

**Submission
No 3**

ELECTRIC AND HYBRID VEHICLE BATTERIES

Name: Mr William Isley
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Submission to the Joint Standing Committee on Road Safety on Electric and hybrid vehicle batteries.

My concern is with the fire risk associated with electric vehicles (EVs) and, in particular, managing the fire risk associated with these vehicles in basement car parks of residential strata buildings.

Car Parking in Strata Residential Buildings

A typical strata building has basement car parking. The ceilings of these basement car parks generally have significant infrastructure attached to them such as plastic stormwater and sewerage pipes, trays of electric cables and copper water pipes. Car spaces are allocated to each residential unit and often, but not always, there is an additional allocation of car spaces for visitor parking. The parking spaces are generally in rows and are 2.4 metres wide, allowing just sufficient room for passengers to enter and exit the vehicle. Many car spaces have open wire storage cages behind them which may contain flammable material.

Often there is little fire mitigation infrastructure in the basements, with few heat or smoke detectors and sprinklers.

Fire Risk of EV vehicles in basement car parks

The currently available statistics indicate that the rate of occurrence of fires associated with EVs is much lower than fires associated with internal combustion engine (ICE) vehicles. But, approximately a third of the fires in EVs have occurred when the vehicle is being charged (although some caution should be exercised when assessing these statistics as electric vehicles are still relatively new and the statistics are based on quite small volumes).

EV fires are much hotter than ICE fires, are much more difficult to extinguish and they expel dangerous gases that makes fighting the fire hazardous. Given that the fires, once initiated, typically engulf the vehicle in around three minutes, there is little prospect of Fire and Rescue NSW attending the fire before it is out of control. Any EV fire in one of these car spaces where there is inadequate automatic fire mitigation infrastructure has the potential to cause a very significant fire, as neighbouring vehicles and items in the storage cages are likely to ignite and spread the fire. There is a real potential that the consequences of the fire will be catastrophic. It is likely that rows of cars could be burnt and that there would be significant damage to the building infrastructure. It is not inconceivable that there could be significant damage to the slab making up the ceiling. Moreover, toxic gases would need to be vented and contaminated water contained.

As the number of EV charging facilities in the building increases, the likelihood of a fire will also increase. As well as the risk associated with charging an EV, there is also the risk of an EV with a damaged battery being parked in the building and subsequently igniting.

NSW Government's "Electric vehicles ready buildings" program.

The NSW Government has been urging existing strata buildings to make their strata building "EV ready" by installing EV charging facilities. I have watched webinars and read through the documentation on the Climate and Energy Action Website as well as the current EV Ready Buildings Grants documentation. The focus is on the installation of electrical infrastructure associated with the charging facilities. There is insufficient focus on the fire risk associated with these facilities (Indeed, the photo on the front page of the Grants application documentation suggests to me that the fire risk has not been sufficiently considered. No fire mitigation infrastructure is apparent and there would appear to be inadequate separation between vehicles).

Insurance Considerations.

If the management of the fire risk is inadequate, then it has the potential to drive up building insurance costs, perhaps even to the stage where insurance premiums become prohibitively expensive or insurers refuse to offer insurance at all.

At this stage, there appears to be little advice from insurers in Australia about what they consider to be adequate fire mitigation measures. This is in sharp contrast with some of the European insurers.

The following recommendations from the large multinational insurer, RSA Group, are typical of advice being offered by European Insurers:

"Vehicle Charging Location.

*Locate electric vehicle charging points where the chances of effective manual firefighting are maximised, and the chances of fire spread and damage minimised. **Ideally chargers should not be in underground car parks**, and if this is unavoidable then provide adequate sprinkler protection and/or effective fire separation to reduce the potential for fire spread between vehicles. Locations of vehicle charging are listed below in order of preference. As an example, locate charging equipment on unenclosed roof areas in preference to lower enclosed floors, and with 100% underground car parks place close to building entrances if installation of chargers cannot be avoided.*

Locations of vehicle chargers in order of preference:

- 1. External charging points away from buildings and equipment, such as within secure, outdoor, open, areas.*
- 2. Detached, low value, buildings.*
- 3. Unenclosed roof levels of multi-story car parks (within hose stream reach or accessible to fire tenders).*
- 4. Aboveground sprinklered car parks.*
- 5. Aboveground levels of open sided car parks where firefighting hose streams can reach (typically within 15-m of external ground floor level).*
- 6. Ground floor levels of enclosed car parks within access of firefighting hose streams from building entrances. (i.e. external firefighting is possible).*

7. Aboveground level of enclosed carparks within access of firefighting hose streams from safe access points

8. Belowground level areas with adequate automatic sprinkler protection.

9. Belowground level areas with 120-min fire separation from other areas, including automatically closing fire shutters or doors at access points to the charging areas (including vehicle access points) and minimum 120-mins structural integrity

10. Belowground level area with no fire separation or sprinkler protection but with minimum 120-min fire integrity (this offers no fire control and is undesirable).

Charging equipment should be located on a raised island (minimum 100-mm) and should be protected against impact damage by kerbs, bollards, or metal barriers.”

The full document is available at the following link:

<https://static.rsagroup.com/rsa/commercial-insurance-products/risk-consulting/electric-vehicle-charging-enclosed-car-parks.pdf>

Conclusion

The Government and the Electric Vehicle industry do not appear to have sufficient focus on the fire risk that Electric Vehicles represent when being charged (or indeed, parked) in building basement carparks. I believe that that the Government must place much more emphasis on the potential fire risk of EV charging facilities in strata building basement carparks and provide clear guidance on acceptable fire mitigation strategies.