

Cross-Party Group on Sustainable Transport

30 May 2023, 13:00

Topic: Bus decarbonisation

Held as an online meeting via Zoom

Present

MSPs

Graham Simpson MSP (Convener, chairing)

Mark Ruskell MSP (Vice-Convener)

Invited guests

Guest speaker: Debbie McCreath (Group Marketing Director at Alexander Dennis)

Guest speaker: Jude Balfour (Decarbonisation Delivery Manager at First Bus)

Guest speaker: Sara Collier (Public Affairs Manager (Scotland) at Confederation of Passenger Transport)

Non-MSP Group Members

Laura Hyde-White (Transform Scotland)

Colin Howden (Transform Scotland)

Gus Russell (Tweed Valley Railway Campaign)

James Harkins (Light Rail UK)

Tom Flanagan (Transform Scotland)

Marina Coroller-Larifla (Sustrans)

Catriona Melville (Age Scotland)

Duncan Cameron (First Bus)

Dave du Feu (Spokes)

Jenny Milne (Scottish Rural and Islands Transport Community)

Robert Samson (Transport Focus)

Chris Day (Edinburgh Bus Users Group)

Craig Laws (Enterprise Holdings)

Mike Connelly (Rock Rail)

Paul White (CPT Scotland)

Gordon Gilfillan (Community Energy Scotland)
Elspeth Wray (Transform Scotland)
Lara Fahey (EAUC Scotland)
Naya Koulocheri (Sarah Boyack MSP office)
Lara Henderson (Scotland CTA)
Ralph Roberts (McGills)
Kirstie Henderson (RNIB Scotland)
Aimee Chin (Personal capacity)
Ally McInroy (MaaS Scotland)
Ian McCall (Paths for All)
Paul Tetlaw (Transform Scotland)
Duncan Clark (CTA)
Rosie Brown (Community Energy Scotland)

Apologies

Douglas Bryce (Disability Equality Scotland)
Allison Cosgrove (Railfuture Scotland)
John Mason MSP
Susan Fulton (MACS)
Vic MacKinlay (Light Rail UK)

Welcome and introductions

The Convener noted that as part of the short inquiry into the decarbonisation of transport, an evidence session had already been held on decarbonising railways, that this session will consider the topic of decarbonising buses and that the next evidence session will look at decarbonising ferries. The Convener declared the meeting quorate and welcomed all to the online meeting which would be recorded and published.

Minutes

There being no suggested amendments to the minutes from the evidence session on rail decarbonisation, held on 10 May, they were proposed by Mark Ruskell MSP, seconded by the Convener and approved.

Speakers

Sara Collier noted that the transport sector is the largest emitter of greenhouse gases in Scotland, around 80% of public transport journeys in Scotland are by bus, but that bus and coach travel is responsible for only 5% of road transport emissions. Modal shift away from car transport is crucial as cars account for more than half of transport emissions. She added that we also need to make sure that public transport by rail, bus and ferry is decarbonised.

The 2021/22 Scottish Programme for Government committed to the removal of the majority of diesel buses by the end of 2023. Yet research by Transform Scotland in 2022 had shown that only 16% (c. 600 buses) will be electric or hydrogen by the end of 2023. No date has been agreed for the phasing out of the entirety of the diesel bus fleet.

The Scottish Government has previously provided Scottish Green Bus Fund (renamed the Scottish Ultra-Low Emission Bus Scheme in 2020) funding for low and very low emission buses. This SULEBS scheme covered up to 75% of the cost difference between a diesel bus and an ultra-low emission alternative, including infrastructure costs.

Low-carbon and low-emission additional payments were also available to operators as part of the Bus Service Operator Grant (now re-named the Network Support Grant).

Currently, the Scottish Government has announced £120m of potential funding through the Scottish Zero Emission Bus Challenge Fund (ScotZEB) over five years, beginning in 2021/22, to support investment in zero-emission buses. In 2021, ScotZEB awarded £62m to nine bus operators and local authorities for 276 zero-emission buses and charging infrastructure.

Last year, the Zero Emission Market Transition Scheme for SME bus and coach operators and community and school transport provided information on the steps involved in moving to zero-emission vehicles.

Two weeks ago, the Scottish Government announced £58m of funding for ScotZEB Phase 2, which is open for applications until mid-September, but which will be the final funding available. After this, the desire from Government is that the market will be self-sustaining. Funding will only be awarded to those meeting stated criteria e.g. bids must come from a consortium, include a source of private finance, and involve at least two small or medium bus or coach operators or two community transport providers. Feedback on this guidance is being provided to Transport Scotland and the Energy Saving Trust including on compliance with competition regulations if competitor operators are working together, and also on vehicle specifications. As the first home

nation taking this step in ending support, there could be ramifications for the zero-emissions timeline in Scotland.

The 2021/22 Programme for Government included working with the Bus Decarbonisation Taskforce, launched at the end of 2020 with membership from operators, manufacturers, energy sector, finance and government agencies. Their remit was to identify and co-design solutions for charging infrastructure, en-route charging, technology including batteries and financial products, and looking at vehicle charging in rural, island and urban areas. Having met in 2021 and 2022, the taskforce published *Scotland's Pathway to Zero Emission Buses* in summer 2022, showing achievements to date and what remains to be done.

Sara indicated that the Bus Decarbonisation Taskforce has a wealth of information and evidence which it can share with the Cross Party Group.

Jude Balfour informed the group that First Bus operates around 4,500 buses across the UK. The main areas served in Scotland are Glasgow, Lanarkshire and Aberdeen. First Bus plans to have 14% of its fleet as zero emission buses by the end of the current financial year and to have zero emission fleets operating from carbon neutral depots and facilities by 2035. First Bus will not purchase new diesel vehicles after December 2023.

First Bus have trialled zero emission vehicles and infrastructure and 25 leased hydrogen vehicles are running in Aberdeen; meanwhile, there are biogas vehicles in Bristol, turn-key battery-electric vehicles in Leeds, AC-charged battery electric vehicles in York, DC-charged battery electric vehicles in Glasgow and also some vehicle retrofits.

The pathfinder project is at the Caledonia Depot in Glasgow from which they are running 150 Alexander Dennis single and double deck buses which were delivered between 2021 and 2023. Power supply upgrades now provide 12 MVA of electricity. There are over 80 120 KW and 150 KW DC-chargers. A new primary substation provides the electricity needs of the site and also the south side of Glasgow more generally. Vehicles are charged on-site, overnight. First Glasgow has spent more than its operating profit on EV investment in the last three years alongside funding from SULEB 1 and 2 and from Scottish Power Energy Networks and Ofgem.

In Scotland, First Bus will start to operate 74 more electric buses in the next eight weeks of which 24 have already been delivered and are undergoing pre-service checks. A further 58 vehicles will be delivered by the end of June. At that point, one third of the First Bus fleet in Scotland will be low-emission vehicles.

On wider benefits to the community, since October 2022, First Bus have run a business-to-business charging trial, whereby organisations can charge their vehicles during the day using First Bus charging infrastructure.

Air quality improvements have resulted, notably with a reduction in particulates and the removal of 450 tons of nitrous oxide in central Glasgow where the buses operate.

In addition, upskilling is taking place in the local area for engineers servicing and maintaining electric vehicles and charging infrastructure.

First Bus hopes to launch a business-to-consumer charging trial soon, giving the public access to very fast EV chargers.

Debbie McCreath stated that Alexander Dennis has been leading the supply of electric buses in the UK since 2016. Based in Larbert, Alexander Dennis have factories in Falkirk and Scarborough and in other UK locations.

Alexander Dennis buses have covered over 95 million zero-emission miles and saved over 130,000 tons of CO2 emissions compared with diesel vehicles.

Alexander Dennis joined the NFI group, an independent Canadian bus manufacturer, in 2019.

In addition to manufacturing, the company offers AD24 which provides after-sales support for parts and servicing.

Alexander Dennis has been asked to increase the supply of smaller zero-emission buses and has researched and designed the “big-small bus” to address expected demand as buses transition to zero-emission. Significant investment has been made in battery-electric vehicles.

The Larbert facility will be expanded to house manufacturing of zero-emission double decker buses. Previously, hydrogen fuel cell buses were built in Larbert. This investment has been made despite the external challenges of the energy crisis, high inflation and supply-chain headwinds but these pressures have negatively impacted the speed of the transition.

Buses sold to Stagecoach mean that all local services in Perth are electric. Zero emission buses are also in Dunfermline, Aberdeen and Ayrshire.

Electric bus orders have been received from Birmingham, Greater Manchester and First Bus have received funding from the UK Government. However, ScotZEB produced faster results than the equivalent UK scheme.

Overseas, First Bus buses are deployed in Athlone in Ireland and Hong Kong.

Sara Collier noted that it was important to have a whole-system view and highlighted the position in relation to coaches, which are particularly important in Scotland for transporting tourists, school students and other groups. Coaches have different requirements from buses. Currently, the only technology available for coaches is battery-electric and as coaches tend to serve longer routes than buses they are often

further away from charging infrastructure. CPT UK has set up a Zero Emission Coach Taskforce.

Debbie McCreath stressed the need for developing skills to be able to service and maintain buses using a relatively new technology which has only been around for about 10 years, compared with fossil-fuel technology skills which have been around for over a century.

Jude Balfour agreed that a huge transition is taking place and that there is a need to upskill engineers for the maintenance of vehicles and infrastructure and for drivers on how to operate zero emission vehicles.

Debbie McCreath noted that, despite the transition, it is important to recognise that diesel bus purchases are still taking place.

Sara Collier noted that ScotZEB Phase 2 had been launched two weeks earlier, was open for applications and underlined that one condition of funding is that the applicant must demonstrate that future government subsidy will not be required to decarbonize buses. The scheme will also seek to ensure that smaller operators are not left behind.

To ensure whole-system appraisal, CPT Scotland has reconvened the Bus Decarbonisation Taskforce. The Taskforce will look for progress against the timeline in the *Scotland's Pathway to Zero Emission Buses* report.



Figure 1

Even if the £58m is spent it will get the bus sector to less than half-way to replacing diesel buses with zero-emissions vehicles.

The Taskforce has, therefore, looked at leasing models for vehicles or components batteries. The operators would have lower up-front costs but would spend more overall and additional costs would have to be paid for by customers, taxpayers and/or local authorities. In the coach sector, the vehicle can be seen as a 'pension' for its owner, with a second-hand sale value, which needs to be considered. While funding for vehicles will stop, it is not clear if funding may be available through other channels, for example, to encourage investment in emerging technologies or to incentivise network support payments.

Debbie McCreath congratulated CPT Scotland for reinstating the Bus Decarbonisation Taskforce.

Q&A

The Convener opened the meeting to questions.

Q: The Convener asked about ScotZEB Phase 2 funding and whether the criteria is too restrictive. He also asked if, as was permitted in a previous funding scheme, this funding would allow the purchase of buses made in China.

Sara Collier said CPT have already provided feedback to Transport Scotland about the ScotZEB Phase 2 funding criteria, for example, about the inclusion of bike spaces on buses which would mean losing the value of additional seats, and on the consortium requirements and the possible competition regulations implications.

Q: Robert Sampson (Transport Focus): asked about how to improve electricity supply, especially in rural locations and for smaller operators.

Jude Balfour responded that this depends on the number of vehicles being charged. Smaller operators may find there is enough power already through the local grid and no increase is needed. It is hoped that the consortium requirement will enable knowledge to be shared to address issues such as power supply. First Bus are creating a centre of excellence in their Leicester depot where all buses will be electric and, as part of a consortium, could share their knowledge and expertise.

Debbie McCreath reiterated that electric vehicle purchases are only part of the solution and that governments must take a whole-system approach.

Q: Chris Day (Edinburgh Bus Users Group): asked what the impact of electric buses is on road infrastructure if they are heavier than diesel buses.

Ralph Roberts (McGill's Buses): responded that this depends on the timeframe and if dealing with the unladen kerbside weight or the gross, laden weight of the bus. He highlighted that buses have been getting heavier over the last 20 years – between 20% to 35% due to complexity and technology.

Electric unladen buses are heavier than diesel equivalents as while there is no fuel weight for electricity, the batteries are heavy. So, even though there is no fuel, fuel tank, combustion engine or transmission there is a 1 to 1.5 ton difference in unladen kerb weight. This higher weight will increase pressure on the roads but the softer style of driving with less braking, resulting in less transmission of forces to the road surface, and regenerative power with a retardation effect on the bus mitigates this impact somewhat. This means that overall there is a very slight increase in tyre crumb and larger particulate matter emissions. But – against that – there is almost no brake-dust from EVs. In summary, electric buses are heavier but there are lots of pros and cons to consider.

On ScotZEB Phase 2 criteria, he noted that if no Chinese content were permitted, there would be no electric buses in Scotland. There is a 70-95% Chinese content to date, varying by supplier, though Chinese content will reduce over time. Even though the UK is at the forefront of right-hand drive bus developments, we are not yet at the stage to be able to cut out certain nations if the country is to decarbonise its buses.

Q: Mark Ruskell MSP asked if the cost of purchase was decreasing. He also asked if there are winners emerging in developing technology. His final question asked if, within the ScotZEB Phase 2 Scheme, there were operators interested in partnering with smaller operators and communities.

Jude Balfour said that with regards to operating costs, that the DC-charged vehicles from Alexander Dennis have been operating since 2021. With new design vehicles, replacement part costs tend to be higher but, overall, there is a slight decrease in the running and operational costs compared with diesel equivalent.

She noted that in respect of partnering as part of the ScotZEB Phase 2 scheme, First Bus was open to taking part in consortia. First Bus have substantial experience in planning of vehicles and of real-time operations. Substantial interest from smaller organisations has only really emerged within the last six months. The capital cost of the vehicles and infrastructure remains the most significant issue affecting future investment plans.

On emerging technologies, she said that First Bus had been impressed by the charger provider, Heliox. Caledonia Depot was their first installation in the UK. Reliable product and extraordinary uptime and availability led First Bus to deploy Heliox in other UK sites, following a competitive tender. Experience of working with them has been positive

with no issues of buses being unavailable due to the charging infrastructure not working.

On preferred charging types: among which are AC and DC charge, pantograph, plug in and wireless, currently, DC plug-in tends to be a faster charge and suits the First Bus model of charging only at night and with no opportunity-charging at other times of day. This model allows smart charging.

Q: James Harkins (Light Rail UK) – of the 95m zero emission miles for Alexander Dennis buses, what tonnage of non-exhaust emissions was generated. Secondly, if in two years it will be possible to sue polluters and local authorities, how will the organisations cope with that?

Debbie McCreath – the distance is the aggregate, worldwide distance travelled by Alexander Dennis buses, not just UK mileage. Using DEFRA data it should be possible to calculate the UK mileage and the relevant UK tonnage generated.

Duncan Cameron (First Bus) – on emerging technologies, he noted that in addition to the pathfinder project at the Caledonia Depot, there are currently 15, increasing to 25, hydrogen vehicles operating in Aberdeen. Comparing technologies is difficult. Hydrogen is a lot more expensive from both a vehicle capital cost and fuel perspective but he added that the technology is in its infancy and it is currently harder to procure hydrogen as a fuel source. The advantage of hydrogen over electric is that it has a much greater range. Longer range services, in particular, could be better covered with hydrogen buses than electric buses. First Bus is trialling two types of solutions in Scotland and they may serve different purposes.

Decarbonisation will not be achieved if in isolation. Operators are investing but need to make a profit.

On the point about heavier buses putting pressure on the road network he noted that moving to zero emission vehicles does not address congestion and pressure on the road network. A focus must be kept on bus priority and prioritising public transport priority is necessary. Cost of operation has to remain efficient and decarbonisation has to be both achievable and affordable.

Q: Peter Stephens (Stagecoach) – on modal shift, he asked if the speakers had seen an uptick in bus use where zero emissions buses had been introduced. Stagecoach research, published in 2022, showed that if passengers had to bear the cost of zero emissions buses, carbon emissions might increase because fare increases could encourage more use of private cars and, therefore, an increase in emissions.

Jude Balfour – when introducing electric buses, First Bus ran a simultaneous modal-shift advertising campaign on TV / radio etc. promoting a move from cars onto EVs. Although there is no scientific evidence of a modal shift to buses when EVs are

introduced, during the 8-week campaign there was an increase in patronage. There is a sense, though, that the presence of EVs encourages some modal shift from private cars. First Bus also tends to introduce EVs where the community will be interested in the benefit.

Debbie McCreath noted that China had driven a much stronger modal shift than in Scotland, to date. This was, she said, because of the investment by China in encouraging the modal shift, including by building entire zero-emission cities. Modal shift will take longer in the UK and will require a “just transition”. On the move to zero emissions vehicles away from diesel she noted that, without some support, that transition will be difficult and that most ZEBs purchased, to date, have had some form of government support whereas diesel typically had not. She concluded that, if ScotZEB Phase 2 funding is, indeed, the last round of funding, it remains to be seen what that would mean for Scotland.

Jenny Milne (Scottish Rural and Islands Transport Community) – in rural areas, there are community transport, demand-responsive transport and school buses. Solutions need to be practical and rural and island areas are struggling. Often rural areas get diesel buses when the support for electric buses is strong but the users do not have the opportunity to experience them to demonstrate that support. She advised that SRITC has produced a report, to be published in June, on the need for skills training as part of the goal to achieve decarbonisation.

Ralph Roberts (McGill's Buses) – confirmed that capital costs of zero emissions vehicles are going up not down. Supply chain pressures mean that new EV prices are increasing but, as more are used, the operational costs savings are better understood.

On SME collaboration as part of ScotZEB Phase 2 funding, he suggested that the decarbonisation unit within Transport Scotland could encourage the smaller operators to get involved. Having spoken to 13 SME bus operators, none of them are interested in a consortium: mainly because they operate contracted mileage and the funding round does not tie in with the operators' contract end-dates. Local authority interest in funding should be explored. He concluded that there may be a better way to do this but the position would become clearer as bids for funding come in.

Date for subsequent meetings and close of meeting

The Convener thanked the presenters and contributors and closed the meeting at 14:00.

The next session on Tuesday 20 June will be on decarbonisation of ferries.

Minutes

Draft minutes prepared by Gus Russell (Tweed Valley Railway Campaign, on behalf of Transform Scotland) on 31.05.22.