Checklist – Themes for End-of-Life EV Battery Energy Storage Systems

Introduction and purpose of the checklist

This checklist provides an overview of the main stages and themes for establishing a joint procurement between municipalities for end-of-life Electric Vehicle (EV) battery energy storage systems (BESS). The purpose is to guide coordinators and participating organizations through the process of establishing, implementing, and considering key aspects at each stage.
For the pre-analysis phase (1) and the technical and economic evaluation themes (4) some questions for market inquiry with potential tenderers and some relevant requirements and criteria to be used can be found from the checklist of the single-buyer model.

1. Pre-analysis: Needs Assessment

Before launching a joint procurement, participating parties must clearly define the strategic goals and intended functions of their energy storage systems. This phase involves evaluating specific use cases such as peak shaving, backup power, or optimizing solar energy integration. Additionally, organizations must make foundational technology choices, such as prioritizing circularity through second-life EV batteries or opting for new lithium-ion systems. Establishing these requirements early ensures the project aligns with the technical and storage capacity needs of all stakeholders.

Needs assessment

Action	Explanation
Define Purpose	Determine if the system will be used for peak shaving, backup power, solar energy optimization, or participation in the frequency reserve market.
Select Technology	Decide between second-life EV batteries (prioritizing circularity) or new lithium-ion batteries
Specify Capacity	Define the required power output (kW) and storage capacity (kWh).

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2. Organization of Joint Procurement

The success of a multi-organizational project depends on a well-defined leadership structure and a clear contractual framework. This section outlines how to designate a lead municipality or external coordinator to manage the collective responsibilities of the various procurement units. Participants must also decide between utilizing a single joint contract or separate contracts that share standardized terms. Furthermore, a price equalization mechanism should be established to mitigate risks from price fluctuations during the 24-month procurement period.

Organization of procurement

Action	Explanation
Assign Lead Responsibility	Designate a lead municipality or an external coordinator.
Define Roles	**Establish the responsibilities of the various procurement units involved.**
Select Procurement Model	**Choose between a joint contract or separate contracts with shared terms.**
Set Price Equalization Mechanism	**Plan for serial procurement within a 24-month period. Ensure the final price is determined after the last delivery to minimize risks from price fluctuations.**

3. Market Dialogue (Pre-tendering Phase)

Engaging in a formal market dialogue allows procurement lead to assess the current readiness and technical capabilities of potential suppliers. These inquiries help verify critical performance metrics, such as the maximum power output and the documented State of Health (SoH) of the battery modules. It is also an essential stage for identifying necessary safety barriers, including integrated fire detection and thermal management systems. Gathering this information enables the formulation of realistic and robust requirements for the final tender.

Market dialogue

Action	Explanation
Assess Capacity	Query the maximum power output (kW) and storage capacity (kWh) offered.
Verify State of Health (SoH)	**Ask for documented SoH (%) of battery modules at the time of delivery.**

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	Requirement Formulation: "The battery system must have a documented SoH of minimum [insert %] at delivery".
Review Safety Systems	**Identify integrated safety barriers (e.g., fire/gas detection, cooling systems). Requirement formulation: "The system shall include integrated fire detection and thermal management systems".**

4. Technical and Economic Evaluation Criteria

Evaluating a battery energy storage system requires a comprehensive look at its total life cycle cost and its environmental impact. This section details how to use Life Cycle Cost (LCC) calculations and Environmental Product Declarations (EPD) to compare different bids effectively. Key circularity factors are also prioritized, such as ensuring the system's design allows for the easy disassembly and replacement of individual modules. Finally, bidders must provide documentation regarding the estimated remaining charging cycles to guarantee the system's longevity.

Evaluation criterias

Criteria	Explanation
Life Cycle Cost (LCC)	Use LCC calculations (similar to biogas truck assessments) to evaluate total ownership costs.
Calculate Climate Footprint	Require Environmental Product Declaration (EPD) or Life Cycle Assessment (LCA) documentation.
Circularity & End-of-Life	Recycling: Require a description of how modules will be handled and recycled at end-of-life, including a responsible operator. o Design for Disassembly: Ensure the system enables the replacement of individual modules (modular design). o Remaining Lifetime: Document estimated remaining charging cycles in equivalent full cycles.

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5. Award Criteria for Cost Efficiency

To ensure the best value for money, the award process focuses on a combination of total cost of ownership and superior technical performance. Proposals are evaluated based on submitted LCC calculations that cover procurement, operations, and the expected lifetime of the system. Higher scores may be awarded to bidders who exceed minimum requirements for usable capacity or provide stronger guarantees for charging cycles. This structured approach incentivizes suppliers to offer high-quality, long-lasting energy solutions.

Awarding criterias

Criteria	Verification requirements
Evaluation based on total LCC (procurement, operations, and expected remaining lifetime).	LCC calculation submitted by the bidder.
Award for higher remaining lifetime in equivalent full cycles than the minimum requirement.	Documentation of cycles and guarantee statement.
Award for higher usable capacity (kW/kWh) than the minimum requirement.	Technical specification of current usable capacity.

6. Contracting and Tendering Phases

This section bridges the gap between pre-tendering market insights and the formal request for proposals. It emphasizes utilizing the data gathered during market dialogues to refine technical requirements and finalize evaluation criteria. By aligning the contract's scope with market capabilities, organizations can ensure a more competitive and accurate bidding process. This phase is critical for translating strategic goals into legally binding technical specifications.
Market dialogue questions and some relevant questions and requirements for technical evaluation can be found in annex 1 as part of the single buyer concept.

Pre-tendering through market dialogue

- Market dialogue questions and themes
- Definition of technical requirements
- Request for proposals and evaluation criteria

7. Implementation and Contractual Follow-up

Once a contract is awarded, ongoing monitoring is necessary to maintain the system’s performance and transparency over time. Suppliers are required to provide annual reports on the battery's State of Health (SoH) and its remaining usable capacity. The framework also ensures that maintenance protocols are in place so that defective modules can be replaced throughout the contract period. Tracking these indicators allows the participating municipalities to verify energy savings and manage long-term maintenance costs effectively.

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Include relevant follow-up mechanisms in the contract to maintain performance and transparency.

Follow-up mechanisms

Mechanism	Explanation
Annual Reporting	Supplier must report remaining usable capacity and operational performance annually.
SoH Reporting	Supplier must report the documented State of Health (SoH) annually.
Maintenance	Ensure replacement of defective modules is possible throughout the contract period.
Monitoring Indicators	Track delivery schedules, installation, energy savings, and maintenance costs.

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