



EV Charging for Apartments



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Completing the electrification of strata buildings



Survey of 700 strata residents in City of Sydney on EV charging



hybrid electric vehicles over electric vehicles Of vehicles in strata are family cars, which is the most common type of vehicle Knew the location of the nearest public charging station



Key stats

In 2021:





There are 31 EV models available in Australia. 58 by end of 2022







EV models available in Australia in by end of 2022 by Brand





Car makers becoming electric

Committing to becoming 100% electric:



By 2025 these brands will have strong commitment to electric vehicles in Australia:





Property Valuation uplift with EV Charging

EV Charging in new developments

- Developer offered 10 apartments with EV charging "off the plan"
- Inundation with offers led the developer to increase to 40 charge stations "off the plan"
- Other developments such as Genesis at Meadowbank, Burcham at Rosebery, Botanic at Ryde, Landmark at St Leonards, ABTRC LIV Indigo project at Sydney Olympic Park are EV Ready

EV Charging in existing buildings

- Tesla Model X owner was interested in renting in the building
- When Tesla owner learned it was not possible to charge, decided not to rent in the building
- Richmont building in Pyrmont is now pilot site for NSW government EV charging assistance



Infinity Cove



Richmont



Public Charging Infrastructure in Australia

Chargers in Australia





Electric Vehicle Council 2021

Public chargers in NSW and Victoria





Plugshare.com

NSW Sustainability Amendment to Strata Act

The recent Sustainability Infrastructure amendment to the NSW Strata Schemes Management Act in February 2021, only requires passing of sustainability infrastructure resolution (similar to an ordinary resolution with a 50% threshold). Your Strata Manager can assist you with preparing motions and resolution for voting at your next Annual General Meeting (AGM) or EGM.

For the purposes of this amendment, sustainability infrastructure means changes to part of the common property (which includes the installation, removal, modification or replacement of anything on or forming part of that property) for any one or more of the following purposes—

- a. to reduce the consumption of energy or water or to increase the efficiency of its consumption,
- b. to reduce or prevent pollution,
- c. to reduce the amount of waste sent to landfill,
- d. to increase the recovery or recycling of materials,
- e. to reduce greenhouse gas emissions,
- f. to facilitate the use of sustainable forms of transport, Note. For example, installing electric vehicle charging stations.
- g. a purpose prescribed by the regulations.

Sustainability infrastructure resolution means a resolution to do any one or more of the following that is specified to be a sustainability infrastructure resolution—

- a. to finance sustainability infrastructure,
- b. to add to the common property, alter the common property or erect a new structure on common property for the purpose of installing sustainability infrastructure,
- c. to change the by-laws of the strata scheme for the purposes of the installation or use (or both) of sustainability infrastructure.



Difference between special and sustainability resolution

The NSW Government changed the strata law so that only an **sustainability infrastructure resolution** of all unit Owners in a strata scheme is required for ANY sustainability project.

Special Resolution	Sustainability Infrastructure Resolution
75%	50%
Unit entitlements threshold	Unit entitlements threshold



NSW Government - \$500m towards EV Strategy

- The removal of stamp duty and \$3,000 rebates for electric vehicles under \$68,750
- \$171 million for co-funding infrastructure
- 100% bus and government fleet targets
- Delaying road user charges until 2027 or until electric vehicles account for 30% of sales, then replacing upfront stamp duty charges.
- Wattblock has been engaged on this project to assist with driving uptake into residential apartment buildings





Tipping points for EV's

The first tipping point is where it is cheaper to run an electric vehicle, the second tipping point is where it is cheaper to buy an electric vehicle.





The Cost to Run an Electric Vehicle







Countries Planning to phase out ICE vehicles

Country	Year
Belgium	2026
Canada	2035
Costa Rica	2050
Denmark	2030-35
Germany	2030
Iceland	2030
Japan	2035
Netherlands	2030
Norway	2025
Slovenia	2031
Sri Lanka	2040
Sweden	2030
Taiwan	2040
Thailand	2035
UK	2030, 2035



The EV Charger Suppliers On The Market







Prerequisite Projects for EV Charging Installation



EV Charging Survey

• Any interest in buying EVs in the future?



Understand the Maximum Load

- Feasibility Study
- Electricity monitoring device

OR

• Upgrade the electrical infrastructure



Passing an EV Charging by-law

- Set a limit on the charging speed
- Allow more EV Chargers to be installed



Case Study of EV Charging Retrofit from Melbourne - Triptych

- 157 Owners in Southbank did largest EV charging retrofit of an existing strata to date
- 22 apartments enabled for EV charging and 12 EV chargers installed together
- Key principles:
 - EV survey for market research. 25% of owners will buy EV in next 2 years
 - Open architecture, not what a vendor wanted to sell them
 - Benefit principle for cost recovery
 - Owners corp paid for things which improve property value for all owners
 - Legal first, commercial second, technical third e.g. load balancing
- All apartments in the building can be marketed as "EV ready", not just those that have a charge station installed
- Quickly jumped from 2 to 8 EV's after capability to install charger was provided





Case Study – "Regency"

Sub-metered Trickle Charging via GPO

- Trickle charger connected to closest general power outlet (GPO) which is generally rated at 10Amp
- A sub-meter is installed on the GPO to measure the electricity consumption from the GPO
- Owner reimburses the Owners Corporation for using the GPO at an agreed rate per kWh



Owner pays for the electricity at agreed rate per kWh measured on the GPO meter







Pros / Cons

- ✓ No costly EV charger needs to be installed
- ✓ Residents can charge their car at their own parking space
- - Charging speed is relatively slow Not all residents have access to GPO

Case Study – "6 Macleay Street Potts Point"

Unmanaged Charging On Individual Apartment Meter on Main Switchboard

- EV Charger connected to the individual apartment meter which is on the main switchboard
- Owners Corporation approved the installation and connection
- Simple by-law written by an EV owner without engaging strata lawyer



EV charger installed at the individual parking space

Enab

Enables fast charging if the Owners Corporation does not set the charging speed limit Owners pay for the electricity



Pros / Cons

Features

- ✓ Residents can install EV Chargers anytime
- Residents can charge the cars at their own parking space
- Electrician required to check capacity before installation of each chargers
 - Power outage to all units each time an EV charger is installed





Case Study – "Pirrama Wharf"

Unmanaged Charging On Individual Apartment Meter on Apartment Meterboard

- Similar to installation of a split air-conditioning for an individual apartment
- EV chargers are connected to individual apartment meters on apartment meterboards
- Owners Corporation only needs to approve the installation
- Full time building manager has an application form for lot owners to sign before engaging their own electrician
- EV charging by-law written by a strata lawyer

Features

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EV charger installed at the individual parking space

Enable fast charging if the Owners Corporation does not set the charging speed limit (e.g. 50A breaker) Residents cover all the installation cost







Pros / Cons

- Residents can charge the cars at their own parking space
- Residents can charge at anytime they want
- The apartment board capacity limit can be reached after the first 3 or 4 EV chargers are installed
- Residents who would like to install later may not be allowed as there is insufficient capacity left

Case Study – "Observatory Tower"

Building up a "backbone" with an independent connection to the grid

- Understand how many owners are interested in buying an EV in the next 5-10 years via an EV survey
- Increase the electrical capacity of the house service board
- Installation of new distribution boards on 5 levels of carpark for EV charging
- Install cable trays running past every car space on every level of carpark
- New grid link specifically for electric vehicle charging

Features



Increase the capacity limit of house service



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Building becomes EV ready and increases property valuation



Residents install EV Chargers "paying for last mile connection" and own choice of charger similar to NBN model

Pros / Cons

- Residents can install any EV Charger of their choice at anytime
- EV-ready buildings may attract more buyers/renters. The value of properties could also increase

- An extremely costly project (~\$0.5m)
- Owners who are not interested in buying EVs in the future may oppose the project
- 4 years after the initial quotation, this project has not proceeded, and there are no EVs in the building







Case Study – "Infinity Cove" – New development

Load Balanced Smart Charging

- All EV chargers are connected via data cables to a management hub located in the comms room
- The charging speed is automatically adjusted based on the total number of EV chargers being used
- Owners Corporation gets clouds billing system and strata manager doesn't get additional workload
- The developer originally advertised 10 lots to be sold off the plan with EV charging. Demand for EV charging resulted in the developer increasing the number of lots with an EV charger to 40 lots

Features



to a management hub, an internet connected smart box that can put all chargers online with one IP address

Chargers are connected

Enable chargi



The management hub allows users to control the chargers via the online cloud platform and the mobile app



Pros / Cons



- ✓ Avoids a costly capacity upgrade
 ✓ EVs can be charged at anytime
- Allows Owners Corporation to set pricing for charging



 The more EVs are charging at the same time, the slower the charging speed



Case Study – "Genesis" – Embedded network + solar + EV Charging

Chargers in Dedicated Parking Spaces

- Sacrifice some parking spaces, and convert them into dedicated EV Charging spaces
- Engage external billing company (embedded network operator) to collect the charging fees
- 30kW solar system on the roof connected to the gate meter of the embedded electrical network and sharing solar into apartments, common areas and EV charger



EV chargers are installed in a shared, dedicated parking space

Features

The EV chargers are connected off the common area meter within an embedded network



Residents pay the embedded network company for power using a mobile app







Pros / Cons

- ✓ Potentially lower charging rate as the EV chargers are connected to the common are meter
- ✓ The charging rate can be set by the Owners Corporation
- ✓ Solar power EV charging during daytime
- ✓ Card payment via mobile app



 No battery at the building so night time charging is from the grid

Case Study – "Horizon"

EV Charging in Dedicated Visitor Carspaces with new bollards and cloud-billing

- 2 visitor carparking spaces were converted into dedicated EV charging spaces with bollards and painting
- A dual EV Charger was installed which is connected to common area meter
- Owners Corporation paid for the installation and setup which was done by Velocity Electrical

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Dual charging available on single charging station A booking system is

Features

used to reserve the charging spots

(3)

Owner pays for the charging cost via credit card based on the rate the Owners Corporation set

Pros / Cons

- ✓ All residents have access to the charging station
- Charging electricity rate is relatively low as the charging station is connected to the common area
- No extra administration for facilities manager or strata manager, except reconcile re-imbursement of charging costs from cloud billing system

Owners Corporation needs to pay a monthly fee for the payment system

 Charging speed is reduced to half if there are two EVs charging at the same time





Case Study – "Waratah"

Load Management System for EV Charging – EV owner selects their own charger

- A building management system (BMS) which picks up data from all assets in the building needs to be established first
- A communication gateway is connected via BMS to a proprietary control system (NHP)
- The EV chargers are connected via Ethernet (using the OCPP protocol) to the communication gateway

All chargers are connected to a control system

Features

Electric Vehicles will only be charged during the low consumption period when there is sufficient spare capacity (i.e. scheduling)

The control system is equipped to export energy usage data, which enables tracking and reporting of which vehicle chargers are using energy and when





Pros / Cons

- Avoids a costly capacity upgrade
- ✓ Owners Corporation / Building manager has full control of the building assets
- ✓ Individual EV owners can choose any charger of their choice
- ✓ Load management system can be installed by a local electrician

- Maximum 6 EV chargers per control system
- The more EVs are charging at the same time, the slower the charging speed
- EV charging may be delayed until the middle of the night in some buildings which experience high loads during the day



Case Study - "Richmont"

A mixed-use strata building with 118 apartments and 3 commercial lots in Pyrmont. There are 3 levels of carpark with 108 parking spaces including 12 visitor parking

Objectives

- Manage EV charging in conjunction with booking system / bollards for 12 out of 12 visitor carparking spaces
- Secretary of the strata, Dale Cohen, is a Tesla Model S owner, who previously owned a Mitsubishi Outlander
- Estimating this building will have 18 EV's charging in the building within 10 years time

Challenge / Rationale

No electrical diagram available which is a common issue in older buildings. Power factor correction device showing an error

Building has a history of electricity theft from a commercial lot which was plugging fridges into common area GPO's

After a 5 year journey a budget has been allocated to implement EV charging

Solutions

- 1. 10 x Tesla Generation 3 Chargepoints in visitor carparking spaces with Tesla Management System
- 2. 2 x Chargefox chargepoints in visitor carparking spaces with Chargefox Management System
- 3. 3 New 160 amp distribution boards (70 poles each) installed, one for each level of carpark
- 4. New cable tray through three levels of basement carpark
- 5. Hardware load balancer for Chargefox network, software load balancing via wi-fi for Tesla chargepoints







Case Study - "Zinc" – Flat cable

There is one level of carparking in this highly energy efficient strata scheme of 45 Apartments in Alexandria

Objectives

- Building has done energy efficiency and two common area solar projects (25kW), with a third solar project on the way to share solar power into the individual apartments
- The Owners Corporation wanted to improve property valuations through striving for a "green valuation"

Challenge / Rationale

Building did an EV Survey in 2017 and 75% of residents were in favour of EV charging

No visitor carparking

spaces at this site

7m charging cables

allow a chargepoint to be shared by multiple vehicles, not just the vehicle next to the chargepoint

Solutions

- 10 x Tesla Generation 3 Chargepoints in visitor carparking spaces with Tesla Management System 1.
- Flat cable installed behind each carspace by Karchargers 2.
- 25 kW solar system provides solar powered EV charging during the daytime 3.
- Wattwatchers electricity monitoring devices (3 installed) 4.







Learnings and experiences at other buildings

- Using the GPOs for EV charging is least favourable as the Owners Corporation does not want to pay for the charging cost
- Surveys show that owners want to charge in their own private car space
- There is not sufficient public charging infrastructure available in the Greater Sydney Area
- Owners want a reputable, experienced and financially sound EV charging installer
- Very unlikely that Strata Owners Corporation would spend a large amount of money to upgrade the building's electrical capacity just for EV charging ("Observatory Tower" model)
- Would like to have an incremental solution
- Want to charge **premium rents** after EV chargers are installed
- Billing needs to be **automatically** done without any manual operation by the committee members, building managers, or strata managers
- Concerned about "support, extensibility over time"
- An EV charging roadmap should take into account Open Charge Point Protocol (OCPP), EV carshare, solar and batteries



Further information



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https://www.youtube.com/c/WattblockAu/videos



https://www.wattblock.com/ev-charging-training.html

