

Division of Responsibilities

This document further describes the division of responsibilities between contracting entities and details expectations for deliverables and detailed scope within. Parties should review in depth and provide comments to the right columns as appropriate.

The BESS Contractor will be responsible for BESS Supply and EPC.		BESS Supply	EPC	Owner	
Section	Description	BESS Supplier	EPC	Owner	Bid clarifications, Notes
A	DESIGN - ELECTRICAL				
A1	ENERGY STORAGE EQUIPMENT				
A1.1	ESS SUBSYSTEM	X			
	Battery racks with modules and battery management system				
	Battery enclosure design / specification				
	Battery management system (BMS)				
	Battery thermal management system				
	Fire monitoring, alarm and suppression systems				
	Battery + PCS+converters local controller				
	UL 9540 Listing				
	UL 9540A cell, module, unit, installation level test reports				
	FMEA for enclosure complying with IEC 60812				
	Fire Risk Assessment (enclosure)				
	Battery Installation Manual				
	Information on TRM System				
	Information on BMS				
	Operations and Maintenance Manual				
	NFPA 69/68 Calculations				
	Emergency Operating Procedures				
	BESS Commissioning plan, procedure, checklist, and reports				
A1.2	DC DISTRIBUTION, WITHIN ESS SUBSYSTEMS		X		
	DC combiner system - including disconnect switch, over current protection, busbars, ETC				
	DC Grounding, Insulation monitoring and protection				
	DC collection cables - battery racks to enclosure points of connection				
	DC collection cables - ESS enclosures to PCS				
	DC metering				
A1.3	POWER CONVERSION SYSTEM		X		
	Inverter				
	Inverter transformer				
	DC and AC fusing, contactors and other required protection and safety.				
	Low voltage cables or bussing - inverter to inverter transformer, if applicable				
	Installation Manual				
	Operations and Maintenance Manual				
A2	ELECTRICAL SYSTEMS				
A2.1	ENERGY MANAGEMENT SYSTEM (EMS) / POWER PLANT CONTROLLER (PPC)	X			
	EMS Mechanical layout, elevation design, BOM of site level EMS equipment				
	EMS Electrical design, power distribution design of site level EMS equipment including the load and any battery backup requirements for equipment				
	EMS Networking design and port designation				EMS to determine responsibility for overall networking design ownership
	EMS Cybersecurity, remote site access, ISP, Cellular Backup including firewalls and other network security requirements and design				Owner / EMS to determine responsibility for cybersecurity responsibility and ownership including management of ISP, backup cellular connection and remote site access design and ownership
	EMS Mechanical layout, elevation design, BOM of EMS field / unit equipment				If applicable
	EMS Electrical design, power distribution design, and load requirements of EMS field / unit equipment				If applicable
	EMS Fiber field design, equipment BOM, fiber type, patch cables, termination details, splicing requirements (if applicable)				If applicable
	EMS FAT / FIT Testing plans, procedures, and reports				If applicable
	EMS Commissioning plans, checklists, procedures, and reports				
	EMS HMI design, operations manual, and user manuals				

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	EMS Control Narrative / Scheme				Can be in conjunction / incorporated into the overall plant control narrative if a separate narrative is completed by the PPC
	EMS and substation RTU / RTAC Integration including substation devices				If applicable
	EMS and Local Controller Integration Plan				If applicable
	EMS Utility Telemetry Verification				If applicable
	EMS Software, licenses				
	EMS and Site communications conductors, raceways, switches, media converters, etc.				
	Enclosures, panels, racks or similar EMS structures				
	Modification to existing automation system				If applicable
	Main Fiber Patch Panel design, specification, BOM, drawings, terminations, splicing				If applicable
A2.2	SITE LEVEL FIRE ALARM CONTROL SYSTEM		X		
	Mechanical, electrical, and conduit design of site Fire Suppression System including BOM				
	Piping design of Fire Suppression System				
	Network design of Fire Suppression System				
	Fire Suppression System points list				by Integrator
	SCADA Integration of Fire Suppression System				by Integrator
	Emergency Response Plan				
	Hazard Mitigation Analysis complying with NFPA 855 (HMA)				
	Fire Suppression System commissioning plan, procedure, checklist, and report				
A2.3	SITE MEDIUM VOLTAGE PROJECT DISTRIBUTION SYSTEM		X		
	Power poles, overhead lines, transitions and/or connection to sub-station				
	MV circuit breakers and disconnect switch				
	Revenue or Owners power meters; Protection relays, Remote Terminal Units, substation IO, Satellite clock and associated antenna, substation RTAC				The EMS will need a dedicated controls / "Owners" meter(s) for system monitoring and closed-loop power control.
	Grounding transformer, NGR, or other necessary grounding equipment (if needed)				
	Station auxiliary power, transformer, distribution				
	Grounding transformer system, if needed				
	Underground MV conductors, raceways, pull structures, etc.				
	MV Grounding, studies, requirements, design and components				
	Lightning protection, arrestors and grounding				
	Site master controller				Provides interfaces between outside control / dispatch, sub-station protection devices, ESS system controller, Fire Master Control Panel, etc.
	Protection and Control - includes testing and commissioning				
	Substation automation, programming and testing				
	Communications services from outside supplier				
	Utility metering				
A2.4	LOW VOLTAGE AUXILIARY, STATION and PROJECT POWER SYSTEMS		X		
	Station auxiliary transformer, feeder, primary protection				
	Low voltage switchboards and distribution				
	Transfer switches and generator connection points, if used				
	Underground LV conductors, raceways, pull structures, etc.				
	Connection to and termination at ESS equipment				
	Auxiliary power to EMS Field equipment				If applicable
	Auxiliary power to MET Station				If applicable
A2.5	PROJECT LIGHTING and SECURITY		X		
	Cable raceways, Structures				
	Lighting studies and submittals, as necessary				
	Light fixtures and controls				
	Security cameras for required coverage; Night / IR capable; Wired or wireless				
	Light and camera system mounting and/or poles and foundations				
	Security camera / door access integration into SCADA system				
	Security system HMI / Integration into PPC/HMI				If applicable

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B	PROCUREMENT - ELECTRICAL				
B1	ENERGY STORAGE EQUIPMENT				
B1.1	BATTERY SYSTEM	X			
	Battery racks with modules and battery management system				
	Battery enclosure				
	Battery Control System (BCS)				
	Fire monitoring, alarm and suppression systems				Some elements of the FA system will come with the BESS units; Contractors to coordinate with BESS FA, and provide FA Control Panel, protection required in sub-station area, control rooms and all other required elements.
B1.2	DC DISTRIBUTION AT ESS SUBSYSTEMS		X		
	DC combiner system - including disconnect switch, over current protection, busbars				
	Ground detection relaying for ungrounded DC system				
	DC Grounding, Insulation monitoring and protection				
	DC collection cable/bus - battery racks to enclosure points of connection				
	DC collection cable/bus - ESS enclosures to PCS				
B1.3	POWER CONVERSION SYSTEM	X			
	Inverter				
	Inverter transformer				PCS transformer dependent on make/model of PCS
	DC and AC fusing, contactors and other required protection and safety.				
	Low voltage cables - inverter to inverter transformer				
B2	ELECTRICAL SYSTEMS				
B2.1	ENERGY MANAGEMENT SYSTEM (EMS) / PLANT CONTROLLER	X			
	EMS processors, servers, enclosures, power supplies and all other required hardware				
	EMS Software, licenses				
	Enclosures, panels, racks or similar EMS structures				
	EMS and Site communications conductors, raceways, switches, media converters, etc.				
	Substation automation, protection, control, programming and testing				
	Communications services from outside supplier				Contractor to provide and install within Project area, to main point of entry (MPOE) / point of demarcation. Owner to coordinate and provide service to project MPOE.
	Modification to existing automation system				
B2.3	SITE MEDIUM VOLTAGE PROJECT DISTRIBUTION SYSTEM		X		
	Power poles, overhead lines, transitions and/or connection to sub-station				
	MV reclosers, circuit breakers, fusing and/or disconnect switch structures at grid / station				
	Revenue or Owners power meters; Protection relays, Remote Terminal Units				
	Grounding transformer or other grounding equipment like NGR (if needed)				
	Station auxiliary power, transformer, distribution				
	Grounding transformer system, if needed				
	MV sectionalizing gear, switch gear between grid/station and PCS assemblies				
	Underground MV conductors, raceway, pull structures, etc.				
	MV Grounding, requirements and components				
	Lightning protection, arrestors and grounding				
B2.4	LOW VOLTAGE AUXILIARY, STATION and PROJECT POWER SYSTEMS		X		
	Station auxiliary transformer, feeder, primary protection				
	Low voltage switchboards and distribution				
	Transfer switches and generator connection points, if used				
	Underground LV conductors, raceways, pull structures, etc.				
B2.5	PROJECT LIGHTING and SECURITY		X		
	Cable raceways, Structures				
	Lighting studies and submittals, as necessary				
	Light fixtures and controls				
	Security cameras for required coverage; Night / IR capable; Wired or wireless				
	Light and camera system mounting and/or poles and foundations				
C	CIVIL DESIGN				
C1	CIVIL STRUCTURES AND MATERIAL				
C1.1	ELECTRICAL EQUIPMENT, ENCLOSURES		X		

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	ELECTRICAL EQUIPMENT BUILDING OR CONTROL BUILDING FOR ENERGY STORAGE				
	Substructures, Foundations				
	Superstructures, if any				
	ENERGY STORAGE UNITS				
	Substructures				
	Superstructures, if any				
	ENERGY STORAGE PCS				
	Substructures, Foundations				
	MISC. RACKING, FOOTINGS, ENCLOSURES				
	Foundations				
C1.2	STATION AUXILIARY POWER SYSTEM		X		
	ESS & STATION AUXILIARY TRANSFORMER, DISTRIBUTION				
	Substructures, Foundations				
C1.3	CABLE and TRENCHING		X		
	Substation to PCS / Converters / ESS Subsystems				
	Other site trenching and raceways				
	Site grounding system / grid, bonding whips to equipment				
C1.4	TRANSFORMER STRUCTURES		X		
	PCS TRANSFORMERS				
	Substructures, Foundations				
	Superstructures				
C2	SITE WORKS				
C2.1	EXISTING STRUCTURES AND DEMOLITION		X		
	Demolition of existing structures				
	Removal/relocating of existing cables, pipes				
C2.2	SITE PREPARATION, SWPPP		X		
	Site clearing, grubbing				
	Tree and stump removal, fill and compaction				
	Removal of contaminated material				
	Top soil removal and re-use				
	Site grading - cutting and filling				
	Soil improvement				
	Storm Water Pollution Prevention plans (SWPPP) and permitting				
	SWPPP components, permitting and post-construction removal and land recovery				
C2.3	STORMWATER AND DRAINAGE		X		
	Stormwater design, calculations, permitting and inspections				
	Stormwater collection and conveyances				
	Culverts, rip rap, clarifiers and discharge				
C2.4	LANDSCAPING		X		
	Landscape requirements, design, permitting and inspections				
	Landscaping				
	Re-seeding and establishing groundcover				
	Temporary watering, as necessary				
C2.5	PAVING AND SURFACING		X		
	Traffic studies, permits and signage				
	Access roads				
	Interior roads and parking areas				
	Gravel cover				
	Road aprons, transitions, paving				
C2.6	FENCING		X		
	Site fences, gates and accessories				
	Gate locks, access and key boxes				
D	ENGINEERING MISCELLANEOUS				

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D1	ENGINEERING MANAGEMENT		X		
	Engineering management of EPC contractor engineering scope				
	Submittals, approvals and document management				
	Design changes, approvals, re-permitting and change management				
	Project documentation and Handover book to Owner / operations				
	Arc flash labels and other required signage for MV				
	Arc flash labels and other required signage MV collection and BESS system				
D2	MISC ENGINEERING SUPPORT		X		
	Hoist and Lifting plans, permits and requirements				
	Foundations, requirements, inspections for all installed components and equipment				
	Traffic protection, bollards, etc.				
D3	INSTALLATION AND COMMISSIONING DOCUMENTS	X			
	Installation documentation, Warranty information and establishment				
	Commissioning plans, execution and management				
	Commissioning documentation and archiving				
D4	DOCUMENTATION FOR COMMERCIAL OPERATION	X			
	Operation and maintenance manuals on digital media				
	Operation and maintenance manuals as hard copy				
	EMS Code/Software/configurations in Escrow account. Escrow documentation and acct.				

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E	MANUFACTURING AND DELIVERY				
E1	FACTORY ACCEPTANCE / INTEGRATION TESTING	X			
	FAT-FIT plans / submittals / approvals				
	FAT-FIT facilities, execution, management, documentation and observations				
	FAT-FIT Execution				
	Battery System				
	PCS, MVSG, MVT				
	EMS/PPC/SCADA				
E2	COLLECTION TRANSPORT AND LOADING PORT OPERATIONS	X			
	Loading of equipment at place of manufacturing				
	Transportation of equipment from place of manufacturing to port of loading nominated by EPC contractor				
	Transport insurance from place of manufacturing to port of loading nominated by EPC contractor				
	Unloading of equipment at port of loading nominated by EPC contractor				
	Shifting of equipment to warehouse/open storage/container yard				
	Warehousing at port of loading nominated by EPC contractor (up to contractual delivery date)				
	Containerizing of loose non out of gauge cargo at port of loading nominated by EPC contractor to the extent reasonable				
	Pre shipment inspection				
	Pre shipment inspection assistance				
	Shifting of equipment from warehouse to alongside vessel				
	Onshore stevedoring cost at port of loading nominated by EPC contractor				
	Hooking on charges for equipment when delivered alongside vessel at port of loading nominated by EPC contractor				
	Loading of equipment on board vessel or any other transport vehicle				
	Unhooking charges for equipment loaded on board vessel or any other transport vehicle				
	Lashing, securing, dunnage and welding on board vessel or any other transport vehicle				
E3	MAIN TRANSPORT AND UNLOADING PORT OPERATIONS	X			
	Nomination of vessel or other mean of transport				
	Engaging and instructing freight forwarder				
	Arranging of bill of lading				
	Preparation of origin country documents required for destination customs clearance				
	Transportation of equipment from port of loading to port of destination (offloading quay nominated by EPC contractor)				
	Transport insurance from port of loading to port of destination (offloading quay nominated by EPC contractor)				
	Discharging of equipment from vessel or any other transport vehicle at port of destination (offloading quay nominated by EPC contractor)				
	Unhooking charges for equipment discharged from vessel or any other transport vehicle				
	Onshore stevedoring cost at port of destination (offloading quay nominated by EPC contractor)				
	Shifting of equipment from alongside vessel to warehouse/open storage/container yard inside the port of destination (offloading quay nominated by EPC contractor)				
	Shifting of containers delivered by liner vessels to container yard at port of destination				
	Unloading of equipment at warehouse/open storage/container yard at port of destination				
	Wharfage				
	Arrange import license or import permit (if required)				
	Import of goods				
	Import taxes and duties (if required)				
E4	SITE TRANSPORT	X			
	Transport route preparation (if required)				
	Transport permit assistance				
	Loading of equipment on truck at warehouse				
	Transportation of equipment from port of destination to Named Place of Destination				
	Transport insurance from port of destination to Named Place of Destination				
	Equipment at Named Place of Destination for discharging cargo				
	Unloading of equipment at Named Place of Destination				
	Temporary warehousing in country of destination				
	Destination inspection (if required)				

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	Destination inspection assistance				
	Customs bonds				
	Official charges, taxes, dues related to cargo in transit through several countries (if required)				

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F	TAXES, DUTIES, PERMITS AND INSURANCE				
F1	TAXES AND DUTIES	X	X		
	Sales / VAT tax and local taxes				
	Construction labor tax				
	Other taxes / import tariffs / duties (if required)				
F2	PERMITS		X	X	
	State, local and all other business permits				
	Construction permitting, approvals, stamps, etcetera				
	Water permit				
	Environmental permits				
	Permitting procedures				
	Permit and other fees				
	Other permits (if required)				
F3	INSURANCE	X	X	X	
	General liability and product liability insurance				
	Construction and erection all risk insurance				
	Workers' compensation and employer's liability insurance				
G	PROJECT MANAGEMENT SERVICES	X	X		
	Execution plan for supplied equipment and services				
	Schedule creation, coordination and management				
	Project execution plan				
	Project kick off meeting with Owner				
	Monthly report				
	Monthly virtual meeting				
	Face to face meetings				
	Project quality management plan				
	Inspection and test plan				
	Site quality plan				
	Procurement management				
	Document control				
	Site management				
	Construction/site management team				
	Owner site representative				
	Subcontractors personnel work permits				
	Health, safety and environment plan				
	Site safety management and HSE plan implementation				
	HSE reporting and corrective actions				
	Emergency action plan				
	Worksite personnel induction and training for site HSE management system				
	Site security plan				
	Site security plan implementation/security arrangements				
	Construction planning				
	Construction management plan				
	Site manning plan				
	Subcontractors pre-assessments				
	Subcontracting planning				
	Subcontracting bid documents				
	Subcontracting bid evaluation				
	Subcontract negotiations and finalization				
	Subcontracts administration				
	Subcontractors management and steering				
	Construction works sequence and prioritization				
	Daily operational planning during construction				
	Site meetings schedule				
	Site meeting chairing and minutes				
	Online collaboration platform for site information and document handling				
	Site logistics and site material tracking and management				
	Information and communications technology system for site logistics and site material				
	Site storage plan				
	Time schedule covering construction activities				
	Progress follow-up, progress S-curves				

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	Weekly look-ahead schedules				
	Schedule control and weekly updates				
	Construction progress reports				
	Security of vendor supplied equipment				
	Security for personnel transport between site and accommodation				
	Fire protection during construction and commissioning work on the site				
	Medical evacuation plans of seriously injured persons				
	Chemical storage				
	Work permitting at site				
	Locking and tagging procedures				
	Dust control				
H	CONSTRUCTION MANAGEMENT				
H1	SITE ORGANIZING AND RESOURCING		X		
	Site management				
	Regular clean-up, recycling, waste management				
	Cleaning and/or dressing of public roads used by project construction				
H2	HEALTH, SAFETY, ENVIRONMENT (HSE) AND SECURITY MANAGEMENT		X		
	Health, safety and environment plan				
	Site safety management and HSE plan implementation				
	HSE reporting and corrective actions				
	Emergency action plan				
	Worksite personnel induction and training for site HSE management system				
	Site security plan				
	Site security plan implementation/security arrangements				
I	TEMPORARY INSTALLATION AND ARRANGEMENTS				
I1	ROADS AND WORKING AREA		X		
	Temporary access road to site				
	Temporary roads at site				
	Preparing of working areas				
	Lay down area provide				
	Lay down area - preparation				
I2	UTILITIES		X		
	Site office including furniture for EPC contractor personnel				
	Site office for Owner personnel				
	Internet connection to site				
	Internet consumption during construction				
	Electricity source and hook-up				
	Electricity consumption during construction				
	Temporary auxiliary power for BESS environmental maintenance, as needed				
	Water source and hook-up				
	Water consumption during construction				
	Sewage during construction				
	Illumination during construction				
	Parking places during construction				
	Workers social facility				
	Workshop areas				
	Construction equipment and tools				
	Fuel supply for construction equipment usage				
I3	HEALTH SAFETY AND ENVIRONMENT		X		
	Fire protection during construction and commissioning work on the site				
	Medical evacuation plans of seriously injured persons				
	Sanitary				
	Hygiene and safe canteen and food preparation (when on-site canteen)				
	Work permitting at site				
	Locking and tagging procedures				
	Dust control				
	Waste material handling				
I4	DEMOBILIZATION		X		

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	Removal of temporary facilities				
	Cleaning of areas used by EPC contractor				
	Excess imported material				
J	LOCAL SUPPLY AND INSTALLATION				
J1	PROJECT		X		
	Installation of electrical equipment supplied by others				
	Installation of balance of electrical, communications, control and other equipment				
	Other equipment, materials, temporary measures, consumables, etc as required for complete installation				
J2	CIVIL		X		
	Grubbing, grading, demolition or other site preparation				
	Grading, fill, compaction and other earthworks				
	Installation of civil equipment supplied by EPC contractor				
	Stormwater - Temporary and permanent means, methods, structures				
	Installation of civil equipment supplied by Owner				
	Trenches and excavations, de-watering, backfill with recompaction				
	Compaction, concrete or other testing				
	Fencing, security, etc				
K	COMMISSIONING AND COMMISSIONING MANAGEMENT				
K1	BESS COMMISSIONING SERVICES	X			
	Equipment Cold Commissioning				
	Equipment Hot Commissioning				
	Hot Commissioning Verification Testing				
	Substantial Completion Testing				
K2	COMMISSIONING MANAGEMENT		X		
	Commissioning planning				
	Commissioning organization and resourcing				
	Health, Safety and Environment during commissioning				
	Commissioning coordination and meetings				
	Commissioning time management, controls and progress reporting				
	Fire monitoring, alarm and suppression systems				
	BESS Systems				
	System level, utility protection and interconnection				
	Project-level commissioning and performance test				
	Utility COD Checklist				
	Utility Ancillary Services Qualification Tests				
L	TRAINING	X			
	Energy storage, PCS training and operations				
	Training and briefing on balance of equipment at site				
	Coordination & Training with local fire departments				
M	PROJECT LEVEL		X		
	Project labor agreements, Union relations if applicable				
	Apprenticeship program, staffing and documentation				
	Facility related permits (Development Approvals, Grid interconnection applications etc.)				
	Permits required for contractor to execute its construction and installation work				
	General liability and product liability insurance				
	Construction and erection all risk insurance				
	Workers' compensation and employer's liability insurance for Vendor personnel				
	Workers' compensation and employer's liability insurance for non-vendor personnel				
	Protection relay programming coordination				
	QA/QC process & procedures				
	Safety plan & procedures				
	Labor/union agreements & payments				
	Warranty contract and services				
	O&M contract and services				
	Closeout of studies and other technical information to ISO or Interconnecting Utility				