CloudCAM:
Real-time solar forecasting

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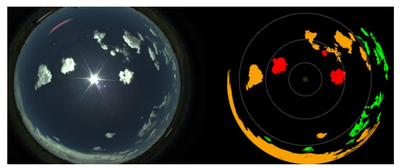
Introduction:
CloudCAM combines advanced computer vision algorithms with complex physical modelling to track and predict future cloud coverage over a PV array. Benefits of CloudCAM forecasting include:

- Meeting grid regulation requirements
- Intelligent spinning reserve management and BESS optimization
- Maximizing PV penetration and minimizing dependency of alternative fuel sources

CloudCAM's core functionalities:

1. **Ramp-Rate Control** or "**Now-cast**" identifies weather conditions that could cause changes in PV power. By pre-emptively ramping down PV, the risk of major fluctuations is mitigated so that network regulation requirements are met. CloudCAM is compatible with all major inverters / control system software.
2. **Power Forecasting** provides quantitative measures of potential energy production in the next 15 minutes. CloudCAM utilizes an Energy Conversion Model (ECM) built for each generator. It processes a plant's real-time operational data and translates cloud coverage into power forecasting values in the time horizon of interest. Probabilistic forecasting values are configurable to suit various control strategies.

   Satellite feeds can be integrated into the ECM to extend power forecasts from 15 min to hours and days ahead.



CloudCAM image (left) and cloud identification (right)

CloudCAM is an on-site cloud detection and solar forecasting system that helps achieve optimal management of solar power fluctuations due to cloud impacts.

Learn more about CloudCAM.

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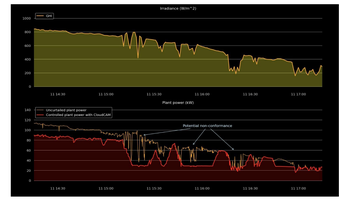
Case Study: BESS Optimization (Now-casting)

Location: Ti Tree, Kalkarindji and Lake Nash PV systems.

Background: The Grid Stability System (BESS) had a design life of 5-10 years, but had suffered significant degradation after 2 years. Three CloudCAMs were installed to predict cloud events and ramp down inverters to a "safe" level, this safe level was determined by the batteries state of charge and generative capacity of the sites.

Results: BESS cycling was reduced by 90% with no impact on yield. The site was able to operate at full PV penetration without BESS support.

CloudCAM Ramp Rate Control



Reference sites:

Plant Name	# of CloudCAM	Size
Ramp Rate Control		
Blackbear Solar Farm	1	130MW
OATI	1	~1MW
Karratha Airport	2	1MW
Power Forecasting		
Haughton Solar Farm	5	120MW
Kidston 1 Solar farm	9	50MW
Katherine Solar Farm	3	25MW
Spinning Reserve Management		
Port Hedland Solar Farm	2	45MW
Kiribati (Microgrid)	2	~3MW
Hybrid Plant Management		
North Star Junction Solar Farm	9	120MW
Mica Creek Solar Farm	5	100MW
Chichester Hub	4	60MW
Gudai Darri Solar Farm	3	34MW
Yuri Renewable Hydrogen Project (Electrolyser)	2	18MW

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