



Engineering for

- > BESS
- > Substation
- > Interconnection

16 GWH BESS Interconnection Studies

2 GWH BESS Commissioned

14 GWH under Execution



BESS Success Stories

- Engineering for the Kingdom's first Grid level and world largest capacity Bisha BESS in record time
- Grid Integration studies for the Kingdom's BESS projects
- 500MW/2000 MWH - BISHA WOA
- 500MW/2000 MWH - RABIGH WOA
- 500MW/2000MWH - QAISUMAH EOA
- 500MW/2000 MWH - DAWADMI COA
- 500MW/2000 MWH - RIYADH COA
- 500MW/2000 MWH - HAIL 2 COA
- 500MW/2000 MWH - TABUK WOA
- 500MW/2000 MWH - JOUF-2 EOA



Power System Studies

Generation and Transmission

- › Conventional/Renewable (Solar PV and Wind Farms) Energy
- › Transient Stability Analysis
- › Bus Transfer and PSS Tuning
- › Generation Rejection
- › Power Plant Auxiliary System Analysis
- › Protection Relay Setting including Pole Slip, Stator Protection, Loss of Field, Rotor Protection and Transformer Protection
- › Generator Capability For Transmission Lines Auto Reclose
- › Islanding Study
- › Black Start

Transmission and Distribution

- › Load Flow/Short Circuit
- › Transient Stability
- › Insulation Coordination/Ferro-Resonance
- › HVDC/FACTS
- › Shunt Reactor/NGR Sizing
- › Out-Of-Step Study
- › Load Shedding
- › Harmonic Analysis and PQ Analysis
- › Capacitor Bank Study/Filter Design
- › Protection Setting and Coordination
- › Transient Recovery Voltage (TRV)
- › Auto Reclose
- › Sub-Sea Cable Reactor Compensation Study
- › Grid Islanding and Load Shedding Study

Industrial / Oil & Gas

- › Load Flow/Short Circuit Study
- › Power Factor Correction Study
- › Relay Setting and Coordination Study
- › ARC Flash Study
- › Harmonic Measurement and Power Quality Study
- › Dynamic Motor Starting Study
- › Automatic Bus Transfer Study
- › Induced Voltage Study on Pipeline
- › Electrical Equipment Failure Analysis
- › Reliability Study
- › DG and Equipment Sizing
- › Grid Islanding and Load Shedding Study
- › Grounding Grid Design
- › Regenerative Drive Studies



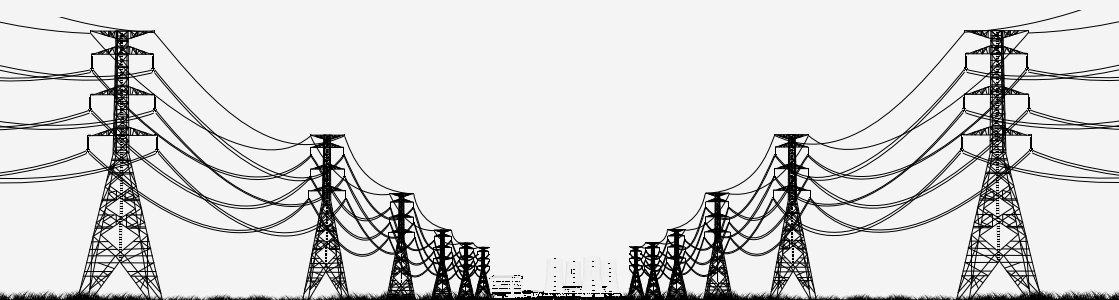
Power Generation: Conventional/ Renewables/ BESS

Detailed Design Stage

- › Detailed Engineering for PV Solar, WTG, BESS, Thermal, CCPP, CHP, and EDG
- › Land Assessment and Site Selection.
- › Electrical Equipment Sizing/ Layouts/ Protection Schemes
- › Thermal Simulation and Process Engineering
- › Yield and Layout Optimization for Renewable Projects
- › Long Lead Equipment Finalization, and Configuration of Inverter, Tracker, Modules, etc.
- › HMBD's, PFD's, P & IDs and SLD's
- › Pipe Stress Engineering
- › Plant Civil and Structural Engineering
- › Plant Instrumentation and Control Automation Design
- › Plant Layout, Equipment Technical Specification and Data Sheets.
- › BOQ and Detailed Cost Estimation
- › Project Management Services

Planning and Feasibility Stage

- › Land Assessment and Site Selection
- › Energy Yield Assessment
- › Rooftop PV Potential Assessment
- › Waste Management Study
- › Plot Development Study
- › Reliability Study
- › Power Evacuation Study
- › Financial Modeling
- › Tender Documentation for EPC Bidding (Specifications, Drawings, Simulations, and Calculations)
- › Cost Estimation





Transmission/Distribution and Grid Automation

Substation (HVAC, HVDC, FACTS and STATCOM)

- › Electrical Design Primary Engineering
- › Electrical Design Secondary Engineering
- › Mechanical Design
- › Civil and Structural Design
- › SCADA/ Telecom Design
- › Project Management and Construction Management Services
- › BIM

Grid Automation and Solutions

- › SAS & SCADA Design & Integration
- › EMS, ADMS & DERMS Solutions
- › WAMS & PDC Systems
- › Microgrid Design & Optimization
- › Battery Management Systems
- › Renewable Grid Integration (Solar, Wind, Hybrid)
- › Demand Response & Load Management
- › IoT-Based Smart Grid Optimization
- › Grid Communication (Fiber & Wireless)
- › Cybersecurity Design & Assessment
- › Smart Metering, AMI & MDMS
- › Grid Stability, Load Shedding & Reliability Analysis
- › Real-Time Data & Predictive Maintenance
- › Energy Transition Consulting & Feasibility, Smart Grid, Next Generation Connectivity

Overhead and Underground Transmission Lines: HVAC and HVDC

- › OHTL Design
- › UG Cable Routing Design
- › Tower Design
- › Civil and Structural Design
- › Project Management/Construction Management Services
- › Environmental Compliance
- › Subsea Cables

Services for Generation, Renewable, Green Hydrogen and Transmission & Distribution

- Feasibility and Assessment Studies
- Architectural Design
- Electrical Engineering
- Power System Studies
- Cost Consultancy
- Equipment Planning
- Project Management
- Grid Automation and Solutions
- Renewable Energy and Sustainability
- Civil Engineering
- MEP Engineering
- 3D Modeling
- Construction Management
- Construction Supervision
- Government Approvals
- Procurement Support Services
- Energy Storage Solution

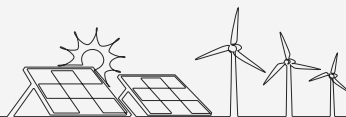


Energy Portfolio

9,900 MW  Power Generation Plant Projects	1,500 MW  Renewables (Solar and Wind)	4000MW/ 16GWH  BESS Projects	5  HVDC/ FACTS
1,300 KM  HVDC OHTL (500kV)	5,000 KM  OHTL (132kV/380kV)	800 KM  U/G Cables (132/380kV)	640  Transmission Substations
75  Transmission Planning and Grid Integration Studies	71  Power System Studies (Utilities, O&G)	375  EMTP Power System Studies	3  EMS/ADMS

Services offered for BESS

- | | |
|--------------------------|--|
| ○ FEED | ○ MEP Engineering |
| ○ Pre-bid engineering | ○ BOP Engineering |
| ○ Detailed design | ○ EMS and SCADA Design |
| ○ Civil Engineering | ○ Grid Integration study |
| ○ Electrical Engineering | ○ Protection and Secondary Engineering |
| ○ Architectural design | |



For further information, please contact communication@dar-engineering.com

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