NDA Power Consulting – Our Services (Long Brochure)

NDA Power Consulting
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About Us

Who we are?

NDA International Limited (UK registered 11708995) is a Grid, Energy and Power Consultancy focussed on Electricity Transmission and Distribution (T&D;) systems, Grid Connections (end to end process), Technical due-diligence and advisory during acquisition of renewable energy and storage projects, Power System simulation and analysis, Investment planning and strategy for development and modernisation of power assets, electrical system designs, value engineering and optimisation of CapEx and OpEx for electrical Balance of Plant (BoP), Grid code compliance associated with conventional and renewable generators and storage systems.

We also specialise in the planning and design of the T&D;, industrial power systems e.g. Oil & Gas, heavy industries, commercial developments and water treatment/pumping plants.

We have years of experience of working with and enjoy close relationship with the transmission and distribution operators (globally). We leverage upon our experience and relationship to manage interests of our customers during end-to-end grid connection process, including grid capacity search, grid connection application process, grid offer discussions, design and acceptance of the designs by the operators. We provide end to end support managing the entire grid connection process, aligning design and scope of works (non-contestable, contestable and customer scopes) associated with grid interconnection and electrical BoP. We also provide support during the most critical phase of the project from energisation to the Final Operational Notification (FON) during grid code compliance checks.

We are well versed in international design standards and practices such as IEC, ANSI, IEEE, ENA recommendations and guidelines (in UK) and UK DNO design standards.

We work closely with our clients during acquisition of new power assets and renewable energy/storage projects. We perform technical due-diligence and advise on de-risking investments.

We believe that power system (especially renewables and storage) industry is facing many challenges in terms of deficiency of network capacity and longer timescale to connect additional generation, completion of reinforcement needed to release additional grid capacity, increasing the operational efficiency, and introducing innovation in the connection process. Additionally, there is a need for reducing the grid related CAPEX and OPEX costs. Therefore, we have chosen a unique ethos and business model which we believe gives us both a technical and commercial advantage over many of our competitors, as well as helping us to improve our clients' satisfaction.

We are fully covered by professional indemnity insurance, which includes design activities for building services, critical services, water, data centres, oil & gas plants, refinery and other similar high risk environments.

Why to engage NDA International Ltd?

We are committed to provide services in a trustworthy, honest, economical, friendly and transparent way. Whilst delivering our promise of delivering services to our clients at extremely competitive rates we always put adequate quality controls in place to ensure that the quality of our work is never compromised.

Our business model engages industry experts both locally (within UK) and globally and this allows us to deliver quality service at rates which are much lower than our competitors.

NDA has an innovative business model, which is very different to many other consultancies. We deliver work through industry experts both locally (within UK) and globally and a pool of semi-retired, highly experienced specialists. Our expert consultants and engineers are who work for us on a flexible,

part-time basis, allowing us to call-off expert resources as needed. This allows NDA to maintain quality at a low cost, which in turn allows us to offer extremely competitive prices to our clients.
The renewable and storage projects face greatest challenge from the grid connections in many aspetcs: In terms of CapEx uncertainty, the compliance uncertainty, and the connection date risks.
NDA experts have years of experience of working with T&D; network operators globally, due to which we are well positioned to offer specialist consultancy and advicse. Furtehrmore, we specify the equipment parameters and design configuration reducing the grid CapEx and compliance risks. We offer support in the grid capacity search for origination, we prepare grid application and support with engineering, identifying re-flags at each stage of the project and perform detailed due-diligence for our clients.
Some of our core services are presented in detail below:

Our Vision & Values
Our Vision
“Offering tailor-made services to meet client needs in the most innovative, interactive, and cost-effective way, and whilst maintaining the professionalism and technical excellence.”
Our Values and Ethics
We care about our clients, our industry, our environment and our reputation. Our values are:
Respect for all
Be Trustworthy
Be Honest & Transparent
Show Integrity
Be Inclusive
Collaborate

Our Services
We offer specialist technical consultancy and engineering services to our clients in the many specialist areas covering entire lifecycle of a project from project inception, planning/permitting phase, concept design development, detailed engineering and design, procurement and project delivery models, construction, commissioning and compliance testing.
We deliver services to projects relating to electrical power system design, transmission and distribution systems design, conventional and renewable generation integration with the grid, renewable energy and storage systems design, industrial power systems design, future networks and innovation pilot projects and modernisation of the existing transmission and distribution system planning, design and operations.
The electric power system, including generation, transmission and distribution, industry is rapidly changing driven by the policies. This rapidly changing environment introduces extreme challenges for investors driving the need for specialist advise during all stages on the investment. Experienced consultants at NDA can provide blended services combining the investment risk with technical risks during various stages of the project. The overall aim is to find low-cost engineering solutions considering the investment lifecycle.
Details of our key services is provided below:
Grid Connection Management (End to End)
Grid capacity identification on grid networks
We provide grid capacity search and identification in many ways. This includes identification of grid capacity on the entire transmission or distribution network, in a selected geographic area/region, or specific project sites. The grid capacity reports provide information on the available capacity, grid connection procedures, constraints and risks, the connection options and associated costs.
Site specific feasibility studies for the grid connection
We undertake site specific grid connection feasibility studies. This includes following activities:
Desktop analysis using publically available information
Site visits
Meetings with transmission and distribution network operators
Identification of cable or overhead line routes and substation locations

Identification and cost/benefit analysis of grid connection options
Recommendation on the grid application and next steps

Grid connection applications
We specialise in preparing, submitting and managing the grid connection application and offer process.
Preparation of the technical data
Preparation of single line diagrams
Preparing and cross-checking all information required for the grid connection application
Submission of grid connection applications and liaising with the operators for receiving offers
Review of the grid connection offers highlighting red flags and advise on or negotiating the grid offers with operators

Management of Grid connection process
After grid offer is accepted, we advise on managing the grid connection process, providing following specific services:
Progressing grid offers through project progression (Statement of Works) process and receiving modification offers
Review of the modification/variation offers and requirements of liability for the grid security payment/bonds, highlighting red flags and advise on investment approval process. This also includes negotiating the modification/variation offers with operators
Development of basic design of the contestable and customer works – SLDs, Plant ratings, layout drawings, etc
Aligning non-contestable, contestable and electrical BoP scopes
Support with the ICP procurement (preparation and running ICP tenders and negotiating price)
Advancing non-contestable scope through operator ensuring CapEx and Programme efficiency
Support with procurement of and/or performing grid code compliance studies and PGMD
Liaison with DNO/TNO during entire process until grid compliance is achieved (upto Final Operational Notification)

Due diligence - Grid connection
We undertake full due diligence of the grid connections during project acquisition and/or sale process. Additionally, we act as grid specialist engineer on Sellers' or Buyers' behalf during the process providing advice to senior management.
This includes following activities:
Review of the grid connection offers/agreements
Review of the modification/variation offers
Identification of key technical, procedural, regulatory, project specific, planning/permitting related, and financial risks to the project
Review of the connection costs, security payments/bonds and equipment/contractor contracts
Review of the project planning approval, permits with regards to the grid connection requirements
Identification of engineering risks and gaps in the permitting
Review of the cable/line routes and comment on the permitting, wayleaves/easements and constructability aspects
Review of expected energy curtailment
Review of the grid compliance gaps

FEED Studies and Design
We offer several engineering designs packages that are specific to the renewable energy and storage projects and/or are tailor-made for project needs.
Our capability for the engineering and design service include:
Grid interconnection drawing package for planning applications – this mainly include but not limited to:
Producing Single Line Diagrams (SLDs) and Operational schemes clarifying project and O&M; boundary and responsibility

Substation layout drawings 11kV to 400kV
Plan and elevations drawings for equipment and control building
Cable route corridor drawings
Overhead Line route and profile drawings
PV and BESS Inverter sizing calculations based on losses, climatical conditions and grid code compliance
Single Line and Functional Diagrams for protection and control
Technical specifications for electrical BoP (e.g. transformers, switchgear, cables, inverters, battery modules, protection and control, etc)
Technical requirements for the grid connection scope of works
Private Wire Connections
We provide specialist services to clients seeking or delivering integrating of renewable energy plants with the existing Commercial and Industrial (C&I;) demand customers' network. We run end to end process from inception meeting to commissioning of the plant, Typical services consist of the following:
Inception meeting with the client and C&I; customer
Assessment of existing grid connection and internal electrical network
Producing concept for the private wire connection for integration of the renewable energy plant to the existing electrical system
Performing power system analysis to investigate potential impact
Liaising with the operators, preparation and submission of grid application
Producing the scope of works and technical requirements for procuring the grid integration scope of works
Support with G100 and grid code compliance
Support with technical details for inclusion in PPA
Power System Simulation and Analysis
We offer all kind of power system studies to our clients. We have a pool of specialised power systems simulation and analysis engineers who have years of experience of performing various kinds of analysis using industry renewed software.
We understand that every type of power system study and each individual software require specialist skills. For example performing a load flow or short-circuit analysis for an industrial or chemical plant is entirely different from performing the similar analysis for a HV electricity transmission system. Similarly, performing an EMT studies (lightning or switching) require complete understanding of the operation of the power system. And performing a curtailment and loss of yield analysis for a renewable plant requires a complete skill set. Performing a study using DigSILENT is completely different than using PSS/E or PSCAD. Therefore, we always prefer that a specialist engineer with the right skill set shall undertake the studies.
Our capability for the network simulations and analysis include:
Load flow analysis
Short-circuit analysis
Reactive power compensation analysis
Power system dynamic analysis
Cable sizing analysis
Filter design analysis
Battery sizing analysis
Inverter capacity sizing to meet grid code requirements
Protection grading and coordination analysis
Arc Flash analysis
Harmonics, flicker and power quality analysis
Electro-magnetic transient (EMT) and switching studies:
Insulation coordination studies

Lightning studies
Transformer/ Reactor Inrush analysis
Transient Recovery Voltage (TRV) and Transient Over Voltage (TOV) studies
Ferro-resonance studies
We have experience of using following industry renowned software – DigSILENT, PSS/e, PSCAD, ETAP, etc.
Furthermore, we offer specialist studies for network wide integration of renewables (wind/solar) and Battery Energy Storage System (BESS) Projects.
Specialist studies for Renewables and Storage projects
Full set of Grid Code Compliance (G99) studies
Harmonic, flicker and voltage unbalance assessment (G5/5)
Flicker assessment - P28 and P29
Active power and frequency control study
Low Voltage Ride Through (LVRT) and High Voltage Ride Through (HVRT)
Reactive power capability study and determination of reactive power compensation
Stability and dynamic analysis – Inverter based plant, Battery Energy Storage System and Conventional generation.
Solar plant yield analysis for various options (Fixed tilt, East-West, Tracker)
Energy balance study (Private wire sites) using Qusai-Dynamic analysis
Battery (MW, MWh) sizing analysis
Inverter capacity sizing (PV) to meet grid code requirements.

Power Quality Management
We undertake site visits to the utility or client owned substations/power plants to perform following data logging/measurements:
Power data logging (power, voltage and currents)
Power quality measurements (harmonics, flicker, unbalance and transients)
Power quality measurement and analysis from CVTs using PQ Sensor technology (uoto 500kV)
Disturbance analysis or fault finding
Power Data Logging and Power Quality surveys

Owners' Engineer
We provide client's owner engineer services e.g. project management and construction supervision services to our client.

Case Studies
See attached
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Example website