

Bus Decarbonisation Taskforce – Meeting 2

Taskforce Members		
Organisation	Name	Remark
Scottish Power	Keith Anderson	Co-chair (rotating)
Transport Scotland	Stuart Greig	Co-chair
Confederation of Passenger Transport (Scotland)	Paul White	Present
Confederation of Passenger Transport (Scotland)	Andrew Jarvis	Present
Confederation of Passenger Transport (Scotland)	Christine McGlasson	Present
Confederation of Passenger Transport (Scotland)	Colin Craig	Apologies
First Bus	John Dowie	Present
Stagecoach	Martin Griffiths	Present
Scottish and Southern Electricity Networks	Chris Burchell	Present
Alexander Dennis Ltd.	Paul Davies	Present
Wrightbus	Buta Atwal	Present
Optare	Robert Drewery	Present
Zenobe	Steven Meersman	Present
Scottish National Investment Bank	Alastair McMillen	Present
HSBC	Robert King	Present
Lloyds	Victoria Whitehead	Present
Scottish Enterprise	Linda Hanna	Present
Association of Transport Co-ordinating officers	John Berry	Present
Transport Scotland	Laura Murdoch	Present
BOC	Mark Griffin	Present

I. Welcome

- 1.1. The co-chairs jointly welcomed attendees to the second meeting of the Taskforce. Stuart Greig set out housekeeping arrangements and also updated the Taskforce on the progress that had taken place since the last meeting including: the launch of the world's first hydrogen double decker bus in Aberdeen, the recent announcement by ADL and BYD to locate more manufacturing in the UK and, the launch of a £25 million SULEBS round by the Scottish Government (which closed on 21 February).
- 1.2. KPMG and Mott MacDonald were in attendance to present findings from their work on future financial models.
- 1.3. Scottish Futures Trust were also in attendance for this meeting.

- 1.4. Apologies were made by Colin Craig of Confederation of Passenger Transport Scotland who was unable to attend.

2. Presentation on Future Financial Models

- 2.1. The Chair handed over to KPMG who presented their findings (Paper 2.1) on the various financial models that could support bus decarbonisation and the results of industry engagement. Initial questions focussed on technical assumptions on the presentation before discussion on financial products and models.
- 2.2. KPMG's work consisted of desk-based research, followed by one to one interviews with stakeholders and a workshop on 16 February 2021 which was attended by around 30 key stakeholders.
- 2.3. The findings from this activity are condensed in Paper 2.1 and the full outputs of the research in the form of an Information and Ideas Pack will be shared with the Taskforce in March.
- 2.4. KPMG also made clear that statements made were not representative of any single organisation but rather an amalgamation of input from multiple stakeholders.
- 2.5. Financial models discussed included;
 - 2.5.1. **Finance and Operating Leases** - Operators pay a fixed amount per month and either return the vehicle to the financier at the end of the lease or make a payment to purchase the vehicle. This model tends to be viewed as slightly more expensive as the financier prices technology risk into the lease cost. Liabilities will remain on operators' balance sheets.
 - 2.5.2. **Concessional Loans** - More common in Asia and South America. Public funding or patient capital (e.g. World Bank) is used in conjunction with a private financier to reduce costs and assume some of the risk for sale and leaseback refinancing. This model is not as common in the EV bus market but this may emerge as financiers see diesel buses as having obsolescence risk.
 - 2.5.3. **Component Leasing** - Bus operators purchase vehicles as they do now, with the exception of the battery, which is leased from a third party who assist the operator in the effective management and protection of the residual value of the battery.
 - 2.5.4. **Green Bonds** - financiers issue bonds which are used to widen the potential pool of investors to finance decarbonisation.

2.5.5. **Residual Value Guarantee** – currently used in civil aviation and are emerging in maritime shipping. This incorporates the residual value lease and insurance costs into the lease.

2.5.6. **Integrated end-to-end Financing** – Differs from traditional operator leasing as the financier “bundles” the vehicle, battery (or fuel cell), maintenance, servicing and infrastructure into one package, and the operators pays on a per-km basis. Unlike with traditional Financing and Operating Leases, there is no requirement for vehicle costs to remain on operators’ balance sheets under IFRS-16 rules.

2.5.7. **Revolving Fund** – Financiers establish a Special Purpose Vehicle Organisation to invest in infrastructure and other necessary assets which are then leased to operators. In the event of a default, the debt converts to equity in those assets. This model also allows energy companies to derive income from their assets earlier, and also allows more than one financier to participate.

2.5. In discussion of technical queries about the presentation, the following points were raised:

2.5.1. KPMG found that while per-vehicle costs are important, the chosen technology option can impact on other operational matters which need full consideration by all stakeholders including; potential changes to Peak Vehicle Requirement, depot space constraints, components’ schedules of maintenance, and local grid capacity constraints.

2.5.2. Total Costs to Operate are constantly evolving and cost models for battery-electric and fuel-cell models will need to be updated on a regular basis as technology improves and costs reduce (unlike diesel where the technology has matured).

2.5.3. Operators and manufacturers have a lot of real-life data on costs from later years of diesel vehicle operation which is currently not available for zero emission buses, which creates investment risk.

2.5.4. KPMG found from engagement with operators that it is difficult for them to plan anticipatory replacement costs for components in the absence of reliable long-term data. This affects their willingness to invest. However KPMG pointed out that manufacturers’ warranties for components are significantly longer than for diesel equivalents and this can be of major assurance to operators.

2.5.5. There is not a standard glossary of terms and definitions, e.g. a common understanding of battery performance, depreciation, residual value etc. to evaluate Total-Life Costs, which makes comparisons difficult.

- 2.5.6. While maintenance costs are expected to be lower for zero emission buses; the cost of replacement components are much higher than for diesel equivalents.
- 2.5.7. KPMG's analysis asserted that hydrogen fuel-cell buses are likely to require additional government support over the short to medium term in addition to that made available for battery-electric buses due to higher capital costs for vehicles and infrastructure, the higher cost of hydrogen relative to diesel, and subsequent higher residual value risk.
- 2.5.8. KPMG's analysis indicates that financiers and manufacturers will need at least some degree of fleet standardisation to reduce costs through bulk order discounts and volumes could be increased if small and medium sized bus operators are able to participate.
- 2.5.9. KPMG analysis and engagements with financiers indicated potential benefit to smaller bus operators in leasing these vehicles by reducing tie-in and addressing some of the up-front cost barrier faced by bus operators.

3. Discussion

- 3.1. The Taskforce agreed that there needed to be a diverse range of financial products which would accommodate the bus industry and respond to their needs as technology evolves.
- 3.2. The point was made by the Taskforce's financial representatives that projects need to be large-scale, or transformational, in order to leverage concessional loans or integrated end-to-end finance, as this allows costs to be spread over more vehicles and can also reduce the number of different infrastructure projects.
- 3.3. Financial representatives indicated that long-term financing is easier to access if continuous usage can be guaranteed over the entire lifetime of the asset in order to guarantee revenue for the financier and reduce demand risk.
- 3.4. An action was proposed for CPT Scotland (in conjunction with the secretariat) to explore how demand could be aggregated across multiple operators of different sizes in different geographies with stakeholders.
- 3.5. The Taskforce agreed that benefits could be derived from operators and other stakeholders working in partnership to aggregate demand in order to drive down costs through bulk ordering but the Taskforce accepted that a degree of standardisation of vehicle specifications is needed to aggregate demand across multiple operators. Greater standardisation was also an important issue for financiers in addressing demand risk for leases.
- 3.6. Some manufacturing representatives indicated that commercialisation of battery electric buses is more developed than hydrogen fuel cell buses and that while per-vehicle costs are higher, there is greater potential for large reductions

in costs for hydrogen. The European Commission is already working to accelerate this through the [Fuel Cell and Hydrogen Joint Undertaking](#).

- 3.7. Some Taskforce members expanded on the potential benefits of working in partnership to manage the component risks. In some potential models, the burden of risks associated with batteries or other components could be borne by parties with specialist skills and experience in these areas.
- 3.8. Operators' made clear that over the short-to-medium term; operator appetite for fleet decarbonisation will likely decrease as their risk exposure to technological obsolescence and residual value risk increases. As zero emission buses increase as a percentage of total fleet and more real world data is gathered, the risk exposure will get closer to operators' acceptable risk tolerance threshold.
- 3.9. While leasing models can address the "up-front commitment" barrier, they do not address the total cost of ownership as financiers must price in the residual value risk to the lease. Some historical experience indicates that leasing vehicles is often more expensive than typical borrowing. This expense may lead to higher fares if operational cost savings do not outweigh this cost
- 3.10. Liabilities for leases may not necessarily be a significant improvement on operators' balance sheets. Payment liabilities for leases versus loans could be more expensive to the operator even if they do not hold the residual value risk.
- 3.11. Experience from the civilian aerospace industry may prove useful to draw experience from. Airline operators lease and operate aircraft, which includes insurance for Guarantee Future Value (GFV) in the lease rate.
- 3.12. Longer-term leases are generally more expensive than secured debt and higher expenses will result in higher fares in the absence of intervention. Shorter leases (two or three years) would reduce up-front payment commitments and avoid any up-front debts on balance sheets.
- 3.13. Leasing models may still be attractive to operators where the residual value risk is borne by a third party and rents held as constant over vehicles' lifespans. Operator lock-in can be avoided if vehicle leases last two to three years even if the operator leases the vehicle for its entire lifespan.
- 3.14. While up-front costs are a significant barrier for operators to fleet transition; operating expenditure is still a major factor and high lease costs will still pose a significant barrier, even if operators' balance sheets do not hold such debts.
- 3.15. The Taskforce agreed that grid connection costs and variation both significantly affected viability of various financing models. Energy network representatives informed the group that network companies need to abide by regulations which are designed to keep costs low for energy bill paying consumers. Electricity Distribution Network Operators (DNOs) will be better able

to make the case for investment ahead of need if a robust plan with commitment from operators, financiers and other stakeholders is demonstrated. Independent Distribution Network Operators (IDNOs) and Independent Connection Providers (ICPs) however are less constrained in how much they can invest – including ahead of need.

4. Securing best Value-for-Money from Government funding

- 4.1. Sara Grainger informed the Taskforce that Transport Scotland are undertaking work with the Scottish Futures Trust, to explore options for an optimal zero-emission bus subsidy regime, based on capital and not resource funding, over the coming 5 years. In light of the discussion on finance models, and the general consensus across the Taskforce, it would seem that the subsidy framework should be designed to enable and support a wide range of commercial financial arrangements and must avoid constraining innovation and development. It is important that the level of Government subsidy is minimised per bus, and reduces to zero over time.
- 4.2. The Taskforce welcomed the level of certainty provided in the paper setting out the quantum of capital subsidy that will be available over the coming 5 years, and some expressed concern about a move to all subsidy being in capital form, though others suggested this was not important to all.
- 4.3. There was general consensus across the Taskforce that future government support should enable innovation and competitiveness in the market between service providers and financiers and does not limit support to any particular financial model/s or technology.
- 4.4. The Taskforce suggested that important factors for the subsidy framework include: assisting with aggregating demand; address uncertainty in the residual value of zero-emission buses; encouraging innovation; responding to improvements in technology; providing certainty for stakeholders; facilitating partnership working.

5. Summary and Conclusions from the Chair

- 5.1. Stuart thanked Keith Anderson for Chairing this meeting and attendees for their contributions.
- 5.2. The Taskforce agreed that effectively managing residual value risk is the most crucial component of achieving a rapid transition to decarbonisation of bus fleets. A variety of financial models are available, with differing pros and cons to different parties. The most appropriate model will likely be on a case-by-case basis according to local market conditions.
- 5.3. The Taskforce agreed that large-scale fleet transitions are far more preferable than incremental or ad-hoc improvements due to long-term advantages in reducing overall infrastructure costs for fleet transition. Large-

scale improvements will also provide assurances for manufacturers to invest in production improvements and drive down costs. Introducing a greater degree of vehicle interchangeability to facilitate re-leasing of buses to a variety of operators can assist with addressing demand risk for financiers.

5.4. The Taskforce accepted that government subsidy for fleet purchase is a transitional arrangement and will not become a permanent feature. The Taskforce agreed that public subsidy needs to both drive forward and adapt to evolution in zero-emission bus markets.

5.5. The next Taskforce meeting will focus on energy infrastructure is scheduled for 29 April, will be co-chaired by Linda Hanna from Scottish Enterprise.

Reference	Action	Due Date	Status
BDT-02a	Produce a paper on technology costs and identify opportunities where costs could be reduced	Revised: ongoing	Open
BDT-02b	Produce a paper on battery risk and possible second use post vehicle.	Revised: ongoing	Open
BDT-05	Secretariat to share full output of KPMG's work (an Information and Ideas Pack on financial models) to Taskforce members.	March 2020	Open
BDT-07	CPT to liaise with stakeholders on the pros and cons of vehicle standardisation which could be taken forward to support leasing arrangements	July 2021	Open
BDT-08	CPT Scotland (in conjunction with the secretariat) to explore how demand could be aggregated across multiple operators of different sizes in different geographies with stakeholders.	July 2021	Open
BDT-09	The secretariat will co-ordinate with manufacturers to addressing data asymmetry and comparability regarding component costs.	July 2021	Open