Table 3-4: Procurement of FCBs – Challenges and Best Practice Solutions.

Challenges	Best Practice Solutions
1. Developing Tender Documents	
• Design and specification of tender document: Lack of mutually recognised guidelines for technical specifications for FCBs (standardisation); e.g. concerning fuel consumption • Joint Procurement: Specifying the buses so that they meet the requirements of all the partners/sites involved • Project Requirements: Complying with the rules of third party co-funded project created some difficulties • Sticking to Tender Laws while procuring a new technology in an immature market environment • Ability to Collect Operating Data from the Buses i.e. to integrate new data streams of 'electrical machines on wheels' into PTO's regular IT system, including for determining state of health / monitoring of batteries (as for BEBs)	• Put responsibility into the hands of the PTO to undertake the purchase through normal purchasing arrangements. They have both leverage with suppliers and understanding of their own operating requirements • Preferably work in with a PTO's investment cycle and be prepared to support them with advice on where to source information about the new technology • Consider using an existing framework for Joint Procurement from an experienced site as a template/starting point for defining e.g. bus specifications, order process and terms & conditions • Negotiation and communication with suppliers are critical throughout the tender process; due to lack of experience in this area, the purchaser is reliant on the suppliers to validate assumptions and provide input as to the most efficient way to procure the FCB, particularly with respect to the supporting services (maintenance & training); use an RFI process • Address data collection/data provision thoroughly (see learnings documented in Section 4) In the event of starting a Joint Procurement with another site(s) with a similar context and requirements (i.e. generally NOT across national boundaries): • Partners need willingness to compromise on common bus specifications. • Appoint a single coordinator for discussions and later negotiations with suppliers. • Using a contract framework to be used by the joint tenderers is the best approach as they specify the contract conditions before tendering - once these are in place, the contracts are relatively simple to put in place • It is critical to develop a framework that is scalable and allows for all interested cities to use it, as it provides suppliers with a level of security over the volume of buses to be procured despite the non-committal nature of a framework

Table 3-4: Procurement of FCBs – Challenges and Best Practice Solutions (continued).

2. Selecting Supplier	
• Lack of Competition/Supply: Manufacturers unresponsive to tender (tenders of under ten vehicles seem to struggle attracting interest); purchaser at a disadvantage; delivery time negotiations can be difficult • Matching proposal specifications with tender specifications: Technology offered not meeting expectations, e.g. buses equipped with a combination of fuel cell and battery with insufficient power to cope with operation in a hilly environment • Suppliers offering different prices in different locations for similar sized orders, because of factors related to the bus specifications, including liabilities, warranty and damages, and the ease of providing maintenance services. • Maintenance costs can increase significantly after around the third year of operation, due to increasing replacement/refurbishment costs of some components. • Evaluating responses requires expertise in H_2/fuel cell technology	• Good communication with suppliers and flexibility to negotiate are critical throughout the tender process • Negotiate add-ons once manufacturers have placed bids • Some manufacturers more able/willing, to lower prices in response to scale • Source expertise on the innovative aspects of the technology – experienced sites may be able to assist with this
3. Developing Contracts	
• Lack of Competition/Supply: Price negotiation; delivery time negotiation; suppliers' side can dictate the negotiations/conditions • Lack experience in procuring FCBs: Technical and legal details • Joint Procurement: Contract needs to allow for multitude of variations on the service offering which increases risk to suppliers; multiple stages of review required prior to suppliers accepting the framework and call-off terms as well as agreeing roles and responsibilities in terms of risk • Fuel Cells: Reassurance needed that FC stacks will last	• Absolute clarity is required between all parties on outcomes wanted and compliance with tender/contract details especially where there are sub-contractors involved • Specify maintenance: set expectations for timeliness and expertise, define contracts, assign responsibilities (PTA/PTO/supplier); a full maintenance contract in the early years can be helpful for the PTO • Include a requirement to work with HRS supplier • Models of 'fuel cell as a service' where bus manufacturer/component supplier agree to replace FCs for free if there is unplanned damage are being explored, as is separating the FC warranty from the other parts of the vehicle