



BEV Concerns

Will the Building Owner be deemed responsible
for BEV fire damage

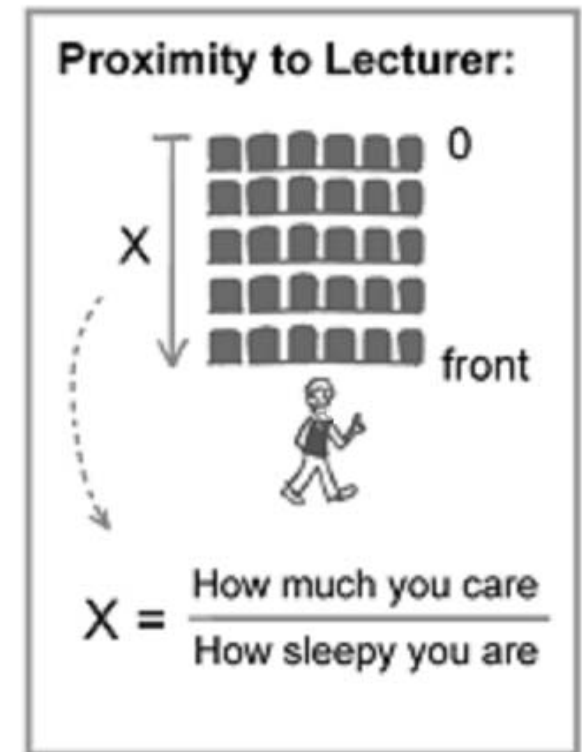
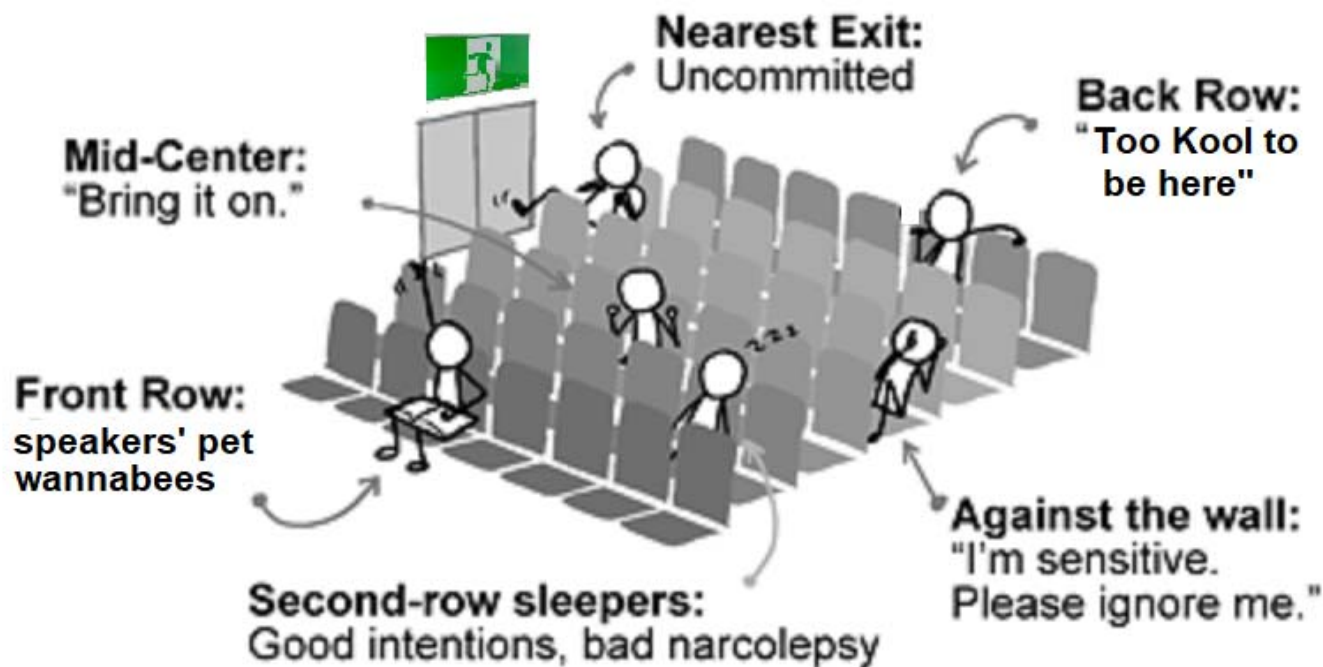
Ian Childs
Principal, FIREASSESS.AU



Where you sit...

WHERE YOU SIT IN A SEMINAR

And what it says about you:



BEV's in your carpark

Building owners & Managing Agents are unprotected

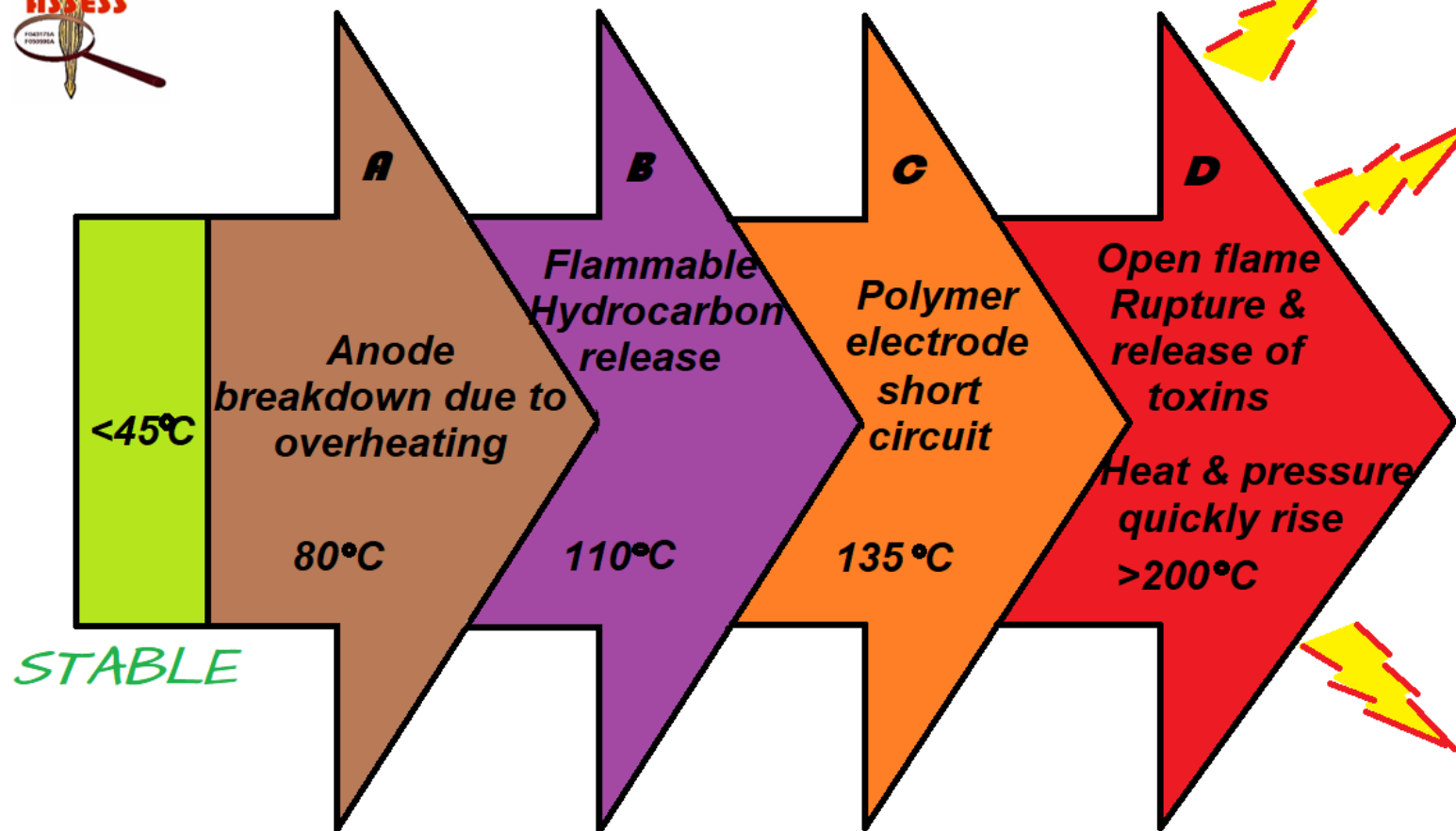
A BEV fire in a carpark can result in structural & consequential damage
Including depletion of structural integrity (holding the structure up) and
health issues associated with the toxins released.







Thermal Runaway - lithium-Ion



Reactive fire

This is where you have a chemical fire where “water” can actually fuel and escalate the intensity of the burn. This is what happens when a Lithium-Ion battery is on fire and upon rupturing the product comes into contact with water.



Current requirement for large or underground car parks

If water comes into contact with Lithium-Ion combusting product it will feed and escalate the Intensity of the fire



Why have sprinklered carparks

NCC E1D5, E1D9, S17C2 AS2118.1 at not less than OH2 for all carparks with a capacity vehicle space greater than 40

*My belief is that **any** carpark with BEV's needs this level of protection.*

This will do little to suppress a Lithium-Ion battery fire, however, it will mitigate fire spread as well as provide cooling of the carpark structure to protect against the real threat of structural collapse.

A real issue of BEV's is that they weigh significantly more than an equivalent ICE vehicle. Older carpark structure design was an allowance of 2,500kilograms per carspace. Bloating of vehicle mass and BEV's mean that many vehicles exceed 3,000kilograms. This additional loading also reduces the effective FRL of the structure.



FRL

FRL stands for Fire Resistance Level and measured in minutes

Note that it is Fire Resistant, NOT Fire Proof! (nothing is)

FRL is represented by 3 sets of numbers **##/##/##**

The first number is “structural adequacy” and if this was 120/-/- then the material has been tested to maintain its structure, without breakdown, in a furnace for 2-hours (120-minutes)

The second (middle) number is “integrity” and if this were -/60/- then the material or tested product would not allow product of combustion through the barrier between the furnace other space for 1-hour (60-minutes)

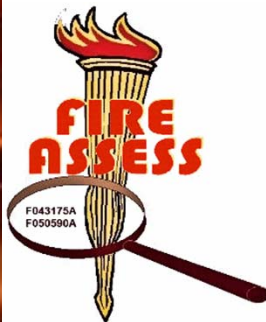
The third number is “insulation” and if this were -/-/30 then the material or product would maintain an appropriate differential temperature across the barrier for a period of not less than ½ hour (30-minutes)

A dash “-” means that there is no requirement.

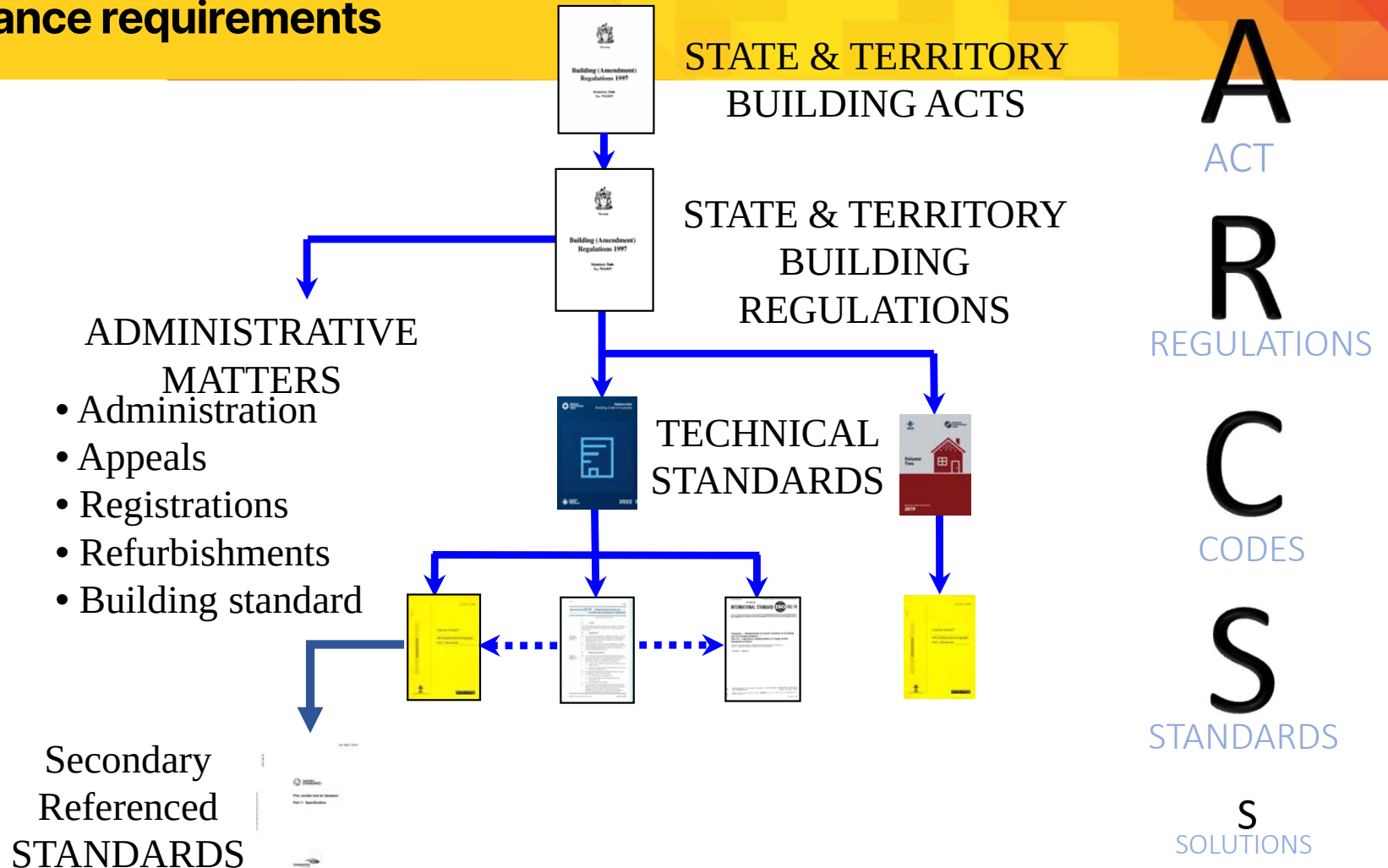


Reactive fire

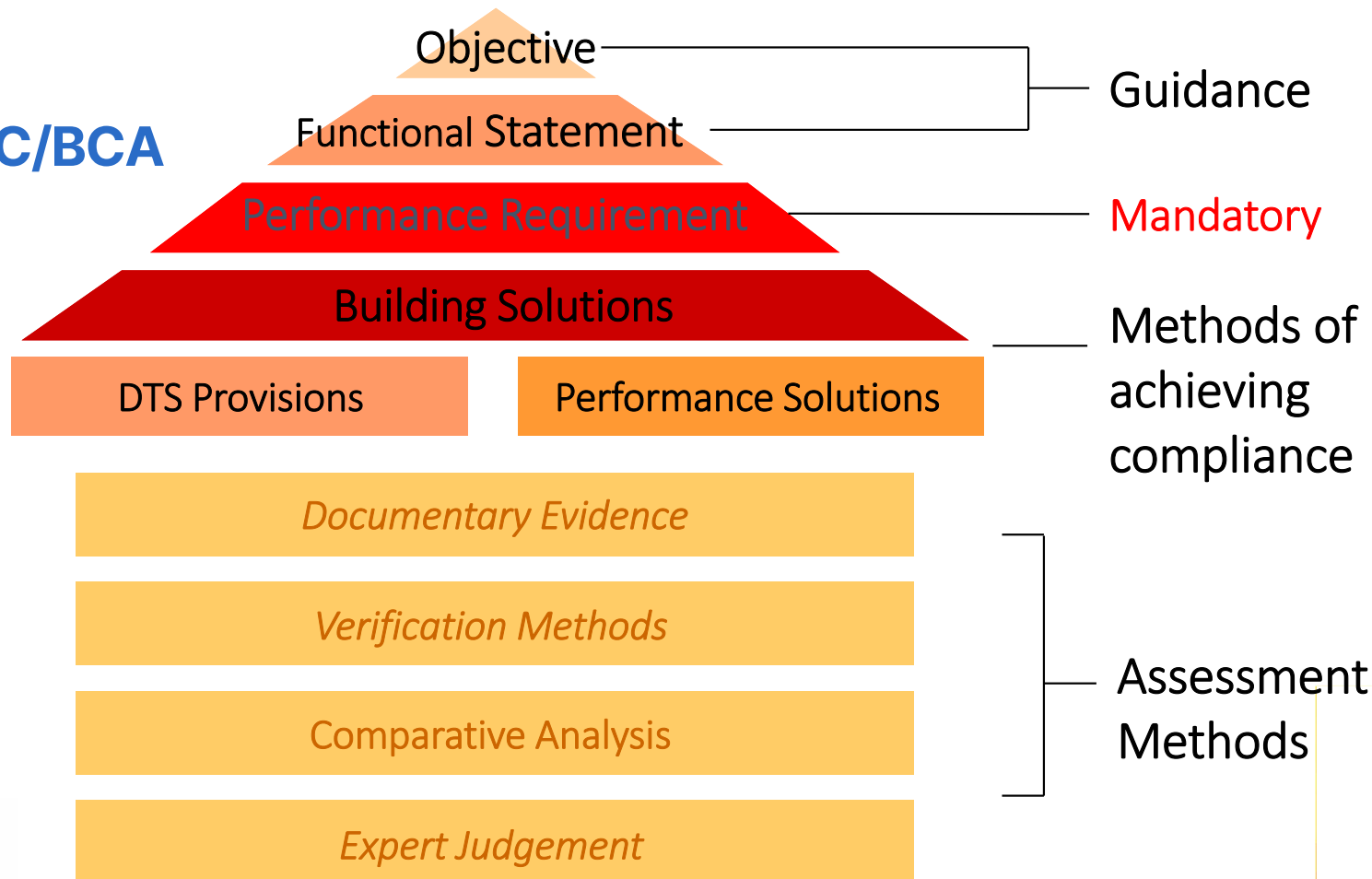
**NOTHING IS
FIRE PROOF!**



Compliance requirements



NCC/BCA



Current requirement for large or underground car parks

The national construction code (previously known as the BCA or Building Code of Australia)
Any carpark containing greater than 40 vehicle parking spaces must be provided with automatic fire suppression (sprinkler) to Australian Standard AS2118.1

The negative of this for BEV fires is that the sprinkler water can take this from a chemical fire, to an intense reactive fire

The only plus points for this are that the vehicle body may provide some shielding from the sprinkler deluge and this would allow appropriately trained and equipped first responders to use a smothering agent to separate the fire from the water and contain the chemical fire until it consumes its fuel source.

The sprinkler suppression should mitigate structural damage to the carpark fabric.



Current requirement for large or underground car parks

Whilst most car parks are required to have mechanical ventilation when natural crossflow ventilation is deficient, such systems are simply not designed to extract the toxic smoke emitted by a BEV fire.

We suggest that in a large commercial or residential enclosed carpark, this would have significant consequences and the volume and density of the smoke is significant

The toxic products must be extracted and discharged to a safe space – well away from those who may be effected.

This is an agenda item for the Standards Australia Technical Committee for AS/NZS1668.1 and AS1668.2



Victoria's MFB management method

It was proposed that all buildings with BEV charging would have an ID plaque to warn first responders.



The proposal stated that if the response was to a BEV fire, the responders would simply let it burn itself out.

We recognise that this would be impractical – but it is understandable.

SO WHAT CAN WE DO???



Statistics

Victoria had a Big Tesla Static Battery fire which went for 3-days

China alone acknowledges 7 EV Fires each week

Fire Brigades worldwide want safety of FB operations considered as a priority

Many insurers have yet to have any issues with BEV currently

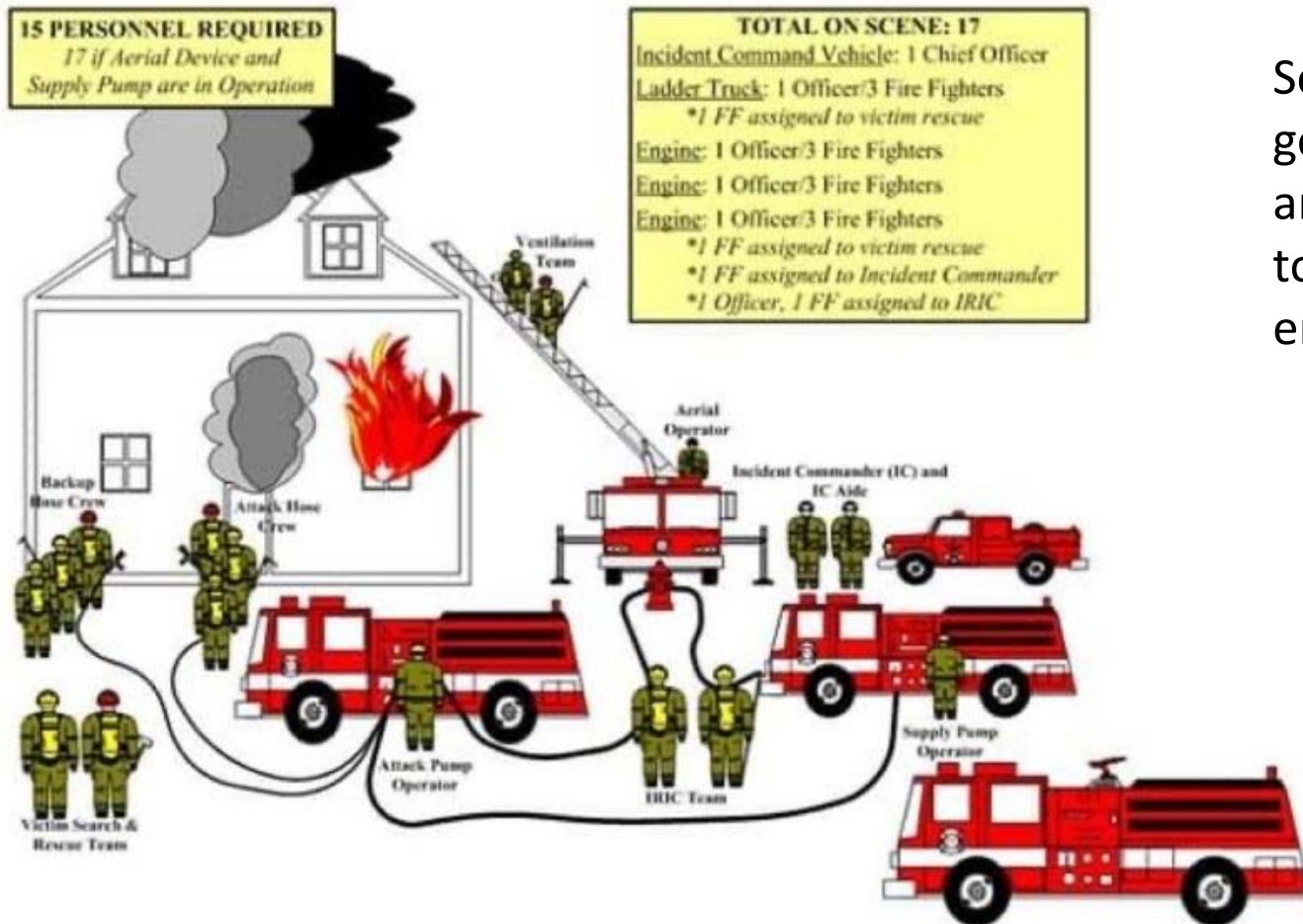
The Federal and State Governments are pushing for BEV take-up as a means of appearing to be green.

Engineers Australia Society of Fire Safety are currently developing a practitioner practice guide to provide an acceptable level of safety

It is expected to have the draft finalised by mid-2024 and we are part of the drafting team of deemed experts.



Typical house fire response



So how are the fires going to get themselves and equipment safely to a BEV Fire in an enclosed carpark?



Mitigation

BEV Charger installations **must** require development consent.

Have BEV Chargers only located in accessible open spaces.

Where this cannot be accommodated:

Exposed rooftop parking space.

Parked where the vehicle can be readily hooked and towed outside.

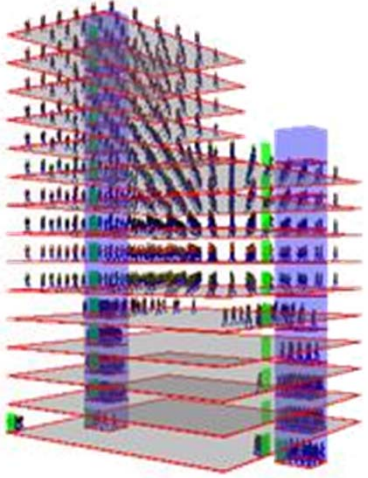
Fire Segregate car-space, replace sprinkler suppression with smothering agent + install mechanical smoke and combustible product exhaust with discharge to safe open space (minimum 3m above any occupied space or intake).

install gas detection to terminate charging and if threshold achieved, trigger release of smothering agent and activation of exhaust with alarm.

RECOMMENDATIONS



Who is responsible?



The building owner / Managing Agent
is always the entity responsible for any
Life safety issues within the building
Under their control.



Who is responsible?

Unlike construction issues with buildings such as: Opal Tower at Olympic Park and Mascot Towers where the building owners are able to point the finger to those who: Designed, built and certified....

This is not the case for Building Owners and their Managing Agents who allow any BEV parking or charging, within their facility.

For this, the building owner or their managing agent ARE deemed RESPONSIBLE for Any consequence arising.

So if there is a BEV Fire in your building, then likely, you shall be held to account for any consequential damage which could be:

- Structural – the fire may have damaged the building fabric and structure.

- Combustion – the fire may spread and damage adjacent vehicles.

- Health – the fire may result in health issues for occupants, responders, and passes by.

Fire Intensity

We have heard that some so called experts are saying that “there are just as many if not more ICE (petrol) fueled vehicle fires as BEV (battery electric vehicle) fires” *and That may well be the case...*

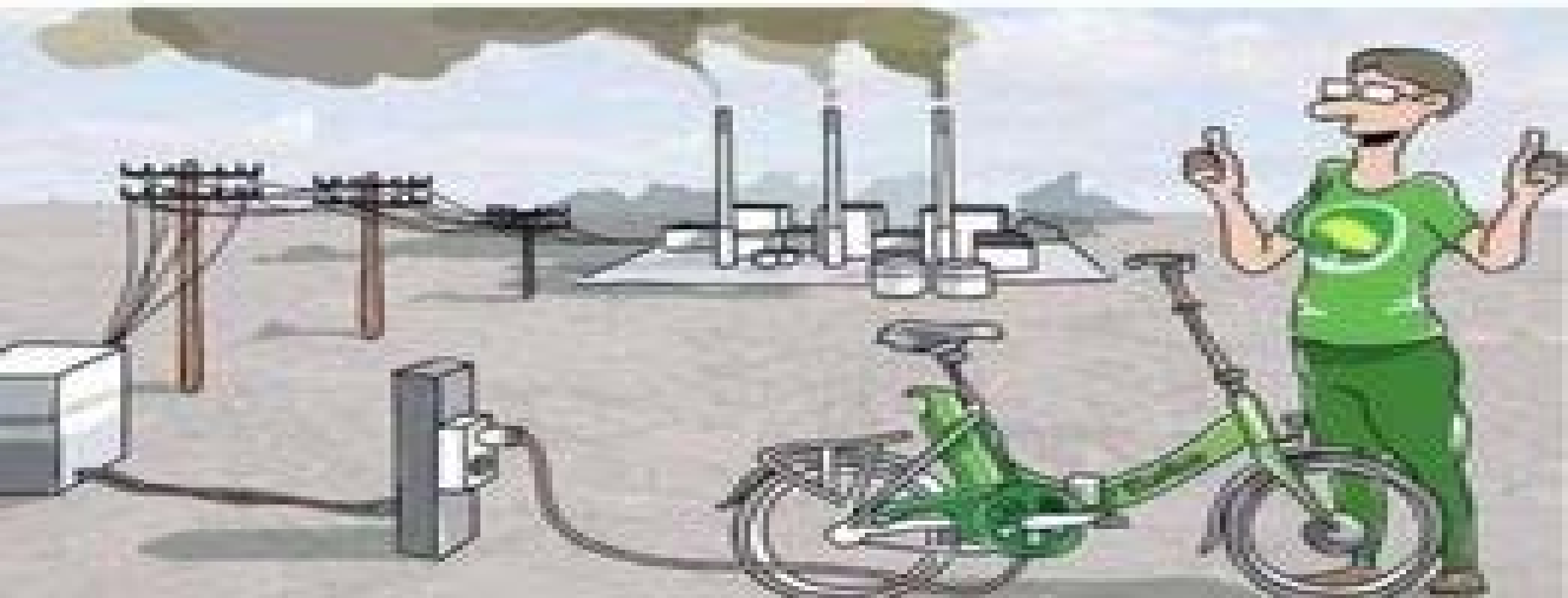
What they don't say is that an:

ICE vehicle fire burns at **435 °C** compared to a BEV fire which burns at **2,760 °C**

That's a fire which is over **6 times hotter** – in addition to the expelling of significantly more toxic material.

Other issues

THE GREAT DELUSION





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