Magellan Solar Smoother

Sky Eye Technology

magellanpower
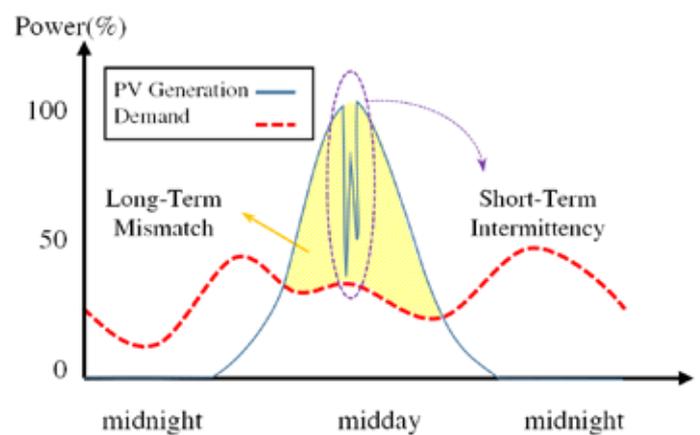
THE NEED FOR
GENERATION MANAGEMENT

Solar energy is very popular in Australia and its installation on both small and large (regional and metropolitan) grid systems is rapidly increasing. However, the erratic nature of solar generation causes problems for the grid and more installations result in more power disturbance.

For example, when clouds cover the sun, the amount of electricity the (solar using) homes generate will drop suddenly, causing this loss to be compensated by the grid. This loss may not be significant for a large, strong grid but it is for a small (weaker) grid. When this happens en mass the loss of solar generation may be too sharp for the grid to cope with, resulting in too much demand on the network - thus causing reliability problems.

The first utility to respond to this problem was the West Australian regional grid power supplier Horizon Power which mandated that all new solar installations using its grid be equipped with technology to smooth the transition of renewable energy, and give time for the generators to react to a cloud event.
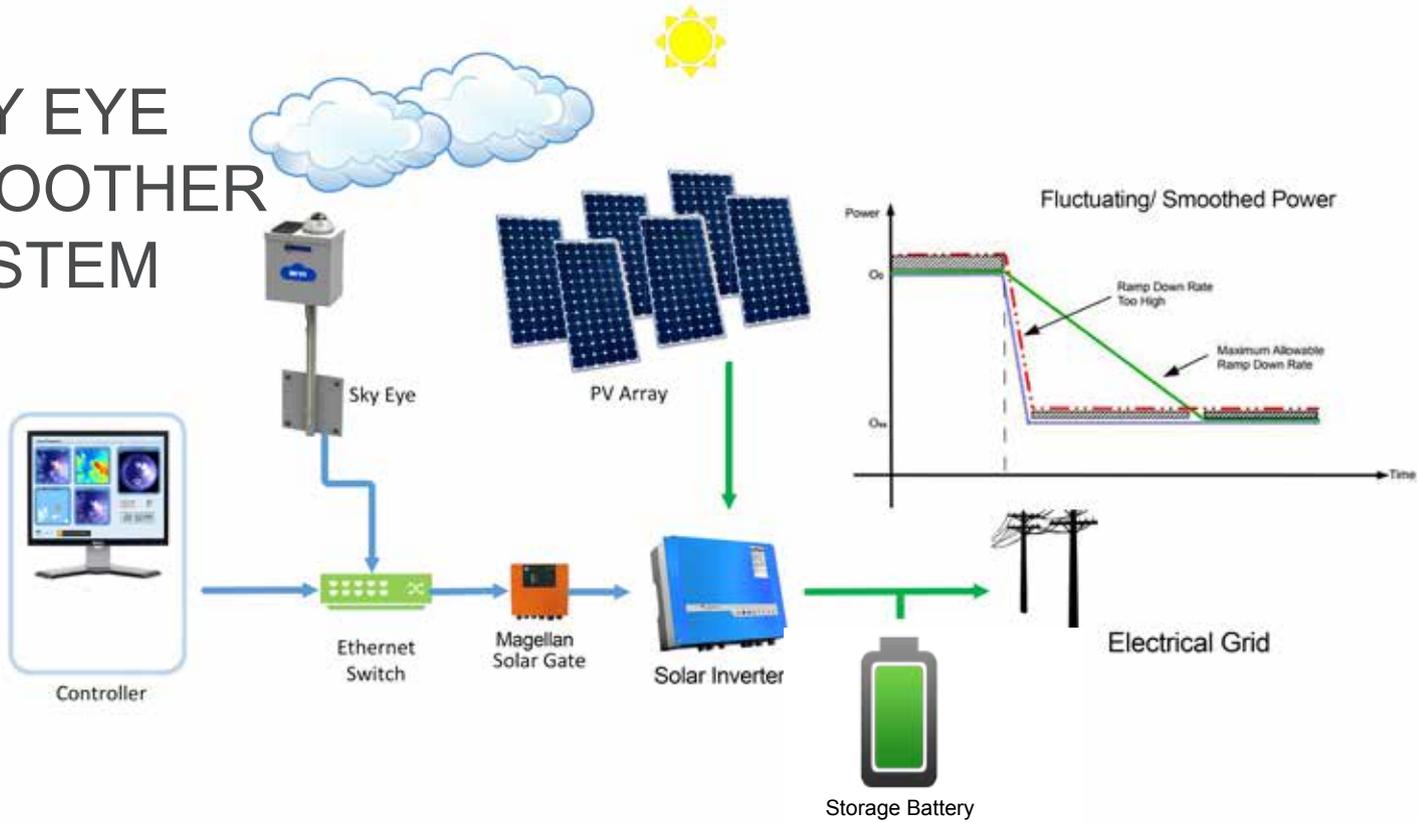
The Magellan Sky Eye Solar Smoother is a practical, innovative and cost-effective solution which uses real-time information from a Sky Camera to predict cloud's motions for periods of 12 mins ahead, and applies ramp down before the arrival of moving clouds. The Sky Eye works proactively through using the latest imagery and predictive algorithms together with machine learning software.

It "sees" the approaching weather, by tracking the cloud movement and precisely calculating the moment of impact of the cloud shadow on the solar panels and therefore the solar generation. It then commands the solar inverter to reduce solar generation in a controlled manner, allowing the grid generator to ramp up and take the load again.
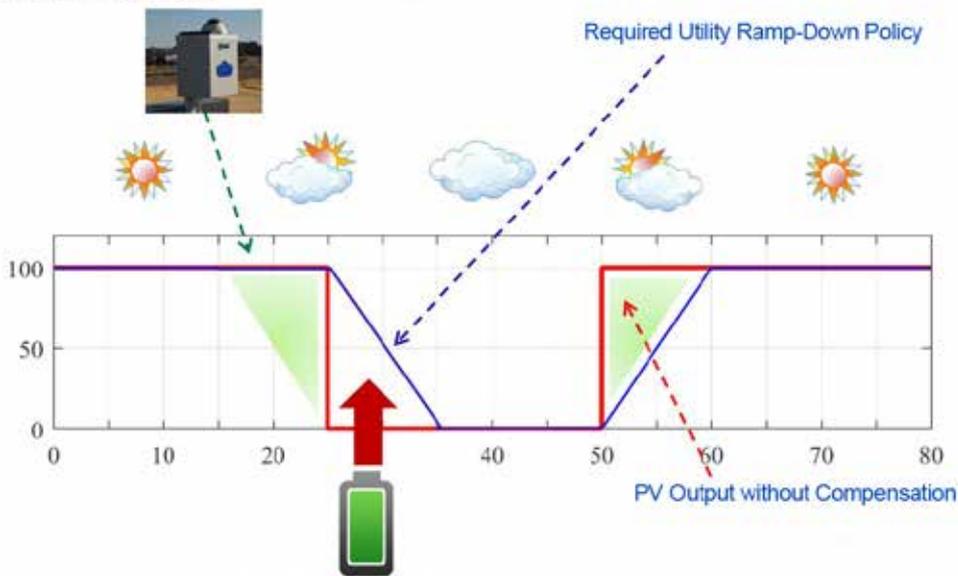
MAGELLAN SKY EYE

SKY EYE SMOOTHER SYSTEM

Sky Eye

PV Array

Controller

Ethernet Switch

Magellan Solar Gate

Solar Inverter

Electrical Grid

Storage Battery

Fluctuating/ Smoothed Power

Ramp Down Rate Too High

Maximum Allowable Ramp Down Rate

HOW IT WORKS

Proposed Solution: Sky Camera Assisted PV (Practical & Affordable)

Required Utility Ramp-Down Policy

PV Output without Compensation

Large Battery is required without Sky Eye

The Magellan Sky Eye is a practical, innovative and inexpensive solution which uses real-time information from a Sky Camera to predict cloud motions for periods of 12 mins ahead, and applies ramp downs before the arrival of moving clouds.

Solar Smoother for 50kW Peak Solar Installation	
Nominal Inverter Capacity	13.8 kW
DC Link Voltage	48V
Battery Type	Lithium-ion
Nominal Voltage	51.8V
Voltage Range	42V - 58.8V
Battery Brand	LG
Chemistry	NMC
Nominal Battery Module Capacity	3.2kWh
Total Nominal Capacity	19.2kWh
Enclosure	Indoor Installation
Weight	550kg with battery
Dimension (WxDxH)	1100mm x 800mm x 2000mm
Cooling	Fan Forced
User Interface	Colour touch screen 4:3"
Remote Monitoring Interfaces	PV Output Portal Magellan Portal Internal Website Smartphone App
Communication Interfaces	Wifi/USB
System Setup Software	Wifi App and Windows Software
Data Logging	Internal non-volatile memory
Standards Compliance	AS4777.2:2015 AS3100/IEC62109-1/-2 IEC62040-1 C-Tick/EN61000
Options	Remote Monitoring using 3G/ 4G modem
Sky Eye Camera Specifications	
Cloud Prediction Range	Up to 12 min
Camera Type	Fish-eye IP camera with Wide-Dynamic-Range (WDR)
Communication	TCP/IP Ethernet Power-Over-Ethernet (POE) 5W
Enclosure	Weatherproof (IP68) Steel Enclosure L250mm x W160mm x H328mm

For Solar installations larger than 50kW peak, multiple 50kW solar smoothers can be used.

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