

Pakistan's Electricity Market Operator

Licensing Application



MO

ELECTRICITY
GENERATION
[GENERATORS]

ELECTRICITY
TRANSMISSION
[NTDC]

ELECTRICITY
DISTRIBUTION
[DISCOS]

ELECTRICITY
SUPPLY/RETAIL
[DISCOS]

END
CONSUMER
[HOMES/BUSINESS]

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ACRONYMS

| | |
|--------|---|
| ADB | Asian Development Bank |
| AEDB | Alternative Energy Development Board |
| APEx | Association of Power Exchanges |
| BoD | Board of Directors |
| BTA | Business Transfer Agreement |
| CEO | Chief Executive Officer |
| CPPA-G | Central Power Purchasing Agency Guarantee Limited |
| CTBCM | Competitive Trading Bilateral Contract Market |
| CV | Curriculum Vitae |
| DISCO | Distribution Company |
| EPA | Energy Purchase Agreement |
| EPIAS | Energy Exchange Istanbul |
| ERP | Enterprise Resource Planning & Energy Risk Professional |
| HR&A | Human Resources and Administration |
| ISO | Independent System Operator |
| KE | K-Electric |
| MO | Market Operator |
| MOF | Market Operator Fee |
| MP | Market Participant |
| MOE-PD | Ministry of Energy – Power Division |
| NEPRA | National Electric Power Regulatory Authority |
| NPCC | National Power Control Center |
| NTDC | National Transmission and Despatch Company |
| OPID | Operational Process Intelligence Dashboard |
| PCF | Process Classification Framework |
| PJM | An ISO in US |
| PPIB | Private Power & Infrastructure Board |
| SO | System Operator |
| SPT | Special Purpose Trader |
| USAID | United States Agency for International Development |

1. BACKGROUND

1.1 PROFILE OF THE COMPANY

Central Power Purchasing Agency (Guarantee) Limited (“CPPA”) is a company incorporated under the Companies Ordinance 1984 (XLVII of 1984) and granted a Corporate Universal Identification No. 0068608 by the Securities and Exchange Commission of Pakistan.

CPPA has been currently operating as a Market Operator (MO) pursuant to the Certificate of Registration as the Market Operator (the “Registration”) issued by the Authority on 16 November 2018 under Rule 3 of the Market Operator Rules.

Pursuant to the mandate given in the Registration as stated above, CPPA has been discharging its Market Operator functions which inter-alia includes development of the Competitive Trading Bilateral Contracts Market (CTBCM) model, implementation of MO related actions and facilitation of other implementation entities to implement CTBCM.

The revenue requirement of CPPA includes the revenue requirement of the market development function of the Market Operator to facilitate the transition from the current regime towards CTBCM has been approved by the Authority from time to time under the Market Operator Fee (MOF) and duly notified by the Federal Government.

1.2 NEPRA ACT AMENDMENT 2018

Through the Regulation of Generation, Transmission and Distribution of Electric Power (Amendment) Act, 2018 (the “Amended Act”) dated April 23, 2018, various additions have been made in the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 (the “Act”), including provisions for the Market Operator and its licensing. Section 23A of the Amended Act was also inserted, which makes MO function a licensed activity to be performed by only one operator in the electricity market.

Moreover, the same section notes that any person acting as a Market Operator on commencement of the Amended Act shall apply for a licence. Therefore, CPPA being the current Market Operator is filling this application.

1.3 DIRECTIONS OF THE AUTHORITY AND FEDERAL GOVERNMENT

The Authority in its determination dated November 12th, 2020 has approved the Detailed Design and Implementation Roadmap of the Competitive Trading Bilateral Contract Market (CTBCM) which directs bifurcation of the CPPA into 'Market Operator' and 'Special Purpose Trader' (the "SPT"). The CTBCM Plan approved by NEPRA under Group Action seven warrants submission of a license application for the license of Market Operator.

The Federal Government has also endorsed the decision of the Authority and accordingly in the CTBCM implementation plan, directed to submit the MO License Application to the Authority that is being filed pursuant to Section 23A of the Regulation of Generation, Transmission and Distribution of Electric Power (Amendment) Act, 2018 (the "Amendment Act").

1.4 REQUIREMENT FOR SUBMISSION OF LICENSE APPLICATION

As per the Section 23A of the Act, following is the requirement for the submission of MO License Application:

1. Any person acting as a Market Operator on commencement of the Act shall apply for a license under this Act.
2. An application for license shall be accompanied by a draft commercial code governing the form and manner in which the Market Operator shall undertake its licensed activities.

1.5 GROUNDS FOR MO LICENSE APPLICATION SUBMISSION

In view of the above, the table below lists the grounds that form the foundation for submission of the MO application by CPPA:

| # | Grounds | Remarks |
|---|---|--|
| 1 | As per Section 23A of amended Act, a person acting as a Market Operator on commencement of amended Act shall apply for a license. | CPPA has been currently operating as a Market Operator pursuant to the Certificate of Registration as the Market Operator issued by the Authority attached at Annexure-I . |
| 2 | As per Section 23A of amended Act, an application for license shall be accompanied by a draft Commercial. | The draft of Market Operator Commercial Code is attached at Annexure-II . |
| 3 | Solvency requirements | Revenue requirements for the MO function for the year FY2020-21 was approved by NEPRA. Furthermore, the revenue requirements for the MO function for FY2021-22 after approval of the Board has been submitted to the Authority in the Market Fee application for FY 2021-22. |
| 4 | Technical requirements | The technical requirements of MO function in-terms of automation of core business processes and inter-alia IT infrastructure, simulation tools, allied software applications etc. have been discussed at length in the Section 2.3 of this application. |
| 5 | Human resource readiness | The detailed organizational chart depicting the envisaged strength of MO function has been developed. The minimum HR requirements necessary for the pre-market phase has been approved as part of the budget by the |

| | | |
|----------|------------------------------------|---|
| | | Board and submitted to NERPA as part of Market Fee. The HR readiness is described under Section 2.1 of this application. |
| 6 | Processes and procedures readiness | <p>To deliver high quality of service to the market participants and ensure transparency of transactions in the wholesale market detailed mechanisms have been developed. MO's Commercial Code Annexure II, rests at heart of operations to achieve these desired objectives.</p> <p>Supplemented by MO business processes progressive automation indicated in Section 2.3, the desired results will be achieved.</p> |

Table 1 – Requirement for submission of MO license

As demonstrated in the table above, all the requirements for submission of an application to the Authority for License of Market Operator under Section 23A of the Act are hereby complied with. Accordingly, this application for the Market Operator license is filed by CPPA in the capacity of existing Market Operator (the Applicant) before the Authority in accordance with the current and/or envisaged institutional arrangement for MO as specified in the following section.

1.6 CURRENT AND ENVISAGED INSTITUTIONAL ARRANGMENT FOR MO

The transition towards wholesale market demands restructuring of several power sector entities as their roles are being changed. Market Operator and System Operators restructuring and reforms are most important as they form commercial and technical pillars of wholesale market governance. This section describes the current and future institutional arrangement in relation to the pre and post market regime w.r.t MO.

1.6.1 CURRENT INSTITUTIONAL ARRANGEMENT

CPPA has been currently operating as a Market Operator pursuant to the Certificate of Registration as the Market Operator (the “Registration”) issued by the Authority on 16 November 2018 (16.11.2018) under Rule 3 of the Market Operator Rules.

In the said Registration, the Authority directed that before the commencement of competitive market operations, the CPPA shall remove any conflict of interest that may impact its functioning as an independent and impartial Market Operator, including but not limited to segregation, bifurcation or removal of its power procurement and agency functions from other Market Operator functions. It was further directed that before the commencement of competitive market operation, CPPA shall cease participation in any activity or function that may, directly or indirectly, compromise its objectivity, effectiveness, independence or impartiality as the Market Operator.

The Authority in its determination dated, December 05, 2019 has approved the high-level conceptual design of the CTBCM and subsequently through its determination dated November 12, 2020 has approved the Detailed Design and Implementation Roadmap of CTBCM which also envisages bifurcation of the CPPA’s agency role from the Market Operator role.

Consequently, an institutional arrangement required to comply with the above direction is envisaged to be in place before the commencement of competitive market operation which is discussed in the next section of this application. The company has strived hard to ensure that MO function achieves readiness in-terms of people, process and technology before the commencement of wholesale electricity market.

1.6.2 ENVISAGED INSTITUTIONAL ARRANGEMENT

From global experience w.r.t central economic dispatch markets, the preferred institutional arrangement is to combine the System Operator and the Market Operator into one single independent entity. This institutional model is termed as Independent

System Operator (ISO). Since, in such coupled markets, the System Operator and the Market Operator are technical and commercial pillars of the wholesale market and are interdependent functions even at routine operational level, therefore, it is imperative that these interdependent roles are performed by an independent, corporatized, and credible institution to demonstrate credibility and ensure confidence and trust among market players to achieve the competitive wholesale market objectives.

This proposition is under deliberation at the level of policy makers and as such, the Ministry of Energy (Power Division) is in the process of moving a summary in consultation of relevant stakeholders before Federal Government for creation of a new entity having similar institutional structure. The final decision will be taken by the Federal Government. The term 'new company' has been used in this document to describe the independent company that will be established pursuant to Federal Government decision.

CPPA has strived hard to ensure that MO function achieves readiness in-terms of people, process and technology before the commencement of wholesale electricity market. Eventually, the MO function of CPPA will be transferred to the new company through a Business Transfer Agreement (BTA), once incorporated in accordance to the final decision.

Subsequent to the incorporation of new company, and pursuant to the decision of the Federal Cabinet, application(s) under Section 33 read with Section 27 and 23 A of the Act will be filed to seek approval for re-organization and bifurcation of CPPA into Market Operator and SPT, and for grant / assignment of the Market Operator license to the newly established company.

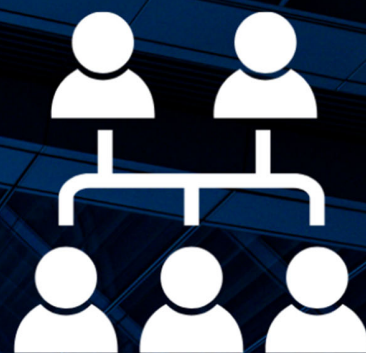
1.7 TRANSFER OF MARKET OPERATIONS FROM CPPA TO NEW COMPANY

A Business Transfer Agreement (BTA) will be signed between the Applicant and new company to be established pursuant to the decision of the Federal Government.

Through the BTA, the following functions are planned to be transferred to the new company:

- i. the functions under (a) the Market Operator Commercial Code, (b) Schedule-II of the Market Operator Rules 2015 (related to competitive market development), (c) MO's registration and (d) Contract Registrar and other functions originally envisaged in NTDC's license and transferred to CPPA under BTA with NTDC.
- ii. All functions which are ancillary or incidental to the above functions.

For the avoidance of doubt, it is hereby clarified that all functions related to the power procurement on behalf of DISCOs and agency functions shall continue to be performed by CPPA in its current agency role and will not be transferred to the new company.



COMPETENCIES
AND
READINESS

2. COMPETENCIES AND READINESS FOR MO LICENSE

Since 2016, envisaging the bifurcation of the two functions, the Applicant has been working on enhancing its competencies in order to prepare itself to undertake the development and operations of the competitive wholesale electricity market. In this regard, a specialized and dedicated department titled “Strategy and Market Development (SMD) / Market Operations and Development (MoD)” was created in 2016 to lead this important function with full dedication. This department is equipped with the skilled human resources specialized in market design and operations, possess specialized tools, and has requisite infrastructure required for design, its evolution and subsequent market operations.

This section of the application describes the competencies that have been developed till date to undertake market operations in terms of human resources, processes development, technical capabilities & technological advancements and financial resources.

The details presented under the subsequent subsections focus exclusively on the competencies and capabilities of the market development & operations facet of the Applicant.

Section 2.1 discusses the readiness in terms of skilled and qualified human resources required to undertake and run the MO business. Section 2.2 explains the details of the market related business processes being developed including a brief discussion on the Market Operator Commercial Code. Section 2.3 demonstrates the technical competencies being undertaken in order to digitally manage the complex operations of the competitive wholesale market. Section 2.4 exhibits the financial resources required to run the MO business in an optimum and efficient manner.

2.1 HUMAN RESOURCES

This section begins with summarizing the organizational hierarchy envisaged for the new company derived from the extensive restructuring exercise. Then the strength currently possessed by the organization in terms of skilled human resources mainly under the domain of market design, development and implementation is presented. This is followed by the discussion on the staffing plan to complete the hiring and placement of the staff within the Market Operator with each passing year until the ultimate sanctioned strength is achieved. Lastly, the list of onboard and enabled international and local consultants is presented.

2.1.1 ORGANIZATIONAL HIERARCHY OF THE NEW COMPANY

Globally the Market Operators in different countries have a smaller lean organization with experienced, capable and motivated staff. The electricity Market Operator functions requires highly skilled and experienced human resource to operate effectively. Although, the combination of the three organizational pillars i.e. right people, efficient processes and technology makes an organization effective but even amongst the three the people's dimension is most important and imperative.

The strategy devised to build a lean organization having a balance mix of technical, commercial, legal and finance professionals with a focus on their experience, competency and motivation. All efforts are made to provide an environment that not only fosters high productivity but also help to retain such resources. Such efforts have enabled the Applicant to prepare a team that is competent and well equipped to undertake the challenges of the forth-coming market development and operations functions as reflected in Commercial Code under the proposed license.

The new company will be headed by a CEO who will report to a designated Board of Directors. The CEO will be reported by five (5) Chiefs who will head their respective departments of **Market Operations and Development, Information Technology, Legal, Finance** and **HR & Admin**. The **Chief Internal Audit** and the **Company Secretary** will report directly to the Board of Directors of the new company. Given the

diversity and complexity of the Market Functions of the new company, the Chief Market Operations and Development will be supported by three Senior Directors each looking after their specialized domains of Market Operations, Market Development and Market Services. The total sanctioned strength of the new company will be 194.

This scheme is depicted in the following high-level organogram illustrating the strength of the senior management along with the reporting lines.

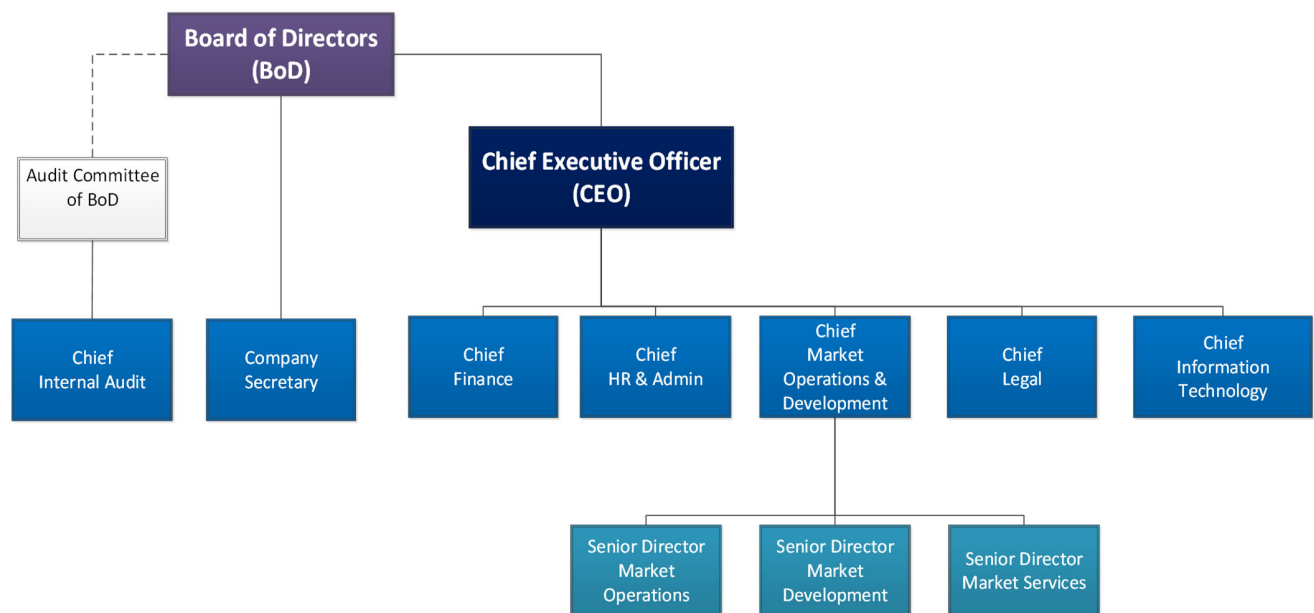


Figure 1 – Leadership Structure of Market Operator

2.1.2 HIERARCHY OF THE MARKET DEPARTMENT

Since the main business of the new company will be to administer the competitive wholesale electricity market, therefore, exclusive details of this department are presented underneath this section.

The department responsible to undertake the market functions will be headed by the Chief Market Operations and Development. This department is further divided into three interdependent streams: (i) Market Operations (ii) Market Development (iii) Market Services. Each stream will be headed by a Senior Director. This scheme is presented in the following depiction:

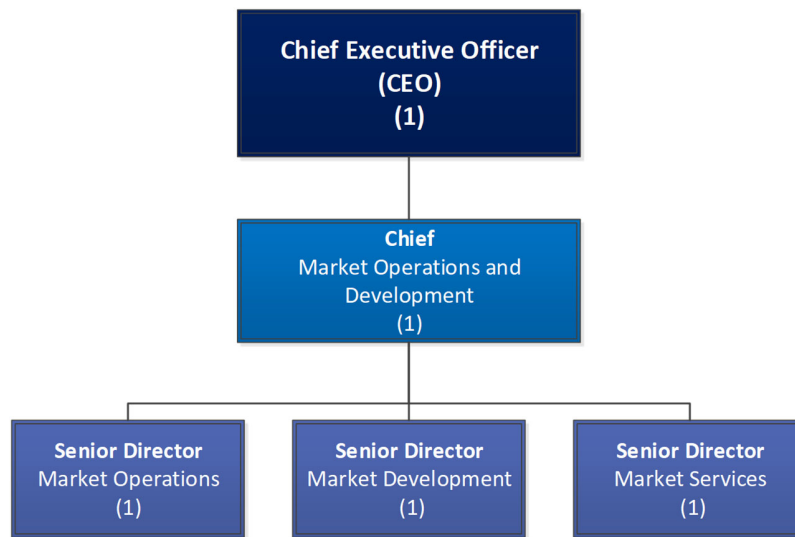


Figure 2 – MOD Department Leadership Structure

I. MARKET OPERATIONS

The Market Operations will reside at the heart of the Market Operator and will be responsible for administering the trading operations of the wholesale electricity market of Pakistan. This sub-department will have two major workstreams. Firstly, it will operate in the capacity of a Registrar under which it will be mandated to register not only the individual market participants but also will register their bilateral contracts. Additionally, this sub-department will ensure the capacity obligation by the market participants and will issue firm capacity certificates. Another major domain under this sub-department will be to perform the market settlements and run the balancing mechanism for energy and capacity. The sub-department will also collect the and process the requisite metering and system operations data required to run the balancing mechanisms for energy and capacity.

The following diagram represents the hierarchy as described above:

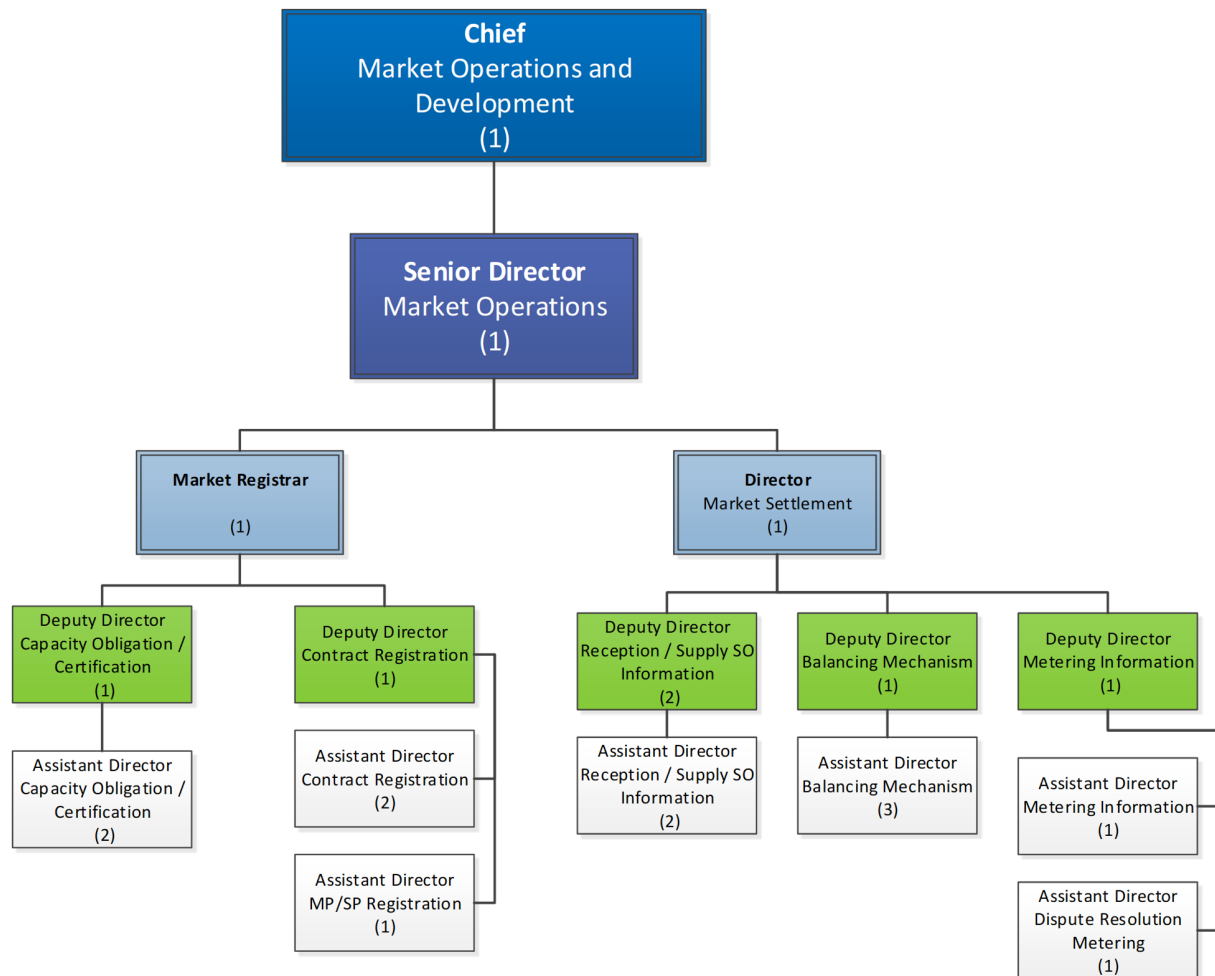


Figure 3 – Structure of Market Operations Sub-Department

II. MARKET DEVELOPMENT

Market development will continue even after the commencement of the wholesale market. The market will continue to evolve itself: development of new products, creation of ancillary services, centralized trading platforms, and gradual transition to retail market are the few snapshots that define the future market evolution. Keeping this in view, there will be a never-ending need of the specialized professionals working on the new product development, market maturity, and market evolution.

The development of the new products and services will also warrant introduction of new policies, regulations and process flows etc. and their related concept papers /

recommendations. Therefore, these workstream are also embedded in the core functions of this sub-department.

Another core expertise of this sub-department will be to prepare the mathematical models for carrying various types of technical, commercial and techno-commercial analysis and perform market simulations to generate and project market related statistics including the most important projection of Marginal Prices.

The hierarchy of this sub-department is illustrated as follows:

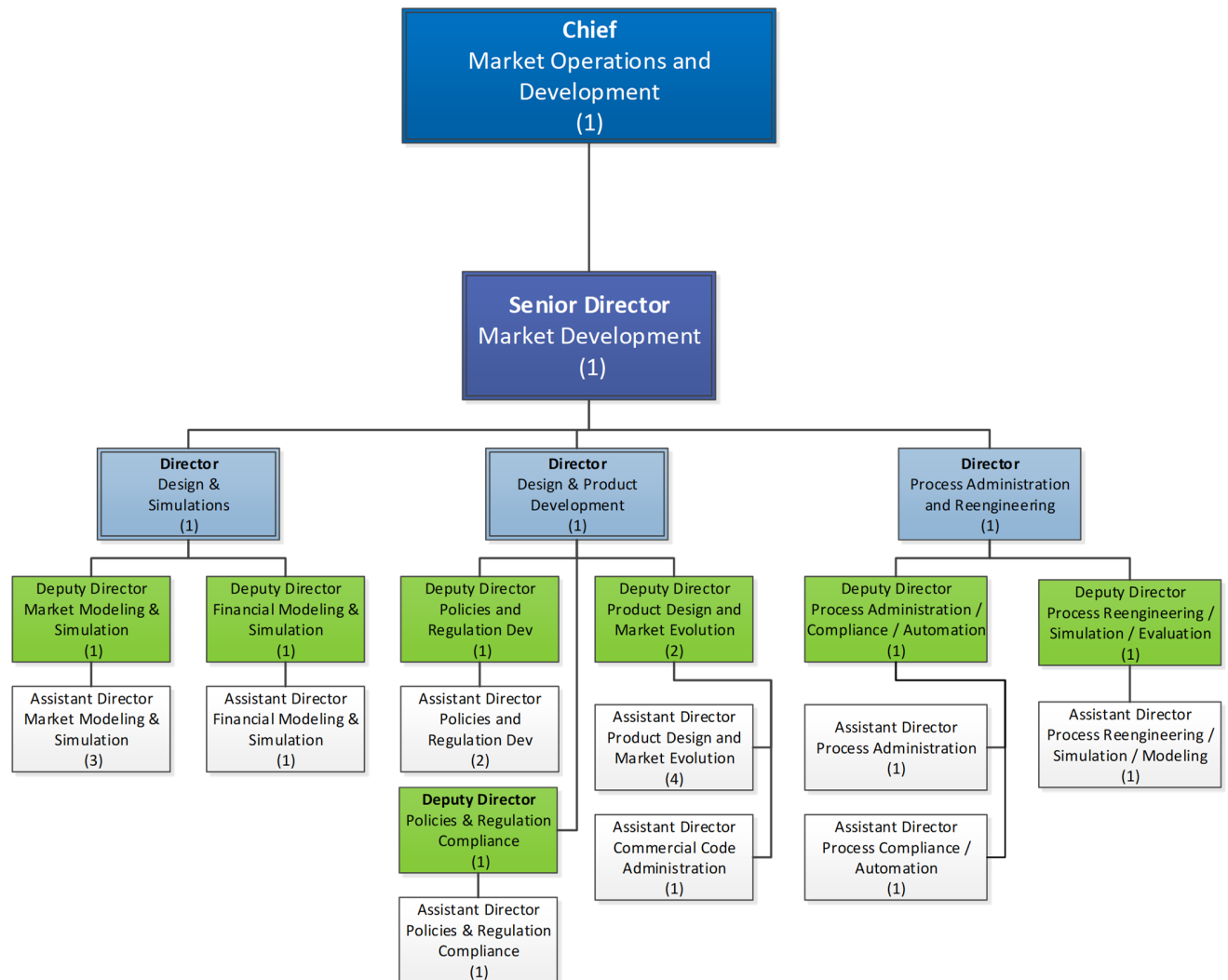


Figure 4 – Structure of Market Development Sub-Department

III. MARKET SERVICES

Market Services sub-department will be headed by an Senior Director who will be responsible for ensuring that seamless services related to the competitive wholesale market are extended to the market participants and service providers in a non-discriminatory manner. One of such service is the dissemination of information to ensure transparency in the market.

In order to ensure the transparency, market-based information and numbers in form of the periodic reports envisaged in the MO Commercial Code will be published. These services also include fulfilment of ad-hoc information requirements from the market players. Additionally, timely access of the market information and statistics to the market stakeholders through the website is also a mandatory service to be provided by the MO. Since, this area also warrants communication and outreach expertise, therefore, the reporting and information dissemination activities will be strengthened with the addition of experts specialized in the field of communication.

One of the most important that will be provided to the market participants and service providers will be the training and capacity building in market related areas on continuous basis to ensure the participants understands the changing market dynamics and exhibit mature participation in the market.

Another core domain of this sub-department will be to perform the market surveillance to detect any fraudulent practice and to avoid the exercise of market power by any market player. Additionally, this function will also ensure that market participants observe full compliance with the market-based rules, regulations, codes and guidelines.

The hierarchy of this sub-department is illustrated as follows:

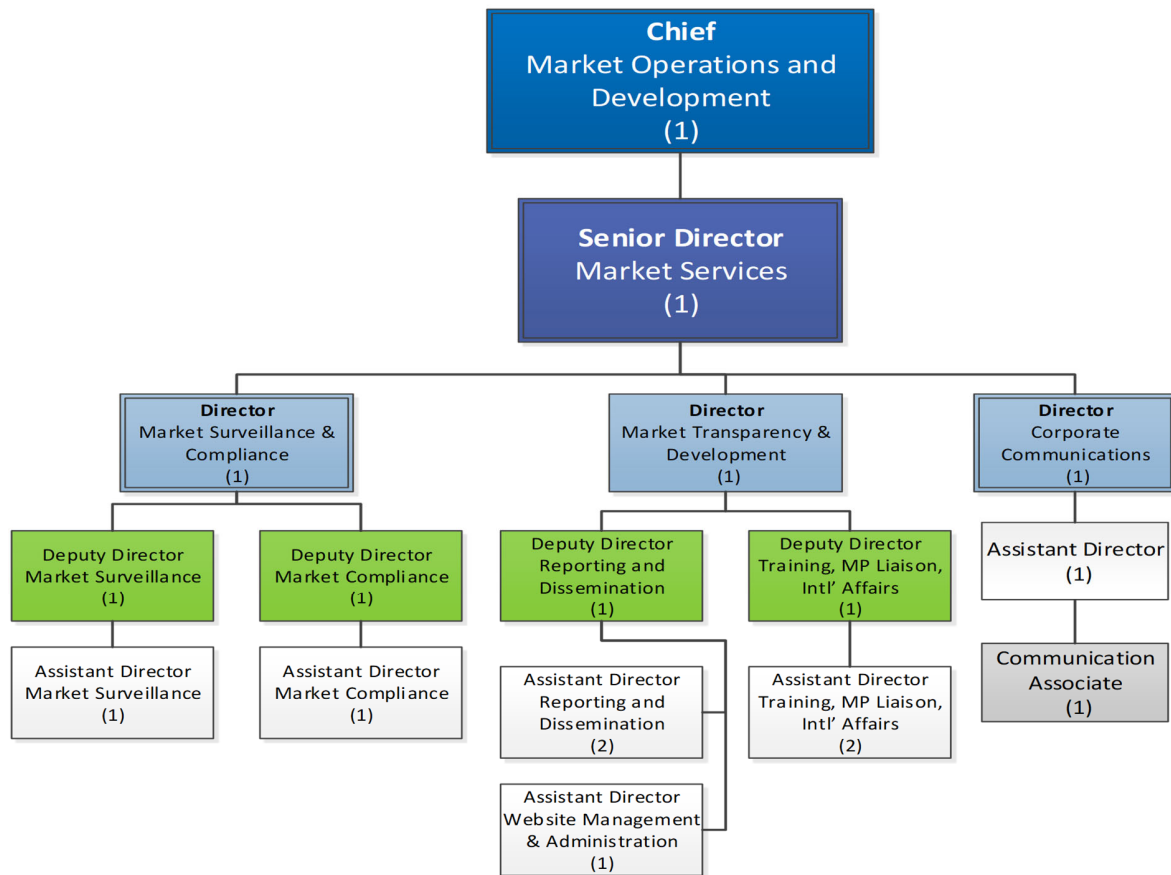


Figure 5 – Structure of Market Services Sub-Department

2.1.3 HIERARCHIES OF THE CORPORATE DEPARTMENTS

To support the mainstream function of the Market Operator company, and to run its business in the lines of a traditional modernized firm, following corporate departments will be established to support the MO functions.

I. INFORMATION TECHNOLOGY

The complexity of the market transactions, extravagant flow of inwards and outwards information, managing large number of contracts, market participants & service providers, and digitization of business processes demands a Market Operator to have a vibrant, augmented and up-to-date IT infrastructure capable to handle such operations. Keeping in view the international best practices and with an attempt to bring the Market Operator

of Pakistan at par with the international counterparts, the IT department is designed as such to cope with the ever-emerging needs of the market.

This department will be headed by the Chief IT Officer with dedicated team of IT professional having skills and competencies ranging from software development to business intelligence to database administration. The functional capabilities to be included in the IT department's portfolio includes software development, IT infrastructure management, solution architecture, business intelligence, IT governance, project management and user support.

The section of software development will be responsible for developing applications for the use of MO function as well as cater to the facilitation needs of market. IT infrastructure management division will do installation, configuration, operationalization & management of data centers. All IT equipment including servers, storage, switches, routers, firewalls, IDS, IPS, Power, computing, and cabling etc. would fall under its purview.

Solution architecture wing will be responsible for the overall solution orchestration and architecture planning, design, and development. Moreover, the section also determines viability, feasibility, appropriateness of technology, and prioritization of automation initiative. Business Intelligence unit will do the most important task of identifying and connecting all data sources for conducting business specific analysis, forecasting, and simulations for what if solutions based on data captured, stored, extracted, transformed, loaded, and derived.

The IT governance and risk management section will ensure compliance to various policies and identify incidents/threats/cases of policy breaches as well as respond to various other incidents related to access, privileges, leakage prevention, availability and security of information. The program management unit will be responsible for resource allocation on new projects, change management as well as for handling the maintenance phases of the existing projects.

A centralized user support help desk for IT service management and application support to internal and external users will be established. IT procurement section will be able to ensure that IT procurement is handled in compliance with the policies of the organization.

This high-level hierarchy of the IT department is shown hereunder:

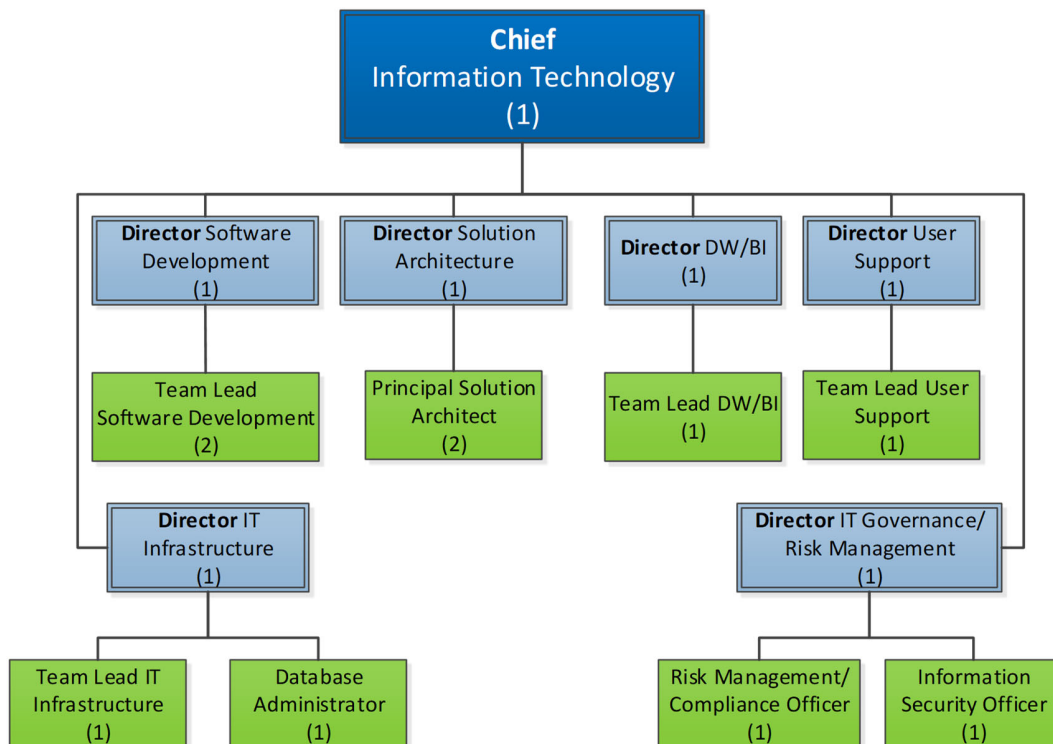


Figure 6 – Hi-Level Structure of Information Technology (IT) Department

II. FINANCE

The Finance department will be responsible for managing the corporate money as well as market money. This department will comprise three workstreams: Accounts & Taxation, Banking & Treasury and Collateral Management & Recovery. The Accounts & Taxation section will ensure proper accounting for the company, preparation of management report, financial statements, financial analysis and interpretation of company' financial results. Its Taxation wing will be oversee all direct and indirect taxes (including computation of taxable income, filing sales tax & income tax returns on periodic

basis, ensure compliance with tax provisions & withholding tax regime). Budgeting function also lies under this domain.

Functions of Banking and Treasury will include effective working capital management and banking transactions. It will handle all receipts and payments (including corporate payments as well as payments to market participants). As a financial control, reconciliation of bank statements, party balances and fixed assets shall also be part of this team.

The Collateral Management and Recovery section will be responsible for calculating initial Credit Cover requirements & Settlement Guarantee Fund (SGF), periodic recoupment, preparing settlement advices, debit & credit memos, regular follow up with market participants, execution of SGF (in case of non-payments and inadequacy of credit cover), re-calculation (in case statistically this market participant entails a higher risk according to the applicable regulation); claim re-filling in case of partial use of this guarantee etc.

The high-level structure of the Finance Department is illustrated hereunder:

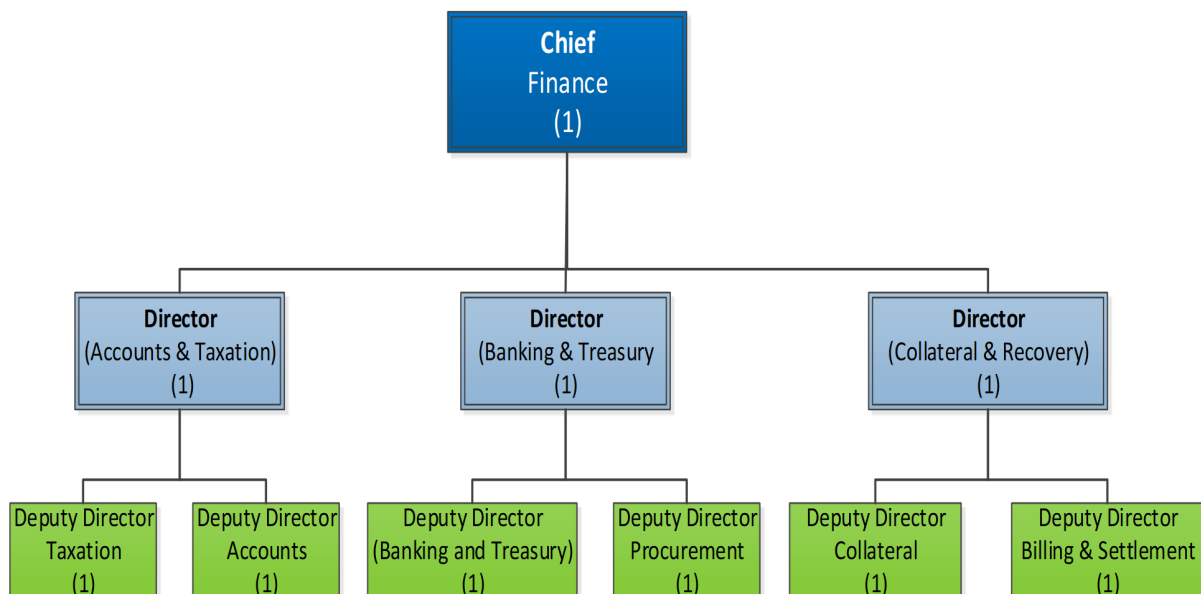


Figure 7 – High-level Structure of Finance Department

III. LEGAL

The Legal department will be headed by Chief Legal and will possess two further subsections: Contract Administration and Legal Corporate Affairs. This section will be responsible for negotiation and drafting of agreements, ensuring consistency from legal perspective, provision of legal opinion on contract relevant matters, corporate legal matters, review of corporate policies, codes and other related documents, correspondence with external stakeholders as and when required to ensure consistency with the applicable contractual, regulatory, and legal framework.

The department will have the following structure:

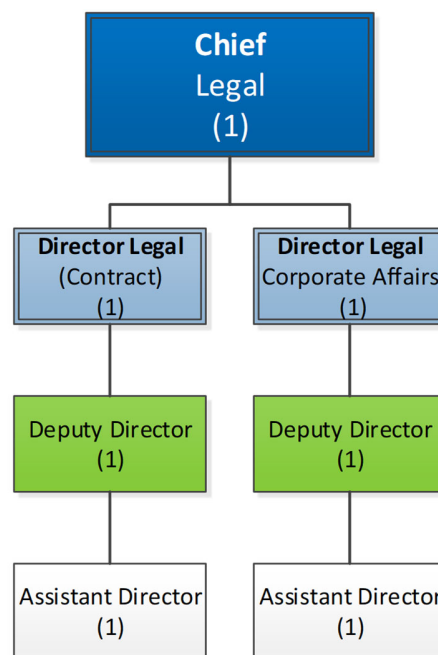


Figure 8 – Structure of Legal Department

IV. HUMAN RESOURCE AND ADMINISTRATION

An organization's overall success will be determined to a significant degree by its ability to have the right people, with the right skills, in the right places, at the right times. Additionally, administration of the seamless services to the organization as well as to its employees is also an important aspect of a progressive organization. These two aspects

will be managed by HR and Admin Department which will be headed by a Chief. Under the HR domain, this department will perform workforce planning and recruitment, organizational development and manage compensation and benefits to the employees. Under the Admin purview, the general corporate administration services will be managed.

The hierarchy of this department is depicted as follows:

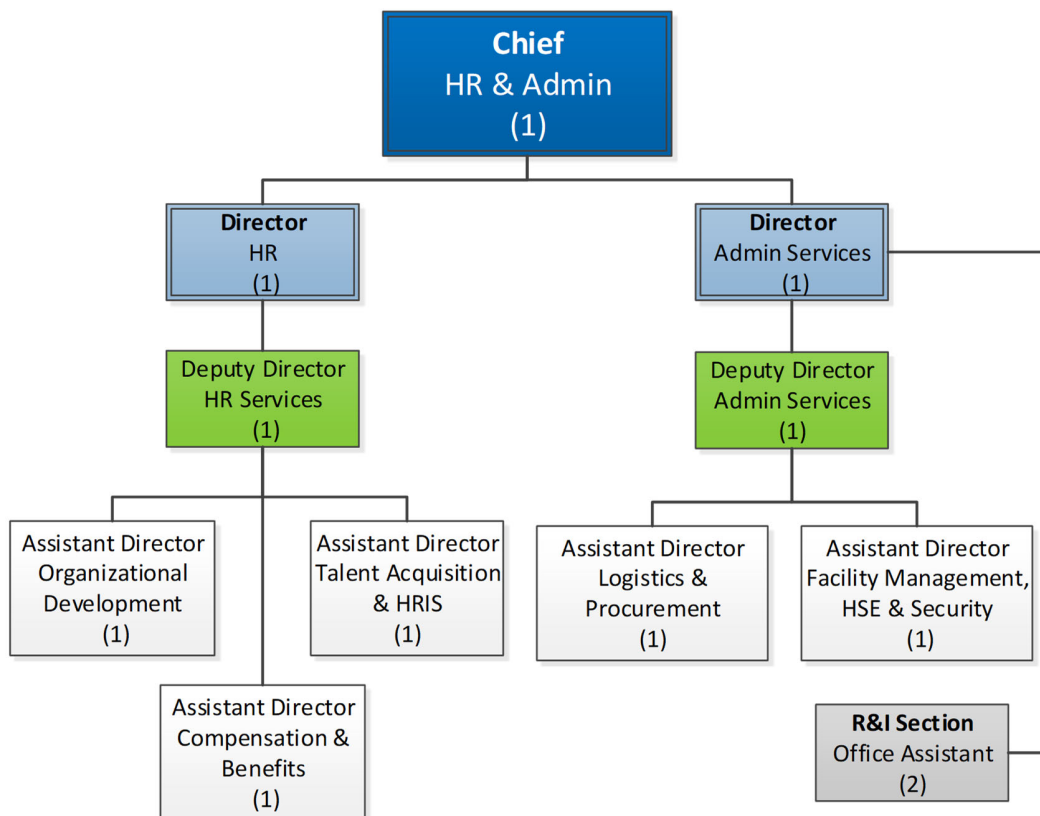


Figure 9 – Structure of HR & Admin Department

V. INTERNAL AUDIT

The role of internal audit is to provide independent assurance that an organization's risk management, governance and internal control processes are designed appropriately and are operating effectively to the Audit Committee of the Board of Directors. There is a statutory requirement that there shall be an Internal Audit Function in every Public Sector Company.

The scope of work of Internal Audit Function encompasses the examination and evaluation of adequacy and effectiveness of governance, risk management and control processes and providing an independent and unbiased opinion to the Audit Committee of the Board of Directors in order to ensure that sufficient safeguards and controls are in place and that the overall goals and objectives of the organizations is achieved.

This department will comprise of the following hierarchy:

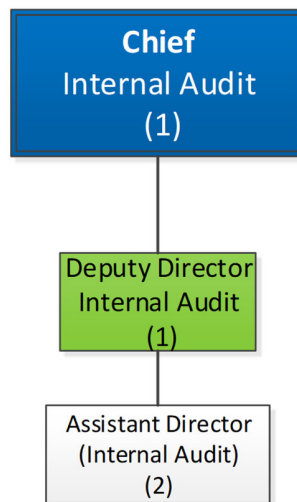


Figure 10 – Structure of Internal Audit Department

VI. OFFICE OF THE COMPANY SECRETARY

The Office of the Company Secretary maintains compliance of SECP Act, 2017 and Public Sector Companies (Corporate Governance) Rules 2013. It is also responsible for the engagement of External Audit and preparation of Directors Report. This office organizes important hi-level meetings for the company including Annual General Meetings (AGMs) / Extra Ordinary General Meetings (EoGMs) Board meetings, Board Committee meetings, and Commercial Code Review Panel (CCRP) meetings along with maintaining documentation of above-mentioned meeting.

It also provides secretarial support to the General body, Board of Directors, Board Committees and Commercial Code Review Panel. Lastly, and preparation of the

Company's Annual Report, maintaining the record, maintenance of books of accounts, filing of tax returns of company's employees, managing Gratuity Fund & Employees Provident Fund will also be performed by this office.

Following is the structure of the Office of Company Secretary:

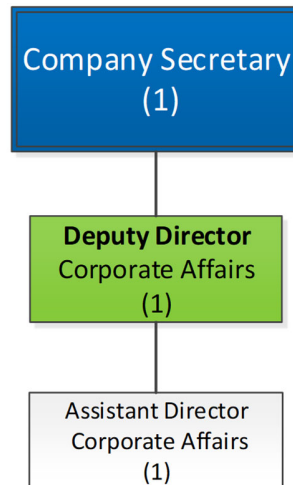


Figure 11 – Structure of the Office of Company Secretary

2.1.4 DETAILED ORGANIZATIONAL CHART

The complete organizational chart portraying the overall organizational hierarchy of the company is attached at **Annexure-III**. Due to size limitation and for clarity of purpose, the organizational chart is segregated into two separate organograms. The first organogram depicts the Market Functions while the second organogram illustrates Corporate Functions.

2.1.5 HUMAN RESOURCE STRENGTH

The strength of an organization is primarily measured by the strength of its human resources. For the past few years, the applicant has been working on enhancing the strength of its professionals in the capacity of market development and operations. The market development team of CPPA have developed a unique capability in the design, development and implementation of the competitive wholesale electricity markets. The

skills and competencies now possessed by the team of market professionals at CPPA are developed through after extensive and rigorous efforts over last few years by virtue of:

- working with **international consultants** and market experts of global repute
- having **international exchanges** to several international markets
- study and research of the electricity markets across the globe
- active **MoUs** with similar international organizations and academic institutes
- representation in Board of **Association of Power Exchanges** (APEX)
- certification in **Energy Risk Professional (ERP)** program offered by GARP USA
- conducting numerous **training workshops and capacity building** sessions of the power sector entities
- involvement in development / approval of **CTBCM Detailed Design & Roadmap**

The following table provides summary of the professionals (Cadre G-10 to G-5) currently working in the Market Operations and Development department of CPPA. It also tabulates the additional workforce that will join the Market Operator front of CPPA by October 2021. It is envisaged that by the end of Oct 2021, the facet of the Market Operator of CPPA will achieve a strength of 41 professionals and the same team will be transferred to the new company under a Business Transfer Agreement.

| #. | Name | Designation | CPPA Grade |
|----|-------------------|---|------------|
| 1 | Omer Haroon Malik | Head of Market Operations & Development | G-10 |
| 2 | Syed Shaheer Ali | Manager Design and Coordination | G-9 |
| 3 | Farooq Qurban | Manager Design and Simulations | G-9 |
| 4 | Ahmed Qazi | Manager Design and Product Dev. | G-9 |
| 5 | Hafiz Naeem | Manager Legal | G-9 |
| 6 | Arshad Khan | Manager Finance | G-9 |

| | | | |
|----|--------------------------------|--|-----|
| 7 | Zeeshan Khan | Manager Communications | G-9 |
| 8 | Abrar Hussain | Dy. Manager Design and Product Dev. | G-8 |
| 9 | Nida Mukhtar | Dy. Manager Design and Regulations | G-8 |
| 10 | Aakash Ahmed | Dy. Manager Design and Product Dev. | G-8 |
| 11 | Aitzaz Hussain | Dy. Manager Design and Coordination | G-8 |
| 12 | Zeeshan Bashir | Dy. Manager Commercial Code Administration | G-8 |
| 13 | Waleed Cheema | Dy. Manager Finance | G-8 |
| 14 | Under Process* | Dy. Manager (DB Administration) | G-8 |
| 15 | Kamal Ahmad | Assistant Manager SMD | G-6 |
| 16 | Under Process* | Assistant Manager SMD | G-6 |
| 17 | Muhammad Umer Khan | Assistant Manager SMD | G-6 |
| 18 | Ali Imran** | Assistant Manager SMD | G-6 |
| 19 | Adeel Khan** | Assistant Manager SMD | G-6 |
| 20 | Muzammil Ijaz | Assistant Manager SMD | G-6 |
| 21 | Usman Khalid** | Assistant Manager SMD | G-6 |
| 22 | Under Process* | Assistant Manager SMD | G-6 |
| 23 | Fahad Shabaz** | Assistant Manager SMD | G-6 |
| 24 | Malik Muhammad Umar | Assistant Manager SMD | G-6 |
| 25 | Khalil Ur Rahman | Assistant Manager SMD | G-6 |
| 26 | Akhunzada Muhammad Zohaib Khan | Assistant Manager Finance | G-6 |
| 27 | Under Process* | Assistant Manager (Information Security) | G-6 |
| 28 | Sabahat Ashfaq** | Assistant Manager (Functional Analysis) | G-6 |
| 29 | Muhammad Irfan | Assistant Manager (Software) | G-6 |

| | | | |
|--------------|-----------------------|---|-----------|
| 30 | Wajiha Batool** | Assistant Manager (Software) | G-6 |
| 31 | Ali Imran** | Assistant Manager (Software) | G-6 |
| 32 | Asfandiyar Shakeel** | Assistant Manager (Software) | G-6 |
| 33 | Hassam Farid** | Assistant Manager (SQA) | G-6 |
| 34 | Awais Aslam** | Assistant Manager (Datacenter) | G-6 |
| 35 | Nadia Mumtaz** | Assistant Manager (Project Coordinator) | G-6 |
| 36 | Ammama Furrukh Gill** | Assistant Manager (Software) | G-6 |
| 37 | Saadullah Javed** | Assistant Manager (Graphic Design) | G-6 |
| 38 | Under Process* | Communication Associate | G-5 |
| 39 | Support Staff x 3 | - | - |
| Total | | | 41 |

* Recruitment under progress

** Offer accepted and will join in Oct-2021

Table 2 – Summary of Professionals working in Market Operations and Development

The detailed CVs of the key professionals (G-10 to G-8) working under Market Operations and Development Department are attached as **Annexure-IV**.

2.1.6 STAFFING PLAN

Staffing requirements, considering expected workload and level of activities, for next 3 years have been worked upon. The staffing against sanctioned strength of the new company is planned over a period of three years.

The strategy is to gradually increase the staff in line with expanding operations until the achievement of the full strength.

In the first year (July 2021 – June 2022) that predominantly comprise pre-market operation phase, a total of 79 positions will be filled. Staffing of this year would mainly include onboarding of CEO before start of the market to lead the new company at strategic level. Additionally, the Company Secretary to convene meetings of Board and

Committees and to look after other secretarial matters would also be hired. Moreover, the Market Operations and Corporate Departments will be augmented with professional staff in different cadres.

In the ensuing two years moving forward, Heads of the remaining departments will be hired, as per maturity of the company and its functions. Similarly, second and third year, all the remaining positions will be filled and the ultimate sanctioned strength of the new company will be achieved.

2.1.7 CONSULTANTS TEAM

In addition to the inhouse team of market development professionals, a number of international and local consultants have been engaged in the areas of market development and implementation, energy and demand forecasting, organizational restructuring, business process reengineering and IT systems design and implementation. The services of consultants and experts would continue to be utilized after commencement of wholesale competitive market for guidance and technical assistance in market operations, product development and market evolution.

I. INTERNATIONAL CONSULTANTS

International consultancy firms of global repute have remained engaged with the market development team since 2015 for providing advisory, guidance and technical assistance in the design, development and implementation of competitive wholesale market in Pakistan.

A. MRC CONSULTANTS & TRANSACTIONS ADVISORS, SPAIN

MRC Consultants and Transaction Advisors is a boutique consultancy firm established to address the commercial, economic, regulatory, and management bottlenecks in key infrastructure sectors. MRC Consultants have worked in more than 70 countries over the last 30 years.



MRC helps its clients, private or institutional, to:

- Promote economically efficient and sustainable markets,
- Designing effective regulation conducive to sustained, affordable services, and
- Evaluate investment opportunities and reach successful closure of commercial transactions.

MRC has been providing support to Pakistan in the development of competitive wholesale market since 2016. Following is the team of individual international consultants who remained engaged during the market development phase with the Applicant and are currently part of the consultants' team.

| # | Title | Name | Overall Experience | Energy Markets Experience |
|---|--|-------------------|--------------------|---------------------------|
| 1 | Power Market (Senior Settlement, Policy and Regulatory) Expert | Roberto D'Addario | 39 | 32 |
| 2 | Power Market (Senior Generation, Transmission and Distribution) Expert | Jorge Bircher | 40 | 40 |
| 3 | Power Market (Senior Modeling and Simulations) Expert | Daniel Serrano | 18 | 18 |
| 4 | Energy Sector Finance Expert | David Parish | 38 | 32 |
| 5 | Organizational Restructuring Expert | Carlos Migue | 38 | 24 |

Table 3 – Summary of MRC Consultants

The CVs of the above MRC Consultants are attached at **Annexure-V**.

B. NATIONAL RENEWABLE ENERGY LABORATORY (NREL), USA

National Renewable Energy Laboratory (NREL) is a federally funded research and development center sponsored by the Department of Energy, USA. It works with organizations across the globe to expand the clean energy economy, R&D and provide technical solutions to problems related to energy



industry. Different industries, universities, foundations, and governments experts are working with NREL on different projects.

NREL experts coordinated through USAID Pakistan have been on board for advising on critical and technical matters related to electricity market structure in Pakistan. NREL will extend its assistance to the Market Operator function and will be engaged as and when required.

C. PSR- ENERGY CONSULTING AND ANALYTICS, BRAZIL

PSR is a global provider of technological solutions and consulting services in the areas of electricity and natural gas (E&G) since 1987. Their main areas of expertise are:



- a) Development of decision support tools for E&G markets, ranging from fully deregulated to emerging countries undergoing reform / transition.
- b) Integrated economic/financial/regulatory studies with respect to energy sector.

Two experts from PSR namely Ricardo Cunha Perez (Power Market Expert) and Gabriel Clemente (Simulation and Modeling Expert) have been actively engaged with the market development team of the Applicant and provided advisory in the matters related to market design and simulation & modeling.

Moreover, state-of-the-art tools for market analysis simulations and projections have also been acquired from PSR. PSR experts also remains involved in training and capacity building of market development team on the said tools. PSR is currently onboard with CPPA and providing remote support for the operations of SDDP tool. The PSR experts have been actively engaged in CTBCM and may also be engaged in the matters related to the market design, simulations and product development in the future if the need arises.

D. CRA- CHARLES RIVER ASSOCIATES, USA

Charles River Associates (CRA) is a leading global consulting firm that offers economic, financial, and strategic expertise to major law firms, corporations, accounting firms, and governments around the world. Their experts possess unique experience combining

cutting-edge research, state-of-the-art methods, and proven history to bear on most complex challenges related to financial markets.



The power market experts from CRA namely Plewes Jeff and Simon Ede have provided training to market development professionals of the power sector on capacity markets. The consultants have also reviewed the design of CTBCM and have been regularly engaged for seeking guidance in different aspects of the market design. They are also resource available with good understanding of the Pakistani market and enabled to provide future consultant services in market design and development for Applicant.

II. LOCAL CONSULTANTS

In addition to international consultants, local experts and specialists in different domains of the power sector have been engaged for seeking technical assistance, training and capacity building and professional advice on specialized matters ranging from legal, financial, organizational and technical matters.

Following table provides a list of the local consultants working along with the market development team:

| Sr. No. | Title | Name | Total Experience |
|---------|---|---------------------|------------------|
| 1 | Grid Code Consultant | Shahid Abdul Raheem | 41 |
| 2 | Restructuring/BPR Consultant | Bilal Manzoor | 22 |
| 3 | Legal Corporate Consultant | Nazir Shaheen | 40 |
| 4 | Legal Corporate Consultant | Imtiaz Haider | 35 |
| 5 | Legal Counsel | Munawar Salam | 32 |
| 6 | Policy, Regulatory and Financial Expert in Implementation of CTBCM through World Bank | Abid Latif Lodhi | 32 |

Table 4 – Summary of Local Consultants

The detailed CVs of Local Experts are placed at **Annex-VI**.

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BUSINESS PROCESSES

2.2 BUSINESS PROCESSES DEVELOPMENT

The functions of the new company are segregated into two major areas i.e. Market Functions and Corporate Functions. Market Functions include all those processes, work stream and areas relevant to the core business of the new company i.e. administration of the competitive wholesale market. Corporate Functions are those traditional domains which are required to support the core business of any organization and includes Finance, HR, IT, Internal Audit, Legal, Secretarial etc.

Therefore, apart from developing its capacity in terms of human resources, significant efforts have been invested in developing the business processes and the associated documents that would govern the core functions and operations of the new company under the two major domain of Market Functions and Corporate Functions:

2.2.1 MARKET FUNCTIONS

The Market Functions will mainly be governed by the MO Commercial Code (MO Code) which has been developed to establish, govern, and promote transparent operations in centrally administered by the Market Operator.

The MO Commercial Code will be a guiding tool to govern the market transactions after the Competitive Market Operation Date (CMOD). Moreover, this will set out the rights and responsibilities of Market Participants (MPs) in relation to buying and selling of electric power, settlement and payments of Imbalances and settlement of other service charges and not limited to set out the rights and responsibilities of the Service Providers with respect to provision of metering service and other allied functions. At the same time, it will be the torchbearer to provide the rights and responsibilities of the Market Operator.

Lastly it will be used to promote and enable the development of competitive power markets in Pakistan in accordance with the NEPRA Act 2018, the approved market design and the rules and regulations made thereunder by ensuring adequate information dissemination for protection of transparency in the Market.

The MO Code is attached at **Annexure-II** as a prerequisite to this MO license application for regulatory approval. The summary of the Commercial Code is covered in the subsequent section.

I. CHAPTER WISE SUMMARY OF MO COMMERCIAL CODE

CHAPTER 1: GENERAL CONDITIONS

Chapter 1 briefly outlines the objectives of Commercial Code. The composition of This Chapter is to highlight the terms to be used in this Commercial Code and their meanings in the perceptive of this Code. Further the rights to interpret the Codes and what mechanism will be adopted to achieve the same is explained. Last but not the least, composition and function of Commercial Code Review Panel and Working group is also explained.

CHAPTER 2: ROLES OF INSTITUTIONS IN CTBCM

Chapter 2 highlights the roles of different institutions in the CTBCM. This begins with classifying them is Operators, Market Participants, Service Providers and Power Procurement. Additionally, this part of Commercial Code highlights the criteria to categorize different institutions in these classifications.

CHAPTER 3: REGISTRATION MARKET PARTICIPANTS & SERVICE PROVIDERS

Chapter 3 emphasizes eligibility requirements for Market participation registration and what are the rights and responsibilities of Market Participants once the admission application has been approved by the Market Operator.

This part of Code also discusses in depth the process of Applicant to become Market participant of their chosen category and mechanism to be adopted by such Market Participant once he wants to Voluntarily cease the Market Participation registration. This

section also shed light what are the footsteps to be taken by Market Operator to terminate Market Participant and Service Provider.

CHAPTER 4: CONTRACTS AND CONTRACT REGISTRATION

In the CTBCM, Energy and Capacity buying and selling among Market Participants shall be primarily carried out through Contracts, so Section 4 of the Code discuss this instrument in detail. This part describes contracts formats, their different types, and characteristics. To register or unregister any kind of bilateral Contract among Market Participants what procedure is to be adopted this Chapter explains that.

Finally, this part of Code also underlines the commercial allocation of Legacy Contracts.

CHAPTER 5: COMMERCIAL METERING SYSTEM

Capacity and Energy values used for market settlement shall be measured through the Commercial Metering System, operated by the Metering Service Provider. This part of the Commercial Code appraises Commercial Metering general requirements, responsibilities, and procedure for Data collection. This part assign responsibility on Metering Service Provider regarding frequency of Data Collection and validation checks that shall be performed to maintain the transparency in Market Settlements. Last part of Commercial Metering deals with annual report that will be submitted to the Market Operator by Metering Service Providers.

CHAPTER 6: BALANCING MECHANISM FOR ENERGY

Chapter 6, as the name indicates, deals with the procedure and mechanism to determine, for each Market Participant, the Imbalance of Energy calculated as the difference between the Energy injected into or withdrawn from the Grid System at the relevant Trading Points duly adjusted for the losses in the network and the contracted quantities registered in the Contract Register of the Market Operator. Such Energy Imbalances shall be calculated on hourly basis (the Energy Balancing Period) and the results thereof shall be consolidated on monthly basis for settlement purposes (the Settlement Period).

CHAPTER 7: ADDITIONAL MARKET CHARGES

The purpose of this chapter 7 is to provide a procedure for identification of the Generation Units which may be eligible for compensation for Must Run Generation and/or for allowing provision of Ancillary Services so that the amount of compensation for Must Run Generation and/or for allowing provision of Ancillary Services can be determined. The Criteria for such entitled generators have been discussed in length and no Economic Compensation shall be awarded to any Market Participants apart from the guidelines provided in this part of the Code.

At the last part of this Chapter, the composition of different headers for the Market Operator Fee and, if applicable, the System Operator Fee has been discussed.

CHAPTER 8: MONTHLY SETTLEMENT

The intention of this Chapter 8 is to provide a procedure for administration of a Market Settlement System to issue the monthly Settlement Statements to Market Participants. It emphasizes on the responsibility of the Market Operator for verification of data and the accuracy of the outputs of the Market Settlement System.

Monthly Settlement composition has been explained in depth and the same time how communication will be done with Market Participants regarding this. At first, Preliminary Settlement statements shall be issued, and any objection/claim can be raised by Market Participants. On resolution or conclusion of this activity Final Settlement statements will be made. Any adjustment throughout the process can be accommodated in Extraordinary Settlement statement.

CHAPTER 9: FIRM CAPACITY CERTIFICATION

The purpose of this Chapter 9 is to provide a procedure for administration of the certification process of Firm Capacity for Generators and Imports. Such Certificates having unique identification number and nominal value of 0.1 MW will eventually be part of Capacity transactions and/or bilateral contract. To support such Capacity transactions

different types of Certificates like Temporary or permanent will be issued and status of such certificates will be changed from available to booked subjected to Contract Registration with the Market Operator.

The responsibility and guidelines for Market Operator and Market Participants are also discussed in detail to review or Dispute Resolution regarding the issued Firm Capacity Certificates.

CHAPTER 10: BALANCING MECHANISM FOR CAPACITY

The objective of this Chapter 10 is to apprise Market Participants the process to comply with their Capacity Obligations. In the Balancing Mechanism for Capacity (BMC), a Market Participant purchases Capacity from other Market Participants which have Capacity more than their obligations.

This Chapter discuss in detail the 8 steps process from Identification of Critical Hours to the Capacity Credited to Capacity Requirements of Market Participants leading to their Capacity Balances which will eventually determine the Capacity Balance Payable or Receivables. After such determination BMC shall be executed and non-compliance with instructions issued by the Market Participants will lead to Non-Compliance and limitation to participate in BMC.

CHAPTER 11: COMPLIANCE WITH EX-ANTE CAPACITY OBLIGATIONS

The intent of this Chapter 10 is to provide a mechanism for verification of Ex-Ante compliance with Capacity Obligations of Market Participants and to take the necessary actions in case of non-compliances by Market Participants.

This mechanism starts with the Demand Forecast Submission of Market Participants and their review by the Market Operator (MO). Demand Incident Report will be generated as per the guidelines provided in Code in case of false, misleading, or material damaging information submission by demand participants. Based on the provided information

principles are defined to calculate the Capacity Obligation of each Market Participant. As a result of this determination Ex-Ante verification will be performed and results of such verification will be communicated. Last but not the least, actions and procedure to deal with Non-Compliance of Ex- Ante Capacity Obligation is explained.

CHAPTER 12: YEARLY SETTLEMENT STATEMENTS (FOR BMC AND EXCESS LOSSES)

Chapter 12 of Commercial Code explains how the Market Operator shall make Yearly Settlement Statement for the previous year. The composition of such Yearly Statement shall include the Amounts Payable or Receivable by a Market Participant, as the case may be, for the participation in the Balancing Mechanism for Capacity, the amounts payable by a Transmission Service Provider to the Market Operator for the Excess Losses(if applicable), any correction in the form of Yearly Extraordinary Settlement Statement but not limited to the Amount Payable to or Receivable by the Market Participant on account of accrued interest for previous late payments or default in making payments.

CHAPTER 13: PAYMENT SYSTEM

As Monthly and Yearly Settlement Statements have been made as per the previous Sections of Commercial Code here Chapter 13 of Commercial Code explains in depth the procedure and mechanism for execution of payments in-align with the Settlement Statements.

Instructions about the types and counts of Bank accounts to be opened and maintained by Operators, Service Providers and Market Participants are given. Mostly importantly subjected to nature of Settlement Statements payment procedure has been debated and what actions will be taken by the Market Operator if any party fails to comply with the payment instructions either late/non-payment or overpayment.

CHAPTER 14: GUARANTEES AND SECURITY COVERS

Chapter 14 of Commercial Code talks and guides about the Appropriate Security Covers to be provided by Each Market Participant for guaranteeing their expected amounts payable as per Final Monthly/Yearly Settlement Statements and/or expected amounts payable for the Capacity purchased in the Balancing Mechanism for Capacity.

How the initial Security Cover amount shall be calculated for different Market Participants is explained in detail and this determination principle will be different for different Market Participants (MPs). In addition to Security Cover, Settlement Guarantee Fund shall also be provided by MPs for their purchase as per the Monthly Settlement Statements. Finally, the administrative principles are discussed that how the MO will act in case of insufficient or non-providence of Security Cover and/or Settlement Guarantee Fund by MPs.

CHAPTER 15: SETTLEMENT OF DISPUTES

Chapter 15 discusses the Dispute resolution procedure and its applicability especially what can or can't be settled under the domain of this Code.

This procedure starts from Notice of Dispute to amicable resolution to expert determination to adjudication tribunal. Even exercising the process, grieved party can appeal to the Authority as well. This chapter also imposes responsibility on MO regarding confidentiality, record keeping, publication and costs/fees to be charged.

CHAPTER 16: MARKET DEVELOPMENT AND SURVEILLANCE

Chapter 16 sets out the responsibilities of the MO in market development and surveillance. While implementing the Commercial Code, the MO shall continuously review the overarching legal, policy and regulatory framework and propose recommendations to the competent authorities to enhance the efficiency of the Market. The MO shall recommend for the approval of Authority, any modifications in the design of the CTBCM, introduction of new products such as Ancillary Services market, day-ahead market, trading platforms etc.

The MO shall establish a separate department to investigate any activity related to the CTBCM or the conduct of a Market Participant or a Service Provider, and thereafter prepare and submit reports to the Market Operator board to take necessary action.

CHAPTER 17: ENFORCEMENT

As to comply with Commercial Code is the obligation of the MO, SO, Service Providers and all the MPs, the Market Operator shall monitor compliance with the provisions of this Code by all concerned. Chapter 17 explains in detail the procedure concerning alleged breaches of this Code and how it will be addressed.

Where this part of Code explains the procedure, it also discusses the punitive actions that shall be taken by the MO in case of Breach and/or Non-Compliance.

CHAPTER 18: DISCLOSURE, ACCESS, AND CONFIDENTIALITY

Chapter 18 addresses the issue of Maintenance of records, information disclosure and access to the information. The Market Operator shall make and publish a record keeping policy for Records prepared by the Market Operator, the System Operator, the Service Providers and Market Participants in connection with this Code. This part also sets out the principles on Information Disclosure and confidentiality.

CHAPTER 19: MISCELLANEOUS, COMPLEMENTARY AND TRANSITORY PROVISIONS

Chapter 19 talks about the Supplementary Provisions for MPs holding multiple licenses or authorization. In additions to these transitory provisions for Initial Metering Service Providers, Initial Cap on transmission losses of KE, manual meter reading, initial Capacity Obligations but not limited to efficient level of reserve are discussed in this part of the Code.

CHAPTER 20: APPENDICES

Chapter 20 comprise the methodology for determination of system marginal prices and ancillary service charges. General Approach and Interim procedure for such calculation has been elaborated.

II. CORE MARKET FUNCTIONS IN RELATION TO MARKET COMMERCIAL CODE

Following table provides an illustration of the core market operations to be performed by the new company in relevance to the Market Commercial Code. Additionally, the standard Commercial Code Operating Procedures (CCOPs) and related Process Manuals have also been prepared to cover other aspects of market services and market development.

| # | MO Core Functions | | Relevant MO Code Chapter (s) |
|---|-------------------|---|------------------------------|
| 1 | Market Operations | Commercial Code Administration | Chapter 1 |
| | | Registration of Market Participants and Service Providers | Chapter 3 |
| | | Contract Registration | Chapter 4 |
| | | Metering Information Management and Metering System | Chapter 5 |
| | | Balancing Mechanism for Energy & Settlement | Chapter 6 & 8 |
| | | Additional Market Charges Calculation & Collection | Chapter 7 |
| | | Firm Capacity Certification & Capacity Obligations | Chapter 9 & 11 |
| | | Balancing Mechanism for Capacity & Settlement | Chapter 10 & 12 |
| | | Payment Systems | Chapter 13 |
| | | Security Covers Management | Chapter 14 |
| | | Dispute Management with Stakeholders | Chapter 15 |
| 2 | Market Services | Reporting and Dissemination | Chapter 16 & 17 |
| | | Market Compliance | |
| | | Market Surveillance | |
| | | Market Trainings | Covered in Process Manuals |
| | | Liaisons with Market Participants and other Stakeholders | |

| # | MO Core Functions | | Relevant MO Code Chapter (s) |
|---|--------------------|--|------------------------------|
| | | Market Communications | |
| | | International Affairs | |
| | | Market Website Administration | |
| 3 | Market Development | Policies & Regulation Development | Covered in Process Manuals |
| | | Product Design Market Evolution | |
| | | Market Evolution | |
| | | Process Administration and Reengineering | |
| | | Policy and Regulatory Compliance | |
| | | Modelling and Simulation | |

Table 5 – Summary of core market functions in relevance to MO Commercial Code

III. MARKET OPERATOR'S OPERATIONAL PROCESS MANUALS

In light of Commercial Code, operational **Process Manuals** for the all the functions of Market Operations and Development have been developed. Each Process Manual contains following sections:

- List of Sub Processes with step-by-step detail
- Sub-Process Business Rules and Conditions
- Inputs and Outputs of each Sub-Processes
- Inputs and Outputs of each Activity
- Risk Management
- Responsible and Accountable role for each Activity
- Business Process Maps (BPMN Diagrams) representing Workflows, Information flows, Participants, Communications and Business Rules.
- Expected Timeline / Gantt Chart for the execution of each Step and Sub-Process
- Functional Standard Documents and Data Forms

A. PROCESS CLASSIFICATION AND ADMINISTRATION FRAMEWORK

The operational manuals and sub-processes referred above are built under the guidelines of Process Classification Framework (**PCF**). It is a taxonomy of business processes that allows organizations to objectively track and compare process performance internally and externally.

This framework is not only providing the foundation of Market Operator's Operational Process Manuals but in future this frame will lead to establish Process Monitoring Platform, Determination / Calculation of periodic Process Quality Index, and Process Re-Engineering activities.

B. OPERATIONAL PROCESS INTELLIGENCE DASHBOARD

On top of that framework, an interactive Operational Process Intelligence Dashboard (**OPID**) is developed. This dashboard is used for the quick visualization of relational between MO Functions, Organization Roles, Sub-Processes and Activities along with:

- Hierarchical Visualization of Sub-Process and Activities
- Workload / Activities defined for Organizational positions
- Activity Responsible and Accountable
- Slicing of data for quick analysis

Following is a depiction of the OPID: the first picture is the snapshot of the main tab of the OPID summarizing the number of functions, processes, activities and other statistics used in the PCF; the second picture gives further resolution of the OPID by elaborating the process of BME.





2.2.2 CORPORATE OPERATIONS

The processes related to the corporate operations under the domains of Finance, HR, IT and Communications would be governed in the following manner:

I. FINANCE OPERATIONS

In order to govern the finance & accounting operations of the new company, comprehensive finance and accounting manual shall be developed. Additionally, the internal audit manual to provide guidance related to the internal audit processes will also be developed.

II. HR OPERATIONS

The new company will have a corporate culture aligned with the sector best practices to ensure professionalism & transparency in its operations. The conduct of human resources shall be governed by a comprehensive HR Manual (covering all required areas) and allied procedures. Existing HR Manual of the Applicant shall be used as a reference point and shall be adopted after incorporating necessary improvements / required adjustments. Additionally, HR Policies will be developed to guide on the certain aspects of HR and administration side of the corporate business.

III. IT OPERATIONS

The business processes of the new company are highly technology-driven and required sophisticated efforts for the automation of the processes and digitization of the information. The applicant considers the information technology assets, as the foundation for future development for the Electricity Market, without which the dream of a transparent, effective and efficient electricity market cannot be realized. For this, information has to be treated as a strategic asset and would require establishing a robust, reliable, modern, and interoperable technology infrastructure to support data collection, analysis, reporting, and even direct operations.

In order to automate the MO business processes, a comprehensive IT Strategy and IT Plan has been prepared and is being implemented to develop and launch the requisite MO IT systems and applications coupled with the installation of the allied hardware infrastructure before the commencement of the wholesale market. This strategic plan outlines the information technology roadmap for becoming a modern Market Operator in line with the international best practices and the prevailing models implemented at similar MO organizations globally. Additionally, different IT Policies will be issued from time to time to provide guidance to the users regarding access, storage, network, data, assets, systems, security etc.

IV. CORPORATE COMMUNICATIONS

Corporate communications refer to the way in which businesses and organizations communicate with internal and external various audiences. These audiences commonly include:

- Market participants and service providers
- Employees
- Key stakeholders
- The media and general public
- Government agencies and other third-party regulators

It is difficult to undermine the importance of effective communication for most businesses and organizations. The corporate communications department envisaged in the MO will be responsible for all internal and external communication materials.

The corporate communications department envisaged in the MO will focus on building up a strong corporate and market communication program through but not limited to:

- Knowledge Products
- Brand Awareness (Corporate Identity)
- Brand Credibility (Corporate Reputation)
- Brand Talent
- Employee Engagement
- Employee Productivity

In order to have a standardized communication across the organization, corporate communications department of the new company will develop a comprehensive corporate communication strategy and plan. Additionally, corporate communications department will also align other departments to adopt a brand guidance manual to provide guidance related to the internal and external communications of the new company.



MMS

TECHNICAL CAPABILITY

2.3 TECHNOLOGICAL ENHANCEMENTS

Information Technology is crucial to the success of the modern organization. It plays a catalytic role by proactively partnering with its functional counterparts to identify new opportunities where technology can drive greater business effectiveness and efficiency. Therefore, a great deal of effort must be invested in planning, designing, and implementing information technology systems that can really improve business operations.

Given the fact that the business processes and functions of the new company are highly dependent on the robust technological infrastructure comprising several systems, tools, software and applications etc., the need for an IT platform that can manage such complex transactions of the multi-buyer market increases manifolds. Similarly, the transparency of the market operations and easy access to the market data is also of the prime importance for a market. Keeping this in view, following IT interventions are being implemented to cater the technological needs of the new company.

2.3.1 MARKET MANAGEMENT SYSTEM

In order to provide a secure, transparent, reliable, integrated and robust automation platform, CPPA under MO license aims to implement a complete market settlement management system (MMS). The MMS System covers the detailed business process automation of the core business functions of MO including the registration of market participant and service providers, information exchange, calculations of imbalances (energy, capacity), settlement, billing, payment method, reporting and analytics. There is a roadmap to gradually automate these functions.

Following table depicts the modules being developed under the MMS system with the brief explanation of the objective to be served by each module.

| # | Module Name | Description |
|---|---|---|
| 1 | Registration of Market Participant and Service Provider | <p>This module shall include creating an electronic register of the market participants and service providers. The module shall cover in detail the process flow for initial registration and then updating the entries in the register.</p> <p>This module will be governed by Chapter 3 of the Commercial Code.</p> |
| 2 | Capacity Obligations | <p>This module shall be capable to store the information provided by the participant in an organized manner in a digital register, perform the capacity calculations, store and publish the results. The module shall be capable to automatically established linkages with other databases such as metering data, contract register, firm capacity certificates register and market participants register.</p> <p>This module will be governed by Chapter 11 of the Commercial Code.</p> |
| 3 | Firm Capacity Certification | <p>This module shall contain an electronic register to store the information used in the calculation of the Firm Capacity Certificates as well as the Firm Capacity Certificates. The module shall also be capable of archiving all the documents used in this process with proper linkages with the certificates and the market participants.</p> <p>This module will be governed by Chapter 9 of the Commercial Code.</p> |
| 4 | Bilateral Contract Registration | <p>This module shall contain an electronic register to store the information related to the contracts assigning a unique ID to each contract. The module shall also cover the process flows for making changes in the contract register like the validation of the contract, un-registration of contracts, suspension of contracts etc. The module shall also be capable of archiving all the documents used in this process with proper linkages with the Contracts, the Market Participants and the corresponding trading points.</p> |

| | | |
|---|----------------------------------|---|
| | | <p>This module will be governed by Chapter 4 of the Commercial Code.</p> |
| 5 | Marginal Price Application | <p>This module shall cover the processing of the information provided by the system operator and apply an algorithm to discover the marginal price. This module shall be capable to establish linkages with the System Operation Information database. The marginal price for each hour shall be stored in an electronic register in a manner that the information can be accessed by other processed in a systematic manner.</p> |
| 6 | Balancing Mechanism for Energy | <p>This module shall cover the receipt of metering data from the metering database and apply an algorithm as defined in the commercial code to come up with the actual quantities for each market participants. The module shall also be capable to establish linkage with the contract register to obtain information related to the contracts registered by such participants. Another related process that this module shall cover is the adjustment of excess transmission losses. The module shall be capable to handle the workflow and data of the BME process.</p> <p>This module will be governed by Chapter 6 of the Commercial Code.</p> |
| 7 | Balancing Mechanism for Capacity | <p>This module shall be capable to take inputs from the metering database, System Operator Database, Contract Register and other external parameters being fed by the user for running BMC. This module shall cater for processes required for the BMC including work-flow, building algorithm, storing parameters in an electronic register in an organized manner.</p> <p>This module will be governed by Chapter 10 of the Commercial Code.</p> |
| 8 | Billing & Settlement System | <p>This module shall be capable to cater for the needs of the billing and settlement process. The module shall support calculation of penalties and subsequent adjustment / revision, if required. The module shall be flexible to incorporate the changes in the settlement process with evolution of the market. The module shall interact with the ERP.</p> |

| | | |
|----|---|---|
| | | This module will be governed by Chapters 8 & 12 of the Commercial Code. |
| 9 | Metering Information | <p>This module shall be capable to register data pertaining to the actual quantities injected/taken from the grid through the commercial metering system of NTDC so that it can be easily accessed by other processes where this data is used as input. The module shall also include data validation protocols to check validity of the data received. The module shall be equipped with the functionality to automatically fetch the data from the data registers of NTDC.</p> <p>This module will be governed by Chapter 5 of the Commercial Code.</p> |
| 10 | System Operator Information | <p>This module shall be capable to handle all the data which is being exchanged between the Market Operator and the System Operator and being capable to establish linkages with other processes to use this data in the market settlement and other allied processes. As this information will be used in many processes, the module shall be capable to establish linkages with other modules. This responsibility will be performed by NTDC, therefore it is required that NTDC would be ready before CMOD to assume this function.</p> <p>This module will be governed by Chapter 5 of the Commercial Code.</p> |
| 11 | Administration of Credit Covers | <p>This module shall be capable to handle the calculations of credit cover amounts, possibly its linkage to imbalance (monetized at applicable price) of each participant in the preceding month / year and real time communication to the participants to recoup the deficiency if any, its management through the banks, the constant monitoring and the frequent changes (to cover both upward and downward revisions as well as renewal / replenishment) in the credit cover requirements.</p> <p>This module will be governed by Chapter 14 of the Commercial Code.</p> |
| 12 | Ancillary Service Charges and Must Run Generation and Independent | This module will cover for all of the three categories of settlements, i.e. ancillary services, |

| | | |
|----|--|---|
| | System and Market Operator and System Operator Fee | <p>must run generation and market administration and system operation fee. This module will cater for the calculation and administration of any other kind of grid charges being introduced in the future that needs to be settled by the New company including the transmission service charges, the metering service charges and the strategic projects charges or any other levies imposed by the government that will be collected and disbursed by the New company.</p> <p>This module will be governed by Chapter 7 of the Commercial Code.</p> |
| 13 | Complaints Management | <p>This module will handle all the complaints raised by the market participants and service providers in the form of an efficient complaint management system. The system will be able to incorporate different complaint management workflows.</p> <p>This module will be governed by Chapter 15 of the Commercial Code.</p> |
| 14 | MO Service Charges | <p>This module will be capable to calculate service charges for MO as approved by the Regulator, send invoices and proper accounting thereof.</p> <p>This module will be governed by Chapter 7 of the Commercial Code.</p> |

Table 6 – Modules being developed under MMS

2.3.2 ENTERPRISE RESOURCE PLANNING (ERP)

Building on the successful implementation of ERP System that has resulted in automating most of the back-office business processes of the Applicant, including the financial, billing, treasury management, assets management, as well as the automation of the core HR



ERP Flow Chart

functions, the ERP will be implemented building on the previous experience. Automation of these back-office processes would significantly enhance the quality of decision making while enormously increasing the productivity of respective corporate functions of new company. This process integration will prove beneficial for the new company and will provide greater visibility and

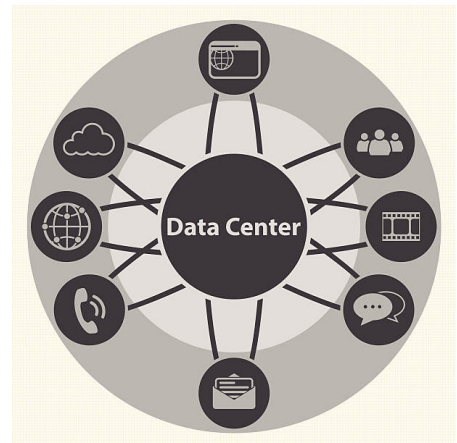
transparency, better monitoring and process control, improved projections and estimations, paperless transactions and quick decision making across the company.

2.3.3 CENTRALIZED DATA EXCHANGE PORTAL

The implementation of ERP System as mentioned above will bring standardization of internal business processes of the new company, more data security and enhanced communication across the departments and business users. Moving forward to automate the processes of integration with the other stakeholders of power sector for receiving and dissemination of data and information, there is a plan to launch a web-based data exchange portal in the lines of CDXP that has demonstrated its success and usefulness for the power market.

This portal will be integrated with the ERP system and connect it with business processes of stakeholders of power sector i.e. Power Generation Companies, DISCOs, NTDC, NPCC etc. for exchange of the requisite data for running market operations.

This portal will be aimed to serve as a hub of communication and exchange of data/ information for all the stakeholders of power sector. It will be developed using the modular approach and will reach out to all the stakeholders in different phases. This portal will also help in elimination of complexity of physical record keeping, to save time, money and provide a central access point for the market players.



2.3.4 MARKET WEBSITE

One of the key objectives of Market Operator would be to ensure the transparency in the processes of the market functions to build up confidence of market participants and provide easy and instant access of market data to the market players for timely decision making & other services.



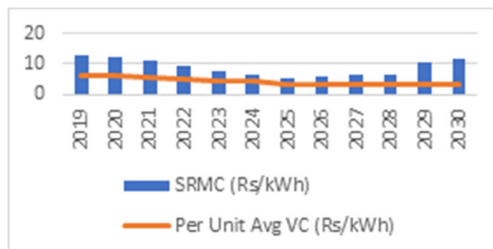
Sample Website

To ensure this objective, among other required IT interventions, one of the major interventions is to develop a state-of-the-art website for the competitive wholesale electricity market for availability and accessibility of information, processes and data to the targeted audience.

Keeping in view the above, the Applicant has already initiated the process for development of a state-of-the-art website. This website would be capable to handle the market information and statistics and disseminate the same to the interested parties. In this regard, request for proposal has already been floated and the technical and financial evaluation of the received proposals has already been concluded for contract award.

2.3.5 MARKET SIMULATION & MODELING TOOLS

To enable successful operation of a competitive electricity market; transparency and information symmetry for the market participants is a pre-requisite. Keeping this in view, the Applicant has developed an Integrated Energy Market Simulation Model (IEMSM) to generate the necessary information required by the market players for analyses and decision making in the future market of Pakistan.

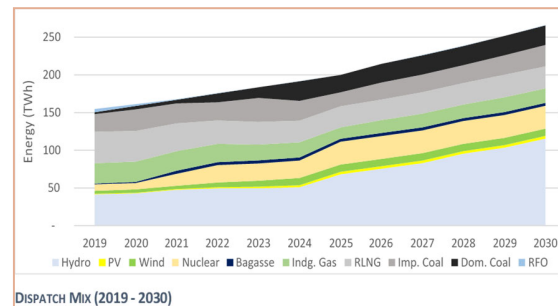


Market Projections

IEMSM is a combination of off-the-shelf and Excel based automated tools that process different types of input and produce different analysis and results. These include SDDP Tool, ECAT, MCAT, FCAT and Dashboards (Preliminary dashboards prepared to see the

impact of varying different factors on the outputs for all these tools). Inter-alia it includes marginal prices, total system cost (variable and fixed costs), allocation of capacities and energies to DISCOs and respective sensitivities.

It is pertinent to highlight that, in addition to the tools referred above, the market department also have the capacity to run and utilize other complex and advanced tools such as NCP and PLEXOs.



Dispatch Mix

With the market simulations and modeling capability already well equipped by the Applicant in the form of IEMSM, the same competency will be transferred to the new company.



FINANCIAL RESOURCES

2.4 FINANCIAL RESOURCES

As per the current MO Registration Certificate, CPPA is performing the market development function of the Market Operator to facilitate the transition from the current regime towards CTBCM and to establish processes and system to perform the market operation before commencement of the CTBCM. Accordingly, the revenue requirement in this respect is approved by the Authority from time to time under the Market Operator Fee (MOF) and duly notified by the Federal Government.

In this regard, the Applicant would prepare a multi-year budget for entailing both CAPEX and OPEX requirements of the new company, keeping in view future expansion and scale of operations likely to be occurring in foreseeable future.

Accordingly, the budget for the period (FY 2021-22) has been prepared which covers predominantly the pre-market phase, highlighting with necessary developments required to operationalize the market and its corresponding financial impact. The summary of the CAPEX and OPEX for the first year is exhibited as follows.

2.4.1 CAPITAL EXPENDITURES

The summary of CAPEX required for FY 2021-22 is given below:

| | ----- Rs 'M' ----- |
|----------------------------------|--------------------|
| IT systems & solutions | 229 |
| Pool vehicles | 19 |
| Furniture, fixtures & appliances | 13 |
| Building construction cost | - |
| | 261 |

2.4.2 OPERATING EXPENDITURES

The summary of OPEX required for FY 2021-22 is given below:

| | ----- Rs 'M' ----- |
|------------------------------|--------------------|
| Human Resource cost | 162 |
| Admin expenses | 27 |
| Consultancy & Licensing fee | 57 |
| Training & capacity building | 97 |
| IT OPEX | 26 |
| | 369 |

It is pertinent to highlight that the budget for the first year i.e. FY 2021-22, after approval of CPPA Board, has already been submitted to NEPRA for regulatory approval, along with Market Operator Fee application.

STRATEGIC PARTNERSHIPS



EPEXSPOT
EUROPEAN POWER EXCHANGE

EPIAS

APEx
Association of Power Exchanges



ADB
ASIAN DEVELOPMENT BANK



THE WORLD BANK



3. STRENGTHENING THE ELECTRICITY MARKET

The competitive wholesale electricity market is a new domain in the power sector of Pakistan. Once established, the market will continue to grow towards maturity and further evolve to offer new products & services. To keep pace with the evolving market, the Market Operator, other service providers and the market participants need to upgrade themselves in order to utilize the maximum potential of the market.

Building strategic alliances and partnerships with the international organizations across the globe would help the Market Operator to learn best market practices. These partnerships could also help other service providers to gain knowledge under their respective domain from their international counterparts. Similarly, the training and capacity building would be a mandatory feature of the competitive wholesale market so that up-to-date market knowledge could be transferred to the respective stakeholders.

3.1 BUILDING STRATEGIC PARTNERSHIPS

With a belief in developing goods liaison with similar international organizations and bodies administering competitive power markets globally, persistent efforts are made to build strategic partnerships and alliances across the globe. Moreover, collaborations with the local reputable institutions are also made to work on the matters of mutual interests.

In this regard, five Memorandums of Understanding (MoUs) have been signed by the Applicant in the role of the MO with local and international counterparts including European Power Exchange (EPEXSPOT), Market Operator of Turkey (EPIAS), Lahore University of Management Sciences (LUMS), National University of Science & Technology (NUST) and Pakistan Institute of Development Economics (PIDE). Additionally, representation in the Board of International Association of Power Exchanges (APEX) in the capacity of Market Operator of Pakistan has been obtained.

Likewise, active coordination with the international funding agencies including USAID, ADB and the World Bank for technical assistance and collaboration in the areas of mutual interest is in place.

It is envisaged that similar efforts will be invested by the new company to not only continue with the active coordination with legacy partners but also developing new alliances with the international similar entities such as Market Operators of North America, Canada etc.

3.1.1 INTERNATIONAL STRATEGIC ALLIANCES

Following section summarizes the partnerships and alliances made with the international counterparts across the globe.

I. MEMBERSHIP OF APEX

Association of Power Exchanges (APEX) is an international association formed to facilitate development and communication of ideas and practices in the operation of global competitive electricity markets. CPPA as the Market Operator of Pakistan has been member of Association of Power Exchanges (APEX) since March 2017. Apart from Pakistan, the association has 47 full-time members all over the globe ranging from EXIST: the Market Operator/Exchange of Turkey, to PJM: the ISO in United States.



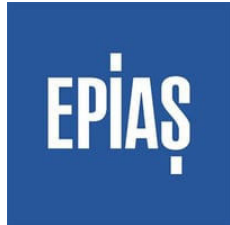
II. REPRESENTATION ON BOARD OF APEX



Pakistan has not only remained an active member of APEX for last 3 years but also succeeded in getting representation on APEX Board for its dedication and strong commitment towards learning and exchanging experience with global power Market Operators. In January 2021, the Head of Market Operations and

Development of CPPA got selected as Board Member of Association of Power Exchanges (APEX).

III. EPIAS: THE MARKET OPERATOR / EXCHANGE OF TURKEY



Market Operator of Pakistan has built a strategic partnership with EPIAS which is the Market Operator / Power Exchange of Turkey. This partnership started in 2016 with signing up of an MoU followed by several exchanges between the two parties with interaction of key professionals on both sides. Since then, Market Operator of Pakistan and EXIST are in regular contact and are also collaborating in the areas of mutual interest.

IV. EPEXSPOT: EUROPEAN POWER EXCHANGE

European Power Exchange (EPEX SPOT) is an electric power exchange operating in more than 13 countries i.e. Austria, Belgium, Denmark, Finland, France etc. Market



Operator of Pakistan has been a member of EPEX SPOT since December 2017. CPPA has also signed an MoU with the EPEX SPOT to work in the areas of mutual interest.

3.1.2 INDIGINEOUS PARTNERSHIPS

In this section, the collaborations built with the local universities and policy institutions are enlisted:

I. LAHORE UNIVERSITY OF MANAGEMENT SCIENCES (LUMS)



The Applicant has not only built strategic partnerships with international organizations but also continuously engaged national academic institutes in this journey of power sector paradigm shift. In this regard, MO has signed non-binding MoU with Lahore University of Management Sciences (LUMS) in June 2018. The objective of this MoU was to exchange knowledge, conducting trainings and capacity building of the power market participants. So far, under this MoU, CPPA has successfully delivered two batches of its

signature Electricity Market Professional (EMP) Program along with numerous other trainings sessions and consultative workshops.

II. NATIONAL UNIVERSITY OF SCIENCE & TECHNOLOGY (NUST)

Market Operator of Pakistan has signed non-binding MoU with National University of Science and Technology (NUST) in November 2019 for building healthy relationship with



Pakistan renown academic research institutes and a step towards industry academia research linkages. Under this MoU, CPPA and NUST collaborate with each other on fronts of capacity building, trainings and market simulations and quantitative analysis.

III. PAKISTAN INSTITUTE OF DEVELOPMENT ECONOMICS (PIDE)



With same objective of knowledge sharing, capacity building and conducting trainings, Market Operator of Pakistan has signed MoU with Pakistan Institute of Development Economics (PIDE) in October 2020.

Under this MoU, PIDE provides technical assistance in conducting research, professional development and inter alia activities.

3.2 TRAINING AND CAPACITY BUILDING OF POWER SECTOR ENTITIES

Training, capacity building & continuous professional development of the power sector entities is of prime importance for successful implementation of the competitive wholesale market and subsequently to run the operations of this new market. This is the reason why the Applicant not only focuses on the training of its own employees but also gives significant importance to the capacity building of all the power sector entities working closely for transformation of the electricity market and have share in the market operations.

In this connection, a number of trainings, workshops, webinars, consultative sessions were held during last 5 years which were attended by representatives from MoE (PD), NEPRA, DISCOs, KE, NTDC, NPCC, AEDB, PPIB and other stakeholders.

3.2.1 ELECTRICITY MARKET PROFESSIONAL PROGRAM

The most prominent of capacity building initiatives is the signature Electricity Market Professional (EMP) Program which has seen completion of its two batches. Through the EMP Program, around 100 professional of power sector entities have received training on the electricity markets in general and the approval CTBCM model in particular. This program has enabled the implementing entities not only in the implementation of their respective actions under the CTBCM Plan but has also enabled them to undertake the future market operations.



Team of Electricity Market Professionals

The targeted audiences for this program are officials from relevant entities of power sector entities including Ministry of Energy (Power Division), NEPRA, NTDC, NPCC, DISCOs and K-Electric. Additionally, faculty members from indigenous universities, LUMS

and NUST, were also part of this program from the perspective of train-the-trainer. This is a regular training program which will be offered to the participating power sector entities on a yearly basis through the platform of Power Sector Center of Excellence.

3.2.2 POWER SECTOR CENTER OF EXCELLENCE (PSCE)

Moving forward, to cope with this significant transformation of the power market of Pakistan, specialized trainings and certifications of professionals employed in the power sector institutions of Pakistan is necessary to attain long-term goals and objectives of the country. There is a need that all the stakeholders have adequate understanding of the tools, technologies, governing legal, policy and regulatory framework relevant to the

market so that the governing law and best practices are followed as should be. Therefore, a Power Sector Center of Excellence (PSCE) has been established in collaboration with



Training of EMPs

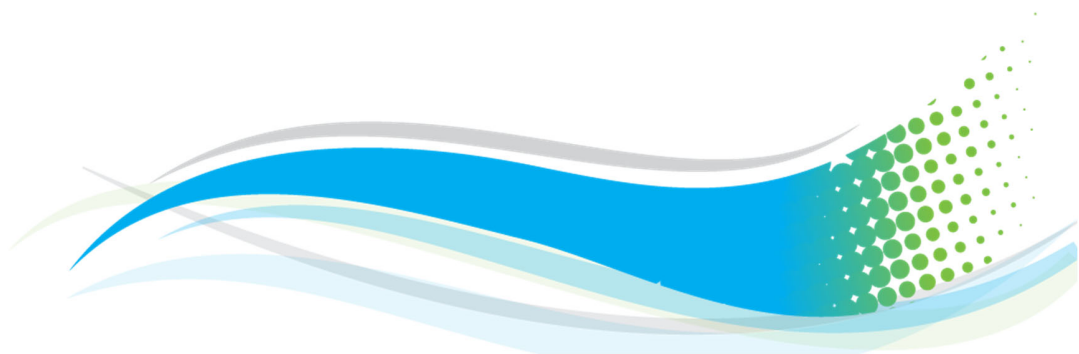
LUMS which will act as the central resource to provide the requisite trainings, capacity building and sustainable knowledge-base to power sector professionals. This will ensure that the stakeholders are well-equipped for the smooth running of affairs in the power market of Pakistan.

The PSCE is envisaged to become a training and certification hub in the power sector of Pakistan. One or two-days trainings are designed for executives and senior management personnel and longer duration trainings are envisioned for middle management and specialized technical staff.

Subsequently, officials from MoE (PD), NEPRA, NTDC, DISCOs, NPCC, PPIB, AEDB, CPPA and other relevant stakeholders of the power sector will undertake the required trainings through this platform. This will ensure that officials are skilled and trained with the latest concepts and practices and can therefore contribute towards a sustainable power sector. It will also provide a professional career development pathway where personnel may specialize in one or more aspects and move up in institutional hierarchy.

4. PRAYER

Pursuant to the provisions of NEPRA Act, the Applicant is submitting the licensing application before the Authority along with MO Commercial Code. Pursuant to the decision of Federal Cabinet in near future, separate application(s) based on sections 23A, 27 and 33 of NEPRA Act will be submitted before the Authority for kind consideration and grant / transfer of license.



LIST OF ANNEXURES

| | |
|---------------|--|
| ANNEXURE-I: | MARKET OPERATOR CERTIFICATE OF REGISTRATION |
| ANNEXURE-II: | MARKET OPERATOR COMMERCIAL CODE |
| ANNEXURE-III: | MARKET OPERATOR ORGANIZATIONAL CHART |
| ANNEXURE-IV: | CVS OF KEY MARKET DEVELOPMENT PROFESSIONALS |
| ANNEXURE-V: | CVS OF INTERNATIONAL CONSULTANTS |
| ANNEXURE- VI: | CVS OF LOCAL CONSULTANTS |


National Electric Power Regulatory Authority**CERTIFICATE OF REGISTRATION****Market Operator**

In exercise of the powers conferred by Rule-3 of the National Electric Power Regulatory Authority (Market Operator Registration, Standards and Procedure) Rules, 2015, the National Electric Power Regulatory Authority hereby grants a certificate of registration to **Central Power Purchasing Agency (Guarantee) Limited** (having Corporate Universal Identification No. 0068608), as a Market Operator subject to the provisions of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 (XL of 1997), as amended or replaced from time to time, the National Electric Power Regulatory Authority (Market Operator Registration, Standards and Procedure) Rules, 2015 or as may be specified or imposed hereafter by the Authority and the terms and conditions prescribed in the annexure attached herewith.

The registration number of the Market Operator is **MOR/01/2018**




Dated: 16/11/2018

Place: ISLAMABAD

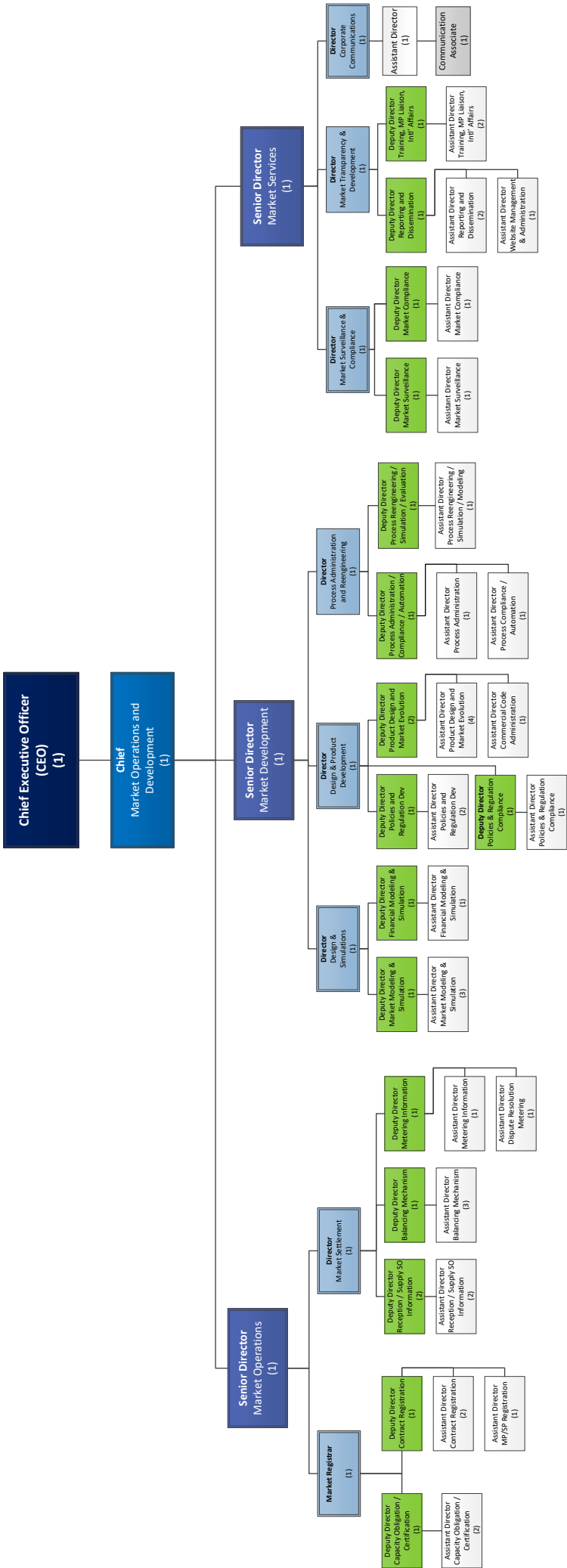

16-11-18
Registrar



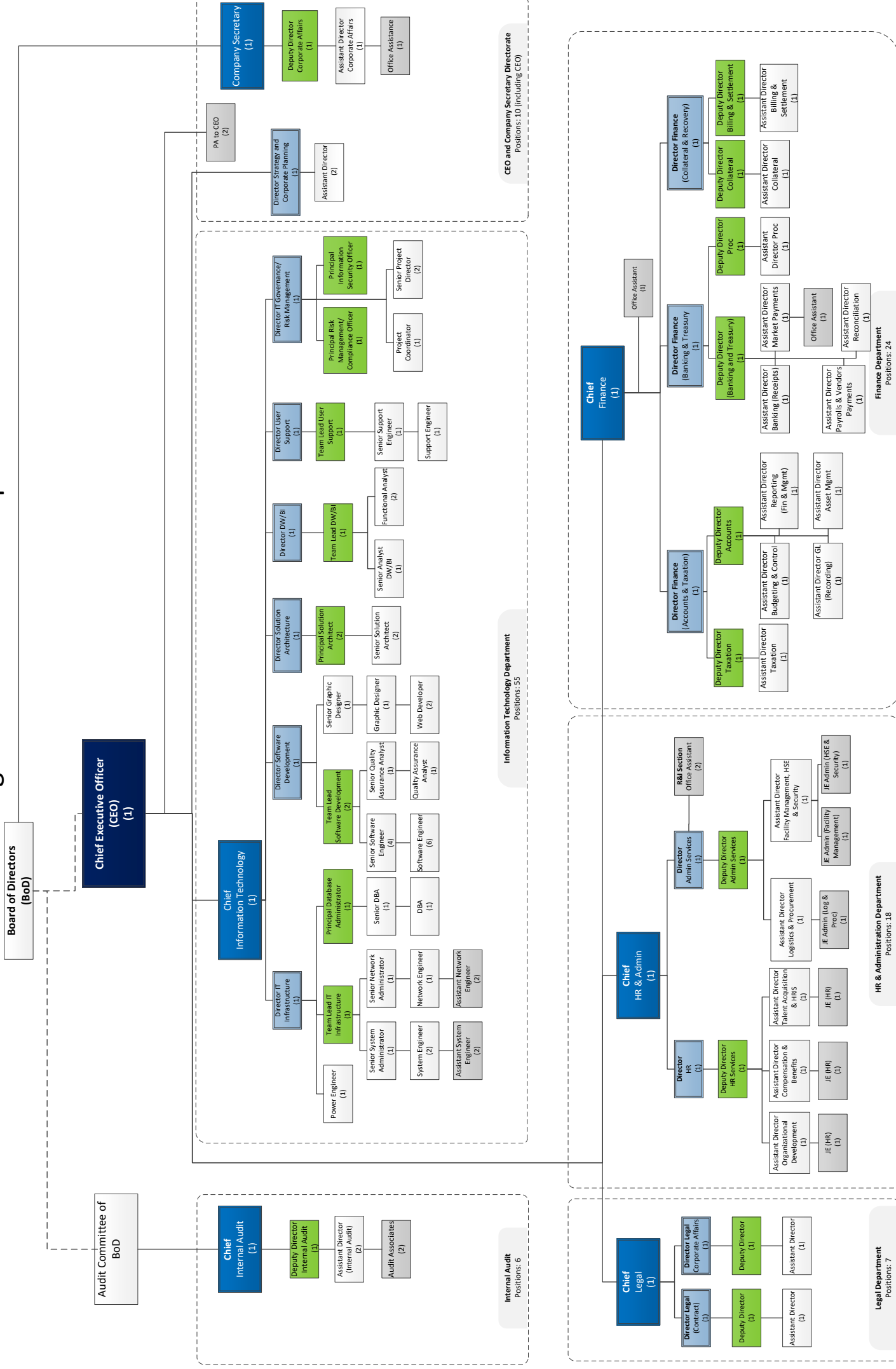
For and on behalf of THE NATIONAL ELECTRIC POWER REGULATORY AUTHORITY

Organizational Chart – Market Functions



Organizational Chart - Corporate Functions



OMER HAROON MALIK

ohmalik@cpga.gov.pk

Electricity Market Reforms Leader

Market Reforms | Electricity Market Design Solutions | Change Management

Senior energy reforms executive with a successful background of leading, business strategy, enterprise-wide solutions, market reforms, policy, legal and regulatory undertakings. Almost 19 years of professional career, with numerous successes to his credit. In the past, he has worked for local and international entities including **International Resource Group (IRG)/Engility, CPPA** and **LESCO**. He is also serving as member of **Board at Association of Power Exchanges (APEX)**. His collaborative work includes working with ministries, regulator, utilities, international electricity market operators, IFI's and other key institutions in the power sector supply chain.

Mr. Malik is currently leading electricity market reforms from CPPA end as **Head of Market Operations and Development Department**. He is also serving as **Secretary to Market Implementation and Monitoring Group (MIMG)** led by Secretary Energy (Power Division) and Chairman NEPRA. At IRG/Engility he was part of senior core team and headed Business Planning, PMO and Commercial Teams during his period of service and had several successes to his credit.

Areas of Expertise

- ♦ Strategic Planning ♦ Market Development ♦ Change Management ♦ Process Improvements
- ♦ Compliance & Standards ♦ Performance Management Systems ♦ Policy and Regulatory reforms
- ♦ Operational Efficiencies ♦ Business Technology ♦ Program Management ♦ Contract negotiations
- ♦ International Operations & Collaboration ♦ Team Leader/Mentor

Career Achievements

- ♦ Serving as Board Member on Association of Power Exchanges (APEX) with almost 50 member countries ♦ Earned the annual Performance Excellence Award at IRG ♦ Most annual performance ratings have been 'Outstanding' throughout the career ♦ Youngest member of the Core Senior Management at IRG ♦ Performance recognition certificates from the Board of Directors for outstanding performance at LESCO ♦ Certified PMP and Board of Director

PROFESSIONAL EXPERIENCE

2021 – TILL DATE

MEMBER BOARD

ASSOCIATION OF POWER EXCHANGES (APEX), USA

- The Association of Power Exchanges (APEX) was formed to facilitate development and communication of ideas and practices in the operation of global competitive electricity markets. One of its primary intentions is to provide a platform for sharing of ideas and information between its members on competitive market development. Currently, members of APEX are from Asia, Australasia, Europe, North America and South America. Serving this prestigious association as Member Board since January 2021.

- As a **member of the auspicious Board**, sharing key learnings from South Asian electric market, piloting new initiatives to connect regional players and expanding the outreach of the organization are main contributions. Also, learning from international experience to apply customized solutions to overcome local challenges.

2016 – TILL DATE

HEAD, MARKET OPERATIONS AND DEVELOPMENT

CENTRAL POWER PURCHASING AGENCY (CPPA-G), PAKISTAN

- Leading the power market development efforts that includes efforts ranging from preparation of competitive wholesale electricity market model for Pakistan, the transition plan, detailed designing of wholesale market, lead actions related to CPPA to collaborate and facilitate other stakeholders in implementation of their actions.
- Developed and leading competent electricity market design, simulations and development team within CPPA. Also, supervising a diverse pool of international and local consultants supporting in market design and implementation.
- Leading organizational re-structuring of Market Operator function at CPPA and also managing diverse requirements of donors and subsequent program management.
- Established global strategic partnership with market operators and ISOs and now liaising with global partners.
- Facilitated related power sector entities in building their required capacities to implement market reforms and undertaking their respective market reforms actions.

2020 – TILL DATE

SECRETARY, MARKET IMPLEMENTATION AND MONITORING GROUP (MIMG)

MOE (PD), NEPRA, DISCOS, PPIB, NTDC, AEDB

- Serving as Secretary MIMG since 2020 and providing project management support to Market Implementation and Monitoring Group (MIMG), a group led by Secretary MoE (PD) and Chairman NEPRA.
- The MIMG group has participation from all 16 implementation power sector entities and is an exclusive monitoring and facilitation body for CTBCM related actions.

As Secretary MIMG has facilitated implementation entities in provision of local and international resources through IFIs

2011 – 2015

DIRECTOR PMO AND TEAM LEAD BUSINESS PLANNING

IRG AN ENGILITY COMPANY

- He was part of the **Senior Core Management** and worked as **Director Program Management Office (PMO)/ Team Lead Business Planning** at **IRG** (a subsidiary of Engility Corporation) in Pakistan.
- IRG was a subsidiary of Engility corporation USA. Performing various duties at IRG, he led the diverse teams of very senior local and international experts. In 2012-13, in addition to his duties of Director PMO, he also served as **Team Lead Commercial Operations** for almost a year to turnaround the troubled team, which he did successfully. Further, because of his overall firm understanding of the electric utility business and the power sector, he was given additional appointment of **Team Lead Business Planning** in late 2014 to prepare the business plans for the two distribution companies.

- He also served as a key technical resource for the Policy and Regulations Team on policy improvement initiatives. As **Director PMO** he led a team of experts in the areas of Monitoring and Evaluations, Environmental Compliance and Program Management.

2003 – 2011

EXECUTIVE ENGINEER / SECRETARY SBU

LAHORE ELECTRIC SUPPLY COMPANY

- | | |
|-----------|--|
| 2009-2011 | Executive Engineer / Deputy Manager (Planning, Monitoring and Control), Project Management Unit (PMU) , Lahore Electric Supply Company (LESCO), Pakistan. in LESCO Omer was promoted out of turn (based on outstanding performance) from Assistant Manager to Deputy Manager (XEN) after only six years of service, where it took more than fifteen years on the average. He earned many meritorious performance certificates that were given by the Board, the Managing Director and CEO during his service in LESCO. |
| 2009-2011 | Secretary Strategic Business Unit (SBU) , Lahore Electric Supply Company (LESCO), Pakistan (additional charge). |
| 2004-2009 | Assistant Manager Planning and Projects Design , Lahore Electric Supply Company (LESCO), Pakistan |
| 2003-2004 | Assistant Manager Operations and Assistant Manager Metering and Testing , Lahore Electric Supply Company (LESCO), Pakistan |

EDUCATION

2017

MASTERS IN BUSINESS ADMINISTRATION for EXECUTIVES

LAHORE UNIVERSITY OF MANAGEMENT SCIENCES (LUMS), PAKISTAN

- Placed on Deans Honor's List

2002

BSC ELECTRICAL ENGINEERING,

UNIVERSITY OF ENGINEERING & TECHNOLOGY (UET) LAHORE, PAKISTAN

CERTIFICATIONS

2011

CERTIFIED PROJECT MANAGEMENT PROFESSIONAL (PMP),

PROJECT MANAGEMENT INSTITUTE, USA

2010

CERTIFIED 'BOARD OF DIRECTOR'

RISK METRICS GROUP, USA

2008

CERTIFIED PRIMAVERA USER

PRIMAVERA UNIVERSITY

TRAININGS/COURSES/WORKSHOPS

- Study visits to **Alberta, Ontario, New York's ISOs** in 2019 to analyze and learn from their experiences and transition challenges.
- As course Director, designed and delivered **Electricity Market Professional (EMP)** program in collaboration with LUMS in 2018-19 and 2019-20 for key market stakeholders in Pakistan.
- Assisted USAID in design and **delivery of competitive power markets course in Thailand** for key stakeholders in Pakistan (2017). Attended the detailed course on Nordic market models.
- Exchange visits to study **Turkish power market**. The exchanges included the visits of market operator (**EXIST**) in Istanbul and regulator, network operator/system operator and other key power sector entities in Ankara.
- Attended power purchase agreements (**PPAs**) training by Infocus group in **Dubai** in 2017.
- **Represented Pakistan in India (2018)** for presenting Pakistan's electricity market model and way forward through **SAARC** platform
- Visited California (USA) in mid of 2016 and met with state regulator of **California (CPUC)**, **California ISO**, **California Energy Commission** and met energy market experts to understand the transition and clarify certain questions especially with respect to California's power market disaster.
- Under United States International Visitors Leadership Program (**IVLP**), he visited six different states of USA in 2010 and Across US, he visited FERC, NARUC, state regulators, system operators to power plants and utilities. FERC
- Visited Carnegie Mellon University, Pittsburgh, USA to participate in **Smart Grid Maturity Model** Session. Thoroughly understands the Smart Grid Maturity Model developed for electric utilities by Carnegie Mellon University and applied its understanding locally
- In 2010, on invitation of World Bank, attended Regional Workshop on **Program of Activities (PoA)** under the **Clean Development Mechanism (CDM)** Organized in Bangkok, Thailand
- In 2015, visited Engility's Home Office in Alexandria USA to participate in program design and business development efforts for a program to integrate **Clean Energy in Pakistan Economy** through facilitation in technical, legal, commercial, financial and regulatory domains
- Series of trainings delivered by ADB consultants on **competitive power market development**.
- Training by Maycroft Pvt. on **competitive power markets**
- **Strategic Planning and Change Management** trainings by Lahore University of Management Sciences (LUMS)
- **Integrated Energy Modeling**, series of workshops on model design, structure, reference scenario and sharing of models results conducted by Planning Commission of Pakistan & IRG
- **Improving Effectiveness of Boards** by Lahore University of Management Sciences (LUMS)

PROFESSIONAL AFFILIATIONS

- Member Board on Association of Power Exchanges (APEX)
- Member Project Management Institute (PMI), USA
- Member Pakistan Engineering Council (PEC), Pakistan

SYED SHAHEER ALI

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Shaheer.ali@cpga.gov.pk • +92 336 589 9170

Skilled Program Management Professional focused on Power Sector

Institutional reforms | Electric Market Design Solutions | Project Designing Senior energy professional certified by GARP USA in Energy Risk Professional (ERP) electricity physical market program having 16 years of successful background of crafting enterprise-wide solutions, process improvements and governance policy within energy operations. Experienced in the energy sector predominantly covering competitive electricity market development, power sector reforms and program management for a versatile portfolio of power sector projects in all domains of generation, transmission and distribution. In the past he has worked for renowned local and international entities including **CPPA-G, USAID Energy Programs, NED University of Engineering and Technology, Proctor & Gamble and Ministry of Defense Production.**

Areas of Expertise

Program Management ♦ Strategic Planning ♦ Process Improvements ♦ Global compliance & Standards ♦ Performance Management & KPIs ♦ Monitoring Framework ♦ Project Design ♦ Annual Work Plans ♦ International Operations & Collaboration ♦ Impact assessments ♦ Project evaluation

Career Achievements

- ♦ Pioneers of Strategy and Electricity Competitive Market Development Department at CPPA-G
- ♦ ERP Certified
- ♦ Experience in multi-million dollars of energy and construction projects
- ♦ Seasoned trainer and academician

PROFESSIONAL EXPERIENCE

2018 – TILL DATE

MANAGER DESIGN AND COORDINATION, SMD

HEAD OF PROGRAM MANAGEMENT OFFICE – CTBCM

CENTRAL POWER PURCHASING AGENCY (CPPA-G), PAKISTAN

- Responsible for designing, developing, and devising plan for power market transition, facilitating the implementation of the plan, managing extensive coordination with around 18 implementing power sector entities
- Involved in CPPA's re-structuring for the creation of independent Market Operator under competitive regime and allied activities.
- Leading the Program Management Office of the CTBCM within CPPA-G while implementing the best practices of project management and utilizing the standardized tools and methodologies of the project management to plan, manage, execute and control this complex program.
- Supporting MIMG, Market Implementation Support Committee of CPPA Board, and Head Market Operations and Development in monitoring and managing the market reforms under CTBCM.
- Contributed in the preparation of the CTBCM Implementation roadmap along with the consultants and stakeholders and obtaining regulatory approval on the same

- Achieved completion of the Batch-1 and Batch-2 of the Electricity Market Professional Program (EMP) in collaboration with LUMS.
- Operationalized Power Sector Center of Excellence in partnership with LUMS.
- Effective coordination with international donors, organizing the consultative workshops, CPPA's re-structuring for the creation of Market Operator, providing facilitation and support to power sector entities in implementation of respective CTBCM activities

2016 – 2018

SENIOR M&E SPECIALIST, USAID MONITORING, INSPECTION, MILESTONE CERTIFICATION AND DESIGN REVIEW (MIMDR)

USAID/PAKISTAN ENERGY OFFICE PROJECTS, PAKISTAN

- Led the M&E function of the program.
- responsible for monitoring the implementation of USAID funded G2G conventional and clean energy generation and transmission projects.
- Designing, implemented, and oversaw project monitoring and evaluations systems, and ensured that M&E systems track all performance indicators in accordance with the requirements of USAID/Pakistan Office of Energy.
- Managed extensive coordination and timely collaboration with participating Government of Pakistan entities such as WAPDA, GENCOS, NPGCL, NTDC etc. for project monitoring, data collection and results verification.

2010 – 2015

DEPUTY TEAM LEAD, PMO / MANAGER M&E

USAID POWER DISTRIBUTION PROGRAM, PAKISTAN

- Established a result-based monitoring system for monitoring, evaluation and reporting for PDP; by developing and maintaining PDP Performance Management Plan (PMP) in accordance with USAID's Mission Strategic Framework (MSF).
- Managed digitized system for data collection and reporting of KPIs for all PDP projects/activities in collaboration with project delivery teams (Engineering, Commercial, Field Ops., Finance, HR&CM, Cost of Service Study and Gender).
- Carried out collection, compilation, analysis and reporting of performance data to USAID, on the predefined frequency and managed the performance indicators in USAID web-based M&E system 'Pak Info'.
- Conducted on-ground performance evaluations of on-going and closed out projects of PDP all across Pakistan in order to track the progress of individual projects, identify gaps and suggest corrective actions.

2009 - 2010

ASSISTANT PROFESSOR

NED UNIVERSITY OF ENGINEERING & TECHNOLOGY, PAKISTAN

- Taught several courses at under-graduate and graduate level.
- Taught the "Project Management Frameworks & Tools" at post graduate level.
- Carried out practical laboratory demonstrations of some courses and supervised several engineering projects.

2008 - 2009

PLANNING ENGINEER (DRY LAUNDRY PROJECT)

PROCTOR AND GAMBLE, PAKISTAN

- Responsible for overall project planning, scheduling, progress measuring, monitoring & tracking.

- Prepared & compiled Project Plans for internal team and client.
- Managed preparation and issuance of standard daily, weekly and monthly reports related to progress, efficiency and cost on regular basis.
- Analyzed the schedule network through CPM, PERT & schedule compression techniques
- Used Earned Value Techniques for measuring the performance of work breakdown structure component & control account of project.
- Managed communication with the project managers, functional managers, area engineers and all the relevant departments involved in project.

2004 - 2008

ASSISTANT MANAGER PROJECTS, PEOPLES STEEL MILLS

MINISTRY OF DEFENSE PRODUCTION, PAKISTAN

- Responsible for overall Project Planning including estimation, scheduling and execution of projects. Periodic reviewing, project status monitoring and progress tracking and updating for ensuring achievement of project deliverables within scheduled time and cost parameters.
- Performed cost estimation, cost control and managing commercial issues effecting project performance. Prepared catch-up plans to control slippage and to meet targets.
- Managed effective coordination & liaison with Management, Project Team Members, Functional Managers and Departments to manage day-to-day project activities.
- Performed review of drawings, standards, specifications, purchase orders, contracts, inspection reports, delivery schedules, technical evaluations, instruction manuals and technical data.

EDUCATION

2007

ME ENGINEERING MANAGEMENT

NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, PAKISTAN

- Graduated with distinction

2004

BE MECHANICAL ENGINEERING

NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, PAKISTAN

CERTIFICATIONS

2011

CERTIFIED ENERGY RISK PROFESSIONAL - PART 1 (ERP)

GLOBAL ASSOCIATION OF RISK PROFESSIONALS (GARP), USA

2018

CERTIFIED ELECTRICITY MARKET PROFESSIONAL - (EMP)

CENTRAL POWER PURCHASING AGENCY

TRAININGS/COURSES/WORKSHOPS

- **PLEXOS** Basic Training offered by **Energy Exemplar**, got hands on training of simulation tool for generation and transmission modelling, 2020
- **SDDP & NCP** Training delivered by **PSR**, got Hands on training of simulation tools for short- and medium-term modelling, 2019
- **Electricity Power Markets** – An international perspective by **MRC Consultants & Transaction Advisors**, Pakistan (2016)
- Delivered **Electricity Market Professional (EMP) program** in collaboration with **LUMS** in 2018-19 for key market stakeholders in Pakistan
- Series of trainings delivered by **ADB** consultants on competitive power market development

PROFESSIONAL AFFILIATIONS

- Member Pakistan Engineering Council (PEC), Pakistan

FAROOQ QURBAN

farooq.qurban@cpga.gov.pk • +92 333 950 3333

Electrical Engineer focused on Market Design & Simulations

Market Development | Electricity Market Design Solutions | Power System Operations |
Power Market Simulations

Senior energy professional **certified by GARP USA** in Energy Risk Professional (ERP) electricity physical market program Electrical engineer with 10 years of professional experience in Power sector of Pakistan. Well versed especially in the area of competitive electricity market design, System Operations and Power Market Simulations. Successful background in producing IE-MSM report of CPPA-G including power market simulations. In the past he has worked for renowned local entities such as **NTDC** and **CPPA-G**.

Areas of Expertise

Competitive electricity market design and development ♦ market simulations ♦ power system operations ♦ Generation planning KPIs ♦ Regulatory Compliance ♦ Operational Efficiencies ♦ Dispatch optimization ♦ Price setting mechanisms ♦ Trading Arrangements ♦ Business & Market Development

PROFESSIONAL EXPERIENCE

2021 – TILL DATE

MANAGER (STRATEGY AND MARKET DEVELOPMENT)

CENTRAL POWER PURCHASING AGENCY (CPPA-G), PAKISTAN

- Responsible for design and implementation of competitive market design components, conducting simulations to imitate the result of certain aspects of competitive market, scenario-based simulations of the power sector outlook under different assumptions of the demand and supply situation
- Preparation of detailed methodology and procedures for certain components of the electricity market such as determination of marginal prices, capacity obligations, firm capacity of generation technologies etc.
- Develop regulatory instruments, especially the commercial code and amendment in the grid code as per the approved market design to ensure the interface between the two and alignment with the overall framework.

2018 – 2021

ASSISTANT MANAGER (STRATEGY AND MARKET DEVELOPMENT)

CENTRAL POWER PURCHASING AGENCY (CPPA-G), PAKISTAN

- As a part of the detail design team of SMD; involved in development of detail design of Competitive Wholesale Market of Pakistan (CTBCM) and producing the Integrated Electricity Market Simulations Model (IE-MSM).
- Completed comprehensive markets research of several electricity markets to inform the proposed solution for Pakistan.
- Coordinated with the System Operator and National Transmission Company for necessary coordination and facilitation in implementation of respective group of actions under the CTBCM implementation roadmap.

- Contributed to a variety of market development activities.

2012 – 2018

ASSISTANT MANAGER (SYSTEM OPERATIONS), NPCC

NATIONAL TRANSMISSION & DESPATCH COMPANY (NTDC), PAKISTAN

- Working as Assistant Manager in NTDC, various positions and responsibilities held during the tenure included:
 - **Shift Engineer – Regional Control Center North**
 - As a shift engineer in RCC, primary responsibilities included operational control of the secondary transmission network of the northern region of country and manage load flows.
 - **Electricity Dispatcher / Shift Engineer - National Control Center**
 - On this highly specialized position, I was entrusted for the dispatch of electricity in Pakistan. Responsibilities included unit commitment, economic dispatch of electricity, operational control & load flow on the primary transmission network (500/220 kV) and congestion management.
 - **Assistant Manager (Power Control)**
 - Responsibilities include but are not limited to short and medium generation / demand forecast, preparation of daily operational reports of National Power Control Center and office management.

2011 - 2012

DESIGN ENGINEER

RWR PVT. LTD., PAKISTAN

- Worked as Design Engineer in electronic hardware design department.

EDUCATION

2015

MS ELECTRICAL ENGINEERING

UNIVERSITY OF ENGINEERING AND TECHNOLOGY (UET) TAXILA, PAKISTAN

2011

BSc ELECTRICAL ENGINEERING,

HITEC UNIVERSITY - TAXILA, PAKISTAN

CERTIFICATIONS

2020

CERTIFIED ENERGY RISK PROFESSIONAL - PART 1 (ERP)

GLOBAL ASSOCIATION OF RISK PROFESSIONALS (GARP), USA

2018

CERTIFIED ELECTRICITY MARKET PROFESSIONAL

CENTRAL POWER PURCHASING AGENCY (CPPA-G), PAKISTAN

TRAININGS/COURSES/WORKSHOPS

- Electricity Market Professional (EMP) Program arranged by CPPA-G (Organizer and trainer)
- Power Market Development Workshop by CPPAG and Maycroft.
- Training / Interactive sessions with Turkish Power Market stakeholders in Istanbul and Ankara

SKILLSET

- Plexos
- SDDP
- OPTGEN
- NCP
- Critical Thinking
- Technical Knowledge
- Active Learner
- Innovative Thinking
- Organizational & Interpersonal skills
- Industry skills
- Teamwork

PROFESSIONAL AFFILIATIONS

- Member Pakistan Engineering Council (PEC), Pakistan
- Member of GLOBAL ASSOCIATION OF RISK PROFESSIONALS (GARP), USA

AHMAD TANVIR QAZI

ahmad.qazi@cpga.gov.pk • +92 303 444 1690

Mechanical Engineer focused on Power Market Operations

Electricity Products | Electricity Market Design Solutions | Process Improvement

Mechanical engineer with 10+ years of professional experience in Power sector of Pakistan. Well versed especially in the area of competitive electricity market design & product development and contracts. In the past he has worked for renowned local entities including *Engro, PARCO, KMLG* and *CPPA-G*.

Areas of Expertise

Competitive electricity market design and development ♦ Strategic Planning ♦ Regulatory Compliance ♦ Business Technology ♦ Contract negotiations ♦ Operational Efficiencies ♦ Business & product Development

Career Achievements

♦ Achieved 80% water recovery by installing biological waste water treatment plant coupled with ultra-filtration & R.O filtration ♦ Represented Pakistan at Shell energy conservation marathon at regional headquarters ♦ Presented conference paper on water usage and conservation at UN regional headquarters

PROFESSIONAL EXPERIENCE

2021 – TILL DATE

MANAGER (ELECTRICITY DESIGN & PRODUCT DEVELOPMENT)

CENTRAL POWER PURCHASING AGENCY (CPPA-G), PAKISTAN

- Leading the designing, developing, and devising plan for power market transition, facilitating the initiatives to bring in desired change, leading CPPA's re-structuring to Market Operator under competitive regime and inter alia activities.
- Co-ordination with WB consultant and DISCOs in revision of Distribution Code in light of market evolution and CTBCM
- Co-ordination with DISCOs, NTDC, PPIB and other relevant entities in development of connection agreements in light of CTBCM
- Preparation of Business Plan for Market Operator
- Alignment of market Commercial Code, Distribution Code, Grid Code, Connection Agreements to form basis for future operations of Competitive Electricity Market Regime of Pakistan.

2013 – 2021

GROUP HEAD – POWER & UTILITIES

KOHINOOR MAPLE LEAF GROUP (KMLG), PAKISTAN

- Dismantling and relocation of 6.4 MW Wartsila HFO plant from Dongguan, China. Successful commissioning at Kohinoor Textile Mills, Raiwind division.
- Dismantling and relocation of 3.2 MW Wartsila HFO plant from Vaasa, Finland. Successful commissioning at Kohinoor Textile Mills, Rawalpindi division.
- Successful EPC of 3 MW solar park at Kohinoor Textile Mills, Rawalpindi.

- Successfully installed and commissioned 8 ton/hr chain-grate, coal fired boiler.
- Re-location & re-commissioning of complete compressor fleet consisting of 600 M3/min capacities at 8 barg.
- KTML Recognition Award for Utilities Benchmarking and identifying savings worth 0.8 Mn USD/annum.
- Successful synchronization of all the KTML power sources. i.e. Gas engines, diesel engine, HFO engines, WAPDA & Solar power plant.
- Successfully conducted 15 Major overhauls of engines. This includes 4 X 12,000 Major overhauls of Nigatta engine, 3 X 16,000 hours Major overhauls of Wartsila HFO engines and 8 X 60,000 hours Major overhauls of JMS-320, gas engines.
- Operations & maintenance of 50 MW power generation. This includes 21 MW of generation on HFO, 17 MW on gas engines, 9 MW on diesel engines and 3 MW on solar.
- Operations & Maintenance of compressors with more than 1000 m3/min of compressed air capacity at 8 Barg.
- Looking after 60 tons/hr of steam generation. Cumulative capacity of 28 tons/hr gas fired boilers, 18 tons/hr coal-fired boilers and 21 tons/hr waste heat recovery boilers.
- Managing 180 m3/hr of effluent treatment plant that includes both chemical and biological treatment.
- Managing operations and maintenance of 26 Evaporative cooling AC plants.

2012 - 2013

TECHNICAL EXECUTIVE

PAK-ARAB REFINERY LIMITED (PARCO), PAKISTAN

- Coordinating, measuring and analyzing productivity of 5 LPG plants. Resolving operational and technical issues as a liaison between company's top management and operational personnel.
- Ensuring compliance of the plants to the applicable regulatory industry standards i.e. COP1, COP2, NFPA58, API 2510, API2510A. Translating the codes in operational instructions and SOPs.
- Estimation and Project Management of different projects and retrofits at plants.
- Implementation of annual maintenance plan (re-qualification) of company owned storage and equipment at respective customer sites.
- Designing and managing installation of Vessels and associated systems including Primary/secondary pipe network within customer premises.

2011 - 2012

GRADUATE ENGINEER

ENGRO FERTILIZERS LIMITED, PAKISTAN

- Part of the GTE program 2011 at Engro fertilizers limited which is a comprehensive learning experience, giving an in depth cross functional rotation in different departments i.e. Maintenance, Inspection, Project Engineering, Maintenance Planning.
- Inspection: Corrosion rate calculation of caustic and acidic lines, setting up inspection frequencies of Urea Plant equipment, worked on different non-destructive testing techniques with special focus on Eddy Current Testing.
- Project Engineering: acquired basic understanding of piping dynamics and designing of pressure vessels, heat exchangers in accordance with prescribed codes and standards. Worked on different projects i.e. modification of Technical/Enven Building, modification of ETP facility, installation of shed over TP-1403 at UTY-3 area.
- Maintenance: Looked after maintenance of different rotary and stationary equipment used i.e. gas turbines, compressors, pumps, boilers etc.

EDUCATION

2022 (IN PROGRESS)

MASTERS IN BUSINESS ADMINISTRATION for EXECUTIVES

LAHORE UNIVERSITY OF MANAGEMENT SCIENCES (LUMS), PAKISTAN

- Currently on Deans Honor's List

2011

BSC MECHANICAL ENGINEERING,

GHULAM ISHAQ KHAN INSTITUTE (GIKI), PAKISTAN

TRAININGS/COURSES/WORKSHOPS

- **CHINA** - Dismantling of 6.4 MW HFO power plant from Dongguan, China. Re-commissioned in Pakistan.
- **FINLAND** - Dismantling of 3.2 MW HFO power plant from Vaasa, Finland. Re-commissioned in Pakistan.
- **UNITED ARAB EMIRATES** - Development of alternate vendors for supply of 32 type Wartsila engine spare parts.
- **AUSTRIA** - Development of alternate vendors for supply of JGS-320 gas engines spare parts.
- **NETHERLANDS** - Purchase of coal-fired boiler. 8 ton/hr & 12 ton/hr @ 22 Bar(g) saturated steam.
- **SPAIN** - Development of alternate vendors for supply of turbocharges for complete range of engine fleets.
- **GERMANY** - Training on SMA invertors for 5 MW solar power plant.
- **FRANCE** - Training on tracking system of 5 MW solar power plant.
- **HUNGARY** - Purchase of back pressure steam turbine.
- **THAILAND** - Presented conference paper on water usage and conservation at UN regional headquarters.
- **MALAYSIA** - Represented Pakistan at Shell energy conservation marathon at regional headquarters.
- **ITALY** - Attended training for Ingersoll Rand centrifugal compressors.

PROFESSIONAL AFFILIATIONS

- Member Pakistan Engineering Council (PEC), Pakistan

HAFIZ NAEEM

hafiz.naeem@cpga.gov.pk · +92 305 931 0622

Experienced Power Market Legal Counsel

Contracts & Agreements Review | Power Purchase Agreements | Arbitration Tribunals

Senior Power sector lawyer with a successful background of providing legal advice to leading companies in the field of Oil & Gas, Energy, Telecom, Construction, Banking, Fertilizer, and Hotel Industry. While providing legal advice to the clients, reviewed FIDIC Contracts, Petroleum Concession Agreements, EPC Contracts, Power/Energy Purchase Agreements, Share Purchase Agreements and Construction Contracts etc. Apart from providing legal advice to the clients, regularly drafted writ petitions, suits, replies as well as appeals on various propositions of law and represented clients before Civil Courts, High Courts. Also represented clients before arbitration tribunals and different regulatory authorities such as Competition Commission of Pakistan, National Electric Power Regulatory Authority and Oil & Gas Regulatory Authority. In the past, had the honor of working for renowned local and international entities including **NEPRA**, **Ministry of Energy (Petroleum Division)** and **CPGA-G**.

Areas of Expertise

- ♦ Corporate Law ♦ Litigation ♦ Arbitration Tribunals ♦ EPC Contracts ♦ PPAs ♦ Regulatory Compliance
- ♦ Contract negotiations

Career Achievements

- ♦ Involved in restructuring of Board of Investment (BOI) in a **USAID** funded project ♦ Part of the team which drafted the requisite rules to operationalize Special economic Zones Act, 2012 ♦ Drafted rules and regulations for KPK Ehtesab Commission under a project funded by World Bank ♦ Various reported judgments in High Court

PROFESSIONAL EXPERIENCE

2021 – TILL DATE

MANGER LEGAL, STRATEGY AND MARKET DEVELOPMENT (SMD)

CENTRAL POWER PURCHASING AGENCY (CPGA-G), PAKISTAN

- Assisting the SMD in drafting and finalizing key legal documents such as Commercial Code, PPA, Connection Agreement etc.
- Providing support to the Government in drafting legislation, rules and regulations related to the power sector
- Providing legal opinions on different legal propositions
- Handling litigation and coordinating with external legal counsels

2019 – 2021

LEGAL ADVISOR, DIRECTORATE GENERAL OF PETROLEUM CONCESSIONS (DGPC)

MINISTRY OF ENERGY (PETROLEUM DIVISION), PAKISTAN

- Assisted the DGPC in drafting and finalizing legislation and rules and regulations
- Reviewed and vetted different contracts and agreements such as Petroleum Concession Agreements, Joint Operations Agreements, Gas Sale and Purchase Agreements, Gas pricing Agreements, Supplemental Agreements etc.

- Provided legal opinions on different issues related to the upstream and midstream oil and gas sector
- Handled litigation and coordinated with external counsels
- Coordinated with different stakeholders and other departments

2015 – 2018

ASSISTANT LEGAL ADVISOR

NATIONAL ELECTRIC POWER REGULATOR AUTHORITY (NEPRA), PAKISTAN

- Assisted the Authority in discharging its statutory functions
- Provided legal opinions on wide array of regulatory issues related to the power sector of Pakistan
- Drafted and reviewed orders and determinations on behalf of the Authority
- Handled litigation and appeared before courts and coordinated with the external counsels
- Reviewed PPA, EPC contracts etc.

2011 - 2015

ASSOCIATE PARTNER

KAZMIZ ADVOCATES & CORPORATE CONSULTANTS, PAKISTAN

- Represented clients before the High Courts, Civil Court, Arbitration Tribunals and regulatory authorities
- Provided legal services to multitude of clients
- Drafted and reviewed commercial contracts

EDUCATION

2009

MASTER OF LAWS, LL.M

UNIVERSITY OF VIRGINIA, CHARLOTTESVILLE, VA, USA

- Merit Scholarship from University of Virginia
- Member Submission Review Board of Virginia Journal of Intl. Law

2007

BACHELOR'S DEGREE IN LAW, LL.B.

CAIRO UNIVERSITY, EGYPT

- Top Students Award, 2004 and 2007
- Scholarship for LL.B. from Cairo University
- Cultural Knowledge Competition Award, 2003

RESEARCH PAPERS AND PUBLICATIONS

- The Educational Crisis in the Arab World, Published in the Political Science Review of the American University in Cairo, 2006
- Extraterritorial Jurisdiction, Antitrust Laws and American Practice: A Review
- The Role of Bi-Lateral Investment Treaties (BITs) in Affecting the Sovereignty of States: A Review of Claims Made by States
- Extraterritorial Jurisdiction and its Conflict with the Notion of Sovereignty: An Analysis of Intellectual Property Rights
- Role of the Courts in Approving the Department of Justice Settlements under the Tunney Act

■ ■ ■

- The Existence of Ethics in Foreign Policy, Iraq War Discussed

PROFESSIONAL AFFILIATIONS

- Member Islamabad Bar council
- Member Islamabad High Court Bar association
- Member Islamabad Bar association
- Member Lahore Bar Association

ARSHAD KHAN

arshad.khan@cpga.gov.pk • +92 333 900 6079

Chartered Accountant – CA Pakistan

Financial Planning & Analysis | Quality Assurance | Risk-based Audit

Senior Chartered Accountant with a successful career of 15+ years (11 years post qualification) of working in cross-culture environment and managing diverse team members working on multiple projects in parallel. In the past he has been associated with leading names in the field of finance and professional services which include **A.F. Ferguson & Co. (PwC)**, **EY Ford Rhodes**, **PTCL** and **CPGA-G**. Has led Quality Assurance teams which performed quality reviews and self-assessment of group entities. Experience with setting up new functions, designing governance documents like Charter, Policies & Procedures and Operating Manual; as well as capacity building of team members to implement those policies. Expertise in financial planning, business strategy formulation, financial analytics, risk-based auditing, value addition through process reengineering and ensuring optimization.

Areas of Expertise

Financial Planning ♦ Budget Forecasting ♦ Process Improvements ♦ Compliance Reviews ♦ Performance Management & KPIs ♦ Regulatory Compliance ♦ Operational Efficiencies ♦ Business Strategy Formulation ♦ Financial Analytics ♦ Risk-based audits ♦ Team Leader/Mentor ♦ financial feasibility ♦ Effective Report Writing

Career Achievements

♦ Led the project and obtained Quality Conformance certificate for PTCL Group IA (covering three companies) from an independent IIA affiliate ♦ Successfully implemented audit automation software at PTCL Group ♦ Conducted feasibility study for a greenfield project and secured financing from a commercial bank

PROFESSIONAL EXPERIENCE

2021 – TILL DATE

MANAGER FINANCE, SMD

CENTRAL POWER PURCHASING AGENCY (CPGA-G), PAKISTAN

- Lead Finance and Treasury functions.
- Overseeing both market finance as well as corporate finance including budgeting, financial accounting & reporting, taxation, banking and payment mechanism, management of security covers & settlement guarantee fund and allied functions.

2016 – 2021

SENIOR MANAGER AUDIT

PAKISTAN TELECOMMUNICATION COMPANY LTD. (PTCL), PAKISTAN

- Developed a three years Audit plan 2020-2022, based on Risk Assessment of unified Audit Universe for both PTCL & Ufone supplemented by a presentation for Audit Committee.
- Led External Quality Assessment Project covering PTCL, Ufone and U Microfinance Bank conducted by IIA Affiliate.
- Led the Control Self-Assessment exercise under COSO Framework for PTCL & Ufone.

- Devised project plans, developed audit programs, supervised the execution of approved audit programs, reviewed the work done by team members on various audit engagements in domains such as;
 - Corporate Governance
 - Legal & Regulatory Compliance
 - Financial & Capex Planning
 - Taxation
 - HR Strategy & OD
 - Health & Safety
 - Wholesale and International Business
- Drafted Internal Audit Reports for above engagements covering findings, root cause analysis, potential impact and practicable recommendations.
- Performed annual review of Internal Audit Charter, Internal Audit Manual & allied policies.
- Undertook Training Needs Assessment against the Functional Competencies Framework and finalized annual training plan to cover the gap.
- Further he conducted special assignments assigned by Audit Committee.

2013 – 2016

EXECUTIVE MANAGER ASSURANCE

EY FORD RHODES, CHARTERED ACCOUNTANTS, PAKISTAN

- Responsible for engagement planning, supervision of statutory audits of various clients in following industries:
 - Power generation & utilities
 - Oil & Gas exploration
 - Telecommunication
 - Commercial banks, Fund Managers & DFIs
 - Pharmaceutical & Service industry
 - Real estate & construction engineering
 - International Development Agencies / Public sector programs
 - Logistics & transportation industries.
- Performed as team lead for accounting and reporting aspects - Advisory project for DABS

2011 - 2013

MANAGER INTERNAL AUDIT

AL-HAFIZ CRYSTOPLAST (PVT.) LTD., PAKISTAN

- Set-up IA function and developed Internal Audit Charter & allied policies.
- Reviewed major business processes, internal controls assessment to highlight deficiencies and set forth practicable recommendations to improve controls.
- Performed pre-audits of all payments.
- Reviewed monthly payroll before disbursement.
- Spot checked on inventory count - finished goods and raw material.
- Conducted feasibility study of a new venture, which secured a financing of Rs 100 million.
- Performed investment appraisal of a new capital project.

2005 - 2009

AUDIT ASSOCIATE

A.F. FERGUSON & CO. CHARTERED ACCOUNTANTS (PWC), PAKISTAN

- Conducted Forensic review of ADB funded project implemented by ZTBL.
- Performed Financial due diligence of a microfinance bank.
- Performed Compliance & system review of National Education Foundation.

- Part of the team on the statutory audits of various clients in Financial Institutions (Commercial Banks, Mutual funds and Fund Managers), Pharmaceuticals (Barrett Hodgson, and Novartis Pharma) and Public Sector Programs.

EDUCATION

2010

CHARTERED ACCOUNTANT

THE INSTITUTE OF CHARTERED ACCOUNTANTS OF PAKISTAN

- Registration Number: (R – 6215)

2014

CERTIFIED FORENSIC AND INVESTIGATIVE AUDITOR

ASSOCIATION OF FORENSIC & INVESTIGATIVE AUDITORS, CANADA

M.COM EQUIVALENCE

ISSUED BY HIGHER EDUCATION COMISISON (HEC), PAKISTAN

TRAININGS/COURSES/WORKSHOPS

- Emotionally Intelligent Auditor
- Artificial Intelligence - trends for telecom industry
- Effective Problem Solving & Decision Making by XCalybr Consulting
- Developing a world class audit function arranged by FinMan Consulting
- CFO Conference by ICAP PAIB Committee
- Three days' course on Yellow Book; USAID Rules and Regulations by AICPA certified trainer
- Four days' simulation training on "Making connection throughout the engagement life cycle
- Quality & Risk Management training from EY Mena Region
- Two days training on Effective Presentation Skills conducted by EY Mena Region
- Various IFRS trainings and refresher courses on International Standards on Auditing
- Various trainings on EY Global Audit Methodology & PwC Audit Methodology

PROFESSIONAL AFFILIATIONS

- Member of the Institute of Chartered Accountants of Pakistan (R - 6215)
- Certified Forensic and Investigative Auditor, Canada (M - 140337)
- Corporate Member of the Institute of Internal Auditors (IIA) USA

MUHAMMAD ZEESHAN KHAN

Zeeshan.khan@cpga.gov.pk • +92 301 859 8542

Talented and skilled Communications All Rounder

Strategic Communications | Brand Visibility | Stakeholder Relations

Communications specialist with 15+ years' experience in corporate communications, stakeholder relations and media outreach. Exceptional interpersonal skills with a professional and calm demeanor. Experience of working for renowned local and international entities including **JAZZ (Formerly Mobilink)**, **NRSP** and **CPGA-G**. His collaborative work includes cooperation with **USAID**, **European Union (EU)**, **UNESCO**, **UNDP**, **DFID & GoP** on key social sector and strategic communications projects in Pakistan. Compelling public speaker with exceptional writing skills and strategic planning.

Areas of Expertise

Corporate Communications ♦ Internal & External Communications ♦ Media Networking ♦ Establishing Brand Identity ♦ Digital Media ♦ Strategic Communications ♦ Visual learning products ♦ Behavioral Change Communication ♦ Annual & Corporate Reports

Career Achievements

♦ Nominated for IVLP (International Visionary Leadership program) by US Embassy, Islamabad ♦ Youngest delegate at Muslims Leaders of Tomorrow in Doha, Qatar ♦ Appreciation Letter issued by Ministry of Narcotics Control (MoNC) for strategic initiatives for staff development on media engagement, Public relations & advocacy activities to improve messaging and increasing public outreach ♦ Tasked by Ministry of Information & Broadcasting, put together a project to create a fact-based branded effort (PakLOT) by the Government to inform, engage and mobilize youth as a critical component for democratic security in Pakistan ♦ Part of the team which led the "I AM PAKISTAN" campaign to promote the soft image of Pakistan at global scale ♦ Assisted German Embassy in Islamabad to design and implement the strategy to celebrate "50 Years of German Pakistani Development Cooperation" ♦

PROFESSIONAL EXPERIENCE

2021 – TILL DATE

MANAGER COMMUNICATIONS

CENTRAL POWER PURCHASING AGENCY (CPGA-G), PAKISTAN

- Responsible for developing, coordinating and supervising the implementation of the Market and Corporate Communication across the board.
- Manage the preparation of instruments for internal and external communications.
- Draft content (e.g. press releases, newsletters) for mass media or company website.
- Liaise with media and handle requests for interviews, statements etc.
- Assist in communication of strategies or messages from senior leadership.
- Impart training to CPGA-G employees on improving interpersonal communication.
- Liaise with the Internal & external stakeholders, to map out the ongoing and planned communications activities.

2021 – 2021

EXPERT DIGITAL COMMUNICATIONS (CORPORATE & REGULATORY AFFAIRS)

PMCL-JAZZ (FORMERLY KNOWN AS MOBILINK), PAKISTAN

- Responsible for managing and analyzing the effectiveness of digital presence and media campaigns of the company.
- Work closely with Regulatory and Corporate Affairs functions for formalizing priority communication requirements of the company.
- Keep strong linkages with GSMA, external Communication forums, Industrial and business councils etc. to drive digital agenda for the organization.
- Crisis communication management in alignment with business continuity plans of the company.
- Work with cross functional teams for ensuring robust internal communications for employee engagement and information.
- Develop digital communication narrative of sustainability projects and showcase them at appropriate forums for mutual learning and positive impact.
- Establish partnerships where possible/ required.

2018 – 2021

MANAGER COMMUNICATION & VISIBILITY

NATIONAL RURAL SUPPORT PROGRAMME (NRSP), PAKISTAN

- Manage official communications with donors such as the delivery of reports, responding to requests for information, grant adjustments, proposal submissions, operational advocacy approaches
- Responsible for reviewing, refining and approving all communication and knowledge products produced by various internal departments within the organization.
- Managing all digital/online presence of the organization. Was able to increase the organization's social media presence by 70% since I assumed the role.
- Acting as the focal point for donor communication and donor relations, collecting and sharing programme related data
- Lead composing of yearly programme progress and assessment reports for various programmes to be shared with the donors and involved stakeholders.
- Develop and share programme fact sheets and newsletters of the programmes shared with various concerned partners resulting in bringing more donor-funded programmes to the organization.
- Actively participate in donor meetings anticipating the possible issues within the programme and crafted adequate responses to be shared to satisfy the donor.
- Led development of a 'communication and visibility' strategy for the EU funded BRACE Programme which was approved by the donor as it met all required KPIs.
- Lead monitoring of ongoing programmes and interventions resulting in better cohesion between all stakeholders.

2017 - 2018

ADVOCACY COORDINATOR

CENTRE FOR GOVERNANCE AND PUBLIC ACCOUNTABILITY (CGPA), PAKISTAN

- Responsible for analyzing and advocating regulations impacting Khyber Pakhtunkhwa (KP) Right to Information (RTI) Law to proactively disclose data to its citizens.
- Advocating organization's position to KP RTI law at various meetings and speaking at events when needed

- Establishing, maintaining and fostering working relationships with federal and state stakeholder agencies as well as allied organizations to promote the implementation of existing RTI laws.
- Assisting the Executive Director with annual planning of advocacy and outreach activities.

2016 - 2017

CONSULTANT

PUBLIC RELATIONS & IMAGE MANAGEMENT EXPERT, PAKISTAN

- Engaged with a political operative at a mediocre level within his political party and helped him elevate himself to the crucial group within the party.
- Helped build national narratives for General elections 2018 for a leading national political party.
- Established long-range objectives for my clients and developed innovative strategies to achieve them.
- Coached clients on effective communication with the public and other stakeholders.
- Coordinated with client's media and graphics team to produce engaging web content.

2012 - 2016

MANAGER COMMUNICATION & COORDINATION

NORDEX PAKISTAN (PVT.) LTD., PAKISTAN

- Being one of the initial employees, assisted the CEO in anchoring the company in Pakistan as well as aligning all regulatory requirements with respective Govt. authorities ensuring compliance with all applicable laws.
- Conducted strategic analysis of competitors' strengths and weaknesses to help position the regional sales team in Pakistan. Shared findings with the HO ensuring the sustainability of the Pakistan office as the market leader in Pakistan.
- Assisted in seeking approvals, licensing, renewal of licenses, and inspection regulations as and when required. Ensure continual and timely compliance of all applicable laws, rules, and regulations from NEPRA, WAPDA, PEC, and LEAs.
- Collaborated with the German embassy in Pakistan on a strategic marketing initiative "Germany on the Road" to highlight 50 years of German Pakistani Development Cooperation. Events focused on increasing people to people contacts were held in Karachi, Lahore, Sialkot, Multan & Islamabad. The event was widely covered in print and electronic media in Pakistan resulting in building goodwill for the German embassy and German companies in Pakistan.
- Supervised all daily operations of the Pakistan head office and ensured services provided by the staff were beyond reproach.
- Improved office procedures by introducing automation to track records and disseminate data, and handled client correspondence.

2010 - 2012

MEDIA & POLITICAL ANALYST

GLOBAL STRATEGIES (PVT.) LTD., PAKISTAN

- Worked with the senior management to conceive, develop and produce effective communication campaigns for Government bodies including the Office of the President, Ministry of Information & Broadcasting, Ministry of Foreign Affairs and Ministry of Narcotics Control.
- Provided effective weekly analysis to the clients resulting in increased trust and coordination between management and client opening ways for future collaboration.

- Piloted the concept of “PakLOT” – Pakistan Leaders of Tomorrow with GoP (Government of Pakistan): Tasked by MoIB, put together a project to create a fact-based branded effort (PakLOT) by the Government to inform, engage and mobilize youth as a critical component for democratic security in Pakistan. A first one-day session on 9th April 2012 inaugurated by the President of Pakistan. The second session was held on 20th November 2012.
- Led the production of the “I AM PAKISTAN” campaign to promote a softer image of Pakistan globally. Tribune covered the video as the “Video of the day” on 27th March 2011. <https://tribune.com.pk/story/138415/youtube-video-of-the-day-i-am-pakistan>). The dedicated website www.iampak.org was also designed to highlight the effort. The video was also played at an international event with global leaders in Oslo, Norway.
- Appreciation Letter – MONC (Ministry of Narcotics Control): Appreciated by Ministry of Narcotics Control (MONC) for strategic initiatives for staff development on media engagement, Public relations & advocacy activities to improve messaging and increasing public outreach.

2010 - 2012

RESEARCH ASSOCIATE

INDIVIDUALLAND PAKISTAN, PAKISTAN

- Led a team of researchers to complete a research study on privatization in Pakistan in minimal time and resources. (Research study: Examining Privatization in Pakistan, 2006 – 2010)
- Started a weekly session inviting common people making a difference in the lives of others to support them.
- Drafted proposals, research publications, articles, and conceived new ideas for donor-funded programs.
- Conceived the idea FIRM (Free independent Responsible Media). Drafted and aligned the complete proposal for a winning grant.

2010 - 2012

PRODUCT SPECIALIST & COORDINATOR

VERTICAL SYSTEMS INC., PAKISTAN

- Drove business development by effective communication with customers to increase their knowledge of the company's deliverable products.
- Implemented a new system of tracking open/closed issues providing a more robust picture for the management.
- Achieved accurate delivery times and goals for order fill rates by assessing customer requirements.
- Responsible for keeping details and accurate records of customer accounts including site owner's information, problems reported and actions taken to resolve issues.

EDUCATION

2016

M.PHIL. IN GOVERNMENT AND PUBLIC POLICY

NATIONAL DEFENSE UNIVERSITY (NDU) PAKISTAN

2008

MASTERS IN SCIENCE OF DEVELOPMENT STUDIES

IQRA UNIVERSITY, PAKISTAN

CERTIFICATIONS

2021

POLICY COHERENCE FOR SUSTAINABLE DEVELOPMENT

UNSSC (UNITED NATION'S SYSTEMS STAFF COLLEGE)

2021

COMPLETE DIGITAL MARKET COURSE

UDEMY

2020

SUCCESS AND LIFE COACH

POSSIBILITIES (PVT.) LTD.

2019

ADVANCEMENT OF COMMUNICATION EXPERTISE

RURAL SUPPORT PROGRAMMES NETWORK

2016

MONITORING AND EVALUATION

TRAINING DEVELOPMENT NETWORK

TRAININGS/COURSES/WORKSHOPS

- Building Blocks for Humanitarian Practice Course from Cornerstone OnDemand Foundation (2021)
- Grant Seeking Essentials from Cornerstone OnDemand Foundation (2021)
- Humanitarian Context, Systems, and Standards Course from Humanitarian U (2021)
- Advanced Branding from LinkedIn Learning (2020)
- Marketing Communications from LinkedIn Learning (2020),
- Strategic Agility from LinkedIn Learning (2020),
- Crisis Communication from LinkedIn Learning (2020),
- Non-profit Management Foundations from LinkedIn Learning (2020)
- Sharpening the winning edge from The Missing P (2015)
- Conflict Management from Individualland Pakistan (Huma Baqai) (2010)
- Gender Dimensions in Economic Globalization from Sustainable Development Policy Institute (2006)

ABRAR HUSSAIN

abrar.hussain@cpga.gov.pk • +92 308 4241329

Electrical Engineer focused on Competitive Electricity Markets Market Operations | Competitive Electric Market Design | Market Simulations

Mid-level energy professional certified by **GARP USA** in Energy Risk Professional (ERP) electricity physical market program with 8+ years of professional experience in Power sector of Pakistan. Well versed in the power sector especially in the area of competitive electricity market design & product development and policy analysis. Successful background of crafting detailed design of CTBCM. In the past he has worked for renowned local firms such as **Telenor, PITCO, NTDC** and **CPGA-G**.

Areas of Expertise

Competitive electricity market design and development ♦ market simulations ♦ demand forecasting ♦ Generation planning ♦ Legal and Regulatory Framework Analysis ♦ Policy Formulation and Impact Analysis

Career Achievements

♦ Development of the Detail Design and Commercial Code ♦ Three years straight 'Outstanding' performance ratings in annual performance appraisals in CPGA-G ♦ Earned Resilience Award during Covid-19 pandemic at CPGA-G

PROFESSIONAL EXPERIENCE

2018 – TILL DATE

LEAD MARKET DESIGN AND PRODUCT DEVELOPMENT

CENTRAL POWER PURCHASING AGENCY (CPGA-G), PAKISTAN

- Supporting the Head SMD on the development of the competitive wholesale electricity market model in Pakistan
- Leading the detailed design of CTBCM by working with and reviewing the work of consultants on the development of the commercial code, other aspects of detailed design, preparation of process manuals, responding to stakeholders' comments, coordination with external entities such as PPIB and NTDC.
- Proactively participate in the system expansion studies, dispatch optimization and market simulations studies.
- Responsible for overseeing the tasks under the demand forecast and by generation planning consultants.

2017 – 2018

ASSISTANT MANAGER LOAD FORECAST

NATIONAL TRANSMISSION & DESPATCH COMPANY (NTDC) PAKISTAN

- Preparation long-term and medium-term demand forecasts.
- Assisted the Demand Forecast consultant in preparing these demand forecasts and presenting it at various forums.

- Actively took part in training and capacity building initiatives to build capacity of NTDC as well as DISCO's staff in the area of demand forecasting. As a result of such efforts, NTDC was able to produce the long-term forecast independently.
- Took initiatives for streamlining the calculation procedures for the long-term forecast.

2016 – 2017

MANAGEMENT TRAINEE OFFICER

CENTRAL POWER PURCHASING AGENCY (CPPA-G), PAKISTAN

- Assisted the Demand Forecast consultant in preparation of the Power Market Survey (PMS) based Medium Term Forecast as per provisions of the Distribution Planning Code of NEPRA and the regression analysis based Long Term Load Demand and Energy Forecast as per provision of the Grid Code of NEPRA.
- Both reports were published, and the PMS based report was also submitted to NEPRA for regulatory approval.
- Took several initiatives to streamline various tasks such as development of an operational manual for the PMS Model, automation of data inputs and outputs and improved the presentation of the results in the reports.
- Developed detailed training plans for the capacity building of DISCOs and NTDC staff regarding demand forecast and implemented those plans.

2014 - 2016

PROJECT ENGINEER

PITCO PRIVATE LIMITED, PAKISTAN

- Involved in projects aimed to assess the effectiveness of different policies in attracting investment, adequacy of the incentives offered to steer growth, success of the policy in terms of capacity addition and coordination requirement among various institutions.
- Thoroughly analyzed different policies such as RE Policy 2006, Climate Change Policy 2012, Power Policies 1994, 2002, 2013 and 2015 and also various development strategies such as Vision 2025, Vision 2030, Energy Security Plan 2006 and Sustainable Development Strategy 2012 etc.
- Involved in the preparation of feasibility studies of different type of power generation projects such as High-Pressure Cogeneration and biomass, fuel switch and energy efficiency projects.
- Involved with calculation of emission reductions based on the data provided by the clients and developed several Project Design Documents (PDD) as per Clean Development Mechanism (CDM) guidelines for the registration of CO2 mitigation projects with UNFCCC.

2013 - 2014

NOC OFFICER

TELENOR PAKISTAN, PAKISTAN

- Responsible for overseeing the maintenance and operation of the towers of Telenor in Gujranwala regions.

EDUCATION

2013

BACHELORS OF SCIENCES IN ELECTRICAL ENGINEERING

UNIVERSITY OF ENGINEERING & TECHNOLOGY (UET) LAHORE, PAKISTAN

CERTIFICATIONS

2020

CERTIFIED ENERGY RISK PROFESSIONAL (PART 1) | PHYSICAL ENERGY MARKETS

GLOBAL ASSOCIATION OF RISK (GARP), USA

TRAININGS/COURSES/WORKSHOPS

- Study visits to **ERCOT, FERC, NERC, NREL** etc. to understand the electricity markets and learn from their experiences
- Two days training workshop organized by **World Bank** from international renowned firm, Charles River Associates (CRA), on **Capacity Markets**
- Four days online training delivered by **PSR Brazil** on **Competitive Electricity Markets**
- Several Trainings on **SDDP**, a tool developed by PSR Brazil for medium term dispatch optimization
- Three days training on **PLEXOS** by third-party trainers with support from **Energy Exemplar**
- Six days training on **OPTGEN**, a state-of-the-art **Generation Capacity Expansion Tool** by **PSR Brazil**

SKILLSET

- SDDP
- OptGen
- E-Views
- Industry skills
- Technical Knowledge

PROFESSIONAL AFFILIATIONS

- Member Pakistan Engineering Council (PEC), Pakistan
- Member of GLOBAL ASSOCIATION OF RISK PROFESSIONALS (GARP), USA

MUHAMMAD AITZAZ HUSSAIN

aitzaz.hussain@cpga.gov.pk · +92 345 7273231

Electrical Engineer focused on Power & Control systems

Market Simulations | Electric Market Design Solutions | Complex problem-solving skills

Electrical engineer with 7+ years of professional experience in Power sector of Pakistan. Well versed with Power Markets around the world predominately working in design & development of Competitive Wholesale Power Market (CTBCM) of Pakistan. Successful background of working with Distribution Companies. In the past he has worked for renowned local organisations **RPPL**, **SNGPL**, **MEPCO** and **CPGA-G**.

Areas of Expertise

Power System Studies ♦ Expansion Planning ♦ Costing & Budget Estimation ♦ Medium-term Demand Forecast ♦ Grid Interconnection Study ♦ Evaluation of Transmission Losses ♦ Preparation of PC-1

Career Achievements

♦ Reduced Transmission Losses of MEPCO 3.2% to 1.4% ♦ Prepared Business Plans for MEPCO improvement in Operational Efficiency, Quality of Supply and Customer Services ♦ Prepared 3 Demand Forecasts predicting the Peak Demands and Sales within 2% error margins ♦ Prepared “No Load Shedding Plan” of MEPCO in 2016 to eradicate Load Shedding due to Technical Constraints by 2018 ♦ Commissioned 04 Compression Gas Turbines in 2 months to timely Complete Phase-1 of LNG Project ♦ Modified Plant Start-up Sequence at Rousch Power Plant to avoid Liquidated Damages ♦

PROFESSIONAL EXPERIENCE

2021 – TILL DATE

DEPUTY MANAGER (DESIGN, SIMULATION & COORDINATION)

CENTRAL POWER PURCHASING AGENCY (CPGA-G), PAKISTAN

- Participating in the designing, developing, and devising plan for power market transition
- Co-ordination with WB consultant and DISCOs in revision of Distribution Code in light of market evolution and CTBCM
- Coordination with DISCOs, NTDC, PPIB and other relevant entities in development of connection agreements in light of CTBCM
- Coordination with DISCOs to establish and operationalize MIRAD in each DISCO along with its SoPs
- Coordination with DISCOs to assist them in the preparation of their Business Plan
- Setting up of Power Sector Center of Excellence at LUMS along with its curriculum development and quality assurance for building capacity in various entities for operationalization of Electricity Market
- Performing scenario-based simulations of power sector outlook under different assumptions of the demand supply situations

2015 – 2021

ASSISTANT MANAGER (PLANNING & ENGINEERING)

MULTAN ELECTRIC POWER COMPANY (MEPCO), PAKISTAN

- Carrying out Power System Studies (Load Flow, Short Circuit & Stability Analysis) on Power System Simulator for Engineering (PSS/E)
- Expansion Planning and Analysis of Transmission System for reliable and stable operation in line with Grid Code Stipulated by National Electric Power Regulatory Authority, Pakistan
- Preparation of PC-1 Documents for STG Network
- Grid Interconnection Study of Renewable Energy Sources Integrating with the National Grid
- Preparation of Medium-Term Demand Forecast as Incharge Power Market Cell
- Member of Electricity Market Team of Pakistan, a venture of Government of Pakistan for transitioning to Competitive Market
- Costing & Budget Estimation of Development Projects for 132kV System
- Evaluation & Monitoring of Transmission Losses
- Creation & Vetting of HT Proposals on SynerGee Electric

2015 – 2015

E&I ENGINEER (COMPRESSION)

SUI NORTHERN GAS PIPELINES LIMITED (SNGPL), PAKISTAN

- Installation & Commissioning of Gas Turbines (Solar T50, T47, T45) for LNG Project.
- Preparation of SOPs for the Projects
- Leading the teams for the routine maintenance of E&I equipment & troubleshooting.
- Hands on experience on Rockwell's AB PLC-5 & ControlLogix 5555 Control System.
- Technical Procurement as per PPRA rules.
- Hand on experience of calibration of various valves, actuators and sensors

2013 - 2015

MANAGMNET TRAINEE OFFICER (MTO)

ROUSCH PAKISTAN POWER LIMITED (RPPL), PAKISTAN

- Complete Performance evaluation of Plant & BOP including the preparation of KPIs and Scorecard.
- Supervision of Maintenance Activities.
- Supervision of Gas Turbine retrofitting 2015.
- Hands on experience on TelepermXP Distributed Control System (SPPA-T2000) by Siemens based on S5 and standalone PLC system based on Allen Bradley PLC-5/20 & Siemens Simatic S7-S200.
- Maintenance planning, reporting, follow up & RCA.
- Contract Management & Commercial Dealing with OEM (Siemens AG) & O&M Contractors (Electric Supply Board of Ireland (ESBI) & DESCON).
- Inventory Management & Technical Procurement.
- Hand on experience of calibration of various valves, actuators and sensors

- Conducting toolbox talks, safety audits and general presentations to culminate safety culture.

EDUCATION

2013

B.E ELECTRICAL ENGINEERING

NUST SCHOOL OF ELECTRICAL ENGINEERING & COMPUTER SCIENCE (NUST-SEECs),
PAKISTAN

CERTIFICATIONS

2019

PSS/E ADVANCED LEVEL TRAINING

USAID

2019

ELECTRICITY MARKET PROFESSIONAL

LAHORE UNIVERSITY OF MANAGEMENT SCIENCES (LUMS), PAKISTAN

2016

TRANSMISSION & TRANSFORMATION LOSS EVALUATION

POWER PLANNERS INTERNATIONAL (PVT.) LTD. (PPI), PAKISTAN

SKILLSET

- | | |
|---|-------------------|
| ▪ Critical Thinking | ▪ Industry skills |
| ▪ Technical Knowledge | ▪ Teamwork |
| ▪ Active Learner | ▪ SDDP |
| ▪ Innovative Thinking | ▪ PSSE |
| ▪ Organizational & Interpersonal skills | ▪ PMS |

PROFESSIONAL AFFILIATIONS

- Member Pakistan Engineering Council (PEC), Pakistan

NIDA MUKHTAR

House # 640, Street #103, G-9/4, Islamabad, Pakistan

nida.mukhtar667@gmail.com • +92 342 550 1889

Electrical Engineer focused on Electricity Market Frameworks

Market Operations | Electric Market Design Solutions | Legal & Regulatory Framework Analysis

Mid-level energy professional certified by **GARP USA** in Energy Risk Professional (ERP) electricity physical market program Electrical engineer with 6+ years of professional experience in Power sector of Pakistan. Well versed with Power Markets around the world predominately working in design & development of Competitive Wholesale Power Market (CTBCM) of Pakistan. Successful background of policy regulations and frameworks analysis. In the past she has worked for renowned local **General Electric (GE)**, **Pakistan Microbiological Associates (PMA)** and **CPPA-G**.

Areas of Expertise

♦ Legal & Regulatory Framework Analysis ♦ Electricity Market Design and Development ♦ Market Simulations ♦ Policy Formulation ♦ Regulatory Compliance ♦ Codes Administration

Career Achievements

♦ One of the first employees of the Strategy and Electricity Competitive Market Development Department at CPPA-G ♦ ERP Certified ♦ Former President of Women Engineering Society (WES) ♦ Former Executive Member of Association for Computing Machinery (ACM)

PROFESSIONAL EXPERIENCE

2020 – TILL DATE

DEPUTY MANAGER, SMD

CENTRAL POWER PURCHASING AGENCY (CPPA-G), PAKISTAN

- Lead the market regulatory framework of the competitive electricity market of Pakistan,
- Responsible for the revision of the legal and regulatory framework of Power Sector Pakistan with respect to the Competitive Trading Bilateral Contract Market including the rules & commercial codes.
- Facilitating the legal regulatory actions under the implementation plan of CTBCM.
- Responsible for drafting and preparing the new rules and regulations in collaboration with Ministry of Energy (Power Division) required for CTBCM.
- Leading the development of various training programs for the capacity building of the market participants on the aspect of policy and regulatory framework for Capacity building of the stakeholders for the implementation plan of CTBCM.

2018 – 2020

ASSISTANT MANAGER, SMD

CENTRAL POWER PURCHASING AGENCY (CPPA-G), PAKISTAN

- Performed the detailed gap analysis of existing power policies, rules, regulations and codes with respect to CTBCM.

- Supported the reforms of Power Markets regulatory framework.
- Conceptualized design and detailed framework for the integration of market participants like Traders and Suppliers in the CTBCM.
- Researched and developed the understanding of key market design parameters of International Market Models of Latin American countries, Turkey and India and tailor-made design parameter for the CTBCM.
- Worked on the alignment of Single Buyer Plus Market Model with CTBCM and developed the output plan for implementation along with the drafting of regulatory documents and code.
- Coached the Electricity Market Team (EMT) in Electricity Market Professional course at LUMS for the capacity building of stakeholders of power sector.

2016 – 2018

MANAGEMENT TRAINEE OFFICER, SMD

CENTRAL POWER PURCHASING AGENCY (CPPA-G), PAKISTAN

- Worked on the preparation of high-level market design of Competitive Trading Bilateral Contract Market (CTBCM) with the international consultants and prepared the implementation plan of CTBCM and submitted to the Regulator for approval.
- Also worked on the preparation and submission process of registration application of CPPA-G as Market Operator.
- Coordinated and planned the numerous local and international training sessions for the stakeholders of power section of Pakistan to ensure their capacity building regarding competitive markets.

2015 - 2016

TECHNICAL SUPPORT ENGINEER

PAKISTAN MICROBIOLOGICAL ASSOCIATES (PMA), PAKISTAN

- Provided technical support to the field engineers regarding online monitoring, preventive maintenance, troubleshooting and installation of electro-medical equipment's across Pakistan.
- Worked on the electro-medical equipment's like ACCESS-2, AU 480 and KC4 delta.
- Documented the detailed end-to-end processes for software data management, database for inventory management, monitoring & tracking of period maintenance and installation of medical equipment's within a committed timeline.

2014 - 2015

TRAINEE ENGINEER MAINTENANCE

GENERAL ELECTRIC (GE) O&M 225MW (CCPP) BALLOKI POWER PLANT, PAKISTAN

- Worked on instrumentation and control systems.
- Got hands on experience of installation and troubleshooting of Siemens & GE products and equipment's including, Steam Turbine 74 MW and Gas Turbine V64.3 and GE GTs (6FA), Product control systems: SIMATIC WNCCC, SIMATIC PCS 7, valves, inlet & variable guide vanes, transmitters, and actuators.
- Assisted SKODA Power in overhauling of Steam Turbine and worked with GE TAs on gas turbine.

EDUCATION

2014

BS ELECTRICAL ENGINEERING

GHULAM ISHAQ KHAN INSTITUTE OF ENGINEERING SCIENCES AND TECHNOLOGY (GIKI), PAKISTAN

CERTIFICATIONS

2020

CERTIFIED ENERGY RISK PROFESSIONAL (PART 1)

GLOBAL ASSOCIATION OF RISK PROFESSIONALS (GARP), USA

TRAININGS/COURSES/WORKSHOPS

- **PLEXOS** Basic Training offered by **Energy Exemplar**, got hands on training of simulation tool for generation and transmission modelling, 2020
- **SDDP & NCP** Training delivered by **PSR**, got Hands on training of simulation tools for short- and medium-term modelling, 2019
- Assisted **USAID** in design and delivery of competitive power markets course in Thailand for key stakeholders in Pakistan (2018). Also, attended the detailed course on Nordic market models
- Team Building Training for Young Professionals in Pakistan (2017)
- Exchange visit to study **Turkish Power Market** in 2017. The exchange included visits of Market Operator (EXIST) in Istanbul and regulator, network operator/system operator and other key power sector entities in Ankara
- **Energy and Demand Forecasting Training** in Pakistan (2017)
- **Electricity Markets Training** Course by **Maycroft Pvt.** in Pakistan (2017)
- **Electricity Power Markets** – An international perspective by **MRC Consultants & Transaction Advisors**, Pakistan (2016)
- Delivered **Electricity Market Professional (EMP) program** in collaboration with **LUMS** in 2018-19 for key market stakeholders in Pakistan
- Series of trainings delivered by **ADB** consultants on competitive power market development

SKILLSET

- Critical Thinking
- Technical Knowledge
- Control systems
- SIMATIC WINCC, SCADA, DCS and SIMATIC PCS 7
- SDDP& PLEXO
- MIDE, uKeil, mikroC, Microchip

PROFESSIONAL AFFILIATIONS

- Member Pakistan Engineering Council (PEC), Pakistan
- Member of GLOBAL ASSOCIATION OF RISK PROFESSIONALS (GARP), USA

AAKASH AHMED

aakash.ahmed@cpga.gov.pk · +92 345 214 7753

Electrical Engineer focused on Design and Development of Power Market
Market Operations | Electricity Market Design Solutions | Complex problem-solving skills

Mid-level energy professional **certified by GARP USA** in Energy Risk Professional (ERP) electricity physical market program with 7+ years of professional experience in Power sector of Pakistan. Well versed with Power Markets around the world predominately working in design & development of Competitive Wholesale Power Market (CTBCM) of Pakistan. Successful background of crafting detailed design of CTBCM. In the past he has worked for renowned local **Fast-NU, Metro Power Company Ltd.** and **CPGA-G**.

Areas of Expertise

Market Development ♦ Electricity Market Design Model ♦ Operational Efficiencies ♦ Contract review and analysis ♦ International Collaboration

Career Achievements

♦ Promoted at **CPGA-G** within 18 months of joining ♦ Promoted twice at **Metro Power Company Ltd.** in a span of three years ♦ Gold Medalist of the batch at Fast-NU ♦ Offered a position before graduation by the University as “Research Assistant”

PROFESSIONAL EXPERIENCE

2019 – TILL DATE

DEPUTY MANAGER (DETAIL DESIGN), SMD

CENTRAL POWER PURCHASING AGENCY (CPGA-G), PAKISTAN

- Part of the detail design team of SMD (Strategy and Market Development).
- Involved in development of detail design of Competitive Wholesale Market of Pakistan (CTBCM).
- Did comprehensive Markets Research and in-depth studies on several markets like NYISO, IESO, AESO and Philippines.
- Coordination and necessary facilitation to PPIB in implementation of respective group of actions under the CTBCM implementation roadmap.
- Contributed to a variety of market development activities and has earned a fair share of multiple successes
- Involved in preparation of the CTBCM Detail Design, Commercial Code, Market PPAs along with the consultants and stakeholders and obtaining regulatory approval on the same.

2016 – 2019

SENIOR ELECTRICAL ENGINEER

METRO POWER COMPANY LTD., PAKISTAN

- Involved in various wind, solar and solar-wind power generation projects.
- Involved with the project development & construction of two 50MW Wind power projects
- Development of feasibility studies of various wind, solar PV and solar-wind hybrid power generation projects.

- Conducted critical review and finalization of commercial EPC contracts and Power Purchase contracts
- Coordinated with contractors regarding testing and commissioning of EBOP and turbines
- Service trouble shooting in wind turbine, record keeping, reporting, and inspections to ensure wind turbines availability.

2014 – 2015

RESEARCH ASSISTANT

FAST-NU, PAKISTAN

- Researched on Feedback Control systems & Power system Analysis.

EDUCATION

IN PROGRESS

MASTERS IN BUSINESS ADMINISTRATION for EXECUTIVES

INSTITUTE OF BUSINESS ADMINISTRATION (IBA), KARACHI, PAKISTAN

2014

BACHELORS OF SCIENCE IN ELECTRICAL ENGINEERING

NATIONAL UNIVERSITY OF COMPUTER & EMERGING SCIENCES (NUCES, FAST), PAKISTAN

- *Gold Medalist* of the Batch. Graduated with *Summa Cum Laude*

CERTIFICATIONS

2020

CERTIFIED ENERGY RISK PROFESSIONAL - PART 1 (ERP)

GLOBAL ASSOCIATION OF RISK PROFESSIONALS (GARP), USA

2019

CERTIFIED ELECTRICITY MARKET PROFESSIONAL - (EMP)

CENTRAL POWER PURCHASING AGENCY (CPPA), PAKISTAN

2020

ENERGY MARKETS IN EUROPE

TU DELFTX, NETHERLANDS

TRAININGS/COURSES/WORKSHOPS

- Two days training workshop organized by **Word Bank** from international renowned firm, Charles River Associates (CRA), on **Capacity Markets**
- Four days online training delivered by **PSR Brazil** on **Competitive Electricity Markets**
- Several Trainings on **SDDP**, a tool developed by PSR Brazil for medium term dispatch optimization
- Three days training on **PLEXOS** by third-party trainers with support from **Energy Exemplar**

- Wind power Plant (O&M) training of **N100 turbines** at **Nordex Academy** (Germany)
- NC2 SCADA system of Turbines at **Nordex Academy** (Izmir)

SKILLSET

- | | |
|-----------------------|---|
| ▪ Critical Thinking | ▪ Organizational & Interpersonal skills |
| ▪ Technical Knowledge | ▪ Industry skills |
| ▪ Active Learner | ▪ Teamwork |
| ▪ Innovative Thinking | |

PROFESSIONAL AFFILIATIONS

- Member Pakistan Engineering Council (PEC), Pakistan
- Member of GLOBAL ASSOCIATION OF RISK PROFESSIONALS (GARP), USA

ZEESHAN BASHIR

zeeshan.bashir@cpga.gov.pk • +92 333 717 2031

Mechanical Engineer focused on Electricity Market & Product Development

Product Development | Electricity Market Design Solutions | Commercial Code

Mechanical engineer with 8+ years of professional experience in Power sector of Pakistan. Well versed with product development process for Power Market in Pakistan. He has Lead the Power projects from tender/Bids to deliverables (Technical Data Sheets, Material Costs, and Product Design Approval etc.), business development and production execution.

Areas of Expertise

Product Development ♦ Client negotiations ♦ Business Development ♦ Production execution ♦ Electricity Markets ♦ Commercial Code review and analysis

Career Achievements

♦ Distribution Transformer Design lead for Peshawar Bus Rapid Transit (Peshawar BRT) Project ♦ Project lead for Power Product Design and Services for Kahuta Research Laboratories (KRL) and Pakistan Atomic Energy Commission (PAEC) ♦ Jordan Electric utility (JEPCO) and Saudi Arabia Electric utility (SEC) successful Pre-Qualification as a product /services provider to enhance Pakistan Export in Power Sector

PROFESSIONAL EXPERIENCE

2021 – TILL DATE

DEPUTY MANAGER (DM), SMD

CENTRAL POWER PURCHASING AGENCY (CPPA-G), PAKISTAN

- Responsible to provide contribution in the implementation of the CTBCM Model by undertaking different research and review functions relating to different market models to inform the market design, implementation and future evolution.
- Support Market Development Team in activities related to Market Commercial Code development and evolution.
- Leading development of Manuals for Market Management System for effective implementation of CTBCM.
- Assist in development and delivery of various training programs for the capacity building of the market participants.
- Aiding in the preparation and revision of documents related to market policy, legal and regulatory framework

2016 – 2021

SENIOR ENGINEER, PROJECT LEAD, POWER DIVISION

PAK ELEKTRON LIMITED (PEL), PAKISTAN

- Worked as Project & Team Lead and executed projects for National Organizations (Public and Private) to meet their power needs (Transformer and related Power Products).
- Provided the mechanical design back up support for production to address Quality/Compliance Issues.
- Assisted to control the product reworks & rejections and keep them within targeted limits as per quality objectives.

- Led development of 3-D rich product models (PTC Creo, Pro-E and AutoCAD) and development of true scale automatic 3-D parts, component, assemblies and error free manufacturing drawings by modules using Creo advance tools, parameters, relations and Excel analysis.
- As an active member of PEL Integrated Management System team, aided to achieve leadership in national and international markets by commitment to applicable legal and regulatory requirements like ISO 9001:2015 and ISO 14001:2015 procedures.

2013 – 2016

MECHANICAL DESIGN ENGINEER, POWER DIVISION

PAK ELEKTRON LIMITED (PEL), PAKISTAN

- Executed the design related activities for power sector projects and prepared distribution Transformer manufacturing drawings for floor production using the latest available Design Software. This job included the thermal analysis of the design products to meet the clients' specific needs and requirements.

EDUCATION

2018

MASTERS IN SCIENCE OF ENGINEERING MANAGEMENT

UNIVERSITY OF ENGINEERING AND TECHNOLOGY (UET), PAKISTAN

- Session Topper

2013

BACHELORS' OF SCIENCE IN MECHANICAL ENGINEERING

UNIVERSITY OF ENGINEERING AND TECHNOLOGY (UET), PAKISTAN

- Among top 20 students

TRAININGS/COURSES/WORKSHOPS

- UET Lahore -12 Weeks Course Work on *Project Management & Risk Constraint Management*.
- ICBT, Lahore – Practical training & hands on experience on *Primavera P6*.
- PEL, Lahore- 4 Weeks Transformer Design (Heat Run Analysis) and Testing Training

SKILLSET

- | | |
|------------------------------|---|
| ▪ Management Skills | ▪ Computer-aided design |
| ▪ Leadership | ▪ Organizational & Interpersonal skills |
| ▪ Industrial Problem Solving | ▪ Product Development |

PROFESSIONAL AFFILIATIONS

- Member Pakistan Engineering Council (PEC), Pakistan

WALEED AHMED CHEEMA

waleed.ahmad@cpga.gov.pk • +92 332 4195 450

Resourceful and Experienced Finance Professional

Financial Analysis | Corporate Finance | Internal Audit

Skilled finance professional (member of ACCA since 2014) with solid academic credentials in finance and successful professional experience of increasing organizational work process efficiency and profitability by implementing accounting systems and conducting financial analysis with meaningful results. Rich experience in Corporate Finance, Strategic planning, Accounting Systems, Internal Audit, Compliance and Regulations, Donor funded projects, ERP implementation, financial analysis, reporting and relation building with stakeholders. Experience of working with large-scale entities with considerable financial exposure such as **BISP** and **CPPA-G**

Areas of Expertise

Financial Management ♦ Strategic Budget Planning ♦ Process Improvements ♦ Corporate Finance ♦ Accounting Systems ♦ Regulatory Compliance ♦ Operational Efficiencies ♦ Internal Audit ♦ ERP Implementation ♦ Financial Reporting ♦ Financial Analysis

Career Achievements

♦ Saved PKR 38 Million in procurement through due diligence at NUTECH University, Islamabad ♦ Awarded “Excellent” in overall yearly appraisal at BISP

PROFESSIONAL EXPERIENCE

2021 – TILL DATE

DEPUTY MANAGER (CREDIT COVER ADMIN)

CENTRAL POWER PURCHASING AGENCY (CPPA-G), PAKISTAN

- Working in collaboration with Manager Finance on budgeting, financial reporting, book-keeping, credit cover, settlement guarantee fund management, payment mechanism, issuing debit and credit note.
- Ad hoc and other responsibilities added time to time.

2019 – 2021

FINANCE OFFICER, F&A WING

BENAZIR INCOME SUPPORT PROGRAMME (BISP), PAKISTAN

- Lead and coordinate overall efforts for financial reporting, funds disbursement and accounting for projects worth USD 3 Billion.
- Supervising Cash and Accrual based accounting system by ensuring correct recording and preparation of quarterly financial statements.
- Performed fund level monthly bank reconciliations, supervising beneficiary level reconciliations, ensuring adequate funds availability for upcoming operations, securing replenishment from donor agencies and disbursing funds.
- Facilitated payment for beneficiaries and other related transactions, preparing liquidation reports for projects in coordination with MIS wing and Cash Transfer wing.
- Prepared annual and medium-term operational plans, administrative budgets and various budgets for Director.
- Reported and analyzed disbursement results as part of the Quarterly Reports to the Board.

- Coordinated pre-audit wing efforts on all payments for compliance with applicable financial rules & regulations.
- Led and supervised all efforts related to program reporting, including year-end project approval timelines and analysis.
- Conducted cost/benefit analysis to support BISP Management decision-making.

2018 – 2019

ASSISTANT DIRECTOR FINANCE

NUTECH UNIVERSITY (MoST), PAKISTAN

- Managed a team of 15 staff members to ensure proper accounting procedures were performed.
- Effectively utilized a budget of PKR 1.2 Billion budget while ensuring all payments and procurement requirements were fulfilled under applicable financial and PPRA regulations.
- Successfully completed 71 tenders and 118 contracts under PPRA Rules while saving PKR 38 million in procurement.
- Prepared financial reports, forecasts for future organizational growth, budgets, income statements, balance sheets, tax returns and reports for DGs and Government regulatory agencies.
- Assisted Director in developing and implementing policies, statutes and goals for the department.
- Implemented ODOO ERP financial and procurement module.
- Prepared assessment of long-term financial trends and reviewed prospects for future growth of revenue.
- Prepared reports, analyzed projections of funding and income against actual figures and suggested methods of improving the planning process.
- Managed cash flow and supervised all financial transactions.
- Prepared financial performance reports and presentations related to revenue and development expense, grants, procurement and contracts.
- Prepared remuneration of 500+ staff members while ensuring compliance with all the financial and legal requirements, responsibilities and obligations, including statutory obligations.

2015 - 2018

MANAGER FINANCE

HA TEXTILE NETWORKS, PAKISTAN

- Leading day to day and long-term financial goal for textile trading company.
- Supervised accountant for day-to-day bookkeeping and data entry tasks.
- Analyzed monthly performance of organization, advising on revenue growth strategies and preparing reports on cost-cutting methods.
- Liaisoned with customers on day-to-day basis for receivables and payable.
- Arranged leasing agreements of assets with banks and financial institutes.
- Prepared quarterly financial statements.
- Managed working capital, receivables and payables.
- Performed ROI analysis for effective cash utilization.
- Prepared annual budgets and managed budget variations.
- Performed investment appraisal techniques for new investment opportunities for the group.

2012 - 2015

ACCOUNTS OFFICER

SR SECURITY SERVICE, MANCHESTER, UNITED KINGDOM

- Worked with Finance Manager as an ACCA trainee.
- Performed day-to-day book-keeping of company accounts.
- Recorded all entries in respective ledgers and prepared salaries and wages for staff.
- Filed tax returns every month.
- Recorded revenue and expenses in Sage 50.
- Reconciled all accounts, including credit cards, employee's expenses and commissions.

EDUCATION

2014

ASSOCIATION OF CHARTERED CERTIFIED ACCOUNTANTS (ACCA)

BPP UNIVERSITY, LONDON, UNITED KINGDOM

- Passed all papers in first attempt

2013

BSC APPLIED ACCOUNTING

OXFORD BROOKES UNIVERSITY, UNITED KINGDOM

- First Class Honors

TRAININGS/COURSES/WORKSHOPS

- IPSAS implementation by KPMG

PROFESSIONAL AFFILIATIONS

- Member ACCA (Association of Chartered Certified Accountants) since 2014

Annex-V: Detailed CVs of International Consultants

Roberto D'Addario Power Market Detailed Design Implementation Expert

- **Personal**

| | |
|---------------|-------------------|
| Name | Roberto D'Addario |
| Date of Birth | 24 September 1949 |

- **Professional Qualifications / Certifications**

| Qualification | Institute | Year |
|------------------------------|-----------------------------------|------|
| Postgraduate Studies | Network Control Centers – Germany | 1979 |
| Electrical Engineering (MSc) | University of Rosario (Argentina) | 1974 |

- **Professional Experience**

| Company | Title/Role | From | To |
|--|---|------|------|
| MRC Consultants and Transaction Advisers, Madrid (Spain) | Senior Energy Markets Expert & Team Lead Adviser | 2014 | Date |
| AF Mercados EMI (Spain) | Director of Corporate Development and Transactions | 2003 | 2014 |
| Mercados Energéticos, Buenos Aires (Argentina) | Executive Director, Restructuring and Regulation | 1993 | 2002 |
| Energy Secretariat of Argentina Federal Government (Argentina) | Adviser to the National Department of Coordination and Regulation | 1989 | 1993 |
| CAMMESA (Independent System and Market Operator Company) (Argentina) | Member of the Board of Directors | 1991 | 1993 |
| National Dispatch Center of Argentina | Coordinating General Manager | 1987 | 1991 |

- **Relevant Experience**

Pakistan

- **Pakistan** - Tetra Tech ES Inc. (USA) / Project funded by the USAID - Sustainable Energy for Pakistan Project (SEP): technical support to the CPPA-G in the preparation of the Special Purpose Trader Code (SPT Code) and the Commercial Code for Market Operator (MO Code) (ongoing).

- **Pakistan** – ADB / CPPA – Electricity Market Development Support – Team Leader and Power Markets Expert for the support to the Central Power Purchase Agency (CPPA) for the development and Implementation of the power market in Pakistan (2019-2021)
- **Pakistan** – Tetra Tech ES Inc. (subcontract) - Sustainable Energy for Pakistan Project (SEP): technical, regulatory and market assistance to the CPPA (power market operator). The CPPA-G (Central Power Purchasing Agency) obtained an authorization certificate as the Market Operator in November 2018 and needs to complete several actions as follows:
 - A model for competitive market operations for sale of electric power at wholesale and retail levels;
 - A proposal for rationalization of power purchase contract tenures; and
 - A commercial code draft entailing all the operations of the competitive market and billing and settlement among the market participants.

In this context, MRC provided technical assistance to support CPPA-G in all the above activities to facilitate the establishment of a competitive energy market in Pakistan (2019).

- **Pakistan** - Ministry of Water and Power, Pakistan. Establishment and Commencement of Operations for the Central Power Purchasing Agency (CPPA) which is the counterpart in all PPAs in the country (2007-2008). Team Leader and Power Trade Expert.
- **Pakistan** – ADB / CPPA - Strengthening the Central Power Purchase Agency (CPPA) - Management support, capacity building, and training for the CPPA-G management and employees. Specific objectives are to i) support to the CPPA in designing and implementing the CTBCM, ii) define all aspects required for transition from the single-buyer model to the competitive regime, and iii) identify all stakeholder conditions/actions needed for the next market phase. **Team Leader & Sr. Markets Expert** (2016-2018)
- **Pakistan** - World Bank and Ministry of Petroleum - Gas sector reform, including the unbundling of the sector gas companies, third party access, two tiers transaction approaches, LNG commercialization for large customers, etc. (2016 - 2017)
- **Pakistan** - World Bank and Privatization Commission. Facilitator for the Government Stakeholders and private investors in consensus building to decide the privatization strategy to be follow for privatizing power companies, mostly identifying key drivers to be considered to at the same time obtain efficiency improvements in the overall performance of the power sector. (2014 - 2015)

OECD Countries (EU) (Selected)

- **EU** – Major Private European Utility - Assessment of the integration of the European electric power markets – Analysis of the integration of the Spanish power market to the European energy market from two perspectives: 1) The mid-term consequences over the Iberian electricity production and prices, 2) The short-term consequences of the changes in the settlement algorithm, since the current algorithm used in the Iberian market must be harmonized with the CWE one. (2012)
- **Poland** - BOT GiE / BOT Elektrownia Belchatow (Polish power generation company), financed by the European Bank for Reconstructions and Developemt (EBRD) - Assistance to BOT in the preparation for the liberalized power market in Poland (2007). Markets expert.

- **Spain** - ENDESA, S.A. (private-owned energy utility) - Assistance to ENDESA in the analysis of the impact over the Spanish electricity and gas markets of the Gas Natural takeover of ENDESA. (2005 - 2006). Markets and Regulatory Expert.
- **Spain** - Commission of the Spanish National Energy System (CSEN) (Regulatory authority) - Advisory on a design aimed at organizing an Independent System, within the framework of the new Energy Act (known as LOSEN), based on a market of free competition and contractual capacity among parties. (1995-1996)

Worldwide

- **Argentina** - Buenos Aires Province Government - Buenos Aires Province Electricity Sector reform. Electricity law, regulations, tariffs and concession agreement (1994-1995). Technical, financial and regulatory advisory services.
- **Argentina** - Several private investors in green field generation development (confidential). Assistance in developing their business plans, specially providing production, prices, costs, etc. projections, financial model development and contract negotiations with the off-takers. (1994-2000).
- **Bolivia** - National Government - Capitalization Secretariat - Power Sector Reform. Assistance in the designing of the new Electricity Law; development of regulations for the Wholesale Electricity Market and support during the privatization process. (1994-1995)
- **Cambodia** - The World Bank, Public-Private Infrastructure Advisory Facility (PPIAF) - Attracting Private Investment in Rural Electrification (2003). Conducted a study of the most suitable conditions to attract private investment, for the purpose of extending the grid to un-served areas and serve non-interconnected zones. Standard PPAs design and draft, for small power plants and large scale thermal plants.
- **China** - Tsinghua University - Study on the mechanism and implementation plan for RE in the Spot Market of Inner Mongolia (2019-2020);
- **China** - The World Bank - Development of a Roadmap for Setting Up the new Regulatory Commission (SERC) for the Power Sector in China (2002). Part of Mercados Team that drafted a policy paper on the best practices in setting up market administrators worldwide.
- **China** - Sichuan Electric Power Corporation - Structure and regulation design for the electricity market of the Sichuan Province. Detailed drafting of rules. (2000-2001). Developing the conceptual design of the transmission market for large consumers.
- **Colombia** - Municipal Utility of Medellín (EPP Medellín) - Market power study and its main consequences in the Colombian competitive market. (1999). Conceptual and theoretic analyses of market power and dominant position, particularly in hydro dominated electricity markets.
- **El Salvador** - Consolidated Edison Development, Inc. (Con Edison Develop.). Evaluation of operating revenues of a generating plant located in El Salvador (1999). Projection of the electricity market in El Salvador, considering the integration to the regional electricity market comprising six countries in Central America.

- **El Salvador** - National Electricity Utility (CEL). Organization of the Market Operator (Unidad de Transacciones) and development of the Wholesale Electricity Market Regulation (1997-1998). As part of Mercados Team, advised the National Electricity Utility (CEL) on how to organize the Transactions Unit (UT).
- **Ethiopia** - World Bank and Ethiopian Ministry of Finance and Economic Cooperation (MoFEC). Assessment, analysis, consultation, and report preparation for possible options for undertaking policy reforms in the power sector for improved service delivery, operational performance and financial performance through increased competition and private sector participation. Preparation of a Power Sector Reform Roadmap (2018 - 2019)
- **Guatemala** - Advised in several stages of the development of rules and regulations for commercial operations in the wholesale electricity market. (1994)
- **India** - Moser Baer - Transaction Advisory assistance to a leading hydropower developer in India (2009). Project Manager. Transaction Advisory assistance to Moser Baer for Hydro Power Project Joint Venture Opportunity assessment. Preparation of Flier and Information Memorandum for prospective partner
- **India** - Confidential - Electricity Market in India - Perspectives on the Development of the Sector and Opportunities for Investment (2007-2008). Team Leader. A major European electric utility is exploring opportunities for investment outside of the European market, and requested Mercados EMI to conduct a study of the Indian electricity sector, identify key players, review the status of the generation, transmission and distribution segments and recommend areas for investment
- **Lebanon** - Council for Development and Reconstruction (CDR) - Advisory support to the Higher Council for Privatization (HCP) to corporatize and restructure Electricité du Liban (EdL) (2007-2009). Team Leader.
- **Nigeria** – Mainstream Energy Solutions Ltd. (MESL) - Advisory for Transaction Closing and Management Transition for Kainji Power Plc. Strategic advisory to MESL awarded the 25-year concession to operate Kainji Power Plc. (hydropower plants). Services included the negotiation and closing of all transaction & industry documents and the PPA with the Government of Nigeria, support to the financial modeling and financial closing, company take-over and management transition to private ownership, including recruitment of key executive managers, review and updating of the investment plant, facilitation of Technical Service Provider scale-up, among other services during the first year of private management (2013 – 2014). Transaction Advisor.
- **Nigeria** – Mainstream Energy Solutions Ltd. - Transaction Advisory for Hydropower Generation Privatization (Kainji Power Plc.; Shiroro Power Plc. 1300 MW). Strategic advisory to a large Nigerian investor group on the competitive bids for hydropower assets. Services included the negotiation of Technical Service Agreements with technical partners, analysis and response to government issued transaction documents, investor support with financing institutions, financial modeling, bidding & pricing strategy, and complete bid documentation preparation. Also oversaw parallel due diligence and projections work carried out by technical consults. (2010 – 2012). Transaction Advisor / Project Director.

- **Nigeria** – Century Power Ltd. - Transaction Advisory for Thermal Generation (Sapele Power Plc) Privatization. Strategic advisory to Nigerian investor on the competitive bid for thermal generation assets. Services included the negotiation of Technical Service Agreements with technical partners, analysis and response to government issued transaction documents, investor support with financing institutions, financial modeling, bidding & pricing strategy, and complete bid documentation preparation. Also oversaw parallel due diligence and projections work carried out by technical consults. (2011 – 2012). Transaction Advisor / Project Director.
- **Nigeria** – Time Power Global Dynamics Ltd. - Transaction Advisory for Distribution Company (Enugu & Benin) Privatization. Strategic advisory to Nigerian investor group on the competitive bid for distribution assets. Services included the analysis and response to government issued transaction documents, investor support with financing institutions, financial modeling, bidding & pricing strategy, and complete bid documentation preparation. Also oversaw parallel due diligence and projections work carried out by technical consults. (2011 – 2012). Transaction Advisor / Project Director.
- **Nigeria** - Confidential – Distribution, Hydro and Thermal Generation Asset Privatization. Advisory to four (4) Nigerian investors in the development of Expressions of Interest for pre-qualification in power sector privatization process, recruitment of international power operators (in distribution and generation) for partnership with investor clients, and negotiation of Memoranda of Understanding between the investors and the technical partners/operators. (01/2011-03/2011). Transaction Advisor / Project Director.
- **Russian Federation** - RAO UESR (Unified Energy System of Russia- Design of a model and rules for the CIS (Commonwealth of Independent States) market of electricity (capacity) and other products and ancillary services. Team Leader. The objective of this project was to assist RAO UESR in defining its position and guide the formation and functioning of the CIS common electricity market with regard to the existing specifics of the reform of the electricity market in the Russian Federation and other CIS member states (2006-2007).
- **Russian Federation** - Expert in the project for developing of central power purchasing and capacity payments Mechanisms and its implementation in the Russian power sector. For RAO-UESR. (2004-2005)
- **Saudi Arabia** – Saudi Electricity Company (SEC) –Development Of Principal Buyer (PB) for the Saudi Electricity Sector, Kingdom Of Saudi Arabia (KSA). Project Director. The aim of this project was to Advice SEC on the best practices that can be adopted in KSA for implementing the PB function, and to support the staff involved in the actual implementation of it, in order to set up an effective PB organization. Aspects important for the establishment of the PB include its organization, rules, standar operational procedures, and systems, among many other issues. (2012-2013) – Team Leader
- **Saudi Arabia** - Saudi Electricity company (SEC) – Actual implementation of the Principal Buyer For The Saudi Electricity Sector, Kingdom Of Saudi Arabia to go live on January 2015 and support throughout the year. Project Director. This project is a continuation of the previous one but focused in implementation. The name of the function was changed to Principal Buyer in accordance with licensing requirements from ECRA, the regulator. The aim of the project is to support the Energy Trading and Ventures (ETV) Business Unit in charge of the Principal Buyer function in the implementation of the following processes: (i) Year Ahead Generation Forecast; (ii) Fuel Management; (iii) Generation Contract Management; (iv) Network Services Contracts Management; (v) Settlement and Invoicing; (vi) Market Operations Budgeting; (vii)

New Generation Procurement; (viii) Market Accounting and Reporting; (ix) Pricing & Economics, all of them including the corresponding Personnel Manuals. In addition to that several other tasks have been agreed such as: implementation of a Balancing Fund; Fuel Supply Chain; Execution of the First Year Ahead Generation Forecast for the Kingdom of Saudi Arabia; Modeling and Forecast; Renewable Energy and Nuclear Integration; International Cooperation and Provision and installation of an Optimal Dispatch Model. (2013-2017) - Team Leader

- **Saudi Arabia** – SEC - Ancillary Services Development For Efficient Power Systems Ancillary Service. Project Director. The general objective of this study is to identify the most appropriate ways to incentivize GenCos and TransCo to maximize the efficiency in the electricity production in the Kingdom of Saudi Arabia's electricity sector. (2011-2012)
- **Sri Lanka** - ADB / Ministry of Power & Energy - Capacity Building for Power Sector Regulation to the Public Utility Commission (PUCSL) (2010-2012). As part of it the New Multiyear Tariff Methodology was developed and implemented, along with the Tariff Review Regulation. Team Leader & Regulatory Expert.
- **Tanzania** - The Presidential Parastatal Sector Reform Commission (PSRC) - Power Sector Restructuring Project (2002-2004). The overall objective of the consultancy was to restructure the electricity sector to facilitate privatization in a manner that will be commercially viable and attractive to the private sector. Power market organization, single buyer function, PPAs design and negotiation, transmission pricing, etc.
- **Ukraine** - Utility Strategic Investment Planning / Electricity Market Development. Invited speaker to the International Conference "Experience in reforming energy markets" organized by the Ministry of Fuel and Energy of Ukraine, the National Electricity Regulatory Commission of Ukraine, the World Bank, the Fuel and Energy Sector, the Nuclear Policy and Nuclear Safety Committee of Verkhovna Rada of Ukraine and the Center of Energy Law at the Institute of State and Law of National Academy of Sciences of Ukraine. (1998).
- **Ukraine** – USAID. Professor at the MBA Program (Sponsored by the USAID and the International Management Institute, Kiev) providing targeted training for key energy sector decision/policy makers from the public and private sector and improving managerial skills, meeting the needs of the industry as it moves toward operating in a market economy. (1998)
- **Uruguay** - Inter-American Development Bank (IDB) - Complementing the institutional and regulatory framework of the electricity sector (2001). The aim of the project was to identify the key elements needed to complement the institutional, legal and regulatory framework of the electricity sector in Uruguay.
- **Uruguay** – UNDP/UREE (Energy Regulator). Development of rules and regulation for: Electricity Wholesale Market, Transmission System Access and Pricing and End User Tariff Regime. It also included simulations to determine revenues for all segments of the new power sector. Team Leader
- **Vietnam** - Electricity Regulatory Authority of Vietnam (ERAV) – Workshop on Tariff Design and Setting (2013). Project Director
- **Vietnam** - Electricity Regulatory Authority of Vietnam (ERAV) - Preparation of standard PPA and dispute settlement and enforcement procedure regulation for single buyer model market (2008-2010). Team Leader.

- **Vietnam** - The World Bank / ERAV (Electricity Regulatory Authority of Vietnam) - Advisor on Independent Power Projects (IPPs) (2005-2006). The general objective of the assignment was to support the preparation and implementation of a work program to re-launch the Government of Vietnam's BOT program for power generation projects.
- **Vietnam** - The World Bank / ERAV (Electricity Regulatory Authority of Vietnam) - Advisory services within the power distribution equitization process, which involves sale of shares in the stock market and to staff (2005-2006). Team Leader.

- **Any other information**

Languages:

English (Excellent in reading, speaking and writing)

Spanish (Excellent in reading, speaking and writing)

German (Good in reading, speaking and writing)

Portuguese (Good in reading, speaking and writing)

Jorge Bircher - Market Development, System Operations & Transmission Expert

- **Personal**

| | |
|---------------|-----------------|
| Name | Jorge Bircher |
| Date of Birth | 19 January 1956 |

- **Professional Qualifications / Certifications**

| Qualification | Institute | Year |
|----------------------------------|------------------------------------|------|
| Electronics Engineer (MSc) | Buenos Aires University, Argentina | 1989 |
| Electromechanical Engineer (MSc) | Buenos Aires University, Argentina | 1979 |

- **Professional Experience**

| Company | Title/Role | From | To |
|---|---|------|------|
| MRC Consultants and Transaction Advisers, Madrid (Spain) | Senior Power Systems Expert | 2014 | Date |
| Mercados EMI, Madrid (Spain) | Director of the Network Industries Practice | 1999 | 2014 |
| Cidespa, S.A., Madrid (Spain) | Director, Consulting Division | 1989 | 1999 |
| Argentine Energy Secretariat, Buenos Aires (Argentina) | Coordinator of a Multi Utilities Task Force | 1985 | 1988 |
| Segbea (Argentine Electric Utility), Buenos Aires (Argentina) | Planning Department Analyst | 1979 | 1984 |

- **Relevant Experience**

- **Pakistan** – Asian Development Bank (ADB) - Support to the CPPA (single buyer agency) in the development of the electricity market. The primary role of the consultant is to provide management support, capacity building, access to expert resources, and training for CPPA-G (Central Power Purchasing Agency) through supporting the development of regulatory documents, preparing for balancing mechanism and effective stakeholder coordination (ongoing).
- **Pakistan** – ADB - Strengthening the Central Power Purchasing Agency in Pakistan – (2016-2018). Senior Market expert. Support to the CPPA G in implementing Pakistan’s Power Market Transition (PPMT) Project is provided by defining all required aspects to ensure a successful transit from the current single-buyer model to the competitive regime in the time-frame set by the Regulator, and advising on the future market model, in 2 phases.
 - Phase I. Pre-feasibility Assessment. Review of the Baseline ‘As-Is’ situation of policies, regulatory, legal and technical aspects, and define the ‘To-be’ environments.
 - Phase II. Detailed Market Model Design. Design of the high-level market model & road map, and subsequent Detailed Market Design.
- **Pakistan:** Sustainable Energy for Pakistan Project (SEP): technical support to the CPPA-G in the preparation of the Special Purpose Trader Code (SPT Code) and the Commercial Code for Market Operator (MO Code) (ongoing).
- **Pakistan** – Tetra Tech ES Inc. (subcontract) - Sustainable Energy for Pakistan Project (SEP): technical, regulatory and market assistance to the CPPA (power market operator). (2019). Electricity System (Transmission, System Operations and Market Operations) Specialist. The CPPA-G (Central Power Purchasing Agency) obtained an authorization certificate as the Market Operator in November 2018 and needs to complete several actions as follows:
 - A model for competitive market operations for sale of electric power at wholesale and retail levels;
 - A proposal for rationalization of power purchase contract tenures; and
 - A commercial code draft entailing all the operations of the competitive market and billing and settlement among the market participants.

In this context, MRC provided technical assistance to support CPPA-G in all the above activities to facilitate the establishment of a competitive energy market in Pakistan.

- **Pakistan** - Pakistan: Market Consultant for the Super Six Wind Energy Program - Confidential (institutional investor) - Our client is considering providing financing to 6 wind projects in Pakistan (“Super Six Wind Energy Program”). In this context, our client would like to understand the competitiveness and stranded asset risk for its portfolio, including: overall sense of the main opportunities, threats, risks and/or challenges facing the energy sector in Pakistan over the short to medium term, to assist in evaluating our options and decision-making going forward (2019).

- **Pakistan** – Asian Development Bank - Pakistan: Advisory services to the CPPA-G (Central Power Purchasing Agency Guarantee) on transmission system and dispatch related issues. MRC provided advisory to CPPA-G management on the coordination between the market model and system operations during the public consultation process of NEPRA and provided capacity building to staff and management of CPPA-G. The assignment's outputs were used for ADB's on-going and future policy dialogue on energy sector reforms by providing insights into the coordination between the market operation and system operation. (2018) Senior power transmission system and dispatch expert.
- **Bangladesh** – ADB - SASEC Bangladesh India Electrical Grid Interconnection Project II - Power Systems Specialist; Interconnection Specialist (44192-017) - The scope of the work was:
 - Review the proposed options for power supply from the Indian Power Market:
 - Review the requirements for additional agreement for transmission network usage;
 - Provide inputs to the SAEN team and the Government of Bangladesh for the project including requirements for capacity building and support in Bangladesh for the Interconnection and the power market
- **Albania** - Technical Assistance in Strengthening of Albanian Transmission System Operator. Mr. Bircher is assisting the newly established TSO in its strengthening plan, participating actively in the organization of the company, in the evaluation of the staffing and manpower and on-the-job training programmes. (2005-2006)
- **Albania** - World Bank - Technical assistance for the assessment and diagnosis of electricity market implementation in Albania (2012). Power system expert.
- **Argentina** - Dept. of Energy - Definition of a master plan for the development of the Argentine Interconnection network, in the period (1988-2000). The tasks included demand evaluation. Operational and reliability studies. Technical and economic analysis for the opportunity of interconnection of regional systems.
- **Armenia** - European Bank for Reconstruction and Development (EBRD) and PSRC (regulatory office of the Armenian energy sector) - Support to the Public Services Regulatory Commission (PSRC) for third party access to the electricity grid. Project manager and expert in energy regulation. (2009)
- **Australia** - Australian Energy Regulator (AER), Department of Primary Industries - Institutional arrangements for network regulation: Comparative Analysis of International Energy Network Regulatory Framework (2011). Transmission Regulatory Expert.
- **Bangladesh** – For the World Bank - Grid Interconnection of Solar PV and Wind in Bangladesh. (2017). Expert in grid integration of RE-based generating plants.
- **Bolivia/ Brazil** – Inter-American Development Bank (IDB) / ENDE (National Power Utility of Bolivia) / CENTRAIS ELÉTRICAS BRASILEIRAS S.A. (ELETROBRÁS, Brazil) - Consulting services in support of the project for the electrical interconnection between Bolivia and Brazil (2019-2020) Project manager.
- **Cameroon**- International Finance Corporation - Power Market Study (2020). Transmission planning and regional markets expert.

- **Caribbean:** GIZ - Provision of energy policy and regulatory advisory services within the Technical Assistance Programme for Sustainable Energy in the Caribbean (TAPSEC) - Lot 2: Regulatory Agency & Electric Utility Service Support (ongoing)
- **Central America** - Electrification Council of Central America (CEAC) / CDMER (Executive Board of the Central American Regional Power Market) - The project objective is to evaluate the technical and economic feasibility of the second circuit of the SIEPAC HV transmission line, as a key component in the regional capacity expansion up to 600 MW (2019-2020).
- **Costa Rica** – World Bank - Advisory to the World Bank on the analysis of the strategy to further integrate RES based generation (distributed generation) in Costa Rica under a net metering scheme. (2016)
- **Cyprus** - Ministry of Energy of Cyprus - Advisor for the legal unbundling, the corporatisation and the privatisation of the Electricity Authority of Cyprus (EAC) - The main objective is the analysis and presentation of the advantages and disadvantages of all possible options/scenarios regarding the future ownership status and structure of EAC, within the context of the overall reorganization as well as envisaged changes in the energy sector in Cyprus, and the recommendation of the optimum option(s)/ scenario(s) that best fulfil(s) the Key Government Objectives. (2015-2016). Power Market Expert.
- **Dominican Republic** - For CEPM (power distribution utility) - Assistance to the distribution utilities CEPM-CEB in the calculation of electricity tariffs and network charges (2013-14). The project objective is to determine the electricity rates and the network charges for the distribution utilities Consorcio Energético Punta Cana Macao, S.A. (CEPM) and Compañía de Electricidad de Bayahibe, S.A. (CEB), in line with the current regulatory framework and within the tariff review process launched by the National Regulatory Authority (SIE). Grid distribution engineer.
- **East Africa** - Delegation of European Commission to Ethiopia - EU/ACP - 9th EDF - Technical assistance and capacity building to the Eastern African Power Pool (EAPP) (2009-2011). Expert in Power Systems Planning.
- **EU** - European Commission, Directorate-General for Energy and Transport (DG-TREN). Analysis of investments in the trans-European Energy Network (TEN-E) projects (2004-2005). In charge of the analysis of investments on renewable energy sources and their integration into the trans-European energy networks.
- **FYR of Macedonia** - ELEM Macedonian Power Plants - Provision of technical and regulatory advisory services to ELEM, the national power generation company of the Republic of Macedonia (2009-2010). Team Leader.
- **Ghana** – for a private investor - Assessment and grid studies of the Power Transmission and Generation Systems (2018). Team leader and power system planning and analysis expert. The objective of the study is to perform a series of steady-state and dynamic and transient power system studies in order to analyse the Ghanaian power system aimed at: (i) Assessing the current situation of the power system in Ghana, in general, and the power transmission system in particular; (ii) Assessing the current situation and prospective developments in the gas sector, and in particular focus on the gas-to-power activity; (iii) Assessing the security of supply; (iv) Simulating different scenarios on the power transmission system to evaluate the current and future situation of the same.

- **Ghana** – for a private investor - Assessment and grid studies of the Power Transmission and Generation Systems (2018). Team leader and power system planning and analysis expert.
- **Ghana** – International Finance Corporation – Ghana Power Distribution PSP (2013-2014). Due Diligence of Electricity Company of Ghana (ECG) and National Electricity Distribution Company (NEDCO) and Recommendations of PSP options. Team Leader
- **Greater Mekong Sub-region** – ADB - Regional South Asia Power Market. Design of Trading Arrangements in the GMS (ADB, 2006-2008) / Study for a Regional Power Trade Operating Agreement in the Greater Mekong Subregion (Cambodia, Laos, Myanmar, Thailand, Viet Nam, Yunnan Province of China). Team Member in the study to help GMS (Greater Mekong Subregion) members prepare a regional power trade operating agreement.
- **India** (2014-2016) – Team Leader / Power Systems Engineer - Rajasthan Renewable Energy Capacity Development and Implementation Support (Asian Development Bank (ADB)) Work included: A – Completion of master plan and detailed engineering studies for the Bhadla solar park and preparation of guidelines for future solar parks in the state; B – Renewable energy integration support to RRVNL (power utility), implementation of the roadmap and support for the pilot in the western region of Rajasthan; and C – Institutional support, policy advice and process improvement support for the implementation of pilot mini grid projects
- **India** - Asian Development Bank - Preparing the Rajasthan Renewable Energy Transmission. The objective of the assignment is to assist the transmission company in Rajasthan (India) (RVPN) to review the existing transmission system planning and operation to accommodate significant renewable energy penetration in the network, to share suitable international experiences and also support evaluation of various alternatives to enable smooth and reliable operation of the transmission system using the proposed multi-tranche financing facility (2012). Project Director, Renewable Energy-Transmission Integration Expert.
- **India/ Bangladesh** – ADB - SASEC Bangladesh-India Electrical Grid Interconnection Project II – (2010) Power Systems Specialist; Interconnection Specialist (44192-017) - The scope of the work was:
- **Jordan** - Electricity Regulatory Commission (ERC) / Minister of National Economy SCHLUMBERGER-SEMA (Spain) - Technical Assistance for the Jordanian Electricity Regulatory Commission (2004 -2009). Technical assistance to the ERC (Electricity Regulatory Commission) in implementing the Government of Jordan's policy of liberalization of the markets and of introduction of a comprehensive regulatory framework in the electricity and gas sectors. Resident Project Director.
- **Jordan** - Ministry of Energy and Mineral Resources - Feasibility study for the electricity distribution master plan for ASEZA (Aqaba Special Economic Zone) (integration of high levels of wind generation to the network) (2007). Team leader and expert in distribution expansion planning.
- **Jordan**- European Investment Bank (EIB) / NEPCO (Jordan's power transmission company) Technical, financial and economic feasibility study for the reinforcement of a Jordanian power transmission corridor (2012-2013).
- **Kazakhstan** - EBRD / Ministry of Industry and New Technologies (MINT) - Renewable Energy Development Framework and Regulatory Support (2012-2013) Expert in Grid Protocols

- **Kosovo** - IFC (International Finance Corporation, World Bank Group) - Support to the Kosovo Energy Regulatory Office ("ERO") in regulatory framework improvement related to renewable energy (2013-2014) Power Grid Engineer.
- **Lebanon** - Council for Development and Reconstruction (CDR) - Advisory support to the Higher Council for Privatization (HCP) to corporatize and restructure Electricité du Liban (EdL) (2009). Expert in power system planning and operation.
- **Malawi**: Millenium Challenge Corporation – Power Market Restrcturing study - The scope of services related to the power market restructuring consultancy comprised two main components: I. Component I: Task 1: Recommended adjustments to current energy policy with emphasis on the electricity and renewables industries; Task 2: Review of the electricity market and development of a restructuring roadmap; Task 3: Development of market rules, tariffs and transfer pricing, including transmission pricing, a grid code, etc; Task 4: Preparation for the rollout of market restructuring roadmap. II. Component II: Task 5: Supervision of the implementation of the restructured power market. (2014 – 2016).
- **Maldives** – Team leader and grid code expert. For the ADB - Capacity Development of the Maldives Energy Authority (MEA) for Utility and Technical Regulation – Design of technical regulatory codes for the MEA with regards to their adaption to the integration of distributed generation and RES based generation and net/gross metering schemes. (2014).
- **Mauritius** - Determination of the grid absorption capacity and preparation of a grid code, feed in tariffs and model energy supply purchase agreement for renewable energy (50kW to 2MW systems) (Central Electricity Board (CEB), The World Bank (ESMAP) and UNDP) - (2014) – Team Leader
- **Mexico**. The World Bank. Analysis of the potential use of hydro power generation in providing ancillary services that facilitate the integration of other RES based technologies. (2016).
- **Nigeria** – World Bank - Study on Framework for Performance Contracts for Power Utilities in Nigeria (2010). Team Leader.
- **Perú**: Confidential (major operator and investor in the energy sector) - Market and regulatory due diligence for the acquisition of 6 concessions for power transmission assets (2019-2020). Grid Engineer
- **Philippines** - Grid Management Committee (Philippines) - Technical Assistance for the Second Amendment of the Philippines Grid Code (Integration of Renewable Energy to the Transmission Network) (2013) Team Leader
- **Philippines** – World Bank - Integrating renewable energy in the electricity grid code. RE Grid Integration & Transmission Operations Expert (2012).

- **Philippines-** World Bank - Integrating renewable energy in the electricity grid code - The general objective of this assignment is to provide advice and support the Grid Management Committee (GMC) in updating the Philippines Grid Code (PGC) to enable reliable integration of variable renewable energy (VRE), particularly Wind and Solar Power of any size. Specific objectives include providing international practices and technical standards for dealing with VRE in Grid Codes or similar grid operational procedures; advising on amendments to the PGC and assessing the reserve requirements that may be needed in the short- and medium term for the reliable and efficient integration of VRE in the Philippines, which are expected to gradually increase their participation given the incentive mechanisms of the recently enacted Renewable Energy Act. (2015)
- **Poland** - BOT GiE / BOT Elektrownia Belchatow (Polish power generation company), financed by the European Bank for Reconstructions and Developemt (EBRD) - Assistance to BOT in the preparation for the liberalized power market in Poland (2007). Project coordinator and power generation expert.
- **Regional Asia** – ADB - Smart Grid Capacity Development. Transmission Smart Grid Expert/Team Leader (2012-2013). The objective of this regional initiative is to promote smart grid development to mainstream renewable energy and boost energy efficiency in South Asian developing member countries. Team Leader
- **Regional Europe** - European Commission - Directorate General for Energy - EU: Study on “Barriers to entry in retail energy markets” - ENER/B3/2018-313 - The subject matter of the contract is to provide a detailed comparative analysis of economic barriers to entry on retail markets for electricity and gas in the EU (2019-2020). Energy economics and market expert.
- **Russia** – IFC - Assessment of export potential for renewable-generated electricity from Russia to Europe, under the RUSTEC concept (2012-2013). Grid Engineer.
- **Russia:** Regional electric networks – Renewable Energy and Advanced Network Investment program and business plan for CJSC RES for 2011-2015 (2010-2011). Team Leader.
- **Saudi Arabia** - Saudi Electricity Company (SEC) - The Economic Impact of Power Interruptions on the Kingdom Economy. Project Team Leader (2011-2012).
- **Saudi Arabia** - Saudi Electricity Company (SEC) - The Effect of Power Interruptions on the Kingdom Economy. (2011-2012). Project Team Leader .
- **Serbia** - EU Delegation in the Republic of Serbia / Energy Regulatory Agency of the Republic of Serbia (AERS) - Further Assistance to the Energy Regulatory Agency, Serbia (2009-2011). Team Leader.
- **South America** - Inter-American Development Bank (IADB) - Support to the Andean Electric Interconnection Studies - Feasibility Study of the Electrical Interconnection of the Andean Countries (Bolivia, Chile, Colombia, Ecuador and Peru) (2013-2014) Project Manager.
- **Spain** – Analysis of two complete blackouts in Tenerife Island (Canary Islands) (2010)
- **Spain** – Confidential (major Spanish utility) - Analysis of the power transmission grids in the Canary and Balearic Islands (2009) Project Manager and Network Expert
- **Spain** – Confidential (Spanish Power Utility) - Assessment of the impact of the decommissioning of power generation plants in the security of supply of the isolated systems of the Canary and Balearic Islands (2013) Project Director

- **Spain** – INYPSA / Generalitat de Catalunya (Government of Catalonia) – Analysis of the Power Failures Caused by an Intense Snow (2010).
- **Spain** - UNESA (Association of Spanish Power Utilities) - Development of methodologies for the calculation of electricity access tariffs in the Spanish power sector (2012-2013) Project Director
- **Spain** – INYPSA / Generalitat de Catalunya (Government of Catalonia) - Analysis of a Major Failure in the Transmission System (2007-2011).
- **Turkey** - BASKENT (Electricity Distribution Company of Ankara) - Preparation of the electricity distribution system master plan for the Ankara region (2010). Team leader.
- **Turkey** – EUAS (Power generation company of Turkey), Department of Hydraulic Plants - Feasibility study for improving ancillary services of hydropower plants in four basins. Technical Expert. (2012)
- **Turkey** – For the Ministry of Energy and Natural Resources of Turkey; project funded by the EU and administered by the World Bank - Consulting Services for Energy Market Development (power and gas). The consulting services included activities to support legal, structural and administrative framework for properly functioning energy exchange operations; including alignment with Acquis by providing technical assistance on energy market development, improvement of spot and balancing power market activities, transparency, market surveillance and eligible customer operations; in terms of both structural and operative requirements on the internal electricity and gas markets. Consulting services also covered demand side participation and management and market coupling with the EU markets. The project involved a wide range of stakeholders in the market, including EPIAS (energy market operator), EMRA (regulator), BOTAS (gas company), TEIAS (power transmission operator) as well as other market agents. (2018-2019). Power markets expert.
- **Turkey** – IFC - Market and regulatory consultant in connection with senior loan financing to three Turkish energy companies, power distribution utilities and retail company operating in central Turkey (2017). Team Leader.
- **Turkey** - TEIAS (electricity transmission company of Turkey), financed by the Spanish Ministry of Industry. Provision of technical assistance to TEIAS regarding the procurement and implementation of ancillary services in the Turkish power market (2008). Expert in Power Systems operation.
- **Turkey** - World Bank / TEIAS (Electricity Transmission Company of Turkey) - Capacity Building Assistance for Advanced Electricity Transmission Grid Management Systems in Turkey: Assistance to TEIAS in the large-scale integration of wind power in the Turkish transmission grid (2009-2011). Project director
- **Turkey** - World Bank / TEIAS (Electricity Transmission Company of Turkey) - Capacity Building Assistance for Advanced Electricity Transmission Grid Management Systems in Turkey: Assistance to TEIAS in the large-scale integration of wind power in the Turkish transmission grid (2009-2011). Project director.
- **Ukraine** - Confidential (major Ukrainian private-owned energy corporation) - Business strategy for exporting electricity to Central Europe: legal, regulatory and commercial due diligence (2011) Power Trading Expert

- **Ukraine** - World Bank and Ukrenerg (Ukraine's national power transmission company) - Feasibility Study to support the second phase of the Power Transmission Project (PTP-2) (2013-2014) Project Manager.
- **Uzbekistan** – ADB - Pro220 kV Northwest Region Power Transmission Line Project: support to Uzbekenergo in the preparation of bidding documents for the procurement of a Transmission System Planning Software and Asset Management System - A project preparatory technical assistance (PPTA) from the Asian Development Bank (ADB) was provided to the Government of Uzbekistan for preparing the 220 kV Northwest Region Power Transmission Line Project (the Project), suitable for ADB financing. The new line will evacuate power from Takhiatash Thermal Power Plant (TPP) (2017)
- **Uzbekistan** - JSC “National Electric Grid of Uzbekistan” (NEGU) - Preparation of transmission network development and renewable energy integration plan for JSC “National Electric Grid of Uzbekistan” (ongoing). Transmission System Planning and Network Analysis Expert
- **Vietnam** - Electricity Regulatory Authority of Vietnam (ERAV)/ World Bank - Support ERAV in the Implementation of Technical Codes (Grid Code and Distribution Code) (2011-2013). Transmission Expert & Team Leader
- **Vietnam** – National Power Transmission Corporation (NPT) / World Bank - Support to the National Power Transmission Corporation (NPT) of Vietnam in the implementation of the smart grid program (2013-2014) Project Director and Lead Grid Engineer
- **Vietnam** – World Bank/ EVN; Consulting Services for Strategic Options for Enhanced Financial Performance of Vietnam Electricity Companies; Power Engineer (2013)
- **Zambia** - Energy Regulation Board (ERB) - Project funded by the African Development Bank (AfDB) - Zambia: Electricity Cost of Service Study and Determination of Economic Cost Reflective Tariffs (2019- ongoing). Power system planning engineer.
- **Zimbabwe**: Zimbabwe Electricity Transmission and Distribution Company (ZETDC) / Project funded by the African Development Bank (AfDB) - Zimbabwe: Network Master Plan study (ongoing).

• **Any other information**

Membership of Professional Associations:
IEEE, USA (Member of the Power Engineering Society)

Languages:
Spanish (mother tongue; excellent speaking, reading and writing)
English (excellent speaking, reading and writing)

Daniel Serrano - Market Modeling Simulations, Market Operator and Systems Operator Expert

- **Personal**

| | |
|---------------|-----------------|
| Name | Daniel Serrano |
| Date of Birth | 23 October 1983 |

- **Professional Qualifications / Certifications**

| Qualification | Institute | Year |
|--|---|------|
| Master of Liberal Arts in Extension Studies, Finance | Harvard University (USA) | 2018 |
| Master for Business Analytics and Big Data | Instituto de Empresa IE, (Spain – Dubai) | 2018 |
| Master of Science in Industrial Engineering | Universidad Pontificia de Comillas, ICAI (Madrid) | 2008 |
| Bachelor of Engineering in Electricity | Universidad Pontificia De Comillas, ICAI (Madrid) | 2006 |

- **Professional Experience**

| Company | Title/Role | From | To |
|--|--|------|------|
| MRC Consultants and Transaction Advisers, Madrid (Spain) | Executive Consultant Energy Markets Modelling and Portfolio Management Expert | 2015 | Date |
| AF-Mercados EMI (Spain) | Executive Consultant Business Strategy and Market Simulation | 2008 | 2014 |
| Mercados EMI (Spain) | Intern | 2007 | 2008 |
| Universidad Pontificia Comillas (ICAI), Madrid (Spain) | Professor's Assistant | 2006 | 2007 |
| Universidad Pontificia Comillas (ICAI), Madrid (Spain) | Laboratory Assistant | 2005 | 2006 |

Relevant Experience

- **Pakistan** – Asian Development Bank - Pakistan: Support to the CPPA (single buyer agency) in the development of the electricity market (2019-2021). **Market Modeling Simulations Specialist.**
- **Pakistan** – Tetra Tech ES Inc. (subcontract) - Sustainable Energy for Pakistan Project (SEP): technical, regulatory and market assistance to the CPPA (power market operator). The CPPA-G (Central Power Purchasing Agency) obtained an authorization certificate as the Market Operator in November 2018 and needs to complete several actions as follows:
 - A model for competitive market operations for sale of electric power at wholesale and retail levels;
 - A proposal for rationalization of power purchase contract tenures; and
 - A commercial code draft entailing all the operations of the competitive market and billing and settlement among the market participants.

In this context, MRC provided technical assistance to support CPPA-G in all the above activities to facilitate the establishment of a competitive energy market in Pakistan (2019). **Market modelling expert.**

- **Pakistan** – Asian Development Bank - Strengthening the Central Power Purchasing Agency in Pakistan. Phase I. Pre-feasibility Assessment and Phase II. Detailed Market Model Design (2017-2018). **Market modelling expert.**
- **Pakistan** - Confidential - Dispatch Simulation for AES Plants Lal Pir and Pak Gen, and Wholesale Electricity Price Forecasting in Pakistan (2009). **Modelling Specialist.**
- **Pakistan** – Confidential - Market Consultant for the Super Six Wind Energy Program (2019). **Market Modelling Expert.**
- **Albania** - Confidential (international private investor) - Comprehensive market study of the Albanian power sector (2013). The overall objective of the electricity market study is to broaden the investor's knowledge of the power market in the country within a European context and, in particular, to assess whether renewable-based power generation projects in Albania are able to sell their production in the Italian market and, in that case, whether they are eligible to receive an economic compensation based on premiums, feed-in tariffs, etc. **Modelling expert.**
- **Albania** - World Bank - Study of the Optimization of the Operation of Hydroelectric Plants of Albania (2013). The Consultant used a hydrothermal dispatch model to model and identify the operational strategy that minimized the costs to meet the demand (Fuel costs; Variable operation and maintenance costs; Imports costs, and; Environmental costs). The dispatch model used for the market study in Albania was the SDDP model. **Modelling expert**
- **Argentina/Chile** – CAF (Development Bank of Latin America) - Study of the benefits of the joint operation, economic dispatch, regulatory analysis and options for the interconnection between Chile and Argentina (2018). **Modelling expert (system planning and generation dispatch).**

- **Argentina** - Confidential - Independent Quantitative Valuation. Module 1: Regulatory issues discussion and short-term regulatory outlook; Module 2: Detailed quantitative analysis via simulations (2017). **Project Manager and modelling expert.**
- **Azerbaijan** - Asian Development Bank / Azerenergy Joint Stock Company - Preparation of the power distribution, transmission and generation development investment program (2010). **Modelling expert.**
- **Bolivia/ Brazil** – Inter-American Development Bank (IDB) / ENDE (National Power Utility of Bolivia) / CENTRAIS ELÉTRICAS BRASILEIRAS S.A. (ELETROBRÁS, Brazil) - Consulting services in support of the project for the electrical interconnection between Bolivia and Brazil (2019 – 2020). **Expert in energy systems modeling, simulation, planning and optimization**
- **Bolivia** - Ministry of Energy and Fuels of Bolivia / CAF (Latin American Development Bank) - Feasibility study of electricity interconnections between Bolivia and neighbouring countries (2013-2014). **Modelling specialist.**
- **Bolivia** – Confidential – Electricity Generation Master Plan (2018). **Planning and modelling expert.**
- **Cameroon** – International Finance Corporation (IFC) – Power Market Study. IFC is currently evaluating some investment opportunities in the power sector in Cameroon and is looking to develop a deeper understanding of the growth path of the sector. As part of this effort, IFC requires a full analysis of the demand- supply situation of the Cameroon power sector and the different markets in the region given potential interconnection projects (2020 – ongoing). **Project leader, market and modelling expert.**
- **Cape Verde** - Technical Assistant for the Electric Sector Regulation Support Project in Cabo Verde - Package 2. The specific objective of this consultancy is to elaborate the following regulations for the Electric Sector in Cape Verde: Network Access and Interconnection Regulation; Dispatch Regulation; Regulation applicable to the isolated micro-grid system powered by renewable energies (2019 - 2020). **Market and system dispatch expert.**
- **Central America** - Electrification Council of Central America (CEAC) / CDMER (Executive Board of the Central American Regional Power Market) - Feasibility analysis of the second transmission circuit in the SIEPAC corridor (2019-2020). **Expert in market modeling and simulation.**
- **Central and West Asia** – Confidential - Technical and economic feasibility of a new interconnection line between Turkmenistan and Pakistan (2019 – ongoing). **Expert in power system planning and modelling.**
- **Colombia** – World Bank - Introducing a Multi-Nodal Pricing System in Colombia: Assessing the Options, Conditions, Benefits and Transitional Arrangements (2018). **Market Modelling Expert.**
- **China** - The World Bank - Energy Intensity Strategy: Power Dispatch Efficiency Improvement in China (2009). **Energy Expert.**

- **Djibouti** - GIZ (German Cooperation Agency) - EUEI PDF / Ministry of Energy - Establishment of a national strategy and action plan for the development of the electricity sector (2012-2013). **Modelling expert.**
- **Ethiopia** - The World Bank / Energy & Extractives Global Practice - Ethiopia: Cost of Service and Tariff Study (2018-2019). **Market modelling expert**
 - **EU** - Confidential (Spanish power utility) - Assessment of the integration of the European electric power markets (2012). **Energy modelling expert.**
- **Gambia** - GIZ (German Cooperation Agency) / Ministry of Energy, Gambia - Development of an Electricity Strategy and Renewable Energy Law for the Gambia (2012). **Modelling expert.**
- **Georgia** - IFC (International Finance Corporation) / Turkish private investor - Market due diligence consultancy for the Paravani Hydro Power Project in Georgia (2010). **Modelling expert.**
- **Georgia** – Confidential - Market consultancy for the 450 MW Namakhvani Cascade Hydropower Plants Project in Georgia. (07/2010- 07/2011) **Modelling expert**
- **Georgia** - Confidential (European investor) - Adjaristsqali hydropower cascade: projections for wholesale electricity prices in North-eastern Turkey (2011). **Expert in modelling of power markets**
- **Georgia** – IFC - Market consultant for the Shuakhevi Hydropower project in Georgia (2013). **Modelling expert.**
- **Ghana** - Public Utilities Regulatory Commission (PURC) - Electricity cost of service and tariff study for Volta River Authority (VRA), Ghana Grid Company (Gridco) and Electricity Company of Ghana (ECG). (2010 –2011). **Energy expert.**
- **Greece** - DLA PIPER UK LLP - Support measures in the context of the closure of lignite power generation facilities. The purpose of this consultancy is to provide expert advice and economic quantification on the impact of the proposed phasing out of lignite fired power stations in Greece in order to support the country's position in front of the European Commission and the DG ENER. (2020 - ongoing). **Market modelling expert.**
- **Guatemala** - Electricity Market Administrator (AMM) - Revision of the reference price for power supply in the balancing market. Establishment of the remuneration for power reserves and ancillary services (2011). **Modelling expert.**
- **India** - Development of SDDP Model- (2011-2012). **Instructor.**
- **Jamaica** - Petroleum Corporation of Jamaica (PCJ) - Development of an integrated energy plan for Jamaica to achieve greater energy self- sufficiency/independence (ongoing). **Modelling expert.**
- **Kenya** - Energy Regulation Commission - Consulting services to assist ERC with the drafting of regulations, codes, procedures, guidelines, licences and permits (2008-2009). **Energy expert.**
- **Kyrgyz Republic** – EBRD - Strategic Planning for Small and Medium-Sized Hydropower Development (2009 - 2010). **Modelling Expert.**

- **Macedonia** - EBRD / ELEM Macedonian Power Plants - Technical and Economic Review of Lower Carbon Alternatives for Power Capacity Increase (2012). **Energy systems Modelling.**
- **Maghreb:** World Bank - Electricity system planning tools for better integration of renewable energy into regionally interconnected national grids of the Maghreb region (2011). **Modelling Expert.**
- **Moldova** – EU Energy Commission (2017) – Drafting of Cross-Border Capacity Allocation Rules for Moldova. **Economic Regulation Expert.**
- **Mexico** - GranSolar– Strategic and Market Advisory for the development of Solar Photovoltaic Plants (2016). **Modelling Expert.**
- **Mexico** - World Bank– Regulatory Framework of Hydro Pumping Storage Facilities. (2016) **Modelling expert.**
- **Mexico** - World Bank / SENER (Energy Secretariat of Mexico) (2010) – Mexico Renewable Energy Assessment. **Modelling expert.**
- **Morocco** – Confidential (global energy investor) - Analysis of Electric Power Market Trends for Morocco to assist an international client in its investment decisions in RE-based generation projects (Wind Onshore and Offshore and Solar) (2020 – ongoing). **Modeling expert.**
- **Morocco** – World Bank - Analysis of Low Carbon Development Options in the Power Sector: Review of Planning Tools (2011). **Expert in modelling of energy systems.**
- **Morocco** - European Investment Bank / ONE - Analysis of the gas supply options for Morocco (2012). **Modelling Expert.**
- **Morocco** - Confidential (global energy investor) - Analysis of Electric Power Market Trends for Morocco to assist an international client in its investment decisions in RE-based generation projects (Wind Onshore and Offshore and Solar) (ongoing). **Modelling Expert.**
- **Morocco** - Confidential (group of international investors) - Morocco: power sector diagnostic study (2013). **Project manager and lead modelling expert.**
- **Morocco** – ACWA Power - Morocco: power sector diagnostic study (2015). **Project manager and lead modelling expert.**
- **Nigeria** – Confidential - Generation Privatization Advisory for Hydropower Plants - Technical Assistance (2011-2012). **Modelling Expert.**
- **Panama** - MINERA PANAMA - Electricity Market Evaluation for the 300 MW Cobre Panama coal-fired power generation project (2013). **Modelling Expert.**
- **Philippines** - Confidential (private investment fund)- Updating of WESM Pricing, Revenue Stream Calculations and Evaluation of Ancillary Services Revenues (Magat & Ambuklao-Binga HPPs) (2015). **Modelling Expert.**
- **Philippines** – Confidential - Electricity spot price forecasting for the Luzon grid in the Philippines. (2008). **Modelling expert.**

- **Philippines** - Confidential - Philippine Wholesale Electricity Market Modelling in Support of IPPA Bidding. (2009). **Modelling Expert.**
- **Philippines** - SN Aboitiz Power Inc - Wholesale Electricity Market Modelling - 300 MW Greenfield Coal-fired Plant. (2010) **Modelling expert.**
- **Poland** - IFC - Electricity market consultancy. The IFC is considering the financing of a wind farm project in Poland, sponsored by a Spanish developer (2011). **Power Market Expert.**
- **Regional Africa** - Delegation of European Commission to Ethiopia - Technical assistance and capacity building to the Eastern African Power Pool (EAPP). (2009 - 2011). **Modelling expert.**
- **Regional Asia** - World Bank - South Asia Regional Energy Security and Cooperation: Modelling Different Degrees of Interconnection between Electricity Grids. (2014). **Modelling expert.**
- **Russian Federation** - Confidential (major Russian energy corporation) - Strategic advisory services to a major Russian energy corporation for the reorganization of its power generation activities (2009). **Modelling Expert/ Market analyst.**
- **Sao Tome and Principe** - Subcontractor of Ricardo Energy & Environment - Least-Cost Power Development Plan for Sao Tome and Principe. (2018). **Power system planning expert.**
- **Saudi Arabia** – National Grid Company - Economic Operation: Recommendations on functions & Processes, and implementation support, Kingdom of Saudi Arabia (2015-2016). **Power systems modelling expert.**
- **Saudi Arabia** - Saudi Electricity Company (SEC) - Generation and Transmission Incentives - Ancillary Services Development for Efficient Power Systems. (2011 –2012). **Power Systems Modelling Specialist.**
- **Saudi Arabia** - Saudi Electricity Company - Development of Single Buyer for the Saudi Electricity Sector, Kingdom of Saudi Arabia (2011-2013). **Power Systems Modelling Specialist.**
- **Saudi Arabia** - Saudi Electricity Company - Implementation of Single Buyer for the Saudi Electricity Sector, Kingdom of Saudi Arabia (2014-2016). **Power Systems Modelling Specialist.**
- **Saudi Arabia** - Saudi Electricity Company - Ordena Dispatch Simulation Model for the Saudi Electricity System (2012-2015). **Modelling Expert.**
- **Singapore** - Confidential – Market Study for the development of a Reverse Osmosis (RO) plant in Singapore (2016). **Modelling Expert.**
- **South America** - Inter-American Development Bank (IADB) - Support to the Andean Electric Interconnection Studies - Feasibility Study of the Electrical Interconnection of the Andean Countries (Bolivia, Chile, Colombia, Ecuador and Peru) (2013-2014). **Modelling Expert.**
- **Spain** – Ferrovial – Training course to Ferrovial’s staff on the electricity business and electricity markets (2017). **Market expert.**

- **Spain** – Protermosolar – Quantitative Analysis of the benefits of Concentrated Solar Power technologies in the Spanish Energy Mix (2018). **Modelling and regulatory expert.**
- **Spain** - Confidential (Spanish power utility) - Analysis of the economic remuneration to the national coal-fired power plants (2013). **Expert in energy systems modelling.**
- **Spain** - Government of Catalonia - Proposals for improving the current power sector model in Spain (2012). **Modelling Expert.**
- **Spain** - Confidential – The impact of the environmental law proposal in Murcia (2011-2012). **Modelling / Regulatory Expert.**
- **Spain** - Confidential (Spanish energy corporation) - Analysis of economic incentives to the special regime (renewables and co-generation) in the Spanish power sector (2009). **Modelling Expert.**
- **Spain** - AES Spain - Forecast of electricity prices and regulatory vigilance in the Spanish power market. (2010 - 2011). **Modelling/ Regulatory expert.**
- **Spain** – ENDESA - Analysis of perspectives on pumping stations for the expansion of generation in Spain, and the possible REE participation in this activity (2010). **Modelling/ Regulatory Expert.**
- **Spain** – ENDESA – Long Term Generation Expansion Plan 2015-2040 (2009). **Modelling/ Regulatory Expert.**
- **Spain** – ENDESA – Updated Analysis for Long Term Generation Expansion of Endesa in Spain 2011-2040. **Modelling/ Regulatory Expert.**
- **Spain** - ENDESA – The current critical situation of the energy sector and proposals for overcoming it (2010-2011). **Modelling/ Regulatory Expert.**
- **Sudan** – World Bank - Advisory support for electricity tariff reform (2nd phase) (2020 – 2021). **Generation expansion expert.**
- **Turkey** - Confidential (private investor) - Analysis of the gas and power prices in the Turkish energy market (2013). **Project director and energy markets modelling expert.**
- **Tanzania** - Energy and Water Utilities Regulatory Authority (EWURA) - Development of Electricity Rate-Setting Methodology & Cost of Services Study (2012). **Modelling Expert.**
- **Turkey** - Consulting Services for Energy Market Development (power and gas) - Ministry of Energy and Natural Resources (MENR), Turkey. Project funded by the EU Instrument for Pre- Accession (IPA 2013) Trust Fund and administered by the IBRD (World Bank) (2018-2019). **Project Leader and Market Modelling Expert.**
- **Turkey** – IFC – Market and Regulatory Due Diligence OEDAS and OEPSAS (2017). **Market modelling expert.**
- **Turkey** – TERNA - Development of the Renewable Energy Sector. Assessment of Current Situation, Barriers and Road Map (2017). **Power system planning and modelling expert.**
- **Turkey** – Confidential - Georgia Adjaristsqali Hydropower Cascade: Price projections for private wholesale electricity prices in Turkey (2012). **Project Director and market modelling expert.**

- **Turkey** - Confidential - Market Advisory Services for a CCGT Project in Turkey (2012). **Energy modelling expert.**
- **Turkey** - Confidential - Market Advisory Services for a 1220 MW CCGT Project in Turkey (2020). The market advisory services relate to the newly refurbished 1,220 MW 60% efficiency combined cycle gas turbine (“CCGT”) plant located in Kirklareli, approximately 180 km north west of Istanbul. The market modeling, price projection and dispatch analysis were carried out with MRC proprietary software package EDM. **Power market modelling expert.**
- **Turkey** - Confidential - Turkish Electricity Market Report (2012). **Project Director.**
- **Turkey** - Crescent Capital - Electricity Market Report (2012). **Energy modelling expert.**
- **Turkey** - Confidential (private investment group) - Market advisor for the Kirikkale CCGT project in Turkey (2012). **Energy modelling expert.**
- **Turkey** – Confidential - Market Study for Turkish Energy Market. (2011). **Modelling Expert.**
- **Turkey** - Confidential (Turkish private investor) - Technical and commercial due diligence of two combined-cycle power plants and one gas-fired power plant located in the Marmara region in Turkey. (2010). **Modelling Expert.**
- **Turkey** - TEIAS (electricity transmission company of Turkey) -Feasibility study for establishing a central monitoring system for ancillary services in the Turkish electricity market. (2009- 2010). **Coordinator.**
- **Turkey** - RES Mediterranea - Long-term price forecast and market review or the Turkish electricity market for RES Mediterranea. (2010). **Modelling Expert.**
- **Turkey** - Turkish investment group (confidential) / Private funds - Forecast of long-term wholesale electricity prices in Turkey (2007). **Modelling Expert/Market Analyst.**
- **Turkey** - Confidential (major global infrastructure group) / Private funds - The Turkish electricity market: price forecasts and dynamics (2008). **Modelling Expert/Market Analyst.**
- **Turkey** - BOYABAT Elektrik Üretim - Long Term Price Forecast and Market Review of Boyabat Hydropower Plant in Turkey (2009). **Modelling Expert/Market Analyst.**
- **Turkey** – Confidential - Long Term Price Forecast and Market Review of Turkish Electricity Market (2010-2011). **Modelling Expert.**
- **Turkey** - ENERJISA GROUP (Turkish Energy Corporation) - Study for the optimization of Enerjisa's hydropower plants. (2009) **Energy systems modelling expert.**
- **Turkey** – ENERJISA GROUP (Turkish Energy Corporation) - Optimization of Enerjisa’s Thermal Power plants in Electricity Spot Market. (04/2010-12/2011). **Modelling Expert.**
- **Turkey** - JOINT-STOCK COMPANY AKKUYU NPP - Market model development, including price forecast of electricity produced by AKKUYU Nuclear Power Plant (2011-2013). **Modelling Expert.**
- **Turkey** – Confidential (major global infrastructure group) Market Advisory Services for generation assets valuation in Turkey and Iraq (2014-2015). **Project Director.**

- **Uganda** - Ministry of Energy and Mineral Development - Study on Integrating Nuclear Power in Generation Capacity Plan 2014-2040 (2014-2015). **Energy and Economic planning expert.**
- **UK** - The Scottish Government - Provision of an Electricity Dispatch Model (2012-2013). **Modelling Expert.**
- **UK** – Ofgem - Access Reform Options – Consultancy to consider options for a market-based approach to managing network constraints and to support effective use of system resources across different uses (2017). **Economic Regulation Expert.**
- **Ukraine** - Confidential (major Ukrainian private-owned energy corporation) - Business strategy for exporting electricity to Central Europe: legal, regulatory and commercial due diligence (2011). **Regulatory Expert.**
- **Zambia** - Energy Regulation Board (ERB) / Project funded by the African Development Bank (AfDB) Electricity Cost of Service Study and Determination of Economic Cost Reflective Tariffs (2019 - ongoing). **Power system modelling expert.**
- **Zimbabwe** - Zimbabwe Electricity Transmission and Distribution Company (ZETDC) / Project funded by the African Development Bank (AfDB) Network Master Plan study (ongoing). **Generation modelling expert.**

- **Any other information**

Memberships:

Member of the IEEE (since year 2010).

Member of the ICAI engineers' association (since year 2008).

Languages:

Spanish (mother tongue; excellent in speaking, writing and reading)

English (excellent in speaking, writing and reading)

Other relevant training:

- **2009 - 2011:** Several courses on energy economics, regulation and operational research part of the PhD/MSc Degree in Electric Power Industry.
- **2010:** Training courses on EU's energy policy (regulations, sustainability, security, etc.) and, geopolitics and international energy supply, Spanish Energy Forum.
- **2010:** Training course on hydro energy management, Spanish Energy Forum.
- **2009:** Training course on Electricity Markets, Spanish Energy Forum.
- **2008:** Training course at PSR (Brazil) on the use of SDDP (Stochastic Dual Dynamic Programming)

- **Client contact information**

David Parish - Financial Expert

- **Personal**

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|---------------|--------------|
| Name | David Parish |
| Date of Birth | 26 June 1950 |

- **Professional Qualifications / Certifications**

| Qualification | Institute | Year |
|---------------|--|------|
| Msc Economics | Queen Mary College, University of London | 1972 |
| BSc Economics | Queen Mary College, University of London | 1971 |

- **Professional Experience**

| Company | Title/Role | From | To |
|--|--|------|------|
| - | Independent Economic & Energy Consultant | 2006 | Date |
| C3 Consulting | Director | 2003 | 2006 |
| PwC, Czech Republic | Partner | 1997 | 2002 |
| Cooper & Lybrand Management Consulting Services Africa | Chief Executive | 1992 | 1996 |
| Coopers & Lybrand, UK | Associate Director | 1986 | 1992 |
| Coopers & Lybrand, Zimbabwe | Associate Director | 1982 | 1986 |
| Coopers & Lybrand, Tanzania | Senior Economist | 1979 | 1981 |
| Coopers & Lybrand, UK | Consultant | 1978 | 1979 |
| UK Government | Economist | 1972 | 1978 |

- **Relevant Experience**

| Client Company / Project Title | Position Title & Brief Nature of Assignment | From | To |
|---|---|-------------|-----------|
| Millennium Challenge Corporation, Nepal | Tariff and Financial Adviser Advising on the tariff and commercial implications of a major new transmission link between Nepal and India which is under consideration for financing by the MCC. | 2018 | To date |
| Central Power Purchasing Agency, Pakistan | Financial Adviser Financial consultant on an ADB funded study devising new systems for Pakistan's Central Power Purchasing Agency. | 2016 | 2018 |
| KETRACO, KPLC and GDC (World Bank) | Team Leader & Financial Expert Team Leader for the development of a financial tool and analysis for a 5-year investment and financing plan for the distribution (KPLC) and transmission (Ketraco) companies in Kenya. Subsequently worked on a similar project for the geothermal development company. | 2017 | 2021 |
| Power Sector Regulator, Albania | Tariff Adviser Consultant on a USAID funded project advising the power regulator on tariff methodologies and implementation issues. | 2016 | 2018 |
| ICED Sierra Leone | Business Planner Consultant on a DfID funded project under the Infrastructure and Cities for Economic Development initiative to consider the case for investment in the rehabilitation of the power transmission and distribution systems in Sierra Leone's second and third largest cities, Bo and Kenema. Subsequently advised on possibilities for DfID involvement in the power sector as a whole. | 2016 | 2017 |

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| ECOWAS Regional Electricity Regulatory Authority | Tariff Evaluator Advised the regional power regulator on transmission tariff methodologies and implementation approaches developed by the West Africa Power Pool. | 2015 | 2016 |
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| Nigeria Infrastructure Advisory Facility, Nigeria | Tariff and Regulatory Advisor Advised Nigeria's power sector regulator, under NIAF financing, on the development and application of regulatory policy for retail tariffs and the management of government's remaining stake in the power sector. Separately advised the Bureau of Public Enterprises on discharging its role as owner of the government's minority stakes in generation and distribution companies. | 2015 | 2017 |
| Vietnam Power Sector Financial Restructuring Plan | Team Leader Team leader on a World Bank funded study to devise a financial restructuring plan for Vietnam's power sector. | 2013 | 2015 |
| Government of Nigeria, Nigeria | Power Sector Advisor Advisor in a project team, supporting a number of potential private investors in generation and distribution companies being privatised by the government of Nigeria. Advising on the finances of the various companies, on the key financial risks associated with investment and on possible financial projections for the companies. | 2011 | 2011 |
| MCC, Malawi | Power Sector Consultant Carrying out an assessment of the options for financing investment in Malawi's power sector in the light of proposed sector unbundling. Separated the accounts of ESCOM into two proposed successor companies. | 2015 | 2017 |
| USAID, Ghana & Liberia | Energy Sector Consultant Consultant to Power Africa on the evaluation and monitoring of proposed support programmes to the power sector in Ghana & Liberia. | 2014 | 2014 |

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| WB, Ghana & Gambia | Export Expert Advised on the evaluation of two loans to support the promotion of export-oriented industries and industrial parks in Ghana and Gambia. | 2012 | 2013 |
| WB, Cape Verde | Senior Corporate Economist A project to review the power sector's performance in Cape Verde and identify the steps required for ELECTRA to gain a credit rating. | 2010 | 2011 |
| ADB, Cambodia | Energy Consultant Country assessment programme evaluation, examining the performance of the support programme for the energy sector. | 2009 | 2009 |
| 2008 ADB, Vietnam | Energy Consultant On a country assessment programme evaluation for ADB, examining the performance of the support programme for the energy sector. | 2008 | 2008 |
| EC, Jordan | Tariff Advisor As a member of an EU funded technical assistance team, acted as Tariff Advisor to the Electricity Regulatory Commission of Jordan, devising tariff methodologies, financial model and practical tools for tariff implementation. | 2007 | 2008 |
| ADB, India | Power Sector Consultant Review of ADB lending to the power sector, covering lending to three states, Gujarat, Assam and Madhya Pradesh, as well as Power Grid and other central utilities, focusing on the success factors in existing programmes and their lessons for future lending. Subsequently acted as a consultant on an evaluation of a private transmission project in India. | 2007 | 2008 |
| ADB, Sri Lanka | Consultant Review of ADB lending programme in Sri Lanka, identifying factors which has led to delays in reform programmes. | 2007 | 2007 |

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| C3 Management & Economic Consulting | <p>Director/Executive Consultant Advised ADB in two separate projects on the evaluation of its thirty year lending programs to the power sectors in Philippines and Bangladesh, with particular emphasis on management, financial and economic issues. Calculated the long run marginal cost of supplying power at different voltages and evaluated the adequacy of power sector tariffs against the long run marginal cost and the financial position of the utilities. Made recommendations for change in tariffs and the regulatory regime.</p> <p>Participated in a review of ADB's country program in Pakistan, focusing on the power sector and evaluating the financial and operational performance of various generation and distribution companies. Subsequently prepared a Project Completion Report on three ADB loans, for the energy sector restructuring program.</p> <p>Consultant to two companies in the Ukraine in the development of remuneration policies and bonus schemes for staff.</p> <p>Consultant on a DfID funded project to improve governance in Palestine. Specific responsibilities included structural reviews of the main economic ministries, support to the Ministry of Planning in developing its organization structure and staffing and a review of establishment control and the role of the General Personnel Council in controlling the size of the civil service.</p> | 2003 | 2005 |
|-------------------------------------|--|------|------|

| Client Company / Project Title | Position Title & Brief Nature of Assignment | From | To |
|--|--|-------------|-----------|
| PricewaterhouseCoopers | <p>Partner</p> <p>Partner in charge of the management consulting and human resource consulting practices in the Czech Republic. Responsible for public sector advisory services and for human resources advice. Provided benchmarking advice to CEZ, the main national power utility, and various HR advice to a power distribution company.</p> <p>Responsible for a number of EU funded projects including a PHARE funded project with Fontys University for the National Training Fund to develop best practice models for HR development in the Czech Republic for small and medium enterprises. Also responsible for EU funded projects on corporate governance and improving environmental management in Czech companies.</p> | 1997 | 2002 |
| Coopers & Lybrand Consulting Services Africa | <p>Chief Executive</p> <p>Chief Executive of newly created regional consultancy operation, responsible for developing and implementing the corporate structure. Regional leader of consultancy practice, based in Nairobi with responsibility for consulting services in Kenya, Uganda, Tanzania, Zambia, Zimbabwe, Malawi, Ethiopia, Eritrea, Somalia, Sudan, Mauritius and Seychelles. Undertook a range of assignments including privatisation and restructuring advice to the Tanzania Electricity Supply Corporation, several World Bank missions in Kenya, mainly concerned with improving the performance of the banking sector and capital markets and World Bank missions and follow up projects in Zambia in connection with privatization, developing proposals for</p> | 1992 | 1996 |

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| | restructuring of parastatals and financial proposals for achieving successful sales | | |
| Coopers & Lybrand, UK; Coopers & Lybrand, Zimbabwe; Coopers & Lybrand, Tanzania | Various Positions Economist and Team Leader undertaking energy assignments around the world, with projects from Zimbabwe to Tanzanian to Ireland, Thailand and Ghana. | 1978 | 1992 |

• **Any other information**

Languages:

English (Native)

French (Conversational)

Swahili (Basic)

Memberships:

Former Board Member & Chairman, International Consulting Economists' Association

Former Board Member & Chairman, British Chamber of Commerce in the Czech Republic

Carlos Migueo - Organizational Restructuring and Cost of Service Expert

- **Personal**

| | |
|---------------|---------------|
| Name | Carlos Migueo |
| Date of Birth | 14 May 1960 |

- **Professional Qualifications / Certifications**

| Qualification | Institute | Year |
|---|--|------|
| Master in Economics | Federal University of Rio de Janeiro, Brazil | 1994 |
| XVII Latin American Course of Energy Planning & Economics | Instituto de Economía Energética, Fundación Bariloche, Argentina | 1987 |
| Industrial Engineering (MSc equivalent) | Republic of Uruguay University in Montevideo, Uruguay | 1985 |

- **Professional Experience**

| Company | Title/Role | From | To |
|---|--|------|------|
| MRC Consultants & Transactions Advisers | Senior Energy Economics and Regulatory Expert | 2015 | Date |
| AF-Mercados EMI, Madrid (Spain) | Executive Consultant (since 2013) Deputy CEO (from 2007 to 2013) Executive Consultant (from 2002 to 2006) Senior Consultant (from 1999 to 2002) | 1999 | 2014 |
| Various, internationally | Economic, Financial and Strategic Analyst | 1993 | 1999 |
| UTE, Montevideo, Uruguay | Engineer, Planning Department | 1986 | 1992 |

- **Relevant Experience**

| Client Company / Project Title | Position Title & Brief Nature of Assignment | From | To |
|--|--|-------------|-----------|
| Asian Development Bank (ADB)/ CPPA, Pakistan | Restructuring Expert to the new Market Operator Support to the CPPA (single buyer agency) in the development of the electricity market- The primary role of the consultant is to provide management support, capacity building, access to expert resources, and training for CPPA-G (Central Power Purchasing Agency) through supporting the development of regulatory documents, preparing for balancing mechanism and effective stakeholder coordination. | 2020 | ongoing |
| Ministry of Mineral Resources and Energy (MIREME)/ Energy Regulatory Authority (ARENE), Mozambique | Project director and energy economist Formulation of regulatory fee mechanism for ARENE - the main objective of the assignment is the design an appropriate mechanism for setting and implementation of regulatory fee application, defining the calculation formula, establishing parameters and procedures for calculation and application of the fees, criteria and respective regulation that should guide and govern its implementation. | 2021 | ongoing |
| World Bank, Sudan | Team Leader Advisory support for electricity tariff reform (2 nd phase) – the consultant assisted the Bank and the Government of Sudan in the process for the reform of the electricity tariff regime. In particular, a full cost of service study “Bottom-up cost calculations” and revision the interim tariff roadmap. | 2020 | ongoing |
| World Bank, Tunisia | Project coordinator and energy economist The consultant is carrying out a cost of service study for electricity and gas, assessment of the financial impact of subsidies under the current tariff structure, and proposals for medium-term tariff reforms. | 2020 | ongoing |

| Client Company / Project Title | Position Title & Brief Nature of Assignment | From | To |
|--|--|-------------|-----------|
| ENABEL (Belgian Development Agency), Mozambique | Team Leader and regulatory expert The consultant is carrying out a consultancy for elaboration of a Planning, Monitoring and Evaluation Manual for the Ministry of Mineral Resources and Energy (MIREME). | 2020 | ongoing |
| Luxembourg Agency for Development Cooperation (LuxDev) | Project Leader and regulatory expert Technical Assistant for the Electric Sector Regulation Support Project in Cabo Verde - Package 2 | 2019 | 2020 |
| Jamaica Public Service (JPS), Jamaica | Team Leader Cost of Service Study and Regulatory Framework Advisory – the consultant was hired to provide commercial, economic, and technical basis of the methodology employed to determine the Long Run Marginal Cost (LRMC) for electricity generation, transmission, and distribution service, as well as administrative and general costs. | 2017 | 2017 |
| IEDM, Nigeria | Expert in power distribution analysis, planning and financial modelling Electricity Distribution Privatization (Eko, Ibadan, Ikeja and Yola) - Preparation of the bidding offer of four power distribution utilities in Nigeria for a private investor. Carlos participated in market analysis, analysis of regulatory, market and financial risks, demand forecast, analysis of tariff scheme, elaboration of loss reduction plan, and preparation of business plans and commercial offer. | 2011 | 2012 |

| Client Company / Project Title | Position Title & Brief Nature of Assignment | From | To |
|--|---|-------------|-----------|
| ENERJISA - Turkish investment group (confidential) | Project Coordinator Forecast of long-term wholesale electricity prices in Turkey - The objective of this study was to carry out a market analysis of the development and performance of the Turkish electricity sector for the period 2007-2020. The study was focused in particular on the wholesale electricity prices, and their long-term evolution under different regulatory and economic scenarios. | 2007 | 2007 |
| TSA (Trading System Administrator of the Russian Wholesale Electricity Market), Russia | Power Markets Expert The consultant carried out a research of international practices on power markets surveillance, organization and functioning of financial derivatives markets, and guarantees for market agents. In addition, the consultant delivered a one-day presentation in Moscow of international experiences in long-term capacity markets, capacity auctions, capacity payments, guarantees and financial instruments. | 2007 | 2007 |
| Jiangsu Provincial Electric Power Company (JPEPC), China | Project Coordinator and Restructuring and Tariffs Specialist Transmission and Distribution Unbundling and Tariffs Study | 2003 | 2004 |
| Stone and Webster Management Consultants / Government of Trinidad & Tobago | Restructuring and regulation studies for the electricity and water and sanitation sectors | 2000 | 2001 |
| Saudi Electricity Company (SEC), Saudi Arabia | Organizational Expert / Regulatory and Pricing Expert Coordinated the implementation of the Single Buyer internal functional processes, also assisted SEC in its modelling procedures related with the Economic Operation of the System Operator, as well as in the definition of strategic reserves, back up and ancillary services prices. | 2013 | 2015 |

| Client Company / Project Title | Position Title & Brief Nature of Assignment | From | To |
|---|--|-------------|-----------|
| Electricity Authority of Cyprus (EAC), Cyprus | Financial and Restructuring Expert Regarding the unbundling, corporatisation and privatisation of EAC, assessed all possible scenarios and options regarding the future structure and ownership regime of EAC | 2016 | 2016 |
| Council for Development and Reconstruction (CDR), Lebanon | Team Leader Assisted the CDR in the corporatisation of Electricité du Liban (EdL) including the definition and specification of internal procedures and job descriptions of the proposed Single Buyer, and supporting all related activities in order to lay the ground for future privatization of the sector. | 2007 | 2008 |
| Albanian Transmission System Operator, Albania | Team Leader Assisted in sector restructuring and internal reorganisation of Albanian Transmission System Operator. He supported strengthening the TSO to fulfil its responsibilities in accordance with the ongoing power sector reform program, the Transitional Market Model, and Albania's commitments as a member of the Energy Community of South East Europe. | 2006 | 2007 |
| Ministry of Industry, Energy and Fuel Resources, Kyrgyz Republic / European Bank for Reconstruction and Development | Designed the regulation and studied the financial feasibility of Small and Medium-Sized Hydropower plants, as part of a RES promotion support program. | 2009 | 2010 |
| Alternative Energy Development Board, Pakistan | Participated in the renewable energy policy formulation and capacity development for Alternative Energy Development Board, designing an incentive mechanism based preferential RE buyback tariffs and gradually transitioning towards a more competitive RE market with producers fully integrated into the country's mainstream energy supply mix. | 2007 | 2008 |

| Client Company / Project Title | Position Title & Brief Nature of Assignment | From | To |
|---|--|-------------|-----------|
| ERC, Thailand | Regulatory and Tariff Expert Defined tariff review approach and procedures of the electric utilities (EGAT, EA and PEA), on the basis of an unbundled and open system. | 2018 | 2019 |
| ERAV, Vietnam (WB project) | Regulatory, Tariff and Financial Expert Reviewed and finalized Regulations and Detailed Procedures for Distribution Charges Calculation. | 2010 | 2010 |
| ERAV, Vietnam (WB project) | Participated in the preparation of standard PPA and dispute settlement and enforcement procedure regulation for single buyer model market. | 2008 | 2009 |
| LEC, Lesotho | Financial and Restructuring Expert Assisted in the undertaking of LEC unbundling and restructuring of the energy sector. | 2019 | 2019 |
| Millenium Challenge Corporation (MCC), Malawi | Restructuring and Regulatory Expert for the Electricity Sector Restructuring. | 2014 | 2014 |
| PHCN, Nigeria | Regulatory and Organizational Expert Assisted in the implementation of the restructuring of the generation and distribution sub-sectors of PHCN. In particular, implementation of financial/accounting, human resources, organizational/business process and Management Information System/IT solutions for the functional separation of PHCN into operational New Business Units (NBUs). | 2006 | 2006 |
| Electricity of Vietnam / World Bank, Vietnam | Economic and Financial Expert Consulting Services for Strategic Options for Enhanced Financial Performance of Vietnam Electricity's Power Companies. The objective of the services was to support EVN in developing a comprehensive strategy for addressing the current financial performance constraints facing its | 2013 | 2014 |

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| | group of power companies (2013-2014). | | |
| Client Company / Project Title | Position Title & Brief Nature of Assignment | From | To |
| Electricity Regulatory Authority of Vietnam (ERAV) | Financial Expert Consultant services for Distribution Companies Tariff Calculation. Specifically, in charge of modeling and simulating the financial sustainability of the electric PCs under the new tariff framework. | 2008 | 2009 |
| National Electricity Regulatory Entity (ENRE), Argentina | Tariff Specialist Tariffs revision study for the next tariff period starting year 2002, as well as efficient operation and management costs estimation. | 2001 | 2002 |

- **Any other information**

Languages:
Spanish (mother tongue; excellent speaking, writing and reading)
English (excellent speaking, writing and reading)
Portuguese (excellent speaking, writing and reading)

MOHAMMAD SHAHID RAHIM

CAREER SUMMARY

A power engineering professional specializing in sustainable energy and power system planning and development, especially integrating distributed and renewable generation technologies with the grid. Holds a Ph.D. with diverse academic training in electrical power engineering, resource and technology assessment, policy analysis, economics and pricing, regulation, demand analysis and forecasting, energy conservation, demand-side management, environmental assessment and control, contract law, and project management. Has over 35 years of experience in system planning, development, and regulation with Asia's two largest power utilities and national regulator. Has developed long-term demand forecasts, system development plans, transmission and distribution codes, planning criteria and standards, and performance monitoring and compliance schemes.

CORE COMPETENCIES

- Evaluation of energy supply and demand management options
- Preparation of integrated resource plans
- Energy policy evaluation and formulation
- Feasibility studies and project appraisals for RETs
- Development and implementation of T&D codes
- Development and implementation of planning standards
- Preparing of demand forecasts and system development plans
- Monitoring and management of electric utility performance
- Resource and technology assessments of renewable energy options
- Study/analysis of cost of service, pricing, and tariff issues and schemes
- Preparing and defending of regulatory submissions
- Developing and managing of bulk supply agreements/contracts
- Environmental impact assessment of energy technologies and projects

EXPERIENCE

Professional

July 2017 to date

Senior Freelance Consultant

Evaluation of energy supply and demand options; preparing of integrated resource plans; energy policy analysis; feasibility studies and project appraisals for RETs; development and implementations of transmission and distribution codes; preparation of demand forecasts and system development plans; monitoring and management of system performance; resource and technology assessments; analysis of cost of service, pricing, and tariff issues; preparing and defending of regulatory submissions; developing and managing of bulk supply contracts; and environmental impact assessment of energy technologies and projects.

Recent Assignments

On-going (March 2020 to date)

Assisting the Central Power Purchasing Agency-Guarantee (CPPA-G) in the modification of Pakistan's Grid Code to align it with the newer developments (technical and institutional) relating to high shares of VRE generation projects and the wholesale competitive market design currently

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| | <p>under implementation in the country. Essentially, to review, support, and complement the grid code revision work that DNV-GL is conducting for National Transmission & Despatch Company (NTDC). Review of T&D Performance Standards, developing of model Connection Agreements, and review and finalizing of Technical Code for CASA-1000 project (regional interconnection between Pakistan and Central Asian countries).</p> <p><i>Completed (November 2019 to February 2020)</i></p> <p>Provided consulting and advisory support to Energy Institute of Lahore University of Management Sciences (LUMS-EI), Pakistan in developing and publishing of its landmark Pakistan's Electricity Outlook 2020-25.</p> |
| February 2016 to June 2017 | <p>Independent Consultant, System Planning, Saudi Electricity Company (SEC), Riyadh, Saudi Arabia. Major Functions: Study/evaluate generation and transmission expansion options and schemes. Supervise developing of peak and energy demand forecasts. Conduct reliability assessments for existing and future grid and suggest appropriate system enhancement and upgrades. Conduct resource and technology assessments for both conventional and renewable generating technologies. Develop technical codes, procedures, and standards for system operation, reliability, security, load shedding, and safety. Advise management on transmission and market-related matters concerning connection of new facilities, constraint management, network planning and development, market management, dispute resolution, and settlement mechanisms and procedures. Provide technical support in developing and administering contractual documents. Preparing of system planning and state of the network reports. Identify R&D needs and commission studies. Pursue Company's power and energy sharing with neighboring country system.</p> |
| January 2012 to January 2016 | <p>Senior Engineering Expert, System Planning, Saudi Electricity Company (SEC), Riyadh, Saudi Arabia. Major Functions: Studied/evaluated generation and transmission expansion options. Supervised developing of demand forecasts. Conducted reliability assessments. Conducted resource and technology assessments for both conventional and renewable generating technologies. Developed technical codes, procedures, and standards for system operation, reliability, security, load shedding, and safety. Advised management on transmission and market matters concerning connection of new facilities, constraint management, network planning and development, market management, dispute resolution, and settlement mechanisms and procedures. Provided technical support in developing and administering contractual documents. Prepared and issued system planning and state of the network and other periodic reports. Identified Company's R&D needs and commissioned appropriate studies. Pursued Company's power and energy sharing with neighboring country systems.</p> |
| January 2004 to December 2011 | <p>Manager, Strategy and Compliance Division, Transmission Regulation Department, Saudi Electricity Company (SEC), Riyadh, Saudi Arabia. Major Functions: Examined/assessed regulatory schemes for transmission and market development. Led a team of professionals to develop the Saudi Arabian Grid Code (SAGC) between 2005 and 2007 and managed the entire development, launching, and implementation process, including drafting, stakeholder consultation and review, approval by the regulator (ECRA), final publication, launching through a set of 7 workshops in major cities of Saudi Arabia, and implementation. Supervised the development of SAGC's Compliance Monitoring and Enforcement Scheme also. Advised</p> |

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| | management on transmission and market matters concerning connection of new facilities, constraint management, network planning and development, market management, dispute resolution, and settlement mechanisms and procedures. Provided technical support in developing and administering contractual documents and also help in resolving disputes on technical issues as and when such disputes arose. Prepared and defended regulatory review petitions. Prepared and issued system planning and state of the network and other periodic reports. |
| February 2001 to December 2003 | Engineer I, Systems Planning Department, Saudi Electricity Company (SEC), Dammam, Saudi Arabia. Major Functions: Studied and evaluated energy and peak demand needs of major customer groups and prepared requisite cost-effective capacity expansion plans. Conducted studies to understand demand patterns of customers and enhance demand and capacity modelling. Past studies also included pricing for private transmission service providers, tariff policy for industrial co-generators, and selecting of appropriate benchmarks for system reliability. Coordinated developing of power quality standards through local universities and research institutions. |
| August 2000 to February 2001 | Technical Staff Officer (Senior Engineer), Office of Chairman, Pakistan Electric Power Company (PEPCO), Lahore, Pakistan. Major Functions: Assisted the Chairman on day-to-day and strategic issues of technical nature. Coordinated with various subordinate formations within PEPCO regarding technical performance issues, reporting of technical performance, and initiate timely corrective/remedial actions. Prepared briefs for the Chairman on current and emerging technical issues. |
| March 1998 to August 2000 | Director (Technical), National Electric Power Regulatory Authority (NEPRA), Islamabad, Pakistan. Major Functions: Provided technical and managerial support to Member (Technical). Co-ordinated all technical regulatory activities of NEPRA. Provided technical assistance to professional staff. Developed regulatory framework and procedures for licensing, tariff setting, industry and performance standards, and governance and performance of regulated entities. Studied transfer pricing between generation, transmission, and distribution companies. Studied the suitability of power pooling and trading models and developed Power Acquisition Guidelines. Evaluated tariff review petitions from WAPDA and Karachi Electric Supply Company (KESC) and prepared recommendations for final determination. Managed consulting work and staff training. Supervised developing of information and database systems. Supervised research studies on key regulatory issues. Prepared position descriptions and participated in hiring of NEPRA professional staff. |
| September 1995 to February 1998 | Senior Instructor, Power Distribution Academy, Water and Power Development Authority (WAPDA), Islamabad, Pakistan. Major Functions: Developed training material for distribution planning and optimisation courses. Designed and executed training courses. Taught and trained WAPDA professionals on Electric Utility Organisation and Management, Power System Planning and Optimisation, Demand Forecasting, Project Management, and Management Information Systems (MIS). Developed training schedules for the Academy and supervised their implementation. Organised seminars for improving training materials. |
| April 1993 to | Research Fellow and Head, Energy and Climate Change Programme, |

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|----------------------------|--|
| September 1995 | <i>Sustainable Development Policy Institute (SDPI), Islamabad, Pakistan.</i> Major Functions: Conducted policy research in energy and sustainable development. Developed SDPI's research program on Energy and Climate Change. Provided policy advice to public/private sectors on energy issues. Commissioned and supervised policy research. Provided policy input to government on energy and climate change issues. Wrote, edited, and published numerous papers on power sector efficiency, DSM, and sustainable development in Pakistan. Planned, organised, and conducted workshops, seminars, conferences, and made presentations on pressing issues. Liaised with local and regional energy groups and organisations. |
| August 1992 to March 1993 | <i>Assistant Director (Advisor on Generation Planning), National Power Plan Project, Water and Power Development Authority (WAPDA), Lahore, Pakistan.</i> Major Functions: Contributed to developing a least-cost capacity expansion plan for Pakistan up to year 2018. Using WASP, studied the feasibility of alternative generation sequences. Analysed future demand scenarios and developed demand forecast for the country. Motivated the study and inclusion in the Plan of DSM options for the country. Studied the viability of alternative/renewable sources in the future expansion of power sector. Coordinated with governmental and international agencies like Planning Commission and World Bank, etc. |
| August 1986 to August 1992 | <i>Remained in the United States for MS and PhD studies on a scholarship from Ministry of Science and Technology, Government of Pakistan.</i> |
| 1983 to 1986 | <i>Assistant Director (Technical), National Institute of Power, Ministry of Science and Technology, Lahore, Pakistan.</i> Major Functions: Research and development in technical and economic issues relating to electric power generation, transmission, and distribution in the country. Contributed to establishing the Institute and its organizational structure. Conducted R&D in developing renewable energy technologies, in particular, micro-hydel power plants indigenously within the country. |
| 1981 to 1983 | <i>Junior Engineer (Power Distribution), Water and Power Development Authority (WAPDA), Lahore, Pakistan.</i> Major Functions: Supervised the operation and management of WAPDA's distribution systems including operation, augmentation, repair, and metering. Planned and executed distribution systems, and supervised their testing and commissioning. |
| 1980 to 1981 | <i>Electrical Engineer, Thal Jute Mills, Mazaffargarh, Pakistan .</i> Major Function: Supervised and managed the electrical and air-conditioning departments of Pakistan's largest Jute Mills. |

Consultancy

| | |
|--------------------------|--|
| August to September 1997 | <i>Consultant (Energy and Power), East-West Center, Hawaii, USA.</i> Studied the environmental issues facing Pakistan's power sector and explored the role of efficiency improvement to stabilize GHG emissions. |
| January to April 1997 | Energy Consultant to Sustainable Development Policy Institute (SDPI), Islamabad, Pakistan, for UNEP Study on Impacts of Climate Change. |

Teaching

| | |
|---------------------------------|---|
| September 1995 to February 1998 | Power Distribution Planning, Electric Utility Organisation and Management, Project Management, and Management Information Systems |
|---------------------------------|---|

| | |
|-----------------------------|---|
| | (MIS) at the WAPDA Power Distribution Academy, Islamabad, Pakistan. |
| 1990 to 1991 | 1. Electrical System Design; and 2. Solar System Design. (Both senior level courses), Civil, Environmental, and Architectural Engineering Department, University of Colorado at Boulder, Colorado, USA. |
| <u>Seminars</u> | |
| 1988 – 1989 | Graduate Seminar Co-ordinator , Joint Center for Energy Management, University of Colorado at Boulder, Colorado, USA. |
| <u>Other</u> | |
| 1990 – 1992 | Director, Quantitative Skills Lab , University of Colorado at Boulder, USA. Supervised the Lab's functioning, established by the Dept. of Student Housing to help students improve their problem-solving skills. |
| 1990 – 1992 | Computer Advisor , Anderson Language Technology Laboratory, Univ. of Colorado at Boulder, USA. Supervised this unique Lab for 2 years. Developed an interactive German language learning program, REISE. |
| TRAINING | |
| August to November 1982 | Power Distribution System Planning, development, and Management, WAPDA Training Institute, Faisalabad, Pakistan. |
| May to June 1984 | Small Scale Power Generation, International School of Solar Energy and Renewable Technologies, Sogesta, Italy. |
| EDUCATION | |
| 1988 – 1992 | PhD, Civil Engineering, University of Colorado at Boulder, Boulder, Colorado, USA (Specialisation: Integration of renewable and distributed generation technologies with the grid) |
| 1986 - 1987 | M.S., University of Pittsburgh, Pittsburgh, Pennsylvania, USA (Specialisation: Energy and Power Resources) |
| 1975 – 1980 | B.Sc. Engineering, University of Engineering and Technology, Lahore, Pakistan (Specialisation: Electrical Power) |
| MANAGERIAL SKILLS | Project Management, PERT/CPM, MIS, Risk Analysis and Decision Making, Quantitative Modelling, Multi-objective Optimisation. |
| COMPUTING | |
| <i>Languages</i> | FORTTRAN, BASIC, C |
| <i>Appl. Software</i> | MS Office (Word, Excel, Powerpoint, Visio) |
| <i>Statistical packages</i> | SAS, SPSS |
| <i>Planning packages</i> | WASP, ENPEP, EGEAS, LEAP, IPM |
| LANGUAGES | English, Urdu, and Arabic |
| PUBLICATIONS | Numerous (details available separately) |

BILAL MANZOOR

BPR Expert | Business Analyst
Project Manager

- 📍 CB-1023, Hamza Street, Afshan Colony
Rawalpindi Pakistan 46000
- 📞 +92-300-5349404 | +92-51-5144531
- ✉ bilal.manzoora@gmail.com
- 🌐 [pk.linkedin.com/in/aboutbilalmanzoora](https://www.linkedin.com/in/aboutbilalmanzoora)

CORE COMPETENCES

- 💡 BPR Specialist
- 💡 Business Process Management
- 💡 Process Modeling
- 💡 Business Analysis
- 💡 Agile/ Scrum Methodology
- 💡 Project Management
- 💡 Business Intelligence
- 💡 Data Modeling & Visualization
- 💡 Software Design & Architecture
- 💡 IT Service Management
- 💡 Software Development Lifecycle

PROFESSIONAL TOOL EXPERTISE

- ✳ Microsoft Visio
- ✳ Microsoft Power BI, Tableau, IBM SPSS
- ✳ IBM Blueworks Live, Savvion, Ultimus
- ✳ Microsoft Project, Oracle Primavera
- ✳ Visual Studio .NET, Visual C++, VB, C#, MVC
- ✳ Oracle, SQL Server, Entity Framework, MongoDB
- ✳ Azure DevOps, TFS, JIRA
- ✳ CSPro, ODK
- ✳ UniCenta POS, SambaPOS, Microsoft RMS
- ✳ Kazzola, HMIS.Online, WORK+ BPM Suite

CERTIFICATES, MEMBERSHIPS, RESEARCH

- 📄 Certified Business Analyst Professional
- 📄 Certified Project Management Professional
- 📄 Member of IIBA (International Institute of Business Analyst)
- 📄 National Database Management - JTEC/NEC Tokyo Japan
- 📄 Microsoft Power BI (edX Microsoft)
- 📄 Azure Machine Learning Studio (edX Microsoft)
- 📄 Project Planning & Scheduling (Skill Development Council)
- 📄 Research Paper "Impacts of Social Networks and Team Collaboration on Project Success"
- 📄 Research Paper "Impact of Cloud based Project Management Information System"
- 📄 Certified Workflow Professional Certificate (Ultimus FloPro)

EDUCATION

- 🎓 **MS Project Management (2013)**
SZABIST, Islamabad
- 🎓 **M.Sc. Computer Sciences (1998)**
QAU, Islamabad
- 🎓 **Diploma Computer Sciences, (1996)**
Punjab Technical Board, Lahore
- 🎓 **B.Sc. (Mathematics and Physics) (1995)**
Punjab University, Lahore

Innovative Information Technology / Management Consultant with over 23 years' experience in client-centric and value-driven Enterprise solutions. Proven experience in Business Process Management, handling & clarifying Business Requirements Specifications, Project Management, Process Modeling and Gap Analysis, and Re-Engineering of Business Processes to increase organizational productivity and efficiency.

SELECTED ACHIEVEMENTS

- 👑 Worked as **Business Process Re-Engineering Specialist** to study existing business processes of **CPAA (Central Power Purchase Agency)** organization and its partner organizations includes **NPCC, NTDC and DISCOs**. Developed a Future Process Model for Invoice Processing, Economic Merit Order, DISCOs Billing and LDs.
- 👑 Led the development team to implement data exchange portal (**CDXP**) between Power Producers and CPAA. This portal dramatically improved the performance at all levels, reduced lag time.
- 👑 Worked as **BPR Expert** to study existing business processes of **Islamabad Capital Territory Police**, performed analysis and proposed to-be model based on Industrial and International best practices.
- 👑 Led the development of SaaS based startup named **Kazzola** specially designed for SMEs to Business Manage Processes, Office Automation and Team Collaboration. Startup successfully recognized, groomed and graduated from the first cohort of **NIC (National Incubation Center) Islamabad**.
- 👑 Led the team as **Business Analyst** for **ERP implementation** at Counter Terrorism Force, **Islamabad Police**.
- 👑 Initiated a startup **HMIS.Online** for **Healthcare** sector aiming online service to provide low-cost solution suitable for Hospitals, Clinics, Laboratories and Pharmacies.
- 👑 Oversaw the design and implementation of first-ever **Security, Guarding and Patrolling** industry solutions using mobile apps with **GIS tracking and fencing** in Pakistan. That dramatically improving the performance of field teams and helping in improving the customer's satisfaction.
- 👑 Led various Humanitarian sector projects as **Project Manager** and **Data Scientist** for NGOs, IGNOs and UN Organizations for data gathering, data profiling, including **Vulnerability Assessment** and calculation of **Food Consumption Score**. Data used by different **Government Agencies** and **Donor Organizations** for decision making and donation eligibility. Successful projects include **IDPs Vulnerability Assessment and Profiling (IVAP)** by **International Rescue Committee** and **Camps / Village Profiling** by **UNHCR**.
- 👑 Developed **PC-I/PC-II** (Project Plan / Feasibility Studies) as **Business Analyst** for automation related projects at **Federal Government** ministries and departments. Key projects include **e-Office Replication** and **Automation of FIA**. Most of these projects has been implemented and resulted in performance and efficiency improvement in the relevant public sector organizations.
- 👑 Led various **Business Process Reengineering (BPR)** studies as **BPR Specialist**. Worked on an assignment to benchmark of GoP common business processes and proposed a to-be process model. Led the BPR study for **Zakat distribution in Pakistan** and **e-Procurement framework in Pakistan** along with the consultants of **IBM**.
- 👑 Led the development of **Business Process Management** product named "**WORK+**". This product successfully used for the **ERP implantation** and automation at **Paktel / CMPak (Zong), Air Headquarters, Ministry of Defense Production, NESPAK, OMV, IRC, UNHCR**.
- 👑 Represented Pakistan in **JICA's training session on "National Database Management"** at Tokey, Japan
- 👑 Performed the on-site Business Process Management deployment and trainings at **Astra CMG, Jakarta, Indonesia** and **Consoft Singapore**.

PROFESSIONAL EXPERIENCE

- | | |
|-------------------------------------|--|
| 2021 – Present (Since July 2021) | Consultant Business Process Re-Engineering– Central Power Purchase Agency (CPPA-G) Working as BPR Consultant with a CPPA team to establish Market Operator company for CTBCM. CTBCM will introduce competition in the Electricity Market and enabling an environment where multiple sellers and buyers can trade electricity. |
| 2020 – 2021 (14 months) | Sr. Business Analyst – Cognitive Healthcare International Worked as a Sr. Business Analyst at CHI, Islamabad to streamline their internal business processes, product specifications management, defining SOPs and monitoring reports. |
| 2019 – 2021 (20 months) | BPR Expert – MRC Group Consultants and Technical Advisors (ADB Funded) Worked with MRC Consultants for the organizational re-structuring of Central Power Purchase Agency (CPPA) and develop the new power market model for Pakistan. |
| 2019 – 2020 (6 months) | BPR Specialist – Prudential Global Advisory, Islamabad Providing consultancy as Business Analyst / BPR Specialist on various public and private sector project. |
| 2018 – 2019 (14 months) | BPR Specialist / Project Manager - Carbon8 Private Limited, Islamabad Led the team as Sr. Business Analyst and Project Manager for the implementation of Data Exchange portal and ERP implementation at CPPA . |
| 2019 - 2020 (11 months) | Sr. Business Analyst / Manager Projects - Workmatec Private Limited, Islamabad Accountable for maintaining company's technical operations. Partner with top management to guide short- and long-range technological and strategic planning. |
| 2010 – 2018 (8 years) | BPR Specialist - Electronic Government Directorate, Ministry of IT, Islamabad Worked as BPR Specialist to study and analyze the Business Processes of different departments of the Federal Government. Assisted EGD's Strategic Planning and Architecture Wing team for the development of PC-I/PC-II for Information Technology projects. |
| 2006 – 2010 (4 years) | Team Lead / Project Manager - Workplains Private Limited, Islamabad Led a team in designing and development of a BPM software for UK based company. |
| 2000 –2006 (6 years) | Software Developer - Ultimus Pakistan, Rawalpindi Started career as an Application Engineer for BPM software. Later excelled as a Software Developer for the company's flagship product to implement its first localized version. |
| 1998 – 2000 (2 years) | |

CURRICULUM VITAE

1. **Name** : Nazir Ahmed Shaheen

2. **Educational Qualifications:**

1. M. A (Economics)
2. LL.B

3. **Professional Qualifications:**

Associate member of Institute of Cost and Management Accountants of Pakistan (ACMA) since 1987 and Fellow member of Institute of Cost and Management Accountants of Pakistan (FCMA) 1995.

Fellow Member of Pakistan Institute of Public Finance Accountants (2007).

Advocate High Court

4. **Courses/Training:-**

- a. **Computer Programming** Course (1980)
- b. **Negotiation Skill:** at Pakistan Institute of Management from 10 - 15 April 1993.
- c. **Operation & Regulation of Capital Markets and Stock Exchanges Programme:** Course organised by USAID / CLA / Institute of Science & Technology Inc. from 11th Oct to 16th Oct 1993.
- d. **Regulatory Framework for Capital Market Programme:** Course organised by USAID / CLA / Institute of Science & Technology Inc. from 17th Oct to 23rd Oct 1993.
- e. **Company Law & Financial Accounting Course** organised by Asian Development Bank / CLA from 16-30 Jan 1994.
- f. **Management Accountant's Role in Market Economy** in 7th MAIC by ICMAP from Dec 1-3, 1994.
- g. **Activity Based Costing (ABC)** from Pakistan Institute of Management in Oct 1996.
- h. Workshop on **IAS** on 26th Nov 1996 by ICMAP.
- i. Seminar on **E-Commerce** by ICMAP on 19th Feb 2000.
- j. Seminar on **New Horizon of Accounting & Information Technology** on Sept 23-24, 2000.

- k. Training on **The Financial Reporting and Practices in Pakistan** from November 1-15, 2001 by SECP/Skans.
- l. Workshop on **Art of Writing Judgment** by LUMS on April 19-20, 2002.
- m. Workshop on **Stress Management** by ICMAP on April 25, 2005.
- n. 2nd Annual Conference on **Corporate Governance in Pakistan** by LUMS – SECP on June 3-4, 2005
- o. 10th MAIC on **the Management Accounting Profession in Changing Global Scenario** by ICMAP on Sept 24-25, 2005.
- p. Seminar on **IFRS** by ICMAP on Aug 2, 2005.
- q. **Legal Training for Executives** by SECP on July 1-2, 2010.
- r. **Seven Habits of Highly Effective People Training Programme** by SECP on June 27-29, 2011.
- s. **Conference on Governance and Board Effectiveness in PSEs** by PICG/CIPE on Apr 11, 2012.
- t. **LLP Advocacy** with USAID from August to November 2014.

5. **Record of Employments:**

- a. **Assistant Director (Finance & Accounts) (BPS-17)** Employees Oldage Benefits Institution (Ministry of Labour, Manpower & Overseas) from 12th March 1988 to 4th October, 1989.
- b. **Deputy Registrar of Companies (BPS-18)** from 5th October 1989 to 4th August 1996 in Corporate Law Authority (Ministry of Finance).
- c. **Cost and Management Accountant (BPS-19)/Joint Registrar** from 5th August 1996 to 1st September, 2000 in Securities & Exchange Commission of Pakistan (formerly Corporate Law Authority, Ministry of Finance).
- d. **Additional Registrar of Companies/Director (Enforcement) (CPS-9)** from 1st September, 2000 to 30th June 2004 in Securities and Exchange Commission of Pakistan.
- e. **Registrar of Companies (CPS-9)** from 1st July 2004 to 30th November 2008.
- g. **Executive Director/Registrar of Companies (CPS-10/F)** from 16th October 2006 to 26th June 2009.
- h. **Executive Director (Corporatisation and Compliance Department) (CPS-10/F)** from 26th June 2009 to 3rd August 2014.

6. Professional practice and experience:

- a. Chief Consultant / CEO Nazir Shaheen & Associates :** Corporate Adviser and Management Consultant. August 2014 to date.
- b. CEO Institute of Development, Enterprise and Leadership (Pvt) Ltd. June 2015 to date.**

7. Visiting Faculty: -

- a. Quaid-E-Azam University, Deptt. of Administrative Sciences, Islamabad – 1994 to 2000.
- b. University of Arid Agriculture, (University Institute of Management Sciences) Rawalpindi – 1998 to date.
- c. Hamdard University, Islamabad Campus 2002 to 2005.
- d. Bahria University, Islamabad – 2003 to 2005.
- d. Institute of Chartered Accountants of Pakistan, (College of Financial and Management Sciences, Islamabad) 1995-1999.
- e. Institute of Cost and Management Accountants of Pakistan 1991 to date.
- f. Air University, Islamabad. 2008 to 2010.

8. Membership:

- a. Member of National Council of Institute of Cost and Management Accountants of Pakistan (2008)
- b. Member ICMAP Research and Publication Committee since 1999.
- c. Member ICAP Public Sector Committee since January 2014.
- d. Member Company Law Review Commission since 2013. Also remained member of Company Law Review Committee in 2002.
- e. Remained member of Task Force on Corporate Governance in PSEs.

9. Publication:-

- a. Practical Approach to Companies Ordinance, 1984;

IMTIAZ HAIDER

Address: House No. 15 Street # 62, Sector 13/2, Islamabad -PAKISTAN

Mob: (+92-300) 555-4399

Email: haider.imtiaz@gmail.com

Linkedin:

PROFESSIONAL PROFILE

- Business graduate having law degree with 25 years diversified management experience in Capital Markets – Policy, Regulation and Operations, Education, Real Estate Investment Trust, Social Housing, Mutual Funds, Project Management, Business Development and working with International Development Agencies
- Served as Director on the Board of Pakistan Mercantile Exchange Limited, Central Depository Company of Pakistan, Institute of Capital Markets in Pakistan, , National Clearing Company of Pakistan & JCR-VIS Credit Rating Company.
- Qualified in professional, leadership and career development trainings from domestic and international institutions. Contributing towards training and teaching related initiatives with the objective of discharging duty to the society.

| <u>AREAS OF EXPERTISE</u> | |
|---|--|
| • Strategic Planning & Policy Making | • Project Management |
| • Corporate Finance | • Financial Management |
| • Corporate Governance | • Non-Banking Finance Companies |
| • Business Development & Investment Banking | • Regulatory Compliance, Enforcement and Risk Management |
| • General Administrative roles | • Training & Education |
| • Interaction and coordination with donor and government agencies | • Investor Education & awareness |
| • Investor, Industry and Government Relations | • Human Resource Management |
| • Public Private Partnership (PPP) | • Collective Investment Scheme |

PROFESSIONAL EXPERIENCE

Dec-2019 - Todate

Chief Corporate & Capital Market Consultant
Nazir Shaheen and Associates

Providing legal, corporate & capital market advisory

Apr-2017–Mar 2018

National Senior Monitoring & Evaluation Specialist
Asian Development Bank – Pakistan Resident Mission, Islamabad.

Responsibilities include review / input on PPP Policy of Sindh province, Proposing amendments to the PPP Act, Updating Sindh Public Procurement Rules (SPPRA), Setting up of a periodic reporting system

for consultants & Sindh Finance Department (SFD) based on project timelines and deliverables, Consultants' outputs monitoring, coordination and creating liaison among all stakeholders, Maintaining account of disbursement and procurement projections, financial reporting and forecasting and identifying risks for program delivery.

Feb 2017–Feb 2018

Advisor – Business Development

Atlas Asset Management Company Limited, Islamabad.

Responsibilities included business development and access to Retail & Corporate markets, updating the Board and management for changing investment climate, service standards and technical aspects, Monitoring compliance to the regulatory regime, Business development strategy implementation, Identifying new business partners and serving the existing and prospective businesses, Relationship management with government agencies, regulators and industry leaders.

Jun 2015 - Jun 2016

Chief Executive Officer

Punjab Land Development Company Limited, Lahore.

Assignment included operational, executive, financial, accounting, general management, human resources, administrative, marketing & project management functions, Designing new products, Developing and establishing industrial and commercial zones. Contracted a project in PPP mode.

Sep 2014 –Jun 2015

Director General

Hamdard University, Karachi

Assignment included Development & implementation of policies w.r.t. educational quality & standards, Operations and financing, Organizational culture, Human resource management, Communications and public relations. Worked closely with Board of Governors for maintaining liaison with Higher Education Commission (HEC), Federal and Provincial Governments and other stakeholders, Collaborating with other entities of Hamdard Foundation, Planning & co-ordination for oversight of academic structure and organization of the University.

Aug 2011-Aug 2014

Commissioner

Securities and Exchange Commission of Pakistan, Islamabad.

Being Head of Capital Markets, and later as Non-Banking Finance Companies, responsibilities included monitoring, regulating, and developing the securities market and NBFC sectors by instituting appropriate regulatory reforms to develop and promote the market, engender investor confidence and instill transparency, effective risk management and good governance in the relevant sectors.

Feb 2010–Aug 2011

Managing Director

Islamabad Stock Exchange, Islamabad

Responsibilities included monitoring the overall regulatory, operational and administrative activities of the exchange for ensuring orderly functioning of the market place through oversight overtrading, compliance and enforcement functions. successfully turnaround organization through financial

restructuring. ISE Towers 22 Story building was made Operational, Marketed and Maintained.

Aug 2007- Jan 2010 **Chief Executive Officer**
AKD REIT Management Company, Karachi

Established first REIT Management Company in Pakistan and major responsibilities included preparing Formation documents, marketing plans, project execution methodology, competition issues, REITS benefits for investors and Pakistan, value addition by REIT scheme, trust deeds, management plans, feasibility report, business plan were part of responsibilities.

Mar 2001–Jul 2007 **Executive Director**
Securities Market Division- Securities and Exchange Commission of Pakistan

Assignment included Regulation & operations of securities market, monitoring and supervision of the trading activities, clearing and settlement, risk management and surveillance of the exchanges, developing and implementing regulatory policy for capital markets by introducing appropriate regulatory reforms to deepen & widen the market, engender investors' confidence and achieve transparency, effective risk management and good governance.

Jul 1999 – Feb 2001 **Head of Corporate Governance**
National Investment Trust Ltd., Karachi

Responsibilities included contesting elections for Board of Directors of listed companies where NIT had equity investment, Preparing research reports based on financial analysis of listed companies for investments and SWOT analysis to pierce into the affairs of the companies and advise the respective divisions accordingly

Feb 1994 –Jan 1999 **Incharge - Chairman & Assistant Professor**
Department of Management Sciences, Islamia University, Bahawalpur

Established the Department offering MBA Program, designed curriculum, furnished computer labs., set up library to meet the technological and informational needs of the students, hired faculty and started the department from scratch. Initiated faculty exchange program with IBA Karachi

Nov 1989–Jan 1994 **Assistant Chief Manager**
Finance & Investment Division National Investment Trust Ltd

Responsibilities included Appraisal of projects for investments and monitoring of investment by NIT, Maintenance of Trust Fund Accounts, Reconciliation of trust accounts, Maintenance of NIT portfolio and Supervision of new listings.

PROFESSIONAL REFERENCES

To be provided whenever desired

Munawar-Us-Salam (Legal Expert)

- **Personal**

| | |
|---------------|-------------------|
| Name | Munawar-Us-Salam |
| Date of Birth | 09 September 1976 |

- **Professional Qualifications / Certifications**

| Qualification | Institute | Year |
|-----------------------|--|------|
| Bar Vocational Course | Inns of Courts School of Law, London | 1999 |
| LL.B.(Hons) degree | School of Oriental and African Studies, London | 1998 |

- **Professional Experience**

| Company | Title/Role | From | To |
|--|----------------|------|------|
| Cornelius, Lane & Mufti (CLM) Advocates & Solicitors, Lahore, Pakistan | Senior Partner | 2006 | date |

- **Relevant Experience**

| Client Company / Project Title | Position Title & Brief Nature of Assignment | From | To |
|--|--|------|---------|
| Punjab Power Project, Jhang (1263 MW RLNG-based plant) | Team Leader of the Legal Team | 2020 | 2021 |
| CPPA-G | Legal representation in arbitration proceedings pertaining to power purchase agreement disputes | 2020 | 2021 |
| Lahore Matiari Transmission project | Team Leader of the Legal Team | 2016 | 2019 |
| DISCOs /NTDC/NEPRA | Representation of various licensees in tariff / review proceedings before NEPRA | 2010 | 2021 |
| National Power Parks Management (Pvt.) Limited, a Government of Punjab | Legal advisory services to National Power Parks Management (Pvt.) Limited, a Government of Punjab owned company. | 2019 | To date |

| | | | |
|------------------|---|------|------|
| NTDC / CPPA-G | Legal advisor to the Power Purchaser in respect of a Tripartite Power Procurement Agreement with Karachi Electric Supply Company (KESC) for the supply of 650 MW. | 2014 | 2015 |
| USAID - PDP | Team leader of the team subcontracted with respect to the project to carry out legal and regulatory due diligence of the DISCOs for their transition from Governmentowned entities to private management. Carried out extensive and detailed due diligence of the entire distribution sector. | 2014 | 2015 |
| USAID - PDP | Team Leader for the team contracted to review the relevant policies and related documents, and to draft an appropriate agreement between CPPAG and DISCOs, keeping in view the developing and proposed structure of the power sector in Pakistan. | 2014 | 2015 |
| USAID - PDP | Team Leader for the team contracted to review existing drafts for transfer, and draft, a business transfer agreement between NTDC and CPPA-G. | 2014 | 2015 |
| NTDC | Represented NTDC in its disputes with respect to acquisition of land for its activities. | 2010 | 2021 |
| Multiple Clients | Various advisories and representations, including government institutions, foreign investors, local and foreign companies, inside as well as outside the energy sector | 2006 | 2021 |

• **Any other information**

Languages:

English (Excellent reading, speaking and writing)

Urdu (Mother tongue; excellent reading, speaking and writing)

SUMMARY OF PROFESSIONAL EXPERIENCE

I, Abid Latif Lodhi, possess a **diversified professional experience, spanning over 30 years in power and water utilities sector, in private and public sectors of Pakistan and abroad**. I possess hands on experience concerning policy, regulations, competitive market development, privatization, strategic corporate planning, organization restructuring, corporate performance, pricing, finance and accounting, fund management, taxation matters, ERP implementation, developing of tariff and financial models both for annual and multiyear tariff, project implementation and leading diverse and large teams.

Currently, I have been working as **Energy Lead Consultant** of AMA Energy Services which providing wide range of consulting services in Energy Sector, especially in power sector, of Pakistan. Engaged in various market reform, policy and financial management related tasks including support for preparation of National Energy Plan. Carried out various tasks relating to USAID Sustainable Energy of Pakistan (SEP) program and World Bank respectively.

I have served as **Chief Executive Officer** in Electricity Market Operator of Pakistan with notable achievements being the turn around of Market Operator of Pakistan as a separate entity from being the department of Transmission Network Utility, policy formulations, regulatory framework improvement, ERP oriented process automation and its integration with Market Participants and Service providers, Mid-Term Planning and Pricing Forecast Model and the development of competitive market model.

Before joining CPPA-G, I was working as **Team Lead Finance / Policy, Governance, and Privatization / Regulation** at International Resource Group for a project funded by USAID.

I have also worked at **NEPRA (Electricity Regulatory body of Pakistan)** and was instrumental in finalizing the first tariff determination of all Distribution Companies (DISCOs), National Transmission and Dispatch Company (NTDC), Water and Power Development Authority (WAPDA) Hydel and Generation Companies (GENCOs) including the multiyear tariff of K-Electric (the vertically integrated utility).

I have assisted **Ministry of Water and Power (MoWP)** for preparation of Multiyear Tariff applications of two DISCOs for the purposes of privatization, preparation of five years integrated generation, transmission and distribution plans including assistance to NEPRA (the Regulator) for drafting the Tariff Guidelines (Procedure and methodology) for determination of consumer end tariff 2015 and preparation of standard formats for distribution integrated investment plan.

During my tenure in Lahore Electric Supply Company (**LESCO**), as **Chief Financial Officer** and being head of finance, my major accomplishments were implementation of ERP financial, treasury management and timely completion of financial statements of company and getting its price determined by the regulator.

Before joining LESCO, I have served as **Head / Specialist Tariff and Regulatory Affairs** at Power & Water Utility Company (MARAFIQ), **Saudi Arabia** where I developed and recommended tariff and regulatory framework for the multi-utilities environment, prepared and presented tariff filings/ reviews for these multi utilities to the satisfaction of the regulator and carried out cost of service studies and worked out tariffs for utilities services for Jubail and Yanbu Industrial Cities; electricity, sea-water for cooling, desalination & process water and waste water management services.

Moreover, I have authored **two books with one on costing and tariff setting in Pakistan** and other on **Future Wholesales Market in Pakistan** that enlightened the professionals who intend to excel in the power sector.

DETAILS OF PROFESSIONAL EXPERIENCE

Energy Lead Consultant

(June 2020- to date)

AMA Energy Services

Being Energy Lead Consultant, my major role is to provide leadership to the company in-terms of communicating and implementing the strategic targets of the company, providing resources to meet those targets, and playing the role mentor for employees.

AMA Energy is providing full range of the services in the energy sector specially in power sector, covering financial, legal, regulatory, tariff setting, wholesales market development including the interface of retail market with the wholesales market, dealing with licensing matters of transmission, distribution and generation sectors, writing reports on various issues of the energy sector, carry out analysis on specific areas of energy sector etc.

My role is also to ensure the quality of work to be produced by employees working on various assignments with private and public sector entities by reviewing their work. Additionally, I am also carrying out various assignments directly as consultant with USAID Sustainable Energy of Pakistan (SEP) program, World Bank on various tasks such as preparation of commercial code, financial health assessments of DISCO for transition to market reform, financial management assessment of four distribution companies and providing support to government for preparation of National Energy Plan and other institutional reform including the development of strategy for private participation in the distribution sector of Pakistan etc.

Chief Executive Officer

(March 2016-June 2020)

The Electricity Market Operator of Pakistan - Central Power Purchasing Agency (Guarantee)

Being Chief Executive Officer of CPPA G, my major role was to provide leadership to the company in-terms of communicating the vision, setting the strategic targets for the company, providing resources to meet those targets, championing the culture change in company and playing the role mentor for the CPPA family. I also serving as interface between the board and the employees, advises board on strategic and operational issues and formulates policies and recommendations to the board.

The major role also includes transformation of the existing single-buyer market regime into the competitive wholesale market. During this transition phase, the responsibilities includes continuous guidance aimed at not only proposing the design of the competitive wholesale market but also on other capacity building interventions associated with implementation of market reforms.

The other portfolio of responsibilities includes the operations of the organization including the procurement of electric power, management of cash flow, treasury management and other relevant banking functions for the purposes of collection and disbursement as per the Commercial Code, issues pertaining to the external relations of the organization and representation of CPPA-G in regulatory proceedings and other public platforms.

Key Achievements as CEO CPPA-G (March 2016 to June 2020):

Power Procurements as Principle Buyer & Wholesale Power Market

- Negotiating and signing of following Agreements for power procurement on behalf of DISCO pursuant to the Power Procurement & Agency Agreement with the DISCOs:

- a. Seven Wind Power Plants Energy Purchase Agreements (EPAs) & Seven Direct Agreements (DA) having cumulative capacity of **347.505 MW**.
 - b. Two EPA & one DA of Solar Power Plant having cumulative capacity of **30 MW**.
 - c. Four EPAs of Bagasse based co-generation power plants with cumulative capacity of **131.4 MW**.
 - d. Twelve PPAs of Thermal Power plants having cumulative capacity of 7,344 **MW**.
 - e. PPA of Hydel with capacity of 147 **MW**.
- Management of Testing & Commissioning activities of the Generation and interconnection facilities as stipulated in the PPA/EPA and attainment of Commercial Operations of the generation complexes.
 - Developed the **Competitive Power Market Model** for Electricity Wholesale Market of Pakistan along with the transition plan.
 - Established strategic alliance and **partnerships** with Market Operator of Turkey (**EXIST**), the European Power Exchange (EPEXSPOT) and a Leading University in Pakistan LUMS for cooperation in electricity market development.
 - Attained the membership of Association of Power Exchanges (**APEx**) and participated in global events organized by APEx.
 - Facilitated formation of Market Development Team within CPPA and Electricity Market Team (EMT) with members from NEPRA, MoE, System Operator, Transmission Network Operator, Distribution Network Operator including the retail supply, K-Electric, and local universities for (a) building their capacities and (b) for implementation of the identified actions under transition plan.
 - Preparation of comprehensive report on the detailed designing of the Wholesale Competitive Market Model, which is the proposed market model for Pakistan.
 - As part of consultation process, organized over 10 workshops, three international exchanges and numerous training sessions for NEPRA, SECP, System Operator, and CPPA etc.
 - Development of the 3-Year Strategic Plan for CPPA encompassing the Vision, Mission and Strategic Targets for CPPA-G. Operationalization of the core values for CPPA-G and their propagation among staff to improve corporate culture and behavior.

Forecasting and Market Simulations

- Development of advance Market Simulation Model with generation, transmission and load data by nodes populated in the model and capable of projecting wholesales basket price with and without transmission constraints for short term and medium term horizon.
- Assistance in Preparation of Least Cost Generation Plan for NTDC.
- Preparation of Energy and Demand forecasts based on bottom-up and top-down methods for NTDC and DISCOs.

Information Technology

- Successful completion and implementation of ERP System Phase-I that resulted in automating most of the business of CPPA including the financial verification of invoices of Power Producers, Billing to DISCOs, Treasury Management, Assets Management, Agency Operations, and other financial processes as well as the automation of the core HR functions.
- Successful completion and implementation of ERP System Phase-II with a wide scope of automation covering all the remaining business processes with backward integration

with all the power producers in Pakistan and forward integration with distribution companies of Pakistan.

- Design and building the **System for Settlement** module in Oracle platform. This system of settlement will help in automating the billing and settlement process and will be integrated with Network Operator's AMR metering system for wholesale market and instruction sets coming out from SCADA system at the System Operator.
- Successful completion and implementation of a central data exchange portal using the state-of-the-art web, portal, and other middleware technologies for the benefit of the whole power sector.

Legal, Policy and Regulatory

- Lead in preparing National Electricity Policy (NEP) complete draft for the power sector of Pakistan.
- Issuance of Guidelines for Power Procurement by CPPA-G under Legal and Regulatory Framework and submitted concept paper to NEPRA for devising mechanism for the determination of uniform end consumer tariff, in wake of amended NEPRA Act
- Amendments in the Power Purchase Agreements (PPAs) into (a) the tripartite agreements for the transition period till the commencement of competitive wholesale market
- Represented CPPA during the arbitration proceedings at London Court of International Arbitration (LCIA) and provided necessary inputs to the Counsel on the cases
- Lead the preparation of draft new Commercial Code to address the deficiencies of existing code and align it with the proposed market model
- Active Participation in Grid Code Review Panel meetings for continuous up gradation of Grid Code Amendment
- Advocating Competitive Bidding regime in NEPRA for Wind and Solar Power Plants and accordingly coordination with Federal/Provisional Agencies for preparation of RFP for competitive bidding of Wind & Solar generations etc.
- Provided inputs on various power Sector issues to NEPRA, Ministry of Energy, Power Division & DISCOs

Settlements and Treasury Management

- Management of treasury for settlement among the market participants representing demand and offer over Rs. 1500 billion annually.
- Manage periodically the submission & approval of Market Operation Fee and timely approved the capital and operating budgets.
- Preparation of Financial Statement for FY 2015-16 and completion of statutory audit of the financial statements.

HR & Change Management

- Establishment and operationalization of CPPA-G office in Islamabad after relocating it from Lahore
- Development and implementation of Human Resource Policy Manual of CPPA-G duly approved by the CPPA-G Board of Directors
- Built a new corporate **culture** based on the new core corporate values (a) Transparency, (b) Excellence, (c) Teamwork and (d) Being-respectful. This new culture and induction of professionals from the market formed the platform for all achievement made at CPPA.

- Completed the Organizational Restructuring, which involves face lifting of the CPPA through adequate staffing, automation and business process re-engineering. Currently, working on the next phase of restructuring process, which includes mainly the bifurcation of CPPA into two separate companies, i.e. operator of competitive wholesale market and special purpose supplier for dealing with the existing contracts.

Partner RASIKH CONSILIUM / (2015-2016)
Lead Consultant Financial, Policy and Regulation

Key Achievements:

- Drafting and working of 1st tariff application for the determination of Market Fee for Market operator of Pakistan.
- Preparation of RFP for hiring of a firm for the implementation of ERP.
- Provided technical assistance for the preparation of the template for the Connection Agreement between NTDC and existing public sector GENCOs, new Generation Company and the existing distribution companies (DISCO) and also the Connection Agreement between DISCOs and bulk power consumers.
- Preparation of review motion for the review of tariff by NEPRA for Lakhra Power Generation Company.

International Resources Group (IRG), Washington, DC (2013-2015)
Team Lead Policy, Governance, Privatization and Financial Management – USAID PDP

Key Achievements:

- Successfully completed the **sector level Legal and Regulatory Due Diligence** assessments and reports for the Privatization of Public Sector Distribution as well as Generation Companies;
- Developed **guidelines of tariff methodology** and process for the distribution companies of Pakistan's power sector for preparation of annual and multi-year tariff case.
- Lead the effort of uplifting the CPPA as independent power purchaser of the single-buyer market of Pakistan, and accordingly was actively engaged in **operationalizing the Independent Central Power Purchasing Agency** Guarantee Limited, which was the most required step towards one of the most anticipated reform in the power sector of Pakistan for the development of the competitive wholesale market. Preparation of the following key documents:
 - o Business Transfer Agreement,
 - o Power Procurement Agency Agreement,
 - o Market Operator Registration, Standards and Procedures rules and
 - o Commercial Code for settlements of market transition.
- Lead the activity for the documentation of existing **Standard Operating Procedures (SOPs) in support of the Commercial Code**.
- In addition to above, assisted Ministry of Water and Power (MOWP) for amendments of corporate documents and prepared various essential documents required for obtaining the approval of GOP for reforms related to CPPA.
- Assisted Regulator (NEPRA) in the **matter for review and approval of Market Operator registration, standards and procedure Rules and Commercial Code**,
- Prepared **draft of tariff and subsidy policy** for the power sector,

- Lead the activities for the **preparation of five years Integrated Generation, Transmission and Distribution Expansion plan and investment plan in light of National Power Policy 2013.**
- Facilitated NEPRA team for the preparation of the process for approval of integrated generation, transmission and distribution expansion plan and the investment plan submitted by distribution companies
- Developed the mechanism for forward-looking fuel price adjustment and develop spreadsheet model for uniform tariff for Pakistan keeping in view the target subsidy for various classes of customers.
- Lead the **implementation of ERP in two distribution companies** of Pakistan and developed an ERP documentation manual, and provided technical assistant for ERP RFP preparation.
- **Revised, redrafted and updated legacy accounting and internal audit manuals** for all of the distribution power companies of Pakistan, implemented an internal audit co-sourcing arrangement with an external third party, and trained DISCO internal audit staff on the risk-based audit approach as defined in COSO framework.
- **Developed a 10 Year Financial Forecast Model** for nine distribution companies of Pakistan for its utilization towards business planning, budgeting, tariff determination filing and long range financial forecasting of the company.

Lahore Electric Supply Company (LESCO), Lahore, Pakistan
Chief Financial Officer (CFO)

(2008 - 2012)

Being the head of the finance department, I was responsible for managing the entire financial activities of LESCO including budgeting, accounting, cash management, business planning, treasury/fund management, payments, tariff and regulatory activities and taxation matters.

Key Achievements:

- **Timely completed the statutory audit and presentation of audited financial statements** BOD and Shareholders.
- Drafted rate case / tariff applications and presented to the Board of Directors and NEPRA.
- Timely preparation and approval of **Operating and Capital Budget** from LESCO's BODs and development of five year's business plan.
- Preparation of Power Purchase Agreements (PPAs) for purchase of power from distributed generators.
- Assisted GOP in various financial, power sector related matters, dealing with Asian Development Bank (ADB), World Bank (WB), commercial banks and USAID PDIP projects including online processing of withdrawal application of loan through World Bank client connection facility.
- Successfully implemented ERP system in LESCO in all business process being member of steering committee of BOD.
- Successfully implemented Oracle ERP financial and actively participated in the process of integration of Oracle Financials with Oracle Human Resource Management (HRM) and billing module i.e. Customer Billing and Information System.
- Effective treasury management and efficient placement of transitional funds resultantly increasing profit around three times.
- Actively involved in the scrutiny of all business investment proposals from technical (Smart Metering, SCADA, Loss Reduction, STG etc.) to HR capacity building.

- Briefed various legal counsels on tariff & fuel prices adjustments cases including ligations cases relating to taxation matters and advocated and promoted integrated power planning and energy planning.

Power & Water Utility Company (MARAFIQ), Saudi Arabia

(2004 – 2008)

Head / Specialist Tariff and Regulatory Affairs

Key Achievements:

- Developed and recommended tariff and regulatory framework for the multi-utilities environment, prepared and presented tariff filings/ reviews for these multi utilities to the satisfaction of the regulator and carried out cost of service studies and worked out tariffs for utilities services for Jubail and Yanbu Industrial Cities; electricity, sea-water for cooling, desalination & process water and waste water management services.
- Additionally worked out charges for new connections, reconnection, move-in, move-out, theft/ tampering with meter for all the utilities services
- Worked out tariff for sales and purchase of electricity between MARAFIQ and Saudi Electric Supply Company
- Carried out various analyses for centralized utilities complex for Jubail industrial city and worked separately IRR of each service lines and composite IRR for whole of centralized utilities complex.
- Carried out analysis for Jubail Independent Water and Power Producer (IWPP)
- Prepared and presented five-year first businesses plan.
- Assisted consultants for preparation of process flow charts and business blueprint for the implementation of Business Planning and Simulation (BPS) module of SAP SEM, particularly revenue planning, variable operating expenditure for budgeting and five years business plan.
- Involved in the process of strategy formulation/ review for Marafiq; environmental scanning, internal resource assessment, SWOT analysis, review of mission, objectives, corporate strategies and its translation to strategic objectives along with its cause & effect relationship i.e. strategy map and its ultimate linkage to balance scorecards.
- Developed the initial draft for corporate performance management system and developed Balanced Scorecards at various responsibility levels such as corporate, 08 functional and 40 departmental levels, consistent with the objectives set for corporate strategies
- Coordinated with EYC consultants for carrying out the financial due diligence for 2003, 2004, 2005 and 2006 for the area related to tariff and regulation.

National Electric Power Regulatory Authority (NEPRA)

(2003-2004)

Deputy Director Tariff

Assistance to NEPRA Authority in various activities related to tariff determination; evaluated / examined the tariff / pricing cases for generation, transmission and distribution companies from NEPRA during the maiden determinations on restructured power companies' transfer prices, consumer end rates and tariff structure of Pakistan Power Sector.

Key Achievements:

- Evaluated annual and multiyear rate cases applications and prepare working paper for the consideration of Regulatory Board / Commission of consideration and Decision of the following:
 - o Generation Companies of Pakistan:
 - Hydel Power Generation (WAPDA Power Wing),

- i) Central Power Generation Company (CPGC), ii) Northern Power Generation Company (NPGC) and iii) Jamshoro Power Company (JPC).
- Vertically integrated utility i.e. Karachi Electric Supply Company (KESC)
- National Transmission and Dispatch Company (NTDC),
- Distribution Companies of Pakistan:
 - i) Lahore Electric Supply Company (LESCO), ii) Gujranwala Electric Power Company (GEPCO), iii) Multan Electric Supply Company (MEPCO), iv) Hyderabad Electric Supply Company (HESCO), v) Quetta Electric Supply Company (QESCO), vi) Islamabad Electric Supply Company (IESCO), vii) Peshawar Electric Supply Company (PESCO), viii) Faisalabad Electric Supply Company (FESCO), ix) Sukkur Electric Power Company (SEPCO) and x) Tribal Area Electric Supply Company (TESCO)

National Transmission and Dispatch Company Limited (NTDC)

(2000-2003)

Manager Finance, Corporate Planning and Control

Primary responsibilities included financial management, strategic planning, budgeting and particularly development of tariff & financial models for strategic decision-making and preparation of annual financial accounts and related management reporting schedules and its approval from BODs.

Key Achievements:

- Actively participated in the process for issuance of National Grid Company license to NTDC,
- Preparation of first tariff petition of NTDC as National Grid Company including the mechanism of transfer pricing of pool cost to distribution licensees of Pakistan and its regulatory approval from NEPRA.
- Finalization of invoices & transfer pricing for power sales to distribution companies for period prior to regulatory regime,
- Preparation of TOR for the cost of service study conducted by WAPDA for all segments of generation, transmission and distribution.
- Involved in the preparation of operating and capital expenditure budget and its approval from BODs, and its monthly reporting to the CEO & BODs, and the arrangement and release of funds against the approved budgetary limits for operation & maintenance and development projects.

Water and Power Development Authority (WAPDA)

(1989-2000)

Deputy Director, Corporate Planning and Control

- Preparation of all petitions filed by WAPDA to NEPRA for tariff revisions, on consolidated basis, since the inception of the regulatory body
- Preparation of medium, and long-term financial forecast i.e. income statement, balance sheet and cash flow statement and interacted with representatives of International Financial Institutions such as IBRD, ADB, etc. on WAPDA's financial matters
- Involved in the preparation of operating and capital expenditure budget and its approval from BODs, and its monthly reporting to the CEO & BODs, and the arrangement and release of funds against the approved budgetary limits for operation & maintenance and development projects.

- Involved in the determination of overall and specific cost of production at bus bar and consumer end of all segments (hydro & thermal power generation, power transmission and distribution) of WAPDA, preparation of break-down of electricity tariff for each class of consumers (domestic, commercial, industrial, agricultural and others) for the approval of management and NEPRA, preparation of periodic financial management reports for the authority and Government of Pakistan
- Prepared opening balance sheets of all DISCOs, monthly accounts, operating budget, pre-audit of supplier's bills and payments for centrally procured material like transformers, transmission lines, polls, cables etc. for the entire distribution network of WAPDA
- Involved in the allocation of operating budget to the entire distribution area electricity boards (AEBs) of WAPDA, stock accounts and ledgers and preparation of Loan Disbursement Application for submission to donor agencies.

EDUCATION

CMA Cost & Management Accountant, Lahore, Pakistan (FCMA) – F 891
 B.Com. Bachler in Commerce, University of the Punjab, Lahore, Pakistan

PERSONAL DETAILS

Date of Birth: March 01, 1968 **Marital Status:** Married **Nationality:** Pakistani **Domicile:** Lahore. **Father's Name:** Latif Ahmad Lodhi

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