insights on the PV asset operations through:
  - World class monitoring system
  - Service management
  - Asset management
  - Integrated management of multiple and geographically distributed PV plants
  - Extensive and customizable reporting capabilities





O&M REDEFINED. OUTPERFORMING EXPECTATIONS.™



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