FFBL POWER COMPANY LIMITED (FPCL)

Phn: +92 51 9272196, Fax: +92 51 9272198-9

Registrar
National Electric Power Regulatory Authority (NEPRA)
NEPRA Tower, Ataturk Avenue (East)
Sector G-5/1, Islamabad

Subject: **Application for a Generation License for FFBL Power Company Limited**

I, Mokarram Mirza, being the duly authorized representative of FFBL Power Company Limited, by virtue of Board Resolution dated 01 October 2014, hereby apply to the National Electric Power Regulatory Authority for the grant of a Generation License to the "FFBL Power Company Limited" pursuant to section 15 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997.

I certify that the documents-in-support attached with this application are prepared and submitted in conformity with the provisions of the National Electric Power Regulatory Authority Licensing (Application and Modification Procedure) Regulations, 1999, and undertake to abide by the terms and provisions of the above said regulations. I further undertake and confirm that the information provided in the attached documents-in-support is true and correct to the best of my knowledge and belief.

A Demand Draft No. 10627833 dated 09 October, 2014, in the sum of Rs. 689,760/- (Rupees Six Hundred Eighty Nine Thousand Seven Hundred And Sixty Only), being the nonrefundable license application fee calculated in accordance with Schedule - II to the National Electric Power Regulatory Authority Licensing (Application and Modification Procedure) Regulations, 1999, is also attached herewith.

Mokarram Mirza
Authorized Representative
FFBL Power Company Limited

Dated: October 14, 2014

FFBL POWER COMPANY LIMITED

73-Harley Street Rawalpindi

RESOLUTION NO. C-07/2014 DATED 01 OCT 2014
PASSEED THROUGH CIRCULATION

"**RESOLVED THAT** the Company shall proceed with all acts necessary to develop an approximately 118MW Coal Power Project at Port Qasim, Karachi, Sindh, Pakistan."

"**FURTHER RESOLVED THAT** each of Mr. Syed Aamir Ahsan, Mr. Mokarram Mirza and Mr. Muhammad Azam has been duly authorized, severally, to file any and all applications for obtaining a Generation License; file any and all Tariff Petitions; submit affidavits or file any other applications or documents to enable the Company to sell electric power to one or more purchasers and undertake associated activities; and make any oral/written representations on behalf of the Company before the National Electric Power Regulatory Authority or any other regulatory body or governmental agency in relation to the Company's approximately 118MW coal power project at Port Qasim, Karachi, Sindh, Pakistan; and undertake any matter(s) necessary or incidental thereto."

CERTIFIED TRUE COPY

Brig Shaukat Yaqub Malik, SI(M), (Retd)
Company Secretary

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PROJECT OVERVIEW

A. BACKGROUND

FFBL Power Company Limited ("FPCL" or the "Company") is an unlisted public limited company incorporated by the Sponsor as a special purpose vehicle in June 2014 for setting up a coal power plant (CPP) capable of generating power at two different frequencies i.e. 50 Hz and 60 Hz, to meet its clients power and operational requirements as under;

(i) Fauji Fertilizer bin Qasim Limited (FFBL) - 60 Hz

(ii) K-Electric (formally known as Karachi Electric Supply Corporation); and/or Bulk power consumers - 50 Hz

The CPP will be located at Port Qasim, Karachi in the province of Sindh, on approximately 50 acres of land within the existing Fauji Fertilizer Bin Qasim (FFBL) Fertilizer Complex on the south side. The Project will be capable of generating 500 Tons Per Hour (TPH) steam through two (02) equal capacity Circulating Fluidized Bed (CFB) high-pressure coal-fired boilers which are a proven technology for efficient burning of wide range of coal. The Installed capacity of the Project shall be 118 MW, of which ~ 52 – 60 MW of power shall be sold to K-Electric.

As per requirements under the NEPRA Act, FPCL is approaching the National Electric Power Regulatory Authority **("NEPRA")** for award of generation license for the Project.

B. SITE

The Project Site is within the existing fertilizer complex of FFBL located in the Eastern Industrial Zone, Bin Qasim, Karachi. Land for the project will be transferred / leased out in the name of FPCL in due course of time. Given the following characteristics, the site meets the essential criteria for the Project.

- In vicinity of local distribution network to sell power to K-Electric.
- Within vicinity of FFBL to sell power to FFBL fertilizer complex.
- Ample Land availability for the Project.
- Availability of water and other utilities in near proximity.
- Suitability for the construction of intake / outfall structures.

- Port Vicinity for equipment and more importantly coal import.
- Road infrastructure.
- Low cost of site development and suitable topographic-geological conditions.
- Minimum socio-economic and environment implications of the Project such as displacements, availability of nearby ash disposal area etc.

The site co-ordinates are 67° 25' longitudes east, 24° 50' latitude north, about 45 km east / south east from Karachi.

C. FUEL

The Project expects to utilize approximately 470,000 MT/annum (for 310 days of operations) of coal (as per required specifications). The Project boiler technology allows use of different quality of coals including imported and indigenous coal. However, at present, the coal is expected to be imported for the project as the Company sees no issues with the availability of quality coal as per required specifications in the international market. Use of indigenous coal as when reliably available can be used. Given the proximity of the Project to the port, the Project expects to utilize either the existing facilities of the Karachi Port Trust (KPT) or the upcoming Pakistan Bulk Terminal facilities for coal receiving and handling. The basic characteristics of the coal required are as follows:

DESIGN CHARACTERISTICS OF REQUIRED COAL	
LHV	4400 ~ 6100 Kcal / Kg
MOISTURE	9 ~ 26 %
ASH	10 ~ 23 %
VOLATILE MATTER	27 ~ 39 %
SULFUR	1 ~ 3 %

The Company is in the process of shortlisting coal suppliers (from Indonesia/South Africa along with possible local suppliers) and once finalized will enter into medium - long term Coal Supply Agreement(s) to ensure reliable on spec fuel availability.

D. INTERCONNECTION WITH GRIDS

A: Interconnection with K-Electric Grid: The location of the proposed power Project is around 0.6 KM from the 132 kV Dhabeji – BOC 132kV transmission line which lies in the system network of K-Electric (formerly known as KESC).

Power will be generated at 11kV / 50 Hz, with rated Power Factor b/w 0.8 lag to 0.9 lead. Evacuation of power from FFBL Power Company Limited to the K-Electric Network will be achieved after step up to 132kV by Looping in-out arrangement in between existing 132 kV Dhabeji – BOC 132 kV single circuit at the FFBL switchyard (132kV Duplicate Bus) via 132 kV line .

FPCL has engaged the services of OMS (Pvt.) Ltd. to carry out Grid Interconnection Studies (Load Flow, Short Circuit & Transient Stability) in order to evaluate interconnection scheme for evacuation of power from FPCL to the K-Electric power system network.

Electrical studies have concluded that K-Electric network has sufficient capacity to evacuate power (Active & Reactive) from FPCL with all generation capacity options without any transmission constraints or any adverse effect on the K-Electric network.

B: Interconnection with FFBL Grid: FPCL 60Hz power grid will be connected with FFBL existing power grid (60 Hz) through two (02) parallel equal capacity interconnecting feeders.

FPCL has engaged the services of IEG Slovakia to carry out FFBL-FPCL Grid Interconnection required electrical studies.

Note: Both 50 Hz and 60 Hz electrical grids will be independent and isolated as separate Steam Turbine Generators are used to produce power at two different frequencies.

E. ENVIRONMENTAL AND SOCIAL IMPACT

The development of CPP will reduce dependence on gaseous and liquid fuels for thermal power generation and increase diversity in Pakistan's electricity generation mix.

FPCL has carried out a detailed Environmental Impact Assessment Study ("EIA Study") through M/S Hagler Baily in accordance with the standards and requirements of the World Bank / International Finance Corporation and National Environmental Quality Standards. EIA Study was submitted to the Sindh Environmental Protection Agency ("SEPA") for its approval. Public and Technical hearing was conducted by SEPA and NOC from SEPA was granted to the Project in September 2014.

The EIA refers to an Environmental Management Plan ("EMP") prepared for Effective implementation and management of mitigation measures, wherein a delivery mechanism is provided to address potential impacts of project activities, to enhance Project benefits

and to introduce standards of good practice in all Project activities. The EMP has been prepared with the following objectives:

- Defining legislative requirements, guidelines and best industry practices & standards that apply to the Project;
- Defining monitoring / mitigation plan required for avoiding or minimizing potential impacts:
- Defining roles and responsibilities of the Project proponent and the contractor;
- Defining requirements for environmental monitoring and reporting;
- Defining the mechanism with which training will be provided to the Project personnel.

The Project entails construction of new coal-based boilers and steam turbine generators (STGs) to replace existing natural gas-based boilers and gas turbines. This will have positive impacts on the socio-economic environment through direct and in-direct employment generation and increased business opportunities. The continuation of existing FFBL fertilizer plant operation using coal-based power will be beneficial to the fertilizer company through stability of production, and, to the country as a whole through the reduction in dependence on dwindling natural gas supply as fuel and stability of the agricultural sector of the economy through consistent supply of fertilizers.

The Project will be equipped with the following systems and equipment in order to meet the requirements and to comply with the emission limits as imposed by the environmental regulations:

- Low NOx generation due to use of CFB boiler technology
- Desulfurization inside the CFB boilers (SOx reduction)
- Bag house for de-dusting (for dust removal)
- A common stack including two ducts (one duct per unit)
- Emission monitoring system at each duct of each boiler.

The main fuel for the Project is coal. The possibility of using both imported and local coals and its impact are also assessed. Limestone will be supplied by local market and will be used as sorbent to capture the SO_2 in the bed of the CFB boiler. The Project emissions shall comply with the local NEQS standards and World Bank guide lines.

Environmental sensitivities and impacts, as well as the associated mitigation plan have been addressed in the EMP / EIA study. Further, FPCL will ensure that the Project staff will be adequately trained in Health, Safety and Environment sensitivities and operational management procedures, so that all levels of staff effectively contribute to impact prevention and mitigation at all times.

The Project is expected to generate significant local job opportunities both during the construction phase and operation phase which will be filled by Pakistani nationals. It is also expected that part of the available unskilled jobs will be provided to the locals belonging to the vicinity of Project area (as the latter do not have the required education or skill for the skilled or semi-skilled jobs for the Project).

Fauji Group has a number of on-going community development programs with an objective of a literate and functional community, skilled and employed youth, empowered women, health and hygiene awareness and self-reliance through targeting following areas.

- Social Mobilization
- Health
- Education
- Environmental Sustainability
- Economic Development

F. PLANT CHARACTERISTICS & TECHNOLOGICAL CONFIGURATION

The Plant configuration consists of 2 x 250 TPH, 92 bar and 515°C high pressure/temperature Circulating Fluidized Bed (CFB) boilers that are being procured from Hyundai Heavy Industries (HHI) – Korea following a recently executed contract. CFB Technology for boilers is being employed due to its ability to provide improved thermal efficiency and its excellent ability to burn a wide range of coals from international to local as well as bituminous to sub-bituminous coal through the same boiler.

Boilers have proven technology with following main features;

- Elimination of separate De Sox system requirement as desulphurization take place within boiler
- Low NOx generation due to boiler operation at low temperature i.e. 850 – 900 °C

- Low Furnace Temperature
- Good Turn Down Factor (40 to 100 % Operation)
- No Ash Slagging
- Simple Bottom Ash Removal System

The Company has shortlisted world renowned companies like Siemens, Alstom, Elliott and General Electric as the potential suppliers for supply of two (02 x 24 MW) condensing steam turbine generators (STGs) and one (01 x 10 MW) back pressure STG for captive power use at 60 Hz as well as one (01 x 60 MW) condensing STG for power export to K-Electric / Bulk Power Consumers at 50 Hz. Currently bids evaluation is in progress and the contract is expected to be awarded in October 2014.

Other key components of the Project include:

- Coal Handling Plant of 200 TPH capacity with efficient and highly reliable operation (Based on international brand equipment)
- Sorbent (Limestone) Handling Plant of 50 TPH capacity (Based on International brand equipment)
- Mechanically Induced Draft Cooling Water System with 18,000 TPH Circulation Rate (European / USA)
- Condensate and Boiler Feed Water/ Pumping System to meet 500 TPH Steam Production Rate (Korean / Japanese / Europe/ USA)
- Highly Reliable Ash Handling System (European)
- Civil Works including Equipment Foundations, Control Room, Buildings , Roads and Stack thru Local Civil Contractor
- Local and remote Instrumentation (European / USA / Japanese)
- Plant Control and Safety System (ABB / Invensys / Honeywell / Yokogawa / Siemens / Allen Bradley etc.)
- Electrical Equipment & Devices (European / USA / Japanese / Korean)
- Compressed Air and Emergency Diesel Generator System (USA / European)
- 132 KV Grid interconnection facilities to export power to K-Electric

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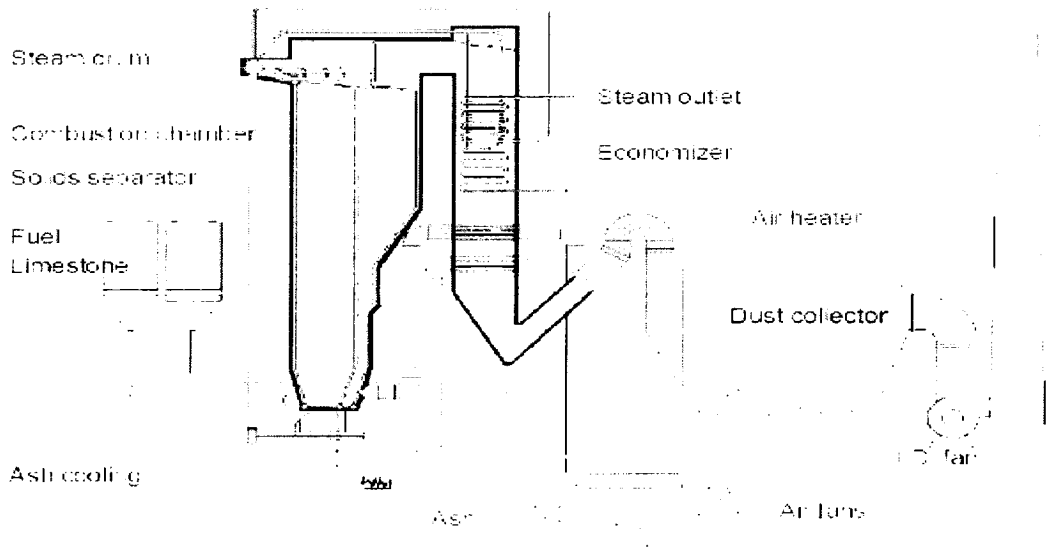
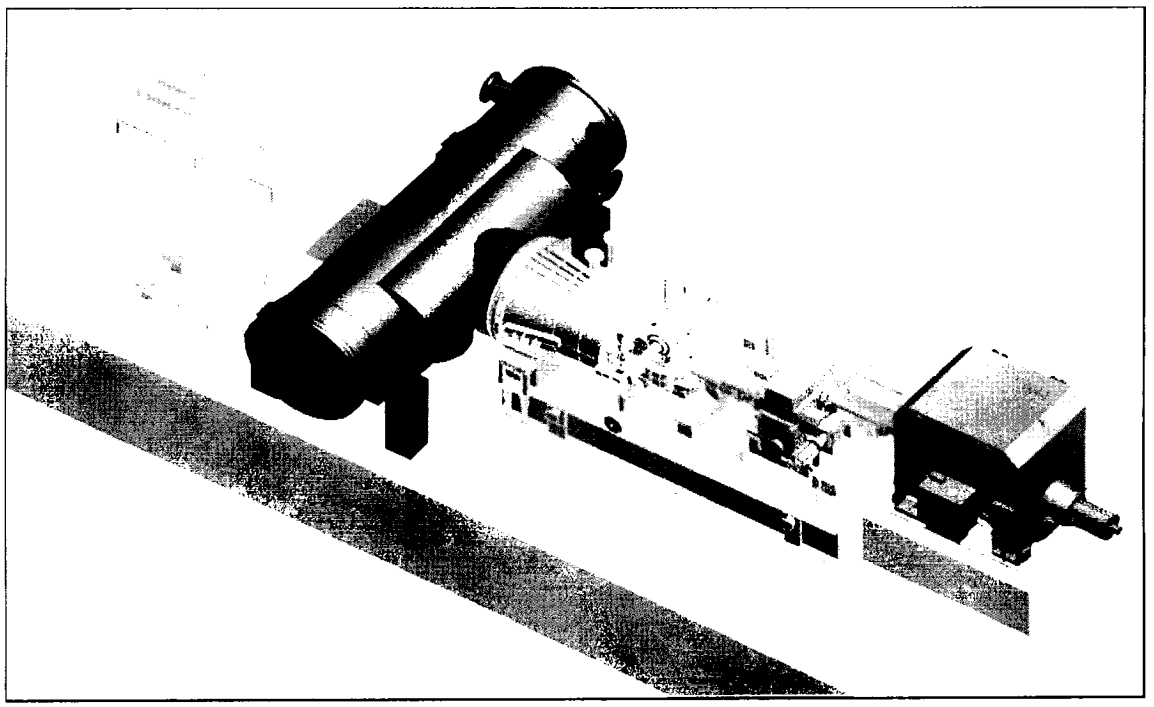
The Project will primarily be based on well proven European/ US / Korean / Japanese Technology.

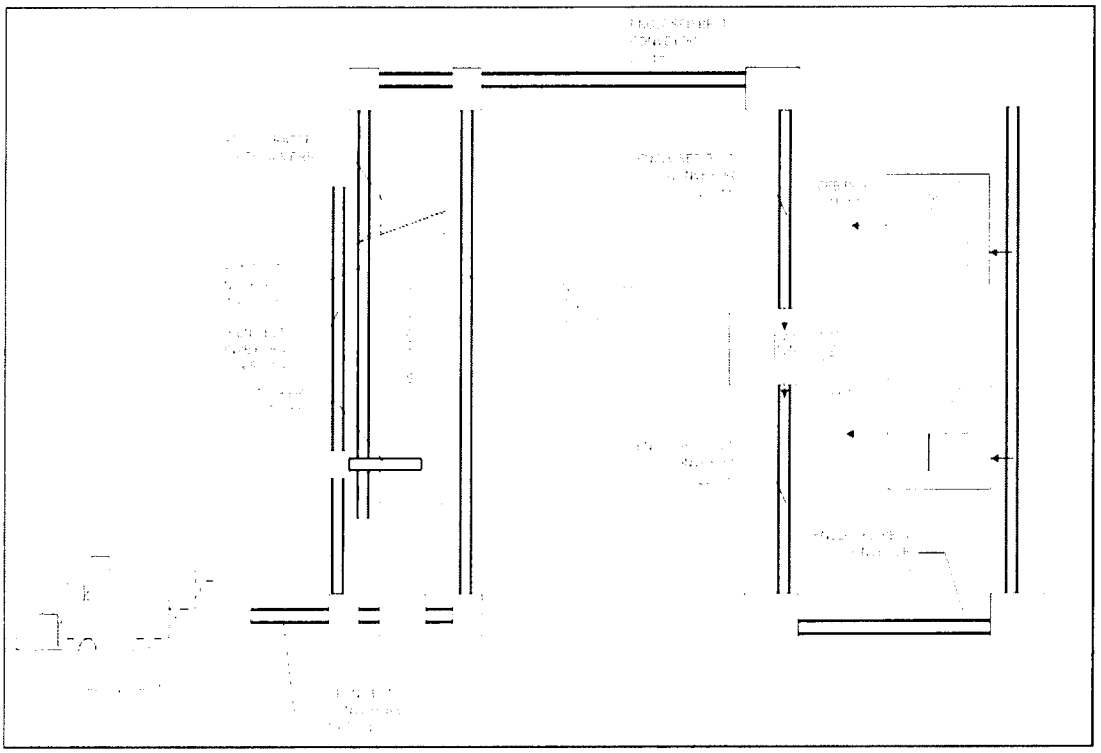
Main Components of the Circulating Fluidized Bed Boiler



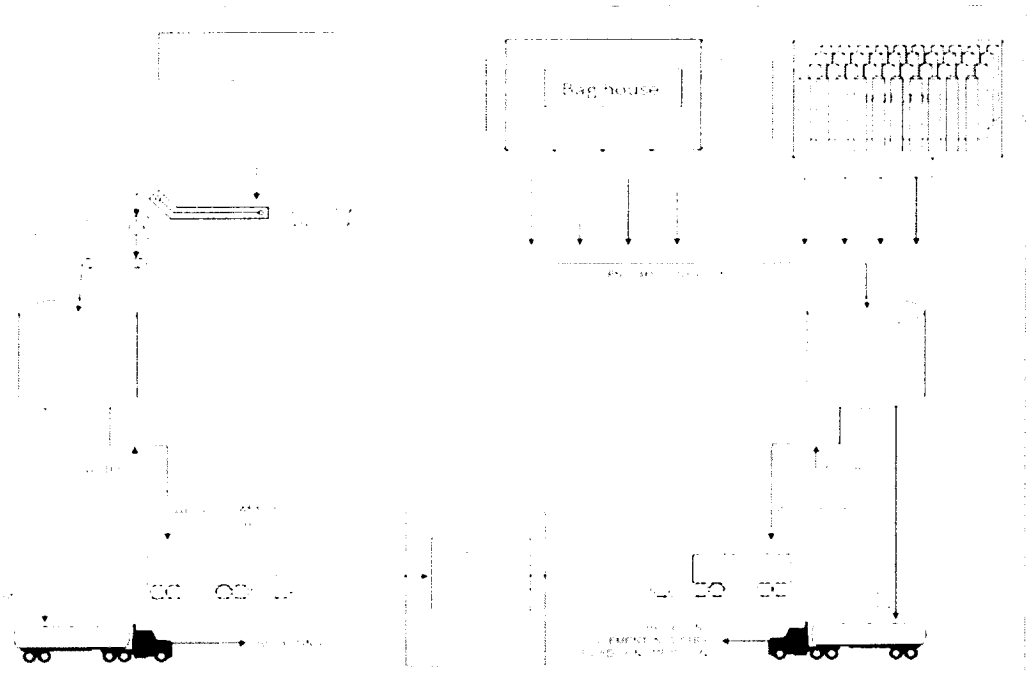
Main Components of Steam Turbine Generators



Main Components of Coal Handling System



Main Components of Ash Handling System



G. OVERALL PLANT AND ENERGY BALANCE:

Each unit will be designed, manufactured, installed and commissioned as per internationally accepted practices and standards. The Project's estimated key performance data and energy balance is set out below:

Power Installed Capacity	118 MW
Installed FFBL Power Capacity at 60 Hz	58 MW; for FFBL and Auxiliary power consumption
K-Electric/Bulk Power Consumers at 50 Hz	60 MW
Days Operation	310
Net Plant Efficiency %	29.2

H. IMPLEMENTATION & OPERATIONAL STRATEGY

The Project shall be implemented and managed by FFBL Team working for FPCL on multi-package approach through its experienced Project team. The Project team has diversified experience of managing similar multi package projects like Balancing Modernization and Revamping of Ammonia & DAP Plants (120 Million USD) along with joint venture Sulphuric and Phos Acid Project in Morocco (240 Million USD). FPCL has also engaged European based international Engineering Company M/s Istroenergo Group, Slovakia for the complete Project implementation phase, which is responsible for the Overall Detail Engineering, Integration, Technical Tender Documents preparation & evaluation, project scheduling and comprehensive site supervision services thru its experts during erection, commissioning and performance testing. In this regard, the initial pre-feasibility was carried by FFBL team and after its internal approval the conceptual and basic design study was carried out by M/s Tractabel Engineering, Belgium. The Project design, configuration, boiler technology and other key features were finalized during the conceptual study.

The operations & maintenance ("O&M") of the Plant will be carried out by the existing FFBL team which will be augmented by further hiring of relevant power sector personnel or through engagement of an O&M Contractor. FFBL currently operates a Natural Gas based power & steam generation facility which comprising of two gas turbines with an ISO rating of 26.2 MW along with three (3) natural gas fired boilers with a combined steam generation of capacity 300 TPH, a water treatment plant, a boiler feed-water system and a

large industrial scale cooling water system as part of its fertilizer complex, which provides it the necessary expertise to operate the Plant. FFBL's existing experienced manpower in Project Engineering, operations, maintenance, supply chain and Finance will be deputed for FPCL which will be supplemented by the engagement / hiring of experienced relevant power sector personnel from the market.

Proper training of the O&M personnel will be ensured thru both onsite & off site training arrangements in coordination with package suppliers. The Company is also considering entering into long term service agreements with key equipment suppliers, subject to such arrangements being financially feasible.

I. TRAINING AND DEVELOPMENT

As per the multi-package Contract (s) it will be the OEM's responsibility to provide customized operation and maintenance training to Employer's personnel. Such trainings include class room as well as On Job Training (OJT). During commissioning and start-up period, vendor specific training will be provided on-site to the Employer's personnel for specified specialist skill for the operation and maintenance of the plant machinery and equipment.

For sustainable optimized performance, FPCL strongly believes in allocating budget for the training and development of the Employees on an ongoing basis. Moreover, FFBL has its own technical training centers and a Training Need Analysis (TNA) based program which determines the training needs and provides training to its employees. This will be utilized for the training of FPCL personnel's. The program has cross-functional trainings for the availability of multi skilled people. In order to upgrade the technical capabilities, different national and international certification programs are offered to FPCL employees.

J. SAFETY

Fauji Group operates in all parts of its organizational functionalities keeping safety as its top priority. Therefore the CPP being a core Project of Fauji Group will adopt relevant guidelines to ensure safety of men and material deployed at plant site. Fauji as a group strives to ensure that the community works in a healthy, safe and environmental friendly atmosphere. For this reason the company has designed its values and behaviors amongst which Health, Safety and Environment (HSE) is of utmost importance and priority. Fauji

Group is committed to building a safe and healthy workforce that contributes towards the business growth and sustainability. It has a proactive approach to achieve zero harm and making endeavors to align itself with internationally recognized Safety Management Systems.

FFBL not only has a tradition of safety at work, but strongly encourages its employees to carry this mindset beyond the workplace and into their homes and communities. Thus FPCL becoming an integral part of FFBL & Fauji Group will ensure safety of all working personals as well as the equipment by incorporating the most stringent safety laws and practices in its working boundaries. FPCL will ensure that all the work practices are well within a healthy, safe and environmental friendly atmosphere, by giving utmost importance and priority to the key factors and guidelines promoting safety and health.

K. PROJECT AGREEMENTS

The Company is expected to enter into, amongst others, the following key agreements as part of the Project:

- Power Purchase Agreement with K-Electric
- Power Sale Agreement with FFBL
- Facility Sharing Agreement with FFBL (for use of common facilities)
- Coal Supply Agreement
- Detailed Engineering & Project Supervision Agreement
- Key Equipment Supply/Construction Agreements related to amongst others:
  - ✓ Boilers Supply
  - ✓ Steam Turbine Generators
  - ✓ Civil Works
  - ✓ Electrical & Instrumentation
  - ✓ Coal, Limestone & Ash Handling
  - ✓ Balance of Plant (BoP) Equipment
  - ✓ Grid Connection System
  - ✓ Erection Contract

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L. PROJECT COST & FUNDING PLAN

Total Project Cost:	US $ 265.0 Million
Debt (75%):	US $ 198.75 Million
Equity (25%):	US $ 66.25 Million

The Project is to be financed based on a 75:25 Debt to Equity Ratio. 100% of the equity equivalent to USD 66.25 million will be contributed by FFBL, whereas USD 198.75 million equivalent in PKR debt is proposed to be financed on a non-recourse Project finance structure from various financial institutions.

The Project is financially feasible in terms of its ability to service its required debt obligations for the loan period. In this regard, the Company is already in discussion with various financial institutions for acquiring financing for the Project and the lead arranger mandate is expected to be finalized in Q4 2014 with Financial Closing expected in 2015.

M. SPONSOR

FPCL is a wholly owned subsidiary of Fauji Fertilizer bin Qasim Limited (FFBL). FFBL is a public limited company incorporated in Pakistan under the Companies Ordinance, 1984, and its shares are quoted on the Karachi, Lahore and Islamabad stock exchanges in Pakistan. The Company commenced its commercial production effective January 1, 2000.

N. MANAGEMENT CAPABILITY

The Management Team of FFBL Power Company Limited supported by FFBL consists of energetic, highly qualified and experienced professionals. They excel in qualities like leadership, collaboration and project management etc. They have experience in managing the large industrial projects and commercial businesses. These Professionals are proficient with technical and entrepreneurial skills and are confident, dynamic, creative and ready to take future challenges.

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O. PLANT DETAIL

Name of Applicant	FFBL Power Company Limited (FPCL)
Registered Office	FFBL Power Company Limited 73 - Harley Street, Rawalpindi
Business Office	FFBL Power Company Limited 73 - Harley Street, Rawalpindi
Plant Location	Plot No. EZ/I/P-1 Eastern Industrial Zone, Port Qasim, Karachi 75020
Type of Facility	Coal Fired Power Plant
Proposed Buyer	FFBL , K-Electric or Bulk Consumers
Total Gross Installed Capacity	118 MW
Plant Configuration	2 x 24 MW & 1 x 10 MW (60 Hz) 1 x 60 MW (50 Hz)
Emission values	NOx 510 mg/NM3 dry at 6% O2 SOx. 1500 mg/NM3 dry at 6% O2 Dust 50 mg/NM3 dry at 6% O2 CO 800mg/NM3 dry at 6% O2
Power Factor	0.8 lag ~ 0.9 lead
Generation Voltage (KV)	11.2 kV (for KE/other BPCs) 13.8 kV (for FFBL)
Frequency (Hertz)	50 Hz (for KE/other BPCs) 60 Hz (for FFBL)
Cooling Water Source /Cycle	Canal Water / 5 Cycles of concentration of cooling water.
Life of facility	30 years

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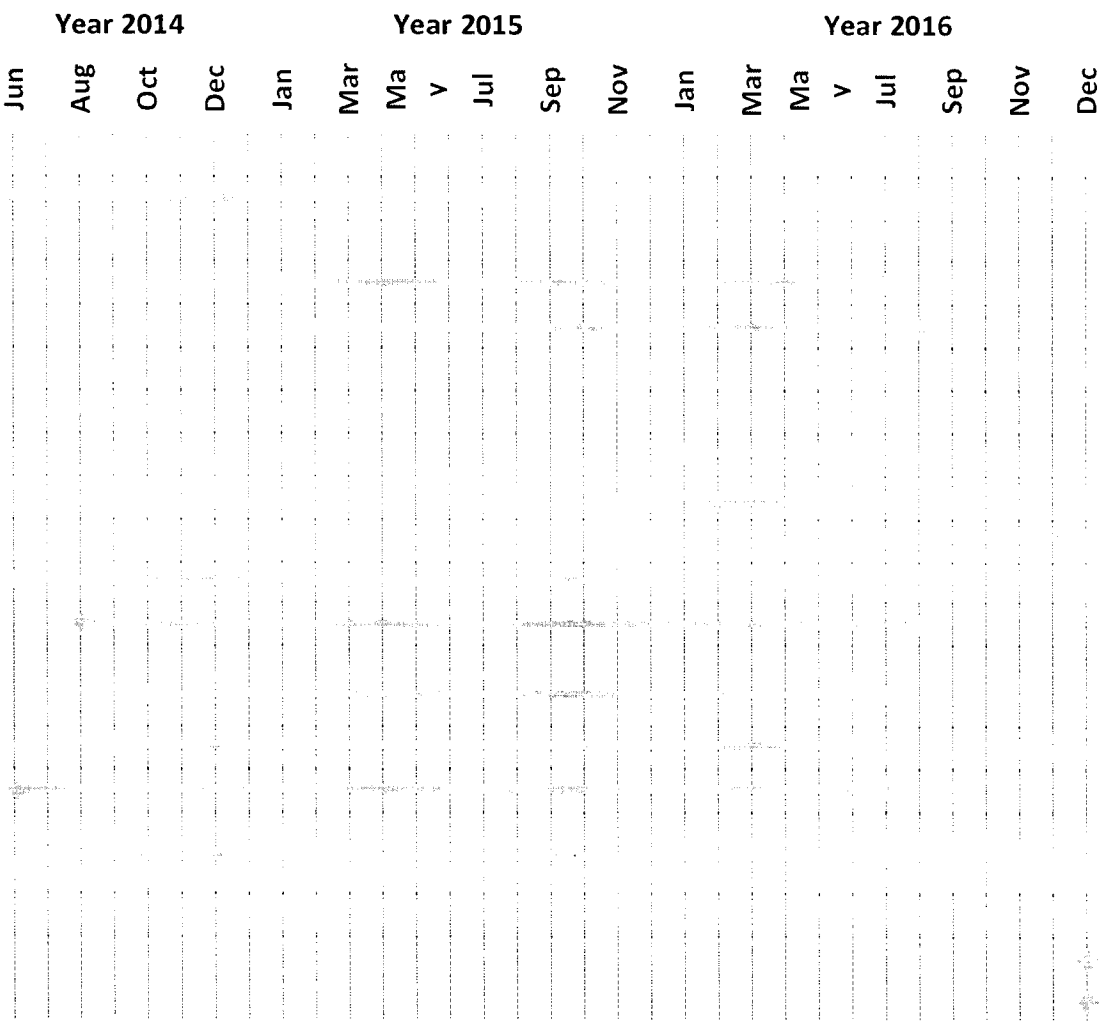
P. IMPLEMENTATION SCHEDULE/ TIMELINE

Sr #	Activities
1	Notice to Proceed (NTP) to Boiler Supplier
2	Detail Engineering by IEG- Slovokia
3	Electrical Studies
4	CFB Boiler – 01 Delivery & Erection
5	CFB Boiler – 02 Delivery & Erection
6	STGs - Contract Placement
7	Civil/Mech/E&I Contract Finalization
8	STGs Delivery
9	STGs Erection Works
10	STGs Commissioning & Performance Test
11	Civil Design & Construction Works
12	Coal, Limestone, Ash Handling System
13	DCS & Control system Ordering, Erection & Commissioning
14	CWS Ordering, Erection & Commissioning
15	Piping System Ordering & Erection
16	Electrical Equipment (MV, LV Switchgears, Transformers, MCC etc.) Supply and Erection
17	Pre-Commissioning & Commissioning of CPP
18	Reliability Runs & Performance Testing
19	Commercial Operation of Facility

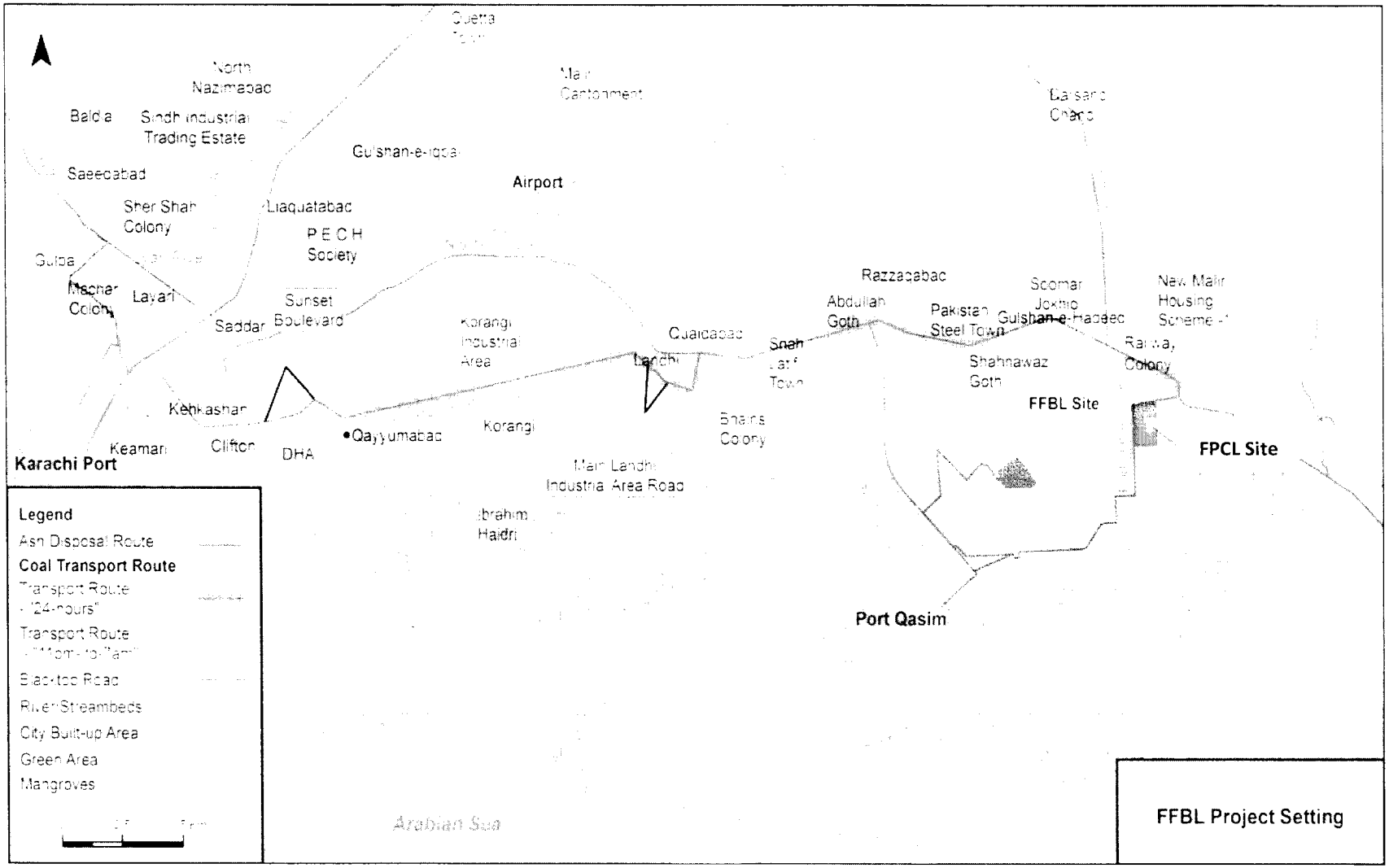


Notes:

1. Every month represents the end of month.

2. Target COD is planned in Dec-2016, however other milestones are subject to change based on placement of firm orders for main equipment.

Q. SITE MAP



COMPANIES ORDINANCE 1984

MEMORANDUM OF ASSOCIATION

OF

FFBL POWER COMPANY LIMITED (FPCL)

(COMPANY LIMITED BY SHARES)

I. The name of the Company is "FFBL POWER COMPANY LIMITED".

II. The Registered Office of the Company shall be situated in the Province of Punjab.

III. The objects for which the Company is established are to undertake any or all of the following activities and businesses subject to the approval from concerned authorities:

1. To carry on all or any of the business of power generation, transmitting, purchasing, importing, transforming, converting, distributing, supplying, exporting, utilizing and dealing in electricity and all other forms of energy and products or services associated therewith or resulting therefrom and of promoting the conservation and efficient use, supply or sale of electricity and all other forms of energy and commodities produced thereby, and to exercise all other powers necessary or incidental to the business of electricity generation, transmission, distribution, sale and supply; including in the term 'electricity' all power that may be directly or indirectly derived therefrom or may be incidentally hereafter discovered in dealing with electricity.

2. To ascertain the tariff for supply of power that will secure recovery of operating costs, interest charges and depreciation of assets redemption at due time of loans other than those covered by depreciation, expansion, projects, payment of taxes, and a reasonable return on investment, to obtain any approval thereof as may be required by law or licence for the time being in force, to quote the tariff to purchasers of electrical power.

3. To locate, establish, construct, equip, operate, use, manage, maintain and own electric power generation facilities including all apparatus and things required for or capable of being used in connection with generation, distribution, supply, accumulation and employment of electricity, *inter alia*

power plants and associated systems, power grid stations, transforming, switching, conversion and transmission facilities, grid stations, cables, underground and overhead lines, sub-stations, switchyards, Switchgears, tunnels, cable bridges, link boxes, telecommunication stations, teleprotection equipment, masts, aerials and dishes, fiber optic circuits, satellites and satellite microwaves connection, heat pumps, plant and equipment for combined heat and power schemes, offices, computer centers, shops, dispensing machines for payments cards and other devices, showrooms, depots, factories, control rooms, laboratories, workshops, plants, printing facilities, warehouses and other storages.

4. To acquire or obtain for use, whether by purchase, lease, concession, grant, hire or otherwise, from any company, body corporate or other entity (public or private), engaged in the generation, transmission or distribution of electric power, part of the business, properties, assets and undertakings of companies and entities in accordance with the relevant laws.

5. To carry on or expand the facilities; and to take over or assume any or all of the belongings, funds, assets, rights, privileges, liabilities, obligations and contracts related to or in respect of the facilities.

6. To do anything which an electricity supplier is empowered or required to do by virtue of or under a license or other authorization granted according to law and its implementing rules and regulations or any statutory instrument made thereunder or any statutory modification or reenactment thereof, and to plan, survey, design and supply equipment and to carry out the electrification of cities, cantonments, towns, villages, housing colonies, industrial estates, complexes, gas and oil refineries, workshops, buildings, highways, bridges, ports, air terminals, and other premises within its area of supply.

7. To carry on all or any of the businesses of wholesalers, retailers, traders, importers, exporters, suppliers, distributors, designers, developers, manufacturers, installers, fitters, testers, repairers, maintainers, contractors, constructors, operators, users, inspectors, reconditioners, services, improvers, altars, protectors, removers, hirers, replacers, importers and exporters of, and dealers in electrical appliances, systems, products and services used for energy conservation, domestic, commercial, agricultural, industrial, household and general equipment, furniture, fixtures, fittings, devices, machinery, materials and installations, including but not limited to cables, wires, meters, pylons, tracks, rails, pipelines and any other plant, apparatus equipment, systems and things

incidental to the efficient generation, procurement, transformation, supply and distribution of electricity.

8. To purchase, take on lease or in exchange, hire, import, apply for or otherwise acquire and hold for any interest, any rights, privileges, lands, buildings, easements, trademarks, patents, patent rights, copyrights, licences, equipment, machinery, plants, stock-in-trade and movable and immovable property of any kind necessary or convenient purposes of or in connection with the Company's business or any branch or department thereof and to use, exercise, develop, grant licences in respect of or otherwise turn to account any property, rights and information so acquired, subject to any permission required under the law.

9. To acquire by concession, grant, purchase, barter, licence either absolutely or conditionally and either solely or jointly with others any lands, buildings, machinery, plants, equipment, privileges, rights, licences, trademarks, patents, and other movable and immovable property of any description which the Company may deem necessary or which may seem to the Company capable of being turned to account, subject to any permission as required under the law.

10. To enter into arrangements, contracts or transactions, with the government or authority (supreme, municipal, local or otherwise) or any corporation, company, persons or entity (public or private) that may seem conducive for the purpose of the Company's objects or any of them and to obtain from any such government, authority, corporation, company or person any charters, contracts, rights, privileges and commission which the Company may think desirable and to carry on exercise and comply with any such charters, contracts, decrees, rights, privileges and concessions.

11. To open accounts with any Bank or Banks and to draw, make, accept, endorse, execute, issue, negotiate and discount cheques, promissory notes, bills of exchange, bills of lading, warrants, deposit notes, debentures, letter of credit and other negotiable instruments and securities.

12. To sell or otherwise dispose of the whole or any part of the undertaking of the Company, either together or in portions for such consideration as the Company may think fit and in particular, for shares, debenture-stock or securities of any company purchasing the same.

13. To borrow or raise money by means of loans or other legal arrangements

from scheduled banks, or other financial institutions, or Directors in such manner as the Company may think fit and in particular by issue of debentures, debenture stock , perpetual or otherwise convertible into shares, bonds, and to mortgage, or charge the whole or any part of the property or assets of the Company, or any specific property and rights present or future, by special assignment or to purchase, redeem or payoff any such securities.

14. To distribute any of the Company's property and assets among the members in specie or in any manner whatsoever in case of winding up of the Company.

15. To guarantee the performance of contract and obligations of the Company in relation to the payment of any loan, debenture-stock, bonds, obligations or securities issued by or in favour of the Company and to guarantee the payment or return on such investments.

16. To carry out a partnership, joint venture agreements or other arrangement with other companies, corporate bodies, persons or entities or countries within the scope of the objects of the Company.

17. To cause the Company to be registered or recognized in any foreign country.

18. To invest the surplus monies of the Company not immediately required in such lawful form as may be expedient.

19. To create any reserve fund, sinking fund, insurance fund or any other special fund whether for depreciation or for repairing, insuring improving, extending or maintaining any of the property of the Company or for any other purpose conducive to the interests of the Company.

20. To do and perform all other acts and things as are necessary, incidental or conducive to the attainment of the above objects or any of them or as otherwise deemed required by the Company.

21. To apply for and obtain necessary consents, permissions and licences from any Government, State, provincial, federal, local and other Authorities for enabling the Company to carry on any of its objects into effect as and when required by law.

22. It is further declared that in case, the registration with the Securities and Exchange Commission of Pakistan, or other formalities are required, the Company will fulfill all requirements accordingly.

23. Notwithstanding anything stated in any object clause the company shall obtain such other approval or license from competent authority as may be required under any law for the time being in force to undertake a particular business.

24. It is declared that notwithstanding anything contained in the foregoing object clauses of this Memorandum of Association nothing contained therein shall be construed as empowering the Company to undertake or to indulge in business of security services payment systems, Electronic funds transfers in and outside Pakistan, deposit taking from general public, network marketing, referral marketing & direct selling banking company, leasing investment, managing agency, insurance business, any of the NBFC business, multi-level marketing (MLM), Pyramid and Ponzi Scheme, commodity, future contract or shares trading business locally or internationally, directly or indirectly as restricted under the law or any unlawful operation.

IV. The liability of the members is limited.

V. The authorized capital of the Company is Rs. 6,000,000,000/- (Rupees Six billion) divided into 600,000,000 (Six Hundred Million) ordinary shares of Rs 10 (Rupees ten only) each with powers to the company from time to time to increase and reduce its capital subject to any permission required under the law.

We, the several persons whose names and addresses are subscribed, are desirous of being formed into a company, in pursuance of these articles of association, and we respectively agree to take the number of shares in the capital of the company set opposite our respective names.

S No.	Present Name in Full	CNIC No or passport No. in case of Foreign National	Father's/ Husband's Name	Usual residential address	Nationality **	Business Occupation*** (if any)	Number of shares taken by each subscriber	Sign-ature
1.	Fauji Fertilizer Bin Qasim Limited (represented by Mr Shaukat Yaqub Malik)	N/A (37301-0971827-3)	N/A (Mr Yaqub Khan Malik)	73-Harley Street, Rawalpindi H No 7, Street 2, Sector E, DHA-I, Islamabad	Pakistani (Pakistani)	N/A (Company Secretary-Fauji Fertilizer Bin Qasim Limited)	99,991 (Ninety nine thousand nine hundred and ninety one)	
2.	Mr Muhammad Mustafa Khan	37405-0355009-5	Mr. Illahi Bakhsh Khan	H. No. 1, Street 9, Sector G, DHA-II, Islamabad	Pakistani	MD-Fauji Foundation	01 (One)	
3.	Mr Muhammad Haroon Aslam	61101-2391782-3	Mian Muhammad Aslam	H No 87, Executive Lodges, Phase III, Bahria Town, Rawalpindi	Pakistani	CE&MD-Fauji Fertilizer Bin Qasim Ltd	01 (One)	
4.	Mr Naeem Khalid Lodhi	36302-0448967-7	Mr. Muhammad Ashraf Khan Lodhi	H No 3, Street 2-C, Sector B, DHA – I, Islamabad	Pakistani	CE&MD-Fauji Fertilizer Co Ltd	01 (One)	
5.	Mr. Qaiser Javed	37405-0670894-3	Mr. Abdul Majeed Qureshi	H No 661, D-Road Phase III, Bahria Town, Rawlapindi	Pakistani	Director-Fauji Foundation	01 (One)	
6.	Mr Nadeem Inayat	37405-0368300-1	Raja Inayatullah Khan	42 D, Tulsa Road, Lalazar, Rawalpindi	Pakistani	Director-Fauji Foundation	01 (One)	
7.	Syed Jamal Shahid	61101-1057143-9	Syed Shahid Ali	H NO C9 EME College Sector F14 Islamabad	Pakistani	Director-Fauji Foundation	01 (One)	
8.	Mr. Gulfam Alam	37405-1261883-9	Mr. Gustasab Khan	H No 79, Lane 5, Askari 11, Qasim Market, Rawalpindi	Pakistani	Director-Fauji Foundation	01 (One)	
9.	Syed Aamir Ahsan	61101-0876034-9	Syed Laique Ahsan	H No 125, Street 42, Agreements-10/4, Islamabad	Pakistani	GMF/CFO-Fauji Fertilizer Bin Qasim Ltd	01 (One)	
10.	Mr. Iftikhar Ahmed	42201-8404832-9	Mr. Munir Ahmed	126 ST 6 Bharia Town Phase I Rawalpindi	Pakistani	General Manager (Technology) - Fauji Fertilizer Bin Qasim Ltd	01 (One)	
						Total number of shares taken	**100,000**	

Witness: National Institutional Facilitation Technologies Pvt Ltd, 5th Floor, AWT Plaza, I.I. Chundrigar Road, Karachi, Pakistan

Dated the 26 day of June 2014

THE COMPANIES ORDINANCE, 1984

(COMPANY LIMITED BY SHARES)

ARTICLES OF ASSOCIATION

OF

FFBL POWER COMPANY LIMITED (FPCL)

1. The regulations contained in Table "A" in the First Schedule to the Companies Ordinance, 1984 shall not apply to the Company except in so far as the same are expressly made applicable by the said Ordinance, or these Articles. The regulation for management of the Company, and for the observance thereof by the members of the Company, and their representatives shall, subject as aforesaid and to any exercise of the statutory power of the Company in reference to the repeal or alteration of or addition to its regulations by Special Resolution as prescribed by the said Ordinance; be such as are contained in these Articles.

INTERPRETATION

2. In the interpretation of these Articles the following expressions shall have the following meanings, unless repugnant to or inconsistent with the subject Articles.

2.1 "Articles" means these Articles of Association as originally framed or altered from time to time by Special Resolutions;

2.2 "Board" means a Board of the Directors, elected by the shareholders, to act on their behalf in the management of the Company affairs;

2.3 "Chairman" means the Chairman of the Board appointed from time to time pursuant to Article 70;

2.4 "Company" means FFBL Power Company Limited;

2.5 "Debenture" shall include Participation Term Certificates and Term Finance Certificates;

2.6 "Directors" means the Directors of the Company appointed or elected from time to time pursuant to these Articles and shall include alternate Directors;

2.7 "Dividend" means the distribution of profits of the Company to its Members and includes bonus shares;

2.8 "Member" means a member of the Company within the meaning of Section 2(21) of the Ordinance;

2.9 "Memorandum" means the Memorandum of Association of the Company as originally framed or as altered from time to time in accordance with the provisions of the Ordinance;

2.10 "Month" means a Gregorian calendar month;

2.11 "Office" means the registered office of the Company;

2.12 "Ordinance" means the Companies Ordinance, 1984 as amended and now in force in Pakistan and any statutory modification or re-enactment thereof, from time to time, and any rules and regulations made thereunder;

2.13 "Persons" includes bodies corporate, corporations, companies, individuals, foundations and charitable endowments;

2.14 "Register" means the register of Members to be kept pursuant to Section 147 of the Ordinance;

2.14A "Rules" means The Companies (Issue of Capital) Rules, 1996;

2.15 "Seal" means the common seal as adopted by the Company;

2.16 "Special Resolution" shall have the meaning ascribed thereto by Section 2(36) of the Ordinance;

2.17 "In writing" means written or printed or partly written and partly printed or lithographed or typewritten or other substitute for writing;

Words imparting singular number include the plural number and vice versa.

Words imparting masculine gender include the feminine gender and vice versa.

Subject as aforesaid any words or expressions defined in the Ordinance shall except where the subject or context forbids bear the same meaning in these Articles.

PUBLIC COMPANY

3. The Company is a "public company" within the meaning of sub-section 2(30) of the Ordinance.

BUSINESS

4. The business of the Company shall include all or any of the objects enumerated in the Memorandum of Association. The business of the Company shall be carried out at such place or places anywhere in Pakistan or elsewhere as the Directors may deem proper or advisable from time to time.

5. The Directors shall have regard to the restrictions on the commencement of business imposed by section 146 of the Ordinance.

SHARES AND CAPITAL

6. The Authorized share capital of the Company is Rs. 6,000,000,000/- (Rupees Six billion) divided into 600,000,000 (Six Hundred Million) ordinary shares of Rs. 10 (Rupees ten only) each with powers of the Company to increase or

reduce the same and to divide the shares into several classes in accordance with the provisions of the Ordinance.

7. The shares shall be under the control of the Board of Directors who may allot or otherwise dispose of the same or any of them to such Persons, on such terms and conditions and at such times, as the Board of Directors think fit, and at a premium or at par or, subject to the provisions of the Ordinance, at a discount and for such consideration as the Board thinks fit. Shares may also be allotted in consideration other than cash, in accordance with the provisions of the Rules. The minimum subscription upon which the Directors may proceed to make the first allotment of shares shall be Rs.1,000,000/- (Rupees One Million) (100,000 shares of Rs. 10 each).

8. Fully paid shares shall be allotted to all subscribers in the first instance and the Company shall not be bound to recognize any equitable, contingent, future or partial claim to or interest in a share on the part of any person other than the registered shareholder, save as herein provided or save as ordered by a Court of competent jurisdiction.

9. The certificate of title to shares shall be issued under the Seal of the Company.

10. Every Member shall be entitled to one certificate for the shares registered in his name, or at the discretion of the Directors to several certificates, each for one or more of such shares.

11. Subject to Section 86 of the Ordinance, where at any time the Board decides to increase the issued capital of the Company by issuing any further shares, then subject to any direction to the contrary that may be given by the Company in general meeting, such shares shall be offered to the Members in proportion to the existing shares held by each Member, and such offer shall be made by notice specifying the number of shares to which the Member is entitled, and limiting a time within which the offer, if not accepted, will be deemed to be declined and after the expiration of such time, or on receipt of information from the Member to whom such notice is given that he declines to accept the shares offered, the Board may, subject to sub-section (7) of Section 86 of the Ordinance, dispose of the same in such manner as it may consider most beneficial to the Company.

12. Subject to the provisions of the Ordinance, the Rules and the Articles, the Board may allot and issue shares in the capital of the Company as payment or part payment for any property sold or transferred, goods or machinery supplied, or for services rendered to the Company in the conduct of its business or affairs.

13. If a share certificate is worn out, defaced, lost, rendered useless or destroyed, it may be renewed on payment of such fee, if any, not exceeding one hundred rupees (or any other limit prescribed by law), and on such terms, if any, as to evidence and indemnity and payment of expenses incurred by the Company in investigating title as the Directors think fit.

14. Except to the extent and in the manner allowed by section 95, no part of the funds of the Company shall be employed in the purchase of, or in loans upon the security of, the Company's shares.

TRANSFER AND TRANSMISSION OF SHARES

15. The instrument of transfer of any share in the Company shall be executed both by the transferor and the transferee and the transferor shall be deemed to remain holder of the share until the name of the transferee is entered in the Register in respect thereof. The Company shall keep a book to be called the "Register of Transfers" and therein shall be entered the particulars of every transfer or transmission of any share.

16. Every Person, whose name is entered as a Member in the Register of Members shall without payment, be entitled to a certificate under the common Seal of the Company specifying the shares held by several Persons. The Company shall not be bound to issue more than one certificate and delivery of a share certificate to any one of several joint holders shall be sufficient delivery to all.

17. The instrument of transfer of any share in the Company shall be in writing in the form appearing hereunder, or in any other usual or common form which the Board may approve The instrument of transfer shall be accompanied by the certificate or, if no such certificate is in existence, the letter of allotment of the shares to be transferred and such other evidence if any as the Directors may require to prove the title of the intending transferor or his right to transfer the shares. Each such transferee shall truthfully disclose his nationality at the appropriate place on such transfer deed and if he shall be the national of more than one state all such nationalities shall be disclosed in the application:

"I_____ s/o_____ of being a _____ national, (hereinafter Called the "Transferor") in consideration of the sum of Rs. _____(Rupees _____) paid to me by _____ s/o of _____a national of _____ (hereinafter called the "Transferee") do hereby transfer to the Transferee_____ share(s) numbered _____ in the undertaking called FFBL POWER COMPANY LIMITED to hold the same into the said Transferee. his (or her) executors, administrators and assigns, subject to the several conditions on which I held the same immediately before the execution hereof. and I, the Transferee, do hereby agree to take the said share(s) subject to the conditions aforesaid.

Signature (Transferor) Signature (Transferee)

Witnesses, etc.

18. Subject to the provisions of the Ordinance and the Articles, the Directors shall not refuse to transfer any fully paid shares unless the transfer deed is defective or invalid. The Directors may also decline to recognize any instrument of transfer unless:

(a) a fee as may be determined by the Directors is paid to the Company in respect thereof; and

(b) the duly stamped instrument of transfer is accompanied by the certificate of the shares to which it relates, and such other evidence as the Directors may reasonably require to show the right of the transferor to make the transfer.

If the Directors refuse to register a transfer of shares, they shall within thirty (30) days after the date on which the transfer deed was lodged with the Company notify the defect or invalidity to the transferee, who shall, after removal of such defect or invalidity be entitled to re-lodge the transfer deed with the Company.

19. The legal heirs, executors or administrators of a deceased shareholder shall be the only person to be recognized by the Directors as having title to the shares. In case of shares registered in the name of two or more holders, the survivors and the executors of the deceased shall be the only persons to be recognized by the Company as having any title to the shares. Nothing herein contained shall release the estate of a deceased shareholder (whether sole or joint), from any liability (whether sole or joint) in respect of any share solely or jointly held by him.

20. No shares shall be transferred to an insolvent or as otherwise prohibited by law.

ALTERATION OF CAPITAL

21. The Company may, from time to time, by Special Resolution increase the share capital by such sum, to be divided into shares of such amount, as the Special Resolution shall prescribe.

22. All further issue of shares capital shall first be subject to the provisions of Section 86 as are applicable to the Company.

23. Except as otherwise provided by the conditions of issuance, the new shares shall be subject to the same provisions with reference to transfer, transmission and otherwise as the shares in the original share capital.

24. The Company may, by Special Resolution:

(a) consolidate and divide its share capital into shares of larger amount than its existing shares;

(b) sub-divide its existing shares or any of them into shares of smaller amount than is fixed by the Company's Memorandum, subject, nevertheless, to the provisions of Section 92; or

(c) cancel any shares which, at the date of the passing of the resolution, have not been taken or agreed to be taken by any Person.

25. The Company may, by Special Resolution, reduce its share Capital in any manner and with, and subject to any incident authorized and consent required by law.

26. If the share capital is divided into different classes of shares, the rights attached to any class may be varied in the manner specified in Sections 28 and 108 of the Ordinance.

BORROWING POWERS

27. Subject to the provision of the Ordinance, the Directors may from time to time at their absolute discretion raise or borrow any sum or sums of money for the purpose of the Company from banks, firms or companies, particularly a person holding the office of the director, and may secure the payment of money in such manner and upon such terms, and conditions in all respects as they think fit particularly by the issue of Debentures of the Company or by making, drawing, accepting or endorsing on behalf of the Company any promissory note or bills of exchange or by giving or issuing any other security of the Company.

28. Debentures and other securities may be made assignable free from any equities between the Company and the persons to whom the same may be issued.

29. Any Debentures or other security may be issued at a discount, premium or otherwise and with any special privilege as to redemption, surrender, drawing, allotment of shares, attending and voting at general meeting of the Company or subject to compliance of the provisions of the Ordinance.

RESERVES

30. The Directors may from time to time before recommending any Dividend set aside out of the profit of the Company such sums as they think fit as a reserve for redemption of Debentures or to meet contingencies for equalization of or for special Dividends or for rebuilding, repairing, restoring replacing, improving, maintaining or altering any of the property of the Company or for such other purpose as the Directors may in their absolute discretion think conducive to the interest of the Company.

GENERAL MEETINGS

31. The statutory meeting of the Company shall be held within the period required by section 157.

32. A general meeting, to be called the annual general meeting, shall be held in accordance with the provisions of section 158, within eighteen (18) Months from the date of incorporation of the Company and thereafter once at least in every year within a period of four (4) Months following the close of its financial year and not more than fifteen (15) Months after the holding of its last preceding annual general meeting as may be determined by the Directors.

33. The Directors may, whenever, they think fit, call an extra ordinary general meeting, and extra ordinary general meetings shall also be called upon requisition by the Members, or in default, may be called by such requisitionists, as is provided by section 159 of the Ordinance.

NOTICE AND PROCEEDINGS OF GENERAL MEETING

34. Twenty one (21) days' notice at the least (exclusive of the day on which the notice is served or deemed to be served, but inclusive of the day for which notice is given) specifying the place, the day and the hour of meeting and, in case of special business, the general nature of that business shall be given in the manner provided by the Ordinance for the general meeting, to such Persons as are, under the Ordinance or the regulations of the Company, entitled to receive such notice from the Company, but the accidental omission to give notice to, or the non-receipt or notice by, any Member shall not invalidate the proceedings at any general meeting.

35. All business shall be deemed special that is transacted at an extraordinary general meeting, and also all that is transacted at an annual general meeting with the exception of declaring Dividend, the consideration of the accounts, balance sheet and the reports of the Directors and auditors, the election of the Directors, the appointment of, and the fixing of the remuneration of the auditors.

QUORUM

36. No business shall be transacted at any general meeting unless a quorum of Members is present at that time when the meeting proceeds to business; save as herein otherwise provided, Members having twenty five percent of the voting power present in Person or through proxy and three Members personally present will be quorum of the Company's meeting.

37. If within half an hour from the time appointed for the meeting a quorum is not present, the meeting, if called upon the requisition of Members, shall be dissolved. In any other case, it shall stand adjourned to the same day in the next week at the same time and place, and, if at the adjourned meeting quorum is not present within half an hour from the time appointed for the meeting, the Members present being not less than three, shall be a quorum.

38. The Chairman may, with the consent of any meeting at which the quorum is present and shall if so directed by the meeting, adjourn the meeting from time to time but no business shall be transacted at any adjourned meeting other than the business left unfinished at the meeting from which the adjournment took place. When the meeting is adjourned for ten (10) days or more, notice of the adjourned meeting shall be given as in the case of an original meeting. Save as aforesaid, it shall not be necessary to give any notice of an adjournment of the business to be transacted at an adjourned meeting.

39. At any general meeting, a resolution put to the vote of the meeting shall be decided on a show of hands unless a poll is, before or on the declaration of the show of hands, demanded. Unless a poll is so demanded, a declaration by the Chairman that a resolution has, on a show of hands, being carried, or carried unanimously, or by particular majority, or lost an entry to that effect in the book of the proceedings of the Company shall be conclusive evidence of the fact, without proof of the number or proportion of the votes recorded in favour of, or against that resolution.

40. A poll may be demanded only in accordance with the provisions of section 167 of the Ordinance.

41. If a poll is duly demanded, it shall be taken in accordance with the manner laid down in section 168 of the Ordinance and the result of the poll shall be deemed to be the resolution of the meeting at which the poll was demanded.

42. A poll demanded on the election of Chairman or on a question of adjournment shall be taken at once.

43. In the case of an equality of votes, whether on a show of hands or on a poll, the Chairman of the meeting at which the show of hands take place, or at which the poll is demanded, shall have and exercise a second or casting vote.

VOTES OF MEMBERS

44. Subject to any rights or restrictions for the time being attached to any class or classes of shares, on a show of hands every Member present in Person shall have one vote except for election of Directors in which case, the provisions of section 178 of the Ordinance shall apply. On a poll every Member shall have voting rights as laid down in section 160 of the Ordinance.

45. A Member of unsound mind, or in respect of whom an order has been made by any Court having jurisdiction in lunacy, may vote, whether on show of hands, or on a poll, by his committee or other legal guardian, and any such committee or guardian may, on a poll vote by proxy.

46. On a poll, votes may be given either personally or by proxy. Provided that nobody corporate shall vote by proxy as long as a resolution of its Directors in accordance with the provisions of Section 162 is in force.

47. (1) The instrument appointing a proxy shall be in writing under the hand of the appointer or of his attorney duly authorized in writing.

(2) The instrument appointing a proxy and the power of attorney or other authority, if any, under which it is signed, or a notary certified copy of that power or authority, shall be deposited at the registered office of the Company not less than forty eight hours before the time for holding the meeting at which the person named in the instrument proposes to vote and in default the instrument of proxy shall not be treated as valid.

(3) A vote given in accordance with the terms of an instrument of proxy shall be valid notwithstanding the previous death of insanity of the principal or revocation of the proxy or of the authority under which the proxy was executed, or the transfer of the share in respect of which the proxy is given, provided that no intimation in writing of such death, insanity, revocation or transfer as aforesaid shall have been received by the Company at the Office before the commencement of the meeting or adjourned meeting at which the proxy is used.

48. An instrument appointing a proxy may be in the following form, or a form, as near thereto as may be:-

I.....of.....in the district of ..... being a Member of the FFBL POWER COMPANY LIMITED hereby appoint ..... of ..... as my proxy to vote for me and on may behalf at the (annual, extraordinary, as the case may be) general meeting of the Company, to be held on the ..... day of ..... and at any adjournment thereof.

DIRECTORS

49. The following persons shall be the first Directors of the Company, who are also the subscribers to the Memorandum, and shall hold the office upto the date of the first annual general meeting.

- Mr. Muhammad Mustafa Khan
- Mr. Muhammad Haroon Aslam
- Mr. Naeem Khalid Lodhi
- Mr. Qaiser Javed
- Mr. Nadeem Inayat
- Syed Jamal Shahid
- Mr. Gulfam Alam
- Syed Aamir Ahsan
- Mr. Iftikhar Ahmed

TERMS OF OFFICE, REMOVAL AND CASUAL VACANCIES

50. The number of Directors shall not be less than three (3).

51. The Board shall fix the number of elected Directors of the Company not later than thirty five (35) days before the convening of the general meeting at which Directors are to be elected, and the number so fixed shall not be changed except with the prior approval of the Company in general meeting.

52. No person, whether a retiring Director or otherwise, shall be eligible for election as a Director unless notice of his candidature for election has been lodged in writing at the Office not less than fourteen (14) days before the date of the meeting at which an election of Directors is to take place.

53. The Directors shall comply with the provisions of sections 174 to 178 and sections 180 and 184 of the Ordinance relating to the election of Directors and matters ancillary thereto.

54. The Company may remove a Director but only in accordance with the provisions of the Ordinance.

55. Save as provided in Section 187 of the Ordinance, no Person shall be appointed as a Director unless he is a Member of the Company.

56. A Director elected shall hold office for a period of not more than three (3) years, unless he resigns, becomes disqualified from being a Director or otherwise ceases to hold office earlier.

57. A retiring Director shall be eligible for re-election.

58. The Directors may at any time appoint any Person to be a Director to fill a casual vacancy in the Board. Any Director so appointed shall hold office for the remainder of the term of the Director in whose place he is appointed.

REMUNERATION

59. The remuneration of the Directors shall, from time to time, be determined by the Directors subject to the provisions of the Ordinance.

60. Any Director who serves on the committee or who devotes special attention to the business of the Company or who otherwise performs services which in the opinion of the Board, are outside the scope of the statutory duties of a Directors, may be paid such remuneration by way of salary, allowances, facilities, perquisites, etc., as may be determined by the Directors in a meeting of Directors subject to the provisions of the Ordinance.

61. The Board may agree to pay pensions or other retirement, superannuation, death or disability benefits or allowances to any Person in respect of any Director or former Director who may hold or may have held any executive office or employment under the Company, or any subsidiary Company of the Company, and for the purpose of providing any such pensions or other benefits or allowances may contribute to any scheme or fund and make payments towards insurances or trusts in respect of such Persons subject to the provisions of the Ordinance.

POWERS OF DIRECTORS

62. The business of the Company shall be managed by the Directors, who may pay all expenses incurred in promoting and registering the Company, and may exercise all such powers of the Company as are not by the Ordinance or any statutory modification thereof for the time being in force, or by these regulations, required to be exercised by the Company in general meeting, subject nevertheless to the provisions of the Ordinance or to any of these regulations and such regulations being not inconsistent with the aforesaid provisions as may be prescribed by the Company in general meeting but no regulations made by the Company in general meeting shall invalidate any prior act of the Directors which would have been valid if that regulation had not been made.

63. The Directors shall have such powers conferred to them under the Section 196 of the Ordinance. Without prejudice to the general powers conferred by the Ordinance or above and to any other powers or authorities conferred by these presents on the Directors, it is hereby expressly declared that the Directors shall have the following powers, that is to say, power:

(1) to pay the costs, charges and expenses, preliminary and incidental to the promotion, formation, establishment and registration of the Company and also to pay to the promoters all costs and charges they may have incurred in acquiring properties, machinery or other rights which the Company may take over from them.

(2) to purchase or otherwise acquire for the Company any property, rights or privileges which the Company is authorised to acquire at such price and generally on such terms and conditions as they think fit and, subject to the provisions of Section 196(3)(a) of the Ordinance, to sell, let, exchange or otherwise dispose of, absolutely or conditionally, any part of the property, privileges and under-taking of the Company upon such terms and conditions, and for such consideration as they may think fit.

(3) at their discretion to pay for any property rights and privileges acquired by or services rendered to the Company either wholly or partially in cash or in shares (subject to Section 86 of the Ordinance), bonds, debentures or other securities of the Company, and any such bonds, debentures or other securities may be either specifically charged upon all or any part of the property of the Company or not so charged.

(4) to secure the fulfillment of any contracts, agreements or engagements entered into by the Company by mortgage or charge of all or any of the property of the Company for the time being or in such other manner as they think fit.

(5) to appoint, and at their discretion, remove or suspend such agents, secretaries, officers, legal advisors, clerks and servants for permanent, temporary or special services as they may from time to time think fit and to determine their powers and duties and fix their salaries or emoluments and to require security in such instances and to such amount as they think fit, and to send any such persons to foreign countries for technical education or otherwise for the purpose of the Company's business and pay all expenses thereof on such terms as the Directors may think fit.

(6) to appoint any person or persons (whether incorporated or not) to accept and hold in trust for the Company any property belonging to the Company or in which it is interested or for any other purposes and to execute and do all such trusts and also all such deeds, documents and things as may be requisite in relation to any such trust and to provide for the remuneration of such trustee or trustees.

(7) to institute, conduct, defend, compound or abandon any legal proceedings by or against the Company or its officers or otherwise concerning the affairs of the Company and also, subject to the provisions of Section 196(3)(b) of the Ordinance, to compound and allow time for payment and satisfaction of any debts due and of any claims or demands by or against the Company.

(8) to refer any claims or demands by or against the Company to arbitration and observe and perform or resist the awards.

(9) to act on behalf of the Company in all matters relating to bankrupts and insolvents.

(10) to determine who shall be entitled to sign on the Company's behalf bills, notices, receipts, acceptances, endorsements, cheques, releases, contracts and documents.

(11) from time to time to provide for the management of the Company either in different parts of Pakistan or elsewhere in such manner as they think fit, and in particular to establish branch offices and to appoint any persons to be attorneys or agents of the Company with such powers (including power to sub-delegate) and upon such terms as may be thought fit.

(12) subject to the provisions of the Ordinance, to invest and deal with any of the moneys of the Company upon such securities (not being the shares of the Company) and in such manner as they think fit, and from time to time vary or realise such investments.

(13) to execute in the name and on behalf of the Company in favour of any Director or other person who may incur or be about to incur personal liability for the benefit of the Company such mortgage of the Company's property (present and future) as they think fit, and any such mortgage may contain a power of sale and such other powers, covenants and provisions as shall be agreed upon.

(14) to give to any persons employed by the Company, as remuneration for their services as such a commission on the profits of any particular business or transaction or a share in the general profits of the Company, and such commission or share of profit shall be treated as part of the working expenses of the Company.

(15) From time to time to make, vary and repeal by-laws for the regulation of the business of the Company, its officers and servants.

(16) to enter into all such negotiations and contracts and rescind and vary all such contracts and execute and do all such acts, deeds and things in the name and on behalf of the Company as they consider expedient for or in relation to any of the matters aforesaid or otherwise for the purposes of the Company.

(17) to establish, maintain, support and subscribe to any charitable or public objects and any institution, society or club which may be for the benefit of the Company or its employees or may be connected with any town or place where the Company carries on business; to give pensions, gratuities, bonuses or charitable aid to any person or persons who have served the Company or to the wives, children, or dependents of such person or persons who have served the Company or to the wives children or dependents of such person or persons that may appear to the Directors just and proper, whether any person, his widow, children or dependents have or have not a legal claim upon the Company.

(18) subject to the provisions of Section 227 of the Ordinance, before recommending any dividends, to set aside portions of the profits of the Company to form a fund to provide for such pensions, gratuities, compensation or to create any Provident or Benefit Fund in such or any other manner as the Directors may deem fit.

(19) to make and alter rules and regulations concerning the time and manner of payment of the contributions of the employees and the Company respectively to any funds as defined in Article 63(18) above and the accrual, employment, suspension and forfeiture of the benefits of the said funds and the application and disposal thereof, and otherwise in relation to the working and management of the said funds as the Directors shall from time to time think fit.

(20) to make and give receipts, releases and other discharges for money payable to the Company and for the claims and demands of the Company.

64. The Directors may exercise all the powers of the Company to borrow, obtain finances and mortgage or charge its undertaking, property and assets (both present and future) and to issue debentures and other securities, whether

outright, subject to any conditions, or as collateral security for any debt, liability or obligation of the Company or of any third party.

65. In addition to or in furtherance of any requirement under the Ordinance, the Directors shall cause minutes to be made in books provided for the purpose:-

(a) of all appointments of officers made by the Directors;

(b) of the names of the Directors present at each meeting of the Directors and of any committee of the Directors;

(c) of all resolutions and proceedings at all meetings of the Company and of the Directors and of committees of Directors.

Every Director present at any meeting of Directors shall sign his name in a book kept for that purpose.

DISQUALIFICATION OF DIRECTORS

66. No Person shall become a Director of a Company if he suffers from any of the disabilities or disqualifications mentioned in section 187 of the Ordinance and, if already a Director, shall cease to hold such office from the date he so becomes disqualified or disabled; provided, however, that no Director shall vacate, his office by reason only of his being a Member of any company which had entered into contracts with, or done any work for, the company of which he is director, but such Director shall not vote in respect of any such contract or work, and if he does so vote, his vote shall not be counted.

67. The Director shall cease to hold office in accordance with the provisions of Section 188 of the Ordinance.

PROCEEDINGS OF DIRECTORS

68. The Directors may meet together for the dispatch of business, adjourn and otherwise regulate their meetings, as they think fit. Questions arising at any meeting shall be decided by a majority of votes. In case of an equality of votes, the Chairman shall have and exercise a second or casting vote. A Director may, and the secretary on the requisition of a Director shall, at any time, summon a meeting of Directors. It shall not be necessary to give notice of a meeting of Directors to any Director for the time being absent from Pakistan.

69. The Directors may elect the Chairman of their meetings who shall be the nominee of Fauji Foundation and determine the period for which he is to hold office; but, if no such Chairman is elected; or if at any meeting the Chairman is not present within ten minutes after the time appointed for holding the same or is unwilling to act as Chairman, the Directors present may choose one of their number who shall be the nominee of Fauji Foundation to be Chairman of the meeting.

70. A resolution in writing signed by all the Directors present in or outside Pakistan, for the time being entitled to receive notice of a meeting of the Directors shall be as valid and effectual as if it had been passed at a meeting of the Directors duly convened and held.

71. The Directors shall meet together at least once in each quarter of a year for the dispatch of business, adjourn and otherwise regulate meetings of the Board as they think fit.

72. Quorum of a meeting shall not be less than one-third of the Director's number or three Directors, whichever is higher, shall be present either personally or through video conferencing.

73. A meeting of the Board for the time being at which a quorum is present shall be competent to exercise all or any of the authorities, powers and discretion by or under the Articles or by or under any law vested in or exercisable by the Board generally.

74. The Board may by unanimous consent determine that a larger number of Directors shall constitute a quorum for deliberating on specified important matters, and further that such matters shall be decided upon the affirmative votes of more than a simple majority as may be specified by the Board.

75. All acts done by any meeting of the Board or of a committee of Directors, or by any person acting as a Director or alternate Director shall, notwithstanding that it be afterwards discovered that there was some defect in the appointment of any such Directors or persons acting as aforesaid, or that they or any of them were disqualified, be as valid as if every such Director or person had been duly appointed and was qualified to act. Provided that as soon as any such defect has come to notice, the Director or other person concerned shall not exercise the right of his office till the defect has been rectified.

COMMITTEE OF DIRECTORS

76. The Board may from time to time delegate all or any of their powers not required to be exercised at their meeting to a committee or committees consisting of two or more Directors, as they think fit. Any committee so formed shall confirm to any regulations that may be imposed upon it by the Board and shall have such quorum as prescribed by the Board.

CHIEF EXECUTIVE

77. The chief executive shall be the nominee of Fauji Foundation and shall be appointed in accordance with section 198 and 199 of the Ordinance. The Board shall vest in him such powers and functions as they deem fit in relation to the management and administration of the affairs of the Company and subject to their general supervision and control.

78. The Board may, by resolution passed by not less than three-fourth of the total number of Directors for the time being or the Company may by Special Resolution remove a chief executive before the expiration of his term of office notwithstanding anything contained (if any) in these Articles or in any agreement between the Company and the chief executive, Upon the expiry of his period of office, a chief executive shall be eligible for re-appointment. A chief executive, if he is not already a Director of the Company, shall be deemed to be its Director and be entitled to all the rights and privileges and subject to all the liabilities of the office of Director of the Company.

DIVIDENDS AND RESERVES

79. The Company in general meeting may declare Dividends, but no Dividends shall exceed the amount recommended by the Board.

80. The Board may, from time to time, pay to the Members such interim Dividends as appear to be justified by the profits of the Company.

81. No Dividends shall be paid otherwise than out of profits of the year, or any other undistributed profits from prior years.

82. The Board may, before recommending any Dividend, set aside out of the profits of the Company, such sum as they think proper as a reserve or reserves, which shall, at the discretion of the Board, be applicable for meeting debt obligations or contingencies, or for equalizing Dividends, or for any other purposes to which the profits of the Company may properly be applied, and pending such application may, in the like discretion, either be employed in the business of the Company or be invested in such investments, other than shares of the Company, as the Board may from time to time think fit.

83. No Dividend shall bear interest against the Company. The Dividend shall be paid within the period laid down in the Ordinance.

84. The Directors may carry forward any profits which they may think prudent not to distribute, without setting then aside as a reserve.

CAPITALIZATION

85. Any general meeting may, upon recommendation of the Board, by resolution resolve that any undistributed profits of the Company, (including profits carried and standing to the credit of any reserves or other special accounts or representing premiums received on the issue of shares and standing to the credit of the share premium account and capital reserves arising from, realized or unrealized appreciation of the assets or goodwill of the Company or from any acquisition/ sale of interest in other undertakings) not required for paying the Dividends on any shares, be capitalized. Such capitalized undistributed profits and reserves shall be distributed amongst the shareholders in the same proportions as if the same were being distributed by way of Dividend. All or any part of such capitalized fund may be applied on behalf of such shareholders for payment in full or in part either at par or at such premium as the resolution may provide, for any unissued shares or Debentures of the Company which shall be distributed accordingly, and such distributions or payment shall be accepted by such shareholders in full satisfaction of their interest in the said capitalized sum.

THE SEAL

86. The Directors shall provide for the safe custody of the Seal and the Seal shall not be affixed to any instrument except by the authority of a resolution of the Board of Directors or by a committee of Directors authorized in that behalf by the Directors and the presence of at least two Directors; and those two

Directors shall sign every instrument to which the Seal of the Company is so affixed in their presence.

ACCOUNTS

87. The Directors shall cause to be kept proper books of account as required under section 230 of the Ordinance.

88. The books of account shall be kept at the Office or at such other place as the Board shall think fit and shall be open to inspection by the Directors during business hours.

89. The Board shall from time to time determine whether and to what extent and at what times and places and under what conditions or regulations the accounts and books or papers of the Company or any of them shall be open to inspection of Members, and no Member (not being a Director) shall have any right of inspecting any account and books or papers of the Company except as conferred by law or authorized by the Board or by the Company in general meeting.

90. Within not less than eighteen (18) Months of the incorporation of the Company, and subsequently once at least in every year, the Directors shall cause to be prepared and lay before the Company in general meeting a balance sheet and profit and loss account, both made up in accordance with the Ordinance and to a date not more than four (4) Months before the date of the general meeting. Every such balance sheet shall be accompanied by an auditor's certificate and the Directors' Report in accordance with provisions of the Ordinance in that behalf.

91. A copy of the report of the Directors and of the balance sheet including a report of the auditors and every document required by law to be annexed thereto and of the profit and loss account shall be sent to all Members along with the notice convening the general meeting before which the same are required to be laid at least twenty-one (21) days preceding the meeting.

92. The Director shall in all respects comply with the provisions of Sections 230 to 247 of the Ordinance, as applicable, in regard to the accounts of the Company.

AUDIT

93. Once at least in every year the accounts of the Company shall be audited and the correctness of profit and loss accounts or income and expenditure accounts and balance sheet ascertained by an auditor or auditors and the provisions of the Ordinance in regard to audit and the appointment and qualification of auditors shall be observed.

94. Auditors shall be appointed and their duties regulated in accordance with sections 252 to 255 of the Ordinance.

NOTICES

95. A notice may be given by the Company to any Member or Director either personally or by sending it to him by first class mail, postage prepaid, or by telegram, telex, cable or radiogram as specified below, at his registered

address, or if he has no registered address in Pakistan, to the address supplied to the Company for the giving of notices to him.

WINDING UP

96. If the Company shall be wound up, whether voluntarily or otherwise, the liquidator may, with the sanction of a Special Resolution and any other sanction required by the Ordinance, divide amongst the Members in specie or kind, the whole or any part of the assets of the Company, whether they consist of property of the same kind or not.

97. For the purposes aforesaid, the liquidator may set such value as he deems fair upon any property to be divided as aforesaid and may determine how such division shall be carried out as between the Members or different classes of Members.

98. The liquidator may, with the like sanction, vest the whole or any part of such assets in trustees upon such trust for the benefit of the contributories as the liquidator, with the like sanction, think fit, but so that no Member shall be compelled to accept any shares or securities whereupon there is any liability.

INDEMNITY

99. Every Director, Chairman, managing director, chief executive, manager or officer of the Company or any person (whether an officer of the Company or not) employed by the Company as auditor or advisor shall be indemnified out of the funds of the Company against any liability incurred by him as such Director, Chairman, managing director, chief executive, manager, officer, auditor or adviser in defending any proceedings, whether civil or criminal, in which judgment is given in his favour or in which he is acquitted, or in connection with any application under section 488 of the Ordinance in which relief is granted to him by Court.

100. No Director, Chairman, managing director or other officer of the Company will be liable for the acts, receipts, neglects or defaults of any other Director or officer or for any loss or expenses happening to the Company through the insufficiency or deficiency of title to any property acquired by the order of the Board or other Officer for or on behalf of the Company or for the insufficiency or deficiency of title of any security in or upon which any of the moneys of the Company shall be invested, or for any loss, or damage arising from the bankruptcy, insolvency or tortious acts of any loss occasioned by any error of judgment or oversight on his part, or for any other loss, damage or misfortune whatever which shall happen in the execution of his duties of his office or in relation thereto, unless the same happens through his own willful act, neglect, default or dishonesty.

SECRECY CLAUSE

101. Every Director, manager, member of the committee, officer, servant, accountant or other Person employed in the business of the Company shall if so require by the Directors before entering upon his duties, sign a declaration pledging to observe a strict secrecy respecting all transactions of the Company with the customers and the state of accounts with individuals, matters relating

thereto and shall by such declaration, pledge himself not to reveal any of the matters which come to his knowledge in the discharge of his duties except when required to do so by the Directors or by a Court of law and except so far as may be necessary in order to comply with any of the provisions in these presents contained.

102. No Member or other Person (not being a Director) shall he entitled to enter the property of the Company, or to inspect any account or books of account or document of the Company or properties of the Company, without permission of the Board and to require disclosure of any information respecting any detail of the Company's trading or any matter which is or may be in the nature of a trade secret, mystery of trade, or secret to the conduct of the business of the Company and which in the opinion of the Board will be inexpedient in the interest of the Company to communicate.

We, the several persons whose names and addresses are subscribed, are desirous of being formed into a company, in pursuance of these Articles of Association, and we respectively agree to take the number of shares in the capital of the company set opposite our respective names.

S No.	Present Name in Full	CNIC No or passport No. in case of Foreign National	Father's/ Husband's Name	Usual residential address	Nationality **	Business Occupation*** (if any)	Number of shares taken by each subscriber	Sign-ature
1.	Fauji Fertilizer Bin Qasim Limited (represented by Mr Shaukat Yaqub Malik)	N/A (37301-0971827-3)	N/A (Mr Yaqub Khan Malik)	73-Harley Street, Rawalpindi H No 7, Street 2, Sector E, DHA-I, Islamabad	Pakistani (Pakistani)	N/A (Company Secretary-Fauji Fertilizer Bin Qasim Limited)	99,991	
2.	Mr Muhammad Mustafa Khan	37405-0355009-5	Mr. Illahi Bakhsh Khan	H. No. 1, Street 9, Sector G, DHA-II, Islamabad	Pakistani	MD-Fauji Foundation	01	
3.	Mr Muhammad Haroon Aslam	61101-2391782-3	Mian Muhammad Aslam	H No 87, Executive Lodges, Phase III, Bahria Town, Rawalpindi	Pakistani	CE&MD-Fauji Fertilizer Bin Qasim Ltd	01	
4.	Mr Naeem Khalid Lodhi	36302-0448967-7	Mr. Muhammad Ashraf Khan Lodhi	H No 3, Street 2-C, Sector B, DHA – I, Islamabad	Pakistani	CE&MD-Fauji Fertilizer Co Ltd	01	
5.	Mr. Qaiser Javed	37405-0670894-3	Mr. Abdul Majeed Qureshi	H No 661, D-Road Phase III, Bahria Town, Rawlapindi	Pakistani	Director-Fauji Foundation	01	
6.	Mr Nadeem Inayat	37405-0368300-1	Raja Inayatullah Khan	42 D, Tulsa Road, Lalazar, Rawalpindi	Pakistani	Director-Fauji Foundation	01	
7.	Syed Jamal Shahid	61101-1057143-9	Syed Shahid Ali	H NO C9 EME College Sector F14 Islamabad	Pakistani	Director-Fauji Foundation	01	
8.	Mr. Gulfam Alam	37405-1261883-9	Mr. Gustasab Khan	H No 79, Lane 5, Askari 11, Qasim Market, Rawalpindi	Pakistani	Director-Fauji Foundation	01	
9.	Syed Aamir Ahsan	61101-0876034-9	Syed Laique Ahsan	H No 125, Street 42, Agreements-10/4, Islamabad	Pakistani	GMF/CFO-Fauji Fertilizer Bin Qasim Ltd	01	
10.	Mr. Iftikhar Ahmed	42201-8404832-9	Mr. Munir Ahmed	126 ST 6 Bharia Town Phase I Rawalpindi	Pakistani	General Manager (Technology) - Fauji Fertilizer Bin Qasim Ltd	01	
						Total number of shares taken	**100,000**	

Witness: National Institutional Facilitation Technologies Pvt Ltd, 5th Floor, AWT Plaza, I.I. Chundrigar Road, Karachi, Pakistan

Dated the 26 day of June 2014

CERTIFIED TRUE COPY

REGISTRAR
OFFICE OF REGISTRAR OF FIRMS
ISLAMABAD

24/9/2014

No. AD
Dated

SECURITIES AND EXCHANGE COMMISSION OF PAKISTAN

1st Floor SLIC Building No.7, Blue Area,
Islamabad

CERTIFICATE OF INCORPORATION

[Under Section 32 of the Companies Ordinance, 1984 (XLVII of 1984)

Corporate Universal Identification No. **0088996**

I hereby certify that **FFBL POWER COMPANY LIMITED** is this day incorporated under the Companies Ordinance, 1984 (XLVII of 1984) and that the company is **limited by shares.**

Given under my hand at Islamabad this 27th day of June, Two Thousand and Fourteen.

Fee Rs. **16,272,000/-**

(Shaukat Hussain)
Additional Registrar of Companies

CERTIFIED TO BE TRUE COPY

JOINT REGISTRAR
CORPORATE REGISTRATION OFFICE
ISLAMABAD

No. ADI 12307
Dated 26/6/14

24/9/2014

No. ADI
Dated

FPCL
FFBL POWER COMPANY LIMITED

The Company was incorporated on 27 June, 2014 and has not yet filed Form A. However, the main corporate information is as follows:

Corporate Universal Identification No: 0088996

Date of Incorporation: 27th June, 2014

Registered Office: 73-Harley Street, Rawalpindi, Pakistan

Authorized Capital: Rupees Six Billion (Rs. 6,000,000,000) divided into Six Hundred Million (600,000,000) ordinary shares of (Rs. 10) each.

Paid up capital: Rupees One Million (1,000,000) divided into One Lac (100,000) ordinary shares of (Rs. 10) each.

Chief Executive Officer: Lt Gen Muhammad Haroon Aslam, HI(M), SBt, (Retd)

Directors:

1. Mr. Muhammad Mustafa Khan.
2. Mr. Muhammad Haroon Aslam.
3. Mr. Naeem Khalid Lodhi.
4. Mr. Qaiser Javed.
5. Mr. Nadeem Inayat
6. Mr. Syed Jamal Shahid
7. Mr. Gulfam Aslam
8. Mr. Syed Aamir Ahsan
9. Mr. Iftikhar Ahmed.

Shareholders:

Sr. #	Name of Shareholder	Number of Shares
1	Fauji Fertilizer Bin Qasim Limited	99,991
2	Individual Shares issued to Directors	09
	Total	100,000

FPCL
FFBL Power Company Limited

Financing

The total Project cost is estimated at USD265 million which is to be financed based on a 75:25 Debt to Equity Ratio. Equity will be contributed by Project Sponsor FFBL. PKR debt is proposed to be financed on a non-recourse project finance structure from various financial institutions. The project is financially feasible in terms of its ability to service its required debt obligations for the loan period.

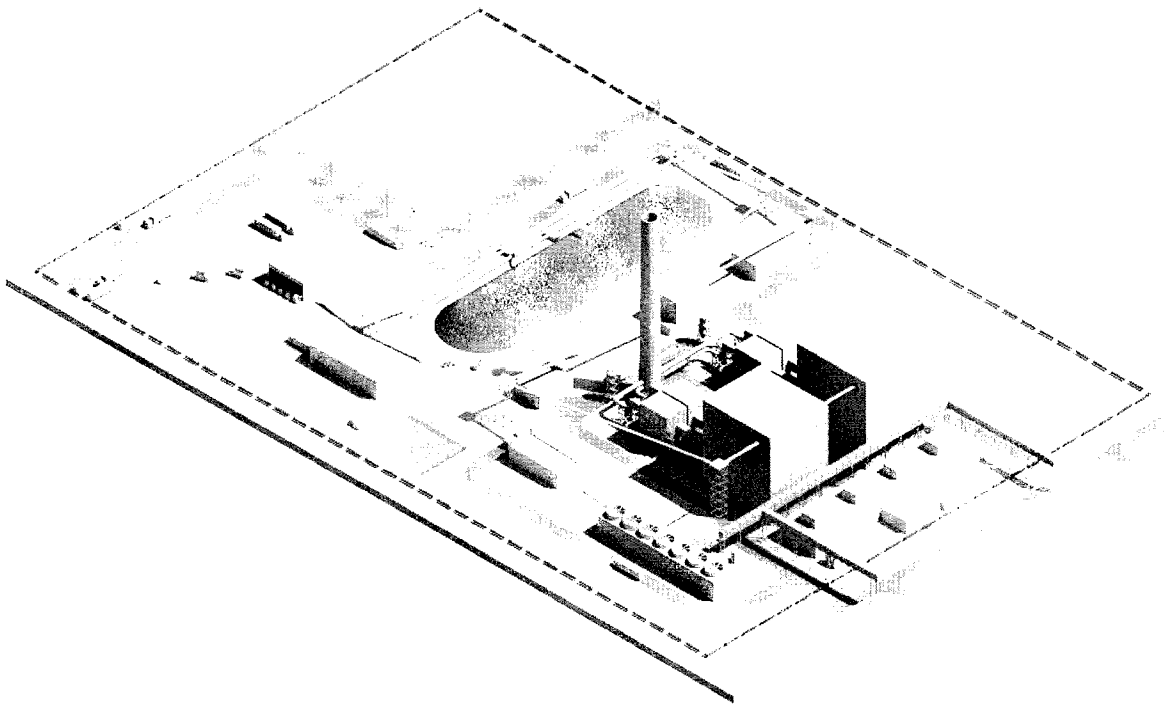
The Company is already in discussion with various financial institutions for acquiring financing for the project and lead arranger mandate is expected to be finalized in Q4 2014 with Financial Closing expected in 2015.

FEASIBILITY REPORT

FPCL

FFBL Power Company Limited

Istroenergo Group a. s.



Coal Based Power Plant Project in Port Qasim Industrial Zone - Karachi (Pakistan)

Technical Abstract

TABLE OF CONTENTS

1. BACKGROUND

1.1. GENERALITIES

1.1.1. FFBL Power Company Limited (FPCL) is an unlisted Public Limited Company incorporated under Section 32 of the Companies Ordinance 1984 (XLVII of 1984) on 27th day of June, 2014 having Corporate Universal Identification No. 0088996. The Company is formed for setting up a coal-fired cogeneration power plant to

1.1.1.1. Sell power to K-Electric (formally known as Karachi Electric Supply Corporation) and/or Bulk Power Consumers

1.1.1.2. Sell power to Fauji Fertilizer bin Qasim Limited (FFBL) to meet the requirements of the FFBL fertilizer plant.

1.2. SPONSER

1.2.1. FPCL is 100% owned subsidiary of Fauji Fertilizer Bin Qasim Limited. FFBL is a public limited company incorporated in Pakistan under the Companies Ordinance, 1984, and its shares are quoted on the Karachi, Lahore and Islamabad stock exchanges in Pakistan. The Company commenced its commercial production effective January 1, 2000.

1.3. THE PROJECT

1.3.1. FPCL is located at Port Qasim, Karachi in the province of Sindh, on approximately 50 acres of land within the existing FFBL Fertilizer Complex (on the south side). The Project will be capable of generating 500 Metric Tons per Hour (MTPH) steam through two (02) Circulating Fluidized Bed (CFB) high-pressure coal-fired boilers each with a capacity of 250 MTPH. The Project shall sell up to 60 MW (net) of power to K-Electric at a frequency of 50 Hz and 22.0 MW power to FFBL at a frequency of 60Hz.

1.3.2. Due to the lack of electricity production means in Pakistan, the Power Plant should operate at full load, with the minimum yearly stops (for maintenance).

2. LOCATION & SITE CONDITIONS

2.1. LOCATION

2.1.1. The Project Site is within the existing fertilizer complex of FFBL located in the Eastern Industrial Zone, Bin Qasim, Karachi.

2.1.2. Given the following characteristics the site meets the essential criteria for site selection.

2.1.2.1. In vicinity of local distribution network to sell power to K-Electric.

2.1.2.2. Within vicinity of FFBL to sell power to fertilizer complex.

2.1.2.3. Land availability.

2.1.2.4. Availability of water and other utilities in near proximity.

2.1.2.5. Suitability for the construction of intake / outfall structures.

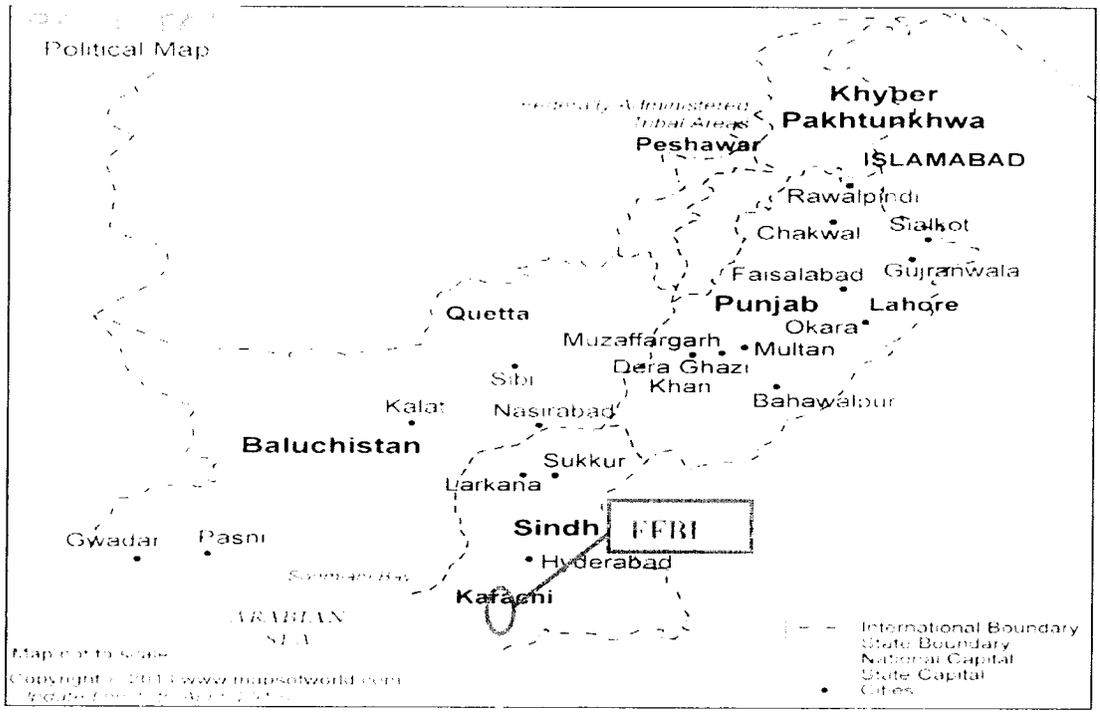
2.1.2.6. Port Vicinity for equipment and more importantly coal import.

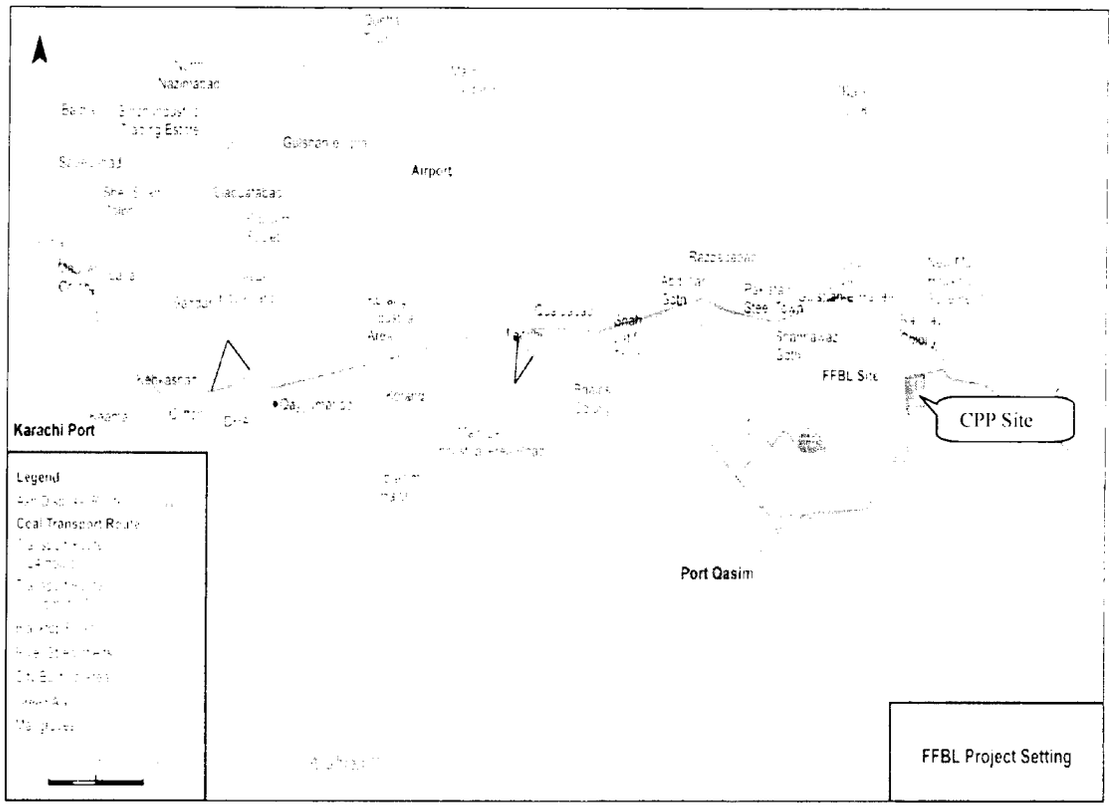
2.1.2.7. Availability of road infrastructure.

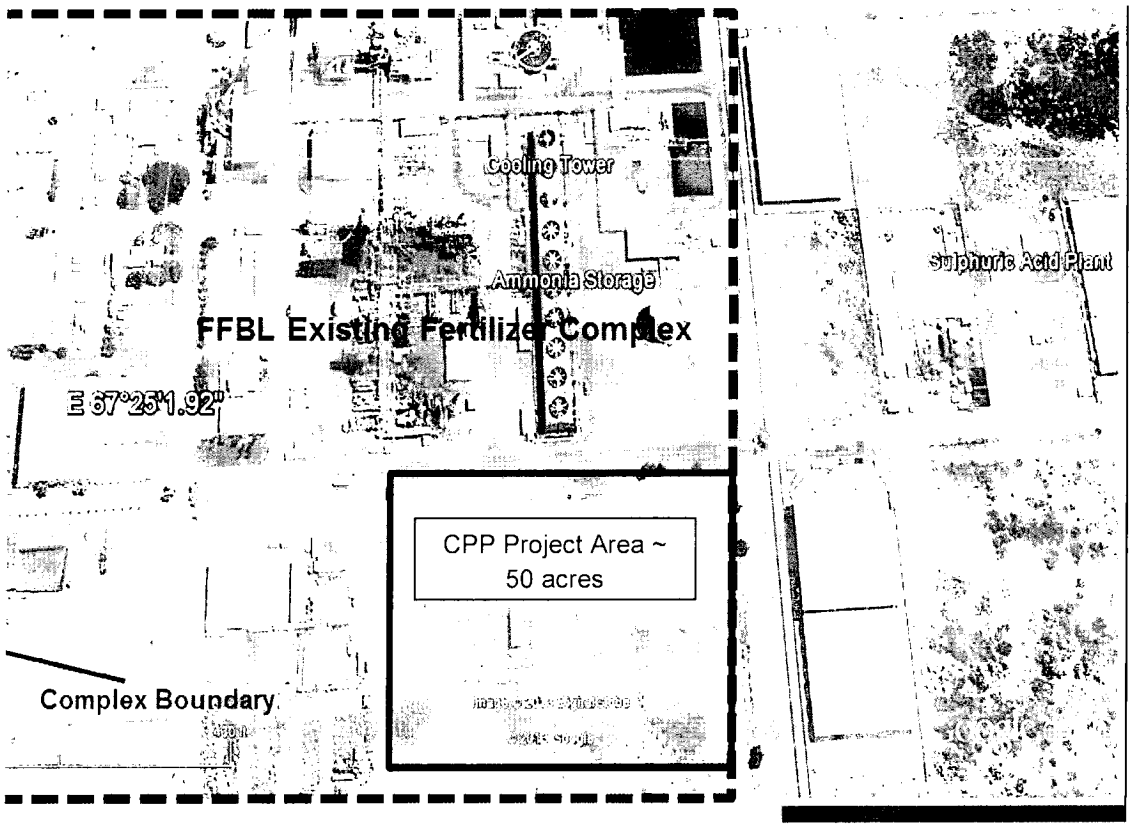
2.1.2.8. Low cost of site development and suitable topographic / geological conditions.

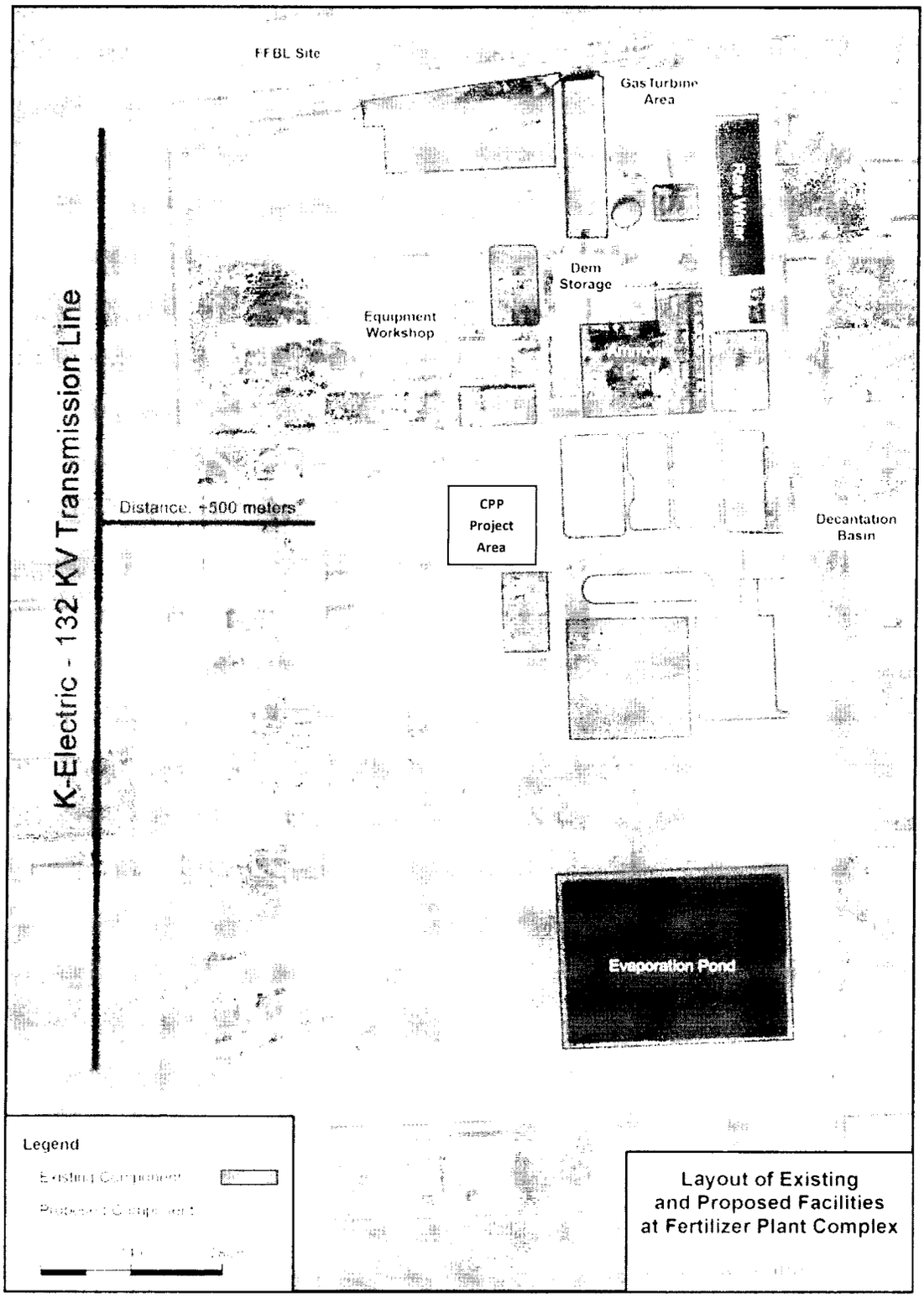
2.1.2.9. Minimum socio-economic and environment implications of the Project such as displacements, availability of nearby ash disposal area etc.

2.1.3. The site co-ordinates are 67 º 25' longitudes east, 24º50' latitude north, about 45 km east / south east from Karachi.


Political Map
Khyber
Pakhtunkhwa
Peshawar
ISLAMABAD
Rawalpindi
Chakwal
Sialkot
Faisalabad
Gujranwala
Punjab
Lahore
Okara
Quetta
Muzaffargarh
Multan
Dera Ghazi
Khan
Sibi
Kalat
Nasirabad
Bahawalpur
Baluchistan
Sukkur
Larkana
Sindh
FFBL
Gwadar
Pasni
Hyderabad
Karachi
ARABIAN
SEA
International Boundary
State Boundary
National Capital
State Capital
Cities


Airport
FFBL Site
CPP Site
Karachi Port
Port Qasim
Legend
Coal Transport Route
FFBL Project Setting


Cooling Tower
Ammonia Storage
FFBL Existing Fertilizer Complex
E 67°25'1.92"
CPP Project Area ~ 50 acres
Complex Boundary
Sulphuric Acid Plant



Layout of Existing and Proposed Facilities at Fertilizer Plant Complex

2.2. TOPOGRAPHY AND SUBSOIL CONDITIONS

2.2.1. The site is located in an almost flat zone close to the existing complex.

2.2.2. The available soils test performed for structures in the neighborhood show that the subsoil consists of very dense fine to medium coarse sand with some silt. The soil stratigraphy seems homogeneous in this area and we can suppose that the soils characteristics will be the same on the new plant location.

2.2.3. Based on the existing soil tests, the allowable bearing pressure on the soil can reach 2.00 to 3.00 kg/cm^2 depending of the embedment depth.

2.2.4. The water table is very deep (more than 20.00 m). Due to the fact that the area is flat, the earthworks volume will be reduced to a leveling.

2.3. CLIMATIC & AMBIENT CONDITIONS

2.3.1. TEMPERATURE

	Air Temperature (°C)	Relative Humidity (%)
Extreme winter site conditions	1	100
Annual average	30	60
Extreme summer site conditions	43	45

2.3.2. WIND

Maximum wind speed	150 km/h
Main direction	West / South-west

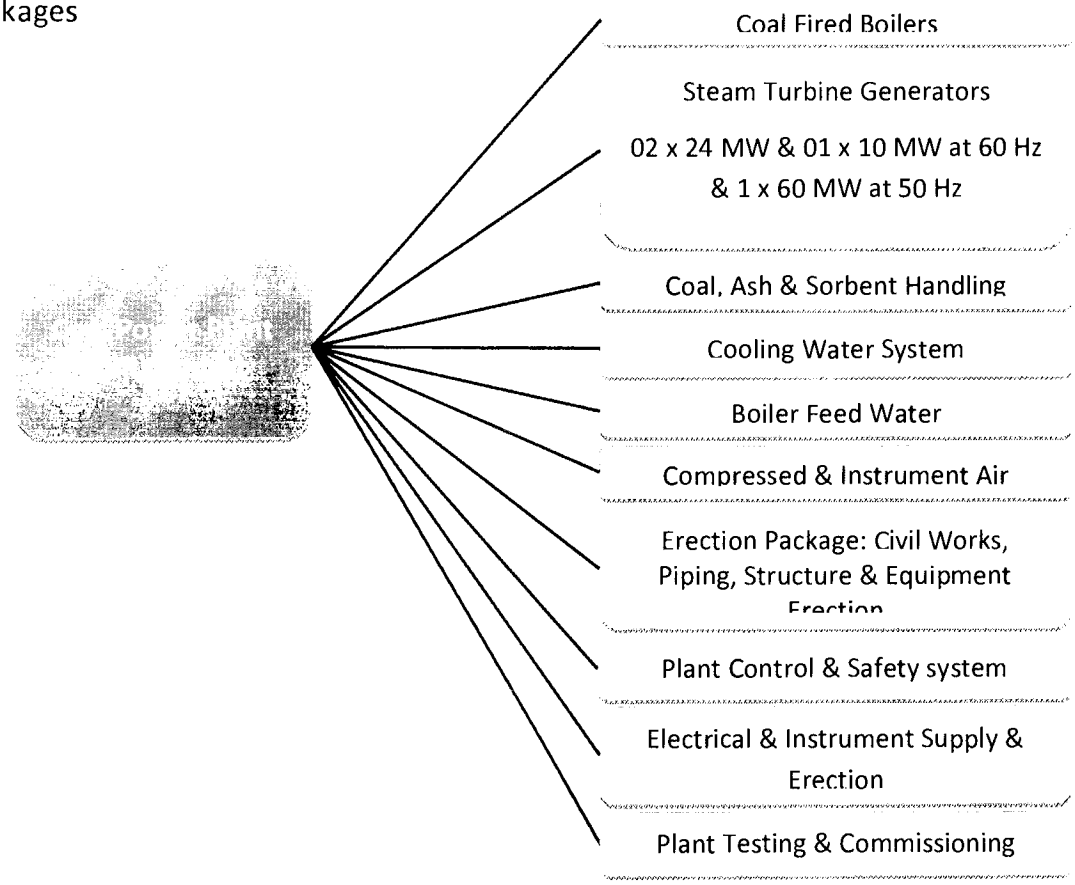
2.3.3. RAIN

Maximum rainfall recorded in one day	207 mm
For storm water sewer	50mm/h
For waste water treatment	40mm/h
Rainy season period	from June till September
Dry season period	from October till May

3. PROJECT IMPLEMENTATION STRATEGY

3.1. The Project shall be implemented and managed by FFBL on multi-package approach through its experienced project team. The project team has diversified experience of managing similar multi package projects like Balancing Modernization and Revamping of Ammonia & DAP Plants (120 Million USD) along with joint venture Sulphuric and Phos Acid Project in Morocco (240 Million USD). The company has also engaged European based international Engineering Company M/s Istroenergo Group (IEG), Slovakia for the complete project implementation phase, which is responsible for the Overall Detail Engineering, Integration, Technical Tender Documents preparation & evaluation, project scheduling and comprehensive site supervision services thru its experts during erection, commissioning and performance testing phases. In this regard, the initial pre-feasibility was carried by FFBL team and following internal approval the conceptual and basic design study was carried out by M/s Tractebel Engineering, Belgium. The project design, configuration, boiler technology and other key features were finalized during the conceptual study.

The Non EPC multi-package approach will include in particular the following main packages



3.2. The project consists of following main facilities:

3.2.1. Circulating Fluidized Bed (CFB) Boiler

3.2.1.1. Two (02) equal capacity CFB Boilers of 250 MTPH of steam production capability.

3.2.1.2. Boilers which can burn coal having variety of characteristics,

3.2.1.3. Flue gas de-dusting and treatment equipment,

3.2.1.4. Bottom ash and fly ash handling equipment.

3.2.2. Power generating equipment (Steam Turbine Generators)

3.2.2.1. Two (02) x 24 MW condensing and (01) x 10 MW back pressure Steam Turbine Generators on 13.8kV at 60 Hz for Power Requirement of FFBL & FPCL.

3.2.2.2. One (01) x 60 MW Steam Turbine Generator on 11kv, 50 Hz for Power Export to K-Electric or Bulk Power Consumers.

3.2.3. Coal Handling Plant of 200 MTPH capacity featuring efficient and reliable operation.

3.2.4. Sorbent (Limestone) Handling Plant.

3.2.5. Highly Reliable Ash Handling System.

3.2.6. Mechanically Induced Draft Cooling Water System with 18,000 MTPH Circulation Rate.

3.2.7. Condensate and Boiler Feed Water & Pumping System to meet 500 MTPH Steam Production Rate.

3.2.8. Civil Works including Equipment Foundations, Control Room, Sub-stations, Buildings, Roads and Stack.

3.2.9. Local and remote Instrumentation.

3.2.10. Plant Control and Safety System.

3.2.11. Electrical Equipment & Devices.

3.2.12. Compressed Air System

3.2.13. Emergency Diesel Generator System.

3.2.14. Fire Fighting & Protection System

4. FUEL AND EMISSIONS

4.1. FUEL

4.1.1. The Project expects to utilize approximately 470,000 MT/annum (for 310 days of operations) of coal (as per required specifications). The Project boiler technology allows use of different quality of coals including imported and indigenous coal. However, at present, the coal is expected to be imported for the project as the Company sees no issues with the availability of quality coal as per required specifications in the international market. Use of indigenous coal as when reliably available can be used. Given the proximity of the Project to the port, the Project expects to utilize either the existing facilities of the Karachi Port Trust (KPT) or the upcoming Pakistan Bulk Terminal facilities for coal receiving and handling.

4.1.2. In order to mitigate any fuel availability risk the Project includes a coal storage yard of 60,000MT storage, which is sufficient for 40 days operation at 100 % plant load.

4.1.3. The basic characteristics of coal range which can be utilized by the project are as under:

Coal Characteristics	
LHV	4800 ~ 6100 Kcal/kg
Moisture	9 ~ 26 %
Ash	10 ~ 23 %
Volatile matters	27 ~ 39 %
Sulphur	1 ~ 3 %

4.2. EMISSION LIMITS

4.2.1. The whole installation will be in accordance to the World Bank Guidelines (WBG) and Pakistan National Environmental Quality Standards (NEQS). The project will be designed to remain within the following emissions limits:

Emission Limits (dry at 6% 02)	
NOx	510 mg/Nm3
SO_2	1,500 mg/Nm3
Dust	50 mg/Nm3
CO	800 mg/Nm3

4.2.2. Taking into account the technology of the boiler and the use of international coal, this limit of emission values will be achieved thru in-situ limestone injection in CFB boiler and do not require additional / external wet flue gas (WFG) de-sulphurization.

5. TECHNICAL CHOICES

5.1. BOILER

5.1.1. The boiler considered is Circulating Fluidized Bed (CFB) Boiler.

5.1.2. The design of the boiler was selected after a detailed techno-economical comparison of available coal-fired boiler technologies for this particular project, taking into account the power requirement, as well as investment cost, emissions requirements, performances, coal selection & the equipment expected reliability.

5.1.3. Two main technologies for boiler burning coal were envisaged for the FFBL Power Company Limited (FPCL) namely

5.1.3.1. Pulverized Coal (PC) Boiler

5.1.3.2. Circulating Fluidized Bed (CFB) Coal Boiler.

5.1.4. Circulating Fluidized Bed (CFB) Boiler Technology is being employed due to its ability to provide improved thermal efficiency and its excellent ability to burn a wide range of coals from international to local as well as bituminous to sub-bituminous through the same boiler. This technology will allow the Project to utilize different quality of coals i.e., including utilization of local coals. Therefore, providing more flexibility of operation.

5.1.5. Other commercially proven characteristics include

5.1.5.1. Coal is only crushed to (< 10mm) before burning. Due to larger coal size, combustion time is higher as compared to fine powder coal used in PC boiler

5.1.5.2. Wide range of Coal and Solid fuels can be burnt including:

a. Bituminous to Lignite

b. Anthracite & Petro-coke

5.1.5.3. No need for separate FGD. SOx removal is carried out by injecting limestone (CaCO3) in boiler.

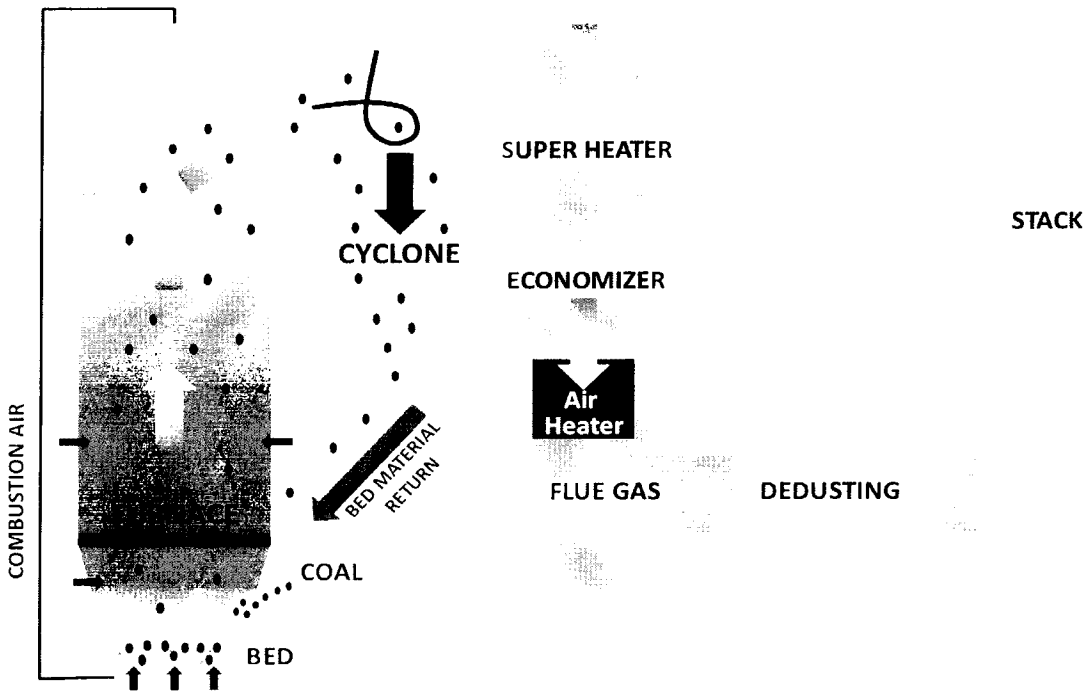
5.1.5.4. Due to lower combustion temperature no SCR required.

5.1.5.5. Medium temperature i.e. 800-900 oC.

5.1.5.6. Good Turn Down Factor (40 to 100 % Operation)

5.1.5.7. No Ash slagging

5.1.5.8. Bottom ash removal system is of simple chute system



Circulating Fluidized Bed Boiler

5.2. STEAM TURBINE GENERATORS

5.2.1. The turbines are single shaft, and the configuration consists of three (03) condensing turbines and one (01) backpressure turbine.

5.2.2. STGs rating and configuration were evaluated on multiple levels of available STG technologies to select the optimum STG configuration. The design & configuration of the STG for this particular project was finalized, taking into account the power requirement of the FFBL and export to K-

Electric, as well as investment cost, performances & the equipment expected reliability.

5.2.3. Two (02) x 24 MW Condensing STG's & one (01) x 10 MW backpressure turbine on 60Hz are finalized for in-house use and export to FFBL.

5.2.4. One (01) x 60 MW Condensing STG at 50Hz for export to K-Electric / other bulk consumers.

6. EXPECTED POWER PRODUCTION

6.1. Hereafter is indicated the awaited installed power generation facilities:

6.1.1. Power Plant for FFBL & FPCL Auxiliary Consumption:

6.1.1.1. 02 x 24 MW condensing STG and 01 x 10 MW backpressure STG at 60 Hz

6.1.2. For Power Export

6.1.2.1. 01 x 60 MW condensing STG at 50 Hz

	Units	
Primary Fuel		Coal
Reference Coal LHV	Kcal/kg	5,925
Total Steam Generation from two (02) CFB Boilers	TPH	500
Boiler efficiency at reference Coal	%	92
Coal consumption	TPH	~ 62.8
Power Installed	MW	118

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PROSPECTUS

Introduction of the Company

FFBL Coal Power Company Limited (FCPCL) is an unlisted public limited Company incorporated under Section 32 of the Companies Ordinance 1984 (XLVII of 1984) on 27th June 2014 having corporate Universal Identification No. 0088996. The Memorandum of Association of the Company include, inter alia, generation of electricity and supply thereof.

FPCL is a wholly owned subsidiary of Fauji Fertilizer bin Qasim Limited. FFBL is a public limited company incorporated in Pakistan under the Companies Ordinance, 1984, and its shares are quoted on the Karachi, Lahore and Islamabad stock exchanges in Pakistan.

Salient Features of the Facility

The coal power plant (CPP) of FPCL will be located at Port Qasim, Karachi in the province of Sindh, on approximately 50 acres of land within the existing Fauji Fertilizer Bin Qasim (FFBL) Fertilizer Complex. The Project will be capable of generating 500 Tons Per Hour (TPH) steam through two (02) equal capacity Circulating Fluidized Bed (CFB) high-pressure coal-fired boilers. The Installed capacity of the Project shall be 118 MW. Salient features of the facility are as follows:

Plant Location	Plot No. EZ/I/P-1 Eastern Industrial Zone, Port Qasim, Karachi 75020
Type of Facility	Coal Fired Thermal Power Plant
Fuel	Coal
Proposed Buyer	FFBL , K-Electric and/or Bulk Power Consumers
Total Gross Installed Capacity	118 MW
Plant Configuration	2 x 24 MW & 1 x 10 MW (60 Hz) 1 x 60 MW (50 Hz)
Life of facility	30 years

FPCL
FFBL Power Company Limited

Proposed Investment

Total Project Cost:	US $ 265.0 Million
Debt (75%):	US $ 198.75 Million
Equity (25%):	US $ 66.25 Million

The total Project cost is estimated at USD265 million which is to be financed based on a 75:25 Debt to Equity Ratio. Equity will be contributed by Project Sponsor FFBL. PKR debt is proposed to be financed on a non-recourse project finance structure from various financial institutions. The project is financially feasible in terms of its ability to service its required debt obligations for the loan period.

The Company is already in discussion with various financial institutions for acquiring financing for the project and lead arranger mandate is expected to be finalized in Q4 2014 with Financial Closing expected in 2015.

Social and Environmental Impact of the Proposed Facility

FPCL has carried out a detailed Environmental Impact Assessment Study ("EIA Study") through M/s Hagler Baily in accordance with the standards and requirements of the World Bank / International Finance Corporation and National Environmental Quality Standards. EIA Study was submitted to the Sindh Environmental Protection Agency ("SEPA") for its approval.

Public and Technical hearing was conducted by SEPA and NOC from SEPA was granted to the project in September 2014 (see attachment-I).

FPCL remains committed to environmental compliance in its operation and will develop processes and programs to proactively prevent and mitigate any possible adverse impacts on the environment.

2014/03/04/EIA/05

Date: 18th September, 2014

SUBJECT: DECISION ON ENVIRONMENTAL IMPACT ASSESSMENT (EIA).

1. **Name & Address of Proponent:** Chief Executive Officer,
   Fauji Fertilizer Bin Qasim Limited (FFBL) Coal Power Plant.

2. **Description of Project:** Construction and Operation of 110~120 MW Coal Power Plant (CPP) Project at Existing FFBL Fertilizer Complex including power export to national grid

3. **Location of Project:** Plot # EZ/I/P-1, Eastern Industrial Zone, Bin Qasim, Karachi.

4. **Date of Filing of EIA:** 24th February 2014

5. After careful review of the Environmental Impact Assessment (EIA), the Sindh Environmental Protection Agency (SEPA) accords its approval subject to the following conditions:-

   i) All mitigation measures recommended in the EIA report should be complied with, for achieving negligible impacts on physical, biological, environmental and socio-economic resources of the area. Sindh Environmental Quality Standards (SEQS) for ambient air quality, noise, industrial emissions, wastewater and drinking water shall be followed in letter and spirit. Decantation basin, as proposed in the EIA, shall be installed for the treatment and reuse of water coming from the coal storage and handling areas.

   ii) The proponent shall engage Independent Environmental Monitoring Consultant (IMC) on the basis of clearly defined criteria including their experience and resources, to ensure monitoring of the project's compliance with the EMP, and to document the status of the project environment during the construction phase at end of every month starting from the inception of project. These monitoring records may be used for compliance purposes as legal records of environmental performance. The Monitoring firm's terms of reference will define a clear work plan, including monitoring indicators, reporting structures and time lines. The firm engaged for independent monitoring will report its findings directly to the CEO or designated person of FFBL for onward submission to SEPA.

Attachment - I

iii) Dense belt of trees would be planted in and around project areas that will serve as dust arresters for the fugitive dust. Dust suppression and extraction system will be provided to minimize the impact of coal dust.

iv) The dust collection or suppression system will be provided for transfer tower, crusher house, and coal bunkers. Wash down systems will be provided in transfer tower, crusher house, tunnels and trestles. Water spray will be provided in coal storage yard. Coal conveyers will be equipped with bag house at suitable intervals to capture the coal dust formed within the enclosed conveyers. To reduce emission of dust from coal pile, Wind breaker or some other appropriate measures will be around the coal piles.

v) Bag filters or adequate technology will be installed to limit the outlet emission of particulate matter. Boilers shall be equipped with low NOx burner systems to achieve the NOx emission limits within NEQS limits during normal operation. Boilers will be designed with sufficient over fire air to further improve NOx control. High combustion efficiency will be achieved by ensuring proper air to fuel ratios and providing adequate turbulence and residence time for combustion of fuels within the furnace, thus ensuring compliance with the permissible emission levels for residual carbon monoxide.

vi) Measures will be taken to minimize soil contamination. Contaminated soil will be immediately collected to minimize the volume of contaminated soil. Appropriate disposal method will be employed, however, until an acceptable method is found the contaminated soil will be stored at the site in secure containers. It will be ensured that storm water from the surrounding areas does not enter the construction site and pass to the sea water.

vii) Fuels, oils and other chemicals should be handled in such a manner to avoid spills and leakage. A contingency/emergency response plan should be developed to immediately encounter any mishap, fire etc., and should be in place 24 hours a day to handle any type of emergency. All environment and safety instructions shall be displayed in bold, at a number of places of the operating sites. Warning boards shall be erected at appropriate places.

viii) The nature of proposed activity in an environmentally sensitive area warrants adherence with the Environmental Management Plan (EMP) and its effective monitoring. The implementation of EMP would be sole responsibility of the proponent. The mitigation measures recommended in EIA report should be complied without fail. For this purpose, EMP should be strictly implemented to achieve negligible and reversible resource impacts. Monitoring reports generated by IMC of the whole operation should be submitted to EPA, Sindh, on monthly basis.

ix) Employment should be provided to local people and assured for unskilled jobs. Skilled jobs shall be given to locals after providing them proper field training,

where a minimum training is required. Local peoples should be provided with community welfare schemes i.e. educational programs, and establishment of health units etc., which should benefit them and develop mutual trust. Sustainability of these facilities should be ensured.

x) A complete code of Health, Safety and Environment (HSE) shall be developed which should include efficient parameters at specific work place. For this purpose HSE setup should be established and supervised by a designated HSE officer at the senior level with sufficient administrative and technical authority to perform the designated functions. Proponent will make sure that the operating instructions and emergency actions are made available to every worker / labor at the site.

6. The proponent shall be liable for compliance of Section 13, 14, 17 and 18 of EIA / IEE regulation 2000, which direct for condition for approval, confirmation of compliance, entry inspection and monitoring.
7. The EIA report is meant only for proposed activities described in EIA only. Proponent should submit separate environmental assessment, along with site specific Environment Management Plan for any consequent and subsequent activity for approval of EPA, Sindh.
8. This approval shall not absolve the proponent of the duty to obtain any other approval or consent that may be required under any law in force.
9. This approval shall stand null and void, in case of failure to comply with set forth conditions.

Naeem Ahmed Mughal
Director General

Attachment - I

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COMPANY PROFILE

OUR HISTORY

Fauji Fertilizer Bin Qasim Limited Plantsite is a modern Granular Urea and Di-Ammonium Phosphate (DAP) fertilizers manufacturing complex, located in Eastern Zone of Bin Qasim, Karachi, with Head Office at Harley Street, Rawalpindi.

The company was formally listed with stock exchanges in May 1996 and commercial production commenced w.e.f. Jan 2000. One of the milestones in the success of FFBL is its accreditation of ISO certification, which was achieved in Mar 2006 for both the Head Office and Plantsite.

FFBL also have membership of industry association and trade bodies;

- Rawalpindi Chamber of Commerce
- International Fertilizer Association

PERFORMANCE AND PRODUCTION

FFBL fertilizer complex is state of the art manufacturing facility with advanced Distributed Control System for safe and efficient operation. Design capacity viz-a-viz actual production of Plants is as under:

Manufacturing Plants	Production (Metric Ton / Day)	
	Original	Revised after Revamp
Urea Granular	1670	1920
DAP	1350	2230
Ammonia	1270	1570

OUR DISTINCTION

FFBL is the only fertilizer complex in Pakistan producing DAP fertilizer and Granular Urea thus making significant contribution towards agricultural growth of the country by meeting 45% of the demand of DAP and 13% of Urea in domestic market.

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JOINT VENTURES

1. Pakistan Maroc Phosphore S.A, (PMP) Morocco

Phosphoric Acid, being the main raw material for DAP production is being imported from Morocco. Office Cherifien des Phosphates (OCP), Morocco, the biggest industrial group of Kingdom of Morocco and the Fauji Group (Fauji Foundation, FFC and FFBL) entered into a joint venture to ensure the continuous supply of Phosphoric Acid. Commercial production and shipment to FFBL started in April 2008 and May 2008 respectively. Plant is designed to produce 375,000 MT per year of Phos acid thus meeting the total requirement of DAP plant of FFBL.

2. Fauji Cement Company Limited (FCCL)

The Fauji Cement (FCCL) operates one of the most efficient and well-maintained cement plants in Pakistan which consumes approximately 50% less energy with quicker production turnaround time. Its multi-fuel burning capability allows it to use either natural gas, coal or furnace oil for its operations and further optimizing its fuel efficiency to improve operating margins. FCCL's management is also composed of senior technical personnel with vast experience of local cement sector.

3. Foundation Wind Energy – I Limited

The total investment required for FWEL-I is around US $ 128 million with debt equity ratio of 75%:25%. The Lending for the project is arranged from foreign and local banks with a distribution of 66 % & 34% respectively. Asian Development Bank and Islamic Development Banks are the Lead Foreign Lenders while National Bank of Pakistanis the Lead Local Lender. The equity financing for the project is being arranged by Fauji Foundation (30%), Fauji Fertilizer Bin Qasim (35%) and Cap Asia (A Malaysian Private Equity Firm 35%).

4. Foundation Wind Energy – I Limited

The total investment required for FWEL-II is around US $ 127 million with debt equity ratio of 75 %: 25 %. The Lending for the project is arranged from foreign and local banks with a distribution of 66 % & 34% respectively. Asian Development Bank and Islamic Development Banks are the Lead Foreign Lenders while National Bank of Pakistan is the Lead Local Lender. The equity financing for the project is being arranged by Fauji Foundation (20%), Fauji Fertilizer Bin Qasim (35%), Cap Asia (A Malaysian Private Equity Firm 25%) and Tapal Group (20%).

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FAUJI GROUP ASSOCIATED COMPANIES

- Fauji Fertilizer Company Limited
- Fauji Foundation
- Pakistan Maroc Phosphore S.A

  (Joint Venture between Fauji Group, Pakistan & OCP Group, Morocco)
- Foundation Wind Energy – I
- Foundation Wind Energy – II
- Fauji Cement Company Limited
- Fauji cereals
- Foundation Gas
- Fauji Kabir Wala Power Company Limited
- Foundation Power Company Limited
- Mari Petroleum Company Limited
- Fauji Akbar Portia Marine Terminal
- Fauji Oil Terminal And Distribution
- Foundation Securities (Pvt) Limited
- Askari Bank Limited
- Askari Cement Company

EXPERIENCE IN ELECTRICITY INDUSTRY

FFBL operates state of the art Utilities unit to provide utilities like electrical power, steam, water, nitrogen, instrument and service air to Ammonia, Urea, DAP & Product Handling & Shipment and off site facilities.

This unit is mainly consists of two (02) Gas Turbines supplied by M/s General Electric Mark 5 design, each having capacity of 26.3 MW ISO rating, one (01) Auxiliary boilers supplied by M/s Zurn having capacity of 105 tons/hr, Heat Recovery Steam Generator having capacity of 85 tons/hr by M/s Zurn.

Raw Water Reservoir with 90,000 meter cube storage capacity, 03 Demin water trains supplied by M/s Ecodyne and its Reservoir with 16,600 meter cube storage capacity, 03 Instrument Air Compressors by M/s Atlas Capco, Cooling Tower by M/s GEA USA, Nitrogen storage by M/s Airliqide and 02 X 700 RT Air Conditioning Units by M/s York. All the

equipment is installed outdoor while its operations are controlled from Utilities Control Room (UCR).

The installed Power generating facility is self-sufficient in handling the entire load of the Fertilizer Complex. The plant is being operated and maintained by own highly trained professionals who assure uninterrupted supply of power with minimum outages. During the last ten years of operation, it has achieved the highest rate of availability. All the electrical maintenance works are carried out with in the plant as having a well-established electrical and instrumentation workshop.

FAUJI GROUP OTHER ELECTRICITY BUSINESS

1. FAUJI KABIRWALA POWER COMPANY LTD (FKPCL)

Fauji Kabirwala Power Plant is a 157 MW Combined Cycle Power Plant located near Kabirwala, District Khanewal. Fauji Foundation set up this US $ 170 million plant in collaboration Messrs. EI Paso Energy International, USA (now replaced by Messrs. Pendekar Kabirwala Power Company of Malaysia) with debt equity ratio of 75:25. ADB and EDC of Canada have financed a major portion of the debt

The project commenced commercial operations on 21 Oct 1999 and ever since is supplying power to the National Grid. Subject to availability of gas, expansion in its capacity is also under consideration

The plant is being operated and maintained by own engineers and staff. During the last ten years of operation, it has achieved the highest rate of availability. Based on its performance, the plant has been declared the world's Best Combined Cycle Plant by Siemens / Westinghouse and awarded New Combined Cycle Power Plant of the Year Award for the Years 2000, 2001, 2002 and 2004.

2. FOUNDATION POWER COMPANY DAHARKI LTD (FPCDL)

The Fauji Foundation had registered with PPIB, for setting up a 178MW Gas Based Power Plant in Daharki (Sindh) in April 2004. Foundation Power Company Daharki Limited (FPCDL) was thus incorporated in November 2005. The Foundation Stone laying ceremony was presided over by the then President of the Islamic Republic of Pakistan, General Pervez Musharraf, NI(M), TBt, on 24 May 2007 at Daharki. Construction work started in October 2007 under M/s Doosan Heavy Industries and Construction Company of South Korea. The project was financed by a consortium of 14 local banks, led by Askari Commercial Bank Limited. The project cost was approximately US$ 217 million.

The installed Combined Cycle Power Plant (Gas Turbine of GE, USA & Steam Turbine of Fuji, Japan) has a gross output of 202 MW. It employs modern technology under strict

international and environment friendly standards. The fuel source, from Mari Deep Well No. 6, has low BTU gas, which is otherwise unsuitable for domestic and industrial uses. By the Grace of Almighty Allah, the plant is fully operational since May 2011 and contributing 178MW electricity to the National Grid at comparatively lower cost than other IPPs. This output is sufficient to illuminate 250,000 urban homes, or meet the needs of 70 medium sized industrial units, or 1,500 small sized villages.

FPCDL entered into an agreement with KEPCO KPS Plant Services and Engineering Company Limited of South Korea for Operation and Maintenance.

The registered office of the Company is located at Fauji Towers, 68-Tipu Road, Chaklala, Rawalpindi.

3. FOUNDATION WIND ENERGY – I LIMITED

In light of its vision of diversification, Fauji Foundation initiated acquisition process of Beacon Energy Limited (BEL), 50MW wind energy project. After successful due diligence process, Fauji Foundation, in a private deal, acquired 100% shareholding in Beacon Energy Limited.

Beacon Energy Limited (BEL) was set up by the Beacon house Group (Kasuri family) for developing a 50 MW wind energy project. In 2005 BEL was awarded a development license by the AEDB for the construction and operation of a 50 MW wind farm near Karachi.

After acquisition, name of the company has been changed to Foundation Wind Energy-I Limited (FWEL-I).

FWEL-I project site is located at Khutti Kun New Island in the Taluka Mirpur Sakro of Thatta District. Project lies within the wind corridor identified by AEDB for commercial wind projects. The Government of Sindh, through AEDB, has allocated Land to the project. The total site land area is 1210 acres.

Fauji Fertilizer Company limited (Subsidiary of Fauji Foundation) is also developing a 50 MW Project in Jhampir, District Thatta Sindh.

The total investment required for FWEL-I is around US $ 128 million with debt equity ratio of 75%:25%. The Lending for the project is arranged from foreign and local banks with a distribution of 66 % & 34% respectively. Asian Development Bank and Islamic Development Banks are the Lead Foreign Lenders while National Bank of Pakistanis the Lead Local Lender. The equity financing for the project is being arranged by Fauji Foundation (30%), Fauji Fertilizer Bin Qasim (35%) and Cap Asia (A Malaysian Private Equity Firm 35%).

The Engineering, Procurement and Construction (EPC) Contract of FWEL-I was successfully signed off on August 23, 2011 with M/s Nordex Germany (Lead) & M/s Descon Engineering Limited consortium. The EPC cost is USD 111 million.FWEL-I is to install 20 Nordex (Model N-100) wind turbine generators. Each turbine has an individual capacity of generating 2.5 MW. The electricity generated will be sold to the Central Power Purchasing Agency (CPPA) at 132 KVA National Transmission and Despatch Company (NTDC) Thatta grid station.

The Onshore Contractor, M/s Descon Engineering Limited and M/s Descon Integrated Projects Limited have been mobilized on site, since December 2011, for executing the preliminary works for project development. FWEL-I is targeting to achieve financial close by September 2012. Main works related to construction and erection of wind turbines are to commence right after financial close and will be completed within 15 months' time. The Commercial Operation of FWEL-I is expected in 4th Quarter of 2013. FWEL-I is also working with Alternative Energy Development Board (AEDB) for seeking carbon credit benefits.

4. FOUNDATION WIND ENERGY - II (PRIVATE) LIMITED

FWEL-II project site is located at KhuttiKun New Island in the Taluka Mirpur Sakro of Thatta District. Project lies within the wind corridor identified by AEDB for commercial wind projects. The Government of Sindh, through AEDB, has allocated Land to the project. The total site land area is 1656 acres.

Fauji Fertilizer Company limited (Subsidiary of Fauji Foundation) is also developing a 50 MW Project in Jhampir, District Thatta Sindh.

The total investment required for FWEL-II is around US $ 127 million with debt equity ratio of 75 %: 25 %. The Lending for the project is arranged from foreign and local banks with a distribution of 66 % & 34% respectively. Asian Development Bank and Islamic Development Banks are the Lead Foreign Lenders while National Bank of Pakistan is the Lead Local Lender. The equity financing for the project is being arranged by Fauji Foundation (20%), Fauji Fertilizer Bin Qasim (35%), Cap Asia (A Malaysian Private Equity Firm 25%) and Tapal Group (20%).

The Engineering, Procurement and Construction (EPC) Contract of FWEL-II was successfully signed off on August 23, 2011 with M/s Nordex Germany (Lead) & M/s Descon Engineering Limited consortium. The EPC cost is USD 110 million. The electricity generated will be sold to the Central Power Purchasing Agency (CPPA) at 132 KVA National Transmission and Dispatch Company (NTDC) Thatta grid station.

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Public Hearing for Tariff determination with National Electric Power Regulatory Authority (NEPRA) was held on Oct 18, 2011. FWEL-II was awarded Tariff by NEPRA on March 16, 2012.

The Onshore Contractor, M/s Descon Engineering Limited and M/s Descon Integrated Projects Limited have been mobilized on site, since December 2011, for executing the preliminary works for project development. FWEL-II is targeting to achieve financial close by September 2012. Main works related to construction and erection of wind turbines are to commence right after financial close and will be completed within 15 months' time. The Commercial Operation of FWEL-II is expected in 4thQuarter of 2013. FWEL-II is also working with Alternative Energy Development Board (AEDB) for seeking carbon credit benefits.

24th September, 2014
Ref: KE/BD/FFBL/240814

Project Manager (CPP)
Head Office
Fauji Fertilizer Bin Qasim Limited (FFBL)
73- Harley Street,
Rawalpindi

Sub: <u>Vetting of Grid Interconnection Study Report (Load Flow Study Report) For 60 MW Coal Based Power Project at FFBL, Port Qasim, Karachi.</u>

This is with reference to your office letter No. FFBL/CPP/KE 08-29-14 dated 29 August 2014. We have reviewed the subject final draft Interconnection Load Flow Study Report of 60MW coal based power project at FFBL at Port Qasim, Karachi. In this regard, it is to state that the results of the load flow study subject Grid Interconnection Study Report have been found appropriate.

You may proceed further.

Sincerely,

Aamir Rizwan
Deputy Director, Business Development.
K- Electric, Karachi

Copy to:
Deputy Chief Transmission Officer, K-Electric, Karachi
Deputy Director, PID, K- Electric, Karachi

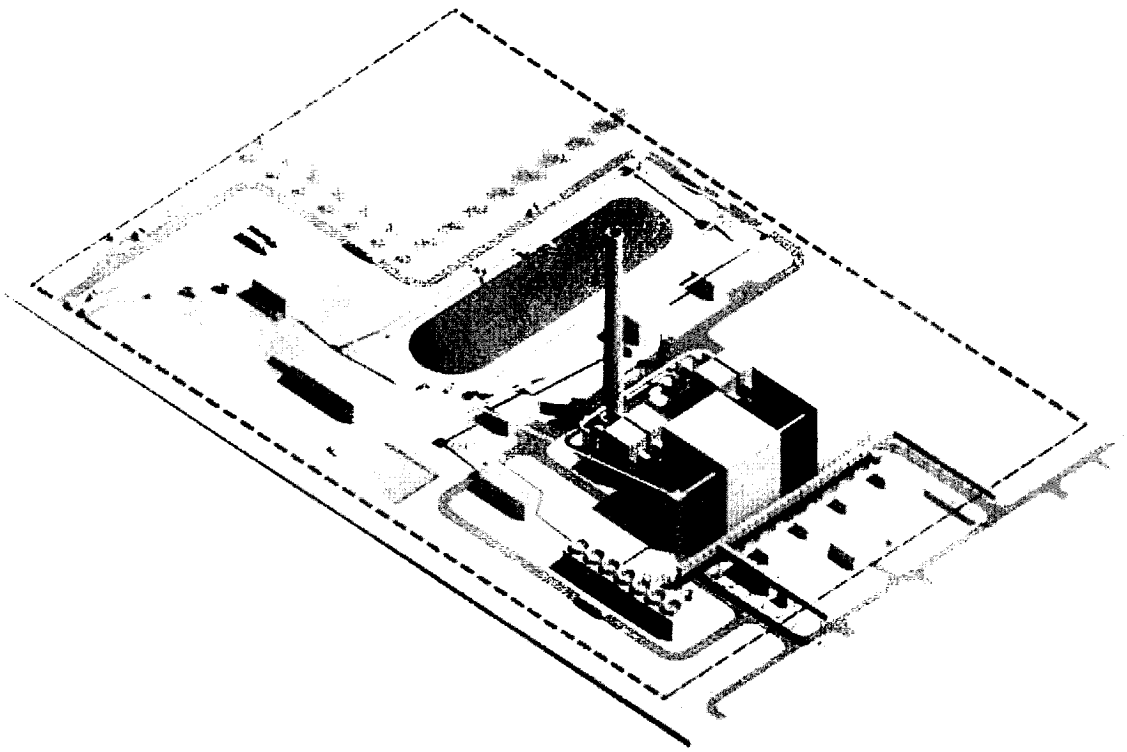
GRID INTERCONNECTION STUDY

For

FFBL 60MW Coal Power Project

At

Bin Qasim Industrial Estate, Karachi



Final Draft Load Flow Study
(August - 2014)

Prepared by
OMS (Pvt.) Ltd.

251-CCA, Block-FF, Phase-IV,DHA, Lahore, Pakistan.
Phone: +92-42-35748650-55-60 Fax: +92-42-35748665
Website: www.omsltd.net

Executive Summary

1. Fauji Fertilizer Bin Qasim Limited (FFBL) intends to set up a coal power plant (CPP) comprising of a steam generator with rated output capacity of 60MWat FFBL site, Bin Qasim Industrial Estate, Karachi. The location of the proposed power project is adjacent to the 132 kV Dhabeji – BOC 132 kV single circuit line which lies in the system network of K-Electric (formerly known as KESC). FFBL hired the services of M/s OMS (Pvt.) Ltd. to carry out grid interconnection study in order to propose interconnection scheme for evacuation of power from the FFBL proposed 60 MW coal Power Plant to the K-Electric system network.

2. This is Report-3 (Final Draft Report) of the grid interconnection load flow study in which the results of the load flow and contingency studies have been presented for the connectivity of FFBL 60 MW coal power project with the K-Electric network. In Report-1, the results of load flow analysis with the addition of FFBL coal power project with three capacity options (50 MW, 70 MW and 100 MW) were presented. In Report-2, the results of the load flow and short circuit studies were presented for the connectivity of FFBL 55 MW coal power project with the K-Electric network.

3. In order to conduct the grid interconnection study, the required basic input data of the existing K-Electric network including power plants, grid stations, transmission lines, load demand etc. has been obtained from M/s K-Electric, whereas, the data of the FFBL power project including generator and step-up transformer has been provided by M/s FFBL. The data has been reviewed and processed to make the computerized model of K-Electric network in PSS/E software to carry out the system analysis. Considering the requirement of this study, the complete 220kV network and the 132 kV network of K-Electric Grid in the surrounding of FFBL power project have been modeled.

4. The following interconnection scheme has been proposed for evacuation of power from FFBL 60 MW coal power project to the K-Electric Network:

   "Looping in-out of the existing 132 kV Dhabeji – BOC 132 kV single circuit at the switchyard of FFBL power project through 132 kV double circuit line of about 0.8 km".

5. The load flow simulation has been carried out by modeling and matching the existing system scenario as received from M/s K-Electric. In this simulated model, loads and power factors at the 132 kV grid stations have been modified in the light of comments received from M/s K-Electric (this scenario is termed as Base case). Then, further simulations and detailed analysis have been carried out on the same Base case with the addition of 60 MW FFBL power project using the above proposed interconnection scheme for evacuation of power to the K-Electric network.

6. The load flow simulations revealed that the power from FFBL 60 MW coal power project can be evacuated to the K-Electric network during normal and N-1 contingency conditions without any overloading or any other network constraints.

7. The impact of the FFBL 60 MW coal power project with the proposed interconnection scheme on K-Electric network has been studied in detail. The benefits of FFBL power project to the K-Electric have also been computed which mainly include:

   - Additional source of power supply in the surrounding network of FFBL power project for BOC, Dhabeji, Gharo, RECP, Pipri West, Pipri East etc.
   - Improvement in voltage profile, especially at grid stations in the surrounding of FFBL power project, due to reactive power supply from FFBL project.
   - Reduction in transmission line losses of K-Electric network.
   - Reduction in loading and losses of 220/132 kV auto-transformers at Pipri West.
   - Reduction in loading and losses of 220 kV circuits from Bin Qasim power plant to Pipri West.
   - Improvement in system reliability in the surrounding of FFBL power project.
   - Improvement in power supply position of K-Electric network.
   - Reduction in load shedding equivalent to the FFBL project capacity.

8. Short circuit and transient stability studies will be carried out after receipt of the detailed data for FFBL 60 MW steam turbine generator of the selected equipment supplier by M/s FFBL and their results will be submitted in the next (final) report.

9. It has been concluded on the basis of load flow and contingency study results that the K-Electric network has sufficient capacity to absorb the power from FFBL 60 MW coal power project and the power from this power project can reliably be evacuated to the K-Electric network under normal and N-1 contingency conditions without any transmission constraints or any adverse effect on the K-Electric network.

Table of Contents

1. Introduction

Fauji Fertilizer Bin Qasim Limited (FFBL) intends to set up a coal power plant (CPP) comprising of a steam generator with rated output capacity of 60 MW at FFBL, Bin Qasim Industrial Estate, in Karachi. The location of the proposed power plant is adjacent to the 132 kV Dhabeji–BOC 132 kV single circuit line which lies in the system network of K-Electric.

FFBL has hired the services of OMS (Pvt.) Ltd. to carry out grid interconnection study in order to propose interconnection scheme for evacuation of power from the FFBL proposed 60 MW coal power plant to the K-Electric system network.

This is Report-3 (Final Draft Report) of the grid interconnection load flow study in which the results of the load flow and contingency studies have been presented for the connectivity of FFBL 60 MW coal power project with the K-Electric network. In Report-1, the results of load flow analysis with the addition of FFBL coal power project with three capacity options (50 MW, 70 MW and 100 MW) were presented. In Report-2, the results of the load flow and short circuit studies were presented for the connectivity of FFBL 55 MW coal power Project with the K-Electric network.

The impact of the FFBL 60 MW coal power Project through the proposed interconnection scheme on the K-Electric network has been studied in detail and presented in this report.

2. Objectives, Scope of Work and Steps in Execution of Interconnection Study

2.1 Study Objectives

The system studies have been carried out for the interconnection of FFBL 60 MW coal power project with the K-Electric network with the following objectives:

1. To propose an interconnection scheme for reliable evacuation of power from the FFBL coal power Project.
2. To determine the impact of the FFBL coal power Project on K-Electric network.
3. To evaluate the benefits of FFBL coal power Project to the K-Electric network.

2.2 Scope of Work

The scope of work of the grid interconnection study for FFBL 60 MW coal power project mainly includes:

1. Interconnection Study Report (Part-1) based on load flow analysis for the addition of FFBL power project with three generation capacity options (50MW, 70 MW & 100 MW) in K-Electric network.
2. Interconnection Study Report with the selected size of FFBL power project
3. Short circuit studies with the addition of FFBL power project to calculate the maximum short circuit levels under possible fault conditions, including, three phase and single phase, at the bus bar of FFBL power project and other surrounding substations in the K-Electric network.
4. Transient stability studies with the addition of FFBL power Project. To observe the dynamic response of FFBL power project and the K-Electric system network in time domain after subjected to severe disturbances.

   "The results of the short circuit and transient stability studies would be presented in the next (final) report after receipt of the detailed generator data for FFBL 60 MW coal power project."

2.3 Steps in Execution of this Interconnection Study Report

The steps in execution of this grid interconnection study Report for FFBL coal power project are presented as under:

1. Collection and review of data/information of K-Electric network, received from M/s K-Electric and data of FFBL power project received from M/s FFBL
2. Processing of data of K-Electric network and FFBL power project according to the input format of PSS/E software
3. Load flow simulation to model the existing system scenario of K-Electric network provided by M/s K-Electric.

4. Load flow studies for normal and contingency conditions with FFBL 60 MW power project. to:
    - Propose and determine the suitability of the proposed interconnection scheme for reliable evacuation of power from FFBL power project.
    - Determine the impact of FFBL power project on K-Electric network.
    - Evaluate the benefits of FFBL power project to the K-Electric network.
5. Conclusions
6. Report Writing

3. Description of K-Electric System Network

The transmission system of K-Electric mainly comprises of 220 kV and 132 kV networks. There is a very small part of 66 kV network supplying power to Uthal and Bela 66 kV grid stations in Baluchistan which is fed from Baldia via Hub Chowki & Vinder 132 kV circuit & 132/66 kV grid station at Vinder and to another 66 KV Gadap grid which is fed from 132/66 KV Malir grid station. The power plants are located at different parts of the K-Electric network and feed at 220 kV and 132 kV voltage levels. The salient features of K-Electric network are described as under:

1. The 220 kV network comprising of seven grid stations (KDA, Pipri West, ICI, K.C.R, Lalazar, Baldia & Mauripur) and three power plants (BQPS-1, BQPS-2 & Korangi CCP) form the backbone of K-Electric system. The 220 kV network is operated in a ring formation except the faulty Lalazar – Mauripur double circuit line.
2. The 220 kV grid stations feed the 132 kV network through 220/132 kV auto-transformers. The capacity and status of the installed auto-transformers is given as under:

Sr. #	Name of 220kV Grid station	Capacity of the Existing 220/132kV Auto-transformer	Status
1	KDA	3x250 MVA	Operational
2	Pipri West	3x250 MVA	2x250 MVA operational & 1x250 MVA out of service
3	K.C.R	1x250 MVA	Operational
4	Lalazar	2x250 MVA	Operational
5	Baldia	2x250 MVA	Operational
6	Mauripur	1x250 MVA	Operational

3. The 132 kV network is mainly fed from the above 220/132 kV auto-transformers and also from some power plants that feed the network at 132 kV voltage level. The 132 kV network at some places is kept isolated/open by M/s K-Electric to avoid any violation of system operational limits.
4. Presently There is a big transmission bottleneck in K-Electric network as one of the 220/132 kV auto-transformer (1x250 MVA) out of three 220 /132 KV auto-transformers (3X250 MVA) at Pipri West grid station is out of service. Due to this bottleneck, the outage of any one of the remaining two auto-transformers at Pipri West may overload and trip the third one as well.
5. The 220 kV network of K-Electric is also connected with NTDC network at two points: (a) KDA – Jamshoro 220 kV double circuit line; and (b) A 220 kV double circuit line from NKI looped in-out at Baldia – KDA single circuit forming NKI –

Baldia & NKI – KDA 220 kV single circuits.

6. K-Electric network gets power import to the tune of 650 MW from NTDC through above 220 kV links. The magnitude of power flows on these 220 kV inter-ties lines vary as per generation dispatch pattern in NTDC and K-Electric systems.

7. Pipri West 220/132 kV substation feeds two 132 kV substations, namely, Pipri East and Pipri West through 250 MVA 220/ 132 KV auto-transformers. Pipri West and Pipri East are connected through two 132 kV circuits of 0.5 km length each. PASMIC power plant is connected with Pipri East 132 kV switchyard whereas through Pipri West feeds many 132 kV grid stations (K.Town, KEPZ, Port Qasim, Landhi & onwards) through 132 kV circuits.

8. The 132 kV network that lies in the surrounding of the proposed FFBL power project, is fed from Pipri West 220/132 kV grid station radially and the technical data of the 132 kV transmission lines is presented as under:

Sr. #	132 kV Single Circuits	Conductor Size	Circuit Length (km)	De-rated Circuit Capacity	
				(Amps)	(MVA)
1	Pipri West -RECP	240mm² Cu + 400mm² Cu	5.5 + 4.12 = 9.62	569	130.1
2	Pipri West -BOC	400mm² Cu	9.5 + 6.74 = 16.24	750	171.5
3	BOC-Dhabeji	400mm² Cu	6.74 + 11.9 = 18.64	750	171.5
4	Dhabeji-Gharo	400mm² Cu	12.6	750	171.5
5	RECP-Gharo	240mm² Cu + 400mm² Cu	5.5 + 29.63 = 35.13	569	130.1

4. Data Collection, Review and Processing

The load flow studies for the grid interconnection of FFBL 60 MW coal power project has been carried out by using "Power System Simulator for Engineering (PSS/E)" software, the most widely used software worldwide for transmission system analysis.

In order to conduct the grid interconnection study, the PSS/E electronic model of the K-Electric system network was not provided as the same was not available with M/s K-Electric. Therefore, on the request of OMS (Private) Ltd. K-Electric provided the, required basic input data of the existing K-Electric network including power plants, grid stations, transmission lines, load demand etc. The data of the FFBL power project has been provided by M/s FFBL.

The information/data of K-Electric network was reviewed and through some interactions with M/s K-Electric was finalized wherever there were some missing information and/or clarifications required. This data has been processed to make the computerized model of K-Electric network into the requisite format of PSS/E software.

Considering requirement of this grid interconnection study, the complete 220 kV network and only that necessary 132 kV part of K-Electric network which lies in the surrounding of FFBL power project has been processed and modeled in PSS/E software. Since this study is with respect to interconnectivity aspects of a 60 MW power project which has no impact on the other parts of K-Electric network except to its surrounding network, therefore, the entire network of K-Electric has not been simulated.

4.1 FFBL Coal Power Project Data

The design data of the generator and step-up transformer for FFBL power project has been provided by M/s FFBL and is presented below:

Generator Data:

- Net Capacity = 60 MW
- Power Factor = 0.8

Generator Step-up Transformer:

- Rating = 80 MVA
- Reactance (X_{HL})= 15% at 80 MVA base

5. Interconnection Scheme for FFBL Coal Power Project

The objective of this grid interconnection study is to propose a reliable transmission scheme for evacuation of power from FFBL power project to the K-Electric network under normal and single line contingency conditions. Keeping in view the generation capacity (60 MW) of FFBL power project and the existing system network in its neighborhood, the following interconnection scheme has been proposed for the FFBL CPP project:

> *"Looping in-out of the existing 132 kV Dhabeji – BOC 132 kV single circuit at the switchyard of FFBL CPP Project through 132kV double circuit line of about 0.8 km".*

The copper conductor of cross-sectional area of 400mm² (same as of the existing 132 kV Dhabeji – BOC circuit) will be required for the above proposed interconnection of FFBL power project.

6. Load Flow Studies

In this section, the objectives, assumptions and criteria of the load flow studies are presented. Then the results of detailed load flow studies have been presented.

6.1 Study Assumptions

The power flow diagram depicting the existing system scenario of K-Electric network has been obtained from M/s K-Electric which serves as a main source of assumption for the interconnection report. The assumptions for the load flow studies, in general, are presented as under:

1. The complete 220 kV K-Electric network has been modeled and it is assumed as interconnected manner except the 220 kV Lalazar – Mauripur double circuit line as per information obtained from K-Electric.
2. The 220 kV lines linking K-Electric network with NTDC network have also been modeled.
3. Only that 132 kV part of the network which lies in the surrounding of FFBL power project has been modeled as it is fed radially from Pipri West and is not connected with any other part of 132 kV network.
4. Loads (MW & MVAR) at 132 kV grid stations as provided by M/s K-Electric.
5. The loads on other 132 kV circuits fed from Pipri West have been modeled by an equivalent lumped load at the 132kV bus of Pipri West.
6. Generation dispatch and power flows on the 220 kV lines have been kept as per information/data received from M/s K-Electric.
7. The import of power by K-Electric from NTDC has been kept the same in all

scenarios studied in this report as per information provided by K-Electric. Due to un-availability of system data of NTDC, the import of power from NTDC has been represented by generation sources mainly at NKI and Jamshoro.

8. On the above existing scenario model, load flow analysis has been carried out to determine the suitability, impact and benefits of FFBL power project through the proposed interconnection scheme.

6.2 Study Criteria

The load flow studies have been carried out keeping in view the system operating criteria/limits in accordance with Grid Code approved by National Electric Regulatory Authority (NEPRA) in Pakistan. The Grid Code Criteria is given below:

Voltage Limits:	±5% under normal and ±10% under single contingency (N-1) conditions.
Transmission Line Loading Limits:	100% under normal and single contingency (N-1) conditions
Transformer Loading Limits:	100% under normal and single contingency (N-1) conditions.

6.3 Study Scenarios

Load flow studies have been carried out for the following system scenarios:

1. Existing system scenario of K-Electric network on computer has been simulated and matched with the recorded power flow diagram obtained from M/s K-Electric.
2. Base case Scenario: In the above simulated model of K-Electric network for the existing scenarios, loads and power factors at the 132 kV grid stations have been modified in the light of comments received from M/s K-Electric.
3. Addition of FFBL 60 MW power project on the same system condition as of Base case scenario.

The description of the load flow studies is given as under;

6.4 Load Flow Simulation (Existing System Scenario)

First of all, the load flow model has been simulated to represent the existing system scenario according to the power flow diagram of the K-Electric network (attached in Annexure-1). In this scenario, the total import by K-Electric from NTDC was 640MW (630MW from NKI and 10 MW from Jamshoro) has been assumed. The generation dispatch and loads at 220 kV grid stations have been adjusted to match the simulated model on computer as closely as possible to the actual/recorded information provided by M/s K-Electric. The voltage profile at 220 kV and 132 kV grid stations in K-Electric network has also been matched as per power flow diagram depicting existing system scenario received from M/s K-Electric. It is clarified that this load flow scenario is without the proposed FFBL power project.

The load flow study model under normal operating condition is shown as Exhibit #0.0

(attached in Annexure-3). In the load flow study Exhibits, the power flows and voltages are shown as under:

1. On each Bus Bar, the Bus name is shown at the top and Voltage magnitude (in kV) & Angle (in degrees) are shown at the bottom.
2. The bus bar of BQPS has been assumed as swing bus with its voltage angle as 0° and the voltage angles of other buses are shown with respect to BQPS.
3. On each of generator, load, transmission line and transformer, the upper and lower values represent MW and MVAR flows respectively.

The above representations will also be followed in the all the load flow Exhibits of other scenarios.

6.5 Load Flow Simulation (Base case Scenario)

On the above simulated model of K-Electric network, the load demand and power factors of 132 kV grid stations in the surrounding of FFBL power project have been modified in the light of comments received from M/s K-Electric on part-1 of the grid interconnection study report which are presented as under:

Sr. #	Name of 132 kV Grid Station	Load (MW / MVAR)	Load Power Factor
1	BOC	4.4 / 3.3	0.8 lagging
2	Dhabeji	13.3 / 6.4 + 14.1 / 6.8	0.9 lagging
3	Gharo	4.7 / 2.3	0.9 lagging
4	RECP	5.2 / 3.9 + 2.1 / 1.6	0.8 lagging

In addition to above, Dhabeji also feeds Amreli Steel with contract load demand of 28MW/9.2MVAR and Dewan Cement with load demand of 14MW/4.6 MVAR through independent dedicated 132 kV single circuit lines. The load P.F. for both Amreli Steel and Dewan Cement has been assumed as 0.95 lagging as per comments received from M/s K-Electric.

In this system scenario, the total import by K-Electric from NTDC has been kept the same (630MW from NKI and 10 MW from Jamshoro). The loads at 220 kV grid stations have been also been kept the same. There is slight increase in generation of BQPS in accordance with the increase in load demand of 132 kV grid stations as mentioned above. This system scenario is defined as "Base case" which will be used as reference for comparison with the scenario which will include FFBL 60 MW power project. The load flow study model for the base case under normal operating condition is shown as Exhibit #1.0 (attached in Annexure-3).

It can be observed from Exhibit #1.0 that with the increase in load at 132 kV grid

stations in the surrounding of FFBL power project, there is slight increase in power flow on: (a) 220kV circuits from BQPS to Pipri West; (b) 220/132 kV auto-transformers at Pipri West; and (c) 132 kV circuits from Pipri West up to Gharo, and slight decrease in the voltage profile of 132 kV grid stations (Pipri West, Pipri East, BOC, Dhabeji, RECP & Gharo). As a whole, the power flows on the 220 kV & 132kV lines and on 220/132kV auto-transformers as well as the voltage profile of 220kV & 132 kV grid stations in the K-Electric network still are within prescribed Grid Code criteria.

6.6 Load Flow Simulation and Analysis with FFBL Coal Power Project

The detailed load flow analysis has been carried out on the same system scenario with the addition of FFBL coal power project with 60 MW rated output capacity through the proposed interconnection scheme in the K-Electric network. In this scenario, the load demand of the grid stations in K-Electric has been kept the same as in Base case Scenario. The generation dispatch at BQPS has been kept as variable whereas the generation dispatch at other power stations has been kept the same and import from NTDC has been kept as same as in Base case Scenario. Therefore, as compared to Base case Scenario, the generation dispatch of BQPS would reduce by the capacity equivalent to that of FFBL power project.

The load flow study for the normal operating condition with MW FFBL 60 MW power project is represented as Exhibit #2.0& 2.0a (attached in Annexure-3). Exhibit #2.0 depicts the active power (MW) and reactive power (MVAR) flows on the loads, generators, transmission lines and transformers as already mentioned earlier. On the other hand, Exhibit #2.0a depict the active power (MW) & reactive power (MVAR) flows on the loads and generators, and current flows (in Amp.) and %age loading on the transmission lines and transformers to fulfill the requirements of M/s K-Electric as per its comments on part-1 of the report.

The above way of representations will also be followed in the forthcoming study Exhibits for N-1 contingency conditions.

As per load flow study, the power flows and current flows on the 132 kV transmission lines in the surrounding of FFBL power project would be as below:

132 kV Transmission Line	Max. Power Flow (MW)	Max. Current Flow (Amps)	De-rated Line Capacity (Amps)
FFBL Power Project – Dhabeji	59.0	281.6	750
BOC – FFBL Power Project	1.0	18.9	750
Pipri West – BOC	3.4	16.8	750
Gharo –Dhabeji	10.5	49.1	750
RECP – Gharo	15.2	71.0	569
Pipri West – RECP	22.5	106.9	569

The above power and current flows are well within the de-rated capacities of the transmission lines. It is also observed from the study Exhibits that the induction of FFBL 60 MW has resulted in the reduction of power flows on 220 kV lines from BQPS to Pipri West and on 220/132kV auto-transformers at Pipri West, as compared to Base-case Scenario. The voltage profile of the grid stations in the surrounding of FFBL has also improved as compared to Base case Scenario as FFBL power project, in addition to active power supply, would also serve as a source of reactive power supply to the K-Electric network. In general, the power from FFBL 60 MW power project can be evacuated to the K-Electric network under normal operation condition without any transmission constraints.

The impact/benefits of FFBL 60 MW power project to the K-Electric network can be assessed from the following comparative analysis:

(i) Reduction in transmission system losses = 0.37 MW

(ii) Improvement in Voltage Profile of Grid Stations:

Sr. #	132 kV Grid Stations	Voltage at Grid Stations	
		Base case (kV)	60 MW FFBL Power Project (kV)
1	Dhabeji	126.8	130.0
2	BOC	128.2	131.3
3	Gharo	127.3	130.2
4	RECP	128.9	130.9
5	Pipri West	129.5	131.2
6	Pipri East	129.6	131.3
7	PASMIC	129.5	131.2

(iii) Reduction in loading of 220 kV Transmission Lines:

Sr. #	Name of Transmission Line	Line Loading	
		Base case	60 MW FFBL Power Project
1	BQPS - ICI	163.7 MW / 79.3MVAR	148.9 MW / 68.7 MVAR
2	ICI – Pipri West	134.7 MW / 79.3MVAR	119.9 MW / 68.8 MVAR
3	BQPS - Pipri West (Circuit #1)	140.1 MW / 81.7MVAR	124.8 MW / 70.8 MVAR
4	BQPS - Pipri West (Circuit #2)	138.1 MW / 80.4MVAR	123.0 MW / 69.7 MVAR
5	BQPS - Pipri West (Circuit #3)	138.1 MW / 80.4MVAR	123.0 MW / 69.7 MVAR

(iv) Reduction in loading of 220/132 kV Auto-Transformers at Pipri West:

Sr. #	220/132 kV, 250 MVA Auto-Transformer Connected To	Auto-Transformer Loading	
		Base-case	60 MW FFBL Power Project
1	Pipri West	170.6 MW / 108.7 MVAR (81.1%)	140.3 MW / 85.5 MVAR (66%)
2	Pipri East	169.5 MW / 107.7 MVAR (80.5%)	139.5 MW / 84.8 MVAR (65%)

Contingency Analysis

The load flow studies have also been carried out for single line contingency (N-1) analysis in K-Electric network with the addition of FFBL power project. The load flow study Exhibits for N-1 contingency analyses are attached in Annexure-3 and their results are presented as below:

Exhibit # 2.1 & 2.1a: FFBL power project – BOC 132 kV single circuit out

The power & current flows on the 132 kV transmission lines in the surrounding of FFBL power project in this condition as well as de-rated line capacities are presented as below:

132 kV Transmission Line	Max. Power Flow (MW)	Max. Current Flow (Amps)	De-rated Line Capacity (Amps)
FFBL Power Project – Dhabeji	60.0	288.8	750
BOC –Pipri West	4.4	24.2	750
Gharo –Dhabeji	9.6	42.6	750
RECP – Gharo	14.2	64.1	569
Pipri West – RECP	21.6	99.4	569

Exhibit # 2.2 & 2.2a: FFBL power project – Dhabeji 132 kV single circuit out

The power & current flows on the 132 kV transmission lines in the surrounding of FFBL power project in this condition as well as de-rated line capacities are presented as below:

132 kV Transmission Line	Max. Power Flow (MW)	Max. Current Flow (Amps)	De-rated Line Capacity (Amps)
FFBL Power Project – BOC	60.0	282.2	750
BOC –Pipri West	55.5	260.3	750
Gharo –Dhabeji	69.5	349.5	750
RECP – Gharo	75.1	372.8	569
Pipri West – RECP	82.7	409.9	569

Exhibit # 2.3 & 2.3a: BOC – Pipri West 132 kV single circuit out

The power & current flows on the 132 kV transmission lines in the surrounding of FFBL power project in this condition as well as de-rated line capacities are presented as below:

132 kV Transmission Line	Max. Power Flow (MW)	Max. Current Flow (Amps)	De-rated Line Capacity (Amps)
FFBL Power Project – Dhabeji	55.6	269.2	750
FFBL Power Project – BOC	4.4	24.2	750
Gharo –Dhabeji	13.9	62.8	750
RECP – Gharo	18.6	84.5	569
Pipri West – RECP	26.0	120.0	569

Exhibit # 2.4 & 2.4a: Dhabeji – Gharo 132 kV single circuit out

The power & current flows on the 132 kV transmission lines in the surrounding of FFBL power project in this condition as well as de-rated line capacities are presented as below:

132 kV Transmission Line	Max. Power Flow (MW)	Max. Current Flow (Amps)	De-rated Line Capacity (Amps)
FFBL Power Project – Dhabeji	69.6	331.9	750
FFBL Power Project – BOC	9.6	42.6	750
BOC –Pipri West	14.0	62.4	750
RECP – Gharo	4.7	22.9	569
Pipri West – RECP	12.0	58.9	569

Exhibit # 2.5 & 2.5a: RECP – Gharo 132 kV single circuit out

The power & current flows on the 132 kV transmission lines in the surrounding of FFBL power project in this condition as well as de-rated line capacities are presented as below:

132 kV Transmission Line	Max. Power Flow (MW)	Max. Current Flow (Amps)	De-rated Line Capacity (Amps)
FFBL Power Project – Dhabeji	74.3	354.7	750
FFBL Power Project – BOC	14.3	63.2	750
Pipri West – BOC	18.7	83.9	750
Gharo –Dhabeji	4.7	23.2	750
Pipri West – RECP	7.3	40.2	569

Exhibit # 2.6 & 2.6a: RECP – Pipri West 132 kV single circuit out

The power & current flows on the 132 kV transmission lines in the surrounding of FFBL power project in this condition as well as de-rated line capacities are presented as below:

132 kV Transmission Line	Max. Power Flow (MW)	Max. Current Flow (Amps)	De-rated Line Capacity (Amps)
FFBL Power Project – Dhabeji	81.7	392.9	750
FFBL Power Project – BOC	21.7	97.4	750
Pipri West – BOC	26.1	119.3	750
Gharo –Dhabeji	12.0	60.3	750
RECP – Gharo	7.3	41.2	569

It is observed in the study Exhibits that during N-1 contingency conditions, the power and current flows on the 132 kV transmission lines in the surrounding of FFBL power project as well as on the 220 kV transmission lines and 220/132 kV auto-transformers in the K-Electric network remain well within their capacity limits (prescribed Grid Code criteria). The voltage profile of the grid stations remain within prescribed Grid Code criteria during contingency conditions.

6.7 Conclusions of Load Flow Analysis

1. On the basis of study results in normal and contingency conditions, it is concluded that K-Electric network has sufficient capacity to absorb the power from FFBL 60 MW coal power project and the power from the FFBL power project can reliably be evacuated to the K-Electric network without any transmission constraints or any adverse effect on the K-Electric network.
2. The benefits with the addition of FFBL 60 MW power project have been computed and highlighted in the report on the basis of analysis.
3. The analysis and impact/benefits of FFBL power project in the report have been computed by keeping the load demand, import from NTDC and generation dispatch of power plants in K-Electric, same as in Base case scenario, except the generation dispatch of BQPS which would reduce by the same amount as of the generation capacity of FFBL power project.
4. The analysis and impact/benefits of FFBL power project on K-Electric network may also be determined with variation of any of the above assumptions, especially, the variation of load demand in different months of the year. In any case, the K-Electric network would be benefitted with the inclusion of FFBL power project.
5. Presently there is a big transmission bottleneck in K-Electric network as one of the three 220/132 kV (250 MVA) auto-transformers at Pipri West grid station is out of service. Due to this bottleneck, the outage of any one of the remaining two 220/132 kV auto-transformers at Pipri West would lead to overloading and tripping of the third auto-transformer as well. FFBL 60 MW power project may not prevent this situation; however, it can reduce the extent of overloading on the remaining transformer as per its generation capacity. The realistic solution to this problem is to bring the one out of service 220/132 kV auto-transformer back to service at Pipri West.

7. Conclusions

1. On the basis of system analysis, the following interconnection scheme has been found reliable for evacuation of power from FFBL 60 MW coal power project to the K-Electric Network:

   "Looping in-out of the existing 132 kV Dhabeji – BOC 132 kV single circuit at the switchyard of FFBL power project through 132 kV double circuit line of about 0.8 km".

2. The impact of the FFBL power project with the proposed interconnection scheme has been studied on K-Electric network in detail. The benefits of FFBL CPP project to the K-Electric Network mainly include:
   - Additional source of power supply in the surrounding network of FFBL power project for BOC, Dhabeji, Gharo, RECP, Pipri West, Pipri East etc.
   - Improvement in voltage profile, especially at grid stations in the surrounding of FFBL power project, due to reactive power supply from FFBL project.
   - Reduction in transmission line losses of K-Electric network.
   - Reduction in loading and losses of 220/132 kV auto-transformers at Pipri West.
   - Reduction in loading of 220 kV circuits from Bin Qasim power plant to Pipri West.
   - Improvement in system reliability in the surrounding of FFBL power project.
   - Improvement in power supply position of K-Electric network.
   - Reduction in load shedding equivalent to the FFBL project capacity
3. The analysis and impact/benefits of FFBL power project in the report have been computed by keeping the load demand, import from NTDC and generation dispatch of power plants in K-Electric, same as in Base case scenario, except the generation dispatch of BQPS which would reduce by the same amount as of the generation capacity of FFBL power project.
4. The analysis and impact/benefits of FFBL CPP project on K-Electric network may also be determined with variation of any the above assumptions, especially, the variation of load demand in different months of the year. In any case, the K-Electric network would be benefitted with the inclusion of FFBL power project.
5. Short circuit and transient stability studies will be carried out after receipt of the detailed data for the FFBL 60 MW steam turbine generator of the selected equipment supplier by M/s FFBL and their results will be submitted in the next (final) report.
6. It has been concluded on the basis of load flow and contingency study results that the K-Electric network has sufficient capacity to absorb the power from FFBL 60 MW coal power project and the power from this power project can reliably be evacuated to the K-Electric network under normal and N-1 contingency conditions without any transmission constraints or any adverse effect on the K-Electric network.