

## Low Emission Bus Scheme Certificate

|                         |   |                     |         |                      |                             |
|-------------------------|---|---------------------|---------|----------------------|-----------------------------|
| Customer:               | LowCVP  |                     |         |                      |                             |
| Customer Address:       | 3 Birdcage Walk, London SW1H 9JJ                  |                     |         |                      |                             |
| Test Purpose:           | LEB vs ULEB: 10°C, Ancillaries On, ULEB Procedure |                     |         | DYNAMOMETER SETTINGS |                             |
| Vehicle Manufacturer:   | Mercedes  | Unladen weight (kg) | 10533.0 | Test Weight          | 11594 kg                    |
| Vehicle Type & Number:  | Citaro BV66 GYD                                   | Gross Weight (kg)   | 18745.0 | F°                   | 276.27 N                    |
| Engine:                 | Euro 6  | Seated Capacity     | 28      | F <sup>1</sup>       | 8.3670 N/kmh                |
| Transmission:           | Auto  | Passenger Capacity  | 84      | F <sup>2</sup>       | 0.00391 N/kmh <sup>2</sup>  |
| Euro VI certificate Y/N | Manufacturer Certified                            | GVW Check           | OK      | F <sup>3</sup>       | 0.000761 N/kmh <sup>3</sup> |

### Declared fuel, properties and source plus carbon conversion factors

|                                  |        |                         |               |                                     |
|----------------------------------|--------|-------------------------|---------------|-------------------------------------|
| Net Heating Value: Diesel        | 36.00  | MJ / Litre              | Fuel Provider | UK market standard                  |
| Well-to-Tank Factor: Diesel      | 15.42  | g CO <sub>2e</sub> / MJ | WTT evidence  | UK GHG reporting factors 2016       |
| Well-to-Tank Factor: Electricity | 143.50 | g CO <sub>2e</sub> / MJ | Fuel Type     | UK Pump Diesel, UK Grid Electricity |

### Emissions and Energy consumption results from approved test facility - Average 3 tests

| Test Phase   | HC (g/km) | CO (g/km) | NOx (g/km) | PM (g/km) | CO <sub>2</sub> (g/km) | CH <sub>4</sub> (g/km)* | N <sub>2</sub> O (g/km)* | Fuel Consumption (l/100 km) | Fuel used over phase/cycle (litres) |
|--------------|-----------|-----------|------------|-----------|------------------------|-------------------------|--------------------------|-----------------------------|-------------------------------------|
| Outer London | 0.004     | 0.012     | 0.593      | N/A       | 916.0                  | 0.000                   | 0.032                    | 34.59                       | 2.224                               |
| Inner London | 0.009     | 0.036     | 0.508      | N/A       | 1286.3                 | 0.000                   | 0.048                    | 48.58                       | 1.176                               |
| Rural        | 0.006     | 0.006     | 0.427      | N/A       | 726.0                  | 0.000                   | 0.020                    | 27.42                       | 2.018                               |
| MLTB Average | 0.006     | 0.018     | 0.569      | N/A       | 1017.2                 | 0.000                   | 0.036                    | 38.41                       | 3.399                               |
| LUB Average  | 0.006     | 0.013     | 0.505      | 0.0032    | 885.0                  | 0.000                   | 0.029                    | 33.42                       | 5.418                               |

### Zero Emissions (Z.E.) Range: Energy consumption and charging efficiency

|   |     |                            |     |                                 |     |
|---|-----|----------------------------|-----|---------------------------------|-----|
| Total measured energy consumed on vehicle (kWh) | N/A | Distance in Z.E. mode (km) | N/A | Usable Battery Capacity (kWh)   | N/A |
| Measured grid energy during charging (kWh)*     | N/A | Charging efficiency (%)    | N/A | Max Theoretical Z.E. Range (km) | N/A |

### Total Tank-to-Wheel GHG CO<sub>2</sub> equivalent

| Test Phase   | CO <sub>2</sub> (g/km) | CH <sub>4</sub> (g/km x 25)* | N <sub>2</sub> O (g/km x 298)* | Fuel TTW** GHG (CO <sub>2</sub> Equivalent g/km) |
|--------------|------------------------|------------------------------|--------------------------------|--|
| Outer London | 916.0                  | 0.005                        | 9.479                          | 925.4  |
| Inner London | 1286.3                 | 0.009                        | 14.349                         | 1300.7   |
| Rural        | 726.0                  | 0.003                        | 5.956                          | 731.9  |
| MLTB Average | 1017.2                 | 0.000                        | 10.808                         | 1028.1   |
| LUB Average  | 885.0                  | 0.004                        | 8.607                          | 893.6  |

### Calculated total Well-to-Wheel GHG CO<sub>2</sub> equivalent emissions over test

| Test Phase   | Fuel Energy (MJ / km) | Fuel WTT*GHG Emissions (g CO <sub>2e</sub> / km) | Electrical Energy (MJ / km) | Electricity WTT* GHG Emissions (g CO <sub>2e</sub> / km) | Measured Fuel TTW** GHG Emissions (g CO <sub>2e</sub> / km) | Total WTW*** GHG Emissions (g CO <sub>2e</sub> / km) |
|--------------|-----------------------|--|-----------------------------|--|---|--|
| Outer London | 12.45                 | 192.0  | N/A                         | N/A  | 925.4   | 1117.5   |
| Inner London | 17.49                 | 269.7  | N/A                         | N/A  | 1300.7  | 1570.4   |
| Rural        | 9.87                  | 152.2  | N/A                         | N/A  | 731.9   | 884.1  |
| MLTB Average | 13.83                 | 213.2  | N/A                         | N/A  | 1028.1  | 1241.3   |
| LUB Average  | 12.03                 | 185.5  | N/A                         | N/A  | 893.6   | 1079.2   |

Data Generated by (On behalf of Test facility):

Date: 24/11/17

Data Approved by:

Date: 01.12.2017

### Low Emission Bus Certificate Summary

|  |            |                             |
|--|------------|-----------------------------|
| GHG Well-to-Wheel  | 1079.2     | g CO <sub>2e</sub> / km     |
| Euro V Average Diesel Equivalent                           | 1271.3     | g CO <sub>2e</sub> / km     |
| WTW GHG saving (compared with Euro V diesel equivalent)    | 192.1      | g CO <sub>2e</sub> / km     |
| % WTW GHG saving (compared with Euro V diesel equivalent)  | 15%        | g CO <sub>2e</sub> / km     |
| Zero Emission operating range (km)                         | N/A        | km                          |
| WTW CO <sub>2</sub> per passenger km (@ Max Pass Capacity) | 12.8       | g CO <sub>2e</sub> /pass km |
| Approved as Low Emission Bus? (15% saving or more)         | <b>YES</b> |                             |

\* WTT : Well-to-Tank

\*\* TTW : Tank-to-Wheel

\*\*\* WTW : Well-to Wheel

**COMMENTS:**

Emission results marked in red are below detection levels.

Maximum seated capacity less than 50% of passenger capacity.

**Test Numbers:** ML02017567 (22/11/2017), ML02017568 (22/11/2017), ML02017569 (22/11/2017).

Certificate approved by:

Certificate Approved by:

On behalf of Bus manufacturer

On behalf of LowCVP/DfT