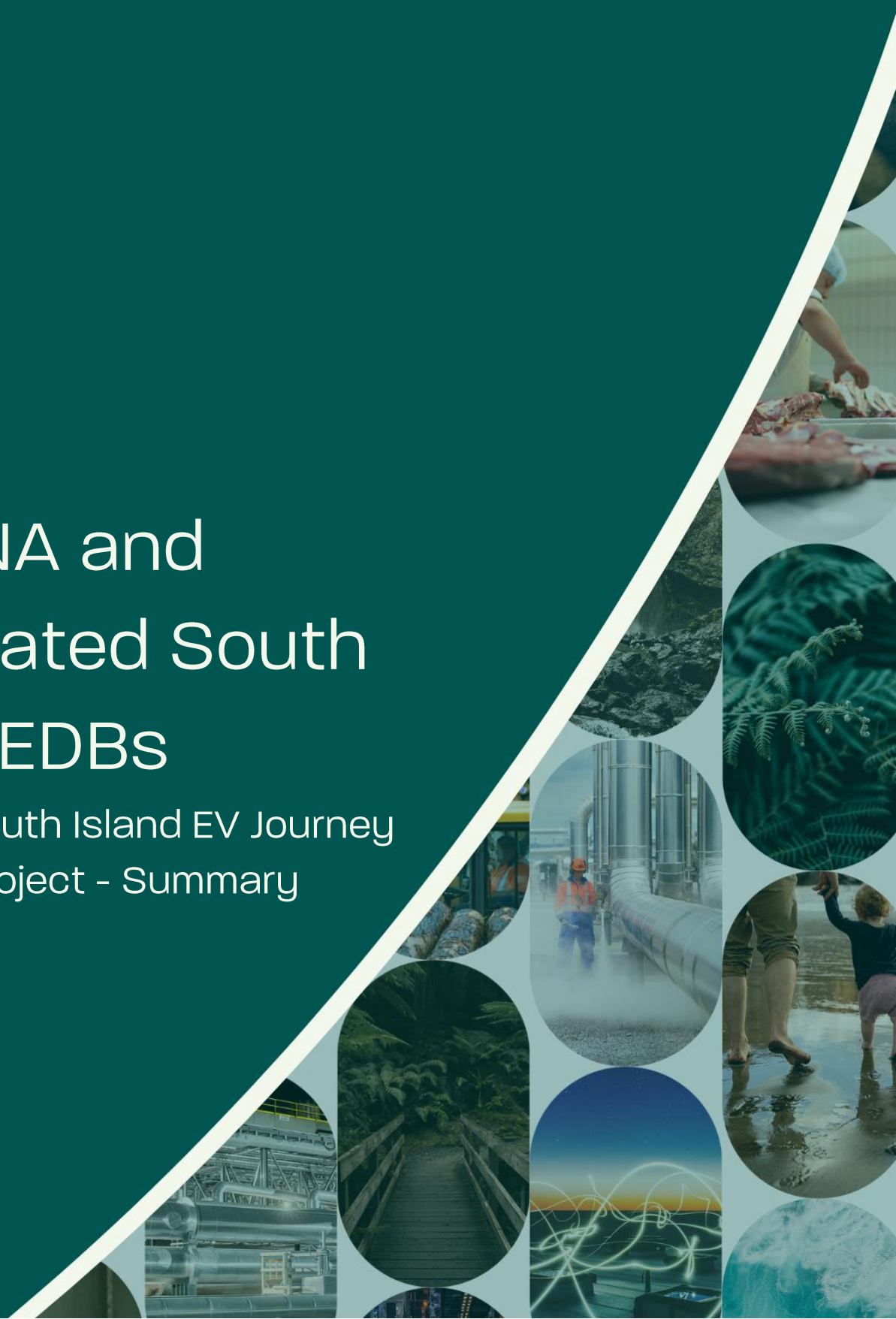
Sustainable action for a better tomorrow

# The ENA and associated South Island EDBs

## Updated South Island EV Journey Charging Project - Summary

Final Report

3/03/2026



| Revision | Date | Revision Details | Author | Verifier | Approved |
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# Project Summary

### Overview of Project

In February 2025, the South Island EV Journey Charging Project Report was released to the public. The aim of this work was to identify places in the South Island (SI) where additional charging capacity would be required in 2030 to meet peak demand, with indicative connection costs provided by electrical distribution businesses (EDBs) for potential new charger sites. This was achieved by building a demand forecast for light EV journey charging using traffic volumes to identify locations where additional capacity would be needed to meet peak half hour demand on the busiest traffic days in 2030. EDBs provided indicative costs to connect EV chargers in these places on their respective networks. These proposed charging sites were selected in order to make sense from a network point of view (available capacity, relatively cheap to connect) and from an EV user point of view (close to State Highways and amenities).

### Purpose of Update

The EV Journey Charging Project was undertaken in the North Island also, incorporating some updated assumptions based on feedback to be more conservative around existing charger reliability and turn-in rates. These adjustments were made to better reflect what EV users were experiencing on their journeys. To present a NZ wide picture of additional capacity and chargers required to meet the peak half hour on the busiest traffic days in 2030, the updated assumptions were applied to the South Island work. This update summary presents the updated demand forecast and current charging capacity for the South Island. EDBs were not asked to provide updated connection costs or investigate new charging sites based on the updated demand forecast, however the original costs given have been used in this summary for completeness.

### Outcome

Quarter-hourly traffic flows at 45 locations across the South Island were reviewed to estimate the EV charging demand in 2030 in these locations. The additional capacity required to meet 2030 peak demand was estimated by incorporating current EV journey chargers. Existing journey chargers (≥50 kW, <2.5km from a State Highway) in investigated SI locations total to 27.5 MW of rated capacity, however, applying our updated assumptions reduces this existing capacity to 16.3 MW to better reflect reality of broken chargers and inefficient charging behaviours.

It is estimated that combined light EV journey charging demand in 2030 will peak at 16.7 MW over a half hour period. 9.1 MW of this demand can be covered by existing journey chargers, resulting in 7.6 MW of additional capacity required (equivalent to 166 additional 50 kW[1] chargers).

Table 1 presents a summary of the additional peak charging capacity and the corresponding number of 50 kW chargers required to satisfy peak journey charging requirements for light EVs in 2030. This is broken down by the five regions in the South Island to highlight the areas with the highest additional charging capacities requirements in 2030.

[1]50 kW chargers were representative of additional demand as they are the most common public DC charger size, however larger chargers (100-300 kW) are popular for journey charging purposes, and the number of chargers would scale accordingly.

Table 1: Summary of 2030 Additional Peak Capacity (MW) and Additional 50 kW Chargers Required to Meet Peak demand

| Region | 2030 Demand (MW) | 2030 Additional Charging Capacity (MW) | No. Additional 50 kW Chargers Required |
|---|---|---|---|
| Nelson/Marlborough | 3.5 | 0.9 | 20 |
| Canterbury | 7.2 | 2.6 | 58 |
| West Coast | 2.0 | 1.6 | 36 |
| Otago | 2.6 | 1.3 | 26 |
| Southland | 1.4 | 1.2 | 26 |
| **Total** | **16.7** | **7.6** | **166** |

The ten locations with the highest additional charging requirements were compared with the ten locations with the highest excess charging capacity, shown in Figure 1. Locations with high additional requirements are generally smaller towns with minimal existing capacity, while locations with excess capacity are generally larger towns which have considerable journey and destination charging already.

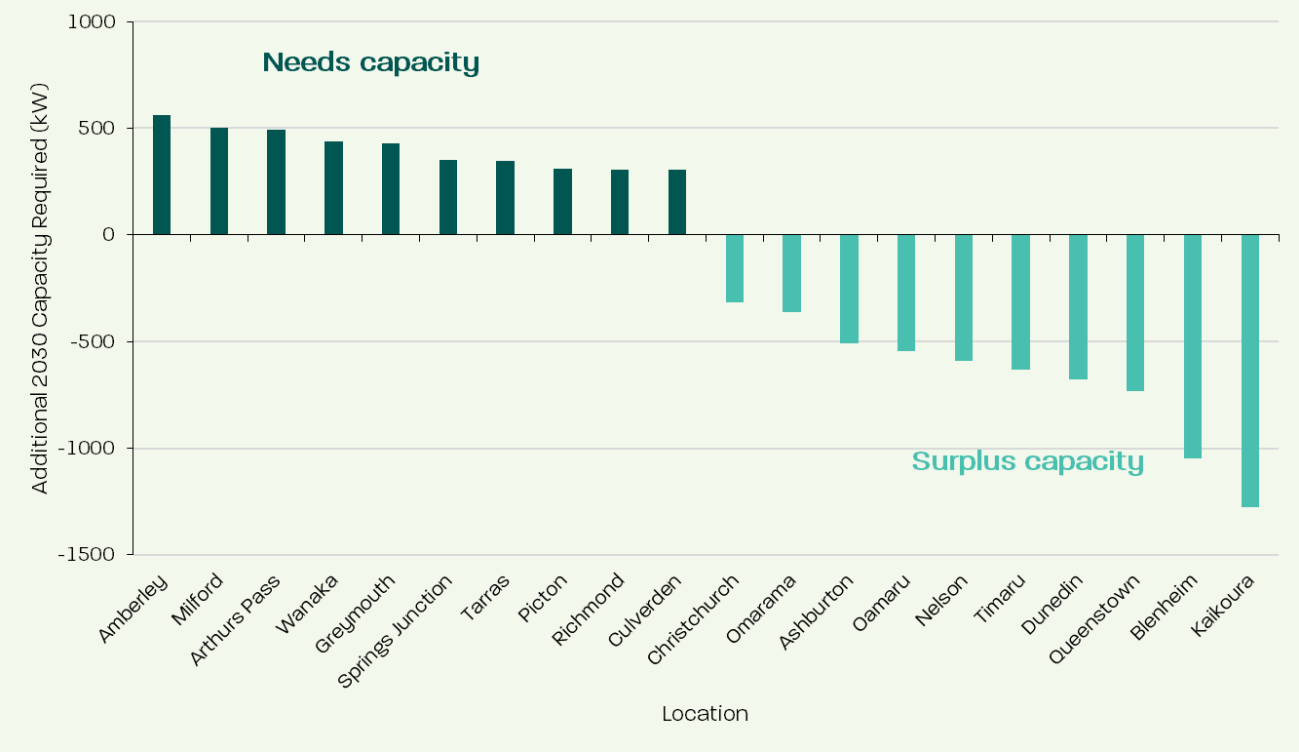


Figure 1: Top Ten Locations with the Highest 2030 Additional Peak Capacity Needed (kW) and the Top Ten Locations with the Lowest Additional Peak Capacity Needed (kW)

### Connection Cost

High level connection costs were given by the EDBs for 109 transformers and serve the purpose of giving an indicative cost (+/- 20%) at a snapshot in time (Dec 2024 - Feb 2025) to connect to specified transformers.

The average indicative connection cost per site was $63,000 with the average available transformer capacity being 240 kVA. The average indicative cost per kW connected was $500/kW and the median was $300/kW, as per the distribution in Figure 2. 88% of all site connection costs were estimated to be less than $1,000/kW, with two thirds below $500/kW, and one third below $100/kW.

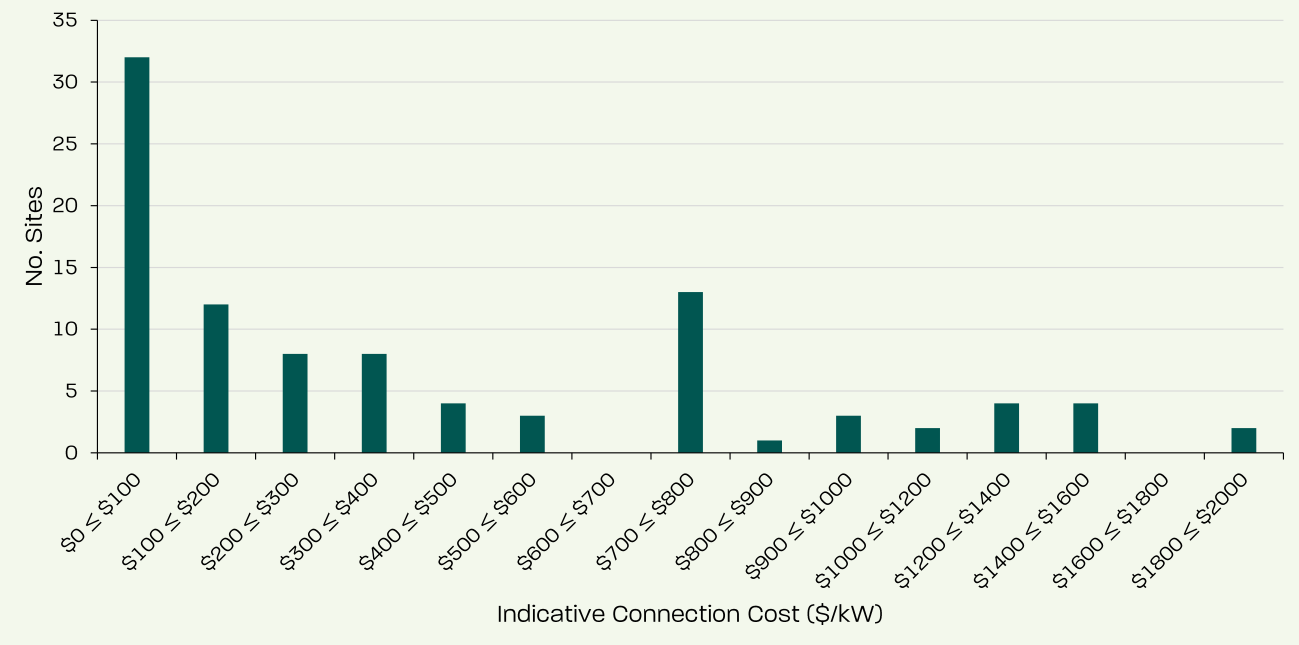


Figure 2: Charger Cost Distribution ($/kW)

An estimated **$11 million** is required to fully install and connect chargers across the South Island to meet peak additional charging demand in 2030, connecting approximately 8.5 MW of capacity. Of this total, $4.0 million (36%) relates to connection costs, with the remaining $7.1 million (64%) covering all other associated costs.

The cost estimate assumes an installed charger cost of $830/kW, which includes charger hardware, software, planning and commissioning costs, but excludes connection costs. When combined with EDB-provided indicative connection costs, this results in the total estimated cost of $11 million. The installed capacity slightly exceeds the theoretical requirement of 7.6 MW, as some sites provide more capacity than required.

It is recommended that support and funding is given to locations where the connection cost is high and the load factor is poor.

# 1. Updated Assumptions

- **Reduction in Current Charging Capacity:**
  - Public DC chargers (≥50 kW) were assumed to have a maximum output of 170 kW to reflect the average maximum charging rate of the top 10 EVs purchased in NZ in 2025.
  - Studies overseas have found that people experience an issue with every 1 in 5 public chargers they use. To account for this, and other inefficiencies in charging behaviour, all charging capacities were reduced by 30%.

- **Turn-in rate:** Turn-in rates were estimated based on how far away traffic monitoring sites were from different sized towns, on a population basis. These have been increased by 5% since the original South Island study. For towns with a population >35,000, a blanket turn-in rate of 20% was applied. It was assumed that drivers are more likely to turn in at these places while travelling given the number of amenities available, making them attractive locations to stop and charge.

- **Current charging capacity made up of ≥50 kW DC chargers (previously any DC charger):**
  - The North Island study only considered a journey charger to be a DC charger that is 50 kW or greater. The original South Island work specified DC chargers of any capacity.
  - This change was made as it is unlikely that 22 kW DC chargers would be used for journey charging due to the increased time it would take to deliver energy to the car. Drivers would prefer to utilise higher capacity chargers to reduce time spent charging en-route to their destination.

- **Representative charger being 50 kW DC:** A 50 kW charger was selected to represent the additional demand in terms of chargers. While higher-capacity chargers (100–300 kW) are increasingly being installed, 50 kW units remain the most common DC charger type in the South Island, accounting for 46% of chargers ≥50 kW. Using a 50 kW charger provides a simple, widely understood reference point for modelling purposes and aligns well with typical charging expectations.

# 2. Updated Results

## 2.1 Summary of Total Additional Charging Requirements

Key Findings:

- 2030 light EV journey charging demand in the South Island is estimated to peak at 16.7 MW over a half hour period. This is not the coincident peak as traffic volumes peak at different times across locations. The coincident peak on the peak day is 15.3 MW from 3:30-4:00pm.

- 9.1 MW of demand can be met with existing DC fast chargers (≥50 kW). While total installed capacity across the South Island is 27.5 MW (or 16.3 MW after model adjustments[2]), uneven distribution of chargers across locations means excess capacity at some places cannot be utilised, limiting practical usable capacity to around 9.1 MW.

- 7.6 MW of additional charging capacity is forecast to be required by 2030, with 166 additional 50 kW DC chargers required to meet this demand.

Table 2 shows the total additional capacity and number of 50 kW chargers required across the South Island to meet peak half hour charging demand in 2030 on a peak and average day.

Table 3 shows this broken down on a regional level for the peak day.

Table 2: Overall Summary of 2030 Additional Peak Capacity (MW) and Additional 50 kW Chargers for Peak and Average Days of the Year

| Day | 2030 Journey Charging Demand (MW) | 2025 Current Capacity (Adjusted) (MW) | 2030 Additional Peak Capacity (MW) | No. Additional 50 kW Chargers Required |
|---|---|---|---|---|
| Peak | 16.7 | 16.3 | 7.6 | 166 |
| Average | 9.0 | 16.3 | 2.8 | 70 |

Table 3: Regional Summary of 2030 Additional Peak Capacity (MW) and Additional 50 kW Chargers for a Peak Day

| Region | 2030 Journey Charging Demand (MW) | 2025 Current Capacity (Adjusted) (MW) | 2030 Additional Peak Capacity (MW) | No. Additional 50 kW Chargers Required |
|---|---|---|---|---|
| Nelson/Marlborough | 3.5 | 5.7 | 0.9 | 20 |
| Canterbury | 7.2 | 6.7 | 2.6 | 58 |
| West Coast | 2.0 | 0.5 | 1.6 | 36 |
| Otago | 2.6 | 3.2 | 1.3 | 26 |
| Southland | 1.4 | 0.2 | 1.2 | 26 |
| **Total** | **16.7** | **16.3** | **7.6** | **166** |

[2] Adjustments include reducing rated charger capacity by 30% to account for inefficiencies and capping capacity at 170 kW based on average max charging rate of EVs.

Key Insights:

- The Canterbury region has the highest journey charging demand due to large volumes of traffic traveling to and from Christchurch, and around the city via State Highway 1. Canterbury also has the highest number of locations that were investigated as part of this analysis, with 16 locations.

- Canterbury and Nelson/Marlborough regions have the highest existing capacity as they contain major centres such as Christchurch, Timaru, Blenheim and Nelson. These areas also contain several smaller towns that are well serviced by large EV charging hubs, such as Kaikoura and Ashburton which the rest of the South Island typically lack.

- Routes that are already well serviced by chargers include:
    - Picton ⇄ Dunedin via SH1

- Routes requiring significantly more charging:
    - Christchurch ⇄ West Coast via SH7 & SH73
    - Takaka ⇄ Wanaka via SH6

- There are also numerous locations around the South Island where there are currently no DC chargers ≥50 kW, as listed in Table 4. Installation of charging infrastructure should therefore be focused on the top 10-20 locations with the highest capacity requirements, as well as those without existing charging capacity.

Table 4: South Island locations with No DC Charging Capacity ≥50 kW

| Region | Location |
|---|---|
| Canterbury | Akaroa |
| West Coast | Karamea |
| | Reefton |
| Otago | Tarras |
| Southland | Milford |

## 2.2 Sensitivity Analysis

Several scenarios were analysed to assess how specific assumptions affected the results:

- **% of Battery Charged (+/-10%):** The base case of 30% of battery charged per half hour was increased to 40% and decreased to 20%
- **Turn-in Rates (+/-5%):** All turn-in rates were increased/decreased by 5% e.g. 10% base case went to 15% and 5%
- **Current Charging Capacity - Faults (+/-10%):** The base case of 30% reduction in charger capacity was Increased to 40% and decreased to 20%
- **Current Charging Capacity - Charger Output (remove max charging rate):** Assumes all EVs can charge at the max rate of the charger (i.e. 250 kW chargers will output 250 kW rather than the base case that assumes a 250 kW charger will have max output of 170 kW)

Figure 3 shows the effects of the above changes on the total number of additional 50 kW chargers required.

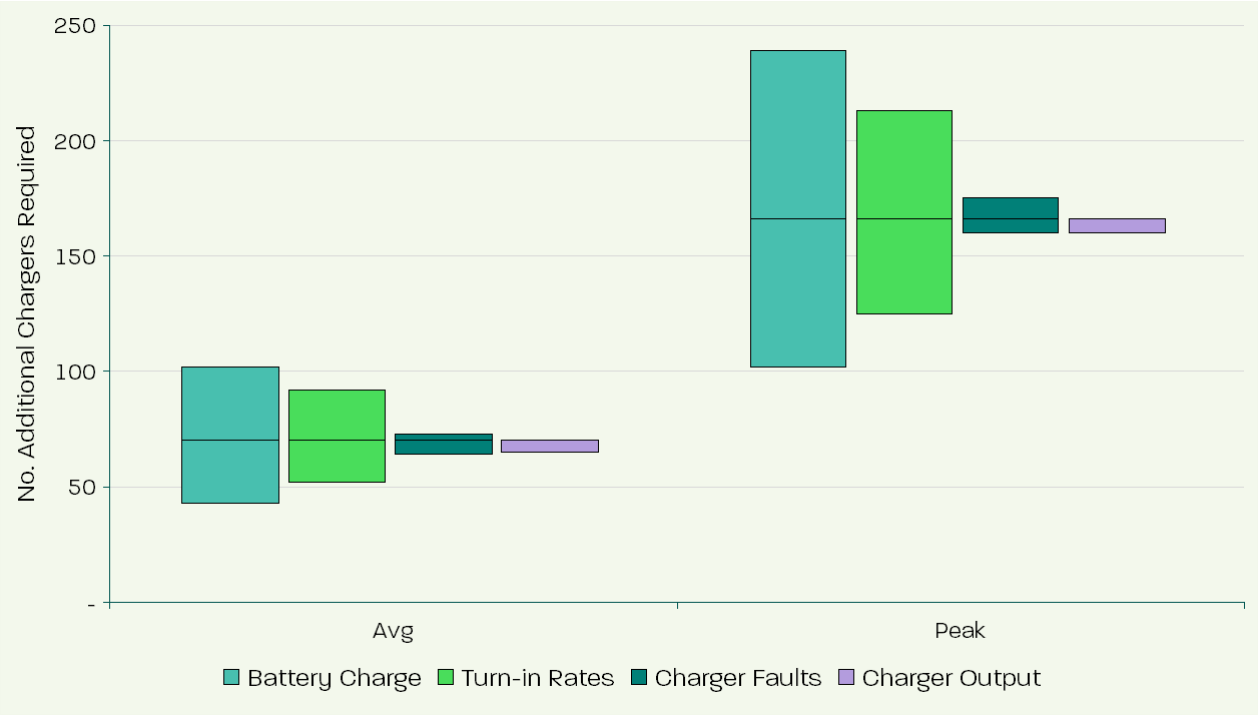


Figure 3: Sensitivity Analysis – Total No. Additional 50 kW Chargers Required

Key points from Figure 3 include:

- **The battery charge %** has the largest effect on the results, with up to a 46% increase and 39% decrease when looking at peak requirements. % battery charge refers to how much the battery is charged in a half hour period, which directly affects the demand and the additional capacity required to meet demand. Note that if drivers choose to charge their battery for longer in one place, then this will reduce the turn-in rates for locations further along the journey, so the overall chargers needed may be less than shown if battery charge % increases,

- **Turn-in rates** also have a significant impact, with the 5% increase or decrease resulting in the charging requirements increasing by 31% or decreasing by 25%. Turn-in rate also directly affects the demand as it dictates the percentage of cars that are assumed to charge over a half hour period.

- **Charger faults and the max charger output** have less of an impact on charging requirements, increasing/decreasing by 3-2%. The larger chargers (>150 kW) are generally located in larger towns/cities where there is already sufficient charging capacity. As such, the "increase" in current charging capacity will have minimal impact on the additional charging requirements.

Further analysis on turn in rates and battery charging rates would be beneficial as technology and vehicle numbers change in the future. This would refine assumptions and calculations, to reduce uncertainty and variation in results.