

# Bus Decarbonisation Taskforce

Final Meeting  
10 August 2022  
Meeting Papers



<b>Agenda .....</b>	<b>2</b>
<b>Paper 6.1: Progress to date.....</b>	<b>3</b>
<b>Paper 6.2: Final Pathway .....</b>	<b>8</b>
<b>Paper 6.3: Commitments to delivery .....</b>	<b>9</b>

## Agenda

Refreshments will be available from 8.30 and members are asked to arrive by 8.45, for a photocall. The meeting will commence following photos.

<b>Item</b>
<b>1. Progress to date (Paper 6.1)</b>
<b>2. Final pathway (Paper 6.2 – note embedded document)</b>
<b>3. Commitments to delivery (Paper 6.3)</b>
<b>4. Any Other Business</b>
<b>5. Close</b>

## Paper 6.1: Progress to date

This paper sets out progress towards zero-emission buses in Scotland made by this Taskforce, in the context of COVID-19 and a global energy crisis.

The taskforce are invited to:

- a) commend the practical actions by those across the bus operating, bus manufacturing, finance and energy sectors over the past 18 months to tackle the barriers to decarbonisation and replace hundreds of diesel buses with zero emission vehicles on Scotland's roads;
- b) raise any further progress already made, or contextual points, that should be recognised.

At its first meeting November 2020, the Taskforce agreed to:

- **agree a vision for a zero-emission bus sector in Scotland;**
- **co-design the solutions for ending the bus sector's contribution to climate change;**
- **set out a collaborative pathway for achieving zero-emissions.**

The first paper discussed set out the challenges and opportunities as:

### **1. Financial**

Running costs of zero-emission buses are lower than those of diesel buses, but battery-electric buses have higher up-front purchase costs compared to diesel buses, and hydrogen fuel-cell buses even more so. This is exacerbated where charging infrastructure also has to be paid for up front.

### **2. Energy provision, technology and infrastructure**

There is a strong interplay between the different energy provision, technology and infrastructure requirements for zero-emission buses and

the potential for novel and innovative financial structures to enable the transition.

Uncertainties remain regarding the battery lifecycle and the residual value of EV buses at their point of retirement. One key risk is the continued ability of the battery in the vehicle to deliver the desired range and the need to replace parts or all of the battery during the life of the vehicle.

Whether a bus operator chooses battery-electric or hydrogen fuel-cell buses, charging infrastructure is required and opportunities for collaboration with other energy users, and providers, emerge.

There is an opportunity and a need for greater information sharing and strategic planning between energy providers, technological innovators and bus operators, and there may be a need for awareness raising and knowledge sharing about infrastructure, grid and connection solutions across bus operators.

### **3. Supply-chain**

There are opportunities to build on Scotland's R&D capacity, and to develop the domestic supply-chain for battery manufacturing and hydrogen generation, to drive down costs, provide high quality skilled jobs, and reduce carbon in the manufacturing and shipping of parts.

The Taskforce has had discussion all of these issues in-depth and co-designed solutions. In tandem, over the course of the life of the Taskforce, there have been a variety of interlinked developments. This is shown in the following table.

	<b>Taskforce activity</b>	<b>Wider developments or interlinked activity</b>
November 2020	Meeting 1: discussed the barriers to zero emission buses and the opportunities, and agreed a <a href="#">guiding vision</a> .	
December 2020		COVID: Plans for the delivery of the first vaccinations are <a href="#">announced</a>
January 2021	KPMG conduct 1:1 interviews with stakeholders to inform the information and ideas pack	Scottish Government <a href="#">announced</a> awards of over £40.5 million capital (plus 5 years of resource subsidy commitment) through SULEBS#2
February 2021	<p>KPMG host a workshop to inform the information and ideas pack with Taskforce members and stakeholders</p> <p>Meeting 2: FINANCE. KPMG present their findings to the Taskforce. Taskforce agreed that residual value risk is key; a variety of financial models are available, with case-by-case assessments required; that large-scale fleet transitions are preferable to incremental or ad-hoc improvements; that government subsidy for fleet purchase is a transitional arrangement and will not become a permanent feature.</p>	COVID: millionth person in Scotland <a href="#">receives</a> their first dose of vaccine
March 2021	The Information and Ideas pack, developed by KPMG is <a href="#">Published</a> .	
April 2021	Meeting 3: ENERGY. The regulatory framework for electricity distribution networks was outlined, leading to discussion about how bus operators and the energy networks can engage most productively. Taskforce agreed that a single subsidy scheme for both battery-electric buses and hydrogen fuel-cell buses may not be appropriate, and discussed the role local government could play in aggregating demand for hydrogen vehicles.	
July 2021	Meeting 4: SUPPLY CHAIN. The virtuous circle between Scotland's strong global reputation for bus	<a href="#">Report</a> on Battery use in Scotland now and in the future published by Zero Waste Scotland

	<p>manufacture, swift transition to bus decarbonisation, and economic opportunities and community benefits was discussed. The drivers of zero emission bus costs were discussed with the Taskforce agreeing that a degree of standardisation of buses, and collaboration across operators, would be helpful. The importance of batteries being understood as an asset, not a liability, and development of a circular economy, was agreed.</p>	<p>COVID: Scotland <a href="#">moves</a> to Level 0 restrictions</p>
August 2021		<p>ScotZEB#1 <a href="#">opened</a></p>
September 2021		<p>Deliveries of buses supported through SULEBS to McGill's begins</p>
October 2021		<p>Deliveries of buses supported through SULEBS to First Glasgow begins</p> <p>Phase two of First Caledonia depot electrification completed</p>
November 2021	<p>Meeting with the International Investment Roundtable</p>	<p>COP 26 held in Glasgow</p> <p>Final deliveries of buses ordered under SULEBS 1 are made</p>
December 2021		<p>COVID: 21 December: mitigation measures against the Omicron variant are <a href="#">introduced</a> for three weeks</p> <p>Spot price<sup>1</sup> for Natural gas exceeds £450/therm for the first time</p> <p>Deliveries of buses supported through SULEBS to Stagecoach begins</p>
January 2022		<p>Crown Estate Scotland <a href="#">announces</a> 25 GigaWatts of new electricity generation capacity will be installed through 17 offshore wind energy projects resulting from ScotWind offshore leasing auction</p> <p>Confederation for Passenger Transport <a href="#">establishes</a> Zero Emission Coach Taskforce</p>

<sup>1</sup> <https://tradingeconomics.com/commodity/uk-natural-gas>

		<p>First deliveries of buses ordered through SULEBS made to Xplore Dundee made</p> <p>COVID: <a href="#">end of reintroduced</a> restrictions in response to Omicron variant</p>
February 2022	<p>Bus Decarbonisation Workshop, aimed at SME operators, hosted by SFT and CPT</p> <p>Publication of <a href="#">guidance</a> to support fleet operators on where to start with electrification</p> <p>Publication of <a href="#">guidance</a> on electric vehicle batteries and battery performance</p>	<p>The Scottish Government <a href="#">announced</a> over £62 million of awards made through ScotZEB #1</p> <p>Russian invasion of Ukraine escalates</p>
March 2022	<p>Meeting 5: JUST TRANSITION AND DRAFT PATHWAY. Taskforce discussed particular issues faced by SME operators, the potential for repowering, scrappage schemes, and the barrier of local authority contracts for supported services being short term and cost-priority.</p>	<p>Stagecoach <a href="#">published</a> a <a href="#">report</a> setting out an ambitious national vision for achieving the introduction of 100% Zero Emission Buses (ZEBs) across the UK</p> <p>Brent crude oil reaches \$100 per barrel</p> <p>Natural gas spot price reaches peak of £500/therm for the first time. <sup>2</sup></p>
April 2022		<p>UK energy price cap increase announced February to a total of £1,971 comes <a href="#">into effect</a><sup>3</sup></p>
May 2022		<p>First Bus completes the major transformation of its Caledonia depot, allowing 150 EVs to be charged at one time</p>
June 2022		<p>Scottish Government <a href="#">launches</a> the Zero Emission Mobility Innovation Fund</p> <p>Scottish Government <a href="#">announces</a> £10 million Hydrogen Innovation Scheme</p>
July 2022	<p>Scottish Government <a href="#">procures research</a> into impact on the second-hand vehicle market through ClimateXChange</p>	<p>Russia restricts natural gas supply to continental Europe.</p> <p>AMTE <a href="#">announces</a> factory for producing battery cells in Dundee.</p>

<sup>2</sup> <https://tradingeconomics.com/commodity/brent-crude-oil>

<sup>3</sup> <https://www.forbes.com/uk/advisor/energy/energy-price-caps/>

## Paper 6.2: Final Pathway

The pathway document is embedded as a PDF document below:



1760 TS Bus  
Decarbonisation Jourr

The taskforce are invited to agree that this document reflects the pathway co-designed over the course of its meetings.



## Paper 6.3: Commitments to delivery

This very brief paper provides the detail of progress toward one step on the pathway – “analyse and plan for impacts on the second-hand market” - other information about how the pathway will be delivered will be tabled by members of the Taskforce at the meeting.

The taskforce are invited to:

a) note the information provided about research into the second hand market;

b) inform the meeting of their respective organisation’s plans to deliver the steps on the pathway.

### **Analyse and plan for impacts on the second-hand market**

The Taskforce has discussed the importance of a Just Transition to zero-emission transport, which does not leave anyone behind. The Taskforce recognised that many SME operators’ business models and the second-hand vehicle market will be disrupted by the transition to zero-emission buses, and battery-as-a-service models, and this needs to be understood.

ClimateXChange, on behalf of Transport Scotland, have commissioned Element Energy to explore this disruption, its impacts and explore how the fairness of the transition across the whole sector can be maximised.

The research will take place over autumn 2022 and will investigate:

- The dominant business models amongst SME bus operators.
- The profile of the current second-hand bus market in Scotland.
- How will the move to battery electric buses amongst large operators impact on these business models and the second-hand market.

- What interventions by government, manufacturers, large operators, second hand market players, or any other body, can maximise the fairness of the transition across the whole sector.

The research will also include discussion of options for 'battery as a service', hire schemes etc. to reduce the capital cost and increase the smooth transition to zero emission busses. This builds on the financial information and ideas pack presented at the second meeting of the Taskforce.

Taskforce members may be contacted by Element Energy to share your insight in the coming weeks.

Taskforce members will be invited to a webinar to discuss the results, and the report is expected to be published in November 2022.