Procurement of Utility Scale Storage

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Energy Storage Procurement Framework

Source: Global Energy Storage Alliance, A Framework for Utility Procurement of Energy Storage
https://www.strategen.com/reports-1/2017/10/3/a-framework-for-utility-procurement-of-energy-storage-lessons-learned-from-leading-utilities

Needs Assessment

1. **Clearly identify the primary procurement needs. Examples:**
   - Meeting a regulatory mandate
   - Add capacity (e.g., resource adequacy)
   - Distribution upgrade deferral

2. **Identify key stakeholders within your organization**
   - Commercial, legal, risk and valuation expertise
   - Interconnection requirements, rates and tariffs, market rules

3. **Identify specific details about location, desired attributes, use cases, etc.**

Source: Global Energy Storage Alliance https://www.strategen.com/reports-1/2017/10/3/a-framework-for-utility-procurement-of-energy-storage-lessons-learned-from-leading-utilities

Request for Offer (RFO) Design

1. **Design the RFO to achieve your objectives.**
   - A narrowly-defined RFO yields a precise set of solutions
   - Less-defined RFOs allow for more innovation and a wider set of offers, but may require more review
2. **Clearly define the roles for internal stakeholders**
   - Set external market expectations
3. **Choose a one-step or two-step RFO**
   - **One-step:** effective if you have a narrowly-defined need
   - **Two-step:** 'short-listed' offers proceed to a second round for further vetting and competing
4. **Strike a balance between defining a product and allowing for creativity**

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Energy Storage Ownership Models

- **Start by considering two simple cases**

1) **Full Utility Ownership:** The utility owns and operates the resource after it is built. The utility takes on risks and captures benefits from operating the resources.
2) **Independent Power Producer (IPP) model:** An IPP fully owns and pays for the energy storage resources. It can monetize the resource by providing grid services.

- **In Practice, many configurations of financing and ownership may be used**

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Examples of Energy Storage Ownership and Contracting Models

Contract	System Owner	Description
Capacity Agreement	Third-party	This IPP model involves a long-term contract with the utility for the 'capacity value' of the resource. In California, SCE purchased much of its BTM assets using a contract that just paid for system capacity (i.e., Resource Adequacy) and required the system to bid into the market at certain times ("must offer obligations"). The project owner is responsible for any merchant pricing revenue/risk for wholesale market participation.
Contract for Differences	Third-party	This IPP value helps manage costs by reducing risks for the IPP. This model has been used in organized wholesale markets (such as NY-ISO) where a certain revenue threshold is necessary to enable a project to be 'in the money'. These contracts set a revenue threshold for a project to be financeable, whereby the difference between actual revenues and the threshold revenues will be paid for by the buyer (if spot prices are lower) or reimbursed by the seller (if spot prices are higher).
Hybrid Wind/Solar + Storage PPA	Third-party	In certain markets such as Hawai'i, hybrid renewables/storage projects are covered under a single power purchase agreement (PPA) that requires certain characteristics (such as ramp rate controls) but are otherwise structured very similarly to a renewable energy PPA. Investment Tax Credit (ITC) eligibility is a key consideration for hybrid agreements.
Owners Engineer/ Hybrid	Utility	A structure in which the utility is more engaged in the project development process than a Turnkey contract, but leverages the technical and subject matter expertise of a third-party "Owners Engineer" to ensure a successful project.
Sale-leaseback	Utility / Third-party	A structure in which a reliability provider purchases a storage asset to provide reliability services, then leases back the device to the developer for an agreed upon period for use as a market asset. It is most likely to be used in wholesale markets where reliability providers may differ from bulk generator owners.

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Examples of Energy Storage Ownership and Contracting Models

Contract	System Owner	Description
Tolling Agreement	Third-party	This structure provides fixed capacity and variable O&M payments for utilityscheduled/operated storage, subject to price reductions for reduced availability, capacity and/or efficiency of the project. Utilities directly dispatch the asset and cover the economics of energy procurement and sale, but the developer would operate and maintain the asset.
Turnkey	Utility	The most straightforward arrangement, where a utility completes a turnkey purchase of an energy storage asset from a developer/integrator/EPC at an agreed upon price at commercial operational date. This will virtually always come with system performance guarantees, and may also come with an O&M agreement with the developer.
Utility as System Integrator	Utility	Similar to the Turnkey arrangement, but the utility acts as the System Integrator and manages construction, installation, and the balance of plant and storage vendors.

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Key Information to Include in a Request for Information (RFI) or Request for Qualifications (RFQ)

- Professional Background and Company Financials
- Technology Preferences
- Energy Storage Project Development Experience
- Performance Characteristics and Guarantees
- Cost Estimates (current and future)

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Common Bid Evaluation Criteria for Energy Storage Applications

	Technical	Financial / Contractual	Operational
Primary	• Capacity and Energy (MW and duration) • Depth of discharge • Round trip efficiency (%) • Maximum charging power (MW) • Technology type/class	• PPA price • Performance guarantees	• Permits and approvals • Maintenance requirements
Secondary	• Discharge ramp rate (MW/min) • Charging ramp rate (MW/min)	• Warranty • Maintenance costs • Contractor success record	• Time availability • Forced outage rate • Contractor's previous experience
Tertiary	• System degradation (%/yr) • Self discharge rate	• Method of termination • Invoicing and payment method • ROFO on defaulted debt	• Size profile • Actionability of response

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Contracting Best Practices

- **Repair & replacement rights:** Due to the changing nature of technology, repair and replacement rights for third-party operators generally are more liberal than conventional agreements (provided contract capacity and other key characteristics don't change)
- **Long-term service agreements:** Specialization of equipment requires specialized skills and replacement parts that third parties may be best suited to provide
- **Termination dynamics**: Subjectivity of termination rights must be closely weighed against financeability concerns given that storage technology is in a deflationary cost cycle
- **Testing & operations:** Requires substantial consideration due to early stages of industry
- **Tax issues:** Can be unique due to incentives and subsidies, particularly if paired with solar PV

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Context-specific considerations

- **Obtaining regulatory approval**
  - When does the regulatory approval process begin? RFO or earlier?
  - What stakeholders need to be involved to ensure successful approval?

- **Flexible contract management**
  - Will modifications be needed to accommodate changing market rules or regulatory changes?
  - Do you have the tools to monitor performance with the contract terms?

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Questions for discussion

- Are there existing policies or strategies in your current procurement process for storage?

- Identify the key stakeholders that are (or would be) engaged in this process?

Thank you!

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