Solar on Strata

A NOOSA MASTERCLASS

WATTBLOCK

Contents

Wattblock Overview

Wattblock has assisted body corporates housing over 50,000 people in the past 5 years.

Our reports cover:

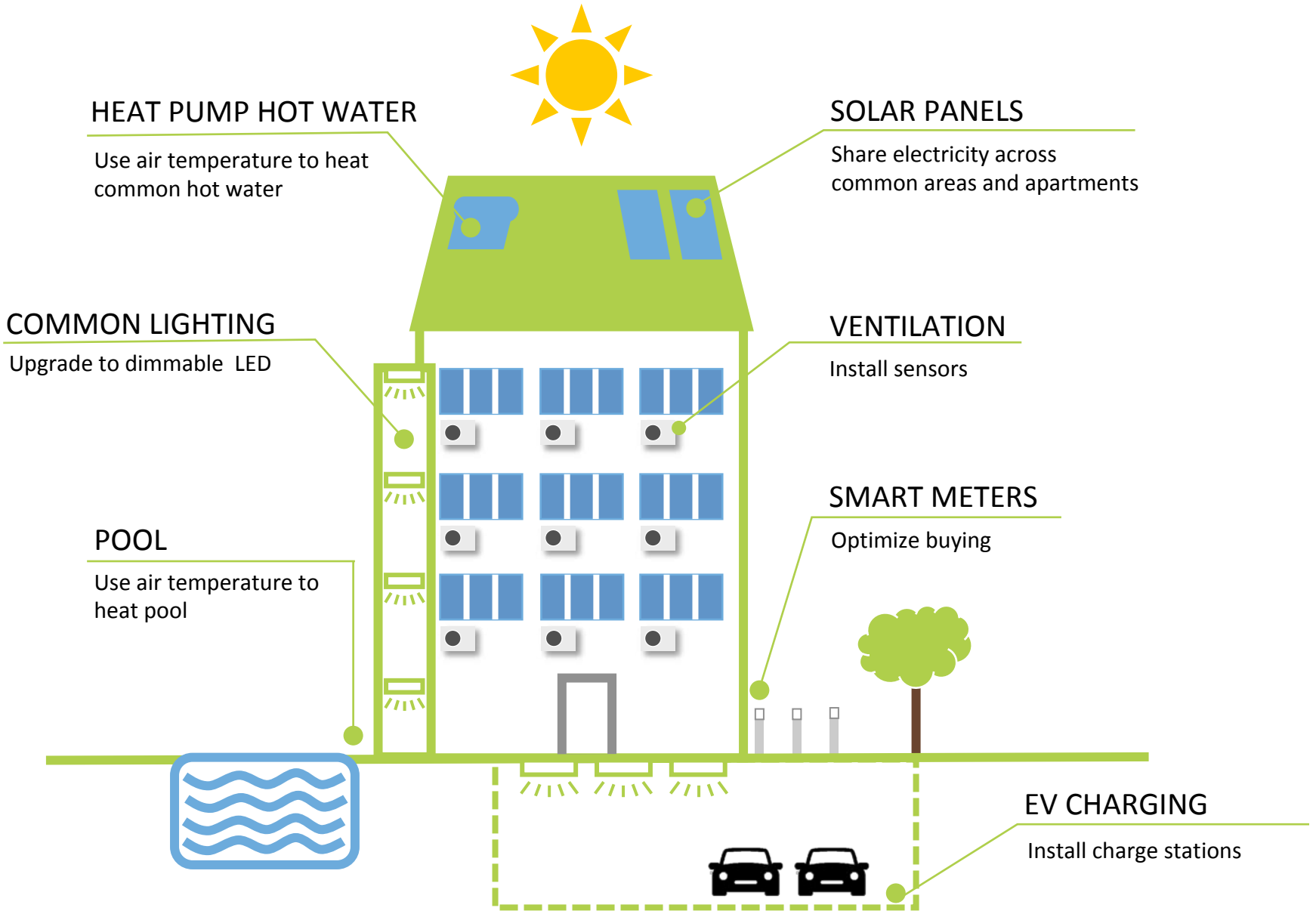
- Solar & battery feasibility studies
- Energy saving
- NABERS ratings
- Electric vehicle charging

Our team has qualified:

- Solar engineers
- Financial analysts
- Energy auditors
- NABERS assessors

We have assisted body corporates from Melbourne to Cairns.

Sustainability in multi-tenant buildings



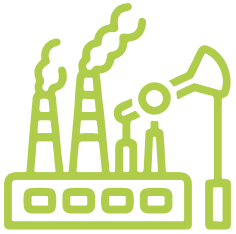
Why put solar on apartment buildings?

Clean electricity

Lower bills

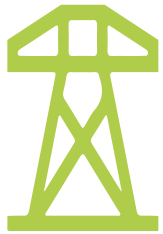
Increased energy security

Low cost generation



Reduced fossil fuel reliance

Reduced CO2 emissions



Reduce network demand

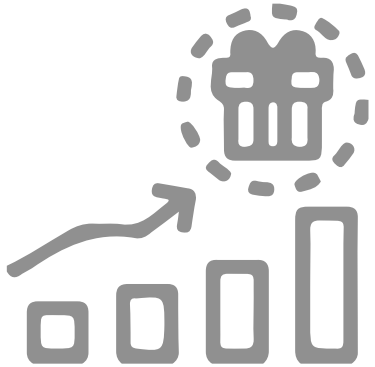
Reduce distribution losses

The Opportunity

- 62% of Australian apartments are in buildings under 4 storeys high
- 1.4 million apartments
- Housing 10% of Australians
- A third of new dwellings are apartment buildings

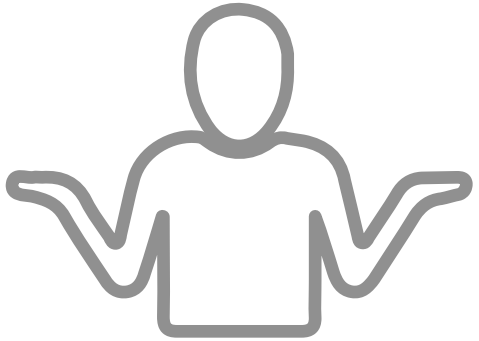
The Barriers to Solar for Body Corporates

Split incentives



Communication

Apathy



Lack of information

Access to finance

Embedded networks

Units of Measurement

Kilowatt (kW)

A measure of instantaneous **power**.

The size of a solar system is measured in kilowatts. E.g. a **25kW solar system**.

Solar systems make Direct Current (DC) which needs to be transformed into Alternating Current (AC) which means there is some loss of power in conversion

Kilowatt hour (kWh)

A measure of **energy**.

- This is what you get billed by your energy retailer for electricity you buy from the grid.
- This is the measure of energy which is stored in a battery e.g**. a 14kWh Tesla Powerwall**

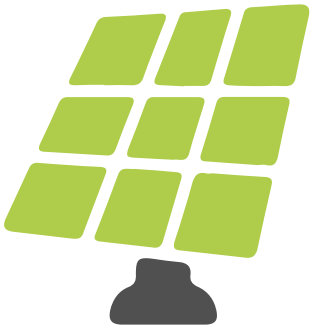
‘Rules of Thumb’ in Solar

The relationship between solar system size in kW and energy produced in kWh

- A 25kW solar system might produce 100kWh of total energy over the course of a day.
- **Rule of thumb** is 4 times the energy in kWh per day is created as the size of the system in kW.

The relationship between solar system size in kW and number of solar panels

- Each solar panel is roughly 2m x 1m
- Panels of similar size may produce more or less power e.g. 250W vs 330W per panel
- The number of panels to make up 1kW of solar system may be 4 panels or 3 panels
- The highest performance panels are the most expensive e.g. ~400W panels.



How can a solar system work in a multi-tenant block?

Source: Allume

Recap

The Band

AC/DC

Solar

DC/AC

Four different solar models

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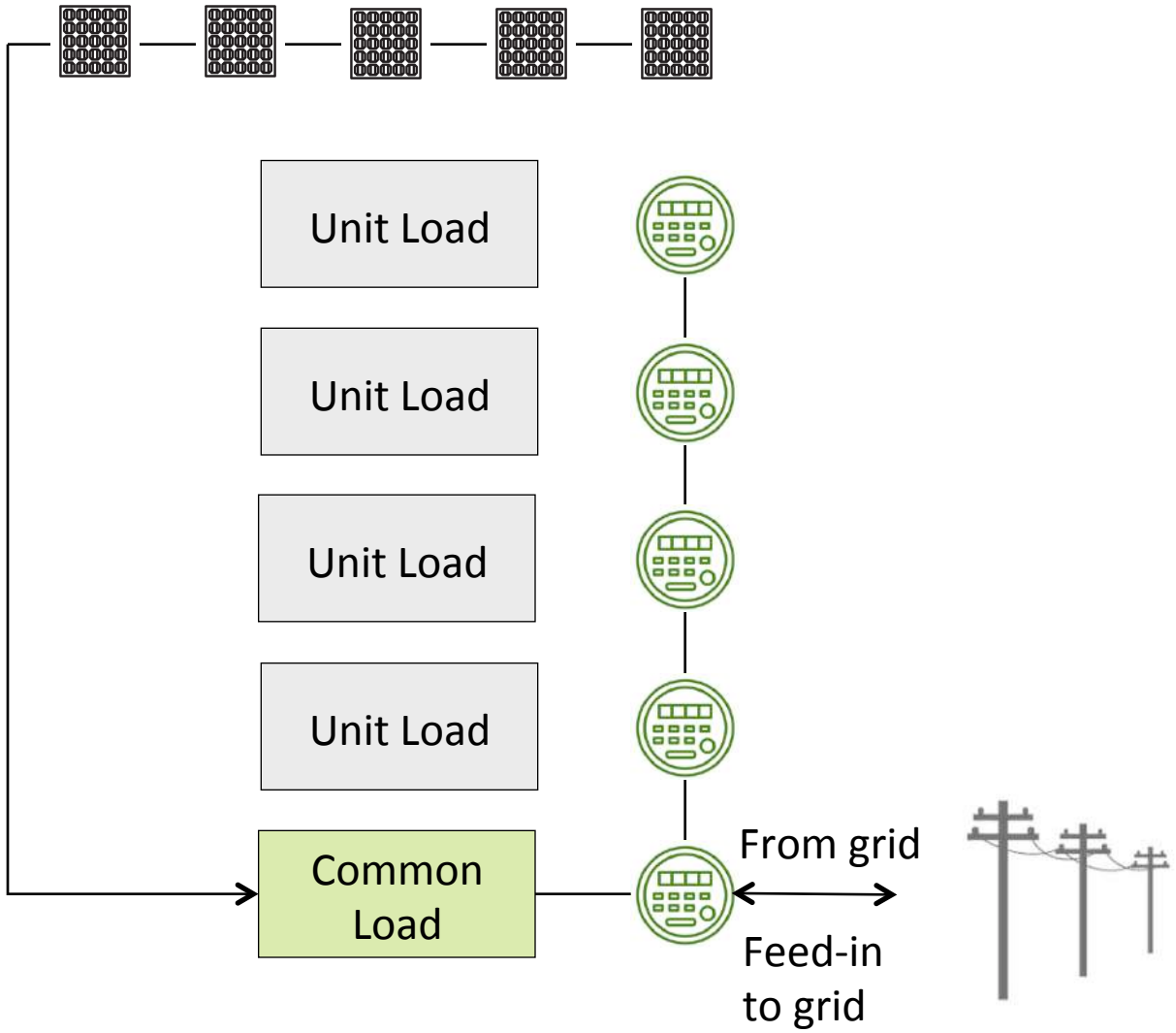
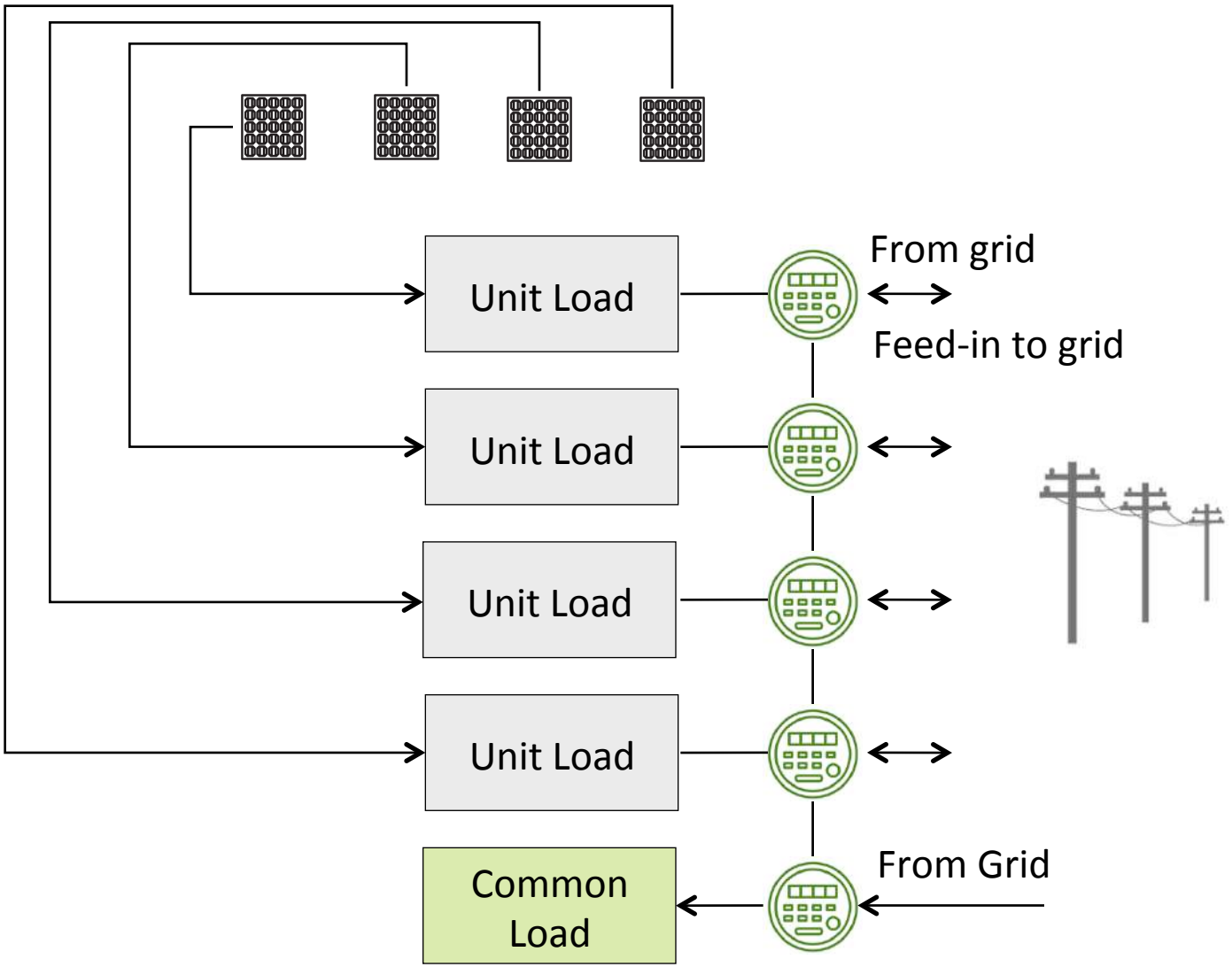
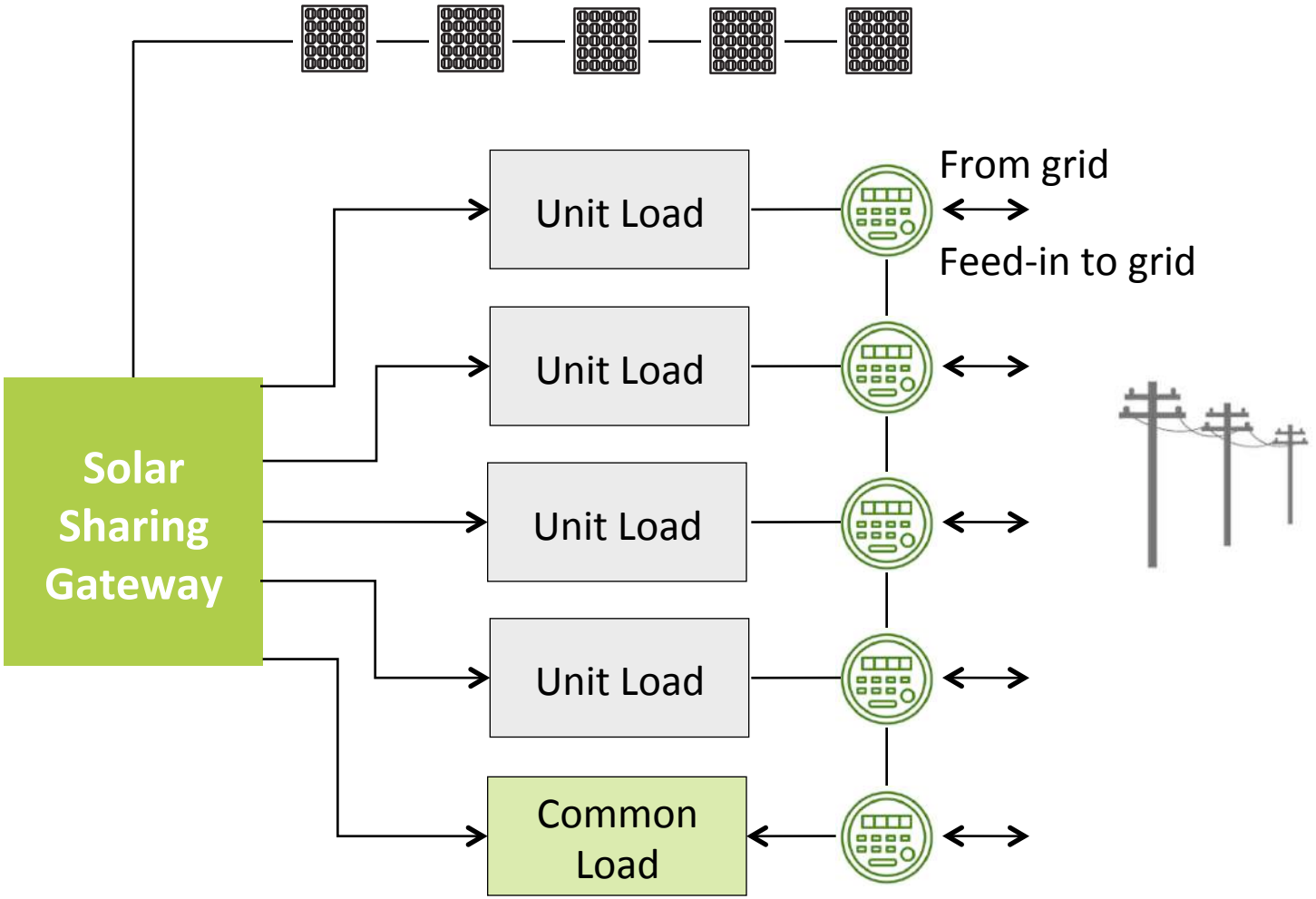
1) Solar system for common property only



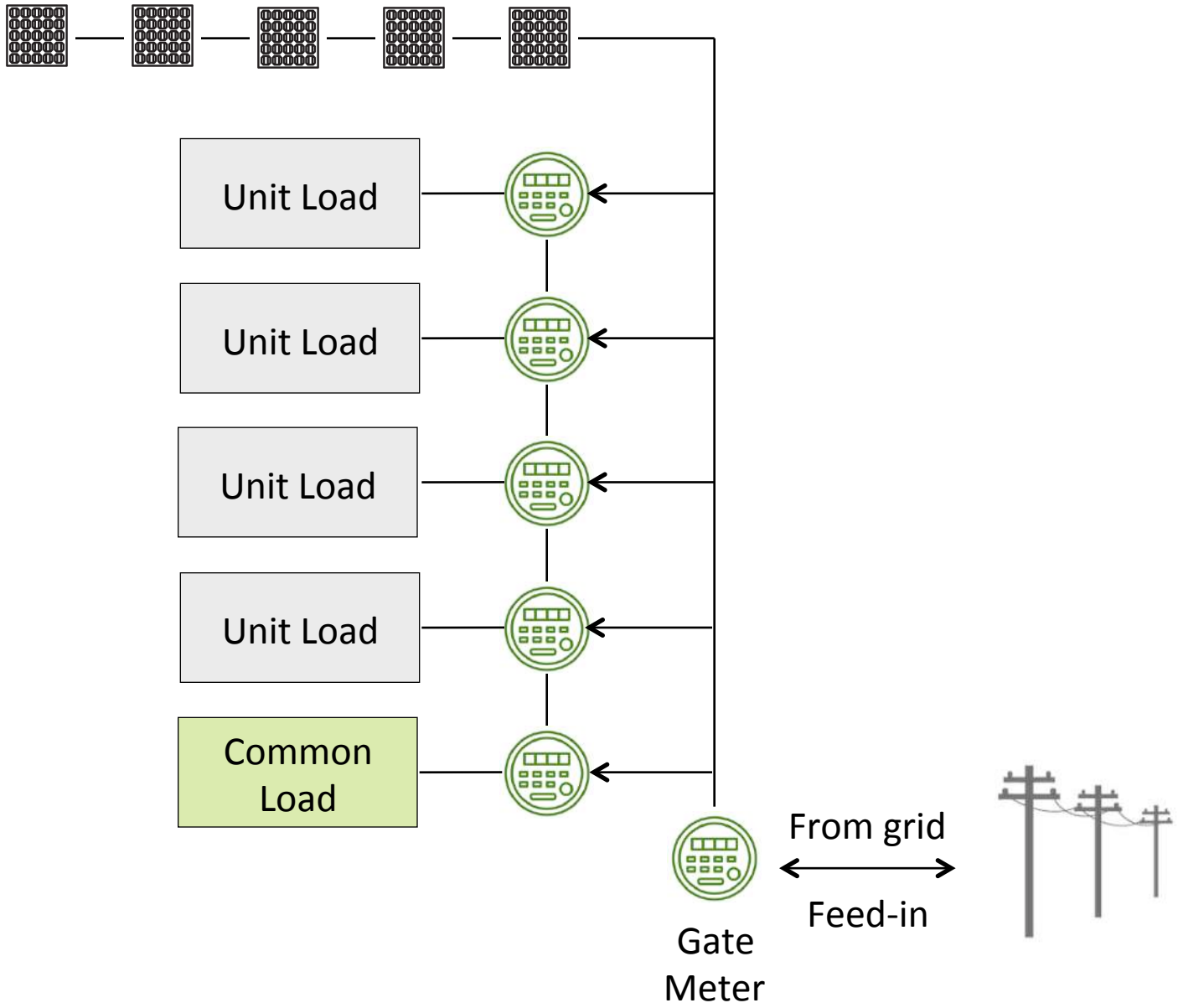
2) Individual solar systems for individual units



3) Solar for units & common areas via solar sharing gateway



4) Solar for units & common areas via embedded network



Two different payment models

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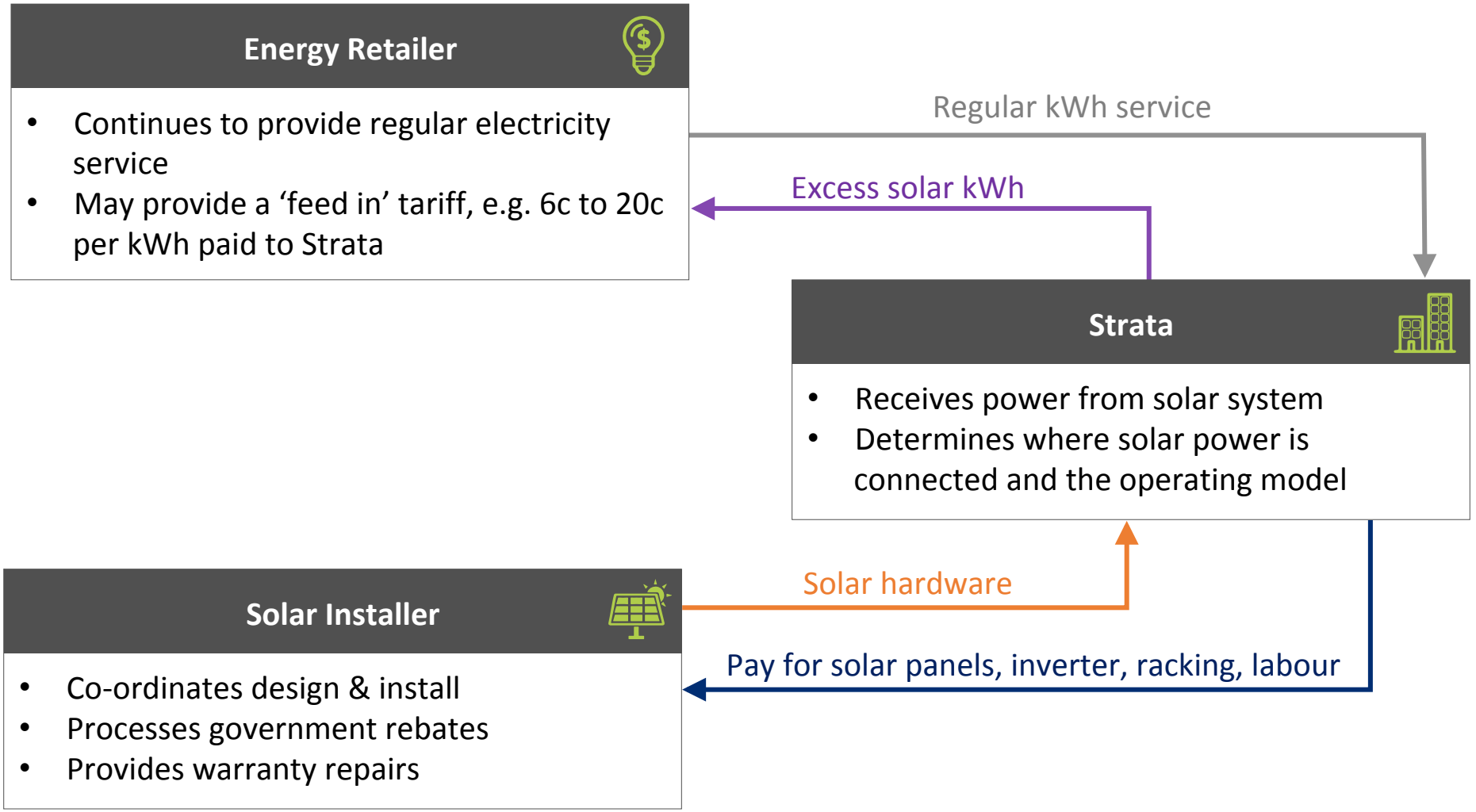
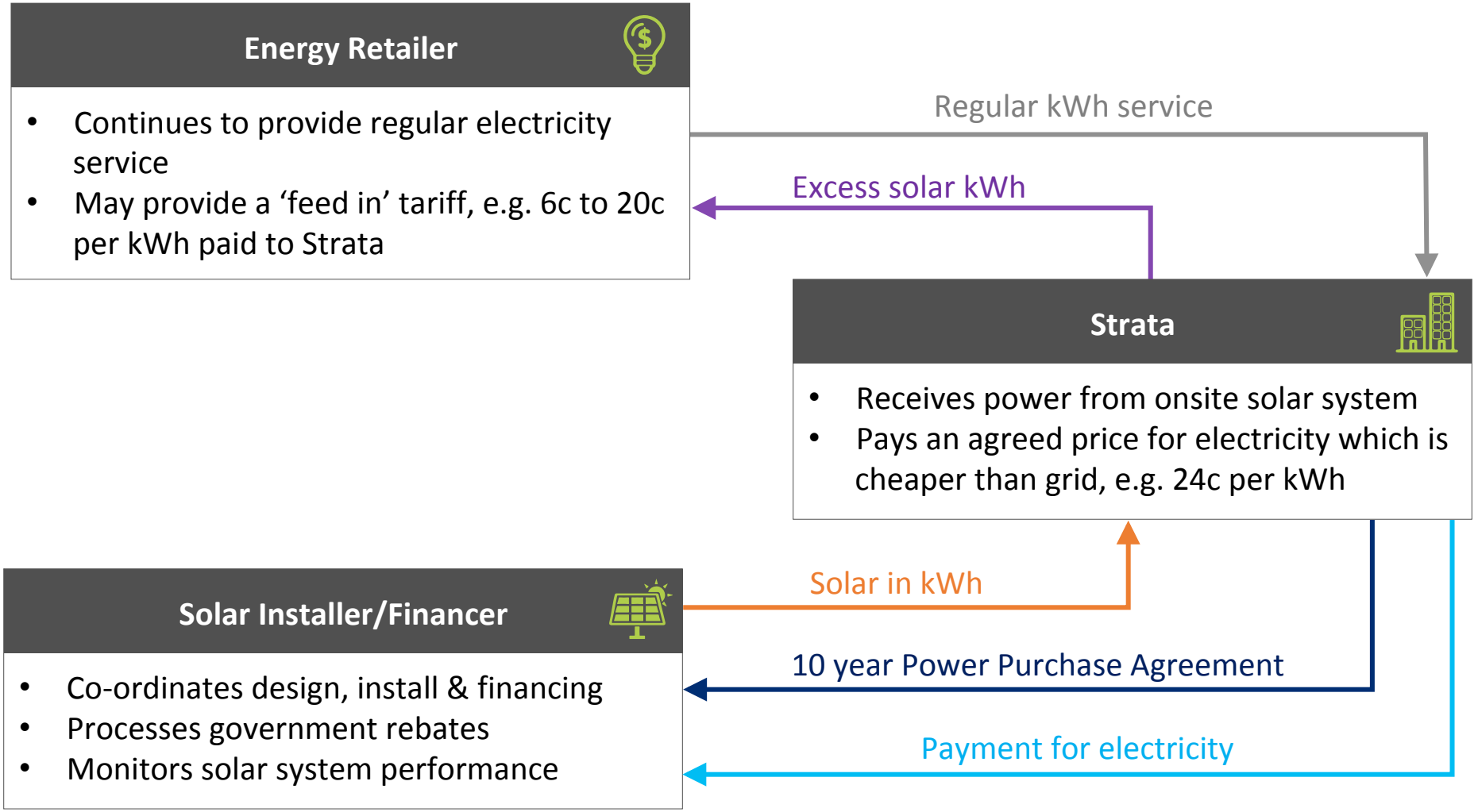
Own Solar Outright

Usually the best way for a body corporate to purchase a solar system is to purchase it outright on a capital expenditure or **capex** model. This gives the maximum amount of control to the strata.



What is a Power Purchase Agreement (PPA)?

- Solar finance or leasing is involved. Strata doesn't initially own the solar system. $0 paid upfront.



What else to consider?

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What are the federal government rebates?

Small Technology Certificates (STC's)

- Applies to solar systems under 100kW in size
- Depends on size of system, location & installer
- Included in quoted capex price to customer
- ~$3,700 on a 6.6kW solar system

Large Scale Generation Certificate (LGC's)

- Applies to solar systems over 100kW in size
- Full price capex price paid upfront on system
- Rebate is paid out on a schedule over 10 years
- Makes installing solar systems over 200kW attractive

Waterproofing

- Solar panel lifespan is 25 years which is longer than the lifespan of typical rooftop waterproofing
- Below is an example of a three layer waterproofing solution which cost ~$100k

Before

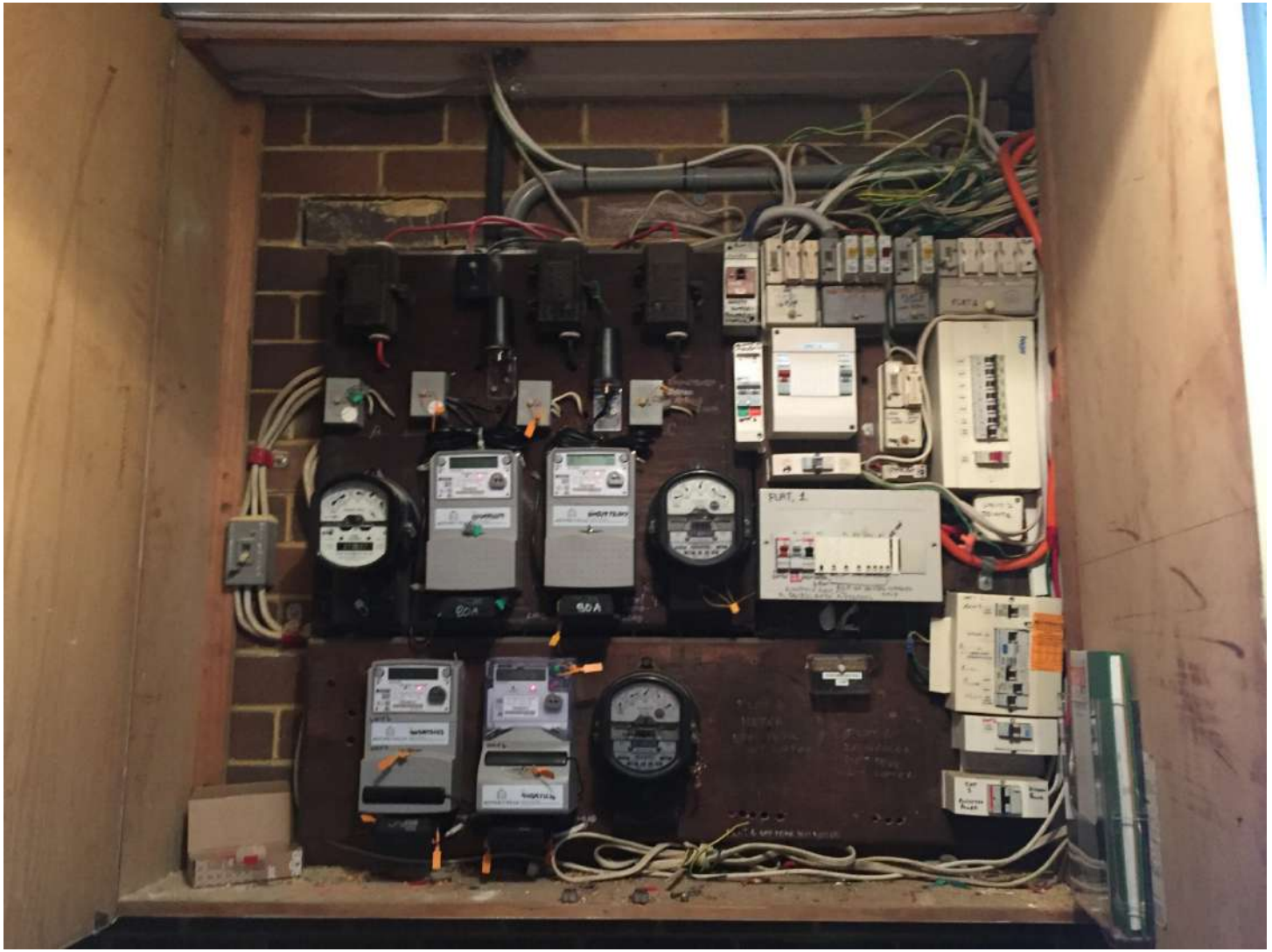
After

Ballast vs Anchoring of Solar Systems

- It’s possible to ballast mount the racking for a solar system, using concrete blocks
- Benefit is that you do not have to penetrate waterproofing or the slab but it costs far more than anchoring the racking into the slab. For example, one third more for the same size solar system

Switchboard and Meterboard Upgrades

- AS3000 is the Australian Standard. The following meterboard/switchboard is NOT compliant.



Getting panels to the roof

- If you do not have stairway access to the roof level, then additional cost is involved in getting the panels to the roof. It may need local council approval to close the street, put tiger tails on overhead electricity wires and hire traffic control.

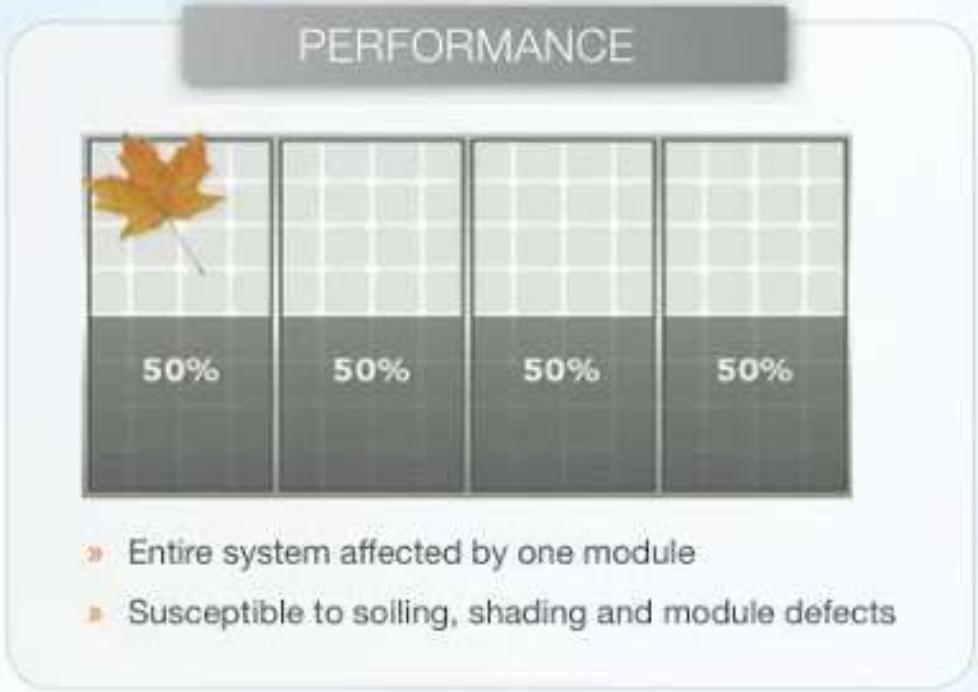
Crane

Solar lift electrical hoist

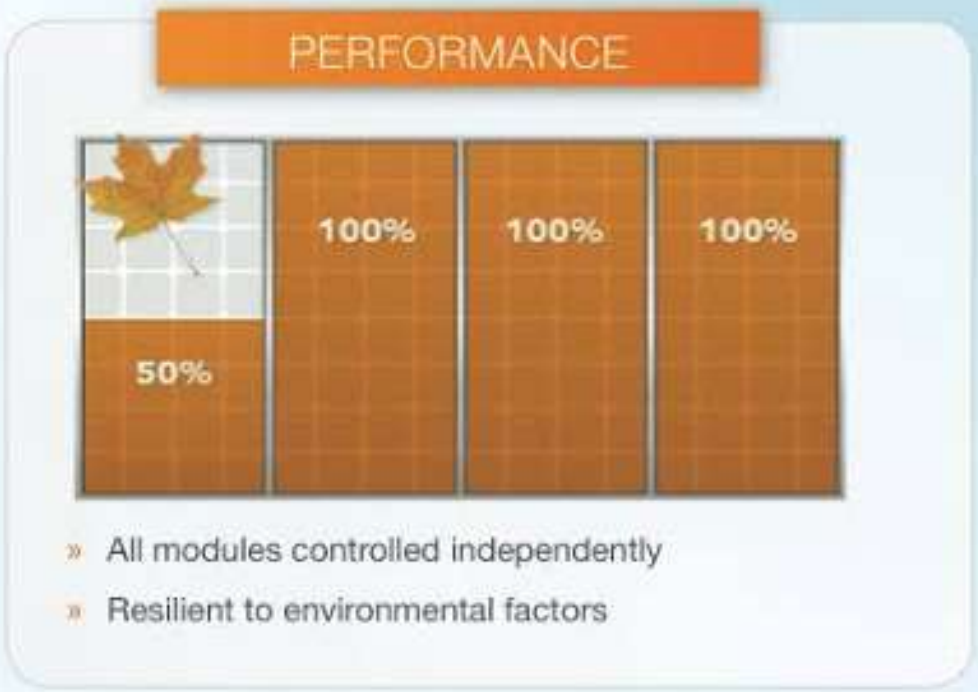
Inverters and shading of solar panels

- String inverters are not good if trees shade the roof during part of the day. To get the best performance from roof area which is sometimes shaded, use microinverters or DC optimisers.

String inverter



Microinverter or DC Optimiser



Noosa case studies

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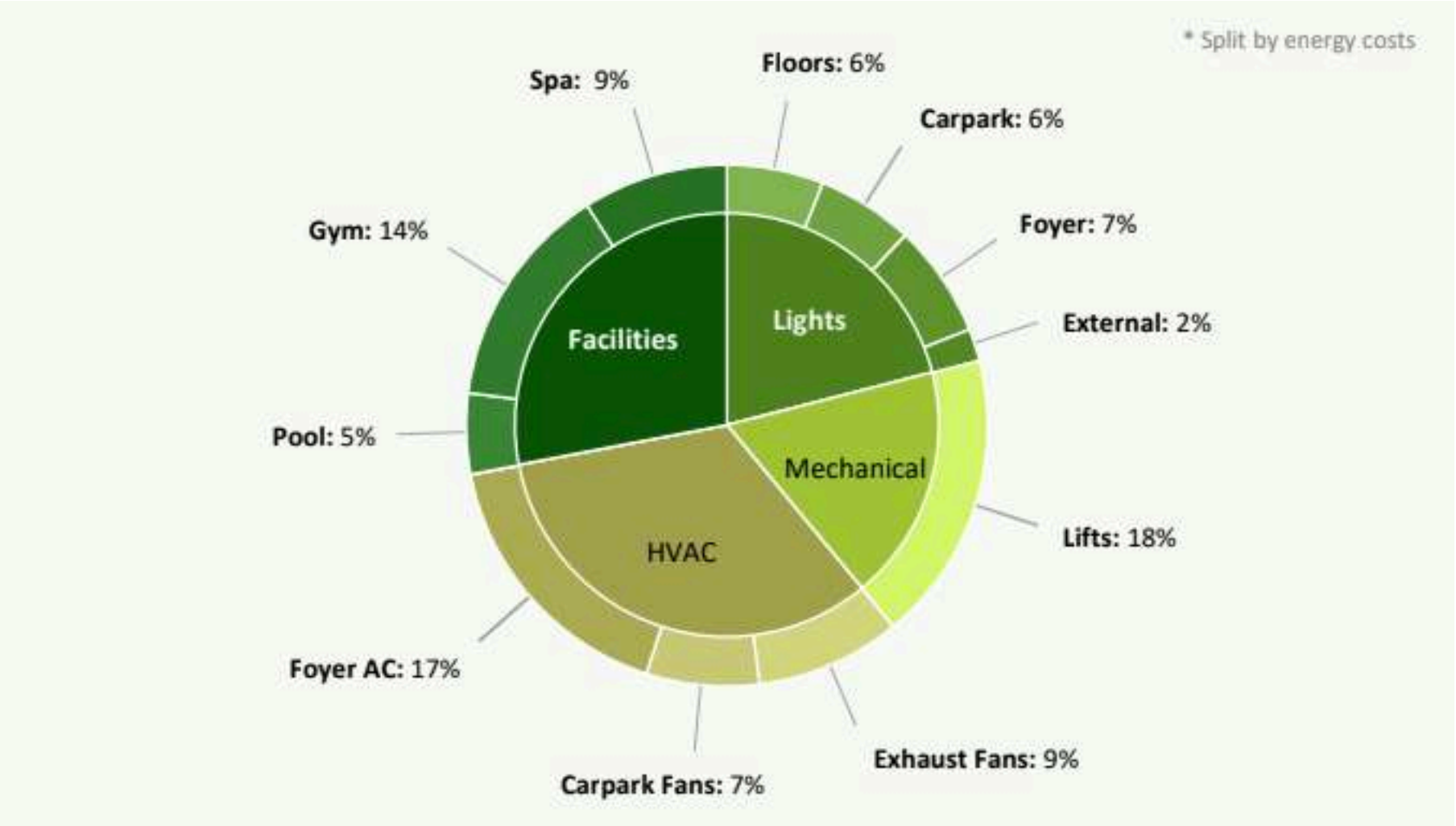
Noosa on the Beach

Noosa on the Beach – Energy Wheel



Noosa on the Beach – 9kW solar concept

ENERGY SAVINGS OPPORTUNITY

This entire page assumes all energy efficiency projects (e.g. LED lighting) have already been completed.

SOLAR SYSTEM SIZE	ESTIMATED COST SAVINGS	ESTIMATED PROJECT COSTS	ESTIMATED PAYBACK
9 kW	$958 p.a.	$11,600	10.4 Years

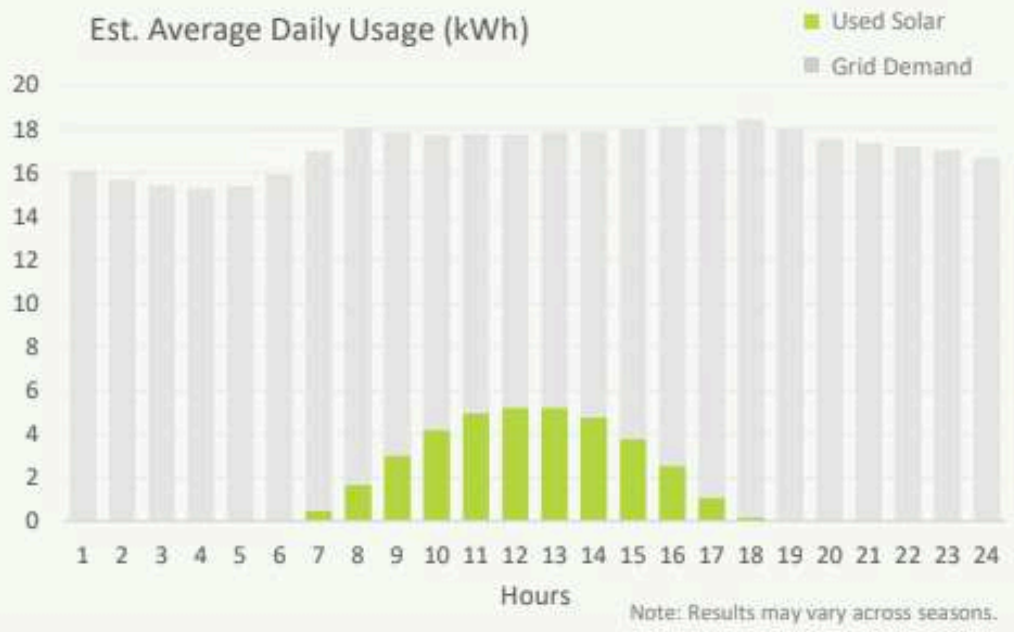
Add Batteries
Based on Tesla Powerwall

Insufficient roof space for extra solar to make batteries viable.

Note: Contact Wattblock for alternative system configurations.

LOAD PROFILE ASSESSMENT

Taking into account the available roof space and your common area energy usage, a 9 kW solar energy system is possible.



Note: Results may vary across seasons.

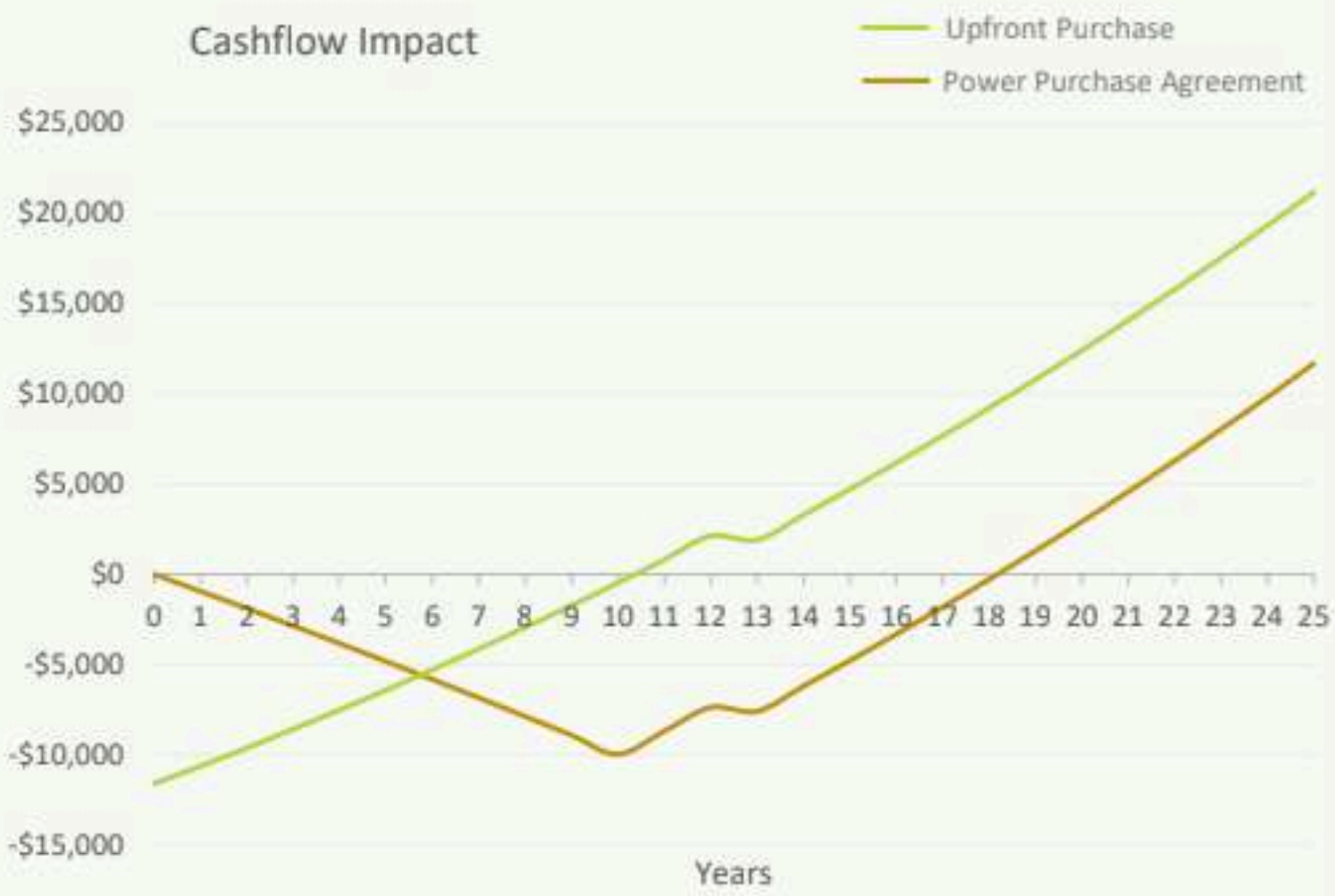
Noosa on the Beach: Upfront Purchase vs Solar Finance (PPA)

SOLAR PAYBACK ASSESSMENT

Upfront purchase of the 9 kW solar energy system is estimated to cost $11,600 with a 10.4 year payback.

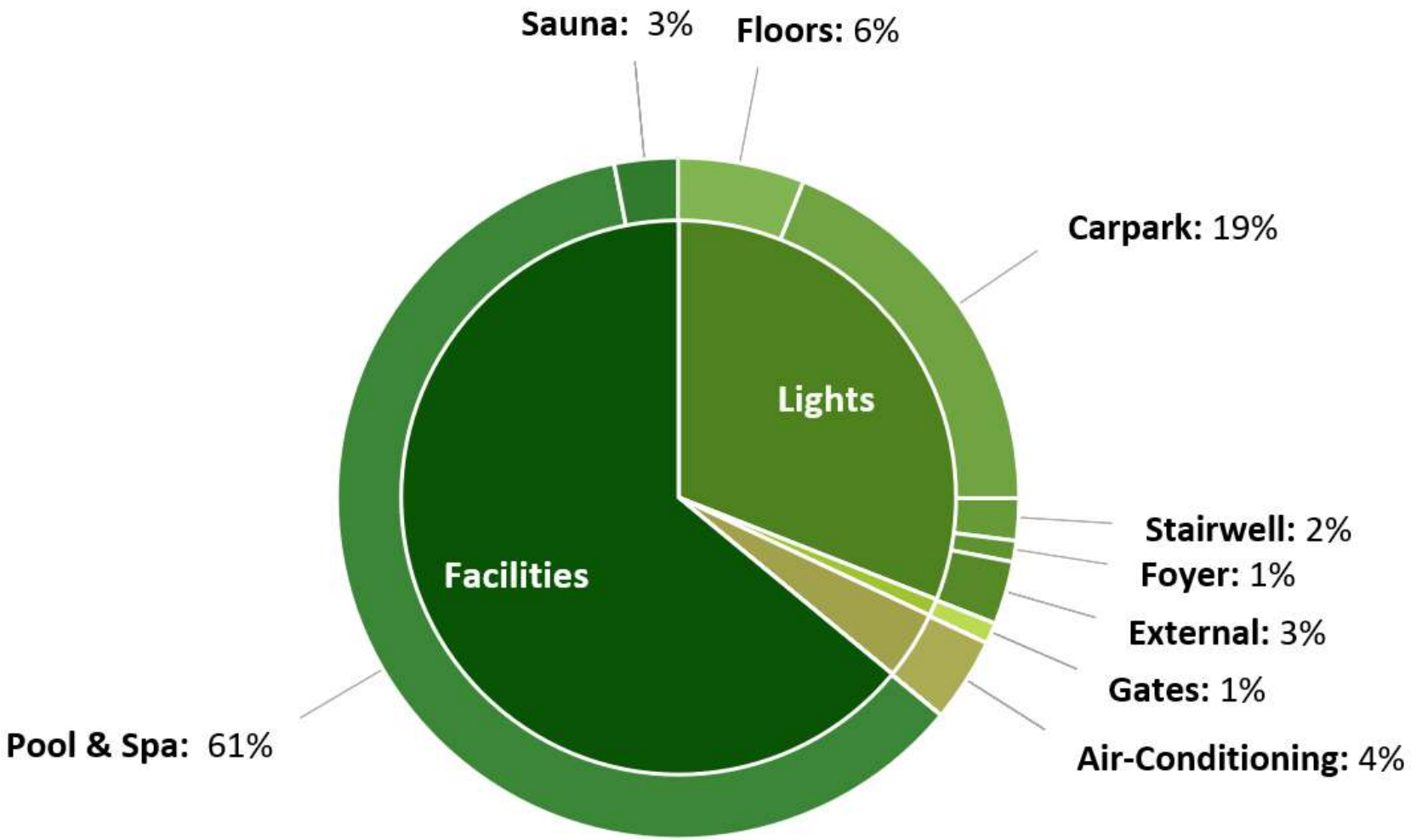
Solar energy suppliers may also offer a no upfront cost installation via a Power Purchase Agreement.

Note: Analysis includes inverter replacement in year 12.



Noosa Harbour Resort

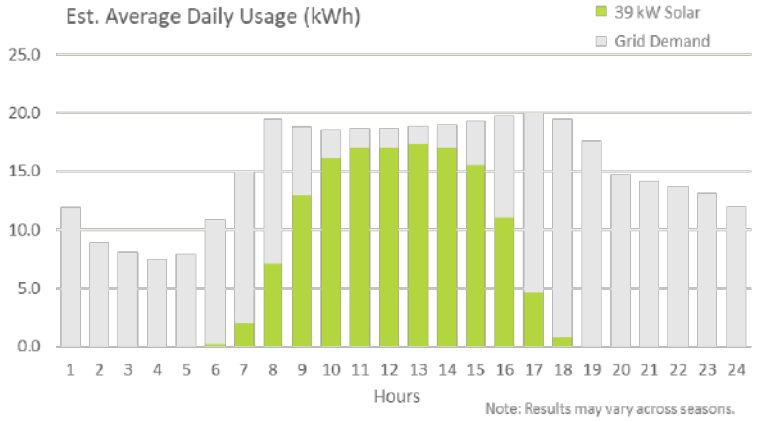
Noosa Harbour Resort – Energy Wheel



Noosa Harbour Resort – 39kW concept

Financial summary for a 39kW solar system (inc GST)

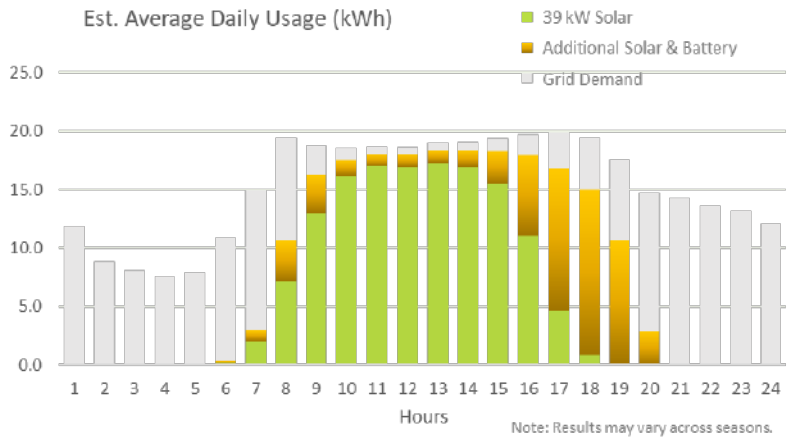
Financial Summary Estimates	
Project Costs	$41,468
Net Annual Savings	$11,129
Payback	3.5 Years



Noosa Harbour – 58kw & 53kWh battery concept

Net saving of using a 58kW solar system with battery for common area (inc GST)

Annual Solar Savings Estimates	
Used Solar Power	$12,772
Used Battery	$3,845
Feed-in	$1,441
Maintenance Costs	-$1,218
Net Savings	$16,840



Noosa Harbour Resort – 100kW concept

Financial summary for a 100kW community solar system (inc GST)

Financial Summary Estimates	
Project Costs	$104,820
Net Annual Savings	$28,812
Payback	3.5 Years

Noosa Harbour Resort – Solar Concepts compared

Financial summary for different options

Cost Saving Opportunities	Est. Cost	Est. Savings	Est. Payback
1) 39kW Solar for Common Area	$41,468	$11,129	3.5 Years
2) 58kW Solar and 53.6kWh Battery for Common Area	$119,426	$16,840	6.6 Years
3) 100kW Solar for Common Area and Individual Apartments	$104,820	$28,812	3.5 Years

The Retreat – Peregian – Townhouse/Villa Setup

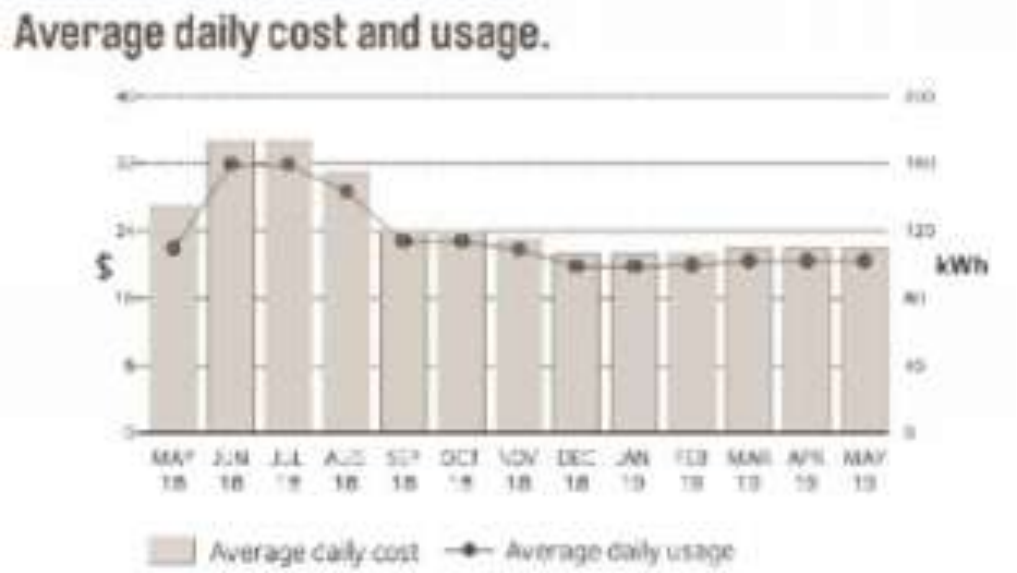
The Retreat Peregrian – Annual Load Profile

Spending ~$10k per annum in common areas

The highest monthly loads are in June and July.

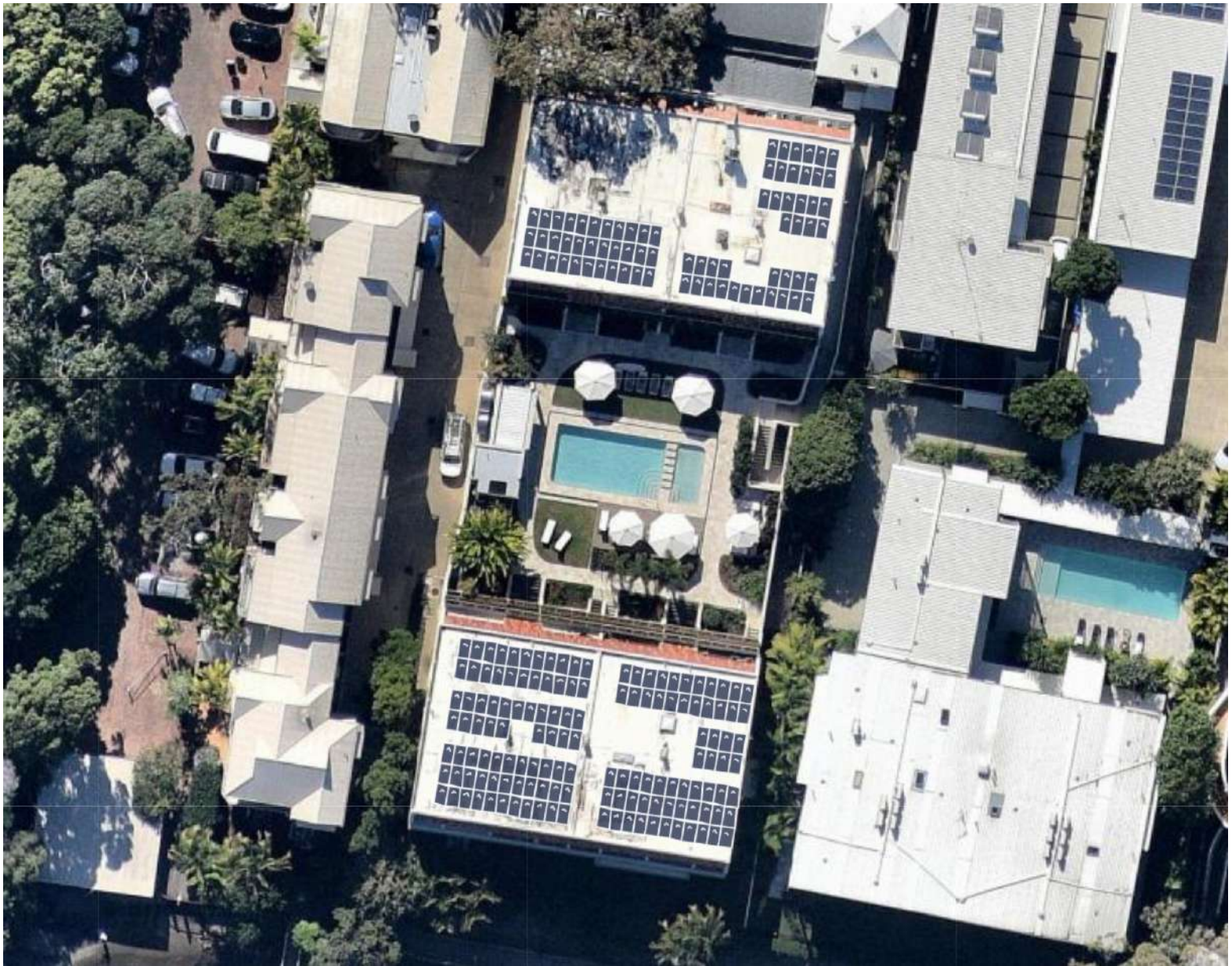
Is this due to:

- Pool heating costs?
- More tennis court lighting?
- Something else?



Hotel Laguna – Solar concept

A solar engineer looks at a building like this and says 60kW solar system is possible.



Marcus Beach Body Corporate

DATE INSTALLED
April 2019

SIZE
13.2 kW

TECHNICAL
Longi 300W solar panel

10kW Fronius Symo inverter

ELECTRICITY COST BEFORE SOLAR
$1,100 - $1,350 per year

ELECTRICITY COST AFTER SOLAR
new system offsets the entire electricity bill

INSTALLATION COST
$10,790

ESTIMATED PAYBACK PERIOD
2.2 years – 3 years (based on 20 cent feed in tariff)

EMISSIONS REDUCTION
Greenhouse Gas Emissions Reduction per year: 16 tonnes of CO2-e

What is being done on the policy front

Special Resolution

In Queensland, a **special resolution** of all owners is required for a strata scheme to make a structural change to the building.

This means that not more than 25% of owners who are paid up on their strata levies, present at a meeting of all owners in person or by proxy (where a quorum is formed by 25% of unit entitlements) can be AGAINST the motion and **still have the motion proceed**.

Ordinary Resolution

Western Australia and Victoria have led by lowering the bar to an **ordinary resolution** for body corporates to pass resolutions for environmental upgrades. This means up to 49% can be against the motion and the resolution can still be passed by the Body Corporate.

Environmental upgrades includes solar, batteries and electric vehicle charging.

NSW is lowering the bar to an ordinary resolution for any environmental upgrade in a strata building in 2020.

Other states are likely to follow in 2021.

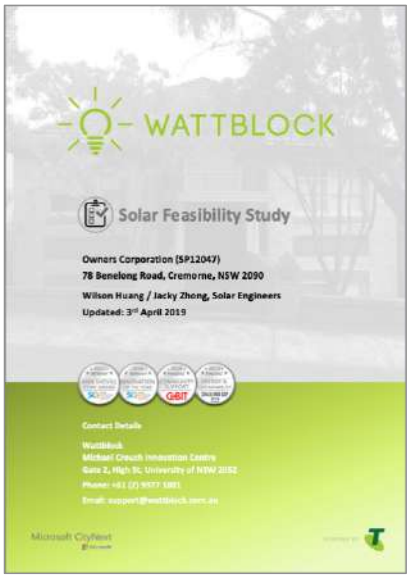
Solar & Battery Reports

Online Solar Survey of Residents

Conducted online

Help strata committee to get a better understanding of residents thinking on solar

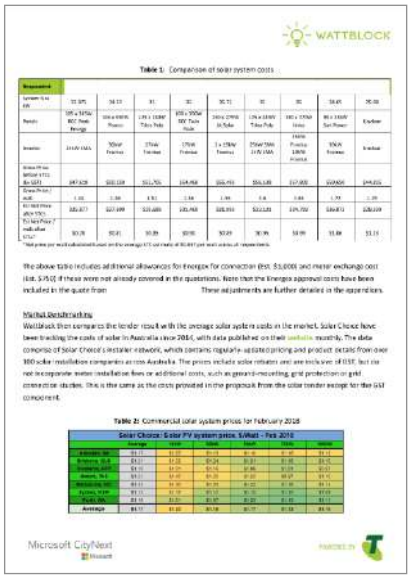
$299



Solar & Battery Feasibility Study

Compare 3-4 different ways of installing solar & batteries with estimated costs & payback. Solar for common areas, solar for sharing into apartments, etc.

From $1,175



Solar Tender

Go to market with a formal process to get the best value solution for your strata

From $2,200

Prices correct as of February 2020

Questions

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Google “Solar on Strata Whitepaper”