Annex 1

**TECHNICAL SPECIFICATION and TENDER FORM**

FOR THE SUPPLY AND INSTALLATION OF THE FAST ELECTRIC CHARGING EQUIPMENT FOR ELECTRIC BUSES

 (ROOFTOP CHARGING USING PANTOGRAPH)

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| **General information**  |
| Riga municipal limited liability company "Rīgas satiksme" (RP SIA "Rīgas satiksme") has electric buses at its disposal, for the operation whereof it is necessary to establish electric charging stations/points appropriate thereto, in order to develop environmentally friendly improvements in the public transport system of the city of Riga, by reducing emissions in provision of public transport services in the State city of Riga. Fast electric charging points are intended for recharging the battery of electric buses on their route, by providing a full charging cycle of electric bus running batteries overnight. Implementation of the project in accordance with investment 1.1.1.2.i. "Environmentally friendly improvements in the public transport system of the State city of Riga" of Component 1 "Climate change and environmental sustainability" of the Recovery and Resilience Facility Plan of the European Union plan, within the scope of the project under measure 1.1.1.2.i.1."Reduction of emissions in the provision of public transport services in the city of Riga". Basic solution: pantograph charging system, consisting of a charging station module and a pantograph mast support (hereinafter referred to as the Equipment). Project costs will be comprised of:1. Acquisition of the Equipment,
2. Supply and installation/assembly of the Equipment in various places in the territory of the city of Riga and the adjustment thereof;
3. RP SIA "Rīgas satiksme" employee training/instructing for working with the Equipment.

The information received within the scope of the market research will be used to select the most appropriate procurement procedure for the subject-matter of the procurement, prepare technical documentation of the procurement, considering the needs of RP SIA "Rīgas satiksme" and ensuring equal treatment of potential suppliers and fair competition, as well as the selection of the most economically advantageous tender. Within the scope of the market research, we would like to also obtain information about the possibilities of combining both types of charging in a charging equipment: using pantograph and using cable. |
| **General characteristics of fast charging equipment for electric buses** | **Description of the offered Equipment**  |
| Equipment is intended for recharging the running batteries of electric buses on Riga city routes. It should ensure direct current (hereinafter also DC) rooftop charging using pantograph (inverted pantograph, pantograph down). |
| The Equipment must have an output power of at least 300 kW (DC). Possible options of the output power of the Equipment: | [ ] ...at least 300 kW[ ] ...at least 600 kW[ ] …other option |
| The Equipment must be compatible with and usable in electric buses produced by different manufacturers, by ensuring electric charging, observing the following vehicle dimensions: 1. Electric bus width – maximum width within the range of 2 530÷2 550 mm;
2. Electric bus height - maximum height 3 400 mm (including rooftop equipment), when the tires have the specified air pressure, the pneumatic suspension system is adjusted to operating mode and the superstructure lowering system is off.
 |
| During operation, the Equipment must not cause an adverse effects on **climate** **change** and environmental sustainability.  |
| **No.** | **Description**  | **Description of the offered Equipment** |
| **Basic data of the Equipment** |
| 1.1. | Name | ………………. |
| 1.2. | Manufacturer (firm name, location of the manufacturing plant)  | ………………. |
| 1.3. | Place of origin of the Equipment | ………………. |
| 1.4. | Equipment model | ………………. |
| 1.5. | Technical data sheet or other source of information enclosed, specifying technical parameters of the Equipment | ………………. |
| **No.** | **Indicator name** | **Minimum requirement of the indicator** | **Description of the offered Equipment** |
| **2. Power network connection** |
| 2.1. | **Type of power network connection** | Alternating current | ………………. |
| 2.2. | Input voltage  | 400V ± 10 % | ………………. |
| 2.3. | **Frequency of power network connection** | 50 Hz | ………………. |
| 2.4. | Integrated electric charging meter  | Included | ………………. |
| **Output current** (per each pantograph mast support) |
| 3.1. | Type of output current | DC direct current | ……………… |
| 3.2. | Charging power | Discretely adjustable from the charging station module control operator’s service menu | .……………. |
| 3.3 | Efficiency at rated (nominal) power/ efficiency factor | ≥ 0.95 at full load. What are the prerequisites for obtaining such indicators? | .……………. |
| 3.4. | Output rate voltage  | 600 VDC, according to IEC 62196-1 | .……………. |
| 3.5. | Output voltage range  | 500-800 VDC | .……………. |
| 3.6. | Maximum output current | 600 ADC, according to SAE J3105-1 or equivalent. | .……………. |
| 3.7. | Types of charging | Rooftop pantograph (*inverted pantograph* )   | .……………. |
| Other type of charging (using cable) | .……………. |
|  |  | Is long electric charging possible as an additional functionality (for charging electric buses during the night hours) and what is the technical and design solution thereof? | .……………. |
| **4. Equipment assemblage, construction**  |
| 4.1 | Equipment assemblage | New, stationary Equipment in full assemblage | Assemblage includes:* ………………
* ………………
* ………………
* ………………
 |
| Characteristics of the Equipment connection point | …………….. |
| 4.2.  | Layout of construction of the Equipment | Charging station module – installation of pantograph mast support, technical solution:* Common (indicating advantages and disadvantages)
 | …………….. |
| * Separated (indicating advantages and disadvantages)
 | ……………. |
| 4.3.  | Permissible charging station module – distance of installation of pantograph mast support  | Preferred solution: ≥ 50 metersPlease provide answers to the following questions:1. What is the minimum and maximum distance between the module and the pantograph support?
2. Can the distance affect the overall quality of the charging process (e.g. noise level)?
 | Minimum distance: \_\_\_\_ metresMaximum distance: \_\_\_\_ metres[ ]  Minimum and maximum distance is not specified. |
| 4.4. | Pantograph  | Please provide a technical description of the pantograph (*inter alia*, specifying information about electrical poles, connectivity of the control unit with the bus connector, positioning tolerances of the bus at rest, height between the contact surface of the contact bar and the road part (mm)). | ……………… |
| 4.5. | System for preventing icing of power transmission device, in the entire operating temperature range | Electric, with consumption ≤ 150 Wh | ……………… |
| 4.6. | Minimum energy capacity of the electric bus battery | ……………… |
| 4.7.  | Pantograph control and communication with the vehicle  | Using a wireless connection (Wi-Fi) according to the requirements of ISO 15118 or an equivalent standard.  | ……………… |
| 4.8.  | Manner of mounting the Equipment | On a specially prepared base. In terms of the loadbearing capacity, the base must correspond to the weight of the placed Equipment and ensure the rigidity of the overall construction against wind, snow and other loads. | The base is built by:[ ]  construction works are ensured by the tendereror[ ]  construction of the base is under the competence and responsibility of the contracting authority |
| 4.9. | Number of pantographs to be mounted on the mast support  | At least 1 | The type of solution offered by the tenderer:[ ]  1 (one) pantograph:* The minimum area necessary for the installation of a single port pantograph (including taking into account the dimensions of the electric bus): \_\_\_\_\_\_\_\_\_(m2)

or[ ]  2 (two, 1 on each side) pantographs:The minimum area necessary for the installation of a double port pantograph (including taking into account the dimensions of 2 electric buses): \_\_\_\_\_\_\_\_\_(m2)**If there are 2 pantographs on 1 support, upon concurrent use thereof:**[ ]  charging capacity for each pantograph is constant[ ]  charging capacity for each pantograph decreases by \_\_\_\_\_ % (for example by 50%). |
| 4.10. | Dimensions of the pantograph mast support:Height (H), mm; Width (W), mm; Thickness (T), mm | H - …… mm;W - …… mm;T - …… mm. |
| 4.11. | Dimensions of the charging station module: Height (H), mm, Width (W), mm, Thickness (T), mm | H - …… mm;W - …… mm;T - …… mm. |
| 4.12. | Weight of the pantograph mast support, kg  | …… kg  |
| 4.13. | Weight of the charging station module: | …… kg  |
| 4.14. | Frame material | The frame is non-corrosive or made of at least 2 mm thick stainless steel or galvanized steel with powder coating (a combination of these materials is permissible) | ……………… |
| 4.15. | Frame protection class | Not lower than IP54 | ………………. |
| Not lower than IK10 | ………………. |
| 4.16. | Permissible relative humidity  | At least 95% |  |
| 4.17. | Colour of the charging station module | For painted surfaces – white from the RAL Classic colour palette (RAL 9003, 9010 or 9016) (or equivalent)) |
| 4.18. | Colour of the pantograph mast support  | For painted surfaces – white from the RAL Classic colour palette (RAL 9003, 9010 or 9016) (or equivalent)) |
| 4.19. | Positioning of power supply cables, input/output of data cables | Through the base of the strut |
| 4.20. | Cooling | Forced |
| 4.21. | Electric shock protection (electrical safety) | must be provided |
| 4.22. | Emergency protection | must be provided |
| 4.23. | Fire safety | must be provided |
| 4.24  | Noise level | In accordance with the applicable regulatory enactments, upon the heat control system being on to the full capacity intended for the normal operation of the Equipment.Please specify the regulatory enactment (including directive, regulation), the requirements whereof is complied with by the Equipment. | Please specify the noise level:* During active charging: \_\_\_\_\_\_\_\_
* Without charging being performed: \_\_\_\_\_\_\_\_\_\_\_\_\_

………………………………………………………… |
| **5. User identification** |
| 5.1. | User identification | The Equipment must ensure electronic identification, authentication and authorization of Users, using the employee card of RP SIA "Rīgas satiksme". |
| Contactless multifactor smart card readers (RFID, NFC)  | ……………… |
| 5.2. | Operation frequency of the user identification system (contactless multifactor smart card readers).  | 13.56 MHz | ……………… |
| 5.3. | Indication signal (contactless multifactor smart card readers) | The contactless multifactor reader is equipped with a light or sound indication that indicates the card reading status. Can be used outdoors, at least IP65 class resistance | ……………… |
| **6. Software** |
| 6.1. | External communication protocol | At least OCPP 2.0.1 or a later version, including proof of compliance certificates submitted within the scope of procurement. | ……………… |
| 6.2. | Software and/or hardware of the Equipment | The Equipment is equipped with the software and/or hardware required to ensure its operation. Connection to the data transmission network of the Contracting Authority – using a cable to the data network of the Contracting Authority.  | ………………. |
| 6.3. | Software and/or hardware updates of the Equipment  | Must be provided free of charge during the entire term of validity of the Contract (including during the warranty period) | ……………… |
| Updating in online mode | ……………… |
| 6.4. | Connection to the data transmission network  | The Equipment must have at least one 10/100/1 000 Gb Ethernet connection and provide for the possibility to connect a 4G and/or 5G mobile data transmission equipment.Data transmission speed in both directions at least 100 Mbit/s. The connection terminates in data centre of the Contracting Authority behind the firewall. | ………………. |
| 6.5. | Equipment control  | Ensures the connection to the control and monitoring system of RP SIA "Rīgas satiksme" charging network. |
| 6.6. | Data storage device (internal memory of the Equipment) | The internal memory of the Equipment must ensure the storage of operational data to secure the operation of the Equipment in the event of a communication disruption. | Please specify the storage device solution (including memory size). |
| **7. Remote diagnostics system** |
| 7.1. | Labelling  | CE | Yes/No (delete or erase as appropriate) |
| 7.2. | Equipment  | LVS *(Latvian State Standard*) EN 61851 (or equivalent)LVS EN 62196 (or equivalent)ISO 15118 (or equivalent)SAE J3105-1 (or equivalent) |  |
| 7.3. | Electromagnetic compatibility of the charging Equipment | EN / IEC 61000 must meet the requirements of the standard (EMC Class A). |  |
| 7.4. | Direct current charging | IEC 61851 series, ISO 15118 (or equivalent)  |  |
| 7.5. | Contactless multifactor smart card readers | ISO/IEC 14443 (Type A/B 13.65 MHz) (or equivalent) |  |
| 7.6. | Functioning of the Equipment | LVS EN 50160:2010/A1:2015 (or equivalent) and according to the requirements of Cabinet Regulation No. 78 of 6 February 2018 "Requirements for electric vehicle charging, natural gas filling, hydrogen filling and shore power supply equipment", as well as the requirements of the regulatory enactments of the Republic of Latvia on the electric safety of equipment, on the electromagnetic compatibility of equipment. |
| **8. Documentation**  |
| 8.1. | The original mounting, maintenance and use instructions in the following languages  | Latvian (and/or English). | [ ] …yes, Latvian[ ] ...no, not available in Latvian[ ]  …English[ ] ...no, not available in English |
| 8.2. | Images of the product submitted, meeting the following requirements:* ".jpg" or ".jpeg" format;
* resolution of at least 2 Mpix;
* it is possible to see the entire product and read all the inscriptions, markings thereon;
 |  |
| **9. Other requirements (including environmental conditions, green public procurement components)** |
| 9.1. | Operation of the charging Equipment within the range of the ambient temperature at least/ Equipment working temperature (Maximum and minimum long-term permissible air temperature **)** | from -250C to +400C | ……………. |
| 9.2. | Dust and water protection of the charging Equipment  | according to IEC60529 | …………….. |
| 9.3. | Noise level at a distance of 1m from the Equipment | ≤ 70dB | \_\_\_\_\_\_ dB |
| 9.4. | Confirmation of the start of charging, display of information about the charging process  | Connection and disconnection of the pantograph of the charging station with the vehicle of RP SIA "Rīgas satiksme" is performed according to the command from the vehicle driver's panel located in the vehicle.Commencement of the charging process must be ensured without additional confirmation commands (for example, pressing the push button on/by the Equipment).Information about charging progress and refusals will be displayed on the screen of the RP SIA "Rīgas satiksme" vehicle driver's panel. Data about the charging progress will be recorded in the vehicle diagnostics and telemetry systems of RP SIA "Rīgas satiksme".  | …………….. |
| 9.5. | Infrastructure and other technical requirements, which are to be provided by RP SIA "Rīgas satiksme" as the Contracting Authority, when constructing the infrastructure necessary for the operation of the Equipment  | Mandatory requirements for the infrastructure to be constructed: |
| 1. In terms of safety, is there any distance to be observed between the stations (information we can use for further development of the charging infrastructure in the coming years, for example - proximity to greenery, high-rise buildings)?

Please enclose possible technical (including design) solutions as annex | [ ]  yes, the minimum distance is: \_\_\_\_ metres;concurrently observing the prerequisites:……………………………………………………………[ ] …no |
| 1. Can a fast charging station be added to the new long-term charging stations, what are the technical and design solutions? Please describe or enclose additional materials (as annex), Internet links where these solutions can be viewed or inspected in more detail.
 | [ ] …yes…………………………………………………………… |
| **10. Deadlines**  |
| 10.1. | Term of supply of the Equipment. Please provide answers to the following questions:1. term of supply from the date of signing the contract:
 | … business days |
| 1. conditions that may affect the term of supply (interfering factors):
 | …………… |
| 10.3.  | Term (business days) for testing and putting into operation | … business days |
| 10.4. | RP SIA "Rīgas satiksme" employee training/instructing for working with the Equipment is to be ensured in Latvian | [ ] …yes[ ] …no |
| 10.5. | Stages of contract fulfilment and the terms for fulfilment thereof (for example, Equipment supply, installation, mounting, adjustment and installation and putting into operation of the control of the Equipment..  | Stages of contract fulfilment and the deadlines thereof:1. ……………. - ….business days;
2. ……………. - ….business days;
3. ……………. - ….business days;
4. ……………. - ….business days;
5. ……………. - ….business days;
 |
| Is it possible to fulfil the stages of the contract fulfilment in several objects (for each Equipment in different places in the territory of the city) in parallel? | [ ]  …yes, if all prerequisites are met:……………………………………………………………[ ]  …no (please justify why it is not possible):…………………………………………………………… |
| **11. Warranty** |
| 11.1. | Warranty for all parts and frame of the Equipment  | ≥ 36 (thirty-six) months from putting the Object - fast electric charging point - into operation | [ ]  …yes, the offered warranty period is: \_\_\_\_\_months[ ] …no |
| The tenderer has at its disposal the following materials approved by the factory of the manufacturer of the Equipment or its regional representative: |
| * basic warranty period ensured by the factory and its terms
 | [ ] ...yes,[ ] …no |
| * period of extended warranty (in addition to the basic warranty) ensured by the factory and its terms
 | [ ]  …yes, possible: \_\_\_\_\_ months[ ]  …no, no extended period of warranty period is additionally offered |
| 11.2. | Service and maintenance during the warranty period  | During the warranty period of the Equipment, the Contractor shall without additional compensation: |
| * eliminate any defect and damage to the Equipment (including replacement of damaged parts at the Supplier's expense)
 | [ ] ...yes,[ ] …no |
| * ensure the replacement of damaged Equipment or its components for the duration of the repair period with Equipment or components of equal or higher performance
 | [ ] ...yes,[ ] …no |
| * perform regular preventative checks and technical maintenance of the Equipment
 | [ ] ...yes,[ ] …no |
| * provide updates of software and/or hardware of the Equipment.
 | [ ] ...yes,[ ] …no |
| **12. Additional Information** |
| 12.1. | Equipment power adjustment possibilities | Please specify what type of adjustment is possible. | ………… |
| 12.2. | Operational lifecycle of the equipment (service life) | ………… |
| 12.3. | The mobile solution (for relocation) of fast charging Equipment, types of technical and design solution thereof | ………… |
| 12.4. | Can passenger vehicles also be charged at fast charging stations intended for electric buses? What are the prerequisites for that? | ………… |