Market consultation EB4

Electric Bus

Confidentiality level: **Public**

Contents

Guide

This document is the market consultation document concerning the 4th Generation Electric Bus (EB4) project for the acquisition of buses and charging infrastructure.

This document contains the following chapters:

Chapter 1: This chapter contains general information about GVB, about this market consultation and about the schedule.

Chapter 2: This chapter contains the administrative terms and conditions that apply to this market consultation.

Chapter 3: This chapter contains a brief description of the current situation and a vision of the future.

Chapter 4: This chapter contains the questions that GVB has for the market in the context of the market consultation.

Definitions

- Interested party: the participant in the market consultation

Abbreviations

- EB4: 4th Generation Electric Bus

1 Introduction

GVB intends to purchase electric buses with charging infrastructure.

Before this happens, GVB wishes to conduct a round of consultations with market participants. This document has been drawn up for this round of consultations.

1.1 Publication

This market consultation was published via Negometrix (www.negometrix.com). All communications and exchanges of information between GVB and the Tenderers in the context of the tender shall take place via this procurement tool.

If you wish to stay informed of further publications with respect to this tendering process, you will have to register on Negometrix and add this tendering process to "My Tenders (tenderer)". See in this connection also the Digital Tenders Instructions.

Any questions about Negometrix should be directed to the Negometrix service desk. The service desk is available on working days between 08.00 and 18.00; the telephone number is 030 666 18 10 and the e-mail address is servicedesk@negometrix.com.

1.2 Definition of market consultation

A market consultation is being used to improve, test and/or further realise the quality of the specifications or programme of requirements and the purchasing process.

By using the knowledge and expertise of the parties, a public organisation is able to test the correctness, completeness and feasibility of a proposed project and the corresponding secondary conditions. As a result, the feasibility of the project can be better determined and the secondary conditions – under which the project must be carried out – determined.

The market consultation is a separate process that is conducted prior to a formal tendering process. The market consultation is not a call to participation and does not form part of a pre-qualification procedure. The information obtained from the market consultation can be used to ensure an effective tendering process. By undergoing an effective tendering process, this increases the chance of a suitable tender for GVB.

1.3 Client

This market consultation will be conducted by GVB.

GVB runs public transport using trams, buses, underground trains (metro) and ferries in and around Amsterdam. The organisation has around 3750 employees. GVB transports

passengers using 56 bus lines (12 of which are night-time lines), 16 tram lines, 4 metro lines and 8 ferry connections.
"Pre-corona", GVB transported an average of around 938,000 travellers on a working day, 110,000 of which in the North/South line.
Passengers want to reach their destination on time, to be informed and to feel safe. The passengers are the most important aspect of GVB's operations.

Thanks to the increase in passenger numbers and higher revenue-cost ratio, GVB was in good shape at the beginning of this year. At the same time, GVB was also severely affected by the coronavirus crisis. The crisis caused the number of daily passengers to decrease dramatically and, as such, revenue too. Different measures have now been taken, such as making use of available government schemes, delaying investments and putting a stop to job vacancies, and GVB believes that its current financial position, including agreements in this regard, are strong enough to counteract the financial impact of the coronavirus.

In addition to operations, GVB is also responsible for the management and maintenance of the vehicles and of the rail infrastructure in the city. GVB's divisions Railmaterieel, Garagebedrijf and Rail Services divisions are responsible for the execution of the maintenance.

GVB likes to see its passengers and employees feel at home: in the vehicles, but also before and after the journey. This is why social safety and up-to-date travel information are important, especially in a busy metropolis such as Amsterdam. In addition to the vehicles, it is also important that the environment is clean and safe and encourages the use of public transport.

For further information about GVB, please refer to the website www.gvb.nl.

1.4 Aim of the market consultation

The aim of this market consultation is:

A. to involve interested parties early on in the organisation of the above-mentioned tendering procedure and the agreement to be concluded;
B. to consult the market in relation to investigating the possibilities for tendering EB4;
C. besides answering the questions asked, interested parties will also be given the opportunity to make suggestions and put forward ideas.

This way, GVB hopes to organise a potential tender and to be able to enter into an agreement that is tailored to the market as closely as possible.

1.5 Phasing

The market consultation has been divided into two phases:

A. A written response to the questions asked by GVB;

B. A verbal explanation of the questions asked with the corresponding answers; this takes place on the basis of individual conversations. See also article 1.7; this phase is optional and is entirely dependent on the result or conclusion based on the answers given to the questions asked. The choice lies with GVB in relation to whether or not make use of this opportunity.

1.6 Conditions

GVB lays down the following terms and conditions which are accepted automatically by the interested party when taking part in this consultation:

A. GVB is in no way responsible for covering the costs associated with this market consultation;
B. GVB reserves the right not to follow up on this market consultation;
C. GVB reserves the right to choose an appropriate and suitable purchasing strategy for the company, depending on this consultation.
D. The information provided may be freely used by GVB.

1.7 Market consultation process

The announcement of this "EB4" market consultation, along with the corresponding documents, has been published via Negometrix in accordance with the schedule from paragraph 1.8, as well as being published automatically on TenderNed and Tenders Electronic Daily (TED). This way, all interested parties are given the opportunity to participate in this market consultation.

Afterwards, until the moment stated in the schedule, there is an opportunity to ask questions in writing in order to clarify the market consultation, for which an Information Memorandum will be drawn up.

After that, GVB will be happy to receive a written response to the questions asked, as can be found in the chapter "Market consultation questions". The answers to the questions can be submitted until the moment stipulated in the schedule, using the messaging service in Negometrix.

In response to these written questions and/or comments, GVB may decide to request further information. This will only occur through written questions or consist of further consultations, but is not limited to this.

Consultation with the parties will be focused on the mutual sharing of information. The parties involved may contribute their ideas concerning the subject of the market consultation. GVB is not obliged to give detailed feedback to the participating parties.

1.8 Market consultation schedule

Please find the schedule for the market consultation procedure below. GVB placed an announcement for this market consultation on Negometrix, thereby formally starting the market consultation.

GVB reserves the right to make changes to the schedule or to deviate from the schedule. In such cases, communication towards all interested parties takes place via Negometrix.

Phase	Milestone	Date
1	Publication of announcement	10 November 2020
2	Submission of questions to clarify market consultation document	17 November 2020 before 5 p.m.
4	Drafting and sending of Information Memorandum	23 November 2020
5	Submission of answers, ideas and comments	27 November 2020 before 5 p.m.
6	Consultation rounds	1)

1) Phase 6 is dependent on the result or conclusion based on the answers given to the questions asked.

2 Administrative terms and conditions

2.1 Correspondence

The communication concerning this market consultation must be sent in writing at all times using Negometrix's messaging service, stating **EB4 Project**.

The following contact person from GVB has been appointed for this market consultation:

Purchasing Department
Attn.: N. el Amrani, Senior Buyer
Postal address: Postbus 2131, 1000 CC Amsterdam
Visitors' address: Arlandaweg 106, 1043 HP Amsterdam
E-mail address: nafie.elamrani@gvb.nl (Cc to robin.verspeek@gvb.nl)
Mobile phone number: +31 (0)6 1029 8718

2.2 Information Memorandum

Any questions for the clarification of this document may be submitted until the deadline stated in the schedule. To submit questions, you must use the document provided in annex 1, Standard form for the submission of questions.
These questions will be anonymised in the form of an Information Memorandum and answered. GVB will place the Information Memorandum on Negometrix.

2.3 Identical information

All parties have access to the same information. The publication of this market consultation and the corresponding documents – market consultation document and Information Memorandum – will be placed on Negometrix.
In the event of a potential tender, the aforementioned documents are shared with all candidates.

2.4 Language

The language to be used in this market consultation is Dutch and English. You are free to decide the language in which you answer the questions.

2.5 Rights

No rights may be derived from the information provided in the context of this market consultation. All verbal and written communication must be regarded as general possibilities for the purchasing process and the approach taken by GVB.

2.6 Confidentiality

The information provided by GVB in the context of this market consultation must be handled confidentially by you. The duty to maintain confidentiality also applies to your

employees and the third parties to be brought in by you. GVB will, of course, handle the information it obtains confidentially too.

2.7 Supplied data

As stated, GVB may start to use the information obtained from this market consultation to begin marketing the tender for the EB4 project. As a result, all answers submitted by market participants will be or are the property of GVB in the context of this market consultation. GVB therefore has free use of this information. GVB would greatly appreciate it if all questions were answered.

2.8 Status of information

The status of the information is **indicative.**

2.9 Notification of discrepancies

If a participating market participant believes that information and/or a provision in this market consultation document and/or other documents is inaccurate, unlawful or in any other way discrepant, the participating market participant must draw GVB's attention to such alleged inaccuracy, unlawfulness or discrepancy within fifteen calendar days of receiving the market consultation document in question.

If a participating market participant has not drawn GVB's attention to this in good time in the prescribed manner, that participating market participant thereby processed every right towards GVB insofar as related to the alleged inaccuracy, unlawfulness or discrepancy.

2.10 Priority of the documents

In the event of a conflict between the announcement of the market consultation and this market consultation document, this market consultation document will prevail.

3 Subject of market consultation

In accordance with the Paris Climate Agreement and the National Administrative Agreement on Zero Emission Regional Transport by Bus, signed in conjunction with the Amsterdam Transport District, the Public Transport District wants to ensure that bus transport is emission-free by 2030. In the Public Transport District's policy framework on Mobility, this objective was specified in the strategic statement 'CO2-neutral mobility system'. For the implementation of this strategic statement, the Public Transport District is working on the Zero Emission Mobility transition programme. The programme focuses on the one hand on firming up the policy, and on the other hand, on supporting projects that contribute to the programme objectives, such as this proposal.

Project partners the Municipality of Amsterdam and GVB have a bigger ambition: The Amsterdam Coalition Agreement 2018 includes the ambition that public transport in Amsterdam will be entirely emission-free by 2025. The Sustainability Agreement by GVB and the Municipality of Amsterdam from 2015 includes the objective to have an entirely emission-free fleet in Amsterdam by the end of 2025, as long as technology and operation allow for this. This is five years sooner than the national ambition.

GVB's strategic objective is to be a partner of Amsterdam and its residents. This means that based on its CSR policy, GVB is taking extreme measures to help the city to solve social tasks in the area of environment, employment, accessibility, safety and economic growth. In this context, and in consultation with the Public Transport District and the Municipality of Amsterdam, GVB wants to explicitly go further than the requirements placed in the concession in the field of CSR.

The 1st Generation Electric Buses project has been an important step in the realisation of this objective because emission-free buses create cleaner air and thereby considerable health benefits for the city's residents, especially in places where the air quality is so bad that it does not or barely meets European minimum standards. Electric buses are also quieter, so people experience substantially less noise pollution. Finally, the introduction of electric buses makes a considerable contribution to the Amsterdam ambition to be leaders in the
field of electric travel, so the city is no longer dependent on fossil fuels, and it offers opportunities in the field of energy storage and demand response.

For the longer term, GVB has signed a zero emissions sustainability agreement with the municipality in which it was agreed that GVB's buses will operate entirely emission-free by 2025. GVB's strategic proposal is leading in this regard, which means that whenever there is a natural time to make a replacement, diesel buses will preferably be replaced by zero emission buses.

If it turns out to be practical, the entire bus fleet will thereby by emission-free by around 2025. As the buses (just like the metros, trams and hybrid ferries) will run on locally generated green electricity, this will make GVB's operations almost climate-neutral.

GVB plans to replace its current bus fleet with Zero Emission buses in the period between 2020 and 2025. This will happen in 6 batches, in principle 1 batch every year. For the first series of buses and chargers, a contract was entered into VDL following a European tender. The next series of buses and chargers will be outsourced in Europe by means of a new contract. This concerns both standard buses (12 metres) and articulated buses (18 metres). The basic principle is "opportunity charging" technology, supplemented if possible with "overnight charging". Charging will take place both in bus depots and in public areas.

As a result of the developments in public transport caused by COVID-19, it is impossible to provide clarity now in relation to the exact numbers of buses to be ordered. The figures below are merely indicative in order to give potential suppliers an idea of the scope of delivery including options. No rights may be derived from these figures. At the time of the tender, GVB is planning to commit to a minimum quantity of buses to be ordered, namely 39, as marked in yellow in the diagram below.

Batch	Delivery date	Expected minimum order		Expected maximum order	
		Total	of which	Total	of which
EB4	2022 December	39	23 standard	67	28 standard
			16 articulated		39 articulated
EB5	2023 December	35	35 standard	46	35 standard
			0 articulated		11 articulated
EB6	2024 December	17	4 standard	29	5 standard
			13 articulated		24 articulated
Total		91	62 standard	142	68 standard
			29 articulated		74 articulated

GVB has a preference for a single turnkey supplier who is able to supply both standard and articulated buses, as well as the corresponding charging infrastructure including the necessary civil and electrical integration and installation work. Based on the information obtained, GVB may decide to split the market consultation into lots and/or different tenders.

4 Market consultation questions

The request is to answer the following questions. These relate to several matters. Firstly, GVB likes to receive information about your company and the market, consisting of contact information and general information. GVB also likes to receive answers to the specific questions asked by us. Finally, you will be given the opportunity to make any comments and/or suggestions. It is not necessary to answer all questions, but we would greatly appreciate it if questions are answered in full. If questions are answered in full, GVB believes it will help them to formulate the correct mandate and programme of requirements for a potential tender. We hereby stress once again that the answering of the below questions will not be used for the selection of suppliers. The aim of the structured questionnaire is to select similar answers by different suppliers. We encourage you to make comments next to the questions and for which you think you need to propose alternatives.

Contact information		
1.	Official name of your organisation	
2.	Visitors' address for your organisation	
3.	Postal address for your organisation	
4.	Name of contact person for this RFI	
5.	E-mail address of contact person	
6.	Telephone number of contact person	
7.	Registration number at the Chamber of Commerce	

General company and market information		
1.	**References** What references do you have that are relevant to the needs of GVB and which we are allowed to approach if necessary? What were the success factors in the work you carried out for these references, what was the client's role, what would you recommend not doing and what went wrong?	
2.	**Batch/order size**	

	The contract for the proposed tender will consist of an initial call/basic order, and the possibility (but not an obligation) to order additional buses over several years (i.e. options). Do you have a minimum number of buses for the basic order and/or the total number of buses to which GVB commits to order with the tender?	
3.	**Differentiation** Can you state in what areas your company sets itself apart compared to competitors in the market? Please state both your company's strong points and weaker points.	
4.	**Customer support/After-sales capabilities in the Netherlands** How is customer support organised within your company and are you able to offer Dutch or English language support?	
5.	**Experience 1** Does your organisation have experience with delivering availability based on the km price over the past 5 years? If so, what constructs are you able to offer?	
6.	**Brochure** If you possess a brochure/presentation with layout and battery parameters, are you able to add this to your answers in the form of an annex?	*Add to answers in the form of an annex*
Specific questions on market consultation		
7.	**ICT: Experience 1** Does your organisation have experience with implementing ICT systems in buses with IPxPT interfaces connected to a transparent IP network? And can you say what components and/or functionalities you possess for such an interface?	
8.	**ICT: Experience 2**	

	In the context of standardisation, GVB would like to see the existing ICT components in use on the existing fleet with an IPxPT interface being implemented as part of the on-board ICT architecture. Are you able to say how you can integrate this (with the basic principle being that this concept has been proven on the current fleet) in your bus concept, where the client wishes to assign responsibility for the delivery, coordination and integration fully to the bus supplier. Deliveries are therefore not being made directly from GVB.	
9.	**ICT: Acceptance of FAT/SAT/IAT** For the delivery and acceptance of an operational bus, GVB takes the following steps: - FAT - Factory Acceptance Test. - SAT - Site Acceptance Test, including the GVB back office systems, such as radio, payment systems and operations functionality. - IAT - Integral Acceptance Test, including GVB use cases. Because not all functionality can be obtained during the FAT outside of the domain of Amsterdam and GVB, we want to know how the supplier can integrate the activities and the process with tests on the site of the supplier and tests on the site of GVB, in order to achieve ultimate integral acceptance.	
10	**ICT: Monitoring** Can you say what monitoring information can be made available to the bus IP network with an IPxPT interface?	
11	**ICT: Experience monitoring** - Does your organisation have experience with the delivery of monitoring applications for vehicles and chargers over the past 5 years? Please specify	

	what applications were delivered in this regard. - Does it concern third parties' own systems or monitoring systems and are the monitoring of chargers and vehicles integrated in this or do they come as separate systems? - What type of data and tool environment do you offer to enable third-party suppliers to create dashboards and reports on the status of charging systems and/or vehicles? - Which of the monitoring systems do you believe offers the most added value for end users such as GVB?	
	Interoperability: GVB is striving to achieve interoperability between the current fleet of electric buses and the future vehicles to be purchased. The current fleet concerns OC buses from VDL with a Schunk pantograph fitted above the front axle and 50 kW and 150 kW chargers from the manufacturer Heliox (both for charging in the depot) and a 450 kW charger (for charging at the end of the line).	
12	Can you guarantee that buses that can be delivered by you are compatible with GVB's current charging equipment?	
13	Conversely, can you guarantee that you can deliver charging equipment that is compatible with GVB's current electric buses?	
14	Can you say whether it is necessary to formulate certain requirements in the tender in order to guarantee the above (e.g. meeting certain standards), and if so, which ones?	
	Smart charging: GVB is interested in solutions that can help to lower the load placed on the electricity network. Options could include smart charging and local energy storage.	
15	In the past 5 years, do you have demonstrable experience with	

	implementing smart charging on a fleet of electric vehicles delivered by you? If so, can you briefly explain how this system works and which end user currently uses it?	
16	In the past 5 years, do you have demonstrable experience with solutions where energy is buffered (e.g. in a battery) in the vicinity of charging facilities by means of local energy storage in order to reduce the peak demand on the network? If so, can you explain how this system works, what the identified advantages and disadvantages are and which end user currently uses it?	
	Realisation of integration of charging equipment: GVB currently has a preference to assign all aspects of the delivery of buses and charging equipment and the realisation of the integration of the charging equipment at the depots and end points to the bus supplier. The integration is complex, however, and often demands a great deal of engineering capacity.	
17	In the past 5 years, do you have demonstrable experience with the turn-key delivery of an electric bus project? If so, can you briefly describe what that project looked like and with which end user that took place?	
18	Are you able to conduct the entire engineering of the integration entirely independently based on a pre-design supplied by GVB, or do you still see a role in this for GVB itself?	
19	If GVB wishes to take full responsibility for this integration and to contract an external contractor for this, would you be willing to take on the coordination of this contractor within the turn-key delivery of the project as a whole? What conditions/requirements would you attach to this?	

20	In order to determine the price in the tender, GVB is considering allowing Tenderers to price up the realisation of fictitious charging sites, so that the resulting unit prices could be used in the future implementation of location-specific realisations. How do you feel about this?	
21	Are you able to say what requirements GVB should take into account when it comes to the indoor placement of charging infrastructure (fire load, noise, temperature control etc.)?	
	Footprint of charging equipment: As small a footprint of the charging equipment as possible is desirable in both the depot and in the public area.	
22	Can you, taking into account the requirements of the setup of the chargers (accessibility of doors/hatches), escape routes and anything else, say how many m2 of setup space is necessary for the installation of: A. 10 depot chargers (in power classes that can be delivered by you as standard) B. 4 fast chargers (in power classes that can be delivered by you as standard)	
	Efficiency, reactive power and harmonic: In the context of saving energy, as low an energy consumption of the chargers as possible is desirable.	
23	For the chargers that are in your supply range as standard, can you say what the efficiency of the chargers is?	
24	Can you say what reactive power these chargers cause?	
25	Can you supply values relating to the harmonic disturbance caused by these chargers?	

	Different supply options: Use of a non-standard (400V AC) way of supplying the charging equipment could offer potential benefits.	
26	Can you say whether you are able to supply charging equipment that can be supplied from existing metro or tram infrastructure (750V DC/600V DC) and what are the advantages and disadvantages of this?	
27	Can you say whether your charging equipment can be supplied directly by 10 kV AC supply voltage and what the advantages and disadvantages of this are?	
28	Can you say whether your charging equipment can be supplied by a central AC-DC rectifier and what the advantages and disadvantages of this are?	
	Prices: The purchase and maintenance costs of the chargers form a vital contribution to the TCO of electric buses. As low a cost level as possible is desirable.	
29	Can you give a guide price (excluding interfaces) for the following items included in your supply range as standard: A. depotchargers B. Fast chargers	
30	Can you explain how the maintenance costs of your depot and fast chargers compare to the purchase costs, assuming an operational life of 15 years and a full-service maintenance contract?	
	Sustainability: GVB places a high importance on sustainability, both for the product, but also for the production process and choices of materials.	
31	What experience do you have in relation to working with a material passport for buses?	

GVB defines Opportunity Charging (OC) buses to be buses that need to be recharged whilst stationary with high power from time to time during the operation period. Battery overnight charging buses (BAT) are defined to be buses where the charging infrastructure is only installed in the depots. This places significant demands on the electricity network when lots of buses need to be charged overnight at the same time. GVB wishes to find out more about the price, performance, costs and delivery time of the OC buses and Battery overnight charging buses that are currently available in order to determine for what part of the operation these buses are currently suitable. GVB also requests that the parties provide some insight into future or potential future developments. Please state in accordance with the table below what buses you have already delivered or are able to deliver within the stipulated schedule.

Properties of OC and BAT vehicles	Battery/overnight charging		Opportunity Charging		
	Standard 12 metres	Articulated 18 metres	Standard 12 metres	Articulated 18 metres	
	Value				Unit
Deliverable in series yes/no/scheduled for:					-
Max. deliverable gross battery capacity					kWh
Net usable battery capacity in operation (for EOL and taking into account the permitted DOD as well as a limp-home range of at least 10 km on top of the operational range)					kWh
Nominal and maximum charging capacity of pantograph [1]					kW
Nominal and maximum charging capacity of connector/plug					kW
Battery technology (LTO, NMC, LFP, other)					-

[1] *Nominal charging capacity = the charging capacity measured in the battery's BMS (on the basis of V * I), which can be supplied over at least 70% of the technical SOC range of the battery on average.*
*Maximum charging capacity = the charging capacity measured in the battery's BMS (on the basis of V * I), which can be supplied to the maximum at any time.*

How is the battery conditioned (air/liquid)					
Expected and guaranteed battery life (with EOL SOH = 80%)					-
SORT1 consumption					-kWh/km
SORT2 consumption					-kWh/km
Power demand of climate system for fully electric heating and cooling (e.g. $\Delta T=20^0$ in the winter and $\Delta T=-5^0$ in the summer)					kW
Brand/type/principle of climate system used					
What consumption benefit could use of a (HVO) fuel heater bring when 1) used below freezing point and 2) used below + 5°C? in SORT2 conditions (18 km/h) How much fuel does the heater consume every year when the bus is used around 80,000 km/yr?					kWh/km
Pantograph on bus/charger/both/or only plug					-
Pantograph possible at the position of the front axle (as standard or optional)					-
Impact of pantograph on maximum battery capacity of the bus					kWh
Height of bus, max. 330 cm reachable in relation to low underpasses?					cm
Driveline concept (central motor, hub motors/electric portal					-

axle, "in wheel" motors)					
Top speed					km/h
Seats					persons
Maximum number of standing places					persons
Indicative purchase price					€
Delivery time					months
Production speed					units/week
Description of standard supplied guarantee / warranty					
Number of vehicles already delivered over the past 5 years					unit
Operational in cities					quantity, since

Specific market consultation questions	
No.	Question
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Any comments and/or suggestions	
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Annex 1 Standard form for submission of questions

Any questions and/or comments must be submitted via the Negometrix messaging service using the table below.

No.	Document	Page no.	Subject	Question