Terms of Reference

***If any of the technical parameters are not feasible, indicate the specific parameter and offer a possible solution.***

**Battery-powered electrical buses** (hereinafter referred to as – the Vehicle).

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| Vehicle category, class and application | Vehicle category M3, Class I.  Low-floor (without steps in doorways and main gangways) mechanical Vehicle, equipped with a power train, with an electrically rechargeable energy storage system that can be charged externally.  The Vehicle must be designed and intended for the carriage of passengers within an urban agglomeration. | |
| Source of electrical energy | The Vehicle must be equipped with a battery (or batteries) that supply the Vehicle with power; the Vehicle must have a driving range (with one charge) of at least 150 km at -200C (minus twenty degrees Celsius) in active driving mode. | |
| Fuelling equipment | Compatibility of charging equipment with offered Vehicles must be ensured according to Cabinet of Ministers Regulations No. 78 (06.02.2018) – *Requirements for charging of electrical vehicles, natural gas fuelling, and hydrogen fuelling and shore power supply equipment*.  Charging equipment operating environment - outdoors.  Charging options – with a plug (according to LVS EN 62196-3:2015; electric bus charging system CCS Combo 2 (overnight charging) or equivalent and a roof-mounted charging system (Opportunity charging) – pantograph. Charging standard LVS EN 61851 -1/21/23/24, DIN 70121, ISO 15118 or equivalent.  Full charging time of the electric bus via plug (CCS Combo 2) - not more than 6 h, with a charging output of not less than 50 kWh. | |
| Climatic conditions | The Vehicle, its systems and sub-systems must safely operate at an ambient temperature range from -400C to +400C (at a relative air humidity of 98% at a temperature up to +250C). | |
| DIMENSIONS | | |
| Length (mm) | | **Not less than 11 800, not more than 12 100** |
| Width (mm) (rear view mirrors excluded) | | Not less than 2 530, not more than 2 550 |
| Height (roof-mounted equipment included) (mm) | | ≤ 3 400,  when tyres are inflated to the specified air pressure, the air suspension system is set to working mode, and the bodywork lowering system is switched off, and the current collectors are fixed in the lower position (by hooks) |
| PASSENGER CAPACITY | | |
| Number of passengers, total | | ≥ 76 |
| Number of seats | | ≥ 22 (folding seats excluded) |
| Wheelchair spaces | | 1 |
| Baby carriage spaces | | 1 |
| PASSENGER DOORS | | |
| Number of passengers, total | | double doors, 3 |
| Floor height at 1st/2nd/3rd passenger door | | 320 /320 / 320-340 mm,  when tyres are inflated to the specified air pressure, the air suspension system is set to working mode, and the bodywork kneeling system is switched off |
| Technical devices facilitating the access of passengers with reduced mobility to the Vehicle | | Extendable (electromechanically driven) platform, located at the 2nd passenger door. |
| ASIS | | |
| Number of axles | | 2 |
| 1st axle | | With independent wheel suspension |
| 2nd axle | | Drop-center drive-axle with in-wheel motors |
| Tyres | | 275/70 R22.5 |
| Clearance | | ≥ 135 mm,  at the rated tyre pressure and maximum Vehicle load |
| TRACTION DRIVE | | |
| Drive | | Drive-axle with two integrated electrical motors |
| Type of engine | | Alternating current (synchronous or asynchronous) motor |
| Rated voltage | | 400 V AC |
| DYNAMIC CHARACTERISTICS | | |
| Maximum operating speed (with speed limiter) | | ≥80 km/h |
| *Vehicle acceleration (fully laden):* | | |
| Average acceleration 0-25 km/h | | 1.2 m/s2 |
| Maximum jerk / acceleration increase must not exceed | | 1.45 m/s3 |

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| Vehicle category, class and application | Vehicle category M3, Class I.  Low-floor (without steps in doorways and main gangways) mechanical Vehicle, equipped with a power train, with an electrically rechargeable energy storage system that can be charged externally.  The Vehicle must be designed and intended for the carriage of passengers within an urban agglomeration. | |
| Source of electrical energy | The Vehicle must be equipped with a battery (or batteries) that supply the Vehicle with power; the Vehicle must have a driving range (with one charge) of at least 150 km at -200C (minus twenty degrees Celsius) in active driving mode. | |
| Fuelling equipment | Compatibility of charging equipment with offered Vehicles must be ensured according to Cabinet of Ministers Regulations No. 78 (06.02.2018) – *Requirements for charging of electrical vehicles, natural gas fuelling, and hydrogen fuelling and shore power supply equipment*.  Charging equipment operating environment - outdoors.  Charging options – with a plug (electric bus charging system CCS Combo 2 or equivalent and a roof-mounted charging system (Opportunity charging) – pantograph. Charging standard IEC61851 -1/21/23/24, DIN 70121, ISO 15118 or equivalent.  Full charging time of the electric bus via plug (CCS Combo 2) - not more than 6 h, with a charging output of not less than 50 kWh. | |
| Climatic conditions | The Vehicle, its systems and sub-systems must safely operate at an ambient temperature range from -400C to +400C (at a relative air humidity of 98% at a temperature up to +250C). | |
| DIMENSIONS | | |
| Length (mm) | | **Not less than 17 900, not more than 18 100** |
| Width (mm) (rear view mirrors excluded) | | Not less than 2 530, not more than 2 550 |
| Height (roof-mounted equipment included) (mm) | | ≤ 3 400,  when tyres are inflated to the specified air pressure, the air suspension system is set to working mode, and the bodywork kneeling system is switched off |
| PASSENGER CAPACITY | | |
| Number of passengers, total | | ≥ 135 |
| Number of seats | | ≥ 28 (folding seats excluded) |
| Wheelchair spaces | | 1 |
| Baby carriage spaces | | 1 |
| PASSENGER DOORS | | |
| Number of passengers, total | | double doors, 4 |
| Floor height at 1st/2nd/3rd/4th passenger door | | 320/320/320/320-340 mm,  when tyres are inflated to the specified air pressure, the air suspension system is set to working mode, and the bodywork kneeling system is switched off |
| Technical devices facilitating the access of passengers with reduced mobility to the Vehicle | | Extendable (electromechanically driven) platform, located at the 2nd passenger door. |
| ASIS | | |
| Number of axles | | 3 |
| 1st axle | | With independent wheel suspension |
| 2nd axle | | Drop-center drive-axle with in-wheel motors |
| Tyres | | 275/70 R22.5 |
| Clearance | | ≥ 135 mm,  at the rated tyre pressure and maximum Vehicle load |
| TRACTION DRIVE | | |
| Drive | | Drive-axle with two integrated electrical motors |
| Type of engine | | Alternating current (synchronous or asynchronous) motor |
| Rated voltage | | 400 V AC |
| DYNAMIC CHARACTERISTICS | | |
| Maximum operating speed (with speed limiter) | | ≥80 km/h |
| *Vehicle acceleration (fully laden):* | | |
| Average acceleration 0-25 km/h | | 1.2 m/s2 |
| Maximum jerk / acceleration increase must not exceed | | 1.45 m/s3 |