



# Commercial Solar – the next big wave in the PV industry?

**SPREE Seminar, UNSW  
Thursday 1st May 2014**



# The questions that will be answered

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- i. Who is ePho Pty Ltd ?
- ii. What has happened in solar over that last few years?
- iii. Where will it go to over the next few years?
- iv. Does commercial solar make sense?
- v. Why is it taking off so slowly?
- vi. Do I get what was promised?
- vii. Summary



# Who is ePho?

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ePho Pty Ltd  
is about Credibility



$e^-$  is the symbol for electron

ePho develops, engineers, procures, constructs, commissions, operates and maintains **commercial solar systems**.

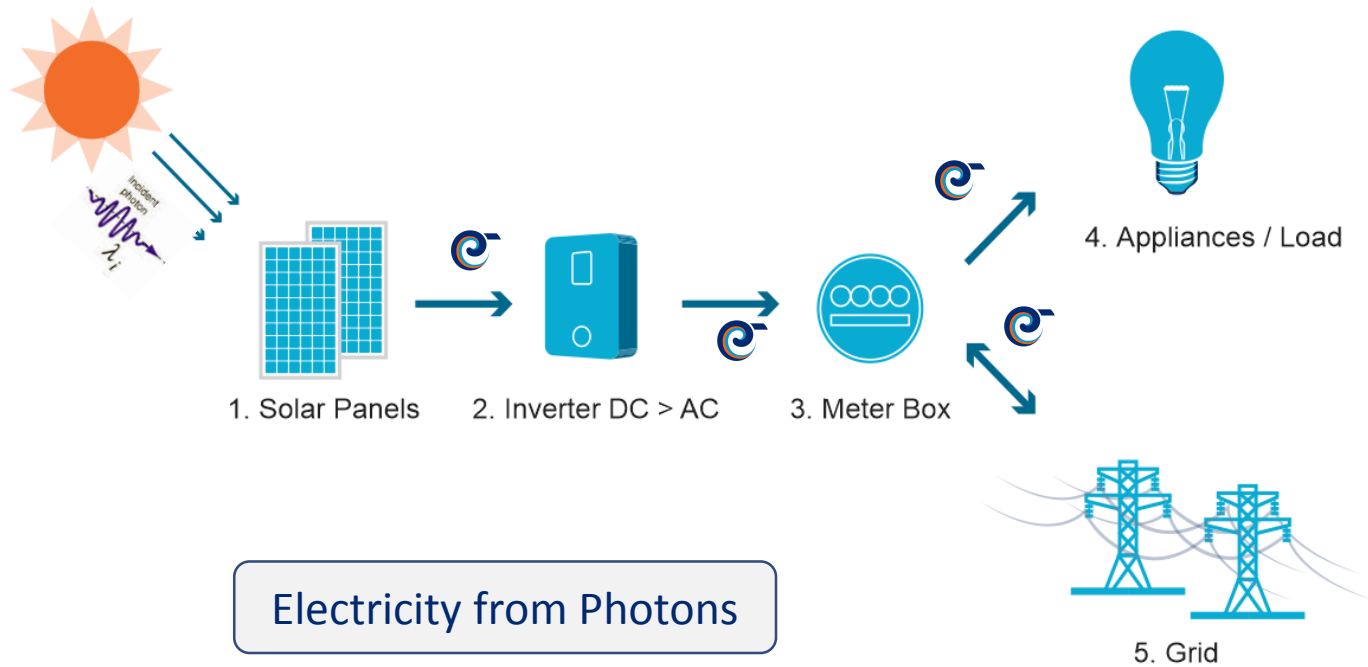
ePho cuts electricity costs

ePho connects companies to the sun

ePho has the team with decades of experience



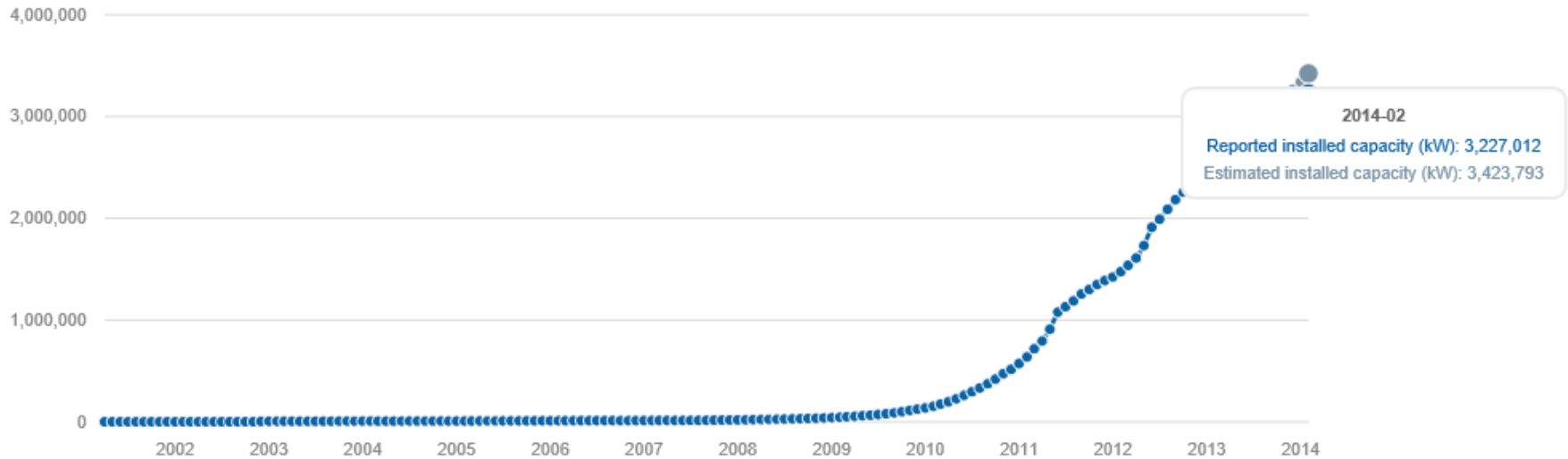
# What is solar energy (photovoltaics)?





# Australia's PV market

Australian PV installations since April 2001: total capacity (kW)



Source: Australian PV Institute, Market Analysis

... and then it grew



# Welcome to Australia's solar-coaster

Australian PV installations since January 2010: kW installed per calendar month

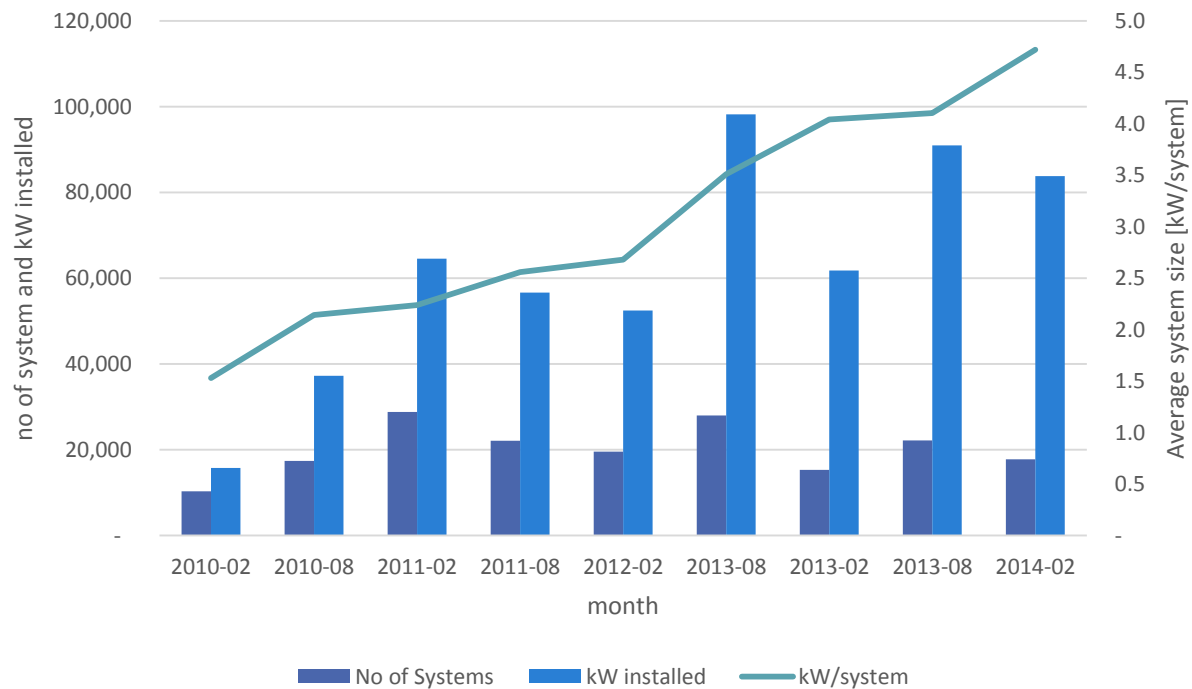


Source: Australian PV Institute, Market Analysis

... And it is never boring



# The country of small systems



Sample months show the continuous increase of system size but remains dominated by residential systems.



# Segment Forecast

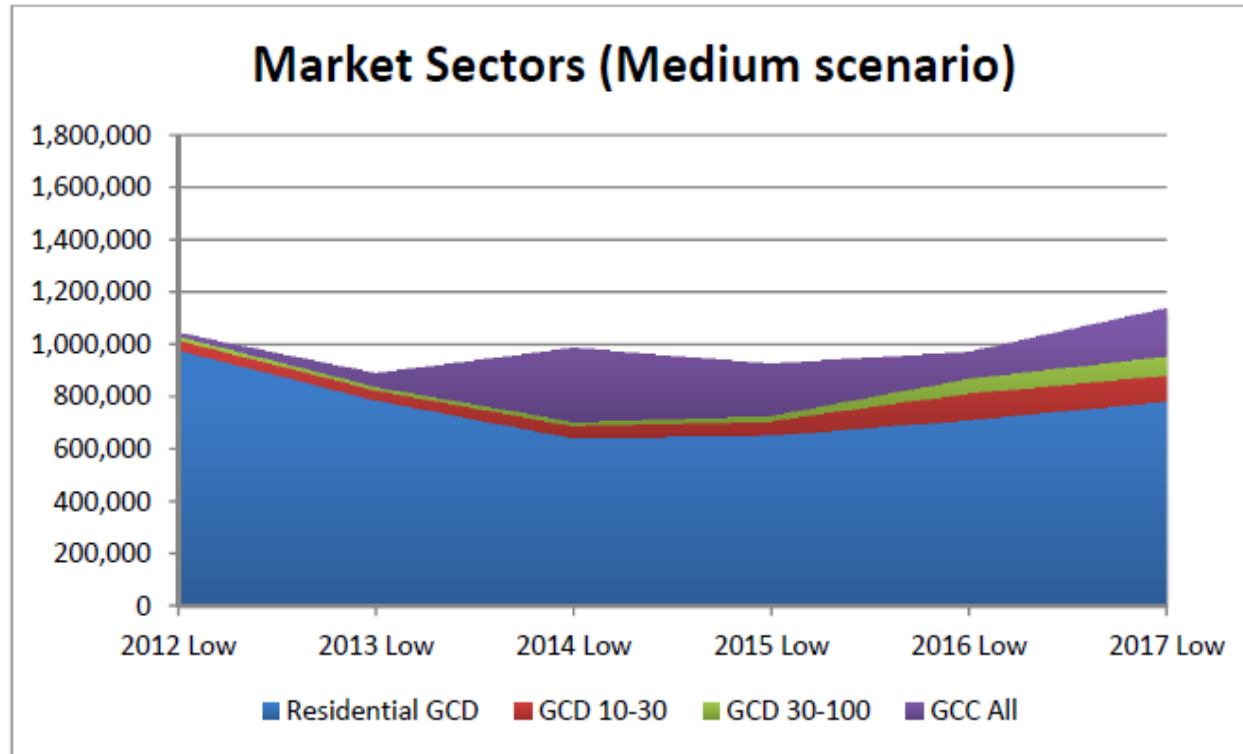


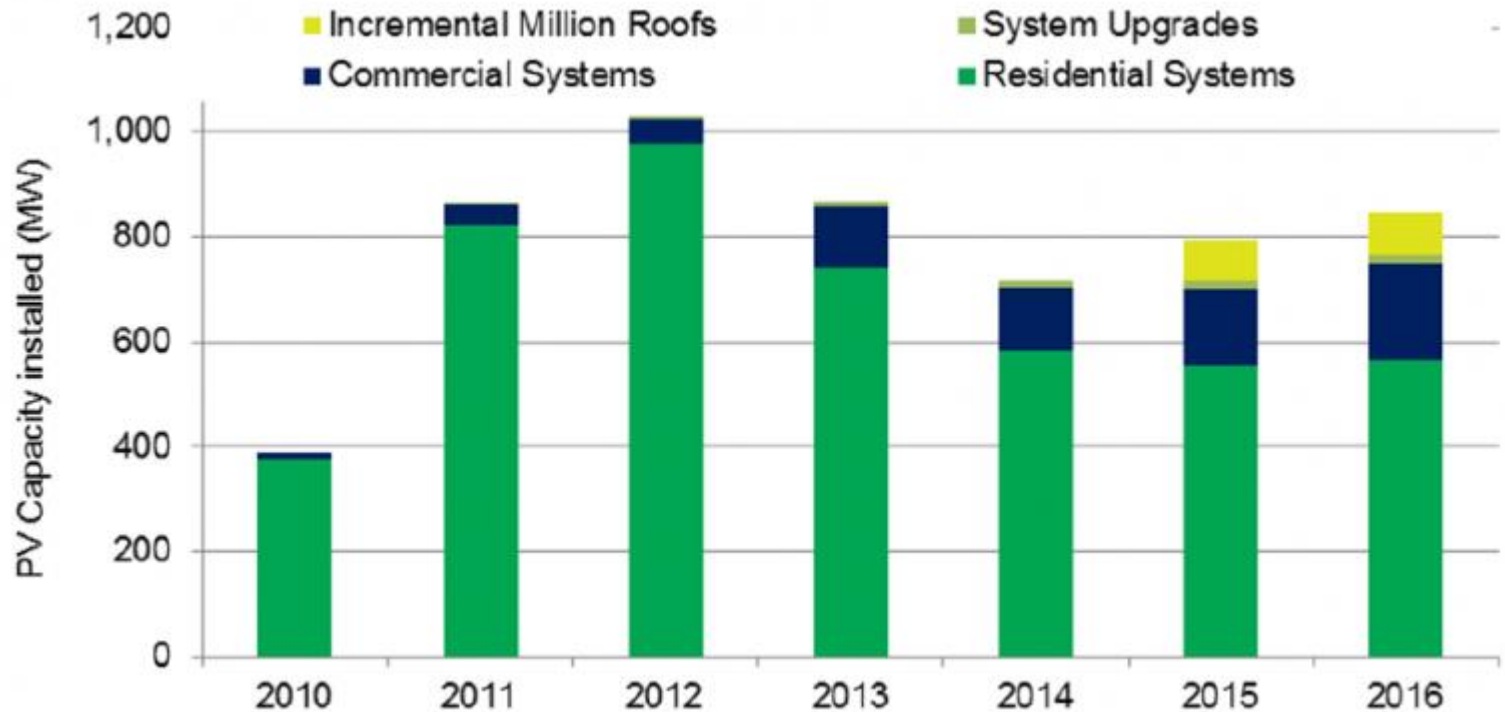
Figure 38: Market Sectors (Medium Scenario)

Source: Australian PV, 2012-2017 Market Forecast (Solar Business Services)





# Latest Forecast

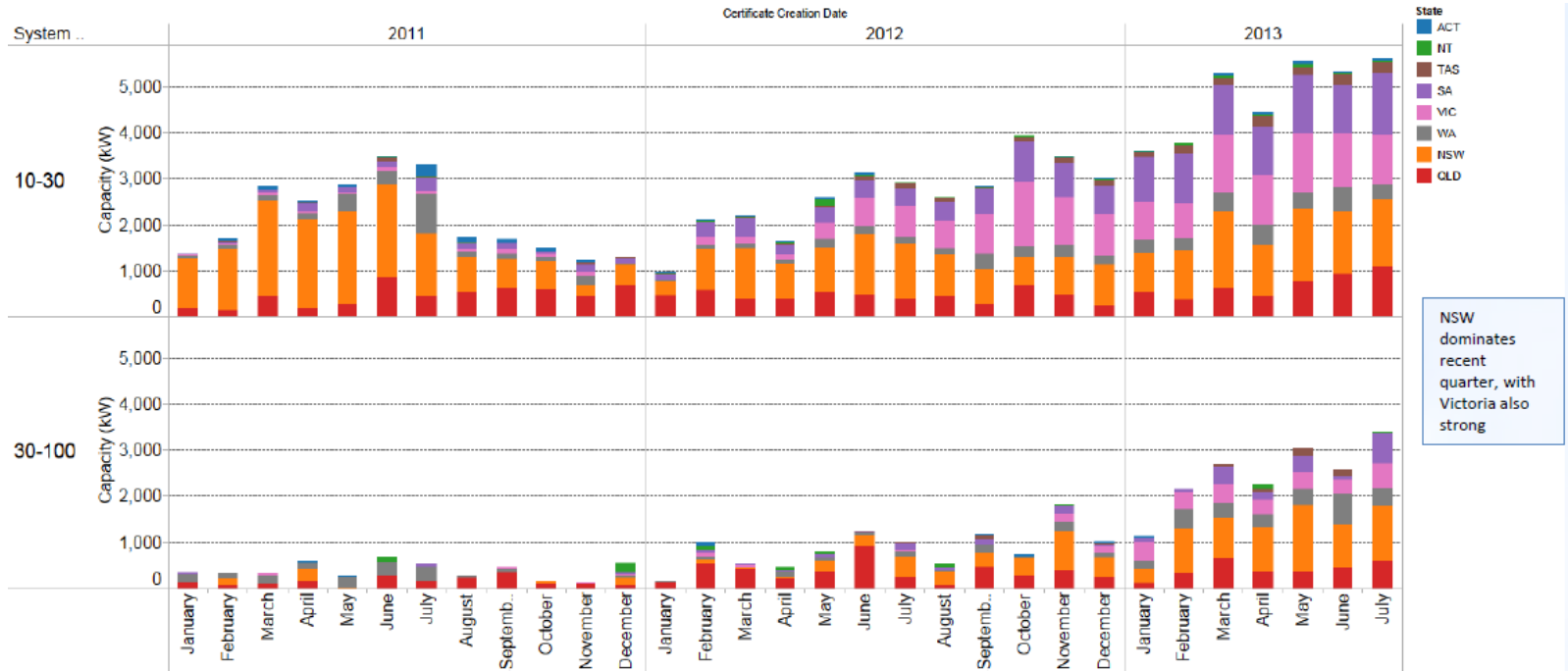


Source: Green Energy Markets (2014) published by Tristan Edis in Climate Spectator "Why residential solar dominates", 4 Apr.2014

Commercial is growing, but slower than it should do.



# Commercial solar trend



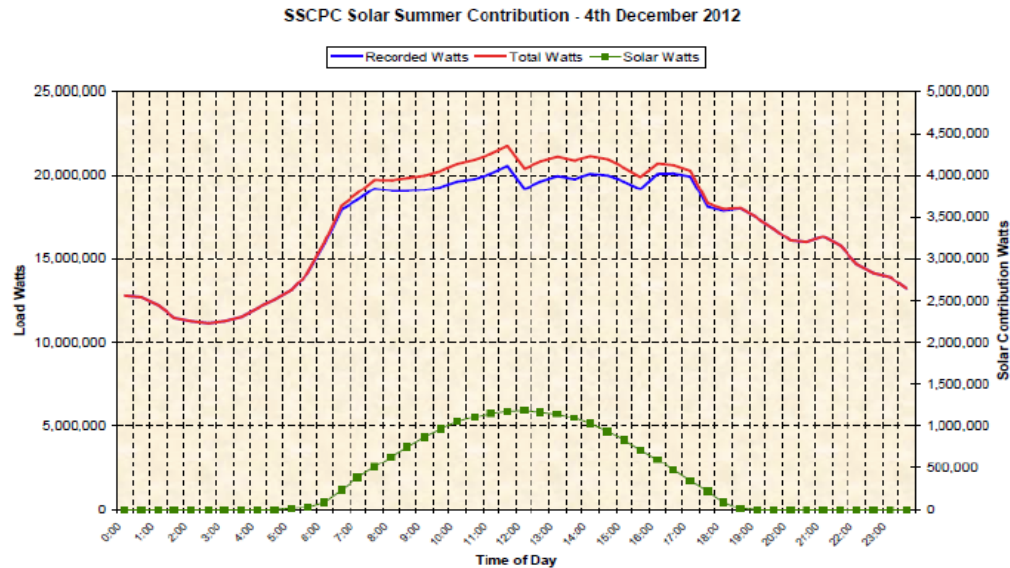
Source: Commercial PV market (Source: Sunwiz, Aug. 2013)

The trend for commercial solar is up-wards, but not a “hockey-stick”



# The Business Case for Commercial Solar

## Solar PV Impact on Industrial Substation Demand



Industrial substations – Minor impact from Solar PV on substation peak Demand – small numbers of PV

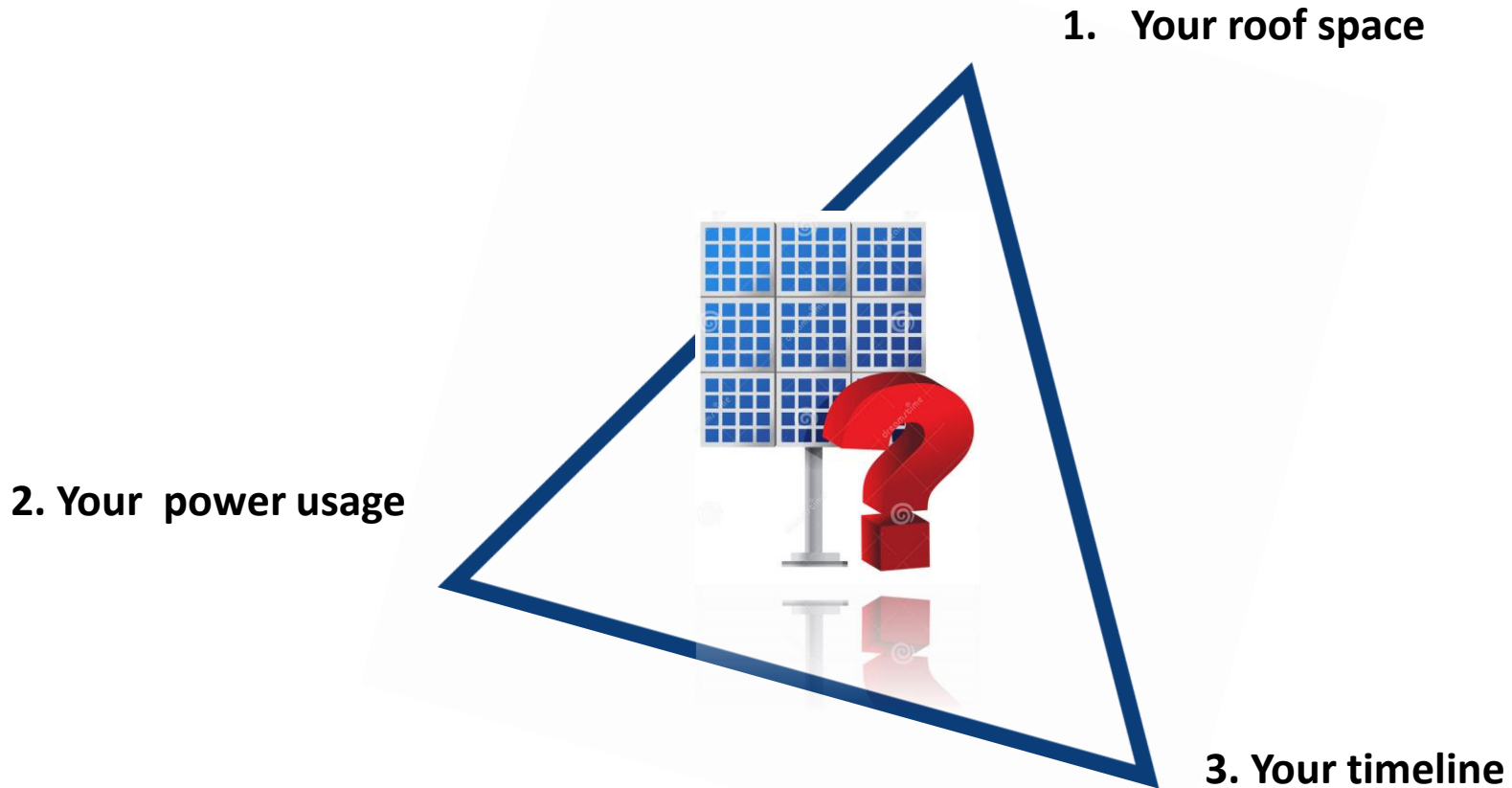


Solar fundamentally makes sense for commercial users



# A balance between three factors

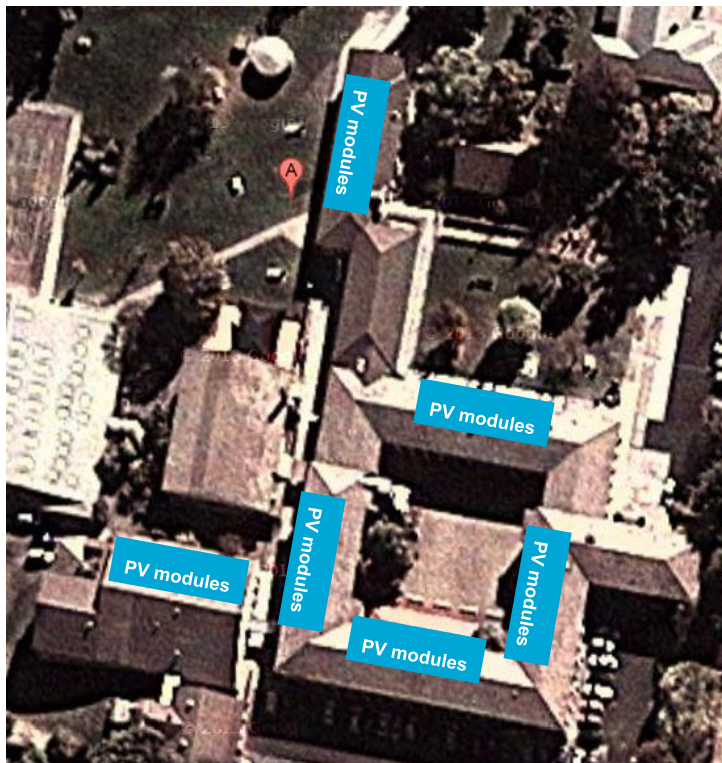
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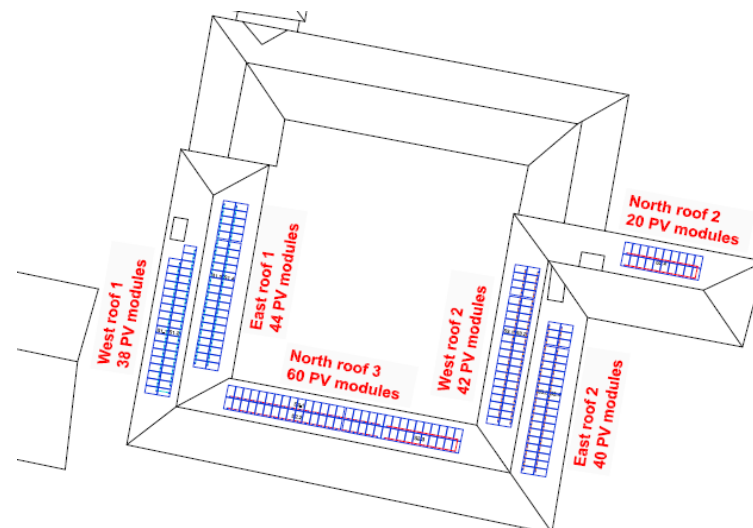


# Roof - James Sheahan Catholic High School in Orange -an example

## Iterations to design the best systems



## Final module layout plan



Layout needs to take into consideration structural suitability of roof, safety etc.

According to **State Environmental Planning Policy (Infrastructure) 2007**:  
Complying Development Certificate is required



# Power Usage – Understanding the power bill



From simple ...

Tariff Class	Description	Units kWh/day	Rate (excl GST)	Fixed Charge \$ per day (excl GST)	Rate (incl GST)	Fixed Charge \$ per day (Incl GST)	Tariff status
5740	Business	All	\$ 0.36000	\$ 1.51140	\$ 0.39600	\$ 1.66254	

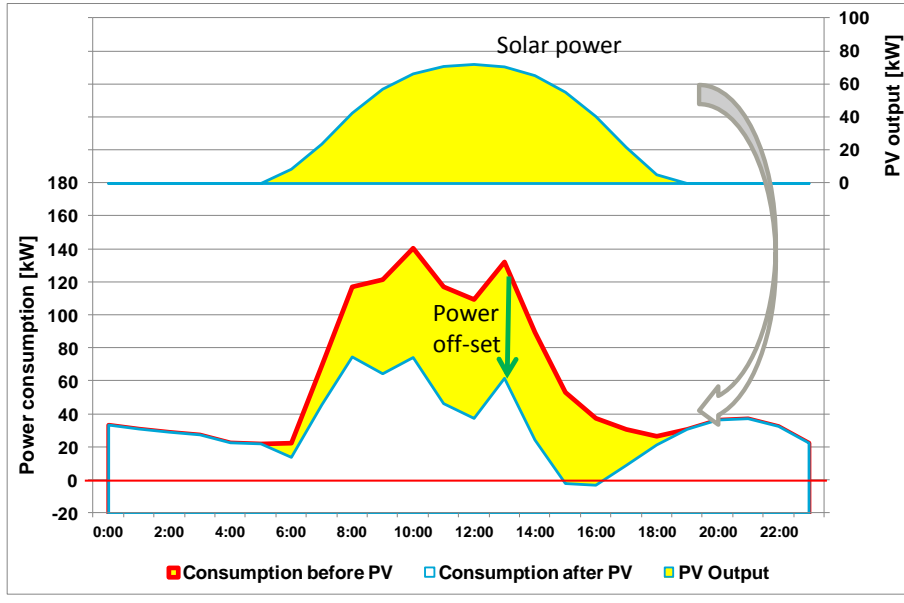
... to not so simple

	Days	Quantity	Rate	Rate (incl. Energy losses)	Charge
<b>Energy Charges</b>					
Peak		10155.987 kWh	\$0.057878 / kWh	\$0.061841/kWh	\$628.06
Shoulder		24588.179 kWh	\$0.057878 / kWh	\$0.061841/kWh	\$1,520.56
Off Peak		20258.936 kWh	\$0.035781 / kWh	\$0.038231/kWh	\$774.52
Carbon Adjustment		55003.102 kWh	\$0.02132 / kWh	\$0.02278 / kWh	\$1,252.94
Sub-total					\$4,176.08
<b>Network Charges</b>					
Network Peak		14587.673 kWh	\$0.111110/kWh		\$1,620.84
Network Shoulder		20156.493 kWh	\$0.059860/kWh		\$1,206.57
Network Off Peak		20258.936 kWh	\$0.029110/kWh		\$589.74
Capacity Charge		211 kVA	\$9.47100/kVA		\$1,998.38
Network Access Charge	28 days		\$16.40000/day		\$459.20
Sub-total					\$5,874.73
<b>Renewable Energy Charges</b>					
EB&REC - LRET		55003.102 kWh	\$0.006350 / kWh	\$0.006785/kWh	\$373.20
EB&REC - SRES		55003.102 kWh	\$0.007340 / kWh	\$0.007843/kWh	\$431.39
EB&REC NSW Energy Saving Scheme		55003.102 kWh	\$0.001360 / kWh	\$0.001453/kWh	\$79.92
Sub-total					\$884.51
<b>Other Charges</b>					
AEMO Pool Fees		55003.102 kWh	\$0.000346 / kWh	\$0.000365/kWh	\$20.08
AEMO Ancillary Charge		55003.102 kWh	\$0.000300 / kWh	\$0.000317/kWh	\$17.44
Metering Charges	1		\$4.10959/day		\$115.07
Retail Service Fee	1		\$40.50000/month		\$40.50
Sub-total					\$193.09
Total GST					\$1,112.84
<b>Total current charges (incl. GST)</b>					<b>\$12,241.25</b>



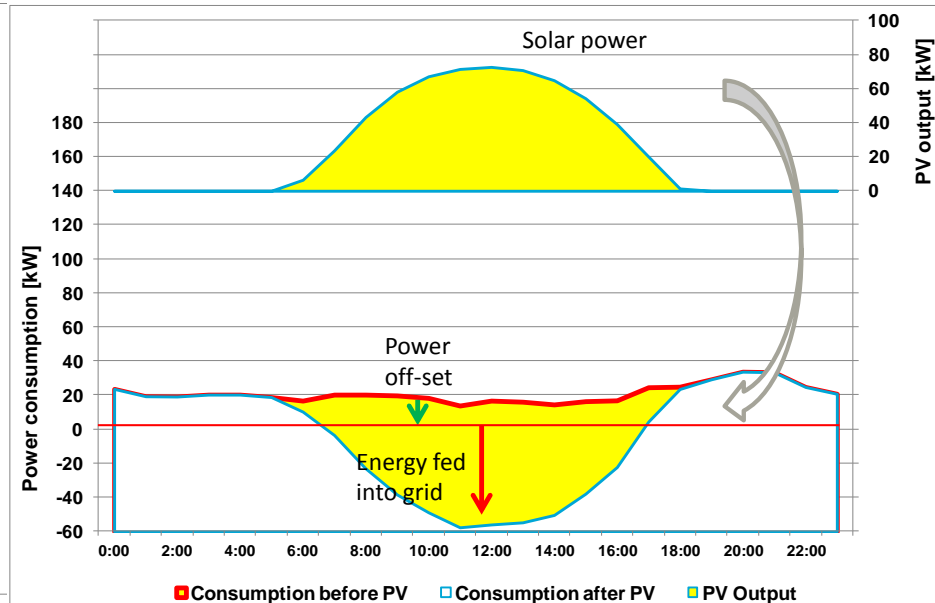
# Power Usage – Analysing the solar benefit

a weekday



Graph 1: Simulated day: 06/02/2013

a weekend



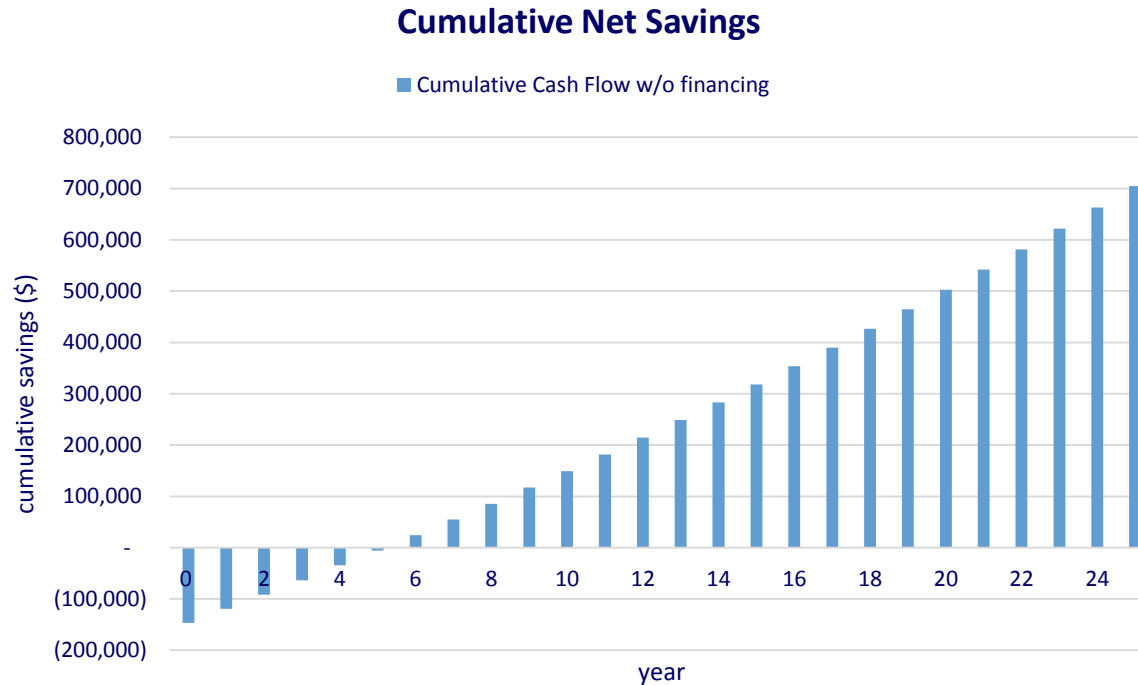
Graph 2: Simulated day: 16/02/2013

Example shows a High School in Orange.

The electricity consumption will be reduced by an estimated 30%.



# Timeline for the payback period



Typical straight-line payback periods are between 4 and 7 years





# Options to deploy commercial solar

## 1. Investment

Driver: ROI

### Benefits:

- Secure attractive return on investment
- System ownership
- Depreciation
- Simple

### Drawbacks:

- Immediate capital expenditure
- Responsibility for system performance

## 2. Leasing

Driver: Cash Flow

### Benefits:

- No initial capital investment
- Simple fixed monthly leasing rates for a fixed term

### Drawbacks:

- Leasing payment not linked to system performance
- Potentially higher financing costs

## 3. Power Purchase

Driver: No Risk

### Benefits:

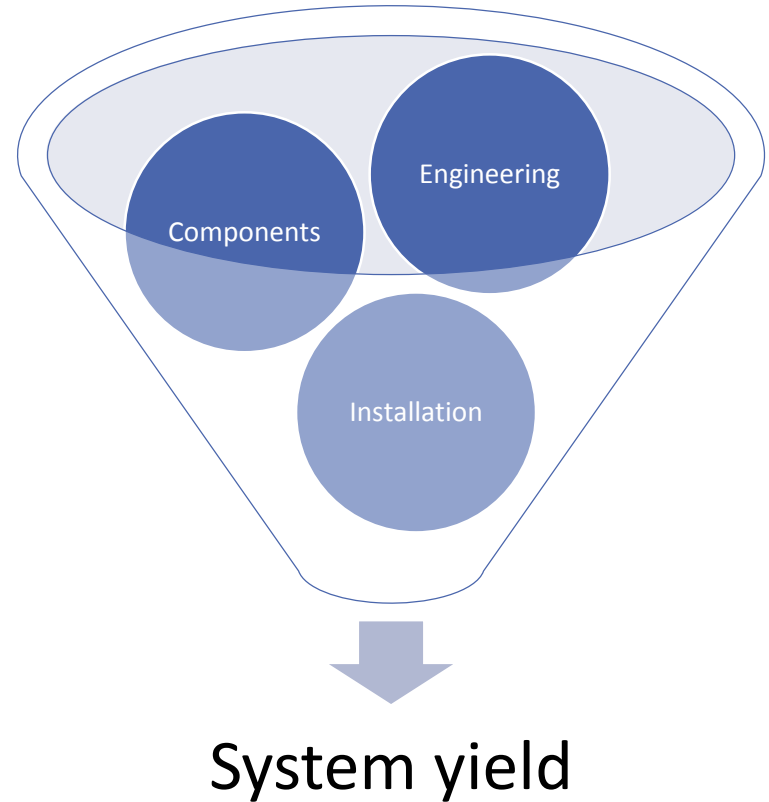
- No ownership required
- Pure purchase of kWh
- No performance risk

### Drawbacks:

- No return on investment
- No free electricity until purchase of PV system.
- More complex



# PV can be highly reliable



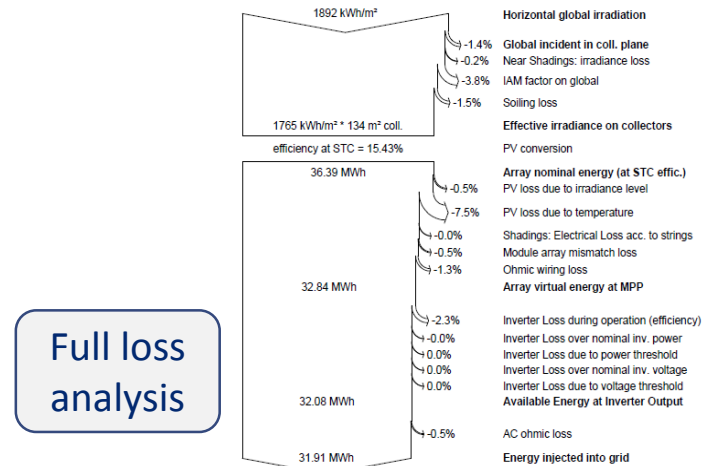
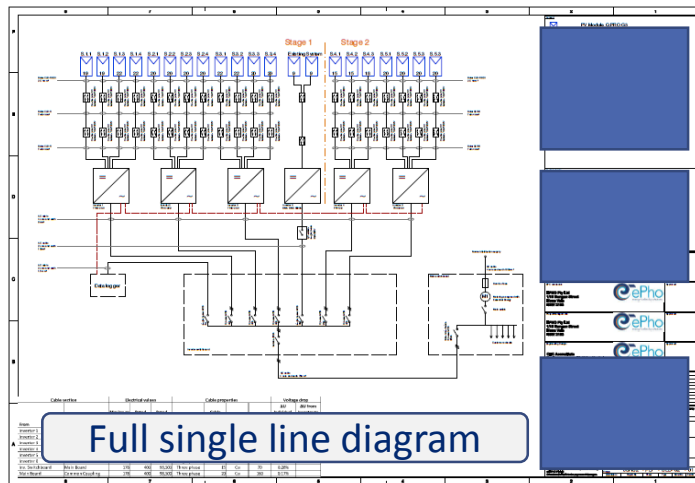
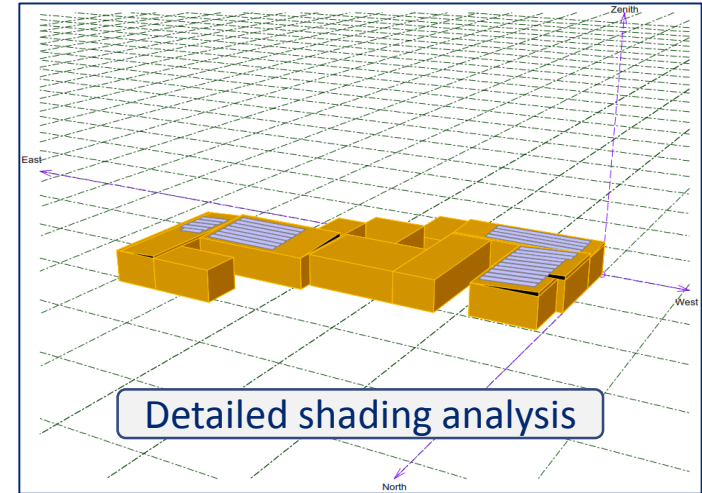
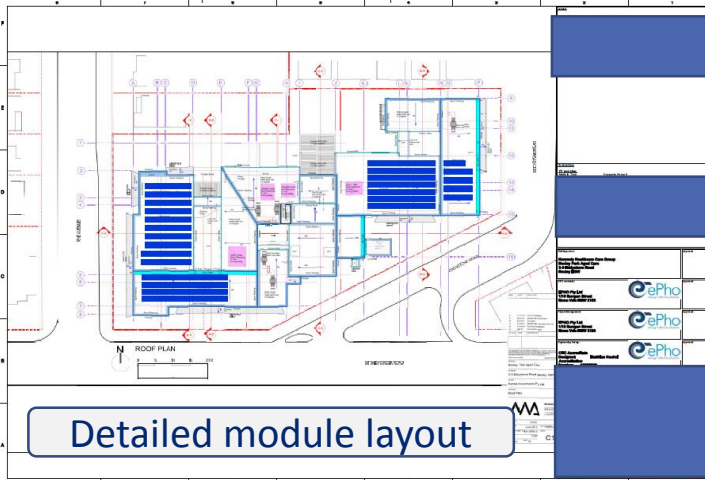
THERE IS ALWAYS SOMEONE...



... WHO WILL DO IT CHEAPER!



# Engineering for commercial systems



**Full loss analysis**

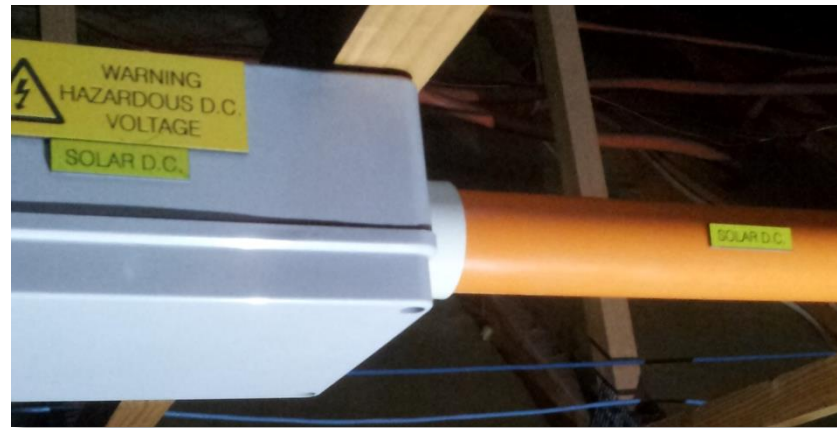


# Installation – it is in the details

The system is supposed to reliably produce electricity for at least 25 years. Everything needs to be done with care.



VS





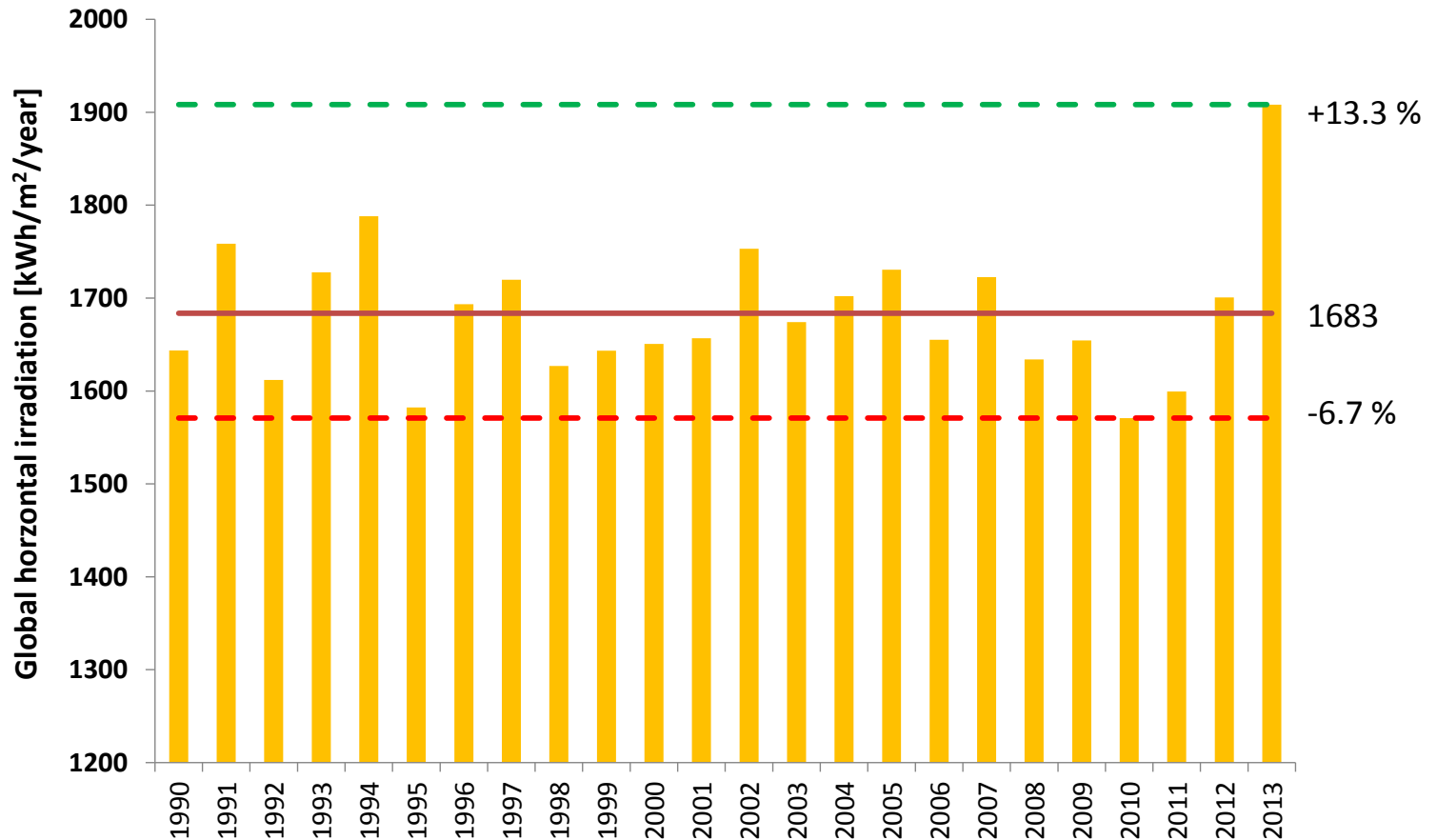
# How often do you monitor your solar system?

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# Solar Irradiance in Sydney



Source: Bureau of Meteorology



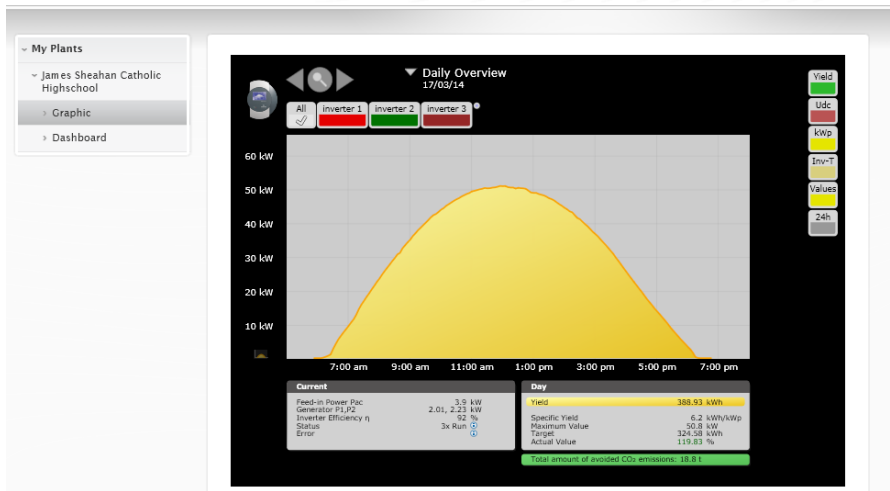
# Monitoring of sunny and rainy days



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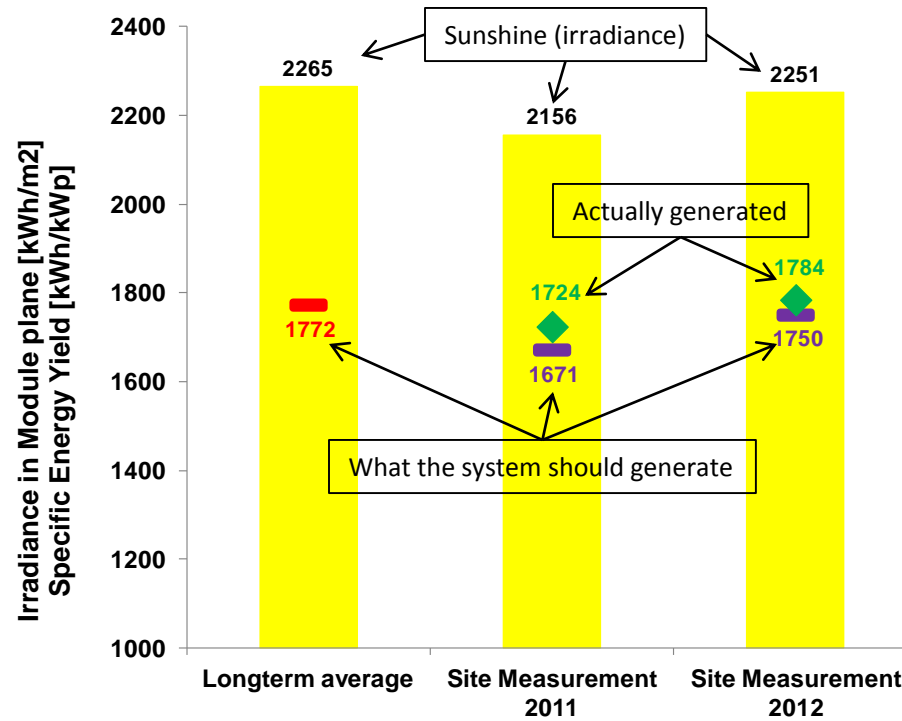
ePho Commercial Solar







# System forecasting



Roof top installation of a 154 kWp Q CELLS solar system for Xstrata Copper at Mt Isa



# Summary

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- Commercial solar makes a lot of sense.
- Commercial solar can be cash flow positive from day one.
- It needs to be done right.
- It is highly predictable and reliable.
  
- My guess ...  
it will become the largest segment of the solar market in Australia.



## Contact details

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