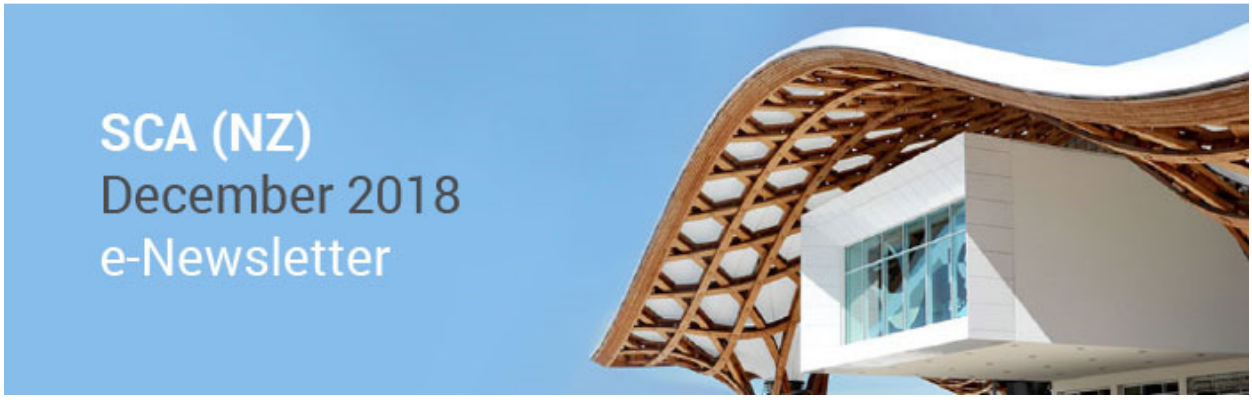

Member Contribution

Article written on behalf of SCA(NZ) and BCCG by David Watt, Executive member of SCA(NZ) and BCCG who was supported with peer reviews by Robert Boyd-Bell (co-President BCCG) and Karl Hutton (Committee Member, BCGG Auckland).

18th November 2018

Electric Motor Vehicles – Do they represent a current and electric load issue for Bodies Corporate???

It is both – it is **current** because there is a rapid creep in demand from early adopters for facilities to charge their new vehicles, and this demand is going to expose **available power or load capacity** to a serious challenge. It will be necessary to design EV charging reticulation to be compatible with existing electrical reticulation, load capacity and usage profile.

In May 2018 BCCG alerted its Auckland members to the rapidly developing need for EV charging. Members were advised that "*doing nothing*" was not an option and for residential buildings that before preliminary design work is completed to be wary of pressures from early EV adopters, and the special requirements of a fast charging facility.

We noted then that:

BC should not:

- Set new rules relating to EV charging that inhibit future adoption of alternative design options and amended BC rules (an early arrangement may become a pre-existing right if new Operating Rules are subsequently introduced).
- Prevent later adopters from achieving equal rights with those granted to early adopters.
- Prejudice the continuity of power supply to common services.
- Approve a design that requires a major upgrade of overall power supply (unless such upgrade is practically achievable, fully costed and expenditure approved by Owners).

Knowledge of the specific BC building electrical layout was crucial:

What is actual supply from Vector (eg 315 amp 3 phase)?

- Understanding the proportions of common supply and apartment supply across each of the phases.
  How are they mixed and how is the load managed?
- How much power is the presently being used and what "spare" capacity is available?
  For an initial assessment, data-log each phase of the supply over a period to establish demand over peak and off-peak times (eg: 6am to 9pm, 9pm to 6am).
  For a broader more detailed view, obtain data "half hour" usage data covering a 12-month period which will enable assessment of peak and off-peak load for both summer and winter conditions.
- This will inform what capacity you have for EV and when you have it?
  The location of existing distribution boards and their proximity to car-parks.
  Get specialist advice / assistance in understanding the EV implications for the building.

Design aims were identified.

For one Case Study BC these were noted as being:

- Optimize new technology / do not over-engineer.
- Use appropriate load/time controls to manage overall usage, maintaining priority supply to common services.
- Keep supply within technical and financial capacities. To fit demand within existing supply special EV sub-boards need to be installed.
- Mix of capped EV & demand controls. For example:
  - Provide a maximum 20 amp EV within each apartment supply [63 amp]?
  - Time-manage "off peak" and actual specific hours to be determined?
- BC to pay for installation of Sub-Boards and Cable Trays.
- Design finalized with owner input, costed proposal provided to Owners.
- Owners responsible for installation beyond sub-boards, Code of Compliance required

In July BCCG arranged for its members an Expert Panel to provide a more detailed background to EV conversion.

The panel included Cristiano Marantes, the Head of Engineering at Vector, and representatives from two EV equipment suppliers - Juice Point Limited and AB Electrical Limited.

Vector provided a robust assessment of EV development globally and predicted exponential global growth in EV uptake. In New Zealand Vector considered the market should be segmented into two parts with the Government target of 64,000 EV by 2021:

- Residential - 65% of light EV were in individual ownership compared to company or fleet ownership,
- Fleet locations, such as company buildings, carparks, shopping malls, etc.

A number of key messages were provided:

- Depending on charging technology, connecting 1 EV is equivalent to an additional 1 to 20 new homes on the electricity network.

  For Example: One 2.4kW trickle charger = **1 new house**, One 22kW fast charger = **9 new houses.**

- It is not the battery size which defines power line capacity and investment requirements, but rather the capacity of the charger.
- Even at 10% EV penetration, low voltage capacity **constraints can occur** when charging during **peak time** and/or using **faster charging** options.

Vector noted that they were preparing ***Network Connection Guidelines for EV Chargers*** and posed a series of questions.

- Are you are installing compliant EV chargers to avoid WorkSafe audits?
- Are you are installing accurate bill-able metering of EV chargers?
- Should you be connecting chargers to house services?
- How many chargers do you need and when? How can network-integrated technology Smart Charging decrease installation cost?
- How to address accessibility of chargers?
- How to ensure technology does not become obsolete too quickly due to changing customer expectations?
- How would the payments system work? How do customers refund the building owners?
- How to install standard-based EV chargers to participate in Vector's full city-wide eMobility roaming services?
- Getting ready to offer customers who want to use V2X modes (e.g. Vehicle to Grid and Vehicle to Home)

Vector advised they were running a NZ-first trial with cutting-edge network-integrated technology to address all of the above – and asked those present to reach out if they were keen to join the trial.

Juice Point and AB Electrical then followed with detailed explanations of Smart Charging product offerings that minimise hard wiring requirements and provide self-balancing load management systems. These offerings were based on use of Cloud technology and proprietary software solutions.

In October at the request of Vector, BCCG arranged for a User Group to meet with Vector to provide feedback on the draft ***Guidelines*** they are preparing for public

release. SCA(NZ) members Tim Jones and Andrew Yovich participated in these discussions which were very useful. A major initiative in this program revolves around how variable load can be dynamically managed.

The topic remains of keen interest to many BC Managers and Facilities Managers and both BCCG and SCA(NZ) will continue to follow progress in this area.

In the public arena, **Shane Colishaw** of **newsroom.** on 8 July 2018 wrote an article which contained some interesting observations:

“Following the change of power, the coalition agreement between Labour and New Zealand First included a goal to turn the (Government) fleet of 25,000 cars, vans and buses emissions-free by 2025/26.”

“A briefing prepared by the **Energy Efficiency and Conservation Authority** for **Energy Minister Megan Woods** illustrates how difficult it will be to meet the Government’s 2025 commitment.”

“Government organisations appear to be reluctant to commit to electric vehicles for one main reason – the high price of the cars and charging infrastructure.”

https://www.newsroom.co.nz/2018/07/08/142382/roadblocks-for-government-fleets-electric-shift

In the Regulatory arena, WorkSafe New Zealand are responsible for developing safety standards and this information is available through the following link:

https://worksafe.govt.nz/laws-and-regulations/consultations/review-of-the-electric-vehicle-charging-safety-guidelines/