

Decentralised generation and Energy Efficiency

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Questions

- ⌘ What does the drop in PV and storage price mean for energy efficiency projects?
- ⌘ How should you integrate them on a site?

Background



- Established 24 years
- Seven engineers + IT
- > 2,500 projects
- Energy efficiency analysis and implementation
- Industrial, commercial and agriculture
- Projects increasingly integrating renewables



Possible threat to energy efficiency ?

- ⌘ Just install PV, don't worry about efficiency
- ⌘ Seduction of the simple solution to a complex problem
- ⌘ Pathway dependent thinking



Positive thinking

- ⌘ Solar PV increases awareness of energy
- ⌘ People start thinking about reducing energy costs
- ⌘ Positive proof that investment return is not the only factor
- ⌘ PV brings customers, and
- ⌘ Energy efficiency will improve a PV project:
 - ⌘ Overall return on investment
 - ⌘ Percentage reduction in grid electricity, \$ and CO₂.



Other Effects

- ⌘ Opportunity / incentive to look at alternatives to natural gas.
- ⌘ Demand management / load profile / controls become more important.
- ⌘ Need to re-examine network tariffs.

Energy Efficiency

- Best Return, Smaller Savings
- Stand-alone efficiency projects
- Cash positive finance available, \$0 down, (typ.) 5 year term
- Typically 40% saving possible, 2.5 year payback

Energy Generation (Solar Power)

- Excellent Return, Largest Savings
- Demand / Supply Profile matching
- Cash positive finance available, \$0 down, (typ.) 5 year term
- VEEC +ESS creation as part of lighting projects will give cash rebate
- Typically 60% saving possible, 3-4 year payback
- Full project management

Combined Project

- Good Return, Smaller Savings
- Stand-alone solar projects
- Cash neutral finance available, \$0 down, (typ.) 7 year term
- Typically 40% saving possible, 6 year payback



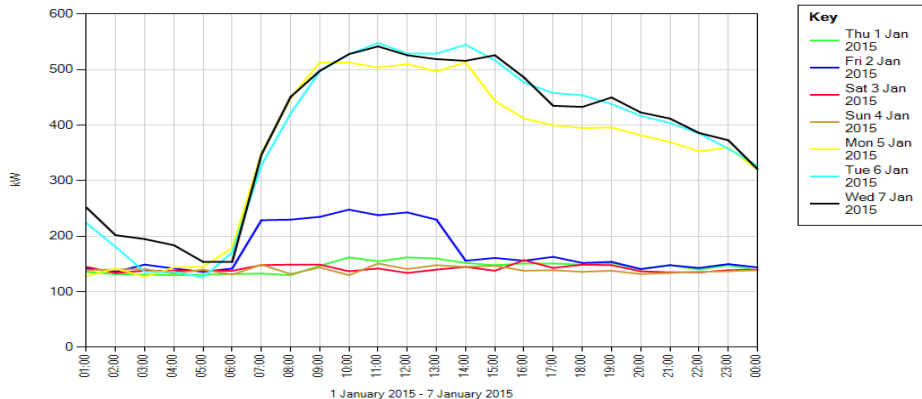
Use of Storage

- ⌘ Stay grid connected
- ⌘ Batteries are expensive, unless replacing diesel generated electricity with solar.
(But if it gets people thinking about energy)
- ⌘ Cheaper forms of storage:
 - ⌘ Heat and coolth (in liquids, buildings, product)
 - ⌘ Product
 - ⌘ Others?



Designing the PV system

- ⌘ Analyse existing electricity demand patterns *and* energy efficiency and demand management opportunities.
- ⌘ Look at Summer and Winter load profiles
- ⌘ Consider PV size, elevation, and orientations other than North.



We're doing it.

Site Details								
NMI	Supply Address	Bill Start Date	Bill End Date	Days	Total Cost			
64073135238	SHOP, 271 BURKE Road, GLEN IRIS	01-Oct-2015	31-Oct-2015	31	(\$95.50)			
Meter Details								
Meter Number	Tariff	Last Read		Latest Read		Multi	Next Read Date	Total Usage
0883903	Peak	30-Sep-2015	0.000 A	31-Oct-2015	62.908 A	1.00	09-Nov-2015	62.908 kWh
0883903	Solar	30-Sep-2015	0.000 A	31-Oct-2015	563.275 A	1.00	09-Nov-2015	563.275 kWh
Supply Charges								
Description	Start Date	End Date	Usage	Unit Price	Total Price			
Daily Charge	01-Oct-2015	31-Oct-2015	31	1.131500	\$35.08			
Peak - step 1	01-Oct-2015	31-Oct-2015	62.908	0.162800	\$10.24			
Solar	01-Oct-2015	31-Oct-2015	563.275	-0.250000	(\$140.82)			
A = Actual, S = Substitute, E = Estimate					Total Cost	(\$95.50)		

- ⌘ Combination of solar PV and energy efficiency:
 - ⌘ Insulation to roof (R4.5), floors, external walls.
 - ⌘ Draft sealing
 - ⌘ Making good use of existing thermal mass.
 - ⌘ Double glazing throughout
 - ⌘ Natural lighting, T5 and LED lighting with occupancy sensing.
 - ⌘ DC EC fans
 - ⌘ High efficiency heat pumps, inverter drive.



We've done it.



⌘ Off grid hotel, French Island

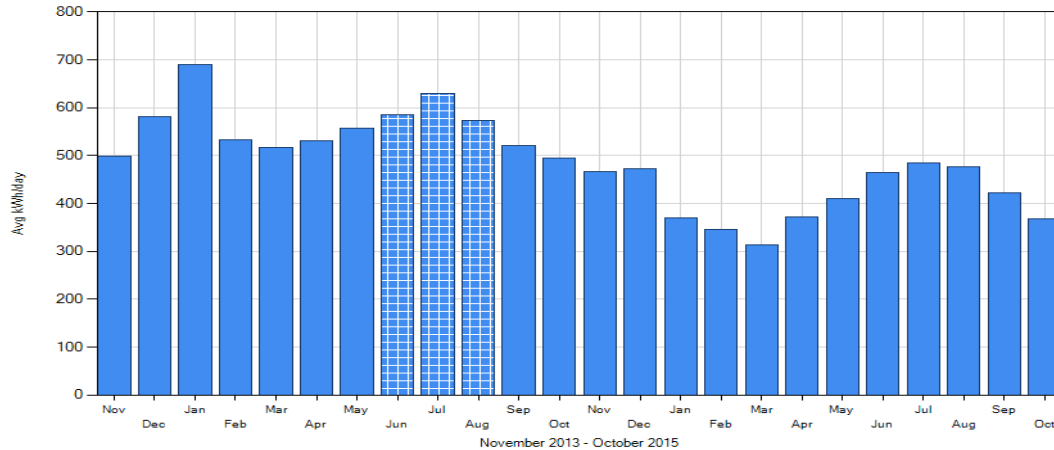
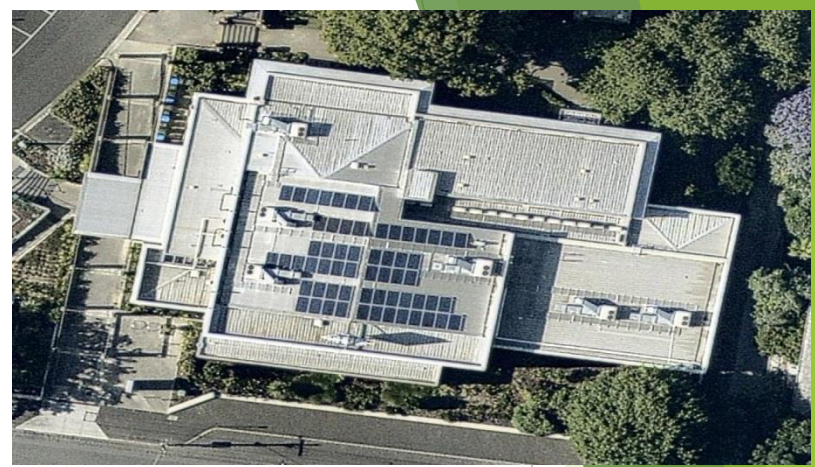
We're doing it.



⌘ Factory, energy efficiency plus 100 kW PV



We've done it.



⌘ Malvern Library, City of Stonnington



Thank you

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