SUSTAINABLE ENERGY AUTHORITY OF IRELAND

Electric Vehicle (EV) Commercial Fleet Trial Report

EV Commercial Fleet Trial

Findings and recommendations

December 2024

Sustainable Energy Authority of Ireland

SEAI is Ireland's national energy authority investing in, and delivering, appropriate, effective and sustainable solutions to help Ireland's transition to a clean energy future. We work with the public, businesses, communities and the Government to achieve this, through expertise, funding, educational programmes, policy advice, research and the development of new technologies.

SEAI is funded by the Government of Ireland through the Department of the Environment, Climate and Communications.

Acknowledgements

This trial would not have been possible without the businesses that took part. Thank you to all of them for taking the time to trial an EV and providing their feedback and insights on their experience of driving electric.

Many thanks to my colleagues in SEAI who have assisted in providing data analysis on the results from the survey and telematics.

This fleet trial was funded by the Zero Emission Vehicle Office (ZEVI) which is part of the Department of Transport.

Contents

Executive Summary

Transport is essential to many businesses but will also contribute to its emissions and running costs. An EV is a solution to reducing transport running costs and emissions.

This EV fleet trial engaged 187 businesses to trial a car or a van for three months with a charging solution offered. On average over 3,000km were driven every three months with vehicle charging required every three days.

Businesses took part from every county in the Republic of Ireland, with a wide range of business types, from retail to construction, consultants to manufacturing.

Range, cost and the availability of public charging were reasons stated not to purchase an EV prior to the trial. The data collected from the telematics in the vehicle showed that the average daily journeys were between 10-200 kilometres with a large proportion of these below 100km. This is easily within the range of any EV currently on the market.

92% of the charging was done on the chargers provided to the business showing that the use of the public charging was in the minority. Charging on your own charger during off-peak times on a lower tariff is the cheapest and most convenient way to charge. Every day you can leave with a full battery.

35% of the respondents to a survey after the trial indicated that they have purchased at least one EV for business use. Another 53% plan to purchase an EV in the next 12-24 months. This result shows the benefit to the business of having time to try out an EV and to understand its suitability for their business.

Any business with transport needs should review the feasibility of an EV. Firstly, they should examine their current transport requirements to identify a suitable route to trial an EV. A suitable charging solution needs to be a part of this, whether it is charging at the business premises, the staff member's home or on the public network. Use the learnings from this to transition other vehicles to an EV. This will enhance the company's sustainability reputation and save money on running costs.

Introduction

The Government of Ireland has set down ambitious targets to be achieved in the transport sector including a 51% reduction in emissions across the transport sector by 2030 and a target of 30% of the fleet to be electric by 2030.

When combined with policies that support increased active and multi-modal travel, EVs represent a viable pathway for the decarbonisation of the transport sector.

Data from the Department of Transport shows that approximately 500,000 goods or passenger vehicles are used for business on Irish roads. Of these only 3% are electric. There is an opportunity for the business sector to switch to electric and reduce emissions and vehicle running costs. Changing to an EV can be challenging for businesses. There are several reasons for this. The technology is still relatively new and ever evolving. There can be a gap in knowledge for fleet managers on how to best use an EV and the charging plan that goes with it. An investment is required for both vehicles and charging infrastructure. Sustainable Energy Authority of Ireland (SEAI) ran a Commercial EV Fleet Trial on behalf of Zero Emissions vehicles Ireland (ZEVI) over a 21-month period.

The aim of this trial was to give businesses real-world experience of using an EV for a period of time in their daily operations. SEAI would also get valuable data on distance travelled and charging type and cycles. The data collected would explore the feasibility of the current EVs in a real-world application. It would identify examples of how this technology can be introduced into a business, how well it worked, or if there was resistance.

Case studies that were completed during the trial, coupled with before and after participant surveys, gave further insights into the use of EVs including any challenges faced. By better understanding any challenges and barriers faced by the business sector, SEAI can then develop advice and supports to help mitigate these issues, building on what worked well. The findings of the trial are set out in this report.

Methodology

There were three parts to this trial: participant recruitment, vehicles procurement and charger procurement.

Participants

Up to 200 businesses could be facilitated in this trial with each getting a vehicle for three months / 90 days. An open call was issued in July 2022 at the launch of ZEVI. There was a strong response with applications closing a week later.

Applications were selected on a first come first served basis. SEAI carried out an online business check on all applications to confirm their financial standing and compliance with regulations. Those approved were invited to take part in the trial. A waiting list was created to ensure all places were filled.

Some applicants who were offered a place decided not to take part. Some of the reasons for this included:

- The cost of the charger installation. Some premises required additional upgrades to accommodate a safe charger installation in compliance with regulations.
- In the absence of a fleet insurance policy, securing short-term insurance proved difficult. Enterprise Rent a Car did offer participants short-term insurance.
- They were no longer in a position to take part.
- The vehicle was not suitable for their needs e.g., not wheelchair accessible or refrigerated.

When an applicant declined the offer, the next on the waiting list was offered a vehicle. When the waiting list was exhausted applications were reopened to fill the last few places and a number of the hires towards the end of the trial were extended to 6 months. In total,187 companies took part in the trial.

Over 80% of participants were from the SME sector with the remainder from large business and public sector organisations.

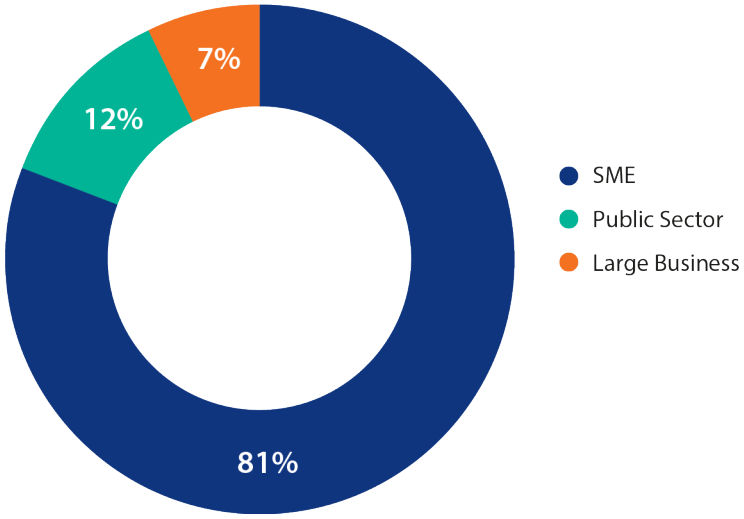


Figure 1: EV Fleet Trial participants by sector

The participants were from a broad range of business types. The largest type was construction services followed by consultants and engineering.

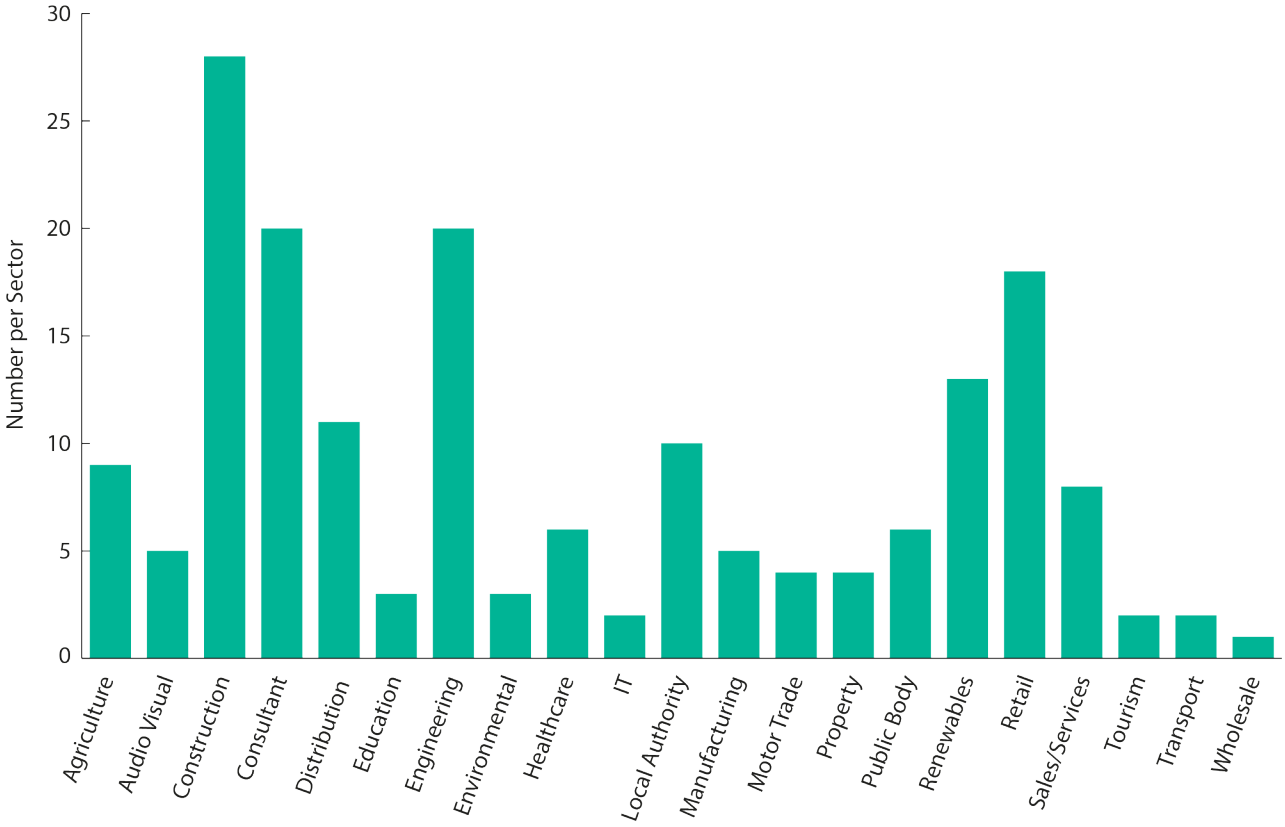


Figure 2: Business Type

All counties in Ireland were represented with the largest number of participants from Dublin and Cork.

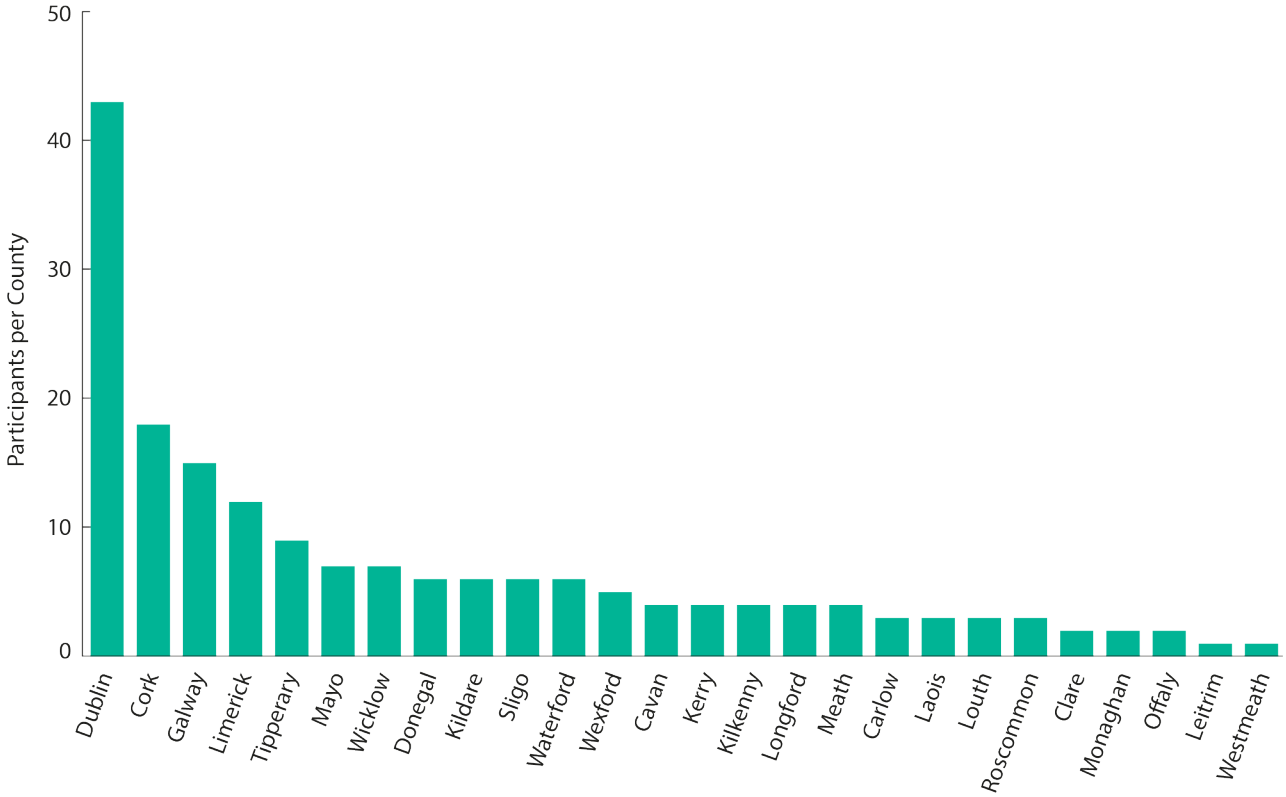


Figure 3: Applications by county location

Vehicles

SEAI published a Request for Tender in April 2022. This tender sought a provider for 20 fully electric N1 vans and 30 fully electric M1 passenger cars for a 14-month lease on each one. The tender also requested the management, distribution, collection, and cleaning of the vehicles. Telematics was required to gather distance travelled and charging cycles.

Following this process, Enterprise Rent a Car was the successful bidder, using GeoTab for telematics.

Below sets out the requirements for both vehicle types.

Vehicle Specification	M1 (30 passenger units)	N1 (20 light commercial units)
Battery Electric Vehicle (BEV, fully electric)	Yes	Yes
Minimum range (km, WLTP)	350	150
Top speed (kph)	>100	>100
Vehicle Warranty	3 years or 100,000km	3 years or 100,000km
Minimum Loading Capacity	Not Applicable	350kg
Whole Vehicle Type Approval	Required	Required
Mileage for lease	30,000km	30,000km

Table 1: Vehicle Requirements

The vehicles available during the trial were:

M1 Passenger Cars	N1 Vans
• Kia eSoul • Opel Corsa e • Peugeot e208 • Peugeot e2008 • Renault Zoe • Skoda Enyaq • Volkswagen ID.4 • Volkswagen ID.5	• Opel Cargo-e • Opel Vivaro-e • Peugeot E-Partner • Peugeot E-Expert • Toyota Proace Electric

Table 2: Vehicles used during the trial

Vehicles were placed with each participant for at least 90 days. Each vehicle had telematics installed. This provided details on kilometres driven, charging cycles and efficiency of the vehicle. The first vehicle was placed in December 2022 and the last one returned was September 2024.

SEAI covered the cost of the lease and taxing of the vehicle for the participants on the trial. The participants provided their own insurance for the vehicle for the time they had it. This was an easy addition if the business had fleet insurance. If they were unable to arrange their own insurance, participants had the option to get insurance from Enterprise Rent a Car.

Chargers

SEAI published a separate Request for Tender for the provision and installation of EV charging units in April 2022. Randridge Smart EV Ltd were the successful bidder.

The following specification was required for the chargers:

- Single socket
- Wall mounted
- OCPP 1.6 compliant
- Charging outlet: Type 2 socket
- Charging Power: Max. 22kW
- Protection options required:
    - Overcurrent
    - Ground fault including DC residual current protection
    - Overvoltage
    - Integrated surge protection
- Dynamic Load Management capable
- IP Class (weather): IP54
- IK Class (external impacts): IK10
- User authentication: RFID, web portal, near field communications
- Monitoring capabilities including time in use and kWh consumption, cumulative and per charging event.
- Warranty: 12 months minimum
- Accredited certification that the equipment has been tested or manufactured according to a relevant standard.
- The product must meet the following standards:
    - 93/465/EC – CE Mark

- 2014/30/EU – Electromagnetic compatibility (EMC) Directive
- 2012/19/EU – Waste Electrical and Electronic Equipment (WEEE)
- 2011/65/EU – Hazardous substances in electrical and electronic equipment
- I.S. EN IEC 62196
- I.S. EN IEC 61439
- I.S. EN IEC 61851

Process

Randridge contacted confirmed trial participants to arrange for the charger installation if requested in their application. SEAI covered the cost of the charging unit and 80% of the installation cost up to a maximum of €1,000. Anything above this was paid by the participant. During the trial, the charge point was monitored for charging cycles. After the trial, the charge point was then owned by the business to use as they required.

The charger was usually installed on the business premises. Some sole traders asked for it to be installed at their home which was facilitated. In some cases, a different charger was requested. This was also facilitated with any additional cost being covered by the participant.

Main findings

SEAI gathered and analysed the data from the vehicle telematics and the vehicle charging units. The cumulative results of the trial regarding distance travelled, number of charging sessions and savings are illustrated below.

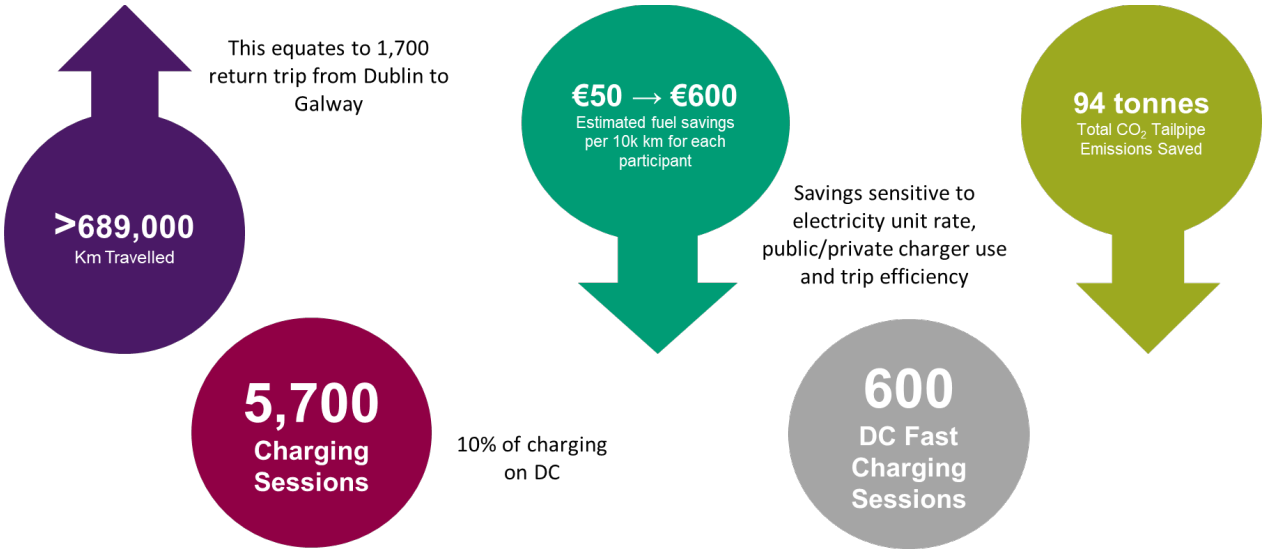


Figure 4: Cumulative findings

Cost / emissions savings and efficiency

It is important to look at the M1 (car) and N1 (van) data separately in relation to savings and efficiency.

	Average for both	M1 Car	N1 Van
Distance Travelled	3,700km	4,400 km	2,800km
AC Charging Sessions	28	29	27
DC Charging Sessions	3	5	2
Tailpipe emissions avoided	512kg	529Kg	484kg
Cost savings per 10,000km	€359	€320	€407
Efficiency Calculated M1 (Car)	23kwh/100km	20 kwh/100km	29 kwh/100km

Table 3: Average fleet trial outcomes by vehicle types

The table above shows the savings that were made in both fuel costs and tailpipe emissions. Most charging was on AC charging, on their own charger, which gives the lowest electricity rate and the highest potential savings.

It is important to caveat this with the changes in energy costs over the past two years. In 2022 and at the start of 2023 electricity prices were much higher than they were in the middle of 2024. Petrol and diesel prices have also fluctuated. These calculations were made using the following fuel prices:

- Electricity at 29c a kWh
- Fuel (petrol and diesel combined) €1.65 a litre.

Any changes in either of these fuel prices will have an effect on potential savings. It should be noted that as we move towards 2030 our electricity grid is expected to be powered by 80% renewable generation. This will result in further emissions reductions and potentially lower energy costs as energy is indigenously sourced.

Charging, energy use and distance travelled

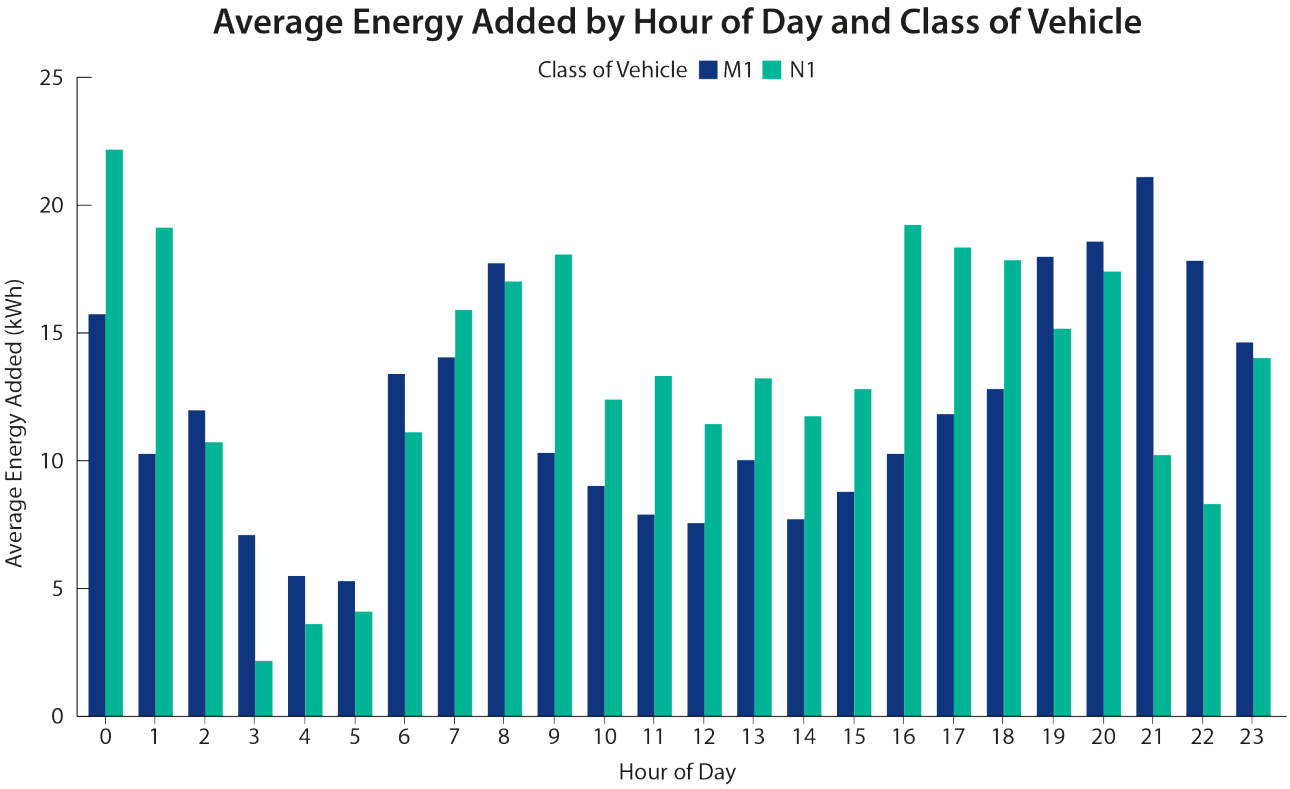


Figure 5: Charging by time of day and vehicle type

The graph above shows the average amount of energy added for each hour of the day for the entire trial period. About 21% of all electricity added during the trial was between 8am and 10am.

It may have been the case that the vehicle arrived at the business between 7am and 9am and was then plugged in. It may be beneficial for a business to provide a home charging solution for their staff who take the vehicle home, so they can leave each day with a full charge. This could also reduce the need for additional power at the business premises for charging.

The graph also shows that the least amount of charging was done during 3am-5am which means business could be missing out on using cheaper electricity. To maximise the fuel saving that can be made a business should review it's time of use (TOU) tariffs. Electricity can be purchased at a cheaper rate at nighttime usually after midnight. Scheduling vehicles to charge during this lower cost period will result in additional fuel cost savings.

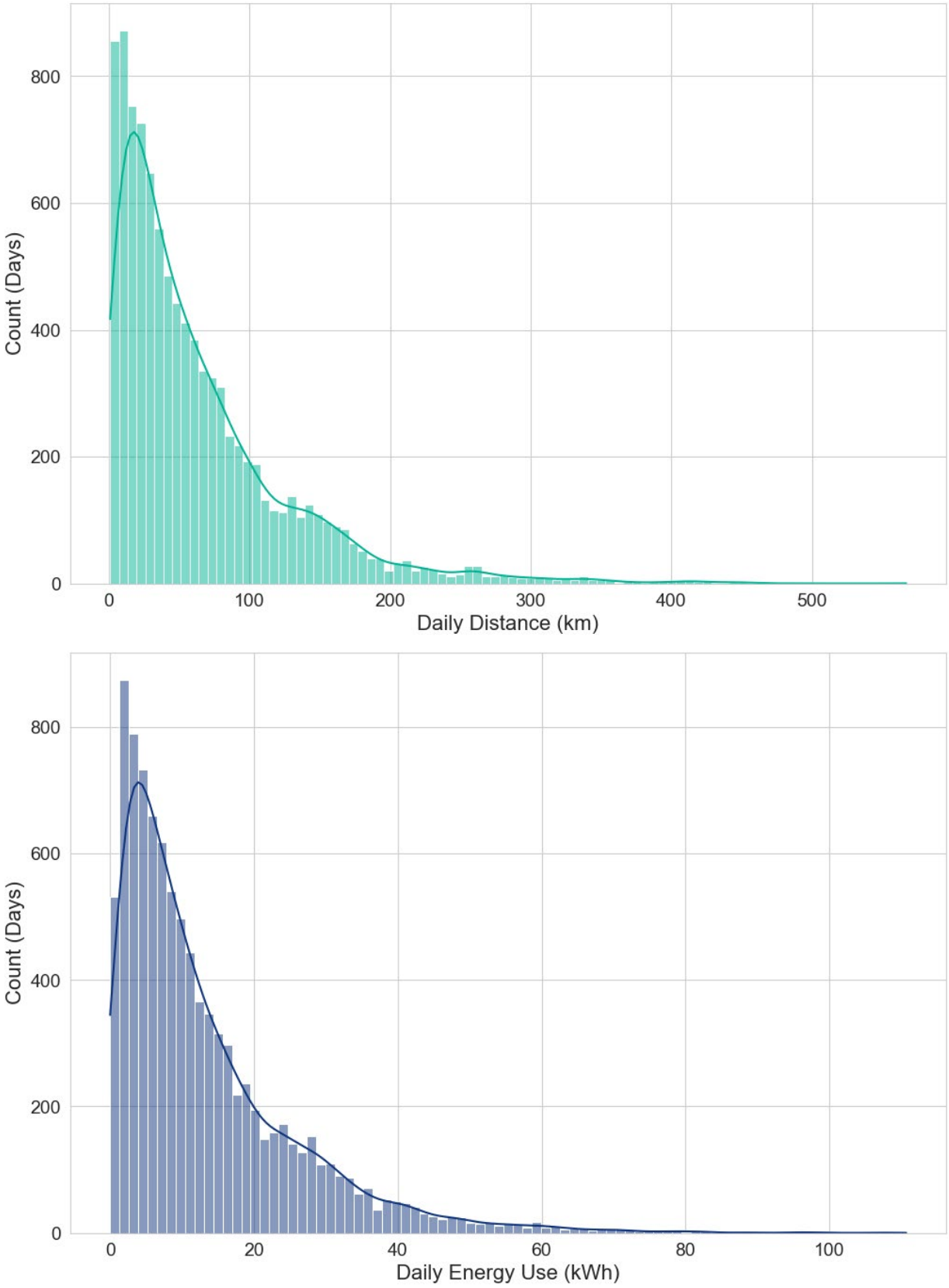


Figure 6: Daily distance travelled and daily energy used

One of the main challenges that the business sector state in relation to EVs is the range. The top graph above shows that most daily journeys in this trial are under 200km the most being between 20 and 100km. This bottom graph

shows how much energy was used per daily journey. Most of these are under 40kWh. It is important to size the battery to your driving needs. If the EV is being purchased for a 100km a day driving requirement there is no need for an 80kWh battery. Usually, the bigger the battery be higher the cost to purchase the EV.

The lowest battery range on most EVs now on the market is around 40kWh with the highest up to around 100kWH. Every business should be able to find a battery size that will suit their needs and budget.

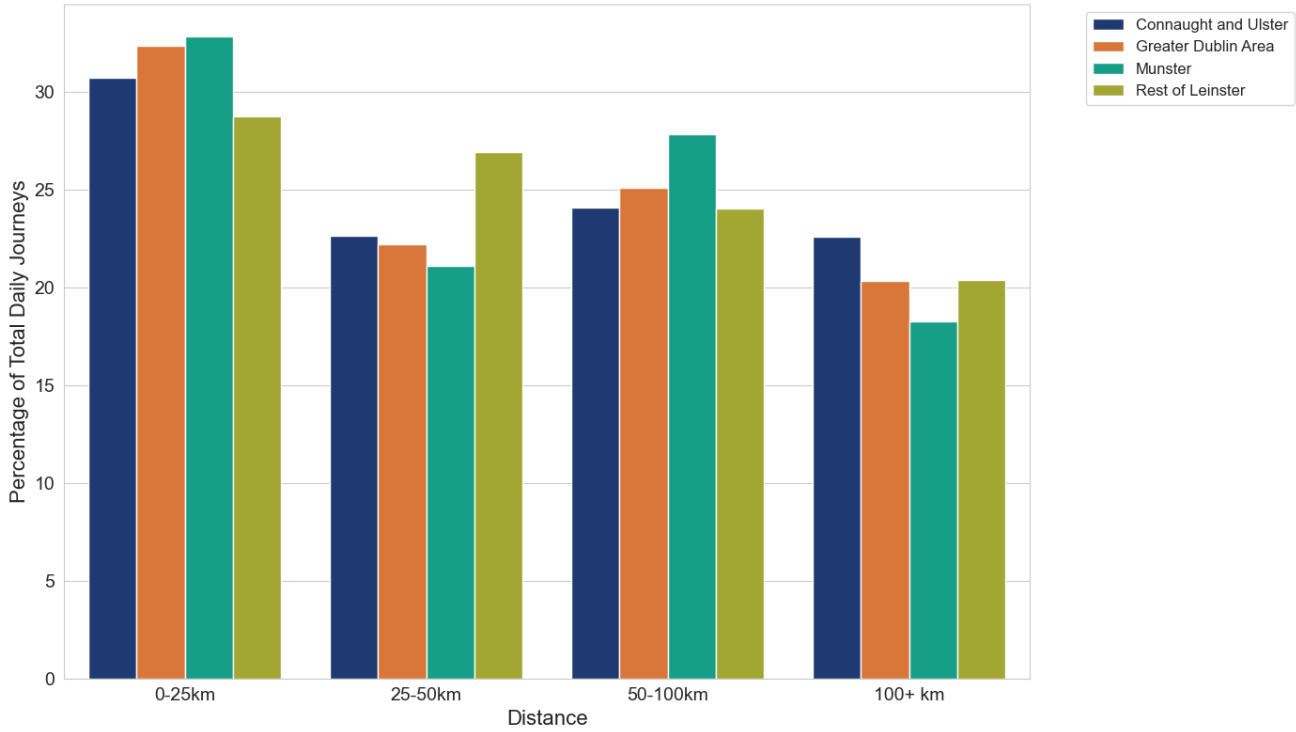


Figure 7: Regional and distance breakdown of daily journeys

There is often a perception that EVs only work in cities. Figure 7 shows the percentage of daily journeys by distance per vehicle over the whole trial. The 0-25km range had the most daily journeys. There isn't a huge difference in the daily distance travelled among the four regions as the distances get bigger. This would indicate that an EV is suitable for driving in all parts of Ireland.

Participant's survey findings

All participants were requested to complete two surveys. The first survey was completed before they took part in the trial. This was to understand their current perceptions of EVs in relation to charging, range, distance travelled etc. The second survey was completed after the trial so see if any of those perceptions had changed. 145 participants responded to the first survey and 88 to the second. 119 respondents had not used an EV before this trial and the key concerns raised by the participants were vehicle reliability and charging availability.

Charging the EV

In the pre-trial survey, 88% of respondents thought they would need to charge the vehicle every day or every second day. In the post-trial survey this reduced to 65% day. The data from the telematics showed that charging was on average every 3 days.

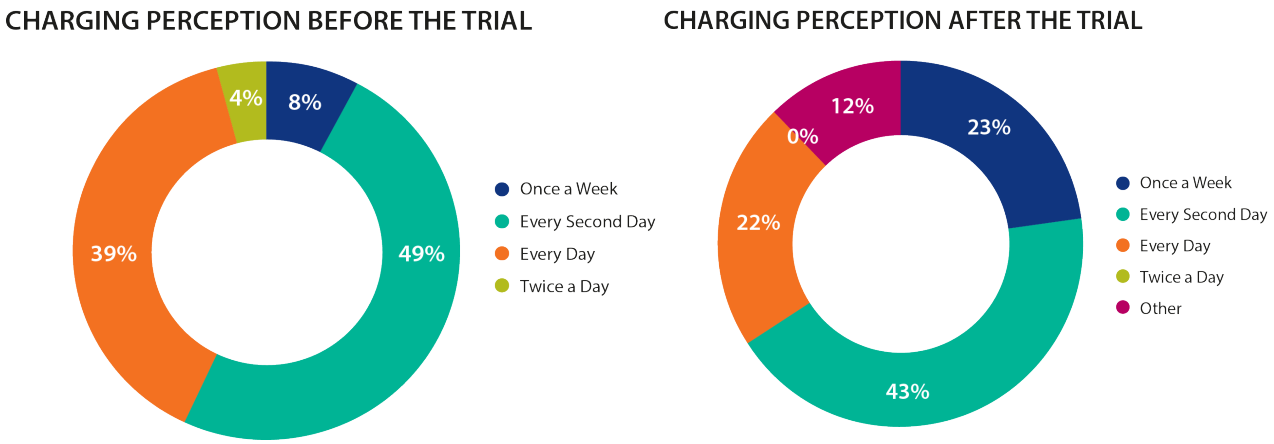


Figure 8: Charging perceptions before and after the trial

When charging, the use of the public network was very low. 92% of charging occurred at the business premises or their home.

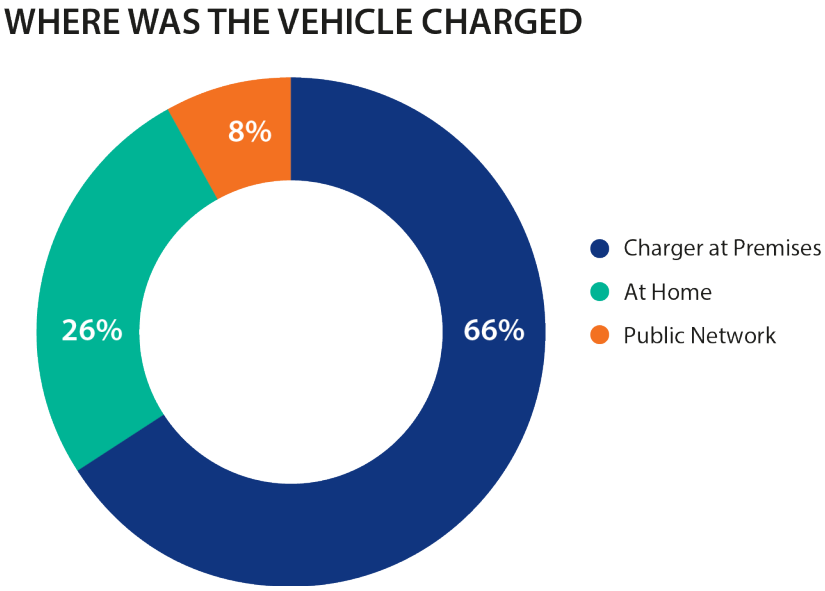


Figure 9: Location of vehicle charging

Top Tip:
Charging on your own charger is the cheapest way especially when you can avail of lower rate TOU tariffs and schedule charging for off peak times. This is also a very convenient way to fuel your vehicle. It is charging while it is parked. You can start each day with a full battery with no need to stop at a petrol station to refuel.

Purchasing an EV, benefits, and challenges

Participants were asked how likely they were to purchase an EV before and after the trial, this was on a 7-point scale. There were 110 car responses to the "before" survey which is 91% of participants for that vehicle type and 71 responses to the "after" which is 60% of participants. The van responses "before" survey was 32 which is 40% of participants and 15 "after" responses which is 18% of participants. The graph below shows the percentage of responses.

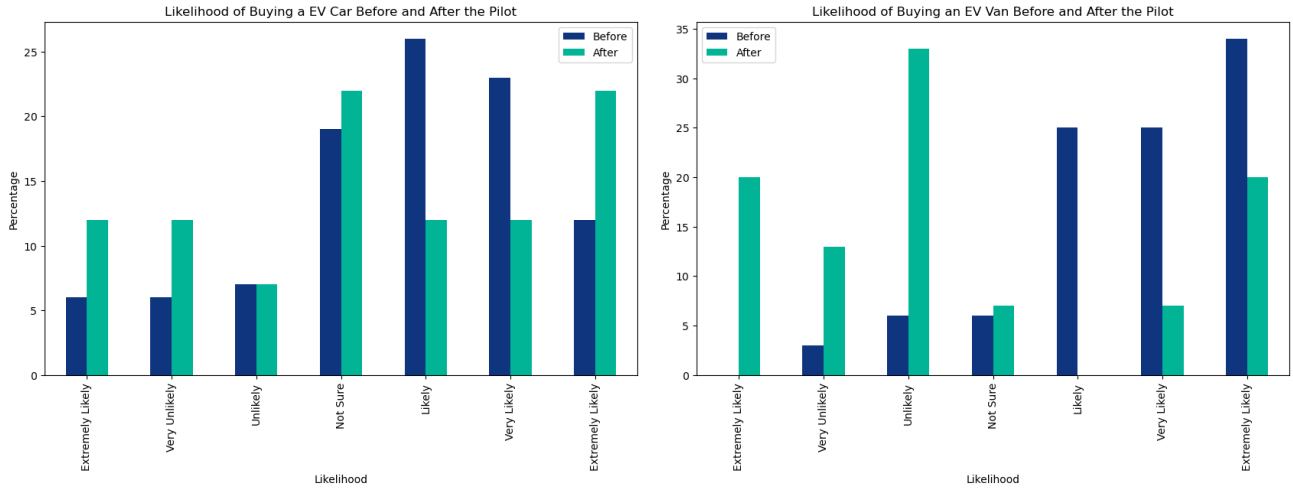


Figure 10: How likely to purchase an EV before and after the trial

Given the lesser response to the "after" survey if it difficult to compare these two questions. It does show, however, an increase in those very likely to purchase a car but a significant decrease in those likely to purchase a van.

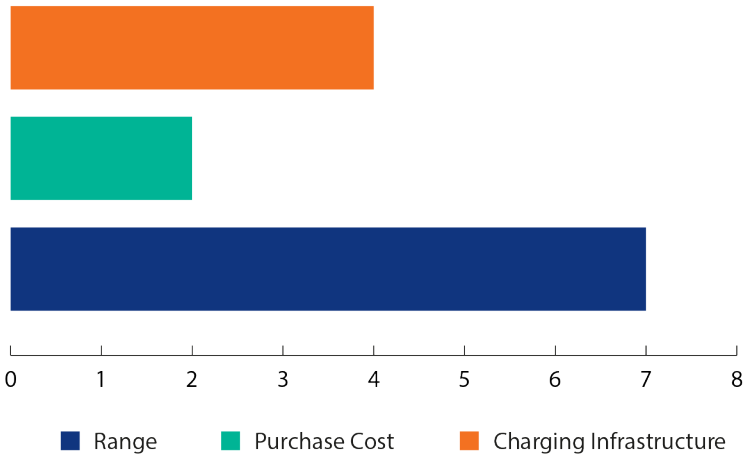


Figure 11: Reasons not to purchase an N1 (van)

The M1(car) respondents has similar issues in relation to range the availability of public charging. Many of the issues for range were due to the nature of the business and the unpredictability of when and how far they would have to travel at short notice.

Participants could also see the benefits of moving to an EV. These included:

- Reducing emissions
- Lower running costs
- Positive image for the business
- More efficient transport

Some of the drawbacks or concerns stated were:

- Range
- Payload
- Availability of fast charging
- Issues with apps using the public network
- High electricity costs
- Initial cost of purchasing an EV

Purchase of an EV

A final short survey was carried out on all the participants to ask if they have purchased in EV since the trial or if they plan to do so in the next one to two years. 80 responses were received. The chart below shows that 35% or respondents have purchased at least one EV after taking part in the trail

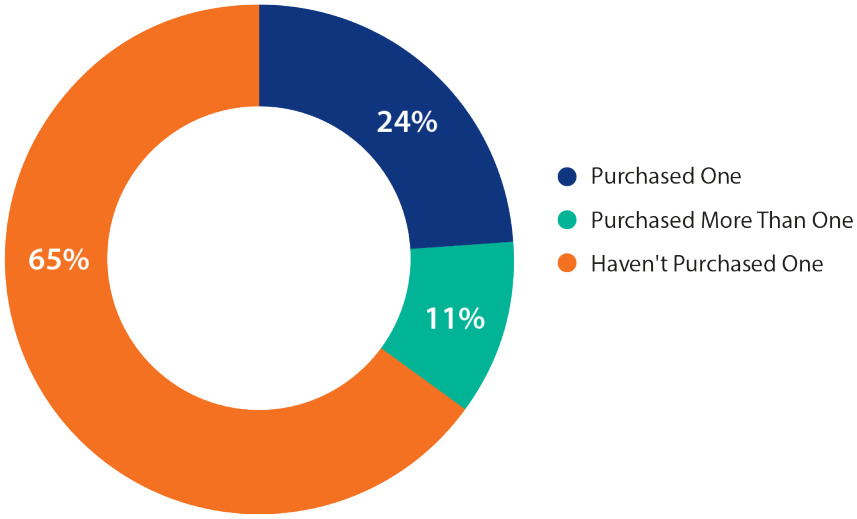


Figure 12: Purchased an EV after the trial

53% of respondents also plan to purchase an EV in the next 12 to 24 months. This is a very positive outcome and shows the benefit of a business having the time to test an EV for their business use.

Panel discussion with participants

As part of the SEAI Energy Show in March 2024, three participants took part in a panel discussion on their experience of the trial and their advice on changing to EVs. They were Wheels We Deliver, Wicklow County Council and Obelisk.

Top Tip:
The main advice shared was:

- Have telematics / data for your current fleet
- Understand what distances are being travelled each day
- Start small, trial an EV with suitable routes
- Engage with the drivers who are interested in trying an EV
- Have a charging plan in place
- Work with the drivers to understand any issues they may have
- Review and adjust where needed

All three organisations have introduced EVs into their fleets since the trial.

Conclusions

This trial has shown that an EV passenger car will work for most businesses in their day-to-day activities. It will reduce their fuel costs and their emissions. EV vans provided in this trial were less successful for some participants. This is due to issues around range and charging infrastructure.

It should be noted that these vehicles were all procured in 2022. Since then, the number of vehicle models available has increased as has the average range of new EVs which in 2024 is around 470 kms. For grant purposes, SEAI has two categories for EV vans. Small panel vans with a gross vehicle weight less than 3.5 tonnes and large panel vans with a gross vehicle weight of exactly 3.5 tonnes. The average range of small panel vans is now 325 kms with the larger ones at 280 kms. The minimum range required for this trial was 150 kms which has now more than doubled.

The purchase cost of EVs has reduced in the last year, which, together with lower running costs, makes an EV for business a viable proposition. Not only will your business save money and reduce emissions it will also provide a positive corporate image. The grants available from SEAI for the purchase of an N1 EV as well as the continued Benefit-In-Kind (BIK) benefits can help to alleviate some of the cost of switching to an EV.

The main advice from the trial is to review your business driving needs. Find suitable routes to change to an EV and get a suitable charging solution in place. Ensure that you have sufficient power for EV charging at your premises. Train your drivers and staff on how to get the best from an EV. Carry out a review with the drivers and staff on a regular basis to ensure it is working for them. A happy driver will be an ambassador for an EV transition in your business.

Appendix 1 – Participant case studies

SPeco Services
EV Fleet Trial - SPeco Services | Blog | SEAI

Bikeworld
EV Fleet Trial - Bikeworld | Blog | SEAI

Commissioners of Irish Lights
EV Fleet Trial - Commissioners of Irish Lights | Blog | SEAI

Mayo County Council
EV Fleet Trial | Mayo County Council | Blog | SEAI

Video case studies

Edge Anderson & Co
SEAI-ZEVI EV Commercial Fleet Trial | Edge Anderson (youtube.com)

Barry Group
SEAI EV Commercial Fleet Trial | Barry Group - YouTube

Wheels We Deliver
SEAI EV Commercial Fleet Trial | Wheels We Deliver (youtube.com)

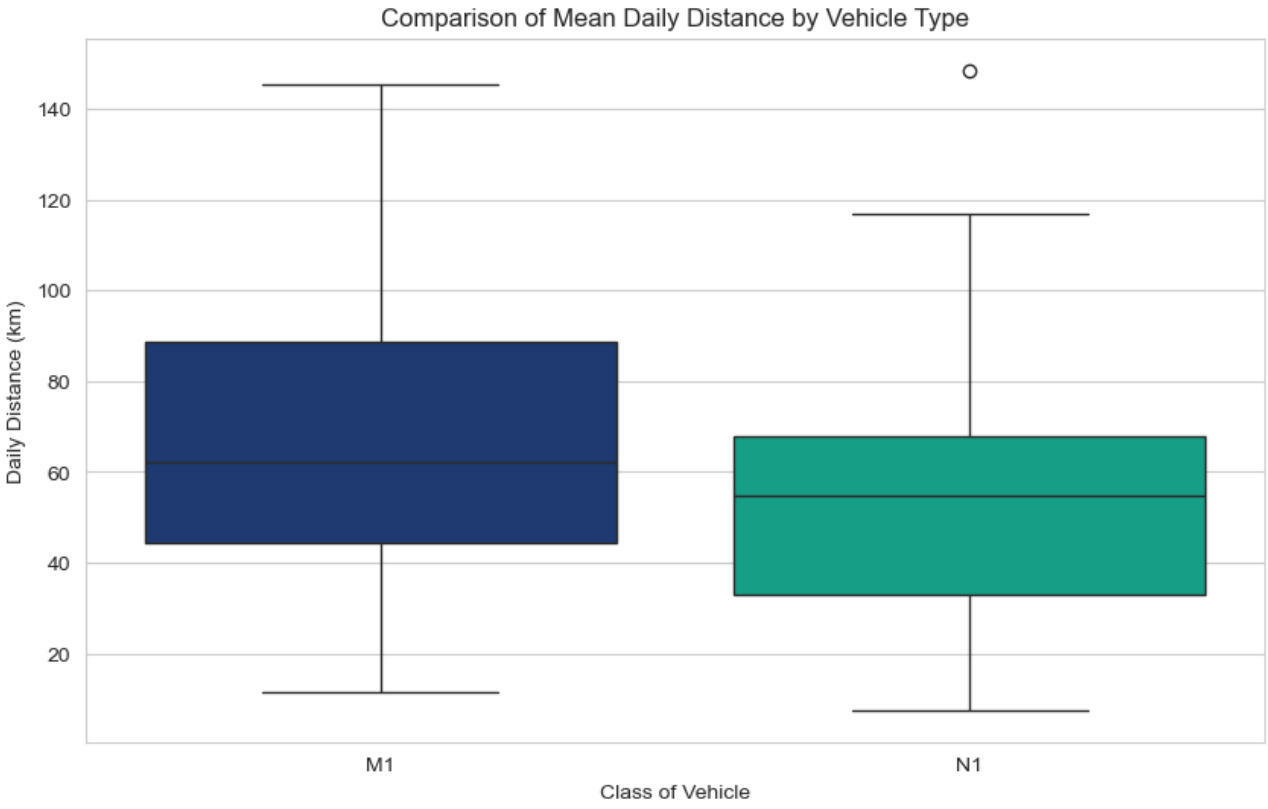
Fortune's Pharmacy
SEAI EV Commercial Fleet Trial 2023 | Fortune's Pharmacy - YouTube

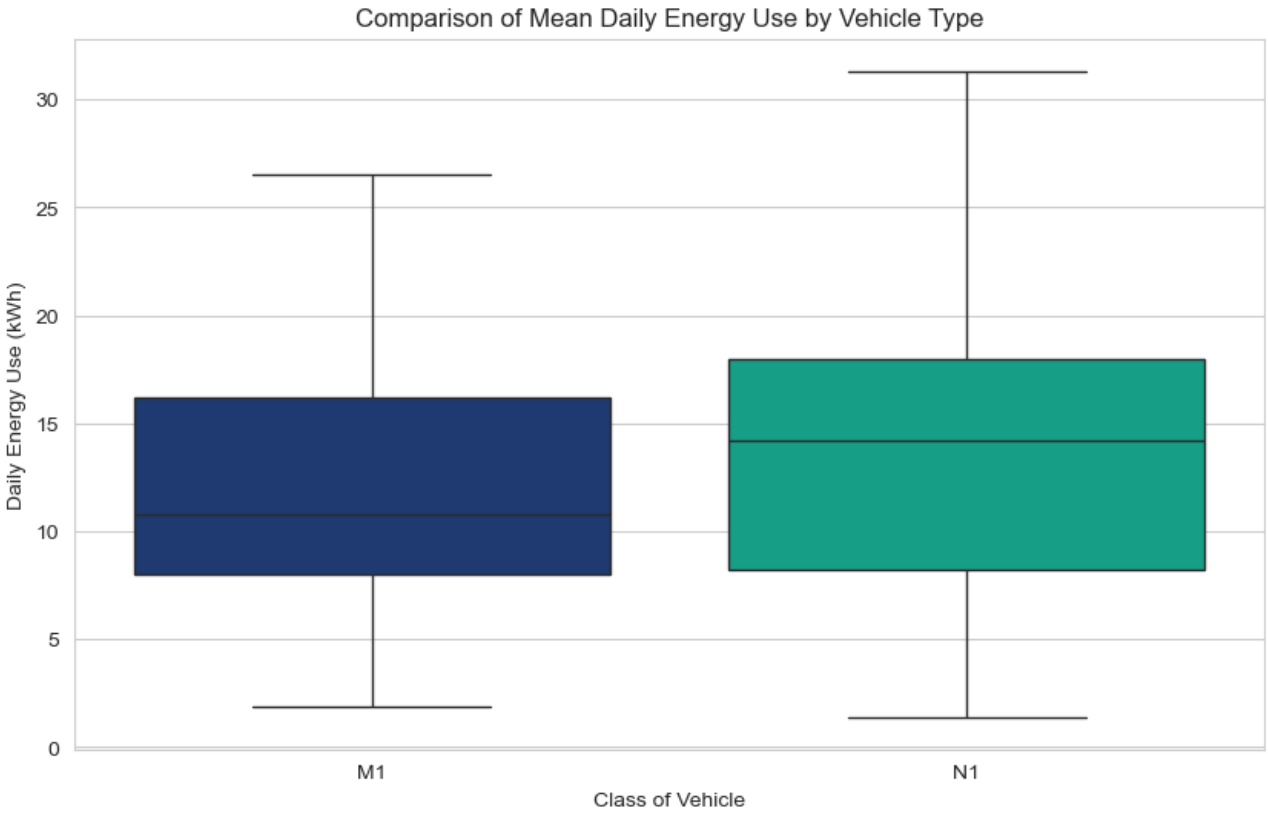
St. Benedict's Veterinary Clinic
SEAI EV Commercial Fleet Trial 2023 | St Benedict's Veterinary Clinic (youtube.com)

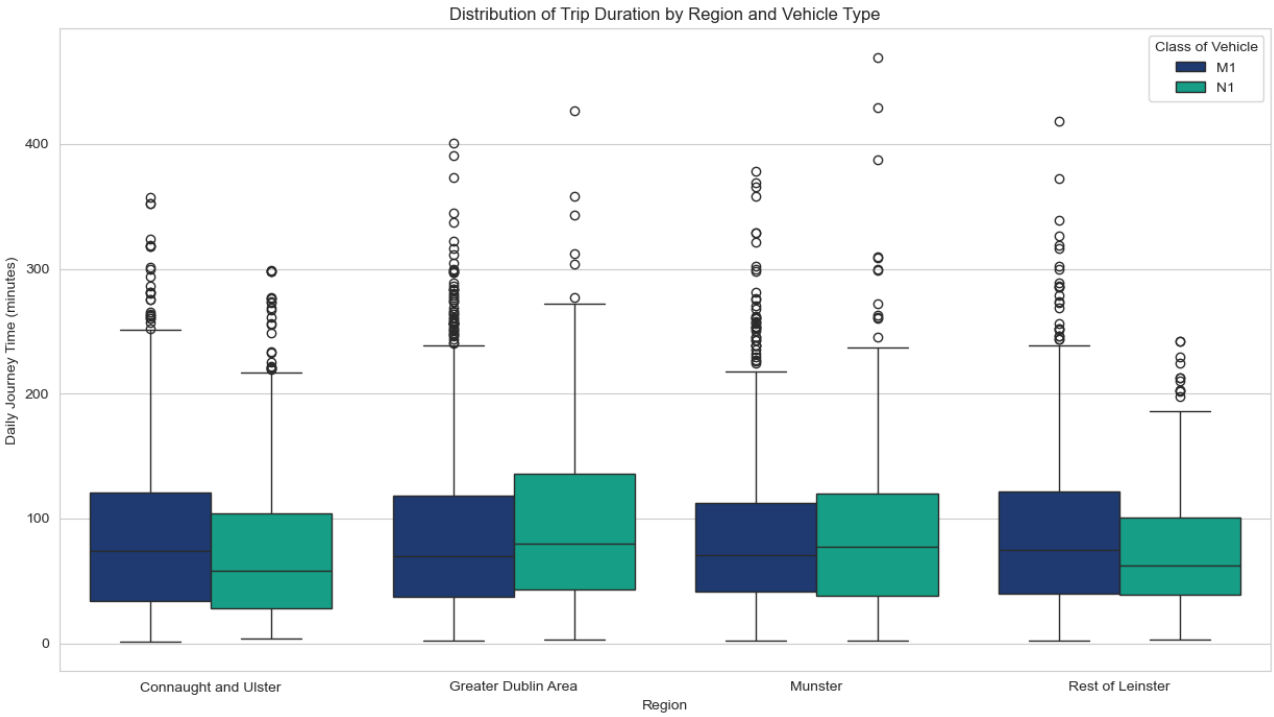
Obelisk
SEAI EV Commercial Fleet Trial 2023 | Obelisk (youtube.com)

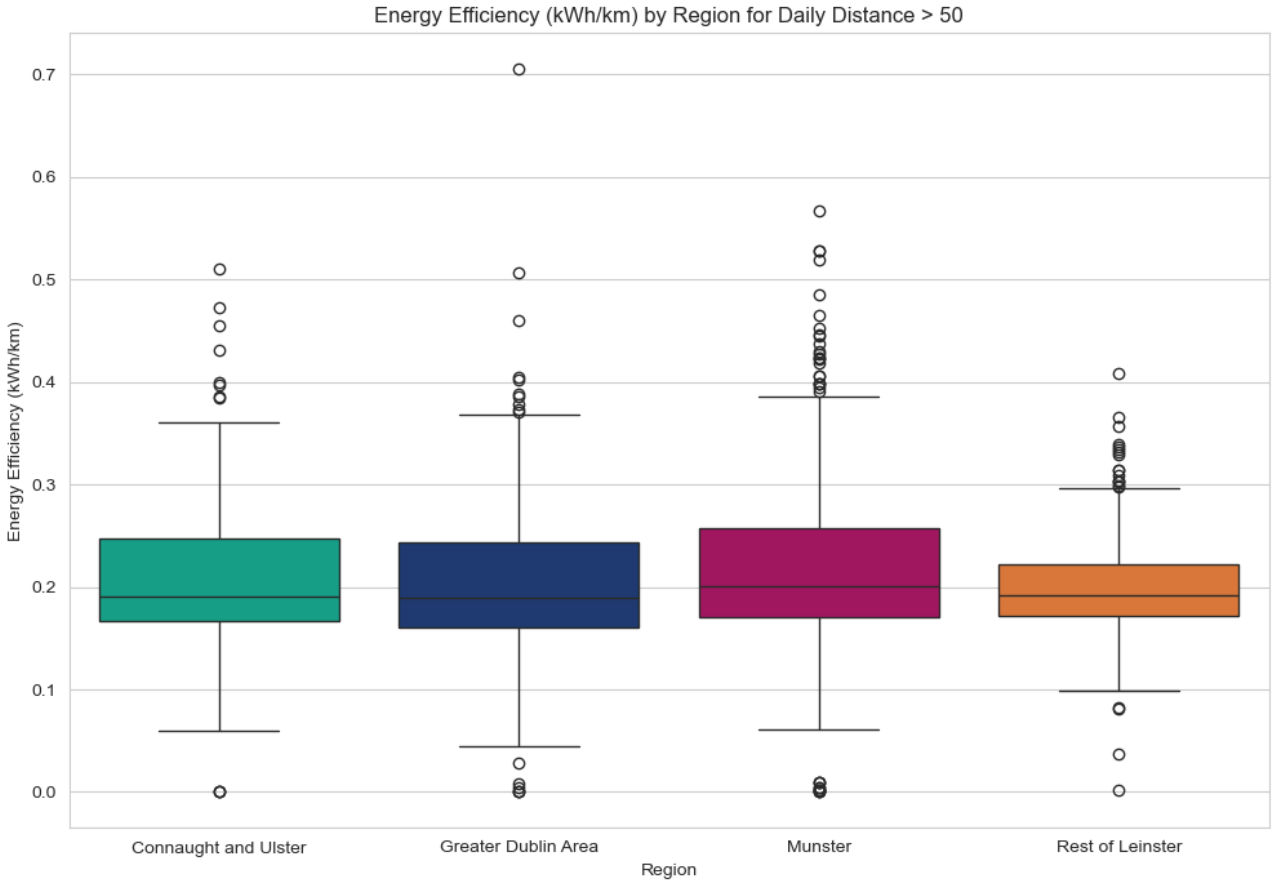
Appendix 2 – List of Charts

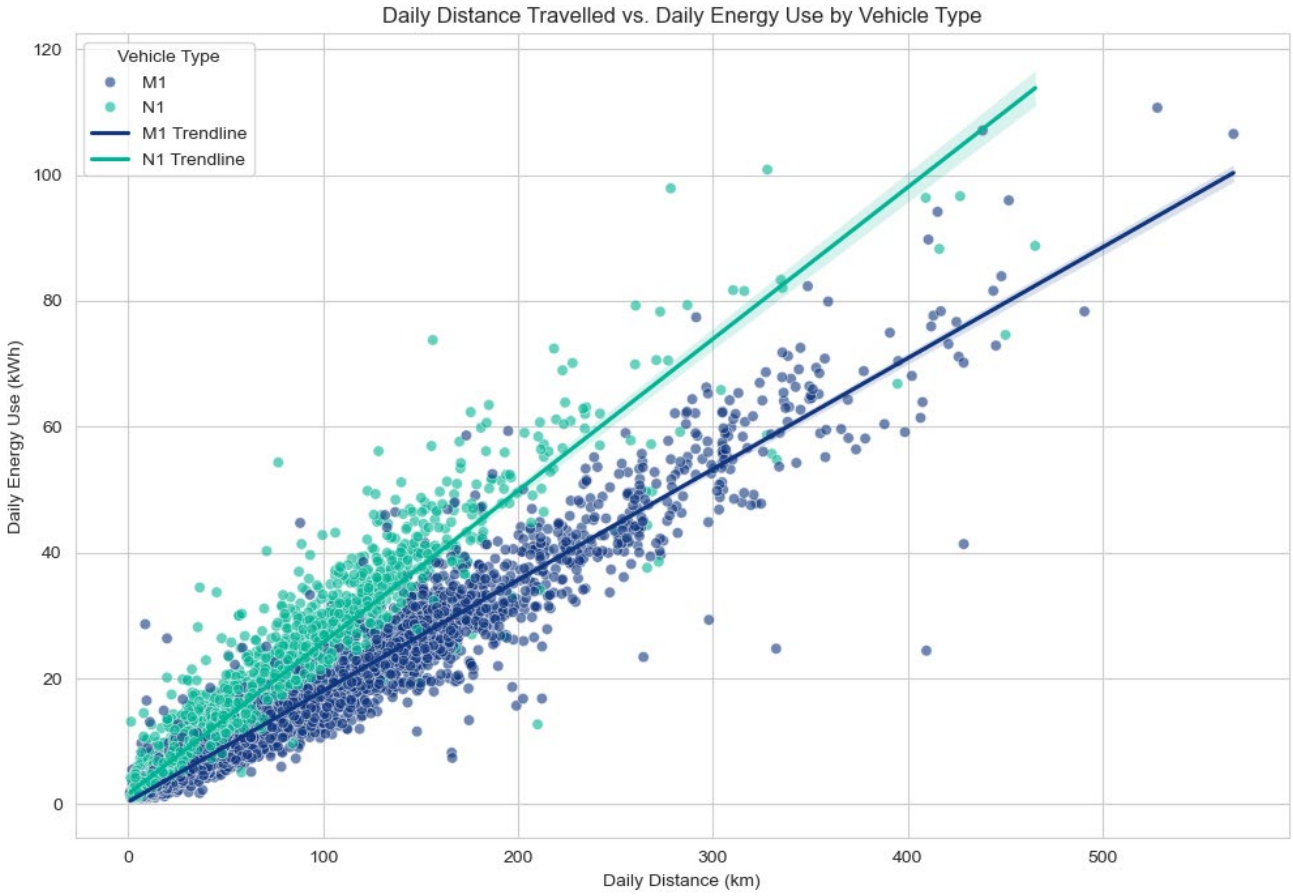
Appendix 3 – Additional graphs

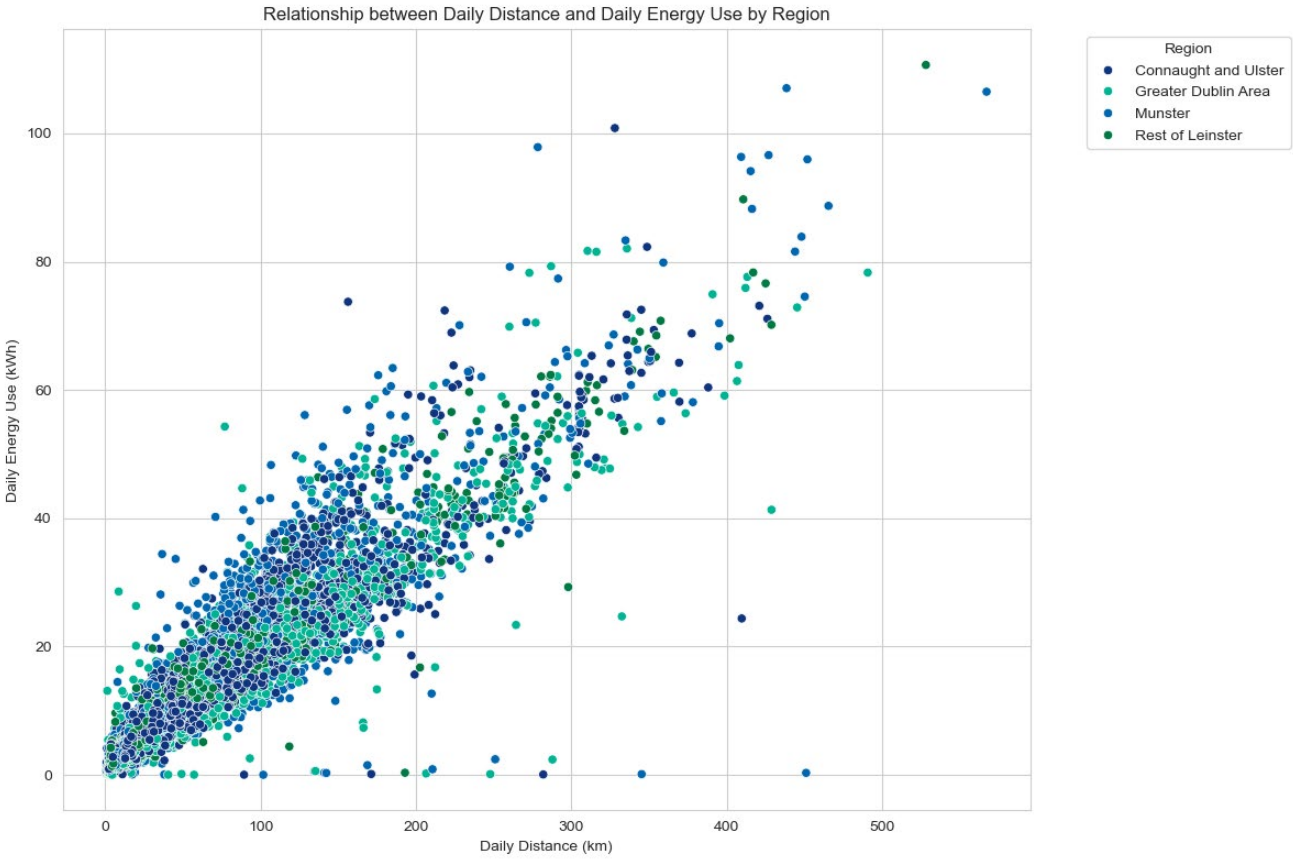





Distribution of Trip Duration by Region and Vehicle Type
Class of Vehicle
M1
N1
Daily Journey Time (minutes)
0
100
200
300
400
Connaught and Ulster
Greater Dublin Area
Munster
Rest of Leinster
Region


Energy Efficiency (kWh/km) by Region for Daily Distance > 50
Energy Efficiency (kWh/km)
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
Connaught and Ulster
Greater Dublin Area
Munster
Rest of Leinster
Region


Daily Distance Travelled vs. Daily Energy Use by Vehicle Type
Vehicle Type
M1
N1
M1 Trendline
N1 Trendline
Daily Energy Use (kWh)
Daily Distance (km)
0
20
40
60
80
100
120
0
100
200
300
400
500


Relationship between Daily Distance and Daily Energy Use by Region
Region
Connaught and Ulster
Greater Dublin Area
Munster
Rest of Leinster
Daily Energy Use (kWh)
Daily Distance (km)
0
20
40
60
80
100
0
100
200
300
400
500

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