Ultra-Low Emission Bus Scheme
Application Form

Guidance on the application process is available on the DfT website¹.

Applicant Information

Are you a (Tick which of the following applies):

- Local Authority ☒
- Bus Operator ☒

Local authority or bus operator name(s):

Cardiff Council / Welsh Government / Cardiff Bus

If it is a joint bid, please enter the names of all bidders and specify who the lead will be. Only one proforma is expected to be completed for a joint bid, however your proforma should make clear who the individual partners are.

(For joint bids only) Who is the lead bidder?

Cardiff Council

¹ https://www.gov.uk/government/publications/low-emission-bus-scheme
Bid Manager name and position:

John Gibson (Section Leader Transport Policy)

Name and position of the official with day to day responsibility for delivering the proposed bid

Contact telephone number: 02920873253

Email address: j.gibson@cardiff.gov.uk

Postal address:

Room 301, County Hall, Atlantic Wharf, Cardiff, CF10 4UW.

Website address for published bid (if applicable): www.cardiff.gov.uk

When authorities submit a bid for funding to the Department, as part of the Government’s commitment to greater openness in the public sector under the Freedom of Information Act 2000 and the Environmental Information Regulations 2004, they must also publish a version excluding any commercially sensitive information on their own website within two working days of submitting the final bid to the Department. The Department reserves the right to deem the bid as non-compliant if this is not adhered to. We welcome any bus operator that wishes to do so too.
SECTION A - Bid description and funding profile

A1. Headline description:

Introduction of Ultra Low Emission Buses and supporting infrastructure across three routes within Cardiff. If successful, this will see the introduction of the first large scale zero emission capable vehicles in Wales, supporting wider Cardiff Capital Region and Welsh Government air quality and decarbonisation objectives. This will bring Cardiff in line with other European capital cities and tourist destinations. Introduction of these vehicles will enable a fleet cascade program that will remove the most polluting (Euro III) vehicles in the Cardiff Bus fleet. Cardiff Council’s Capital Ambition Report recognises that Cardiff is one of the UK’s fastest growing cities, and that it is crucial that this growth is well planned and sustainable. In line with Cardiff’s statutory Local Transport Plan and Local Development Plan the bid will look to assist progress towards the 50/50 modal split target by facilitating sustainable transport modes. There are currently four Air Quality Management Areas (AQMAs) declared across the authority due to elevated levels of NO2 encroaching upon or exceeding statutory limits. Cardiff Council recognises that there is no defined safe level when describing levels of air quality and are committed to achieving NO2 levels as low as reasonably practicable in the shortest time possible. In addition, Welsh Government has issued formal legal direction to Cardiff Council to address its air quality concerns and the improvement of operational bus fleets is viewed as a key enabler in achieving compliance. The bid will target those areas of Cardiff that have been identified as areas of concern from an air quality perspective. Public consultation on the Council’s Transport and Clean Air green paper has identified strong support for decarbonisation of the bus fleet in Cardiff. The ambition of this scheme is become an exemplar for zero emissions operation and influence behavioural change in travel choice within Cardiff.

Please enter a brief description of the bid in no more than 300 words. You will be able to elaborate on this in the sections below.

A2. Geographical area:

In agreement with Cardiff Bus the bid looks to target three busy routes over three years. These main routes operate within designated Air Quality Management Areas and in particular all converge in the Cardiff City Centre Air Quality Management Area (Westgate Street). The routes targeted are 27, 49/50 and 44/45. Route plans are attached.

Please provide details of the area covered by the bid

A3. Total DfT funding sought (£m):

2018/19    £0.341m infrastructure (not including supply/connection costs)
2019/20    £1.752m vehicles only
2020/21    £3.604m vehicles only
Although there is no cap on bids, where they exceed £5m, bidders should demonstrate how their plans (and the amount sought) can be scaled down. In this case, bidders should provide the information for the second, scaled-down, bid in section D.

### A4. Total DfT funding sought for second, scaled down, bid, if applicable (£m):

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018/19</td>
<td></td>
</tr>
<tr>
<td>2019/20</td>
<td></td>
</tr>
<tr>
<td>2020/21</td>
<td></td>
</tr>
</tbody>
</table>

### A5. Total cost of your proposal (This should include DfT funding as specified in A3 + any 3rd party contributions) (£m):

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018/19</td>
<td></td>
</tr>
<tr>
<td>2019/20</td>
<td></td>
</tr>
<tr>
<td>2020/21</td>
<td></td>
</tr>
</tbody>
</table>

### A6. Total cost of your proposal for second, scaled down, bid, if applicable (This should include DfT funding as specified in section A4 + any 3rd party contributions) (£m):

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018/19</td>
<td></td>
</tr>
<tr>
<td>2019/20</td>
<td></td>
</tr>
<tr>
<td>2020/21</td>
<td></td>
</tr>
</tbody>
</table>

### A7. Joint bids:
If this is a joint bid, please give further details of how you will work together and your reason for submitting a joint bid.

As part of the urgency to satisfy Cardiff Council's ambition for sustainable growth it is important that the buses used in Cardiff are as clean and low emission as possible. Although air pollution is a public health priority in Wales, its management needs to be a collaborative approach between public bodies, private companies, third sector partners and the public, all of whom have important roles to play in addressing this pressing issue. Cardiff Council has a professional business partnership with Cardiff Bus and the company has given its full commitment and willingness to support the development and enhancement of their fleet.

To ensure successful delivery of the bid all the stakeholders will work together and are clear and committed to the objectives. A dedicated project team comprising of all stakeholders (Cardiff Council, Welsh Government, Cardiff Bus, ADL/BYD, PowerSystems UK and SSE) will be established to plan, implement and review the project at key points to ensure deliverability and objective targets are met.

The project team builds on existing relationships and will create a multi-disciplinary team with expertise in the key areas of focus.
SECTION B – Evidence against the assessment criteria

B1. Ambition

Use the space below to set out (using a maximum of 1,000 words) how you meet the “Ambition” criteria, as set out in paragraph 3.2 of the bidding guidance. It is highly recommended that you refer to this guidance when providing evidence against the assessment criteria, as this will be crucial to the success of your bid. Ambition has a weighting of 30%. Amongst other things, you may wish to consider:

1. The proportion of your bus fleet that will be ultra-low emission;
2. How innovative is your bid?
3. Your vision for the longer term and how this may fit in with wider strategies

1. This initial bid for 36 vehicles and supporting infrastructure will provide a platform to begin the transition to a low carbon fleet. If successful, this will result in 15% of the fleet being certified as Ultra Low Emission. As a secondary benefit, the ULEB vehicles will enable a fleet cascade programme to replace 36 Euro III vehicles, many of which operate within the boundary of the AQMAs.

2. Whilst Cardiff Bus has investigated the purchase and operation of ULEBs, the economic case could not be made for the infrastructure and increased purchase costs. The contribution towards infrastructure would enable Cardiff Bus to embark on a long-term low carbon/low emission fleet replacement programme. The use of full EV capable vehicles would eliminate idling, with associated noise reduction and emission benefits. The chosen solution would utilise vehicle down time and off peak electricity demand to charge the vehicles. The system will also use a Charge Management System to enable efficient and priority charging of vehicles to ensure up time and availability is maximised.

The bus routes being proposed operate in close proximity to a number of listed buildings, including the historic Grade 1 listed Cardiff Castle. Cardiff Council is committed to conserving this nationally significant monument. The ability to reduce emissions are fully supported.

Following the consideration of a number of technical approaches (CNG, Hybrid, Hydrogen, Depot Charging and Opportunity Charging), it was considered Depot Charging offered the greatest potential to meet current and expected future demands within the operating environment in Cardiff. The selected vehicle provider is partnered with a battery supplier who has a proven track record of delivering ULEB in the UK (250, over 6,000 worldwide) and continues to develop products with increased range. These would be supported by a 5/10 year warranty to provide confidence in their long term operation.

The infrastructure would also support operation by other parties when not required. For example, future use by Cardiff Council vehicles which service the nearby Household Waste Recycling Centre at Bessemer Close. Potentially this service could be offered on a commercial basis to other users.
The bid is also looking to use SSE as a provider of sustainable electricity for the project.

3. Cardiff is the subject of a city centre AQMA and has recently been directed by the Welsh Government to address this issue. The Council is currently consulting on a Transport and Clean Air green paper, which considers a number of options to improve Air Quality. The consultation closes 01st July 2018; however initial analysis of responses indicates a high public acceptance for decarbonisation of the bus fleet.

The transition to a low emission fleet is consistent with the policies of the Welsh Government and Cardiff Council. These include:

Well-being of Future Generations Act (Wales) 2015

**Long-term** – Bus fleet enhancement to support and influence modal shift.
**Prevention** – Improved air quality at a local and regional level.
**Focused integration** – Scaleability of not only the bus fleet but for wider use by other organisations.
**Collaboration** – Establishment of a stakeholder project team.
**Involvement** – Public support as evidenced though public consultation.

Wales National Transport Finance Plan – including T1: Support innovation and rollout of new technology, particular where it can lead to development of safe and efficacious modes of transport.

Contributes to Cardiff Council’s commitment to developing an Electric Vehicle Strategy by December 2019 as set out in the Corporate Plan 2018-21 (Capital Ambition), and the commitment to develop and launch a new Transport and Clean Air Vision for the city by September 2018 set out in the same document.

The reduction of greenhouse gas emissions and environmental impacts is a key priority of the Wales Transport Strategy. This is being updated and will include environmental considerations.

Economic Action Plan 2018 includes measures to transition Wales to a low carbon economy and improve air quality.


The Welsh Government is progressing the development and implementation of the South East Wales Metro initiative, whose ambition is the delivery of an integrated public transport network to facilitate economic growth and reduce environment impact. The use of electric propulsion and new vehicles supports this vision.
B2. Deliverability

Use the space below to set out (using a maximum of 1,000 words) how you meet the “Deliverability” criteria, as set out in paragraphs 3.3 to 3.6 of the bidding guidance. Deliverability has a weighting of 10%. Amongst other things, you may wish to consider:

1. Do you have a delivery strategy?
2. Is there any match funding? Bidders can provide more detail in section C below.
3. Can you show a reducing reliance on government subsidy?
4. Do you have a proven track record of acquiring ultra-low emission buses?

1. Delivery – Project team and partners are in the process of developing a comprehensive Project Plan a summary of this is attached. The proposed site (covered by a separate analysis – attached) is in operator’s ownership with a substation on site and there are no envisaged land issues that would prevent a quick delivery of the project. As the installation will be internal and following a site assessment there are no envisaged planning concerns or associated consultation requirements.

2. Match funding – The Welsh Government and Cardiff Council are currently consulting on options to improve air quality and reduce carbon emissions. It is anticipated this initiative will contribute significantly, with appropriate funding allocated.

3. The mechanism for funding Local Bus Services in Wales differs from the BSOG system utilised in England, including the LCEB incentive. Operators in Wales are eligible for Bus Service Support Grant (BSSG) payments designed to increase quality and consistency of subject to achieving defined standards. These are based on the ‘live’ distance operated with no payment for positioning movements. The decision to transition to a distance based reimbursement mechanism from a fuel based mechanism removed the perverse incentive of attracting increased financial subsidy for using less fuel efficient vehicles.

Given there are currently no alternative fuelled vehicles operating in Wales, the considerable start-up costs (infrastructure and vehicle purchase) it is likely increased subsidy will be required in the short term to incentivise operators (Welsh operators were ineligible to bid for initial rounds of Low Emission Bus funding/Green Bus Fund) as has been the case in England and Scotland for several years. It is however appreciated that the unit costs will decline over time, with a corresponding reduction in the need for public funding to pump prime operation.

4. Whilst the bid authority doesn’t have a direct track record of acquiring ULEB’s due to previous ineligibility, the selected partners have demonstrated extensive experience. Cardiff Bus has operated Low and Ultra Low Emission Buses testing various technologies on a trial basis to ascertain suitability for rollout across the fleet.

Cardiff Bus, Cardiff Council and Welsh Government are members of South East Wales Bus Working Group. This group is responsible for a coordination regional approach to bus
operations, policy and funding distribution (including quality standards and BSSG). This proposed bid is supported by this group.

From an operational perspective Cardiff Bus has a proven history of liaising directly with vehicle manufacturers on projects involving large numbers of vehicles. Since 2013 there have been 90 new vehicles integrated into the fleet and operations with no delays enabling the fleet replacement and environmental strategy to be met alongside and improvements to the network and customer perspective.

B3. Air Quality

Use the space below to set out (using a maximum of 1,000 words) how you meet the “Air Quality” criteria, as set out in paragraph 3.7 of the bidding guidance. Air Quality has a weighting of 30%. Amongst other things, you may wish to consider:

1. What is the air quality problem as identified by this bid?
2. To what extent does your proposal address the local air quality problem?
3. Are you able to estimate the improvements in air quality as a result of the grants made available through this fund?

Air quality monitoring undertaken by Cardiff Council (CC) and modelled projections from Welsh Government (WG) indicate that Cardiff will continue to exceed EU & UK Air Quality Directive Limit Values for NO2 beyond 2020.

Road traffic emissions, in particular particulate matter (PM) and primary/secondary nitrogen dioxide (NO2) are the primary contributing pollutants to poor air quality in Cardiff. CC’s Capital Ambition plan recognises that Cardiff is one of the UK’s fastest growing cities, and that it is crucial that this growth is well planned and sustainable. CC’s Local Development Plan (LDP) provides for 41,000 new homes and up to 40,000 new jobs up to 2026. The LDP sets the target of achieving a 50:50 modal split – that 50% of all journeys need to be made by sustainable transport by 2026, therefore accommodating for future development set out in the LDP. CC’s Transport Vision is for an integrated transport system which provides sustainable travel for all as an attractive alternative to car travel. Our key plans and strategies contain a number of priorities which will help to improve air quality, for example, doubling the number of cycle trips by 2026 and pursuing opportunities for greening the bus fleet.

In order to achieve CC’s ambition of sustainable growth it is important that the buses used in Cardiff need to be as clean and little polluting as possible. Although air pollution is a public health priority in Wales, its management needs to be a collaborative approach between public bodies, private companies, third sector partners and the public, all whom have important roles to play in addressing this issue. CC has a professional business partnership with Cardiff Bus who has given it’s full commitment and willingness to support the development and enhancement of their fleet.
Traffic congestion delays journeys and can damage the environment of the city. Queuing car traffic has a negative impact on air quality and bus services. Cutting congestion by reducing the number of journeys made by car will bring air quality improvements as well as reducing costs and journey times. Bus travel has an important role to play in reducing the number of journeys made by car and CC is working to make bus travel an attractive and practical option for more people by providing bus priority measures to help bus services beat the traffic queues and improve their reliability.

There are currently four Air Quality Management Areas (AQMAs) declared across the authority due to elevated levels of NO2 encroaching or exceeding the national annual mean air quality objective (40ug/m3). Datasets for annual average NO2 levels recorded at locations within the AQMAs do not display signs of improvement; levels are consistently elevated and are seen to be either exceeding or encroaching on the annual average NO2 objective. The pollutants measured, particularly NO2 are derived mainly from road transport traffic, exhausted as oxides of nitrogen (NOx). Source apportionment analysis within Cardiff’s AQMAs indicates that a large proportion of NO2 levels experienced is attributable to Cars (predominantly old diesel models), as well as Buses & Coaches. The principal percentage contribution to monitored NO2 levels in Cardiff’s City Centre AQMA, in particular Westgate Street, is from Buses and Coaches at 39%.

The targeted bus routes (27, 44/45, 49/50) which will use the electric vehicles will have a positive impact on air quality levels within identified AQMA in Cardiff as these routes all travel via Westgate St;

Utilising Westgate Street as a worked example;

Looking at recorded levels of NO2 and an envisaged initial reduction of 24 Euro III movements along Westgate Street per hour for the first year (2019), by acquiring 12 electric buses and treating all bus categories as equally polluting we anticipate NO2 reductions up to 6.7% (2.6μg/m3) approximately for year one. The proposed programme is scheduled over 3 years, therefore the more electric buses added to the fleet during years 2 & 3 and the sequential offset of Euro III vehicles will lead to a further reduction in NO2 levels.
If the bid were successful, the tables below highlight the Cardiff Bus Fleet matrix by 2021. The percentage of Euro III buses would reduce from 41% to 26%.

In order to provide a greater understanding of the air quality impacts associated with the improvement to the Cardiff Bus fleet, CC has commissioned air quality consultants to undertake detailed sensitivity tests via dispersion modelling which would look to examine air quality impacts for Cardiff’s City Centre AQMA. Subject to approval, it is proposed that these sensitivity tests be undertaken and report submitted at a later date.

**Welsh Government’s Local Air Quality Management Policy Guidance, (June 2017)** outlines that there is no defined “safe level” of air pollution. The document states “Nitrogen dioxide and particulate matter currently have no safe threshold defined, and the lower the concentration of those pollutants, the lower the risks of adverse health effects in the exposed population.” Based on these health concerns and in view of WG’s perspective on threshold levels Cardiff Council is committed to achieving levels as low as reasonably practicable with an objective to attain levels within the annual objective set for NO2 (40μg/m3). In order to achieve this, action needs to be taken across the city as whole and it is acknowledged that road traffic emissions (particulate matter (PM) and primary/secondary nitrogen dioxide (NO2)) are the primary contributing factor to poor air quality in Cardiff.

CC is currently developing a citywide Clean Air Strategy (CAS) & Action Plan for Cardiff. The strategy coincides with Cardiff’s Capital Ambition corporate plan and will help implement and deliver the priorities outlined in this plan with an overarching aim to improve air quality to protect and improve public health in Cardiff. The CAS sets out strategic measures that will improve Cardiff’s overall air quality levels. Cited within the CAS are two strategic measures which closely feed into the improvement of the current bus fleet; **Enhance Cardiff’s Transport Infrastructure** and **Increase the Uptake of Sustainable and Active Travel**.

The Department of Environment Food and Rural Affairs (Defra) published the UK air quality plan to tackle roadside nitrogen dioxide (NO2) concentrations in July 2017. The document identifies Cardiff as a problematic area in terms of air quality. Under Part IV of the Environment Act 1995, Section 85(7), Welsh Government has issued formal direction to Cardiff Council to address its air quality concerns outlined by the projections modelled and illustrated within the UK detailed plan. Welsh Government has determined that the
direction is necessary to meet obligations placed upon the United Kingdom under the EU Ambient Air Quality Directive (2008/50/EC).

Due to the heightened profile of air quality and its potential adverse impact on public health, given Cardiff’s Local Air Quality Management scenario, as well as its regional air quality concerns it is imperative that short term measures, such as increasing the uptake of low emission buses are implemented as soon as possible to start the process of achieving compliance with the air quality objectives.

B4. Value for Money

Use the space below to set out (using a maximum of 1,000 words) how you meet the “Value for Money" criteria, as set out in paragraph 3.8 of the bidding guidance. Bidders should make clear where they are referring to buses and where they are referring to infrastructure. Value for money has a weighting of 30%. Amongst other things, you may wish to consider:

1. How competitive is your bid?
2. Have you provided evidence to support any infrastructure ask?
3. What are the estimated annual carbon savings of your proposal?
4. Have you explained the assumptions underlying any quantitative analysis provided?
5. A description of the buses you are replacing

6. How renewable will the source of fuel be?

1. The project team evaluated a range of options when considering the bid and funding criteria. The decision was made on a wide range of criteria that are considered in the operating area being considered. Whilst not the cheapest the assessment showed the proposal chosen presents the best fit, value for money and delivery profile to have an impact in the shortest possible timeframe.

2. Following two site assessments that have been carried out by SSE and PowerSystemsUK. An outline design has been developed which provides the infrastructure necessary to support electric operation. There is opportunity to expand beyond this 3 year funding programme. If successful a detailed design will be undertaken with the preferred supplier to avoid abortive work. Assumptions are attached for our preferred solution. Detailed costs will be forwarded when received from our preferred supplier.

3. Yr 1 574t, Yr 2 1347t, Yr 3 1932 t

The new ULEB test was established in May 2018 and there is a backlog of vehicle manufacturers and vehicles being tested to the new standard.
An Ultra-Low Emission Bus saves 30% well-to-wheel greenhouse gas emissions over the UK Bus Cycle compared to a Euro VI diesel bus of equivalent passenger capacity and has a Euro VI certified engine or equivalent emissions capability.

An Ultra-Low Emission Bus is defined against the average greenhouse gas emission performance of an equivalent Euro VI diesel bus. In autumn 2017, LowCVP conducted a test programme on 8 Euro VI diesel buses on behalf of DfT and OLEV to understand the average performance of the latest conventional diesel buses.

Based on this test data, we can take the greenhouse gas emissions plotted against total passenger capacity of the bus to create a formula that enables us to estimate the greenhouse gas performance of any Euro VI diesel bus.

Based on the performance of Low Emission Buses, LowCVP has set the target for an Ultra-Low Emission Bus at 30% greenhouse gas saving on a well-to-wheel basis. This target is designed to encourage innovation from bus manufacturers and to ensure that government money is spent on supporting the most efficient and lowest emission buses available.

The 30% greenhouse gas emissions target is described as:

\[ [\text{Well-to-Wheel Greenhouse Gas Emissions}] = 6.59 \times [\text{Total Passenger Capacity}] + 336 \]

The graph below describes the average performance of a Euro VI diesel bus based on its passenger capacity and what a low carbon bus needs to achieve to become a ULEB.

To give an example, a manufacturer has a bus of 70 total passengers and wants to know what greenhouse gas target in g CO2e /km the bus must achieve to qualify as a ULEB. Using
the formula, the manufacturer can calculate the target greenhouse gas emissions in g CO2e/km the vehicle must achieve:

Greenhouse gas emissions target (g CO2e/km) = 6.59 x [70] + 336

Greenhouse gas emissions target to achieve ULEB accreditation = 797.3 g CO2e / km

With knowledge of the performance of products performance from previous schemes, a manufacturer will be able to predict if the bus is likely to achieve ULEB accreditation. To achieve this, the manufacturer must test the bus of the UK Bus Cycle and then submit the results to LowCVP and DfT to gain certification.

4. Figures from preferred vehicle supplier included in the attached calculator. Calculations and assumptions are set out in section B3

5. The electric buses would replace 36 Euro III vehicles.

6. Our energy partner, SSE offers a 100% renewable energy tariff – SSE Green. It supplies renewable electricity matched to Renewable Energy Guarantee of Origins (REGOs), certifying that the purchased electricity has been generated exclusively through a portfolio of wind and hydro assets. This allows organisations to report zero emissions for their purchased electricity. Between April 2017 and April 2018, the number of SSE Green customers increased by 173%.

B5. The bid – supplementary information

Please use the space below to provide any further information about the bid not covered elsewhere (max 300 words):

The bid also considers the potential to utilise batteries beyond the end of the their operational life. Whilst battery degradation per annum is low, the cumulative effect can reduce range. Whilst this necessitates replacement for the vehicle fleet, it provides an opportunity for depot installation to make future use of local renewable energy. This will also provide a back up supply in the event of local power outage

SECTION C – Funding

C1. The Buses

<table>
<thead>
<tr>
<th>In total, how many new ultra-low emission buses are you bidding for?</th>
<th>36</th>
</tr>
</thead>
<tbody>
<tr>
<td>In total, how much grant are you seeking?</td>
<td>£5,358,000 not including supply/connection costs (to follow)</td>
</tr>
</tbody>
</table>
For each separate bus type, please provide the following. The calculator will give you the “Base grant”, “Top-up grant” and “Total grant eligibility”: If needed, please copy and paste more tables below. All rows are mandatory.

Note – You **must** submit your completed ‘calculator’ alongside this bid.

<table>
<thead>
<tr>
<th>Manufacturer's name²</th>
<th>ADL/BYD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make and model of bus</td>
<td>Enviro 200EV</td>
</tr>
<tr>
<td>Ultra-Low Emission Bus Technology (e.g. plug-in electric etc.)</td>
<td>Plug in electric.</td>
</tr>
<tr>
<td>Number of buses in bid</td>
<td>36</td>
</tr>
<tr>
<td>Anticipated date of order</td>
<td>11/2018</td>
</tr>
<tr>
<td>Anticipated date of entry into service</td>
<td>08/2019</td>
</tr>
<tr>
<td></td>
<td>Tranche 1, see project plan for further tranches</td>
</tr>
<tr>
<td>Cost per ultra-low emission bus³</td>
<td>£362,666</td>
</tr>
<tr>
<td>Cost per bus of diesel equivalent</td>
<td>£167,954</td>
</tr>
<tr>
<td>Base grant per bus (as per the calculator)</td>
<td>£97,356</td>
</tr>
<tr>
<td>Top-up grant per bus (as per the calculator)</td>
<td>£48,678</td>
</tr>
<tr>
<td>Total grant eligibility⁴ per bus (as per the calculator)</td>
<td>£146,034</td>
</tr>
<tr>
<td>Total grant being sought per bus</td>
<td>£146,034</td>
</tr>
<tr>
<td>Value for Money (VfM) Score (as per calculator)</td>
<td>0</td>
</tr>
</tbody>
</table>

Space below for copying more tables if needed:

---

**C2. The Infrastructure**

*Please give a description of any infrastructure funding being sought over the period of funding (i.e. 2018-2021):*

---

² In exceptional cases where this may be unknown, for example where a local authority is yet to go out to tender, it is sufficient to state the type of technology sought (e.g. hybrid, plug-in electric, gas).
³ In the case where local authorities are yet to go out to tender, an average cost can be given.
⁴ This is the total maximum grant you are eligible for as set out in your calculator (base grant + top-up grant, subject to any imposed caps)
ADL/BYD buses use efficient and low cost 3 phase 80kWh AC chargers which are circa 20% the cost of DC chargers making the cost of installation of multiple chargers extremely cost effective. Their slimline design ensures that they do not take up more space than necessary allowing for more chargers to be sited in already tight bus garages.

The chargers can provide up to 80kW of charge per hour and when used with the ADL/BYD Charging Management System ensures that all buses are charged ready for run-out and that the peak energy draw is managed over a longer period thus reducing the price of the charging infrastructure.

Charging Management System

<table>
<thead>
<tr>
<th>Functions Including:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power demand control</td>
</tr>
<tr>
<td>Vehicle monitoring</td>
</tr>
<tr>
<td>Charging sequence</td>
</tr>
</tbody>
</table>

ADL and BYD are also making available vehicle pre-heat whereby the buses are heated prior to run-out using mains electricity. This removes the need for the vehicle batteries to be used to warm up the bus thus reducing its overall range.

Please give a description of any infrastructure funding being sought over the period of funding (i.e. 2018-2021):

Based on 2019 pricing:-

Charger pricing & Smart Charging, The following should be included in your Infrastructure submission, the options are below, for Charger only or Charger with smart Charging. Please note the one of set up costs below.
<table>
<thead>
<tr>
<th></th>
<th>Charger only</th>
<th>Charger with 3-year smart charging license included (≤10 chargers)</th>
<th>Charger with 5-year smart charging license included (for 10 or more chargers)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per unit (standard 2 years warranty)</td>
<td>£5,700</td>
<td>£10,100</td>
<td>£5,560</td>
</tr>
<tr>
<td>Per unit (inclusive of 5 year warranty)</td>
<td>£6,060</td>
<td>£11,100</td>
<td>£5,560</td>
</tr>
<tr>
<td>Per unit (inclusive of 10 year warranty)</td>
<td>£6,440</td>
<td>£13,920</td>
<td>£22,360</td>
</tr>
</tbody>
</table>

BYD can offer a smart charging solution (Charging Management System) which allows all the chargers at a bus garage to be managed intelligently to ensure all buses are charged sufficiently for their scheduled duties, managing the total power demand within site/supply constraints and low cost tariffs are used to the maximum extent. It also provides for energy consumption reporting vehicle-by-vehicle, day by day.

- The system uses a supervisory computer at the garage (IT requirements including Server/Computer and switches/Cables excluded from any of the costs) to monitor all the chargers.
- There is a one-off set up cost per depot including commissioning of the system and training.

| BYD Charging Management System set-up cost, per depot (one-time) | £10,080 |

In total, how much grant are you seeking for infrastructure? £341,000 not including any supplier/connection costs

For each type of infrastructure⁵, please provide the following. If needed, please copy and paste more tables below. All rows are mandatory.

<table>
<thead>
<tr>
<th>Manufacturer’s name⁶</th>
<th>BYD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of infrastructure</td>
<td>Electric charging</td>
</tr>
<tr>
<td>Anticipated date of order</td>
<td>11/2018</td>
</tr>
<tr>
<td>Anticipated date of installation⁷</td>
<td>07/2019</td>
</tr>
</tbody>
</table>

---

⁵ Please refer to paragraphs 1.7 and 1.8 in the guidance
⁶ Where a local authority is yet to go out to tender, the name may not be known. The remaining rows should be filled in however.
⁷ This is the date after which buses will be refuelled using the infrastructure
| Total cost                                      | £455,000 not including supply/connection costs |
| Total eligible amount\(^8\)                   | £341,000 not including supply/connection costs (to follow) |
| Total grant sought                             | £341,000                                          |

C3. Funding Profile

Please use the information in sections C1 and C2 to complete the following summary funding table:

Please complete the following tables. **Figures should be entered in £000s** (i.e. £10,000 = 10).

<table>
<thead>
<tr>
<th>£000s</th>
<th>2018-19</th>
<th>2019-20</th>
<th>2020-21</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Buses</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of buses in bid</td>
<td>0</td>
<td>12</td>
<td>24</td>
<td>36</td>
</tr>
<tr>
<td>Total grant eligibility (as per your calculator)</td>
<td>0</td>
<td>1752</td>
<td>3606</td>
<td>5358</td>
</tr>
<tr>
<td>Total grant being sought</td>
<td>0</td>
<td>1752</td>
<td>3606</td>
<td>5358</td>
</tr>
</tbody>
</table>

| **Infrastructure** |         |         |         |       |
| Total cost | 455 | | | 455 (see note above) |
| Total eligible amount (i.e. 75%) | 334 | | | 334 (see note above) |
| Total grant sought | 334 | | | 334 (see note above) |

\(^8\) This will be 75% of the cost of your infrastructure
<table>
<thead>
<tr>
<th>TOTAL grant sought (Bus and infrastructure)</th>
<th>334</th>
<th>1752</th>
<th>3606</th>
<th>5692</th>
</tr>
</thead>
</table>

Please provide more information below on any match funding, notably:
1. What it will buy;
2. When it will be bought; and
3. The source(s)

SECTION D – Funding (bid 2 – scaled-down)

Although there is no cap on bids, where they exceed £5m, bidders should demonstrate how their plans (and the amount sought) can be scaled down. In doing so, please complete tables D1-D3 below.

D1. The Buses (bid 2)

| In total, how many new ultra-low emission buses are you bidding for? | 24 |
| In total, how much grant are you seeking? | £3,555,000 |

For each separate bus type, please provide the following. The calculator will give you the “Base grant”, “Top-up grant” and “Total grant eligibility”: If needed, please copy and paste more tables below. All rows are mandatory.

Note – You must submit your completed ‘calculator’ alongside this bid.

<table>
<thead>
<tr>
<th>Manufacturer’s name</th>
<th>ADL/BYD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make and model of bus</td>
<td>Enviro 200EV</td>
</tr>
</tbody>
</table>

---

9 This should include any 3rd party contributions that have been secured
Ultra-Low Emission Bus Technology (e.g. plug-in electric, etc.) | Plug in electric
---|---
Number of buses in bid | 24
Anticipated date of order | 11/2018 11/2019
Anticipated date of entry into service | 08/2019 06/2020
Cost per ultra-low emission bus | £362,666
Cost per bus of diesel equivalent | £167,954
Base grant per bus (as per the calculator) | £97,236
Top-up grant per bus (as per the calculator) | £48,678
Total grant eligibility\(^{10}\) per bus (as per the calculator) | £146,034
Total grant being sought per bus | £146,034

Please give a description of how this scaled down bid still meets the objectives of the fund as set out in the guidance and helps deliver your longer term vision. The bid will still reduce emission levels in the city centre AQMA, and the infrastructure will enable future roll-out of electric vehicles into the fleet.

\(^{10}\) This is the total maximum grant you are eligible for as set out in your calculator (base grant + top-up grant, subject to any imposed caps)

D2. The infrastructure (bid 2)

In total, how much grant are you seeking? | £341,000 not including any supplier/connection costs
For each type of infrastructure, please provide the following. If needed, please copy and paste more tables below.

<table>
<thead>
<tr>
<th>Manufacturer's name</th>
<th>BYD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of infrastructure</td>
<td>ELECTRIC CHARGING</td>
</tr>
<tr>
<td>Anticipated date of order</td>
<td>11/2018</td>
</tr>
<tr>
<td>Anticipated date of installation</td>
<td>07/2019</td>
</tr>
<tr>
<td>Total cost</td>
<td>£455,000 not including supply/connection costs</td>
</tr>
<tr>
<td>Total eligible amount (i.e. 75%)</td>
<td>£341,000 not including supply/connection costs (to follow)</td>
</tr>
<tr>
<td>Total grant sought</td>
<td>£341,000</td>
</tr>
</tbody>
</table>

Please give a description of how this scaled down bid still meets the objectives of the fund as set out in the guidance and helps deliver your longer term vision. Infrastructure remains unchanged to facilitate future roll out of electric vehicles into the fleet.

**D3. Funding profile (bid 2)**

*Please use the information in sections D1 and D2 to complete the following summary funding table:*

Please complete the following tables. **Figures should be entered in £000s** (i.e. £10,000 = 10).

<table>
<thead>
<tr>
<th>£000s</th>
<th>2018-19</th>
<th>2019-20</th>
<th>2020-21</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buses</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of buses in bid</td>
<td>0</td>
<td>12</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td>Total grant eligibility</td>
<td>1752</td>
<td>1803</td>
<td></td>
<td>3555</td>
</tr>
<tr>
<td>Total grant being sought</td>
<td>1752</td>
<td>1803</td>
<td></td>
<td>3555</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Infrastructure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total cost</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

---

11 Examples of the infrastructure most likely to be bid for under this fund are: standard, fast and inductive charging equipment, gas (this includes portable or fixed) and hydrogen re-fuelling systems.
<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total eligible amount</td>
<td>334</td>
<td></td>
<td>334 (see</td>
</tr>
<tr>
<td>(i.e. 75%)</td>
<td></td>
<td></td>
<td>note above)</td>
</tr>
<tr>
<td><strong>Total grant sought</strong></td>
<td>334</td>
<td></td>
<td>334 (see</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>note above)</td>
</tr>
<tr>
<td><strong>TOTAL grant sought</strong></td>
<td>334</td>
<td>1752</td>
<td>1803</td>
</tr>
<tr>
<td>(Bus and infrastructure)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Match funding (if any)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Please provide more information below on any match funding, notably:*

1. *What it will buy;*
2. *When it will be bought; and*
3. *The source(s).*

---

12 This should include any 3rd party contributions that have been secured
SECTION E – Monitoring and evaluation

E1. Monitoring and Evaluation (optional)

While this section is optional, we encourage bidders to comment on how air quality could be monitored and evaluated as part of this scheme (as per paragraph 3.7 of the guidance). This will not form part of the assessment criteria, however, and will only be used to inform DfT on how best to monitor and evaluate this scheme.

Consideration of this could include any existing monitoring arrangements in place on the route(s) set out in the bid. Unless the route is bus-only, there can be difficulties in monitoring specific emission levels. As such, we may monitor and evaluate air quality through other parameters, such as the degree of zero emission running on the route.

Please use the space below to do this:

Air Quality
In accordance with the bid; In order to provide a greater understanding of the air quality impacts associated with the improvement to the Cardiff Bus fleet, CC has commissioned air quality consultants to undertake detailed sensitivity tests via air quality dispersion modelling which would look to examine air quality impacts associated with the Cardiff Bus fleet acquiring 36 zero emission vehicles. The proposed study will focus upon Cardiff’s City Centre AQMA as the routes proposed for the vehicles (27, 44/45, 49/50) will converge at this location.

Utilising the existing network of air quality monitoring along specific routes Cardiff Council will look to review air quality data and examine any improvements in air quality levels, particularly NO2. Cardiff Council will also look to review, amend and enhance the monitoring networks along affected routes to gather as much representative data as possible. The collection of data before and after the use of the zero emission vehicles will allow for cross comparative exercises to be undertaken and therefore determine the level of significance.

Increase in bus customers.
Vehicle telematics. GM
Customer surveys.
Increasing air quality monitoring capabilities – CL
Modal share surveys – JG.
## SECTION F - Declarations

### F1. Section 151 Officer Declaration (for local authorities)

As Section 151 Officer for [name of authority*] I declare that the scheme cost estimates quoted in this bid are accurate to the best of my knowledge and that [name of authority]:

- has allocated sufficient budget to deliver this scheme on the basis of its proposed funding contribution;
- accepts responsibility for meeting any costs over and above the DfT contribution requested, including potential cost overruns and the underwriting of any funding contributions expected from third parties;
- accepts responsibility for meeting any ongoing revenue and capital requirements in relation to the scheme;
- accepts that no further increase in DfT funding will be considered beyond the maximum contribution requested and that no DfT funding will be provided after 2020/21;
- confirms that the authority has the necessary governance / assurance arrangements in place and the authority can provide, if required, evidence of this.

<table>
<thead>
<tr>
<th>Name:</th>
<th>Signed:</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHRISTINE SALTER</td>
<td>[Signature]</td>
</tr>
</tbody>
</table>

*This is only required from the lead authority in joint bids*
Submission of Bids

The deadline for bids is 5pm, 30 June 2018

An electronic copy should be submitted to ulebs@dft.gsi.gov.uk

Please also include the supporting documentation specified either within the guidance document or in this proforma. This should include, but is not limited to: a PSV licence (operators only) and quotes from the manufacturer(s) for the ultra-low emission bus and its’ diesel equivalent. We also require evidence of the calculation of your base grant, top-up grant and total eligible grant. This will be given by the calculator as specified in the guidance. Bidders are also required to submit a separate GHG and air quality improvements spreadsheet which will be published alongside the guidance. Further information on the data required is located within the spreadsheet. Where match-funding has been secured, evidence of this will strengthen a bid. Please also provide evidence that the ULEB has been certified as such.

If, for any reason, you need to send hard copies of papers to DfT, please provide 3 copies to:

Ultra-Low Emission Bus Scheme
Buses & Taxis Division
Department for Transport
Great Minster House
33 Horseferry Road
London
SW1P 4DR