

# Tender for Certified Li-ion Battery Packs & DC/DC Converters

(Ref: APAS00017)

*May 2019*

## Part I – General Specification

### 1. Introduction

Hong Kong Productivity Council (hereinafter referred to as “HKPC”) is a statutory organization established in 1967 to promote productivity excellence and enhance the value-added content of products and services.

HKPC is now looking for qualified supplier(s) (hereinafter referred to as “the Supplier” / “Tenderer”) to supply of Bespoke Li-ion Batteries & Battery Pack (hereinafter referred to as “the Services / the Items”).

HKPC will go through an open tender to invite qualified Suppliers and will enter into contract with the selected Supplier based on the terms and conditions of this tender document (hereinafter referred to as “the Tender”).

### 2. Tender Procedures

#### 2.1. Clarification of Tender

For enquiries, please contact the following person:

Mr. Sam LEUNG, (Officer, Procurement)  
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Finance and Procurement Division  
Tel: (852) 2788 5643  
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Any clarification questions must be sent by using the Annex 1 – Clarification Question from Tenderer via email to [samleung@hkpc.org](mailto:samleung@hkpc.org) on or **before 21 May, 2019 HK Time**. The questions with the answers will be posted on HKPC’s website [www.hkpc.org](http://www.hkpc.org). In this event anonymity will be maintained. Late enquiries may not be considered.

## 2.2. Submission of Tender Proposals

Based on “Part II – Technical Specification” and “Part III – Fee Specification”, your tender should be completed in two proposals, namely “Technical Proposal” and “Fee Proposal” with **one set of original document, one set of duplicate document and one soft copy on CD ROM/USB Flash Drive for each Proposal**, which should be:

- sealed and returned by hand in two plain envelopes with the provided Cover Sheet stuck on each of the two envelopes;
- marked with “Technical Proposal” or “Fee Proposal” on the envelopes;
- marked with the tender reference and closing date on the envelopes; and
- **submitted not later than 12:00 noon, 30 May, 2019 (HK Time).**

Both the hard copies and soft copy of the documents must be submitted in their separate envelopes of Technical and Fee Proposal respectively.

Late tenders may not be accepted.

### 2.2.1. The Technical Proposal should include at least the following:

- Tender Submission Form
- Copy of valid Business Registration Certificate or equivalent documents
- Copy of insurance certificates such as Public Liability, Employee Compensation listed on Section 5
- Annex 2 - Confirmation Letter for Compliance with Anti-Collusion Clauses
- Documents and information required in “Part II – Technical Specification”
- Copy of audited financial statements for the last three financial years, such as income statement and balance sheets, directors and auditors reports, cash flow statements
- Application Form for Inclusion in HKPC Suppliers List (if you are not registered to HKPC suppliers list), the form can be download from HKPC website: <https://www.hkpc.org/en/corporate-info/tender-information/supplier-registration>
- NO PRICE OR COST should be included in “Technical Proposal”, otherwise the tender may not be considered

### 2.2.2. The Fee Proposal should include at least the following:

- Schedule and Offer Form
- Reply to “Part III – Fee Specification”

### 3. General Requirements

#### 3.1. Terms of Payment

Payment will be made by electronic means (e.g. bank transfer with 30 days credit against invoice) after completion of goods / services delivery supported by HKPC's acceptance, unless otherwise specified.

#### 3.2. Validity of Quoted Fees

The fees provided by the Supplier in "Part III - Fee Specification" shall be valid from date of tender submission to the end of the tender appointment period. No change shall be made without the prior consent of HKPC.

#### 3.3. Termination Policy

The appointment may be terminated by HKPC on giving one month prior written notice to the Supplier.

Without prejudice to any other remedy HKPC may have against the Supplier, HKPC shall have the right to terminate the contract immediately if the Supplier:

- (a) is wound up or is petitioned to be wound up, commits an act of bankruptcy or compound or arrange with its creditors or have a receiving order made against it or being a limited supplier enters into compulsory or voluntary liquidation (except for the purposes of amalgamation or restructure only).
- (b) refuses or prevents the furnishing of services / goods under the contract.
- (c) breaches or violates any of the terms and requirements contained in the contract.

#### 3.4. Confidentiality

The Supplier shall at all times keep confidential (and to procure that its respective employees shall keep confidential) any confidential information which it may acquire in relation to HKPC, its clients, business or affairs and shall not use or disclose such information except with the consent of HKPC or in accordance with the order of a court of competent jurisdiction provided that the obligations of the Supplier contained in this clause shall cease to apply to any information coming into the public domain otherwise than by breach by the Supplier of its obligations contained in this clause and that nothing herein shall prevent the Supplier from disclosing any such information to the extent required in or in connection with legal proceedings arising out of the agreement / contract between the Supplier and HKPC.

#### **4. Statutory Obligations**

##### **4.1. Working hours, rates of wages etc.**

The Supplier shall comply with any current legislation or regulations regarding working conditions, working hours, or rates of payment to employees and accept the risk of any impending legislation or other conditions, which alters any obligations or imposes new obligations.

##### **4.2. Compliance with Laws and Regulations**

The Supplier shall ensure full compliance in accordance with the laws and regulations of the Hong Kong Special Administrative Region (“Hong Kong”).

##### **4.3. Where applicable, the Supplier (and its sub-contractors, if any) shall ensure that all staff, labour and workers employed and engaged in the supply of the Services to HKPC are legally entitled to be so employed and engaged, and that all necessary qualification, registration, visas, licenses and permits have been obtained. The Supplier shall indemnify HKPC on demand from any losses, liabilities, costs and claims resulting from violation of or failure to comply with any terms or conditions of any qualification, registration, permits, licenses or visas or any applicable requirements of Hong Kong laws, ordinances, rules and regulations by staff, labour or workers (e.g. the “Designated workers for designated skills” provision under the Construction Workers Registration Ordinance). From time to time HKPC may require the Supplier (and its sub-contractors) to demonstrate that all necessary qualification, registration, visas, licenses and permits have been obtained for the lawful employment and engagement of staff, labour and workers in connection with the supply of the Services.**

##### **4.4. Safety precautions**

The Supplier shall comply with the Labour Department's regulations for safety and health. The Supplier shall be liable for, and shall indemnify HKPC against, any expense, liability, loss, claim or proceedings whichever arising under any statute or at the common law in respect of personal injury to or death of any person, or in respect of any injury or damage whatsoever to any real or personal property in so far as such injury or damage whomever arising out of or in the course of or caused by the carrying out of the works.

HKPC premises operate an Occupational Health & Safety Management System (OHSMS) that complies with OHSAS 18001 / ISO 45001 standard.

HKPC is implementing the ‘Hong Kong Productivity Council Occupational Health and Safety Policy’ which can be viewed at the following link. Supplier is welcomed to contact HKPC for any queries or feedback regarding to the Policy as well as the OHSMS.

*[English Version: [https://www.hkpc.org/images/stories/corp\\_info/hkpc\\_ohs\\_en.pdf](https://www.hkpc.org/images/stories/corp_info/hkpc_ohs_en.pdf)]*

OR

*[Traditional Chinese Version:*

*[https://www.hkpc.org/images/stories/corp\\_info/hkpc\\_ohs\\_hk.pdf](https://www.hkpc.org/images/stories/corp_info/hkpc_ohs_hk.pdf)]*

OR

*[Simplified Chinese Version:*

*[https://www.hkpc.org/images/stories/corp\\_info/hkpc\\_ohs\\_cn.pdf](https://www.hkpc.org/images/stories/corp_info/hkpc_ohs_cn.pdf)]*

The Supplier shall be deemed to be aware of the ‘Hong Kong Productivity Council Occupational Health and Safety Policy’ and shall use its reasonable endeavour to prevent injury and ill health resulting from our operations and services,

HKPC manages its various processes fully in accordance with the requirements of the OHSAS 18001/ISO45001 standard, whilst controlling subcontractors’ work processes that affect HKPC’s own services conformity with requirements.

## **5. Insurance**

### **5.1. Employees’ Compensation Insurance**

HKPC shall not be liable for or in respect of any damages or compensation payable at law in respect of or in consequence of any accident or injury to any person in the employment of the Supplier, save and except an accident or injury resulting from the negligence of HKPC, its agents or servants. The Supplier shall indemnify and keep indemnified HKPC against all such damages and compensation save and except as aforesaid, and against all claims, proceedings, costs, charges and expenses whatsoever in respect thereof or in relation thereto. Compliance with the insurance provisions of this clause shall not limit or modify the Supplier’s liability under the indemnity aforesaid.

The Supplier shall insure against such liability with an authorized Insurer in Hong Kong and shall continue such insurance during the whole of the time that any persons are employed by him on the works and shall, when required produce to HKPC such policy of insurance and the receipt for payment of the current premium.

The Supplier's insurance under this clause shall take the form of an Employees' Compensation Insurance Policy complying with the latest requirements of the Hong Kong Employees' Compensation Ordinance and covering this Common Law liability for an unlimited amount during the period of insurance.

## 5.2. Contractors' All Risks Insurance

The Supplier shall indemnify and keep indemnified HKPC against all losses and claims in respect of injuries to any person or damage to any property whatsoever that may arise out of or in consequence of the provision of the Service and against all claims, proceedings, damages, costs, charges and expenses whatsoever in respect thereof or in relation thereto. Compliance with the insurance provisions of this clause shall not limit or modify the Supplier's liability under the indemnity aforesaid.

The Supplier shall insure in the joint names of HKPC and the Supplier against such liability with reputable Insurer in Hong Kong and shall continue such insurance during the whole of the time that any persons are employed by him on the Service and shall, when required produce to HKPC such policy of insurance and the receipt for payment of the current premium.

The Supplier's insurance shall take the form of a third party / public liability insurance policy covering liability for any material or physical damage, loss or injury that may accidentally occur to any property, including that of HKPC, or to any person including any employee of HKPC that may occur during or arise out of the performance of the Contract. A "Cross Liability Clause" shall be extended in the policy.

The limit of liability in respect of such third party / public liability shall not be less than HK\$20,000,000 any one occurrence and unlimited during the period of insurance.

## **6. Protection of properties**

- 6.1. The Supplier shall take every precaution necessary to protect the public from injury or death during the course of works.
- 6.2. The Supplier shall maintain and protect all public properties of public utility companies and bear all costs incurred in making good any damage caused thereto.
- 6.3. The Supplier shall take every precaution necessary to protect adjoining properties from damage and shall bear all costs incurred in remedying damage caused through lack of proper care on its part.
- 6.4. Special precautions should be taken to protect properties of HKPC and its client(s) from damage and the Supplier shall bear all costs incurred in making good all damages caused through lack of proper care on its part.
- 6.5. The Supplier shall maintain all existing roads, footpaths, steps, etc. and reinstate any damage caused by any reason whatsoever during the progress of the works.
- 6.6. It will be the Supplier's responsibility to ensure that the roads leading to and around HKPC and its client(s) premises shall be kept free from obstruction brought about by the works on the site and in no way shall cause any hindrance to traffic or ancillary works either by its own vehicles or by its workpeople, materials, etc.
- 6.7. The Supplier shall be responsible for repairing damage to private streets and access roads if deterioration occurs during the contract period.
- 6.8. The Supplier shall take all necessary steps to restrict the nuisance of dust and noise.

## **7. Handling of Materials and Garbage (if applicable)**

### **7.1. Loading and unloading of materials**

The Supplier shall take every care in the loading and off-loading of materials for the works, ensure that the streets, roads and footpaths are not obstructed or the traffic impeded and conform with the police regulations therewith.



The Supplier shall take all necessary precautions and care to cause minimal disturbances to the occupants and the usual operations of the existing building.

**7.2. Removal of garbage**

The Supplier shall remove garbage at frequent intervals during the progress of the works and HKPC premises shall be left clean and tidy to the satisfaction of HKPC on completion.

**7.3. Treasure trove, coin, etc.**

Any treasure trove, coins or objects of antiquity shall become the property of HKPC and shall be carefully removed by the Supplier and handed to HKPC.

**8. Acceptance**

HKPC is entitled to accept either the whole or any part of the tender at its sole discretion. HKPC is entitled to select any kind of Services / Items under the tender to meet its requirement and is not obliged to accept the lowest price bidder and to give any reasons.

**9. Conditions of Tendering**

- 9.1. No unauthorized alteration or erasure to the text of the tender documents will be permitted. Any tender containing such alteration or erasure may not be considered
- 9.2. No liability will be admitted, nor claim allowed, in respect of errors in the Supplier's tender due to mistakes which should have been rectified in the manner described above.
- 9.3. HKPC is not bound to accept the lowest or any tender it may receive.
- 9.4. HKPC reserves the right to withdraw the invitation before the acceptance of any tender.
- 9.5. HKPC will not be liable for any expenses or losses which may be incurred by the Supplier in the preparation of this tender including any alternative offers.

## **Part II – Technical Specification**

### **1. Obligations of the Supplier**

- 1.1 Subcontracting and / or out-sourcing the works to other sub-supplier(s) without the prior consent from HKPC are not allowed.
- 1.2 The Supplier shall meet all the terms and requirements set out in this tender document.
- 1.3 The Supplier shall warrant that the Service provided will conform to the technical specifications set by the HKPC and will be of merchantable quality and free from defects.
- 1.4 The Supplier shall meet with HKPC to report the progress as required. The meeting venue will be in HKPC.
- 1.5 The Supplier shall provide contract manufacturing service to make a batch of lithium-ion batteries meeting the given specifications.
- 1.6 The Supplier shall be provide contract build service to assemble one battery pack for electric vehicle meeting the given specifications.

### **2. Scopes of Services**

#### **2.1 Introduction**

The Supplier is invited to submit a tender – “Lithium-ion Battery Pack For Electric Vehicle”. The supplier shall provide contract manufacturing of lithium-ion batteries at a dedicated facility. The details of service requirements are denoted as follows.

#### **2.2 Provision of Lithium-ion Batteries**

##### 2.2.1 Specification of the lithium-ion battery

The Supplier shall provide brand new lithium power batteries which is optimized for high drain electric vehicle application. The cells which meets the specifications in Table 1 shall be used to assemble the battery packs. The flexibility in cell capacity is also given as in in Table 1. The batteries shall be manufactured within 1 year from the date of delivery.

Item	Specification / Description	Remark
Shape	Prismatic type with aluminium shell	
Weight	0.5 to 2.0 kg	
Cathode	Lithium Iron Phosphate (LiFePO <sub>4</sub> )	
Cathode current collector	Aluminium foil	
Anode	Graphite based	
Anode current collector	Copper foil	
Internal cell structure	Multi-layer stacking	
Nominal voltage	3.2 V	
Nominal capacity	20 to 80 AH	During standard discharge
Power density	≥ 135 Wh/kg	
Max charge voltage	3.65 V	
Min discharge voltage	2.50 V	
Max internal impedance	0.5 to 2 mΩ	@ 1kHz
Rated charge rate	1C	Continuous
Rated discharge current	1C	Continuous
Peak charge rate	2C	10 seconds
Peak discharge current	3C	30 seconds
Charge – discharge life cycle	≥ 2000	1C charge, 1C discharge, @ 20 °C, remaining SOC ≥ 80%
Operating temperature (charge)	-5 to 50 °C	
Operating temperature (discharge)	-20 to 55 °C	
Storage temperature	-20 to 35 °C	
Compliance standards	GB/T 31485-2015 GB/T 31486-2015	Proof of compliance shall be provided.

**Table 1 – Cell specification of the bespoke li-ion battery**

## 2.2.2 Requirements on quality of the lithium-ion batteries

Definition of test conditions:

Item	Description	Remark
Standard charge	Charge with constant rate: 1C; Charge with constant voltage: 3.65V End of charge: charge current $\leq 0.1C$	@ Standard test environment as defined in this table
Standard discharge	Discharge with constant rate: 1C End of discharge: $\leq 2.5V$	@ Standard test environment as defined in this table
Discharge energy	Integration of discharge power (battery voltage x discharge current) over standard discharge period.	@ Standard test environment as defined in this table
Standard test environment	Temperature: 15-25 °C Relative humidity: 25% to 85% Atmospheric pressure : 86 to 106 kPa	

Table 2 – Definitions of test conditions

Electrical Performance (in standard test environment unless otherwise stated):

No.	Item	Test Methods	Pass Criterion
1	Rated capacity	Charge: standard charge; Rest for 10 minutes; Discharge: standard discharge; Integrate current over time	= Nominal capacity (+2.5%)
2	Large current discharge	Charge: standard charge; Rest for 10 minutes; Discharge: 1.5C discharge; End of discharge: $\leq 2.5V$ ; Integrate current over time	Capacity $\geq 98\%$ of nominal capacity; No observable distortion in dimension, no swelling, no leakage of electrolyte
3	Low temperature discharge performance	Charge: standard charge; Rest for 10 minutes; Store at -20 °C for 20 hours; Discharge: 0.5C at 0 °C to 2.5V; Integrate current over time; Rest for 2 hours	Capacity $\geq 75\%$ of nominal capacity; No observable distortion in dimension, no swelling, no leakage of electrolyte

4	High temperature discharge performance	Charge: standard charge; Rest for 10 minutes; Store at 50 °C for 5 hours; Discharge: 0.33C at 50 °C to 2.5V; Integrate current over time; Rest for 2 hours	Capacity $\geq$ 98% of nominal capacity; No observable distortion in dimension, no swelling, no leakage of electrolyte
5	High rate discharge safety	Charge: standard charge; Rest for 10 minutes; Discharge: 3C for 30 seconds; Record the battery temperature over time	Surface Temperature $\leq$ 60 °C No observable distortion in dimension, no swelling, no leakage of electrolyte
6	High rate charging safety	Discharge: standard discharge; Rest for 10 minutes; Charge: 2C for 30 seconds; Record the battery temperature over time	Surface Temperature $\leq$ 60 °C No observable distortion in dimension, no swelling, no leakage of electrolyte
7	Charge retention capability	Charge: standard charge; Store for 28 days; Discharge: standard discharge; Integrate current over time	Capacity $\geq$ 95% of nominal capacity; No observable distortion in dimension, no swelling, no leakage of electrolyte
8	Cycle life	Charge: standard charge; Rest for 10 minutes; Discharge: standard discharge; Integrate current over time; Repeat the above steps until capacity $\leq$ 80% of nominal capacity;	Cycle life $\geq$ 2000 times No observable distortion in dimension, no swelling, no leakage of electrolyte

Table 3 – List of electrical tests

HKPC will choose 2 samples from the same batch of batteries then conduct the above tests on the chosen cells.

## 2.3 Provision of Battery Pack & Testing Services

The Supplier shall be responsible for design & manufacturing of two sets of battery packs which consists of eight separate pack for two electric vehicles following the specification given below.

Item	Specification	Unit
Pack dimension	892 x 442 x 385	mm
Battery capacity per vehicle	160	AH
Total battery pack energy	86 - 88	kWh
Nominal pack voltage	537.6	V
Maximum continuous discharge current	150	A
Maximum continuous charge current	80	A
Weight per pack	≤ 200	kg
Thermal management	Natural cool & PTC battery heater	
Operating temperature (charge)	-5 to 50	°C
Operating temperature (discharge)	-20 to 55	°C
Enclosure protection	IP67	
Compliance standard	GB/T 31467.3-2015	

**Table 4 – Battery pack specifications**

The pack design shall take the following factors into consideration:

- Good thermal performance in all weathers;
- Vibration proof in automotive environment;
- Provide thermal partition to counter thermal propagation in case of partial fire;
- Proper use of safety vents for pressure release in case of accident;
- Reduce overall weight to increase energy density of battery pack

### Specification of Battery Management System

The Supplier shall be responsible for customizing the BMS for the specified electric vehicles including configuration and programming CAN communication to integrate into vehicle network.

Item	Specification	Unit
Accuracy of cell voltage	≤ 5	mV
Accuracy of battery current	≤ 1	%

Number of temperature points	$\geq 16$	Points
Cell balancing current	Passive: $\geq 0.5$ or Active: $\geq 1$	A
SOC algorithm	Current integration based with reference to battery model and open circuit voltage	
SOC accuracy	$\leq 5$ under all circumstances	%
EMC compliance	GB 14023-2006 GB 18655-2002 GB/T 17619	

**Table 5 – BMS specifications**

All the necessary components including BMS (Battery Management System), wire harness, high voltage distribution network, terminals, sensors, mountings, thermal materials and cooling system which is installed inside the battery pack shall be procured or custom made by the Supplier for two electric vehicles.

## **2.4 Homologation Tests of Battery Packs**

The Supplier shall obtain homologation of the battery pack for EV from a CNAS (China National Accreditation Service for Conformity Assessment) accredited certification body in China. The Supplier will be liable for providing the required number of battery packs to the certification body. Should the first attempt of homologation fail, the Supplier shall provide improved battery packs until all test items are passed.

Compliance standard	GB/T 31467.3-2015
	Thermal Propagation Energy Density – The latest requirement by the “Ministry Of Industry and Information Technology Of People's Republic Of China (中华人民共和国工信部)”. For example 工信部装[2016]377 号文 《电动客车安全技术条件》

**Table 6 – Homologation tests to pass**

The Supplier shall bear all costs of assembling the required battery packs, submission of test samples, conducting the tests and certification. The battery packs which is delivered to HKPC must be of the same design (including hardware and software) and material as the homologated samples.

## 2.5 Quality warranty of the batteries & battery pack

Given the batteries are stored and used in The Supplier shall provide 3 years of warranty for the batteries against manufacturing defects and material impurities including but not limited to: swelling, leakage of electrolyte, excessive self-discharge, fire & explosion.

In case of violation of battery quality warranty, the faulty batteries shall be replaced by the Supplier with equivalent lithium-ion batteries. In case of violation of battery pack quality warranty, the Supplier shall be liable for on-site repair in Hong Kong or mainland China including parts and labour.

## 2.6 High Power DC/DC Converters

Two high power non-isolated DC/DC converters are required for charging the battery packs in section 2.3. The input is a separate DC power source (not included in this tender) with a nominal voltage of 100V. The DC/DC converters shall be able to operate in these modes including: constant voltage, constant current and constant power. The DC/DC converters shall be controlled via CAN 2.0 communication interface.

The required specifications are listed below:

Item	Specification	Unit
Input voltage	60 to 150	VDC
Output voltage	300 to 600	VDC
Rated output power	$\geq 15$	kW
Maximum output power	$\geq 16.5$	kW
Maximum input current	$\geq 150$	A
Thermal management	Forced air or liquid cooled	
Operating noise	$\leq 66$	dB(A)
Dimension	$\leq 760 \times 510 \times 290$	mm
Operating temperature	-25 to +40	°C
Storage temperature	-25 to +70	°C
Enclosure protection	IP54	
Compliance standard (or new version is acceptable, Supplier need to specify in their proposal)	IEC 61287-1-2014 IEC 61373-2010 GB/T 25119-2010 IEC 60077-1-1999 IEC 60529-2013	



	GB/T 2423.1-2008	
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Table 7 – Specifications of DC/DC converter

## 2.7 Deliverables

The Supplier is required to provide the following deliverables:

- Two sets of battery packs (eight packs) meeting the specifications & standards in table 1, 4 & 5. The battery pack shall be delivered within November 2019.
- Two units of DC/DC converters meeting the specifications in table 7.
- The delivery address is:

湖北省荆州市荆州开发区恒隆路 1 号

- Quality warranty service for the above deliverables for 3 years.

## 3. Information to be provided by the Supplier

### Compliance and Technical Requirement

The Supplier is mandatory to complete and be fully compliant to meet the minimum requirements as set out in Section 3.1 - General compliance requirements.

### 3.1 General compliance requirement

No.	Description / Requirement	Comply (Yes / No)
1	The Part I - General Specifications of Tender are fully understood and accepted.	
2	Statutory Compliance – The Supplier shall ensure full compliance in accordance with the laws of the Hong Kong Special Administration Region.	
3	The scope of Services that stipulated in Section (2) of Part II- Technical Specification is fully met, including the contents and delivery schedules of the deliverables.	
4	Three year warranty service period	

### 3.2 Technical assessment

A total score of 100 will be assigned in this technical assessment. Only tender(s) scoring more than 60 will be eligible to enter fee assessment. The technical assessment includes three sections: I) Supplier profile and II) Engineering information. In “Supplier profile”, Supplier and its sub-contract company background and track record of battery manufacturing experience will be assessed. In “Engineering information”, Supplier will be assessed with their understanding on the project scope, project deliverables and implementation plan.

	Criteria		Remarks
I)	<b>Supplier profile</b>		<b>40 marks</b>
	a)	Provide company information including background introduction, year of establishment, size, R&D team and know-how in li-ion battery or EV powertrain. Experience of mother company or subcontractor company will be considered if any. (full mark: 10 marks)	
	b)	Provide the names of at least 3 largest clients around the world in recent 3 years. Please elaborate the project or product details delivered to these 3 clients. Experience of mother company or subcontractor company will be considered if any. (full mark: 10 marks)	
	c)	Provide track record of power lithium-ion battery and battery pack for EV or energy storage in past 3 years. Experience of mother company or subcontractor company will be considered if any. (full mark: 10 marks)	
	d)	Provide the list of project manager(s) and professional staff(s) involved in this project. Elaborate their title, years of relevant working experience, competence area. Experience of mother company or subcontractor company will be considered if any. (full mark: 10 marks)	
II)	<b>Engineering information</b>		<b>60 Marks</b>
	a)	Provide the datasheet of power li-ion battery using lithium iron phosphate (LiFePO <sub>4</sub> ) as cathode. If this is not available, li-ion battery using other types of cathode material can also be considered. (full mark: 10 marks)	

	Criteria		Remarks
	b)	Provide a test report of similar power li-ion battery & pack from a credible third party testing laboratory. The relevant compliance standards include: GB/T 31486-2015, GB/T 31467.3-2015 (full mark: 15 marks)	
	c)	Provide a short summary to describe the safety technologies of the li-ion battery pack including design technique & thermally partitioned structure. (full mark: 15 marks)	
	d)	Demonstrate the capability of battery pack design by providing a 3D layout of cells (537.6V & 160AH) inside a battery pack. Describe the safety devices of the BMS and battery pack. (full mark: 10 marks)	
	e)	Provide the specifications of DC/DC converter. (full mark: 10 marks)	
	<b>TOTAL</b>		<b>100 points</b>

#### 4. Tender Evaluation

4.1 The items in Section 3.1 - General compliance requirement is mandatory to be completed by Supplier. Full compliance is required, otherwise the submitted tender proposal may not be considered further.

4.2 A total score of 100 will be assigned in Section 3.2 – Technical assessment. Only tender(s) scoring more than 60 will be eligible to enter the fee assessment. HKPC reserves the right to request tender(s) for an interview for further evaluation on the technical competence and project experience when necessary.

4.3 The technical to fee assessment weight will be 40% and 60% respectively.  
Example of the calculating method is as follows:  
Scores obtained in Technical Proposal: 75 (which is the 2nd highest, the highest is 80)  
Fee offered in Fee Proposal: HK\$ 1,600,000 (which is 2nd lowest, the lowest is HK\$ 1,200,000)

Technical Proposal:  $75/80 \times 40 = 37.5$

Fee Proposal  $\text{HK\$}1,200,000/\text{HK\$}1,600,000 \times 60 = 45$

Total scores obtained:  $37.5 + 45 = 82.5$

4.4 In principle, HKPC may select one tender with the highest total scores from technical proposal and fee proposal. However, HKPC reserves the right to accept the whole or part of the tender and is not bound to accept the highest scores or any tender.

4.5 Tentative schedule

It is a tentative schedule of the tender process. However, HKPC reserves the right to change the schedule to suit its operation need.

Items	Tentative Schedule
Tender Posting	16 May 2019
Tender Q&A Submission by Supplier	21 May 2019
Posting of Q&A Reply from HKPC	22 May 2019
Tender Closing	12:00 noon, 30 May 2019
Tender Evaluation	Late May
Tender Award / Issue Purchase Order	Late May/Early June
Delivery of lithium-ion batteries and battery pack	November 2019

5. All documents / materials submitted to HKPC will not be returned.

### Part III – Fee Specification

Please submit “Fee Proposal” with **one set of original documents, one set of duplicate documents** and **one soft copy on CD ROM/USB Flash Drive**, which should be sealed in separate plain envelope.

The Supplier shall complete the tables below to show the prices / fees for the provision of the Services / the Items. All other associated costs shall be specified (if any).

#### 1. Prices

Item	Description	Qty.	Unit Price	Total Price
1	<b>Provision of Li-ion Battery Packs;</b> (requirement as stipulated under Section 2.2 & 2.3 of Part II - Technical Specification)	2 sets		
2	<b>Provision of Homologation Service;</b> (requirement as stipulated under Section 2.4 of Part II - Technical Specification)	1 Job		
3	<b>Provision of DC/DC Converter;</b> (requirement as stipulated under Section 2.6 of Part II - Technical Specification)	2 sets		
4	<b>Warranty</b> 3 year warranty from Successful User Acceptance Test (as specified in Section 2 of Part II - Technical Specification)	1 Job	Included	Included
5	Trade Term Delivery Duty Paid (DDP) to Guangdong China including with insurance coverage	1 Job	Included	Included
6	Premium for insurance as required in Section 5 of “Part I – General Specification”	1 Job	Included	Included

	Note: Insurance under statutory requirement and tenderer's existing policy cover should not be charged.			
7	Others, if any (Please specify)			
Grand total:				
Please specify currency:				

## 2. Payment Term

Please state your acceptance of our payment term in below table.

Description	Acceptance
Net 30 days against invoice by direct credit or T/T after completion of goods / services delivery supported by HKPC's acceptance	Yes / No (If no, please specify)

## 3. Validity of Quoted Prices

The offer provided above shall be valid from date of tender submission to the end of the tender appointment period. No change shall be made without the prior consent of HKPC.

Remarks:

The submitted fee proposal must comply with the submitted technical proposal in accordance with those requirements set by HKPC in "Part I – General Specification" and "Part II –Technical Specification".