

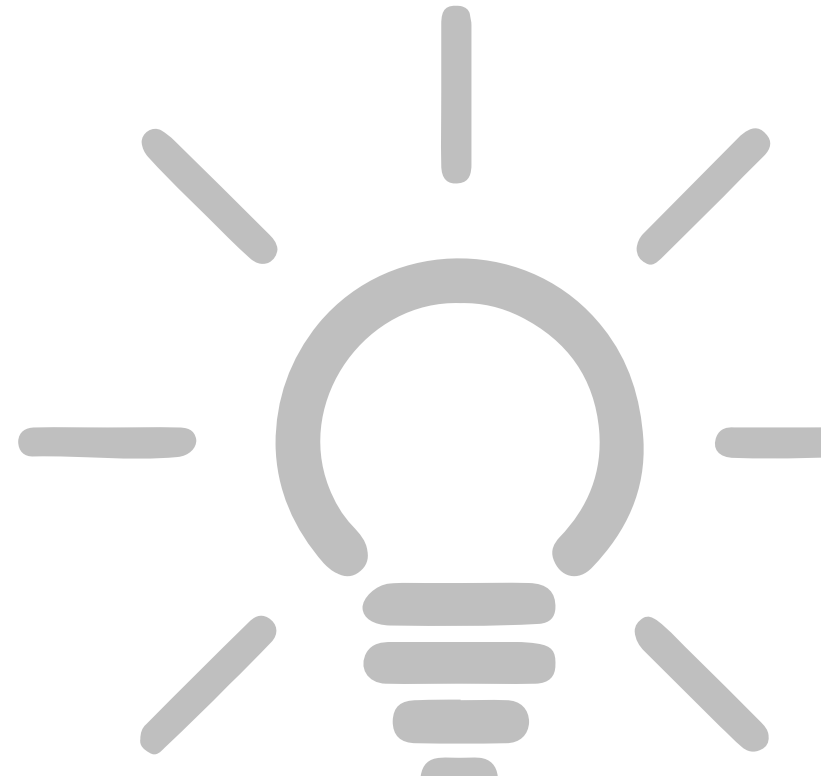
Powering Better Apartments: EV Charging and Energy Efficiency in Action

'Freesia Gardens'

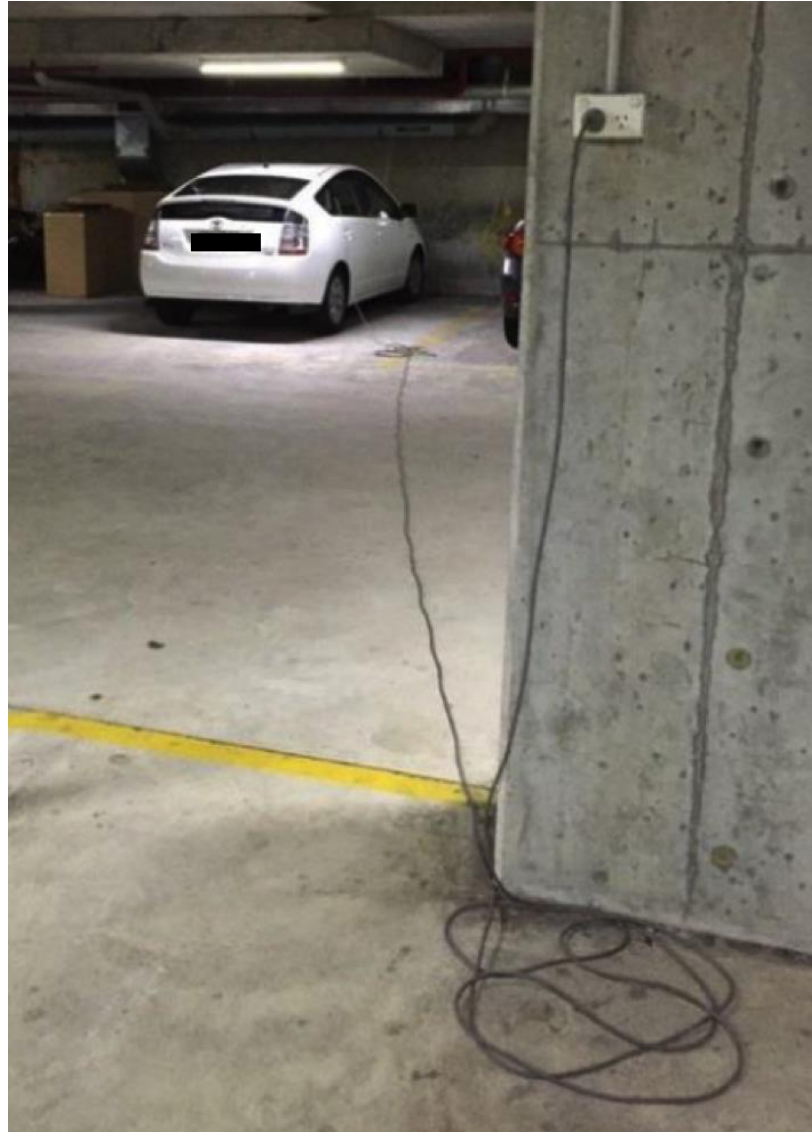


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Energy theft off common power outlet by hybrid electric vehicle in 2017



Energy theft off common power outlet by battery electric vehicle in 2023



NSW government EV charging costing tool for Level 2 backbone

NSW Department of Planning, Industry and Environment

EV ready buildings costing tool

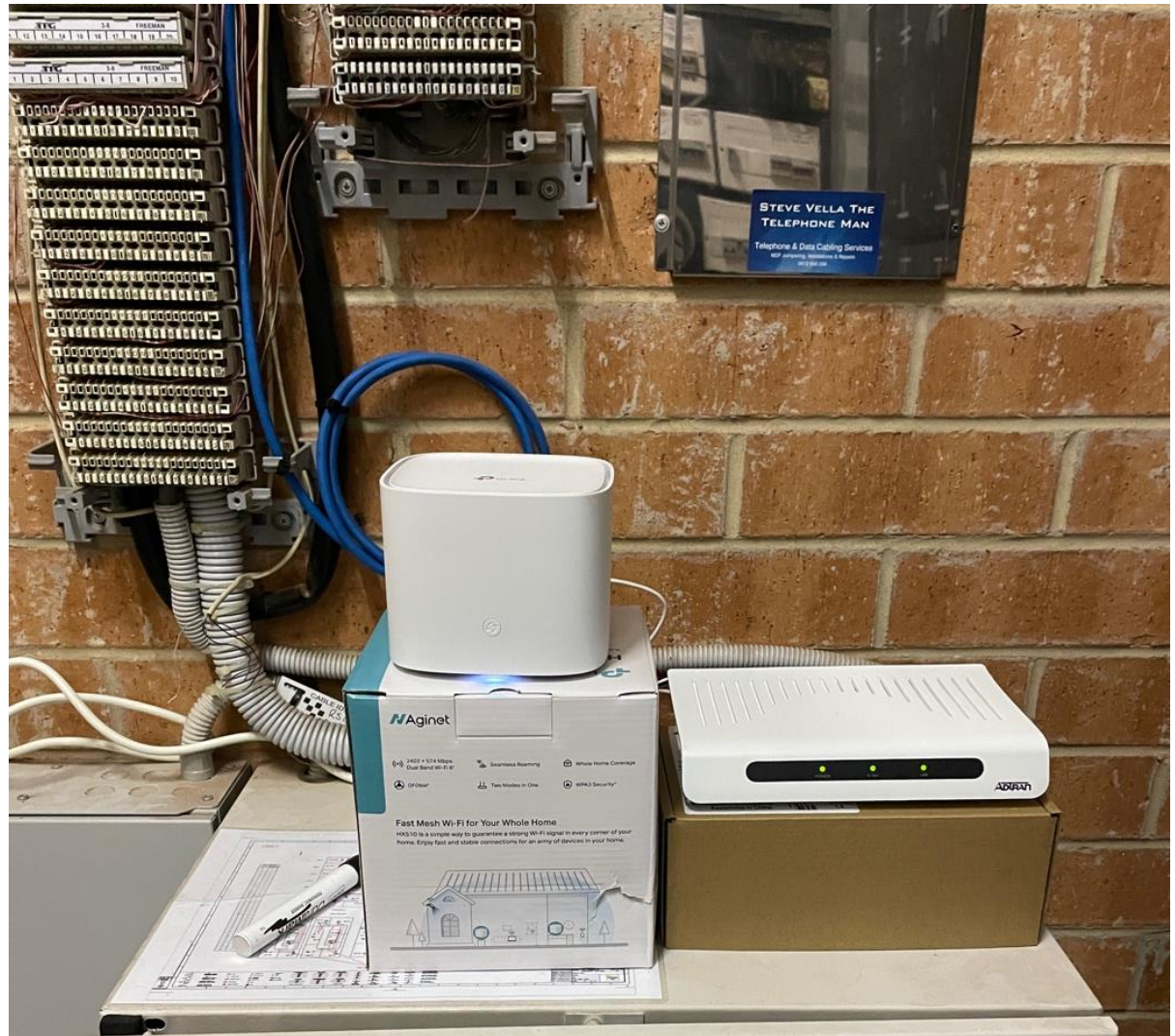
While the assumptions used in the tool are based on industry best practices and have been peer-reviewed by key industry stakeholders, it is to be used as a guide only. The actual costs will vary based on specific circumstances, some key special considerations are listed below. It is recommended that quotes are obtained from charging equipment providers to determine an accurate cost estimate for your site.

The following outputs provide a total installed charging capacity and anticipated infrastructure costs.

Installed capacity [kW]	Total chargers	
389.2	51 x 7kW (AC)	
	1 x 22kW (AC)	
New infrastructure		
Chargers	\$ 99,100	
Cable trays	\$ 28,400	
Distribution boards	\$ 45,000	
Sub-mains	\$ 3,000	
Concrete coring	\$ 265	
Final circuits	\$ 18,460	
Ethernet	\$ 7,584	
New infrastructure cost	\$ 201,809	
Site and upstream works	Lower estimate	Upper estimate
Site electrical upgrades	\$ 32,000	\$ 75,000
Upstream upgrade cost	\$ 40,000	\$ 250,000
Site and upstream works costs	\$ 72,000	\$ 325,000
Total site estimate	\$ 273,809	\$ 526,809

Gigacomm connects Fibre to the Basement and offers Owners Corp Wi-Fi

Gigacomm is a fast broadband provider. They offered to install a base station on the rooftop to provide fast internet. The Owners corporation requested that Gigacomm install Fibre to the Basement instead. In return for connecting the fibre to the basement equipment to the common property power the Owners Corporation was offered either \$500 compensation per year or a modem/router and fast internet account for the common areas. It elected to take the modem/router and this was installed in November 2025 and covers most of 2 levels of carpark area.



ARENA subsidizing low power EV charging in strata



The image is a screenshot of a website announcement. At the top left is the NOX logo, consisting of a green square icon with four smaller squares and the text 'nox'. To the right of the logo is a navigation menu with links: 'About', 'Our Solutions' (with a dropdown arrow), 'Sectors', 'ARENA Project Application', 'News & Resources' (with a dropdown arrow), and 'Contact'. On the far right of the navigation bar is a dark green rounded rectangle button with the text 'NMS Portal' in white. Below the navigation bar is a large dark green banner with white text. The text in the banner reads: 'NOX Energy Secures \$1.51 Million from ARENA to Deliver Nationwide EV Charging Rollout Across Australian Strata Communities'. Below this banner, centered, is the date 'September 24, 2025'. At the bottom of the page, below the banner, is the text 'NOX Energy to install nearly 2,000 Intelligent Power Sockets across Australia'.

NOX Energy Secures \$1.51 Million from ARENA to Deliver Nationwide EV Charging Rollout Across Australian Strata Communities

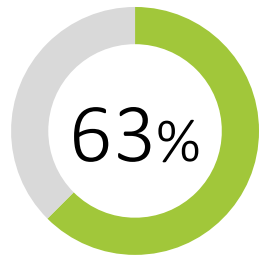
September 24, 2025

NOX Energy to install nearly 2,000 Intelligent Power Sockets across Australia

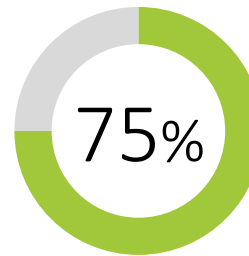
<https://noxenergy.com.au/apply-for-ev-charging/>

EV charging survey in a block of 40 lots

An EV charging survey was conducted at Freesia Gardens. There were 8 respondents. None of them owned an EV.



planned to buy an EV in the next 1-2 years



indicated that they would need an EV charger at their individual carspace, if they purchased an EV

Comments:

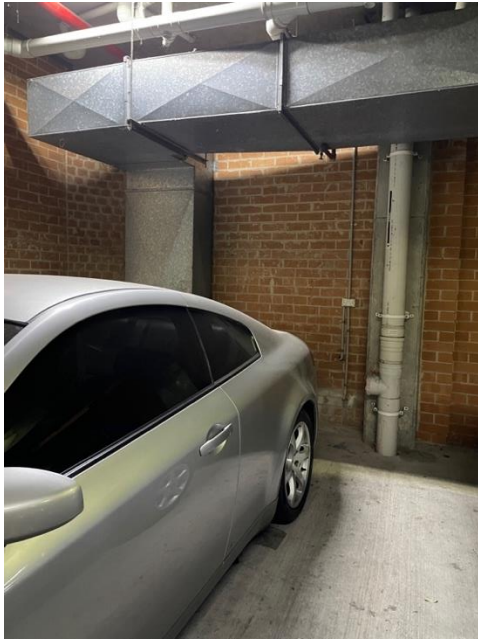
It would be good to have a shared EV charging station in the visitor carpark as we have 12 spaces there.

Due to the fragile nature of these types of batteries, I think significant fire retardant must be installed and strict limits set on their usage. I have a very low expectation that this will be done since people in the building can't even seem to figure out putting things in the recycle bin!

E-bikes:

1 respondent already had an e-bike and confirmed that they are currently charging the battery in their own apartment (there is no by-law to stop charging of e-bikes in apartments at Freesia Gardens). The e-bike owner indicated that they would like to have e-bike charging near the bike racks in the building.

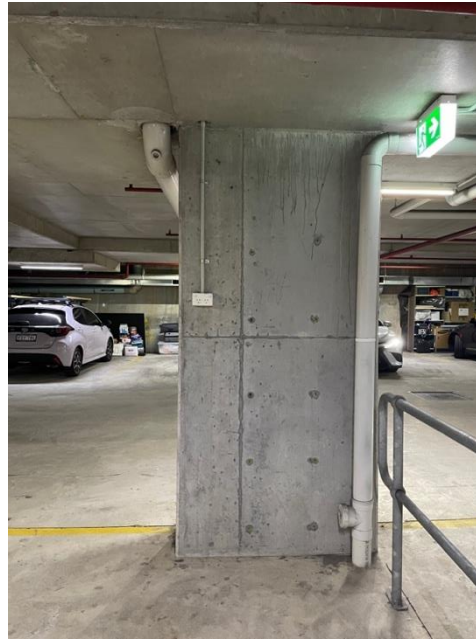
Freesia Gardens had 4 existing common area power outlets in carpark



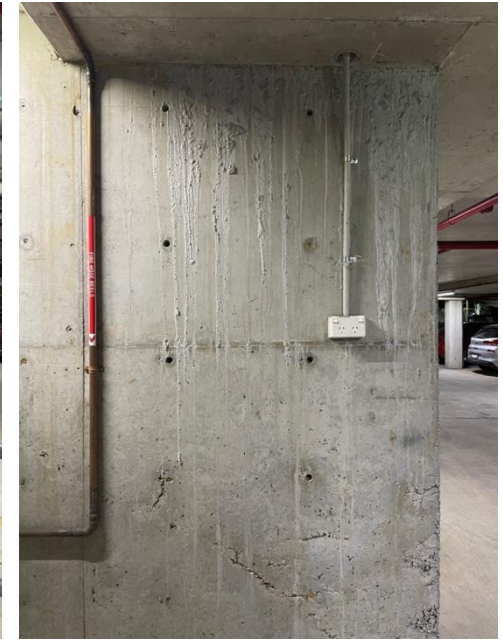
Behind Shared Visitor Space on Basement 1 which had previously been used for charging a Tesla Model S with the EV driver manually recording kWh and paying strata



Next to private EV owner space on Basement 1



Power outlet on B2 which had been subject to energy theft by both hybrid and battery EV's using extension leads



Power outlet on B2

Design for QR code activated low power EV chargepoints

ARENA's Driving the Nation program required a minimum of 5 QR code activated power outlets to be installed.

By installing a new QR code activated power outlet on a brick wall between 2 visitor spaces, it opened the possibility for both visitor spaces to charge using the new chargepoint.

- **B1 Visitor Parking:** 2 QR code activated power outlets to share same circuit and do time-share load balancing
- **B1 Resident Parking:** 1 QR code activated power outlet to be on its own 16 amp circuit
- **B2 Resident Parking:** 2 QR code activated power outlets to be on a third circuit and eventually do time share load balancing



Checked that product was tested to Australian Standards



SAA
APPROVALS®

Certificate of Conformity/Approval

Certificate No.:	SAA-240273-EA
Certificate Holder:	Nox Energy Pty Ltd 401/541 Kent Street Sydney NSW 2000 Australia
Regulatory Definition:	Socket-Outlet
Product Description:	Single-phase Surface-type Switched socket Outlet (Socket-outlet with Earthing-contact, electronic switching)
Standard/s:	AS/NZS 3112:2017 Inc A1 AS/NZS 3100:2022 AS 60669.2.1:2020 AS/NZS 60669.1:2013
Condition/s:	Nil
Approval Marks:	RCM (in accordance with AS/NZS 4417 and EESS requirements) and SAA-240273-EA (in accordance with NSW legislative requirements)
Initial Issue Date:	18 June 2024
Expiry Date:	18 June 2029


For and on Behalf of
SAA Approvals Pty Ltd



www.jas-anz.org/register







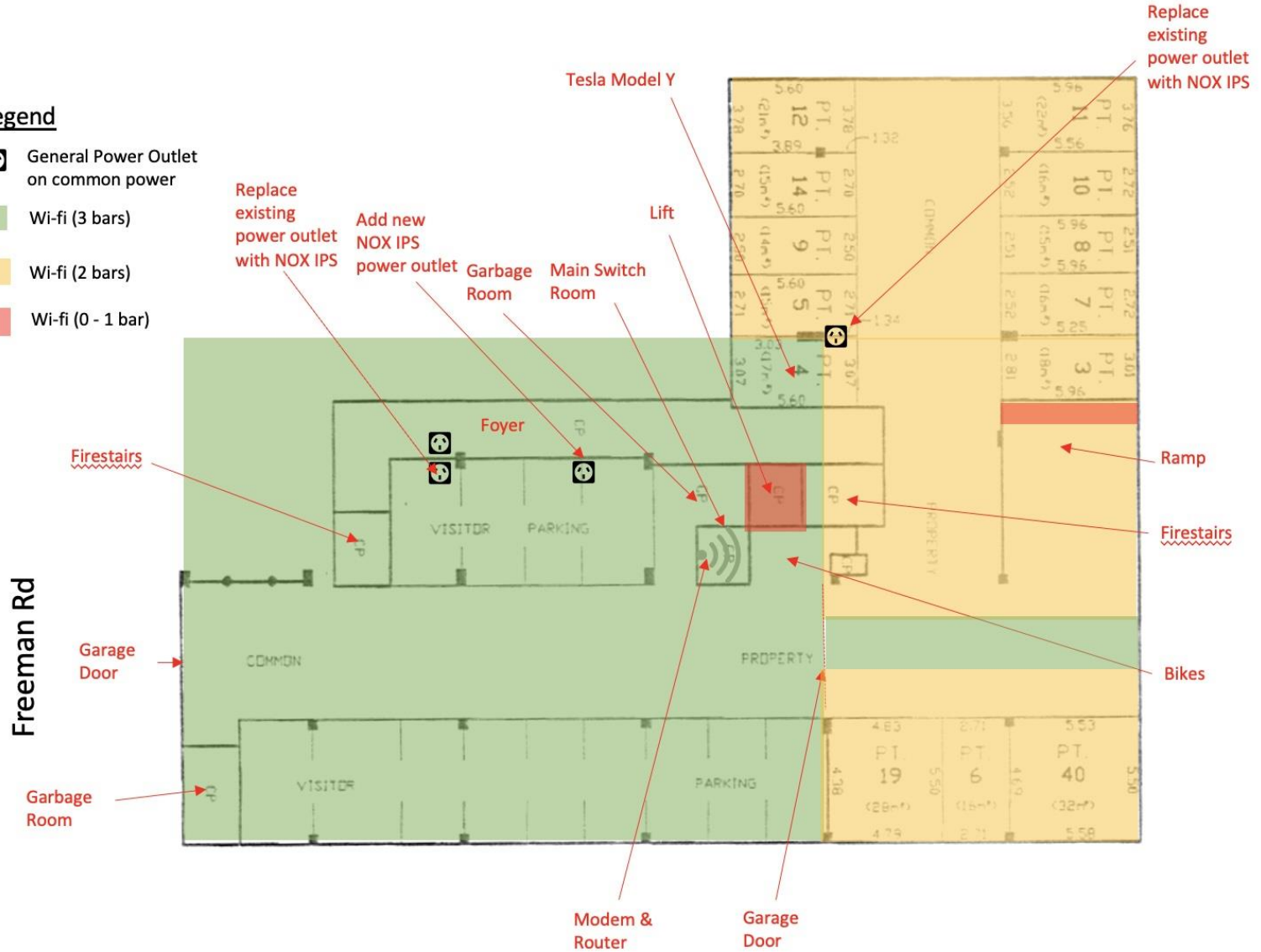
Issued: 18-06-24 240273
Page 1 of 2

This certificate is issued by SAA Approvals Pty Ltd in accordance with the SAA Approvals Electrical Product Safety Certification Scheme accredited by JAS-ANZ, under AS/NZS ISO/IEC 17065, RECS accreditation under the Queensland Government legislative requirements and RECS accreditation under the NSW Government legislative requirements. SAA certifies the product nominated in this certificate complies with standard/s listed above in accordance with the schemes herein. For SAA Contact Details and Certificate verification, go to www.saaapprovals.com.au

Basement 1 – Scope of Works





Legend

-  General Power Outlet on common power
-  Wi-fi (3 bars)
-  Wi-fi (2 bars)
-  Wi-fi (0 - 1 bar)



Basement 2 – Scope of Works

Legend

-  General Power Outlet on common power
-  Wi-fi (3 bars)
-  Wi-fi (2 bars)
-  Wi-fi (0- 1 bar)



Owners Corporation signs agreement with NOX Energy

NOX Energy is the provider of the QR code activated low power power outlets which they call “Intelligent Power Socket” or IPS.

The Strata Manager signed a non-exclusive Chargepoint Operator agreement with NOX Energy on behalf of the Owners Corporation via online document signing.

The existing 5 power outlets installed are governed by the Chargepoint Operator Agreement.

Individual lot owners have the right to contact NOX Energy and on a user pays basis get another IPS installed at their private lot carspace, governed by an End-User License Agreement (EULA).

NOX Energy engaged Future Services as a licensed electrical contractor to install the low power outlets.



Setting an energy rate for charging

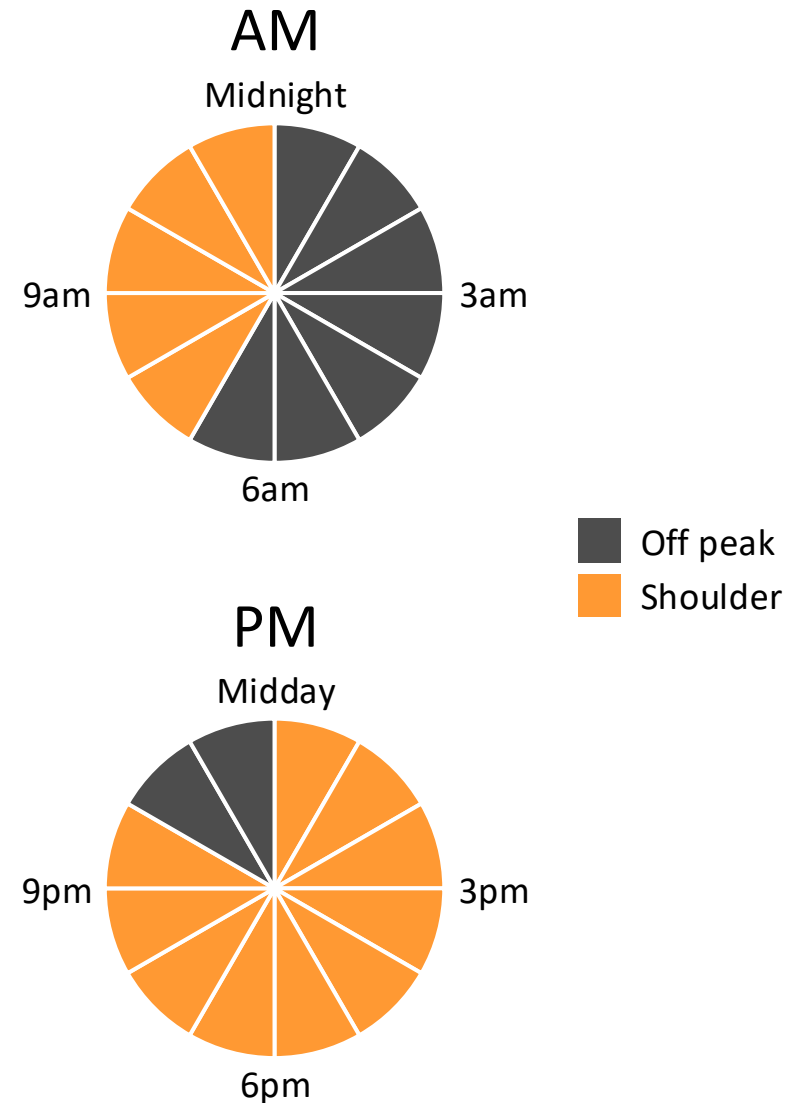
Freesia Gardens are on the following rates with Energy Australia in Ausgrid Areas with a 34% discount:

- **Peak** $\$0.7488690$ per kWh * 0.66 = $\$0.4942535$ per kWh
- **Shoulder** $\$0.4543770$ per kWh * 0.66 = $\$0.2998888$ per kWh
- **Off peak** $\$0.3350490$ per kWh * 0.66 = $\$0.2211323$ per kWh

However, it is a seasonal tariff structure which means that in Spring and Autumn there are no 'peak rates' at all.

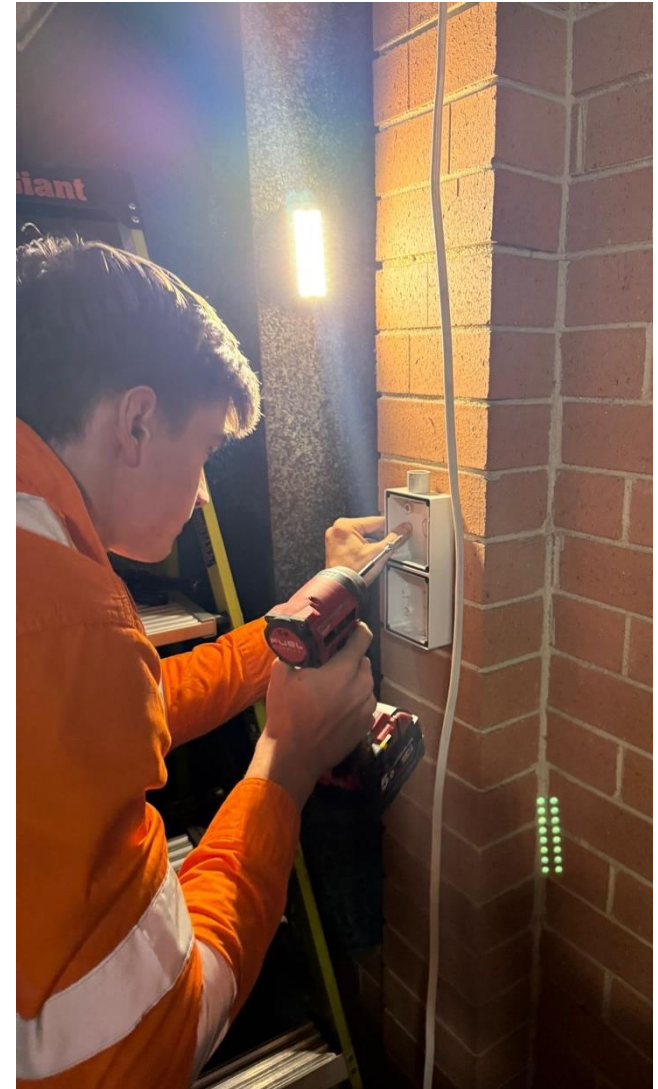
For this reason, a weighted average of the rates based upon common area interval data was decided to be set for all EV charging throughout the year at: **$\$0.2968/\text{kWh}$ inc GST.**

NOX Energy will take a 0.05c / kWh commission on each charging session.



Installation day

- Provide name of Wi-Fi network and password to NOX Energy to assist with commissioning the Intelligent Power Sockets on the house wi-fi network provided by Gigacomm
- Provide perimeter keys/fire escape keys to assist NOX Energy/Future Services with access to the building
- Future Services needed to determine the circuits which the 4 existing power outlets were on as there was no single line diagram available and the house sub-board wasn't marked properly.
- Replacement of 4 existing power outlets
- New conduit and install of a 5th power outlet
- Labelling of each new power outlet with the circuit that it was connected to
- Installation time: ~3 hours for Future Services team
- Test operation of a chargepoint by scanning the QR code on the NOX Energy device and downloading an app and registering on the app
- Take existing EV owner down to carpark to show the new system



Post-installation photos



Replaced power outlet behind Shared Visitor Space on Basement 1 which can be used by two different carspaces. Light around the QR code indicates 'charging in progress'



Newly installed Intelligent Power Socket which can be used by two different shared visitor carspaces



Next to private EV owner space on Basement 1 with existing Tesla Model Y. Model Y owner needs to purchase a new 15-16 amp charging cable to use it



Power outlet on B2 which had been subject to energy theft by both hybrid and battery EV's using extension leads. Green light on unit indicates Wi-Fi connected



Power outlet on B2 is waiting a Wi-Fi repeater to be installed, so that it can be commissioned

Low power EV charging conclusion

Low power QR code activated Level 1 EV charging (10amps-16amps) was **substantially lower cost** than installing a Level 2 EV charging backbone (32 amps).

NSW government online EV charging calculator estimated the cost of a Level 2 EV charging backbone servicing every space to be \$201,809 and this could increase to between \$273k and \$526k if site and upstream electrical works needed to be conducted.

The initial install of **5 QR code activated chargepoints** cost under \$3,000 with ARENA subsidy and has enabled 8 carspaces in a block of 40.

This includes 4 shared visitor carparking spaces which could have bollards and booking system installed at a later point when more electric vehicles arrive at the building.

The cost to charge for the Tesla Model Y owner to charge at the nearest Supercharger is 60-80 cents per kWh. The cost to charge slowly inside the building is 50%-63% cheaper than charging at the nearest Tesla Supercharger.

It is **more convenient** to charge inside the building than at the nearest Tesla Supercharger as you don't have to move your car to avoid idle fees of 0.50c per minute if you leave your car there after charging finishes.

Willoughby ClimateClever Apartments Program (2011)

In 2011, Freesia Gardens joined the ClimateClever Apartments program run by Willoughby Council and received a council funded energy audit.

This was the stimulus to do the basic projects:



Lighting projects

- Foyer, lift, lift corridor downlights
- 2 x levels of basement carpark
- 2 x fire stairs
- Garden lights
- Outdoor footlights



Fan projects

- Timers on foyer ventilation fan
- Installed new 3 speed foyer ventilation fan and set to slowest speed
- Timer on existing garbage chute ventilation fan
- Installation of additional eco-fan in second garbage room



Hot water

- New lagging around pipes out of hot water boilers
- Reduce temperature setting of hot water boilers (within legal limits)
- Replace 2 x ageing hot water boilers










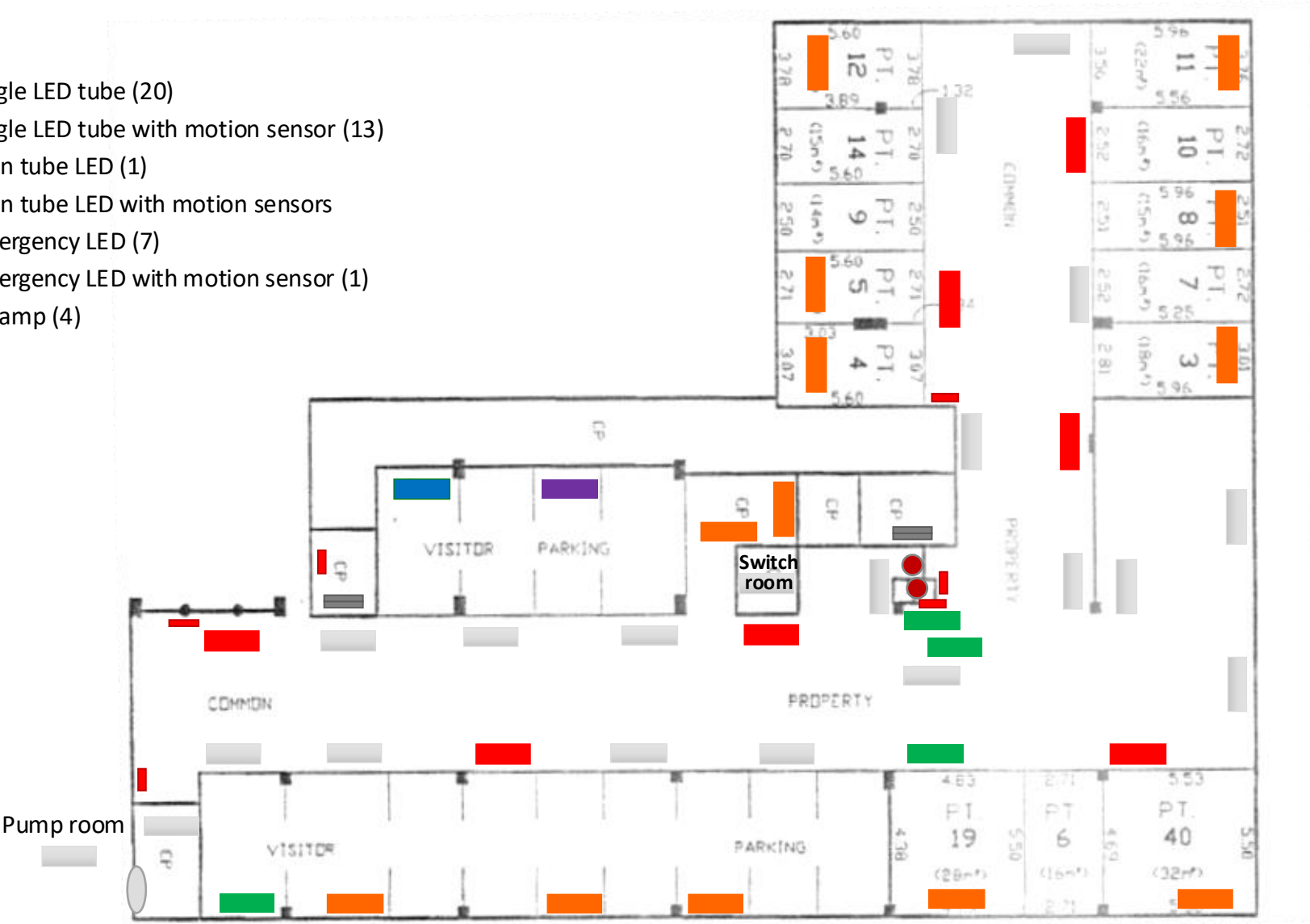
Cold water

- Water saving - taps, toilets, isolation valves, garden taps
- Replaced leaking ball valve on hot water boilers
- Replaced sections of leaking pipes in walls
- Smart garden irrigation system

Example of lighting upgrade plan map

Legend

-  Single LED tube (20)
-  Single LED tube with motion sensor (13)
-  Twin tube LED (1)
-  Twin tube LED with motion sensors
-  Emergency LED (7)
-  Emergency LED with motion sensor (1)
-  Delamp (4)



Freesia Gardens common area electricity costs reduced significantly

Electricity costs per quarter



Water efficiency at Freesia Gardens

Willoughby Council installed a water monitoring device on the head water meter which is a single water meter for the common property and all the apartments and we determined that we had base flow leakage from the report.

After hiring an acoustic monitoring company to determine the source of the leaks and plumbers to fix the leaks the Owners Corporation saved \$6k on water p.a.

We also installed a B-hyve smart irrigation system which connects via Bluetooth to wi-fi to water the gardens.



5 year benefits of energy saving (from 2011 - 2016)

- \$27,000 spent on energy efficiency projects
- \$18,000 additional cash flow from energy savings p.a.
- \$66,000 spent on building improvements over 5 years:
 - Installed a video system to improve security: \$14,245
 - New security gate to stop unlawful use of visitors carpark: \$2,530
 - Extra intercom panel to allow visitors to access carpark: \$2,140
 - New fences to re-invigorate a garden bed: \$5,000
 - New garden gate to reduce catching/noise complaints: \$1,045
 - Repaint front facade of building: \$6,500
 - Repaint common foyer, lift bays and apartment doors: \$11,517
 - Recarpet 6 levels of lift bays: \$16,770
 - New roof over water boilers to lengthen lifespan: \$5,545

Sinking fund health: Up 65% over 5 years

Goal: Lift upgrade within 10 years without a special levy

UNSW AUSTRALIA Strata Sustainability Retrofits
CASE STUDY: Freesia Gardens, Chatswood

Never Stand Still Built Environment

ESTIMATED ENERGY USE REDUCTION 64% Electricity Bills	ESTIMATED COST SAVINGS (PER ANNUM) \$18,905 Energy & Maintenance
--	--

The Case:
In 2011, the 40 unit apartment block in Chatswood, had an electrical fault from the street to the building which resulted in a 3 day power outage. This made electricity issues a high priority for the building's Executive Committee (EC). The EC found that electricity was the biggest cost in the building's accounts, and had gone up 80% in the previous 6-7 years. The EC went about finding a solution to reduce these costs.

Excerpt from Wariblock Energy Progress Assessment

Innovation: Utilising the Climate Clever free report undertaken by the local council, and taking measures outlined in the report, the EC saved on unnecessary electricity usage and used these savings to make aesthetic upgrades to the building that residents were very happy with.

Retrofits:

- Long-term energy contract (2 years)
- Timers on lighting in garbage chute and ventilation fans
- New lagging around pipes
- Turned off 24/7 water pumping
- Fixed leaks
- De-lamped foyer and unnecessary garden lights
- Replaced all lighting with LED where possible – changes to exit, lift bay, common areas, carpark lights

Challenges | **Overcoming these challenges**

Communication
There were many issues with communication that required targeted strategies.

The previous chairperson didn't live in the building and found it hard to connect with the other owners and residents. Having a chairperson who was more connected with the residents was important in creating change.

The EC let people know about the things that had been done and that were planned at the building's Annual General Meetings (e.g. energy savings through the lights).

There was no list of residents in the building, so one was created by an EC member through a Google document database. Names, email addresses, phone numbers and real estate agent names were collected for better communication with everyone in the building.

EC members also actively communicated with the residents in passing at the lifts, and through notices in both the doorways and lifts where people were most likely to see them.

incorporation of LED bulbs to the carpark lighting

NABERS for Apartment Buildings Energy Rating (2018)

Freesia Gardens was offered by the NSW Government the opportunity to be one of the first 10 apartment buildings rated under a new energy rating standard being launched in 2018. Freesia Gardens received a 5 star energy rating (out of a possible 6 stars).



Rating valid until
July 2019

Freesia Gardens

Achieved 5 star NABERS Energy Rating

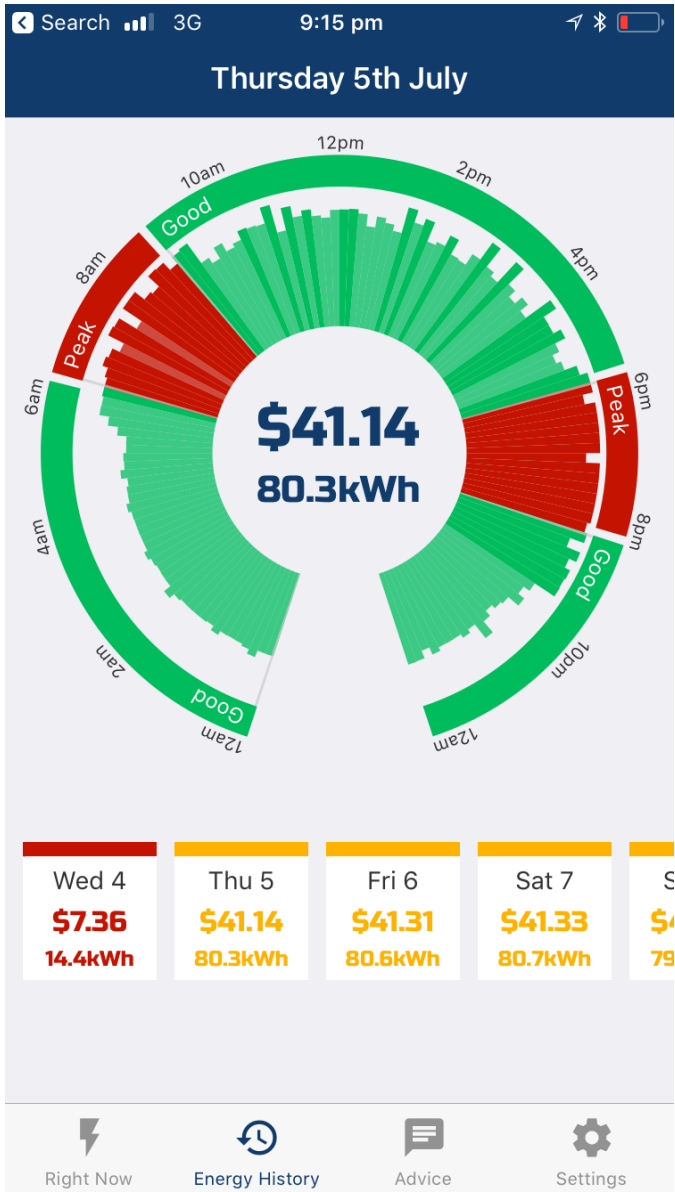
3 Freeman Road
Chatswood NSW 2067



NABERS is a national initiative managed by the New South Wales Government - Office of Environment and Heritage on behalf of the Commonwealth, State and Territory Governments. This NABERS Rating is based on 12 months of operational energy use. More stars indicate better energy performance and lower emissions of greenhouse gases.

www.nabers.gov.au

Installed an electricity monitoring device called Powerpal (2019)



Heat pump for domestic hot water investigation (2021)

Freesia Gardens investigated installing a heat pump for domestic hot water in 2021.

The project was going to cost \$77,000 and create savings of \$14,000 p.a.

The project was voted down due to:

- Residents being fearful of heat pump reliability
- The residents closest to the hot water plant being concerned about noise
- Fear that the building wouldn't be able to do a lift modernization project without raising a special levy

We gave our research to our neighbour building in the same street, 'Serenity.' They went ahead with the heat pump + solar PV project.

Today, a 2 bedroom in Serenity spends \$200 on hot water p.a.

At Freesia Gardens, a 2 bedroom can spend up to \$1,200 p.a. for hot water as we have unmetered gas storage hot water.

Website providing heat pump information to residents:

https://www.cognitoforms.com/FreemanRd1/_3FreemanRdHeatPump

Lift modernisation with energy saving features (2025)

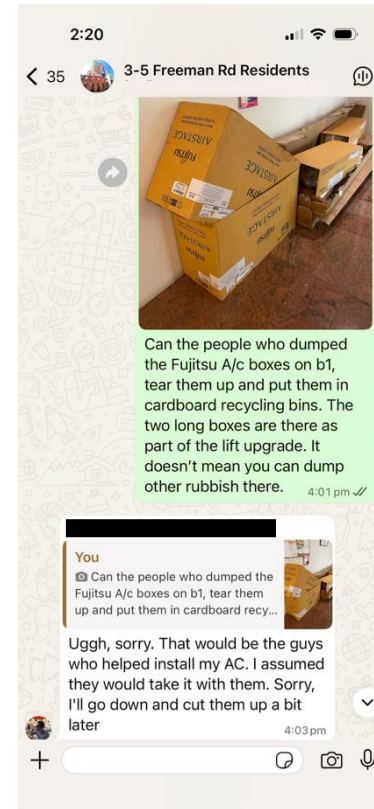
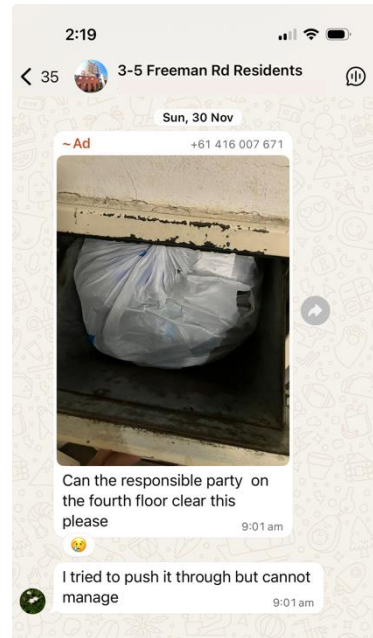
Energy saving features

- Lights in the lift down turn off after the lift is stationary
- Fan to the lift now turns off after the lift is stationary rather than running 24 hours
- Lift features a 'regenerative drive' so that when the lift is slowing down, it actually creates electricity and puts this back into the common area circuit

The Owners Corporation met the goal set in 2016 of doing a lift modernization project, without having to raise a special levy. Project was \$220k.



WhatsApp group – assisting with internal waste management



Jimmy Thomson's Flat Chat podcast (#78) includes a segment on "WhatsApp to the Rescue":

<https://www.flatchat.com.au/podcast-78/>

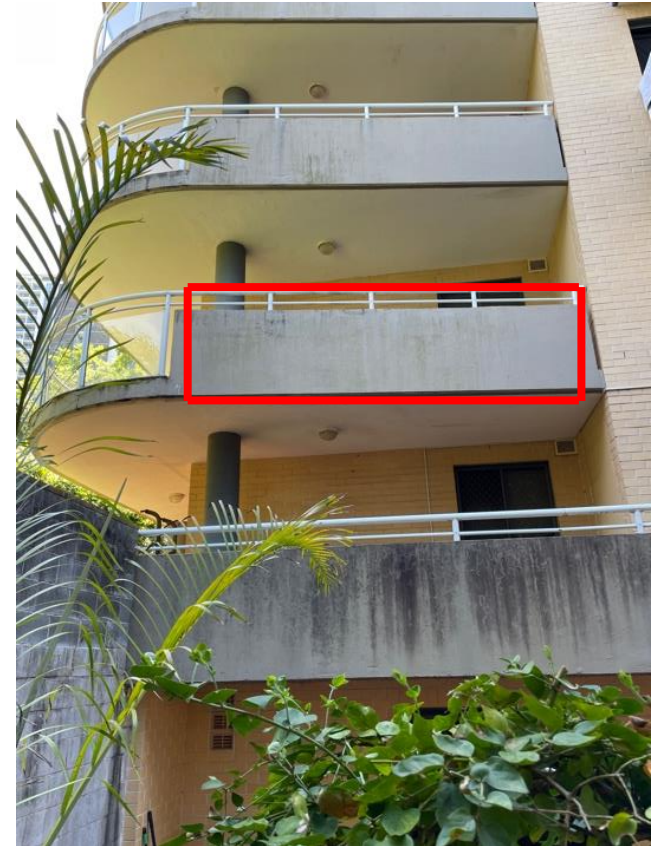
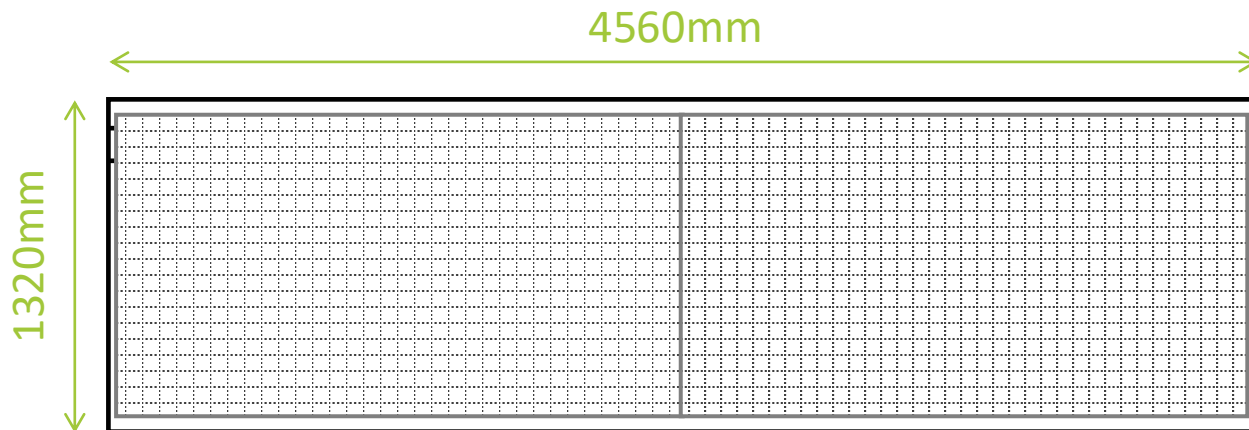
Passed a by-law to allow 'balcony solar' systems (2025)

Over 1 million balcony solar systems were installed in Germany by July 2025. Australian apartments can only do balcony solar systems if they are installed by an SAA accredited solar installer.

Freesia Gardens passed a by-law to allow balcony solar systems, but none are installed yet.

For example, 2 x Sunman 520W panels can fit on our balcony balustrades. Dimensions of the panels are:

2246mm wide x 1197mm high x 2mm depth. 8.6kg each.



Further information



Brent Clark

Secretary, Freesia Gardens

Electrify Strata



Electrify Strata is a WhatsApp community of 300 strata electrification enthusiasts helping each other to install solar, batteries, EV charging, heat pumps and more. Scan the QR code to join the WhatsApp group.

