

Fleet Decarbonisation Case Studies – Volvo Trial

**Accelerating the use of electric vehicles
in Scotland's wholesale industry**



Overview

A shift to low carbon and zero emissions vehicles is underway, spurred on by the Climate Change Act 2019, which requires Scotland to reduce greenhouse gas emissions to net zero by 2045, with an interim reduction target of 75% against 1990 levels by 2030.

In order to meet this target, demands are increasingly placed on businesses to make changes to accelerate their transition to net zero. Reducing emissions from transport is critical to achieving this.

Definition

The term “net zero” means achieving a balance between the carbon emitted into the atmosphere, and the carbon removed from it. This balance – or net zero – will happen when the amount of carbon we add to the atmosphere is no more than the amount removed.

In 2021, the UK Government announced that it will phase out the sale of new non-zero emission heavy goods vehicles (HGVs) weighing 26 tonnes or more, from 2035. From 2040, all new HGVs sold in the UK must be zero emission.

In Scotland, the transport sector currently accounts for approximately 29% of total emissions¹, and UK figures have shown that road transport accounts for 91% of total transport emissions, with HGVs alone equating to 18%². Figures from the Scottish Wholesale Associations’ “Decarbonising the Scottish Wholesale Sector” report shows that 63.7% of members’ operational carbon emissions come from HGVs³.

To help tackle this and support its members to achieve a just transition to net zero that can benefit wholesale businesses of all sizes, the Scottish Wholesale Association launched its “Decarbonising the Wholesale Industry” project in 2021. The project provides opportunities for wholesalers to test, pilot and implement various measures to cut carbon emissions.



Transport accounts for 29% of total emissions

¹ Scottish Government, 2021, Scottish Greenhouse Gas statistics 1990-2019: <https://www.gov.scot/publications/scottish-greenhouse-gas-statistics-1990-2019/documents/>

² Department for Transport, 2021. Transport and environment statistics: Autumn 2021: <https://www.gov.uk/government/statistics/transport-and-environment-statistics-autumn-2021/transport-and-environment-statistics-autumn-2021>

³ Scottish Wholesale Association, 2023, Decarbonising the Scottish Wholesale Sector – Exploring the sectors carbon emissions and attitudes to climate action: <https://www.scottishwholesale.co.uk/media/2927/swa-decarbonising-the-scottish-wholesale-sector.pdf>

Going electric: Learning by doing

This trial was initiated by SWA, in partnership with Volvo Trucks. The trial set out to gain real-world learnings of what electrifying heavy vehicles would look like in practice for Scotland's wholesale businesses: what works, and what would need more attention?

While there has been some political movement that could help make a transition to zero emission HGVs more feasible, such as the draft UK legislation suggesting an increase in weight of certain zero emissions vehicles⁴, allowing electric HGVs to have heavier batteries and therefore greater mileage range, what challenges and barriers remain, from an on-the-ground perspective?

Three participants; JW Filshill, Tennent's, part of the leading drinks company C&C group, and United Wholesale Scotland feature in this case study.

Filshill
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BEST
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2023
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The trial featured the Volvo FE 19-tonne curtain sider truck with a built-in rear lift⁵.

All trial participants received the vehicle for two weeks to explore what fleet electrification may look like for their operations.

The trial also included the provision of a mobile charger to the wholesaler's depot.



⁴ UK Government. 2023. [The Road Vehicles \(Authorised Weight\)\(Amendment\) Regulations 2023](#).

⁵ Volvo FE Electric Specifics: Rigid: 6x2. All axles are air suspended, day cab, short sleeper cab, sleeper cab, low entry cab. Up to 27 tonnes, 200–265 kWh, 11 h with AC charging and 2 h with DC charging, 2 electric motors, 2-speed gearbox, up to 300 kW (408 hp) continuous power, suitability for body-work, electric PTO

Before the trial: A bad reputation

The project revealed widespread negative perceptions of electric vehicles. Before the trial, staff at most of the participating wholesalers expressed reservations. There was scepticism surrounding the vehicle range and if the vehicle would be robust enough to complete the multi-delivery routes. There was also initial reluctance from drivers to use the vehicle.

"It is fair to say that there were negative perceptions at the beginning. However, this started to change after the show round of the vehicle and after it was being used, attitudes started to change for the better and they were overall happy with it by the end of the trial."

United Wholesale Scotland



During the trial: A good reception

As this was a trial vehicle, the specific modification was not standard for some of the wholesalers. Slight changes to the vehicle itself would be required for them to introduce this to their fleets. However, despite the slight differences, the vehicle was comprehensively tested by the participants.

Once the vehicle was in place and completing the routes, scepticism, and concerns, were settled. Drivers and cab-mates consistently noted a heightened user experience. The cab was said to be of a much higher standard than other vehicles. The reduced road noise and increased acceleration made the truck more pleasant to drive compared to traditional vehicles. Drivers appreciated the modern, comfortable cab and also how the vehicle handled while driving. The example below encapsulates this.

One wholesaler also recounted how the introduction of the Volvo truck had sparked curiosity amongst the other employees.

What initially seemed like a drastic change to operations proved to be a welcomed one. All of the participants stated that attitudes improved across the workforce, and there was now increased interest in having EVs integrated into the fleet.

"It worked well for them. The drivers enjoyed the instant power, the experience, and it made a difference to their day to day. It turned into something they would look to venture into more."

JW Filshill

"Overall the trial was a good experience. The team were sceptical at first, however, once the vehicle was introduced their minds were changed."

United Wholesale Scotland



Trial results

Vehicle charging and range anxiety

The mobile charger provided was 42kW and the vehicle took around 6 hours to charge. All the participating wholesalers were able to fit charging into their current operations. This was due to the average route times being up to 8 hours, and the vehicle spending the majority of dwell time at the depot. All participants noted the trucks were parked for long enough overnight that charging this way did not impact the usage of the truck.



However, in order for a full transition to electric fleets to be viable, participants expressed a need to be able to charge while out on routes. This is currently not possible due to a lack of public charging for larger vehicles.

Leading up to the trial, employees from all of the companies expressed range anxiety. However, operations were not compromised, and it was acknowledged that driving behaviour was pivotal in overcoming any challenges associated with vehicle range. All participating drivers contributed to this by successfully maintaining good efficient driving techniques, within the efficiency range of 100kWh to 130kWh. Efficient driving techniques may include:

- Avoiding harsh, unnecessary braking.
- Speed management.
- Familiarisation with eco features.

The main source of range decrease was the rear tail lift. Three of the participants saw a decrease in range when the rear tail lift was used more often. It was suggested that a separate battery for the tail lift may be better and would not compromise the vehicle's mileage.

Although there may be changes needed, overall the trial was able to dispel many of the perceived opinions regarding range and participants noted feeling more confident in transitioning to electric. The most prominent example from the trial came from Tennent's when they put their vehicle to the test.

"Overall, this was a worthwhile trial. The range generally worked for their needs. The only specific drawback was the vehicle wasn't 100% tailored to the delivery needs so the drops were pallets only and not kegs. We would have liked to see a full load including kegs and how this would have affected the range."

Tennent's



A true test

Testing vehicles in a variety of conditions provides the vital real-world evidence currently missing.

Along with range, weather conditions can typically cause anxiety when considering the transition to electric.

Tennent's put their vehicle to the test as they noted that on one of the trial days the temperatures plummeted to -12 degrees. The vehicle was deployed for its normal route, 193 km, and although the low temperature did slightly affect the range, it was not detrimental to operations. The vehicle was returned to the depot with 1% battery remaining despite being on one of the longer routes with multiple deliveries.

This is now the record set for the furthest distance travelled with this particular truck, by any company or driver.



Behaviour change

A key learning from the trial is the importance of influencers within an organisation to challenge the initially negative perceptions and encourage behaviour change among colleagues. A driver with much experience and strong capabilities, whose opinion and advice are particularly respected and valued by fellow drivers and others in the workplace, and who also has strong social connections, was shown to be highly effective in turning the electric truck from something to be avoided, to a vehicle others aspired to drive.

"The driver selected for the trial has 25 years of experience with the company and was a little sceptical at first but this soon settled after use.

"[After employees talked with the driver and drivers mate] The initial resistance changed and heightened the interest of other colleagues which has to lead to some staff members asking if there were more coming."

Tennent's



None of the participants utilised the public charging network during the trial. When questioned further, using the public network was an undesirable option as it had been found to not support the size of the trial vehicle. By removing the public network as an option, depot charging for heavier vehicles becomes of the utmost importance. This could require a behaviour change when drivers drop vehicles back at the depot. At the end of their route, drivers would need to remember to put the vehicle on charge and ensure it is charging before leaving.

Without the option of public charging, businesses would potentially have to go one step further than strategic route planning by cutting the length of routes. This would subsequently limit the delivery range and pool of customers that can be serviced to ensure back to base charging is guaranteed.

Skills and operational activities

The team at Volvo Trucks provided full instructions to the recipients, and drivers stated that there were not any initial differences between the electric truck and a traditional internal combustion engine, or ICE, vehicle.

The team at Tennent's did however highlight that going forward, a comprehensive training plan would be optimal. This is due to how individual driver behaviours can influence the efficiency of the battery.

All of the wholesalers noted that for a successful fleet electrification, route planning may need to be adapted. Strategic and efficient route planning could mean that the electrification of certain routes is more feasible as the drops may be closer together.

"Route planning would need to be revised to work efficiently for the range and battery."

JW Filshill



Garry Whitelock, Truck Sales Director, Volvo Trucks and Keith Geddes, Chief Financial and Operating Officer, JW Filshill.



Conclusions and next steps

All participants agreed that the trial was exceedingly worthwhile and very important to them. It allowed them to gain real-world knowledge first-hand, instilling confidence in managers and employees when considering the future use of EV trucks. All participants said they would advise other wholesalers to take part in similar vehicle trials.

Cost: barriers and opportunities

Cost remains a major barrier to change, due to the significantly higher upfront cost of electric HGVs⁶ compared to their diesel counterparts⁷.

DAF, 18-tonne diesel truck

Volta, 18-tonne fully electric truck

£60–86k

£146–219k

However, despite the recent volatility in the electricity market, there are potential savings to be made from transitioning. The total life costs of EVs have shown to be lower than fossil fuel vehicles, as EVs have significantly fewer moving parts than ICE vehicles and so require less maintenance.

Trial participants stated that innovative financing models are needed to overcome the challenges associated with the higher upfront costs, allowing for arrangements that can make a transition to electric HGVs viable. Participants were also open to changing their practices and adopt leasing models when previously they would have purchased outright when acquiring new vehicles.

Although cost is a barrier to transitioning, most of the participating wholesalers acknowledged that the decision should not be made on cost alone. Increasingly, contracts within the market are stipulating that sustainable measures must be taken. The failure to transition could mean the potential loss of contracts in favour of those who are pushing forward with the transition to zero emission vehicles.

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⁶ N.B. This cost can be in the region of 2.5x higher

⁷ Costings result of high level market review. Prices current as of the time of case study development. Full enquires should be conducted to ascertain accurate market rates.

An increasing number of local authorities are introducing Low Emission Zones (LEZ). Some of these zones have already been activated but not enforced. Glasgow City Council are first, enforcing fines since 1st of June 2023. Any non-compliant vehicle entering the zone will receive a penalty of £60⁸. This penalty will then double for each subsequent breach and is capped at £960 for buses and HGVs, proving costly for non-compliant businesses operating in the area.

“Electrification can possibly future proof the business.”

JW Filshill



Charging

Effective charging is a key requirement for fleet electrification and requires a big commitment from organisations. In the context of the trial, the mobile charger provided was sufficient. But while solutions such as a mobile charger can be utilised in the short term, realistically charge points would need to be installed at depots for larger-scale electrification.

While this would be the best long-term solution, charging installation comes with its own set of challenges:

- Significant additional cost.
- Grid connection and available supply.
- Depot space.

As highlighted, public charging for HGVs would also be required. Whilst this is currently lacking, it provides an opportunity for HGV and larger vehicle charging provisions to be made. Innovative solutions will be required to achieve this and could possibly come in the form of combining private investment with public.

There would be a need for these charging bays to accommodate larger vehicles, and this is a facility that could be utilised by the full logistics sector, wider than that of the wholesale industry.

⁸ Glasgow City Council. 2023. [Glasgow's Low Emission Zone \(LEZ\) – Key Information](#)

Next steps

All companies that took part in the trial plan to continue the transition of their fleets. All, without exception, also stated that participating in this trial had given them the confidence and insight to take the next steps to decarbonisation.

This Scottish Wholesale Association trial in collaboration with Volvo Trucks has shown the value of real-world learning; it has highlighted that negative perceptions of electric vehicles can be easily overcome. It has also shown that while commitment from senior management and clear messages about the direction of travel is essential to drive through changes, internal 'on the ground' influencers within the staff force are pivotal to changing attitudes and behaviours. Designated EV champions could be the first port of call for those who have questions regarding the new vehicles and help with any training needs.

Further, it has highlighted that there are still gaps that require further investigation and action for fleet transition to be successful. The following areas were identified as priorities for further exploration:

- **Cost remains a restrictive factor.** More investigation should be conducted into potential financing models and the total cost of ownership analysis.
- **More trials are needed** to further build real-world insight and understand how to overcome the remaining challenges such as range, strategic route planning, and public infrastructure for HGVs.
- **Charging capacity** at the depot, and the cost of and waiting time for an upgraded connection led one wholesaler to withdraw from taking part in the trial. Speedy charging and a streamlined process for accessing appropriate grid connections will be essential.

In addition, a need for greater provision of information and dialogue with the insurance sector has been highlighted, as one wholesaler who wished to take part in the trial withdrew on advice of their insurers, who claimed it could risk their premium renewal.

This trial has shown that change is possible. More and faster action towards resolving remaining barriers, involving all stakeholders, is now needed in order to accelerate the decarbonisation of vehicle fleets and help organisations reach internal and national targets.



SCOTTISH WHOLESALE ASSOCIATION

The voice of the Scottish Food, Drink and Allied Trades

The Scottish Wholesale Association

The Scottish Wholesale Association (SWA) is the official trade body for Scotland's food and drink wholesaling industry. SWA members are 'the wheels to Scotland's food and drink industry', supplying products to over 5,000 independent convenience stores, 30,000 catering, hospitality, tourism and leisure businesses, and the majority of public sector establishments across Scotland.



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