

January 15, 2020

Ref No. : BSP/SUS/2020/001

SCHEDULE 1
(REGULATION 3(1))
FORM OF APPLICATION

The Registrar,
National Electric Power Regulatory Authority

Subject: **APPLICATION FOR A GENERATION LICENSE**

I, Syed Aslam Mehdi, CEO of Bulleh Shah Packaging {Private} Limited, hereby apply to the National Electric Power Regulatory Authority for the grant of a Generation License to the Bulleh Shah Packaging (Private) Limited¹ pursuant to section 14B 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, 1999², and undertake to abide by the terms and provisions of the above-said regulations 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 Pay Order No. 107043981 dated 10-01-2020 amounting PKR~366,000/- (Rupee Three Hundred sixty six thousand Only) being the non-refundable license application fee calculated in accordance with Schedule II to the National Electric Power Regulation Authority Licensing (Application and Modification Procedure) Regulations, 1999, is also attached herewith.

Sincerely,

S. Aslam Mehdi

Syed Aslam Mehdi

CHIEF EXECUTIVE OFFICER

Bullehshah Packaging (Pvt.) Ltd,

¹ This is an existing generation facility presently used for self-consumption. Now, the company plans supplying surplus electric power to the tune of 2 MW to a Bulk Power Consumer (BPC) in the name of OmyaPak Private Limited. Both the generation facility and BPC are located within the same premises. For further detail refer to Annexure-I & II attached herewith.

² Being existing generation facility/Captive Power Plant the related provision of the relevant regulations is {Regulation 3(5)-A} and accordingly the check list is attached herewith.

BULLEH SHAH PACKAGING (PRIVATE) LIMITED

A Packages Group Company

Lahore Office

Shahrah-E-Roomi P.O. Amer
Sidhu, Lahore – 54760,
Ph: 042-35811541-46

Kasur Factory

Kasur – 7 KM, Kot Radha Kishan Road
Off 4 KM Kasur-Raiwind Road,
District Kasur - 55050
Ph: 049-2717335-45

Karachi Office

416-422, G-20, The Forum,
Block – 9, Khayaban-e-Jami,
Clifton, Karachi
Ph: 021-3586941



Bulleh Shah
Packaging



ANNEXURE I

**AUTHORIZATION FROM
BOARD/POWER OF ATTORNEY**

**TRUE COPY OF THE BOARD RESOLUTION
OF BULLEH SHAH PACKAGING (PRIVATE) LIMITED
DATED 01 JANUARY 2020**

**Application for
generation /
transmission/ special
purpose transmission /
distribution/
modification of any of
the license(s) with
NEPRA**

WHEREAS, the Management of the Company would like to apply to the National Electric Power Regulatory Authority (NEPRA) for Generation / Transmission / Special Purpose Transmission / Distribution / Modification of any of these License of Bulleh Shah Packaging (Pvt.) Limited in respect of supplying/selling electricity to any bulk power consumer / neighboring industries.

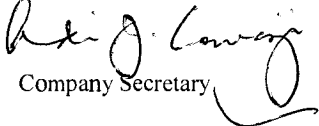
IT IS THEREFORE RESOLVED that the Board of Directors of Bulleh Shah Packaging (Pvt.) Limited (herein referred the "Company") hereby approves to file an application for Generation / Transmission / Special Purpose Transmission / Distribution / Modification of any of the License(s) of the Company with the National Electric Power Regulatory Authority ("NEPRA").

FURTHER RESOLVED that the Company be and hereby authorizes Syed Aslam Mehdi, Chief Executive Officer of the Company holding CNIC No. 42201-3745966-5 to file the application, negotiate, deposit fees and submit documents/License for Generation/Transmission/Special Purpose Transmission/Distribution/Modification of any of the License(s) of the Company with NEPRA, and any documentation ancillary thereto in the matter of supplying electricity to any bulk power consumer.

FURTHER RESOLVED that the Company be and hereby authorizes and empowers Syed Aslam Mehdi to do all acts and things necessary/incidental for the processing, completion and finalization of the application as he may deem fit on behalf of the Company.

FURTHER RESOLVED THAT a certified true copy of this resolution be communicated to whom it may concern and shall remain in force until notice in writing to the contrary be given.

Certified true copy


Company Secretary

BULLEH SHAH PACKAGING (PRIVATE) LIMITED

A Packages Group Company

Lahore Office
Shahrah-E-Roomi P.O. Amer
Sidhu, Lahore – 54760,
Ph: 042-35811541-46

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Clifton, Karachi
Ph: 021-3586941



**Check List for Examination of License Application –
Captive Power Plants {Regulation 3(5)-A}**

Name of Company: Bulleh Shah Packaging Private Limited

Capacity: 30 MW

Regulation #	Information/Documents Required	Information/Documents Submitted
3(1)	Authorization from Board Resolution / Power of Attorney	Attached as Annexure I
3(3)	Application fee (including Indexation)	YES
3(4)	Three copies of Application	YES
3(5)-A(i)	Certificate of incorporation (certified by SECP)	Attached as Annexure II
3(5)-A(ii)	Memorandum and articles of association (certified by SECP)	Attached as annexure III
3(5)-A(iii)	Latest financial statements	Attached as annexure IV
3(5)-A(iv).	Location maps, site maps, land	See Schedule II
3(5)-A(v)	Type of Technology,	Water cooled vibration grade technology
3(5)-A(vi)	No. of Units / Size MW	1/30 MW
3(5)-A(vii)	Year Make/Model, Operation date and expected remaining life.	Turbine: Make: Siemens /Model: SST 300/Type: steam turbine with extraction plus condensing /year 2006. Life: 6 years. Biomass Boiler: Design BWV makes Jinan installation by Ruhn 150 TPH Vibrating Grate 2015. Life: 21 years.
3(5)-A(viii)	Installed capacity, de-rated capacity, Aux. Consumption, Net Capacity.	Turbine-Name Plate Installed Capacity: 41 MW -Operational Installed & de-rated Capacity of the Generation Facility: 30 MW. - Auxiliary Consumption: 4 MW

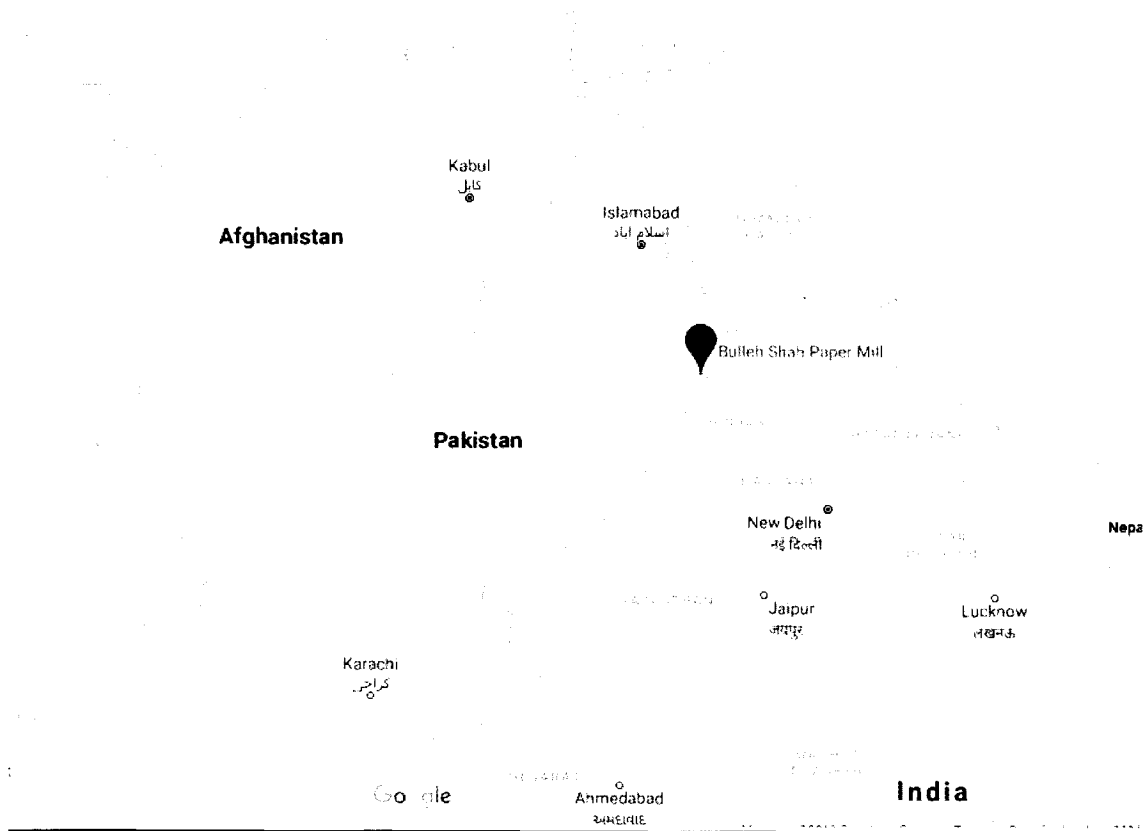
3(5)-A(ix)	Fuel (oil/gas): type, imported/indigenous, supplier, logistics, pipelines etc. In case of Gas fuel, a Gas Sale Agreement (GSA) signed between applicant and Gas Supplier.	Bulleh Shah Packaging is operating a plant using Biomass (Wheat Straw) and Corn stovers, Brassica, Lin seed as supporting Fuel. - Fuel is supplied by Local Suppliers through local transport.
3(5)-A(x)	Supply Voltage (11kV/132kV). In case of 132 KV voltage distance and name of nearest grid (single line diagram).	Medium voltage (11kV) electricity from generator outgoing feeder panel;
3(5)-A(xi)	Plant characteristics: generation voltage, power factor, frequency, automatic generation control, ramping rate, alternative fuel, time(s) required to synchronize to grid.	- Automatic Generation Control: Yes - Ramping Rate: 3 hours on cold /1 hour on Warm/ 30 minutes on hot. - Alternative Fuel: Corn stovers, Brassica, Lin seed
3(5)-A(xii)	Provision of metering, instrumentation protection and control arrangement.	Control, Metering, Instrumentation and protection will be in accordance with ISA (The International Society of Automation) standards.
3(5)-A(xiii)	Efficiency Parameters	
	(i)	Designed Efficiency of power plant %
	(ii)	Gross Efficiency of power plant at Mean Site Conditions %
	(iii)	Net Efficiency of power plant at Mean Site Conditions %
		As per below

Parameter	Design Efficiency	Gross Efficiency	Net Efficiency
150 TPH Biomass Boiler	91%	85%	80%
Turbine	-	93%	90%

Schedule-I

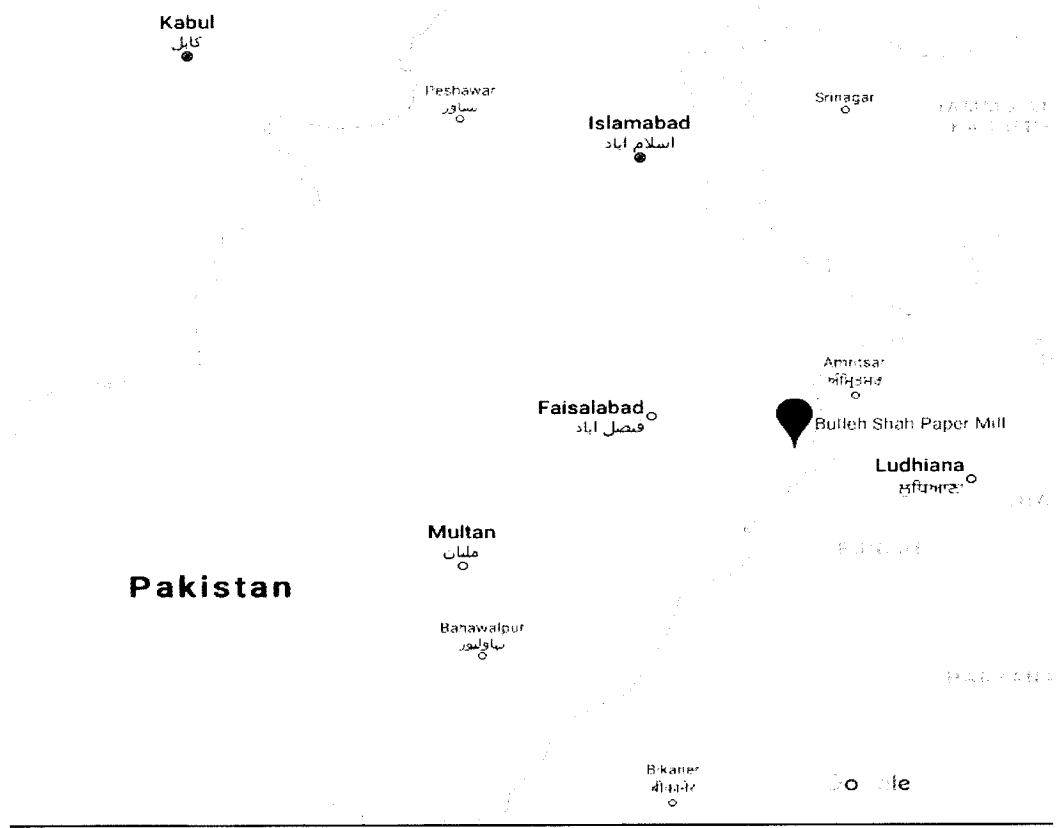
The Location, Size (i.e. Capacity in MW), Type of Technology, Interconnection Arrangements, Technical Limits, Technical/Functional Specifications and other details specific to the Generation Facilities of the Licensee are described in this Schedule

**Location of the
Generation Facility/Co-Generation Facility/Power Plant
of the Licensee on Map of Pakistan**

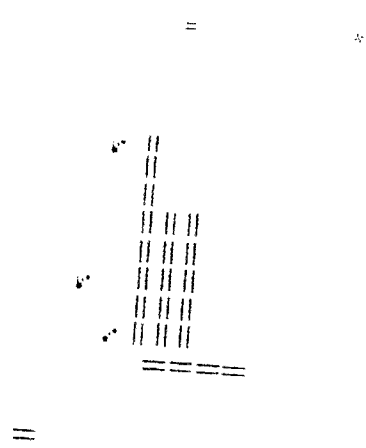


Latitude	N 31.1417458,
Longitude	E 74.3593049

**Location of the
Generation Facility/Co-Generation Facility/Power Plant
of the Licensee on Map of the Province of Punjab**



Lay-out of the
Generation Facility/Co-Generation Facility/Power Plant
of the Licensee



**Single line Diagram (Electrical) of the
Generation Facility/Co-Generation Facility/Power Plant
of the Licensee**



**Interconnection Facilities/
Transmission Arrangements for Dispersal of Electric Power from
the Generation Facility/Thermal Power Plant**

The electric power from the generation facility/thermal power plant will be supplied to one (01) Bulk Power Consumer in the name of OmyaPack (Pvt.) Limited (OPL).

(2). The details pertaining to BPC, supply arrangement and other relating information is provided in the subsequent description of this Schedule-I. Any change in the above Interconnection Arrangement duly agreed by the Licensee and its BPC, shall be communicated to the Authority in due course of time.

Details of
Generation Facility/Co-Generation Facility/
Power Plant

(A). General Information

(i).	Name of the Company/ Licensee	Bulleh shah Packaging (Private) Limited
(ii).	Registered Office of the Company/ Licensee	Bulleh Shah Packaging (Private) Limited, Shahrah-E-Roomi P.O, Amer Sidhu, Lahore - 54760.
(iii).	Business Address of the Company/ Licensee	Bulleh Shah Packaging (Private) Limited, Shahrah-E-Roomi P.O, Amer Sidhu, Lahore - 54760.
(iv).	Location of the Generation Facility	Bulleh Shah Packaging (Private) Limited, Kasur- 7 Km, Kot Radha Kishan Road, Off 4 Km Kasur Raiwind Road, District Kasur – 55050
(v).	Type of the Generation Facility	Biomass boiler with Steam Turbine

(B). Configuration of Generation Facility

(i).	Total Gross/Name Plate Installed Capacity of the Generation Facility	41 MW
(ii).	Total Gross/Operational Installed Capacity of the Generation Facility due to limitation of boiler	30 MW
(ii).	Type of Technology	Water cooled vibrating grate biomass boiler with Siemens turbine
(iii).	Number of Units/Size (MW)	1 Unit with size 30.0 MW

(iv).	Unit Make/ Model & Year of Manufacture	Turbine: Make: Siemens /Model: SST 300/Type: steam turbine with extraction plus condensing /year 2006. Biomass Boiler: Design BWV, make Jinan, installation by Ruhn, 150 TPH Vibrating Grate 2015.
(v).	Commissioning/ Commercial Operation date of Unit of the Generation Facility	December 2015 biomass boiler November 2009 Turbine
(vi).	Expected Useful Life of Unit of the Generation Facility from its Commercial Operation/ Commissioning Date	25 Years biomass boiler 30 Years turbine
(vii).	Expected Remaining useful Life of Unit of the Generation Facility (at the time of grant of Generation Licence)	21 Years biomass boiler 20 years Turbine

(C). Fuel/Raw Material Details

(i).	Primary Fuel	Wheat Straw	
(ii).	Alternate Fuel	Corn stovers, Brassica, Lin seed etc.	
(iii).	Start Up Fuel	RLNG	
(iv).	Fuel Source (Imported/ Indigenous)	Primary Fuel	Alternate/Start Up Fuel
		Indigenous	Indigenous
(v).	Fuel Supplier	Primary Fuel	Alternate/Start Up Fuel

		Biomass suppliers (if available in the nearby area of the Generation Facility)	Biomass suppliers (if available in the nearby area of the Generation Facility)
(vi).	Supply Arrangement	Primary Fuel	Alternate/Start Up Fuel
		Local Loading Trucks/Tractor Trolleys etc	Local Loading Trucks/Tractor Trolleys etc
(vii).	Fuel facilities Storage	Primary Fuel	Alternate/Start Up Fuel
		Open Yard	
(viii).	Capacity of Storage facilities	Primary Fuel	Alternate/Start Up Fuel
		3500 Tons (Bulk Storage)	
(ix).	Gross Storage Capacity	Primary Fuel	Alternate/Start Up Fuel
		3500 Tons (Bulk Storage)	

(D). Emission Values

	Parameter	Primary Fuel	Alternate/ Start Up Fuel
(i).	SO ₂	31.7 mg/Nm ³	
(ii).	NO _x	153 mg/Nm ³	
(iii).	CO	234 mg/Nm ³	
(iv).	PM ₁₀	288 mg/Nm ³	

(E). Cooling System

(i).	Cooling Water Source/Cycle	Deep well Turbine Pump/Tube wells/Underground Water/Cooling Tower
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(F). Plant Characteristics

(i).	Generation Voltage	11 KV
(ii).	Frequency	50 HERTZ
(iii).	Power Factor	0.85
(iv).	Automatic Generation Control (AGC)	Yes
(v).	Ramping Rate	3 hours on cold /1 hour on Warm/ 30 minutes on hot.
(vi).	Time required to Synchronize to Grid	Not applicable

Information
Regarding Bulk Power Consumer(s)/BPC(s) i.e.
OmyaPack Private Limited (Consumer) to be Supplied
by the Bullehshah Packaging (Private) Limited

(i).	No. of Consumers	One (01)	
(ii).	Location of consumers (distance and/or identity of premises)	7 Km, Kot Radha Kishan Road, Off 4 Km Kasur Raiwind Road, District Kasur – 55050 (Present within the premises of Bullehshah packaging.	
(iii).	Contracted Capacity and Load Factor for consumer	1.50 MW _p as of now / 65-75% (2 MW considered for future expansions)	
(iv).	Specify Whether		
	(a).	The consumer is an Associate undertaking of the Licensee-If yes, specify percentage ownership of equity;	No
	(b).	There are common directorships:	YES
	(c).	Either can exercise influence or control over the other.	YES
(v).	Specify nature of contractual Relationship		
	(a).	Between each BPC/Consumer and Licensee.	Bulleh Shah Packaging (Private) Limited (Licensee) owns and operates the generation facility and will provide electricity to OmyaPack (Private) Limited for its use.
	(b).	Consumer and DISCO.	No Relationship/Connection.
(vi)	Any other network information deemed relevant for disclosure to or consideration of the Authority.	N/A	

Information
Regarding Distribution Network for Supply of Electric
Power to BPC in the name of OmyaPack (Private)
Limited

(i).	No. of Feeders	One (01)
(ii).	Length of Each Feeder (Meter)	150-200 meter
(iii).	Length of Each Feeder to each Consumer	NA
(iv).	In respect of all the Feeders, describe the property (streets, farms, Agri land, etc.) through, under or over which they pass right up to the premises of customer, whether they cross-over.	The cable from the generation facility to BPC is located on private property owned by BPC.
(v).	Whether owned by Licensee , Consumer or DISCO-(deal with each Feeder Separately)	
	(a). If owned by DISCO, particulars of contractual arrangement	NA
	(b). Operation and maintenance responsibility for each feeder	OmyaPack
(vi).	Whether connection with network of DISCO exists (whether active or not)- If yes, provide details of connection arrangements (both technical and contractual)	NA
(vii).	Any other network information deemed relevant for disclosure to or consideration of the Authority.	NA

Mr. Iftikhar Ali Khan,
Director, Registrar Office,
National Electric Power Regulatory Authority,
Islamabad.

Subject: Application of Bulleh Shah Packaging (Private) Limited generation license for its proposed thermal power project at district KASUR.

Reference: Your letter No. NEPRA/R/LAG-30/300 dated January 27.01.2020 (received on 29.01.2020) queries regarding license application.

- I. Bulleh Shah Packaging biomass thermal power project is of 30 MW gross capacity. We have a steam turbine that has an installed capacity of 41 MW however the biomass boiler plant can produce maximum 150 tons per hour steam capable of generating up to 30 MW of electricity. Hence the application by BSPL covers 30 MW gross capacity at which it currently operates.

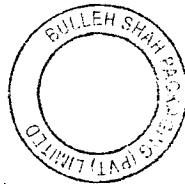
(1).	Total Gross/Operational Installed Capacity of the Generation Facility due to limitation of boiler (Biomass Boiler)	30 MW
(3).	De-rated Capacity of Generation Facility at Reference Site Conditions	30 MW
(4).	Auxiliary Consumption of the Generation Facility	2.0 MW
(5).	Total Installed Net Capacity of Generation Facility at Reference Site Conditions	28 MW

- II. Certified true copy of Certificate of Incorporation duly certified by SECP has already been provided and attached is the colored copy for your ready reference. (annex 1)
- III. Certified true copy of Certificate of Memorandum of Association (MOA) certified by SECP is attached for your ready reference. The application for this license is in accordance to the Companies Act 2017 clause 26 which states that "A company may carry on or undertake any lawful business or activity and do any act or enter into any transaction being incidental and ancillary thereto which is necessary in attaining its business activities." (annex 2)
- IV. Copy of ESIA attached for your reference. (annex 3)

Please feel free to contact the undersigned office in case of any further clarification or queries if required.

Regards,

Syed Aslam Mehdi
Chief Executive Officer
Bulleh Shah Packaging (Pvt.)Ltd.



RESPONSIBLE
Packaging

Lahore Office
Shahrah-e-Roomi P.O. Amer
Sidhu, Lahore - 54760,
Ph: 042-35811541-46

Kasur Factory
Kasur - 7 KM, Kot Radha Kishan Rd.
Off 4 KM Kasur-Raiwind Rd,
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BULLEH SHAH PACKAGING (PRIVATE) LIMITED
A Packages Group Company

Paper • Board • Corrugated Products

www.bullehshah.com.pl

ANNEXURE II

CERTIFICATE OF INCORPORATION



SECURITIES AND EXCHANGE COMMISSION OF PAKISTAN

CERTIFICATE OF INCORPORATION

(Under section 32 of the Companies Ordinance, 1984 (XLVII of 1984))

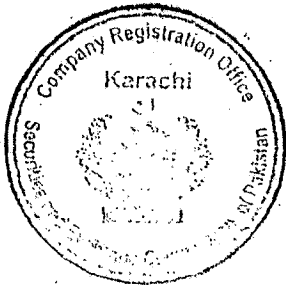
Company Registration No. 00000011656/20050907

I hereby certify, that BULLEH SHAH PAPER MILL (PRIVATE) 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 Karachi this 16th day of September two thousand and five.

Fee Rs. 2,500/- (Two Thousand Five Hundred Only)

CERTIFIED TRUE COPY



Tahir Mahmood

(TAHIR MAHMOOD)

ADDITIONAL REGISTRAR OF COMPANIES

S.No. 72123 dt. 10-09-13

Certified to be True Copy

4 11/04/2015
Asst. Deputy Registrar of Companies

S.No. 3519 dt. 19/9/2005

SECURITIES & EXCHANGE COMMISSION OF PAKISTAN



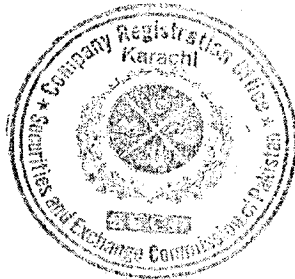
CERTIFICATE OF INCORPORATION ON CHANGE OF NAME
[Under section 40 of the Companies Ordinance, 1984 (XLVII of 1984)]

Company Registration No: 0052465

I hereby certify that pursuant to the provisions of section 39 of the Companies Ordinance, 1984 (XLVII of 1984), the name of BULLEH SHAH PAPER MILL (PRIVATE) LIMITED has been changed to BULLEH SHAH PACKAGING (PRIVATE) LIMITED and that the said company has been duly incorporated as a company limited by shares as a private company under the provisions of the said Ordinance.

This change is subject to the condition that for period of one year from the date of issue of this certificate, the company shall continue to mention its former name along with its new name on the outside of every office or place in which its business is carried on and in every document or notice referred to in clauses (a) and (c) of section 143.

Given under my hand at Karachi this 03rd day of October Two Thousand and Twelve.



(SIDNEY C. PEREIRA)
Joint Registrar/Incharge
Company Registration Office,
Karachi

Rs. 5000/-

Library No. 19046 (1) - dtd. 03/10/2012

CERTIFIED TRUE COPY

[Handwritten signature]

ANNEXURE III

**MEMORENDUM AND ARTICLES
OF ASSOCIATION**

THE COMPANIES ORDINANCE, 1984

(PRIVATE COMPANY LIMITED BY SHARES)

MEMORANDUM

AND

ARTICLES OF ASSOCIATION

OF

BULLEH SHAH PACKAGING (PRIVATE) LIMITED

THE COMPANIES ORDINANCE, 1984
(PRIVATE COMPANY LIMITED BY SHARES)

MEMORANDUM OF ASSOCIATION
OF
BULLEH SHAH PACKAGING (PRIVATE) LIMITED

- I. The name of the company is **BULLEH SHAH PACKAGING (PRIVATE) LIMITED.**
- II. The registered office of the company will be situated in the province of Sindh, Pakistan.
- III. The objects for which the company is established are:
 1. To carry on all or any of the businesses of manufacturers of and dealers in paper and board of all kinds, and Tetra paper for making Tetra Pak of any type, description and dimension, straw board, plain and corrugated, duplex board, chip board, card board, box board, veneer board, mill board, wall and ceiling paper, greaseproof paper and articles made of paper, pulp, paper board specialities and board in all their branches.
 2. To carry on all or any of the business of manufacturing and printing of cartons, packages, specialised containers for various commodities, utensils and other articles; printers, lithographers, type foundry, stereotypers, electrotypers, photographic printers, photo-lithographers, chromo-lithographers, engravers, die-sinkers, book binders, designers, draughtsmen, paper and ink manufacturers and dealers in or manufacturers of any other articles or things of a character similar or analogous to the foregoing or any of them or connecting therewith; manufacturers, importers, exporters and dealers in raw materials, articles and things required for purposes of manufacture and printing of cartons, packages, specialised containers for various commodities, utensils and other articles in which the company is interested or any other marketable commodities, and to establish and maintain showrooms for this purpose; and of distributors, suppliers and sellers of the said articles and contractors for supplying them.

3. To acquire, deal, purchase, import, sale, supply and export any thing whatsoever.
4. To acquire agencies except managing agent of any person, firms or companies and to act as agents, manufacturer's representatives, personal agents, selling agents, buying agents, consultants, technical agents to and for any undertaking or enterprise whatsoever.
5. To do business of contractors, tenders, stockists, distributors, market surveyors, dealers and suppliers of variety of things which the company may consider beneficial.
6. To acquire, establish and carry on stores, depots and factories etc in Pakistan or elsewhere and maintain stalls, booths, godowns and warehouses required for the benefit and promotion of the products or business of the company.
7. To apply for tender, purchase or otherwise acquire contracts, subcontracts, licenses and concessions for or in relation to the objects of business herein mentioned or any of them and to undertake, execute, carry out, dispose of or otherwise turn to account the same. To sublet all or any contracts from time to time and upon such terms and conditions as may be thought expedient.
8. To guarantee the performance of contracts, agreements, obligations of the company and to give any guarantee in relation to the execution of jobs, contracts, payment of securities, deposits, loans, debenture stocks, bonds and also for discharge of the obligations of the company.
9. To establish, participate in or promote commercial, mercantile and industrial enterprises and operation and enter into joint ventures, partnerships or other collaborations and arrangements with any undertaking or company whether local or foreign for the achievement of the company's objects and business.
10. To appoint contractors, except managing agent, brokers, canvasses, agents and other persons to establish and maintain agencies or branches in any part of Pakistan or else where for the purpose of the company and to discharge and discontinue the same.
11. To apply for purchase or otherwise acquire and register any patent or patent rights, licenses, concessions or privileges, trade marks or designs and the like conferring to any exclusive or non-exclusive or limited right to use or any secret or other information as to any invention of which may seem calculated directly or indirectly to benefit the company, and use, exercise, develop or grant license in respect of or otherwise turn to account the property rights or information so acquired.
12. To enter into any arrangements and contracts with any government or authority, supreme, municipal, local or other firms, companies and corporate bodies etc., that may seem conducive to the company's objects or any one of them and to obtain from government or authority any rights, privileges, options, concessions and licenses, and to carry out, exercise or comply with any such agreements, arrangements, rights, privileges, concessions and licenses and to procure the company to be registered or recognized.
13. To amalgamate with any other company in Pakistan or elsewhere established with objects similar or identical to those for which this company is established.
14. To purchase, take on lease or in exchange, hire or otherwise acquire any immovable or movable property, and any rights or privileges which the company may think necessary or convenient for the purpose of its business, and in particular any land, buildings, easements, machinery, plant and stock-in-trade; and either to retain any property so acquired for the purpose of the company's business or to turn the same to account as may seem expedient.
15. To let out on hire, mortgage, sell or otherwise dispose off or deal with whole or any part of the undertaking of the company to any lands, business, property, rights or assets of any kind belonging to the company or any share or interest thereon respectively in such manner and for such consideration as the company may think fit, in the event of winding up of the company.

16. To create and issue different classes of shares, debenture or stock debenture and redeem, cancel or accept surrender thereof; and to issue its members any dividends, bonuses, shares, or distribute amongst them any other property of the company provided that any such issue or distribution of dividends, bonuses, bonus shares or other property does not amount to reduction of share-capital of the company.
 17. To borrow money by the issue of debenture stock (perpetual or otherwise) and to secure the repayment of any money borrowed, or owing to mortgage, charge or lien upon all or any of the property or assets of the company (both present and future) and also by a similar mortgage, charge or lien to secure and guarantee the performance by the company of any obligation undertaken by the company.
 18. To pay all costs, expenses, liabilities and obligations incurred or sustained in or in respect of the promotion, floatation, registration and establishment of the company, or in connection with the establishment and inauguration of any of its branches or business, and also to pay or adjust advocate's fees, brokerage, commission, bonuses, printing charges, or any other preliminary expenditure, which in the opinion of the Directors, may have properly been incurred by any member, advocate or agent, in connection with the aforesaid.
 19. To open an account or accounts with any bank or banks and to draw and endorse cheques and to withdraw money from such accounts
 20. To draw, make, accept, endorse, execute and issue promissory notes, bills of exchange, bills of lading and other negotiable or transferable securities and to advance, deposit money, securities or property to such persons, firm or company and on such terms with or without security as the company deem fit.
 21. And generally to do and to perform all such other things and acts as may appear to be incidental or conducive to the attainment of the above objects or any of them.
 22. It is expressly declared that the several sub-clauses of this Clause and all the powers expressed therein are to be construed as cumulative and independent and in no case unless the context expressly so requires is the generality of any one sub-clause to be narrowed or restricted by the name of the Company or by the particularity of expression in the same sub-clause or by the application of any rule of construction such as the ejusdem generis rule, and accordingly none of such sub-clauses or the objects therein specified or the power thereby conferred shall be deemed subsidiary or auxiliary merely to the objects mentioned in any other sub-clause of this clause, and the Company shall have full power to exercise all or any of the powers conferred by any part of this Clause in any part of the world.
 23. It is hereby undertaken that the company shall not engage in banking business or in investment company or in any unlawful business and that nothing in object clauses shall be construed to entitle it to engage in such business
 24. "Notwithstanding anything stated in any object clause, the company shall obtain such other approval or license from the competent authority, as may be required under any law for the time being in force, to undertake a particular business."
 25. The company shall not engage in banking, business of an investment company, leasing company and insurance or any unlawful business and that nothing in object clauses shall be construed to entitle it to engage in such business, directly or indirectly. The company shall not launch multilevel, pyramid and ponzi scheme.
- IV. The liability of the members is limited.
- V. The Authorized Share Capital of the Company is Rs.15,000,000,000 (Rupees Fifteen Billion) divided into 1,500,000,000 ordinary shares of PKR 10/- each with powers to the Company to increase, reduce, reorganize, consolidate or subdivide the share capital on such terms as the Company in General Meeting may deem appropriate in the capital of various classes from time to time in accordance with the provisions of the Articles of Association of the Company and the Companies Ordinance, 1984.

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

Name & Surname (Present & Former) in full (in Block Letters)	Father's/Husband's Name in full	Nationality with any former Nationality	N.I.C. No.	Occupation	Residential address in full	Number of shares taken by each subscriber	Signature
SYED HYDER ALI	Syed Babar Ali	Pakistani	35201-1655225-1	Professional Manager	70-F.C.C., Gulberg, Lahore	(500) Five Hundred	Sd/-
MUJEEB RASHID	Chaudhry Abdul Rashid	Pakistani	35201-5296887-7	Professional Manager	House No.54, Block L, Phase I, D.H.A., Lahore Cantt., Lahore	(200) Two Hundred	Sd/-
KHALID YACOB	Omar Yacob	Pakistani	35202-2337385-9	Professional Manager	304-Upper Mall, Lahore	(200) Two Hundred	Sd/-

Sd/-

Dated this 9th day of September 2005

Witness to the above signatures:

Father's name:
Occupation:
Nationality:
N.I.C. number:
Full address:

Adi J. Cawasji
Mr. Jehangir N. Cawasji
Service
Pakistani
42000-0524360-9
66 B, South Circular Avenue, D.H.A., Phase-2, Karachi-75500

THE COMPANIES ORDINANCE, 1984

PRIVATE LIMITED COMPANY LIMITED BY SHARES

ARTICLES OF ASSOCIATION

OF

BULLEH SHAH PACKAGING (PRIVATE) LIMITED

1. TABLE 'A' NOT TO APPLY

The regulations contained in table "A" in the first Schedule to the Companies Ordinance, 1984, shall not apply to the Company except to the extent and as hereinafter expressly incorporated.

2. DEFINITIONS

Words or expressions contained in these Articles shall, unless otherwise defined herein or unless inconsistent with the subject or context, have the same meaning as ascribed thereto in the Companies Ordinance, 1984. In these Articles, unless there is something in the subject or context inconsistent therewith:

- (a) "Affiliate" means a person or an entity (other than the Company) which Controls any of the Shareholders or is Controlled by a Shareholder by virtue of shareholding, composition of the principal management body of the entity, contract or any other means;
- (b) "Articles" means these Articles of Association as originally framed or as altered from time to time in accordance with the terms of these Articles;
- (c) "Board" means the Board of Directors of the Company for the time being;
- (d) "Business Day" means any day (other than Saturday or Sunday) when banks in Pakistan are open for the transaction of normal business;
- (e) "Chief Executive" means the Chief Executive Officer of the Company appointed from time to time in accordance with these Articles;
- (f) "Company" means Bulleh Shah Packaging (Private) Limited;
- (g) "Control" (including, with its correlative meanings, the terms "Controlling", "Controlled by") means the possession, directly or indirectly, including together with their Affiliates, of the power to direct or cause the direction of the management or policies of a Shareholder, whether through the ownership of voting rights, by agreement or otherwise;
- (h) "Dividend" means the distribution of profits of the Company to its Shareholders;
- (i) "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 and these Articles;
- (j) "Month" means a calendar month according to the Gregorian calendar;
- (k) "Ordinance" means the Companies Ordinance, 1984;
- (l) "Packages" means Packages Limited, a company incorporated in Pakistan (registered No. KAR No. 396 of 1955-1956), whose registered office is located at 4th Floor, The Forum, Suite No. 416-422, G-20, Block 9, Khayaban-e-Jami, Clifton, Karachi 75600, Pakistan;
- (m) "Register" means the Register of Members / Shareholders to be kept pursuant to Section 147 of the Ordinance;

- (n) "Registered Office" means the registered office of the Company for the time being;
- (o) "Registrar" has the same meaning as ascribed thereto in clause (31) of sub-section (1) of Section 2 of the Ordinance;
- (p) "Reserved Matters" has the same meaning as ascribed thereto in Article 18 (*Reserved Matters*);
- (q) "SE" means Stora Enso South Asia Holding AB, a company incorporated in Sweden (registered No. 556900-1638), whose registered office is at c/o Stora Enso AB, 79180 Falun, Sweden;
- (r) "Seal" or "seal" means the common seal of the Company;
- (s) "Section" or "section" means sections of the Ordinance;
- (t) "Shareholders Agreement" means the agreement titled the "Shareholders Agreement" dated September 17, 2012 entered into between SE, Packages and the Company, as may be amended, restated or replaced from time to time;
- (u) "Shareholder Loan" means, with respect to each Shareholder, a shareholder loan given by that Shareholder or by any of its Affiliates to the Company;
- (v) "Shares" means shares in the share capital of the Company;
- (w) "Special Resolution" has the same meaning as ascribed thereto in clause 36 of sub-section 1 of Section 2 of the Ordinance.

3. BUSINESS OF THE COMPANY AND REGISTERED OFFICE

- 3.1 The business of the Company shall include the objects expressed in the Memorandum of Association.
- 3.2 The Registered Office of the Company will be situated in the province of Sindh.

4. PRIVATE COMPANY

The Company is a private limited company and accordingly:

- (a) the number of Shareholders of the Company shall (exclusive of persons in the employment of the Company), shall be limited to fifty, provided that for the purposes of this provision, where two or more persons hold one or more shares in the Company jointly, they shall be treated as a single member;
- (b) no invitation shall be made to the public to subscribe for the shares or debentures of the Company;
- (c) the right to transfer Shares of the Company is restricted in the manner and to the extent specified in these Articles and the Shareholders Agreement.

5. CHANGES TO THE MEMORANDUM AND ARTICLES OF ASSOCIATION

No Changes shall be made to the Memorandum and Articles of Association of the Company, except without the unanimous approval of all the Shareholders of the Company (including SE and Packages) in a duly convened General Meeting of the Company.

6. AUTHORISED CAPITAL

- 6.1 The Authorised Share Capital of the Company is the amount set out in Clause V of the Memorandum divided into the number of ordinary shares of PKR 10/- each as set out in the said clause with powers to the Company to increase, reduce, reorganize, consolidate or subdivide the share capital on such terms as the Shareholders may deem appropriate in the capital of various classes from time to time in accordance with the provisions of these Articles and the Ordinance.
- 6.2 Except as may be set out in these Articles, the holders of Shares of the Company are entitled to receive notice(s) of general meetings of the Company and to vote at such general meetings and shall have one vote for each share.

7. SHARES

7.1 Issuance of Shares Controlled by the Board

Subject to the provisions of the Ordinance and these Articles, the Shares of the Company shall be under the control of the Board. The Board shall, as regards any issuance or allotment of shares, duly comply with the provisions of these Articles and Sections 67 to 73 and Section 86 of the Ordinance as may be applicable.

7.2 Parity of Initial Shares

All shares issued pursuant to these Articles shall have a par value of PKR 10/- each per share and except to the extent stated in these Articles, shall rank *pari passu* in all respects, including voting rights, dividends, return on capital and otherwise.

7.3 Further Issue of Shares

The Board may, subject to the provisions of the Shareholders Agreement, these Articles and Section 86 of the Ordinance, allot or otherwise dispose of any shares of the Company to such persons, on such terms and conditions and at such times as the Board thinks fit, and at a premium or at par or at a discount (subject to the provisions of the Ordinance) and for such consideration as the Board thinks fit, PROVIDED THAT, where at any time the Board decides to increase the issued capital of the Company by issuing any further shares, such shares shall be offered to the existing Shareholders in proportion to the existing shares held by each Shareholder and such an offer shall be made by a notice specifying the number of shares to which the Shareholder is entitled, and limiting a time within which the offer, if not accepted, will be deemed to be declined, and on expiration of such time, or on receipt of information from the Shareholder to whom such notice is given that he declines to accept the shares offered, the Board may, subject to the provisions of Section 86(7) of the Ordinance, dispose of the same in such manner as it may consider most beneficial to the Company or decide not to allot such shares to any person.

7.4 Issuance of Shares for consideration other than cash

Subject to the provisions of the Ordinance, these Articles and any applicable laws, rules and regulations, the Board may allot and issue shares in the capital of the Company as payment for any property (tangible or intangible) sold or transferred, goods or machinery supplied, or for services rendered to the Company or expenses incurred on behalf of the Company or in conduct of its business or affairs and any shares which may be so allotted shall be issued as fully paid up shares.

8. SHARE CERTIFICATES

8.1 Certificates

The certificates of title to the shares shall be issued under the Seal of the Company and signed by two (2) directors (comprising of at least one (1) nominee director of Packages and one (1) nominee director of SE). Every certificate of Shares shall bear the following legend thereon, unless some other legend or notation is agreed by the Shareholders in the Shareholders Agreement:

"Any disposition, transfer, charge, sale, pledge, hypothecation, assignment of or dealing in any other manner in the Shares represented by this certificate is restricted by a Shareholders' Agreement dated September 17, 2012 and made between Packages Limited, Stora Enso South Asia Holdings AB and Bulleh Shah Packaging (Private) Limited. Copies of such agreement are available in the custody of the company."

8.2 Shareholders' Right to Certificates

Every Shareholder shall be entitled, within ninety (90) Days of the allotment of Shares, without payment, to one (1) certificate for all the shares registered in his name, or upon paying such fee as the Board may from time to time determine, to several certificates, each for one or more shares. Every certificate of shares shall specify and denote the number of shares in respect of which it is issued, and the amount paid thereof. In respect of a share or shares held jointly by several persons, the Company shall not be bound to issue more than one certificate and delivery of the share certificate to anyone of the joint holders shall be sufficient delivery to all.

8.3 Issue of Duplicate Certificates

If any certificate is worn-out, defaced or rendered useless, then upon production thereof to the Board, the Board may order the same to be cancelled and may issue a new certificate in lieu thereof, and if any certificate is lost or destroyed, then on proof to the satisfaction of the Board, and on such indemnity as the Board deems adequate being given, a new certificate in lieu thereof may be issued on such terms and fee as may be prescribed by the Board including payment of expenses incurred by the Company in investigating title.

9. TRANSFER OF SHARES

9.1 Lock-in Period

Except as provided in this Article 9 (*Transfer of Shares*), no Shareholder (including Packages and SE) shall without the prior permission of the other Shareholder, for a period of six (6) calendar years be entitled to transfer, or agree to undertake or transfer, directly or indirectly, any Shares or any right in or attaching to any of its Shares ("Lock-in Period").

9.2 Expiry of Lock-in Period

Except as allowed under these Articles, no Shareholder shall without the prior written consent of the other Shareholders, be entitled, following the expiry of the Lock-in Period, to transfer or agree to undertake to transfer, directly or indirectly, any Shares or any right in or attaching to any of its Shares.

9.3 Validity of Transfer

Any transfer or attempted transfer of shares by a Shareholder (either directly or indirectly) which is not in accordance with the requirements set out in these Articles, shall be void and of no force or effect and the Board shall not be required to register any such transfer or attempted transfer.

9.4 Transfer to Affiliates and to a Nominee Director

- (a) A Shareholder may, at any time, transfer all (but not less than all) of its shares ("Relevant Shares") to an Affiliate of that Shareholder and such Affiliate may at any time transfer all of the Relevant Shares back to the original Shareholder or to another Affiliate of the original Shareholder. The right of first refusal restriction as contained in Article 9.6 (*Right of First Refusal*) shall not apply to the transfer of any Relevant Shares pursuant to this Article 9.4(a). Likewise, a Shareholder may transfer one (1) share to its each of its nominee Directors for providing such nominee Director with the requisite share qualification in terms of Section 187 (h) of the Ordinance. The said right of first refusal restriction will not apply to such transfer of shares, or to further transfer of such shares back to the original Shareholder or to other new nominee Director.
- (b) If the Relevant Shares have been transferred under Article 9.4(a) (whether directly or by a series of transfers) by a Shareholder (the "Transferor", which expression shall not include a second or subsequent transferor in a series of transfers) to its Affiliate or nominee Director (the "Transferee") and subsequently the Transferee ceases to be an Affiliate or nominee Director of the Transferor, then the Transferee shall forthwith transfer the Relevant Shares to the Transferor or at the Transferor's option to an Affiliate or a new nominee Director of the Transferor.
- (c) Prior to transferring the Relevant Shares to a Transferee under this Article 9.4 (*Transfer to Affiliates and to a Nominee Director*), the Transferor shall provide to the Board and the Company such information as may be reasonably required by the Board for the purposes of ensuring that the proposed transfer of the Relevant Shares is in accordance with the requirements set out in this Article 9.4 (*Transfer to Affiliates and to a Nominee Director*). If the said information is not provided within twenty eight (28) days of the request made by the Company, the Board shall refuse to register the transfer of the Relevant Shares in the name of the Transferee.

9.5 Right of First Refusal

- (a) Following the expiry of the Lock-in Period, if a Shareholder ("Proposed Transferor") receives an offer from an identified third party ("Third Party Offeror") (whether through a single transaction or a series of related transactions) to transfer the legal and / or beneficial title to all (but not some only) of its Shares to the Third Party Offeror ("Pre-Emption Transfer"), then prior to entering into a binding agreement in relation to the Pre-Emption Transfer, the Proposed Transferor must give notice in writing ("Pre-Emption Notice") to the Company, as agent for and on behalf of the Shareholder(s) other than the Proposed Transferor ("Other Shareholder(s)"):
 - (i) stating that the Proposed Transferor wishes to transfer all (but not less than all) of its Shares ("Pre-Emption Shares");
 - (ii) setting out the identity of the Third Party Offeror;
 - (iii) setting out the price per Pre-Emption Share ("Pre-Emption Price") and any other key terms ("Pre-Emption Terms") on which the Proposed Transferor proposes to transfer the Pre-Emption Shares to the Third Party Offeror; and
 - (iv) stating that the Proposed Transferor wishes to transfer the Pre-Emption Shares to the Third Party Offeror pursuant to the Pre-Emption Transfer.

- (b) Within five (5) Business Days of the receipt by the Company of a Pre-Emption Notice, the Company shall send to the Other Shareholder(s), a copy of the Pre-Emption Notice. Within twenty (20) Business Days of the date of the Pre-Emption Notice or such other date and time as is agreed between the Proposed Transferor and the Other Shareholder(s) ("**Pre-Emption Right Closing Date**"), the Other Shareholder(s) may by notice in writing to the Company and the Proposed Transferor ("**Pre-Emption Right Exercise Notice**") exercise the right, to acquire all (but not less than all) of the Pre-Emption Shares at the Pre-Emption Price and on the Pre-Emption Terms. Once given, a Pre-Emption Right Exercise Notice shall be Irrevocable and binding.
- (c) If the Other Shareholder(s) fails to submit a Pre-Emption Right Exercise Notice by the Pre-Emption Right Closing Date for any reason whatsoever or has suffered an Insolvency Event (as defined in the Shareholders Agreement), the Other Shareholder(s) shall be deemed to have declined to take up its pre-emption rights pursuant to the Pre-Emption Notice and shall have no further rights under this Article 9 (*Transfer of Shares*) in relation to the Pre-Emption Shares.
- (d) If the Other Shareholder(s) submits a Pre-Emption Right Exercise Notice on or before the Pre-Emption Right Closing Date, then within 5 Business Days of the Pre-Emption Right Closing Date, the Other Shareholder(s) shall give notice in writing to the Proposed Transferor, of a date, place and time ("**Pre-Emption Completion Date**") between 10 and 30 Business Days after the Pre-Emption Right Closing Date (or such other date, place and time as the Proposed Transferor and the Other Shareholder(s) may agree), on which the sale and purchase of the Pre-Emption Shares to the Other Shareholder(s) is to be completed.
- (e) On or before the Pre-Emption Completion Date, (a) the Proposed Transferor shall transfer the legal and beneficial title to all (but not less than all) of the Pre-Emption Shares to the Other Shareholder(s) with full title guarantee and free from all Encumbrances by delivering the share certificates relating to the Pre-Emption Shares along with the duly executed transfer deed(s) in relation thereto and shall take all such actions and deliver all such documents as may be required under the Shareholders Agreement for the transfer of the Pre-Emption Shares; and (b) the Other Shareholder(s) shall make payment of the Pre-Emption Price to the Proposed Transferor.
- (f) Upon completion of the abovementioned requirements and such other requirements as may be set out in the Shareholders Agreement, the Board shall authorise the registration and the Company shall register the transfer of the Pre-Emption Shares in favour of the Other Shareholder(s), subject to due stamping (if required).
- (g) If, by the Pre-Emption Completion Date, the Other Shareholder(s) fails to pay (or procure payment of) the aggregate Pre-Emption Price in respect of the Pre-Emption Shares pursuant to Article 9.5(e) ("**Defaulting Other Shareholder(s)**"), the Proposed Transferor, shall without prejudice to any other rights which it may have against the Defaulting Other Shareholder(s) and subject to the tag-along rights as specified in Article 9.6 (*Tag Along Right*), be entitled to transfer the legal and beneficial title to such Pre-Emption Shares in accordance with Article 9.5(j), as if the Other Shareholder(s) had failed to submit a Pre-Emption Right Exercise Notice in relation to the Pre-Emption Shares and the Defaulting Other Shareholder(s) shall have no claim for damages or compensation (or otherwise) against the Proposed Transferor in respect of such Pre-Emption Shares.

- (h) If, by the Pre-Emption Completion Date, the Proposed Transferor ("Defaulting Proposed Transferor") fails to comply with its obligation to transfer the Pre-Emption Shares to the Other Shareholder(s), the Defaulting Proposed Transferor hereby authorises any director of the Company to execute, complete and deliver as agent for the Defaulting Proposed Transferor the share certificates and the transfer deeds in respect of the Pre-Emption Shares and to further execute all other requisite documents on behalf of the Defaulting Proposed Transferor in terms of this Article and the Shareholders Agreement. Following the transfer of the Pre-Emption Shares, the Other Shareholder(s) shall make payment of the aggregate price in respect of the Pre-Emption Shares to the Defaulting Proposed Transferor and the Board shall authorise the registration and the Company shall register the transfer of the Pre-Emption Shares in favour of the Other Shareholder(s).
- (i) With effect from the Pre-Emption Completion Date, to the extent legally permissible under the Ordinance, the Pre-Emption Shares shall automatically cease to confer the right to the Defaulting Proposed Transferor to receive notice of or to attend or vote at any general meeting of the Company or (subject to the Ordinance) at any meeting of the holders of any class of shares in the capital of the Company or for the purposes of a resolution of the Company and the Pre-Emption Shares shall not be counted in determining the total number of votes which may be cast at any such meeting or required for the purposes of a resolution or for the purposes of any other consent required under these Articles, till such time as the Pre-Emption Shares are transferred and registered in the name of the Other Shareholder(s).
- (j) Subject to the Tag Along Rights as specified in Article 9.6 (*Tag Along Rights*), the Proposed Transferor may, within a period of six (6) months following the Pre-Emption Right Closing Date, transfer the legal and beneficial title to:
- (i) those Pre-Emption Shares in respect of which no Pre-Emption Right Exercise Notices were received; and
 - (ii) those Pre-Emption Shares for which the Other Shareholder(s) shall be deemed to have declined to take-up (by issuance of Pre-Emption Right Exercises Notices) under Article 9.5(c).
- to the Third Party Offeror (i) at a price per Share which is not less than the Pre-Emption Price and (ii) on terms no more favourable to the Third Party Offeror than the Pre-Emption Terms, without following the pre-emption procedure set out in this Article 9.5 (*Right of First Refusal*).
- (k) Each Shareholder shall be responsible for ensuring that any transfer of shares under this Article 9.5 (*Right of First Refusal*) complies with all legal requirements including, without limitation, securities laws and regulations and is not subject to, or is exempt from, registration and similar requirements under applicable securities law.
- (l) If the Other Shareholder(s) has submitted a Pre-Emption Right Exercise Notice but completion of the transfer of the Pre-Emption Shares to the Other Shareholder(s) cannot occur, by reason of a delay in the obtaining of any Government Authorisation for the completion of such transfer, then the Pre-Emption Completion Date shall be deemed to be deferred until the earlier of:
- (i) three months following the original Pre-Emption Completion Date; and
 - (ii) ten (10) Business Days following the date that all of the required Government Authorisations are obtained for that transfer.

(the "Extended Pre-Emption Completion Date")

- (m) If the required Government Authorisations are not obtained by the Extended Pre-Emption Completion Date, then the Proposed Transferor shall be released from its obligations to make the transfer set out in this Article 9.5 (*Right of First Refusal*), which resulted from the original Pre-Emption Right Exercise Notice, it being clarified that if the Pre-Emption Shares are not transferred to the Other Shareholder as a result of the Government Authorisations, then the Proposed Transferor shall not be authorised to transfer the Pre-Emption Shares to the Third Party Offeror.
- (n) Any transfer of the Pre-Emption Shares which is not in accordance with the provisions of this Article 9.5 (*Right of First Refusal*) shall not be made or registered by the Board and the Company and shall be void and of no legal effect.

9.6 Tag-Along Right

- (a) If the Proposed Transferor wishes to transfer all its Shares to the Third Party Offeror in accordance with Article 9.5(j) and has otherwise complied with the requirements of Article 9.5 (*Right of First Refusal*) in connection with such proposed transfer, before making the proposed transfer, the Proposed Transferor shall procure that the Third Party Offeror makes an offer ("Tag Offer") to the Other Shareholder(s) ("Tag Shareholder") to purchase all of the Shares held by the Tag Shareholder for a consideration in cash for each Share, at a price that is at least equal to the highest price per Share offered or paid by the Third Party Offeror, or any person acting in concert with the Third Party Offeror, in the proposed transfer or in any related previous transaction in the six months preceding the date of the proposed transfer ("Specified Price").
- (b) The Tag Offer shall be given by written notice ("Tag Notice"), at least ten (10) Business Days before the proposed sale date ("Tag Sale Date"). To the extent not described in any accompanying documents, the Tag Notice shall set out:
 - (i) the identity of the Third Party Offeror;
 - (ii) the Specified Price and other terms and conditions of payment;
 - (iii) the Tag Sale Date; and
 - (iv) the number of Shares to be purchased by the Third Party Offeror (which shall not be less than all the Shares held by the Tag Shareholder).
- (c) If the Third Party Offeror fails to make the Tag Offer to the Tag Shareholder in accordance with Article 9.6(a) and Article 9.6(b), the Proposed Transferor shall not be entitled to complete the proposed transfer and the Board and the Company shall not register any transfer of Shares effected in accordance with the proposed transfer.
- (d) If the Tag Offer is accepted by the Tag Shareholders by no later than five (5) Business Days prior to the Tag Sale Date, the completion of the proposed transfer shall be conditions on the completion of the purchase of all the Shares held by the Proposed Transferor.

9.7 Transfer upon Default of Shareholders Agreement or Deadlock Provisions

Notwithstanding anything contained herein in respect of the transfer of shares, Packages and SE have entered into the Shareholders Agreement for the purposes of governing the transfer of shares in the event of any default or deadlock under the Shareholders Agreement. The provisions of the Shareholders Agreement with respect to the transfer of shares upon the occurrence of a deadlock or default under the Shareholders Agreement are incorporated in these Articles by reference and shall be binding on all Shareholders and the Company.

9.8 Refusal to Transfer Shares

- (a) The Directors shall refuse to transfer any Shares of the Company if the provisions of these Articles are not complied with. The Directors shall also refuse to transfer any shares if the transfer deed is for any reason defective or invalid, provided that the Company shall, within thirty (30) days from the date on which the instrument of transfer was lodged with it, notify the transferor and transferee of the defect or invalidity, either of whom shall, after removal of such defect or invalidity, be entitled to re-lodge the transfer deed with the Company.
- (b) If the Company refuses to register the transfer of any shares, the Company shall, within thirty (30) days after the instrument of transfer was lodged with it, send to the transferor and transferee notice of the refusal indicating the reason for such refusal.

10. ALTERATION OF CAPITAL

10.1 Power to Increase Authorised Capital

Subject to the provisions of Article 18 (*Reserved Matters*), the Company may from time to time by way of a resolution passed and approved by the Shareholders of the Company (in a duly convened General Meeting), increase its authorised share capital by such sum as the resolution shall prescribe, provided that the nominal value of the Shares remains to be PKR 10/- each.

10.2 Condition of Creation of New Shares

Any capital raised by the creation of new shares shall be considered part of the authorised capital and the new shares shall be subject to the provisions herein contained with reference to transfer, transmission, voting and otherwise.

10.3 Shareholders Rights to New Shares

- (a) Subject to the provisions of Article 18 (*Reserved Matters*), any new shares shall, before issue, be offered to the Shareholders of the Company in proportion, to the amount of the existing shares to which they are entitled. The offer shall be made, following approval of the Issuance of the new shares by the Board (subject to quorum requirements being met) by notice specifying the number of shares offered and limiting a time within which the offer, if not accepted, will be deemed to be declined, and after the expiration of that time, or on receipt of an intimation from the person to whom the offer is made, that it declines to accept the shares offered, the Directors shall, subject to Section 86(7) of the Ordinance and in accordance with the provisions contained in the Shareholders Agreement, dispose of the same in such manner as they think most beneficial to the Company, provided however, that the percentage of ownership of the issued share capital of the Company by Packages and SE remains as follows unless otherwise agreed between Packages and SE:
- (i) Packages holding 65% of the issued and paid up capital of the Company; and
 - (ii) SE holding 35% of the issued and paid up capital of the Company.

10.4 Power to Reduce Share Capital

Subject to the provisions of Article 18 (*Reserved Matters*), the Company may by way of a resolution passed and approved by the Shareholders of the Company (in a duly convened General Meeting), reduce its share capital in any manner and with and subject to any incidental authorisation and consent required by law.

10.5 Power to Cancel Shares

Subject to the provisions appearing after clause (d) of sub-section 1 of Section 92 of the Ordinance and Article 18 (*Reserved Matters*), the Company may by way of a resolution passed by the Shareholders of the Company (in a duly convened General Meeting), alter the conditions of the Memorandum as to cancel any shares which at the date of passing of the resolution in that respect have not been taken or agreed to be taken by any person, and diminish the amount of its share capital by the amount of shares so cancelled.

11. GENERAL MEETINGS

11.1 Holding of Annual General Meeting

An Annual General Meeting of the Company shall be held in accordance with the provisions of Section 158 of the Ordinance once atleast in every calendar year within a period of four (4) months following the close of its financial year at such time and place as may be determined by the Board, provided that no greater interval than fifteen (15) months shall be allowed to elapse between two such General Meetings. All such General Meetings shall be called "Annual General Meetings" and all other General Meetings shall be called "Extraordinary General Meetings".

11.2 Extraordinary General Meetings

Subject to the provisions of Section 159 of the Ordinance and these Articles, the Directors may at any time call an Extraordinary General Meeting of the Company to consider any matters which require the approval of the Company in a General Meeting and shall, on the requisition of Shareholders representing not less than 100% of the voting power on the date of the deposit of the requisition less any voting power attached to the shares held by persons other than Packages and SE, forthwith proceed to call an Extraordinary General Meeting.

11.3 Notice of Meetings

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 the notice is given) specifying the agenda, 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 Section 160 of the Ordinance for the General Meetings to such persons as are under the Ordinance or these Articles, entitled to receive such notices from the Company.

11.4 Special Business

All business shall be deemed special that is transacted at an Extraordinary General Meeting, and also business that is transacted at an Annual General Meeting with the exception of (i) declaring dividends; (ii) the consideration of accounts, balance sheet and reports of Directors and Auditors; (iii) the election and appointment of Directors; and (iv) the appointment, and the fixing of the remuneration of, the Auditors.

11.5 Shorter Notice

In the event of an emergency affecting the business of the Company, the Board may, in accordance with the provisions of Section 159(7) of the Ordinance, make application to the Registrar for a shorter notice period, and, if the Registrar authorises a shorter notice period, then an Extraordinary General Meeting may be convened upon such shorter notice as authorised by the Registrar. Notwithstanding the foregoing, where a Special Resolution is to be passed at an Extraordinary General Meeting, the Board may call such Extraordinary General Meeting by such less than twenty one (21) days notice as is acceptable to all the Shareholders.

11.6 Omission to give Notice of General Meeting

Except to the extent notice is not given in accordance with Article 9.5(l) (*Transfer of Shares*), the omission (either accidental or otherwise) to give notice to any Shareholder of the Company or the non-receipt of notice (either accidental or otherwise) by any Shareholder shall invalidate the proceedings at any such General Meeting called by such notice unless all the Shareholders attend such General Meeting.

11.7 Waiver of Notice

A Shareholder who does not timely receive notice of a General Meeting, but attends and participates in such General Meeting, shall be deemed to have waived timely receipt of such notice.

11.8 Quorum and Decision at General Meetings

- (a) Subject to Article 11.10 (*Adjournment of Meeting for Lack of Quorum*), the quorum for any General Meeting of the Shareholders (be it the Annual General Meeting or an Extraordinary General Meeting) shall be at least two (2) Shareholders representing not less than one hundred percent (100%) voting power in the Company (less the voting power attached to the shares held by any persons other than Packages and SE), either of their own account or as proxies, including one (1) authorised representative or proxy representing each of Packages and SE.
- (b) Any business (other than Reserved Matters which will be decided by unanimous approval in accordance with Article 11.8(c) and Article 18 (*Reserved Matters*)) to be transacted at any General Meeting shall be decided by a simple majority of the Shareholders' votes (present in person or by proxy) in its favour at a General Meeting properly convened and held.
- (c) If a General Meeting has been convened for the purposes of considering and approving a Reserved Matter or if a decision on a matter which is a Reserved Matter is part of the agenda in any General Meeting, then any decision relating to the Reserved Matter will be approved with the unanimous approval of all Shareholders (including Packages and SE) who are present at a General Meeting of the Shareholders (either in person or by proxy).
- (d) No action shall be taken by the Company which is required under the Ordinance or these Articles to be approved by the Shareholders of the Company, unless consent or approval for such action is given at a General Meeting of the Shareholders duly convened and held.

11.9 Who is to preside at General Meetings

The Chairman of the Board of Directors shall also be the Chairman of the General Meetings, but if there is no such Chairman, or and if at any meeting the Chairman is not present within fifteen (15) minutes after the time appointed for holding the Meeting or if the Chairman is not willing to take the Chair, the Shareholders present may choose one of the Directors to be the Chairman of the General Meeting, and if none of the Directors being present or, being present, is unwilling to act as the Chairman, the Shareholders present shall choose one of their number to be the Chairman, provided that the representatives or proxies of Packages and SE have both voted in favor of the resolution appointing the Chairman.

11.10 Adjournment of Meeting for Lack of Quorum

If within thirty (30) minutes after the time prescribed for a General Meeting a quorum is not present or ceases to exist, the meeting, if called upon the requisition of the Shareholders shall be dissolved, and in any other case, the meeting shall be adjourned to the same day in the next week at the same time and place and for that adjourned meeting the Shareholders present, being not less than two, shall form the quorum.

11.11 Voting on Resolution by Show of Hands and When Poll Demanded

At any General Meeting a resolution put to the vote of the General Meeting shall be decided by a show of hands, unless a poll is demanded (before or on the declaration of the results of the show of hands) on a unanimous basis by Shareholders present (subject to the quorum requirements being met) in person or by proxy or by the Chairman of the General Meeting and unless a poll is so demanded, a declaration by the Chairman that a resolution has been carried or lost and an entry to that effect in the books of the proceedings of the Company which is approved by the Shareholders, shall be conclusive evidence of the fact without further proof of the number or proportion of votes recorded in favour of or against such resolution. The demand for a poll may be withdrawn at any time by the person or persons who made the demand.

11.12 Poll

If a poll is demanded as aforesaid it shall be taken (subject to Section 168 of the Ordinance) in such manner and at such time and place as the Chairman of the General Meeting directs, and either at once or after an interval or adjournment of not more than fourteen (14) days from the day on which the poll is demanded and the result of the poll shall be deemed to be the resolution of the General Meeting at which the poll was held.

11.13 Poll on Election of Chairman and Adjournment

Any poll demanded on the election of a Chairman of a General Meeting or on any question of adjournment shall be taken at the General Meeting and without adjournment.

11.14 Effect of Demand for Poll

The demand for a poll shall not prevent the continuation of a General Meeting for the transaction of any business, other than the question on which the poll was demanded.

11.15 Minutes

Minutes shall be made in books provided by the Board pursuant to Section 173 of the Ordinance for the purposes of all resolutions and proceedings at the General Meetings, and any such Minutes if signed by the Chairman of the General Meeting or of the next following General Meeting and approved by the Shareholders shall constitute sufficient evidence on the facts therein stated without further proof.

11.16 Inspection of Minute Books

The books containing Minutes of proceedings of General Meeting of the Company shall be kept at the Registered Office and shall, during business hours (subject to reasonable restrictions as the Board may from time to time impose but so that not less than two (2) hours each day is allowed for inspection), be open to the inspection of any Shareholder.

12. VOTING

12.1 Votes of Shareholders

Except as to voting for the election of the Directors as provided in Section 178 of the Ordinance, every Shareholder entitled to vote may vote, either in person or by proxy, and upon a poll every Shareholder entitled to vote and present in person or by proxy shall have one (1) vote for every share conferring voting rights as aforesaid held by him.

12.2 Voting by Joint Shareholders

In case of joint holders, the vote of the senior who tenders a vote, whether in person or by proxy, shall be accepted to the exclusion of the votes of other joint holders, and for this purpose seniority shall be determined by the order in which their names stand in the Register.

12.3 Representative of Corporate Shareholders

A corporation, foundation or a company being a Shareholder may by a resolution of its directors authorise any of its officers or any other person to act as its authorised representative at any General Meeting and the person so authorised shall be entitled to exercise the same powers on behalf of the Shareholder which he represents as if he were an individual Shareholder.

12.4 Poll by Proxy

On a poll, votes may be given either personally or by proxy, provided that no corporate body shall vote by proxy as long as a resolution of its directors in accordance with the provisions contained in Article 12.3 (*Representative of Corporate Shareholder*) is in force.

12.5 Proxy

Every proxy shall be appointed in writing under the hand of the appointer or by an agent duly authorised under a power of attorney. A proxy holder need not be a Shareholder of the Company.

12.6 Filing of Instrument of Proxy

No person shall act as proxy unless the instrument of his appointment, duly executed, or other authority (if any) under which it is signed, or a notarially certified copy thereof, shall be deposited at the Registered Office of the Company at least 48 hours before the time appointed for holding the General Meeting at which the person named in the proxy proposes to vote.

12.7 Instrument of Proxy

An instrument of proxy shall be in the form specified in Regulation 39 of Table A in the First Schedule to the Ordinance, or in any other form as the Board may approve.

12.8 Validity of Proxy

A vote given in accordance with the terms of an instrument of proxy shall be valid notwithstanding the previous death of the principal or revocation (where permissible) of the proxy or of any power of attorney or the other authority under which such proxy was signed, provided that no intimation in writing of the death or revocation shall have been received at the Registered Office before the General Meeting or the adjourned General Meeting at which the proxy is used.

12.9 Validity of the Vote

No objection shall be made to the validity of any vote except at the General Meeting or at the poll at which such vote shall be tendered, and every vote whether given personally or by proxy not disallowed at such General Meeting or poll shall be deemed valid for all purposes of such General Meeting or poll.

12.10 Chairman to Decide

If any question is raised, the Chairman of the General Meeting shall decide the validity of every vote tendered at such General Meeting in accordance with the Ordinance and these Articles.

12.11 Chairman not to have Casting Vote

The Chairman shall not have a casting vote.

13. DIRECTORS**13.1 First Directors As of the Adoption of these Articles**

As of the date of adoption of these Articles or as soon as practically possible thereafter, the Company shall have six (6) Directors consisting of four (4) Packages Nominee Directors and Two (2) SE Nominee Directors. These Directors will hold office upto the next election of Directors of the Company after adoption of these Articles.

(a) Packages Nominee Directors

- (i) Syed Hyder Ali;
- (ii) Syed Aslam Mehdi;
- (iii) Khalid Yacob;
- (iv) Khurram Raza Bakhtayari

(b) SE Nominee Directors

- (i) Vell-Jussi Potka;
- (ii) Martin Schotten;

13.2 Appointment of Chairman

- (a) The Directors shall appoint a nominee Director of Packages as the Chairman of the Company. The Board may remove the Chairman at any time by unanimous vote (except the vote of the Chairman to be removed) and appoint a new Chairman and such Chairman shall be appointed from amongst the nominee Directors of Packages on the Board. The Chairman shall at all times be one of the six (6) Directors. The term of the Chairman shall be co-terminus with the tenure of the Board. A retiring Chairman shall be eligible for reappointment and shall preside over the General Meeting at which an election of Directors shall be held. Syed Hyder Ali shall be appointed by the Board as the Chairman as of the date of adoption of these Articles or as soon as practically possible thereafter. Syed Hyder Ali shall hold the office of the Chairman till the next election of Directors held after the adoption of these Articles or as soon as practically possible thereafter and shall be eligible for re-appointment after such election if elected as a Director.
- (b) The Chairman shall preside over the meetings of the Board, but shall not have a casting vote. If the Chairman for the time being is unable to attend any meeting of the Board, a nominee Director of Packages shall be entitled to appoint another nominee Director of Packages to act as chairman of that meeting.

13.3 Number of Directors

- (a) Subject to the provisions of Article 13.3(b), the total number of the Directors shall be six (6). The six (6) Directors on the Board shall be elected by the Shareholders (including Packages and SE) as follows:
 - (i) Packages shall have the right to nominate for election (and require removal after election) four (4) Directors; and
 - (ii) SE shall have the right to nominate for election (and require removal after election) two (2) Directors.

- (b) If at any time:
- (i) the shareholding of SE in the Company increases to fifty percent (50%) of the total issued and paid up capital of the Company, then at all following elections of Directors or during any existing term of the Board, as the case may be, the Shareholders (including Packages and SE) representation on the Board (which shall comprise of six (6) Directors) shall be as follows:
- (A) Packages shall have the right to nominate for election (and require removal after election) three (3) Directors; and
- (B) SE shall have the right to nominate for election (and require removal after election) three (3) Directors.
- In order to comply with the provisions of Article 13.3(b)(i), Packages shall ensure that one of its nominated Directors tenders his resignation from the Board, in order for SE to appoint its nominee on the Board.
- (ii) the shareholding of SE in the Company decreases below twenty percent (20%) of the total issued and paid up capital of the Company, then at all following elections of Directors or during any existing term of the Board, as the case may be, the Shareholders (including Packages and SE) representation on the Board (which shall comprise of six (6) Directors) shall be as follows:
- (A) Packages shall have the right to nominate for election (and require removal after election) five (5) Directors; and
- (B) SE shall have the right to nominate for election (and require removal after election) one (1) Director.
- In order to comply with the provisions of Article 13.3(b)(ii), SE shall ensure that such number of its nominated Directors tender their resignation from the Board, in order for Packages to appoint its nominee(s) on the Board.
- (c) The Board shall fix the number of Directors of the Company to be elected not later than thirty (35) days before convening the General Meeting at which the Directors are to be elected, and the number so fixed shall not be changed except with the prior approval of the Company in a General Meeting. It is clarified that in no event shall the number of Directors increase beyond or fall below six (6) until the same has been unanimously approved by the Shareholders in a General Meeting.

13.4 Election of Directors

- (a) After the expiry of the term of office of the existing Directors of the Company as at the date of adoption of these Articles and at each subsequent election of Directors and subject to the provisions of Article 13.3 (*Number of Directors*), the number of Directors fixed by the Board (and such number shall not be less or more than six (6)) shall be elected by the Shareholders in a General Meeting, unless the number of the candidates is not more than the number of Directors to be elected, in the following manner, namely:
- (i) a Shareholder shall have such number of votes as is equal to the product of the voting shares held by him and the number of Directors to be elected.
- (ii) a Shareholder may give all his votes to a single candidate or divide them between more than one of the candidates in such manner as he may choose.
- (iii) the candidate who gets the highest number of votes shall be declared elected as Director and then the candidate who gets the next highest number of votes shall be so declared, and so on until the total number of Directors to be elected has been so elected.

- (b) No person, whether a retiring director or otherwise, shall be eligible for election as Director unless notice of his candidature for election has been lodged in writing at the Registered Office not less than fourteen (14) days before the date of the General Meeting at which the election of Directors is to take place.
- (c) Where the number of candidates is equal to or less than the number of Directors to be elected, it will not be necessary to hold an election as laid down in Article 13.4(a) above and all candidates shall be deemed to have been elected under this Article.
- (d) Notwithstanding anything contained in these Articles, it is hereby agreed that the Shareholders shall vote in the General Meeting in such a manner so as to ensure that the Directors to be elected on the Board are in accordance with the provisions contained in Article 13.3 (*Number of Directors*).

13.5 Term of Office

An elected Director shall hold office for a period of three (3) years, unless he resigns, or becomes disqualified from being a Director or otherwise ceases to hold office earlier under these Articles. An election of Directors in the manner prescribed by the preceding Articles shall be held once in every three (3) years. A retiring Director shall be eligible for re-election.

13.6 Removal of Director

The Company may by resolution in a General Meeting remove an elected Director in accordance with the provisions of Section 181 of the Ordinance.

13.7 Continuing Directors to Act

The continuing Directors may act notwithstanding any vacancy in the Board, but if the number falls below the minimum fixed, the Directors shall not, except for the purposes of filling a casual vacancy in their number or for convening a General Meeting, act so long as the number remains below the minimum.

13.8 Filling of Casual Vacancy

If any Director resigns or becomes disqualified or otherwise ceases to hold office for any reason whatsoever prior to the expiry of a three (3) year term, then the Board shall appoint any person to be a Director to fill such casual vacancy in the Board, provided that the casual vacancy shall be filled through appointment of a nominee of the same Shareholder whose nominee has created such vacancy as a consequence of ceasing to be a Director before the expiry of the three (3) years term for any reason whatsoever, as referred to above. Any Director so appointed shall hold office for the remainder of the term of the Director in whose place he is appointed.

The Shareholder whose nominee has resigned as a Director of the Company shall indemnify and keep indemnified the Company on demand against all losses, liabilities and costs which the Company may incur arising out of, or in connection with, any claim by such Director for wrongful or unfair dismissal or redundancy or other compensation arising out of such Director's resignation or loss of office.

13.9 Remuneration

Subject to any approval or limits required by law, the terms and conditions and remuneration of:

- (a) a Director (including each alternate Director) for performing extra services, including holding office of the Chairman;
- (b) the Chief Executive Officer; and
- (c) any Director (including each alternate Director) for attending meetings of the Board or a Committee of the Directors;

shall be determined by the Board, provided that unless otherwise agreed by the Board, neither the nominee Directors of Packages nor the nominee Directors of SE shall be entitled to any remuneration in their capacity as Directors of the Company.

A Director may also be reimbursed all reasonable travelling, hotel and other expenses properly incurred by him/her in attending and returning from meetings of the Directors or any committee of the Directors or General Meetings of the Company or in connection with the discharge of their duties as Directors of the Company.

13.10 General Management Powers

- (a) The Board shall be responsible for the overall direction, supervision and management of the Company. The Board 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 by these Articles or by a Special Resolution, required to be exercised by the Company in General Meetings, subject nevertheless to the provisions of the Ordinance or to any of these Articles, 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 such regulations had not been made.
- (b) A resolution at a meeting of the Directors duly convened and held shall be necessary for exercising the powers of the Company specified in Section 196(2) of the Ordinance.
- (c) The Board shall not take any decision in relation to any matter which is within the competency of the Shareholders under the Ordinance, other applicable laws and these Articles and regulations as referred to in Article 13.10 (a), unless and to the extent permitted by the Ordinance, other applicable laws and these Articles and the regulations referred to above and the relevant consent is given by all Shareholders at a General Meeting, properly convened and held.

13.11 Power to Obtain Finances and Giving of Securities

- (a) For the purposes of the Company only, the Board may obtain finance or borrow moneys from third party financiers, including (without limitation) banks, development financial institutions, other financial institutions and / or the Shareholders and secure payment of such sum or sums of money in such manner and upon such terms and conditions as it may think fit and in particular by the creation of mortgages and / or charges on the property, assets (movable and immovable) and / or on book debts / receivables of the Company and by the issue of bonds, perpetual or redeemable Debentures or Redeemable Capital, or by mortgage or charge or other security on the whole or any part of the property, assets and rights of the Company (both present and future), and the undertaking of the Company, provided however, that the above power of the Board shall not entitle the Company to carry on the business of banking/finance/investment company;

- (b) any bonds, Debentures, Redeemable Capital or other securities issued or to be issued by the Company shall be under the control of the Board which may issue them on such terms and conditions and in such manner and for such consideration as shall be considered by the Board to be for the benefit of the Company.

13.12 Minute Books

- (a) The Board shall cause minutes to be made in the books provided for the purposes:
 - (i) of the names of Directors (including Alternate Directors) present in person, at each meeting of the Board or any Committee of the Directors;
 - (ii) of all resolutions and proceedings at all meetings of the Company and the Board, and of any Committees of the Directors; and
 - (iii) of appointment of officers made by the Directors.
- (b) Any such minutes of any meeting of the Board or of a Committee of Directors or of the Company, if signed by the Chairman of such meeting or of the next succeeding meeting and approved by the Board or the Shareholders (as the case may be), shall be receivable as evidence of the matters stated in such minutes.
- (c) Every Director (including an Alternate Director) present in person at any meeting of the Directors shall sign his name in a book to be kept for that purpose and a list of the Directors present in person shall be listed as such in that book by the Chairman of the meeting.

14. PROCEEDING OF DIRECTORS

14.1 Meeting of Directors

- (a) The Directors of the Company may meet together for the dispatch of business, adjourn, and otherwise regulate meetings of the Board as they think fit.
- (b) The Board shall at a minimum meet at least meet four (4) times annually at the Registered Office of the Company or at such other location as may be approved by the Board from time to time.
- (c) A Director may, by written notice, summon a meeting of the Board. In respect of any meeting of the Board, at least fourteen (14) days notice will be given to all Directors, unless at least two (2) nominee Directors of Packages (or their alternates) and at least two (2) Directors nominee Directors of SE (or their alternates) approve a shorter notice period.
- (d) Any notice shall include an agenda identifying in reasonable detail the matters to be discussed at the meeting and such notice shall be sent by registered air mail or telexed or emailed to any Director residing outside Pakistan. At least seven (7) days prior to the proposed meeting, copies of any relevant papers to be discussed at the meeting shall be given to each Director. Any Director (or its alternate) is entitled to add matters to the agenda to be discussed at a meeting by serving notice together with the list of the matters and copies of any relevant papers to each other Director not less than four (4) days prior to the meeting. If any matter is not identified in reasonable detail, the Board shall not decide on it, unless all Directors present at the meeting agree.
- (e) A Director's attendance at a meeting shall constitute a waiver of notice of that meeting except when the Director attends a meeting for the express purpose of objecting, at the beginning of the meeting, to the transaction of any business because the meeting is not properly called or convened.

- (f) The meeting of the Board may take place in person or by telephone conference call or video conference, if permitted under the applicable law. Subject to the Ordinance, all business transacted by the Directors by telephone conference or video conference for the purposes of the Articles shall be deemed to be validly and effectively transacted at a meeting of the Directors.

14.2 Quorum of Directors' Meeting

- (a) A meeting of the Board, at which quorum is present, shall be competent to exercise all or any of the authorities, powers and discretion by or under these Articles or by or under any law vested in or exercisable by the Board generally. For the purposes of any Board meeting (other than an adjourned meeting), the quorum shall be no less than three (3) Directors, which Directors shall comprise of at least two (2) Packages nominee Directors and one (1) SE nominee Director.
- (b) If a quorum is not present within thirty (30) minutes from the time when the meeting should have begun or if during the meeting there is no longer a quorum, the meeting shall be adjourned for seven (7) Business Days and at that first adjourned meeting at least three (3) Directors, which Directors shall comprise of at least two (2) Packages nominee Directors and one (1) SE nominee Director (or their alternates) present shall be a quorum. If quorum for the first adjourned meeting is not present within thirty (30) minutes from the time when the meeting should have begun or if during the meeting there is no longer quorum present, the meeting shall be adjourned for another three (3) Business Days, provided however, that the quorum requirements specified in Article 14.2(c) shall apply in respect of such second adjourned meeting.
- (c) At the second adjourned meeting at least two (2) Packages nominee Directors (or their alternates) and one (1) SE nominee Director (or his alternate) present shall form a quorum. If that quorum is not present within thirty (30) minutes from the time when the meeting should have begun or if during the meeting there is no longer a quorum, the meeting shall be adjourned for four (4) hours.
- (d) At the third adjourned meeting the Director(s) (or their alternates) present shall be a quorum.
- (e) A Director shall be regarded as present for the purposes of quorum if represented by an alternate Director in accordance with Article 15 (*Alternate Directors*).

14.3 Who to preside at Directors' Meetings

The Chairman of the Board of Directors shall preside at Directors' meetings.

14.4 Approval of Actions by Directors

- (a) No resolution (other than resolutions relating to Reserved Matters which will be decided by unanimous approval in accordance with Article 14.4(b) and Article 18 (*Reserved Matters*)) will be passed and no action will be taken at a Board meeting, unless a majority of the Directors vote in favour of such resolution.
- (b) If a Board meeting has been convened for the purposes of considering and approving a Reserved Matter or if a decision on a matter which is a Reserved Matter is part of the agenda in any General Meeting or tabled before the Directors for approval, then any decision relating to the Reserved Matter will be taken by the unanimous approval of all the Directors present at a Board meeting properly convened and held.

The approval of a resolution in accordance with the provisions of this Article 14.4 (*Approval of Actions by Directors*) by the Directors at a meeting of the Board at which quorum is present, by telephone conference call or by video device shall be sufficient for constituting such action as the decision of the Board. It is clarified that for purposes of deciding the matters specified in Section 196(2) of the Ordinance, a duly convened physical meeting of the Board at which quorum is present will be required.

14.5 When acts of Meetings of the Board or a Committee Valid – Defective Appointment

All acts done by any meeting of the Board or of a Committee of the Directors, or by any person acting as 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.

14.6 Resolution by Circulation

Except for resolutions relating to matters contained in Section 196(2) of the Ordinance, a resolution which is circulated together with the necessary papers, if any, to all Directors and signed by all the Directors entitled to vote thereon shall be as valid and effectual as if it has been passed at a meeting of the Directors duly convened and held. Transmission of documents and signature of resolutions by facsimile or other electronic transmission shall be effective for the purpose of circulating and executing documents and resolution. A resolution may consist of several documents in the like form each signed by one or more Directors. A resolution signed by an Alternate Director need not also be signed by his appointer and, if it is signed by a Director who has appointed an Alternate Director, it need not be signed by the Alternate Director in that capacity.

15. ALTERNATE DIRECTORS

Subject to the approval by the Board, any Director not permanently resident in Pakistan or any Director so resident but intending to be absent from Pakistan for a period of not less than three (3) months may appoint any person acceptable to the Board to be an alternate Director of the Company to act for him. Every such appointment shall be made by notice to the Board in writing under the hand of the Director making the appointment (with a copy to the Shareholders). An alternate Director so appointed shall not be entitled to appoint another Director, but shall otherwise be subject to the provisions of the Articles with regard to the Directors. An alternate Director shall be entitled to receive notice of all meetings of the Board, and to attend and vote as a Director at any such meeting at which the Director appointing him is not personally present, and generally to perform all the functions of his appointer as a Director in the absence of such appointer, including approving and signing Board resolutions by circulation under Article 14.6 (*Resolution by Circulation*). An alternate Director shall *ipso facto* cease to be an alternate Director if his appointer for any reason ceases to be a Director or if and when his appointer returns to Pakistan or if the appointee is removed from office by notice in writing under the hand of the appointer.

16. COMMITTEES OF DIRECTORS

Subject to Section 196(2) of the Ordinance, the Board may from time to time delegate all or any of its powers to a committee or committees, as it thinks fit. Any committee so formed shall conform to any regulations that may be imposed upon it by the Board and shall have such quorum as prescribed by the Board.

17. CHIEF EXECUTIVE

17.1 Appointment of Chief Executive

- (a) Subject to Article 18 (Reserved Matters), the Board shall appoint, from amongst the Directors, the Chief Executive for a term as is determined by the Board, and at such remuneration as is determined in accordance with Article 17.1(b), and his appointment shall be subject to determination *ipso facto* in accordance with Article 17.2 (Removal of Chief Executive) or if he ceases from any cause to be a Director. It is clarified that the Chief Executive of the Company shall at all times be appointed from amongst the existing Directors of the Company.
- (b) The remuneration of a Chief Executive shall from *time to time be fixed* by the Directors and may be by way of fixed salary, or commission or dividends, profits on turnover of the Company or of any other company which is a Company is interested, or by participation in any such profits, or by any, or all these modes.

17.2 Removal of Chief Executive

The Board may, by resolution passed on a unanimous basis (subject to quorum being met) or the Company may by unanimous approval of all Shareholders in a General Meeting remove a Chief Executive before the expiration of his term of office notwithstanding anything contained in these Articles or in any agreement between the Company and the Chief Executive.

17.3 Filling Vacancy in Position of Chief Executive

In case of a vacancy in the office of the Chief Executive, the Board may select another Director to be Chief Executive, provided that the term of such replacement shall not be for longer than the remaining term of the Chief Executive being replaced.

17.4 Power of the Chief Executive and Management Committee of Directors

Except for matters stated in Section 196(2) of the Ordinance, the Board may delegate to the Chief Executive such of its powers, authorities and discretion as are necessary for and consistent with the effective management of the Company, and as are not required to be exercised by the Directors at their meetings, upon such terms and conditions and with such restrictions as they may think fit, and either collaterally with or to the exclusion of their own powers, and, may from time to time, render, withdraw, alter or vary any such powers.

18. RESERVED MATTERS

18.1 Notwithstanding anything contained in these Articles and unless otherwise agreed between Packages and SE, the following matters, whether required to be approved or decided by the Board or the Shareholders under the Ordinance, shall constitute "Reserved Matters" and will require: (I) in case the matter is required to be approved by the Board, the unanimous approval of all the Directors of the Company present in a meeting of the Board duly convened and held; and (II) in case the matter is required to be approved by the Shareholders, the unanimous approval of all the Shareholders (including SE and Packages) present at a General Meeting (either in person or proxy) duly convened and held:

- (a) any change in these Articles or any change in the capital structure of the Company or the issue of further Shares or the creation of any options to subscribe for or acquire Shares or purchase by the Company of its own shares or reduction of the share capital, other than as expressly contemplated in business plan or investment plan that has been approved by the Directors and/or Shareholders in accordance with the Shareholders Agreement;

- (b) any prepayment of any Shareholders Loans, other than prepayment of all outstanding First Ranking Shareholder Loans as described in the Shareholders Agreement (or, if there are no such loans, of all the other outstanding Shareholder Loans) on a *pari passu* basis;
- (c) any debt-to-equity swap arrangements, other than as expressly contemplated in a business plan or Investment plan that has been approved by the Directors and/or Shareholders with respect to the Company in accordance with the Shareholders Agreement;
- (d) any changes or alteration of the name of the Company;
- (e) the Issue by the Company (other than liens arising in the ordinary course of business) of any debenture or loan stock (whether secured or unsecured) or the creation of any mortgage, charge, lien, encumbrance or other third party right over any of the Company's material assets or the giving by the Company of any guarantee or indemnity to or becoming surety for any third party, other than as expressly contemplated in a business plan, annual budget or Investment plan that has been approved by the Directors and/or Shareholders in accordance with the Shareholders Agreement;
- (f) any arrangement for any joint venture or partnership or for the acquisition of the whole or substantially the whole of the assets and undertaking of the Company or an acquisition by the Company of any part of the issued share capital or of the assets and undertaking of another company, other than as expressly contemplated in a business plan, annual budget or investment plan that has been approved by the Directors and/or Shareholders in accordance with the Shareholders Agreement;
- (g) approval or amendment of the business plan, annual budget or investment plan that has been approved by the Directors and/or Shareholders;
- (h) any change in the nature of the business of the Company;
- (i) a merger, acquisition, spin-off or other corporate reorganisation of the Company;
- (j) the making of any loan by the Company or the creation, renewal or extension of any borrowings by the Company, other than as expressly contemplated in a business plan, annual budget or Investment plan that has been approved by the Directors and/or Shareholders in accordance with the Shareholders' Agreement;
- (k) the acquisition or construction or lease of items of tangible or intangible property (other than real estate) or the entering into the occupation, purchase, sale, transfer, acquisition, lease or licence of any freehold or leasehold real estate, other than as expressly contemplated in a business plan, annual budget or investment plan that has been approved by the Directors and/or Shareholders in accordance with the Shareholders Agreement;
- (l) any transaction by the Company with any Shareholder or Affiliate of the Shareholder or any associated company of the Shareholder, other than in the ordinary course of business and on an arm's length basis;
- (m) any transaction by the Company, either alone or jointly with, through (which includes by ownership of any shares, direct or indirect control) or on behalf of (whether as director, partner, consultant, manager, employee, agent or otherwise) any person, directly or indirectly, to carry on or be engaged or concerned or interested in any business which is in competition with the business activities of any Shareholder (including SE and Packages) as carried on at any time;

- (n) any obligation of the Company outside the normal course of trading, other than as expressly contemplated in a business plan, annual budget or investment plan that has been approved by the Directors and/or Shareholders in accordance with the Shareholders Agreement;
- (o) the assignment, sale or other disposal of any undertaking, asset or related group of assets of the Company, other than in the ordinary course of trading or of obsolete or redundant assets (and verified as such by the Auditors);
- (p) any change in the accounting policies or Auditors of the Company, accounting reference date or the company secretary;
- (q) the establishment of any retirement benefit scheme in relation to the Company's employees, or the making of any contribution to any third party scheme for the provision of retirement benefits;
- (r) the granting or entering into any licence, agreement or arrangement concerning any part of the name of the Company or any of its intellectual property rights or those of the Shareholders;
- (s) the making of any investment (whether through debt or equity), or the liquidation or disposition of any investment made by the Company, in any other person or business, other than as expressly contemplated in a business plan, annual budget or investment plan that has been approved by the Directors and/or Shareholders in accordance with the Shareholders Agreement;
- (t) the making, granting or allowing of any claim, disclaimer, surrender, election or consent for taxation purposes;
- (u) the appointment of any committee of the Board or delegating any of the powers of the Board to any committee;
- (v) establishing any bonus, profit sharing, share option or other incentive scheme for any director or employee of the Company;
- (w) the conversion of the form of the Company into anything other than a private company limited by shares or, a change in the jurisdiction of the seat of the Company;
- (x) any application for the listing of any shares or other securities of the Company on any stock exchange or for permission for dealings in any shares or other securities of the Company in any securities market;
- (y) any resolution for winding up of the Company or taking of any analogous proceedings;
- (z) appointment of, or removal before the expiration of his/her term of office of, the Chief Executive, Chief Financial Officer, Head of Treasury, Head of Packaging Business Unit and Head of Paper and Board Business Unit;
- (aa) application for the appointment of a receiver or an administrator over assets of the Company;
- (bb) incurring any capital expenditure (in any one transaction or series of transactions), other than as expressly contemplated in a business plan, annual budget or investment plan that has been approved by the Directors and/or Shareholders in accordance with the Shareholders Agreement;

- (cc) the commencing or settling by the Company of any litigation, arbitration or other dispute or the admission of fault or liability with respect thereto which has or is reasonably likely to have a material adverse effect on the business or reputation of the Company;
- (dd) the entering into or early termination of any material contract with a supplier or customer of the Company and / or the business of the Company;
- (ee) any matters connected with the Company's compliance with Stora Enso Oyj's sustainability policy; and
- (ff) entering into an agreement that may result in, or for the purpose of, any of the foregoing.

Except for the Reserved Matters stated above, if any matter is required to be approved by the Shareholders by way of a Special Resolution, then such matter shall only be approved once the same has been approved by way of a Special Resolution passed by the Shareholders at a duly convened General Meeting. It is clarified that in respect of Reserved Matters, all such matters (even if the same do not require unanimous approval under the Ordinance) shall be approved by the unanimous approval of the Board and/or the Shareholders, as the case may be.

- 18.2 It is clarified that the Reserved Matters shall be applicable till such time as the shareholding of SE in the Company is twenty percent (20%) of the issued and paid up share capital of the Company. In the event, the shareholding of SE falls below twenty percent (20%) of the issued and paid up share capital of the Company, the Reserved Matters shall no longer be applicable and all decisions whether to be taken at a meeting of the Board or at a General Meeting shall be decided in accordance with the requirements of the Ordinance.

19. DISQUALIFICATION OF DIRECTORS

19.1 Automatic Vacation of Office of Directors

The office of a Director shall *ipso facto* be vacated if:

- (a) he becomes ineligible to be appointed a Director on anyone or more of the grounds enumerated as follows, that is to say, he:
 - (i) is a minor;
 - (ii) is of unsound mind;
 - (iii) has applied to be adjudicated as an insolvent and his application is pending;
 - (iv) is an undercharged insolvent;
 - (v) has been convicted by a Court of Law for an offence involving moral turpitude;
 - (vi) has been debarred from holding such office under any provision of the Ordinance;
 - (vii) has betrayed lack of fiduciary behavior and declaration to this effect has been made by the court under Section 217 of the Ordinance at any time during the preceding five (5) years;

Executive Summary

EXECUTIVE SUMMARY:

1. PROJECT DESCRIPTION

1.1 Introduction

As a result of serious power shortage of electric power, load sheddings are so frequent in Pakistan. The gap between power supply and demand is further on the increase. Consequently, all walks of life are being adversely affected. Pakistan has an installed electric generating capacity of about 19,400 MW. Projection for the demand in year 2030 is forecasted to be 100,000 MW.

Pakistan is energy deficit country. Fossil fuels are already in short supply, and their local availability is fastly depleting alongwith price hike taking place during very short intervals of time. On the other hand, their industrial, domestic and other multifarious usages are also fast on the increase. Import bills of the fossil fuels are swelling at a very fast rate due to their fast increasing demand in the country.

In 2005, Packages Limited, Lahore initiated a new project under the name Bulleh Shah Pulp and Paper Mill (**BSPPM**) in Kasur, located 50 km south of Lahore which later on became Bulleh Shah Packaging Private Limited (BSPPL) BSPPL site spreads over 300 acres and consists of two paper machines PM-6 and PM-7 enabling to increase paper and paperboard production from 100,000 to 300,000 tones per year.

Operation of BSPPL is contingent on reliable supply of electricity from Water and Power Development Authority (**WAPDA**) and gas fuel supply from Sui Northern Gas Pipe Lines (**SNGPL**) limited.

BSPPL is equipped with one gas / Heavy Furnace Oil (HFO) fired 200 tph steam, one 150tph Biomass fired boiler and one smaller gas / Heavy Furnace Oil (HFO)

fired boiler, about 65 tph (for emergency) to meet its internal plant power and steam needs.

The on-going power supply shortage in the country and also compounded by scarcity of natural gas deliveries by SNGPL are causing a significant loss of production at BSPPL resulting in a negative economic impact for the company.

Increase in energy cost i.e. the gas price escalation from Rs. 172.0/mmbtu to Rs.400-/mmbtu during July 2003 to July 2010 and exuberantly price hike in electricity rate besides their acute shortage/non availability, has compelled the management of BSPPL to seek alternative options to be self-sufficient in their present electricity needs.

Bulleh Shah Packaging (BSPPL), with offices located at Packages Lahore and BSPPL Kasur is in process to provide electricity to national grid and increase its contribution in countries economy. BSPLL has already acquired EPA NOC for its all of its operations including turbine and Boilers. But in order to contribute in national grid, a separate NOC is required for 41MW generation capacity.

BSPPL present requirement of steam and electricity is being met through two main boilers:

- 150 tonnes per hour (tph) – high pressure boiler (Biomass fired)
- 200 tonnes per hour (tph) – high pressure boiler (natural gas and heavy fuel oil fired).

BSP also have 65 tph – medium pressure boiler (natural gas & heavy fuel oil fired), which is currently not in use but it can be used in case of emergency. Primarily, biomass boiler is being used to supply high pressure super-heated steam at 525 °C temperature and 95 bar pressure at turbine inlet. The proposed Biomass Boiler will be using water cooled vibrating grate technology.

New biomass based boiler, installed in the vicinity of BSPPL, will be environmentally friendly, replacing the present use of fossil fuels and providing optimum supply of steam and electricity for BSPPL's two paper & board manufacturing plants.

This SEIA Report has been prepared for the Proposed Project keeping in line with the IFC Guidelines for such SEIA reports.

Project Location

BSPPL is located off Kasur – Madina Town – Raiwind Road. The project site, located in the vicinity of BSPPL, is at an altitude of about 205 meters above mean sea level. The global co-ordinates of the plant is $31^{\circ} 07'45.12''$ N (latitude) and $74^{\circ}21'28.8''$ E (Longitude)) as indicated in Figure – E.1.

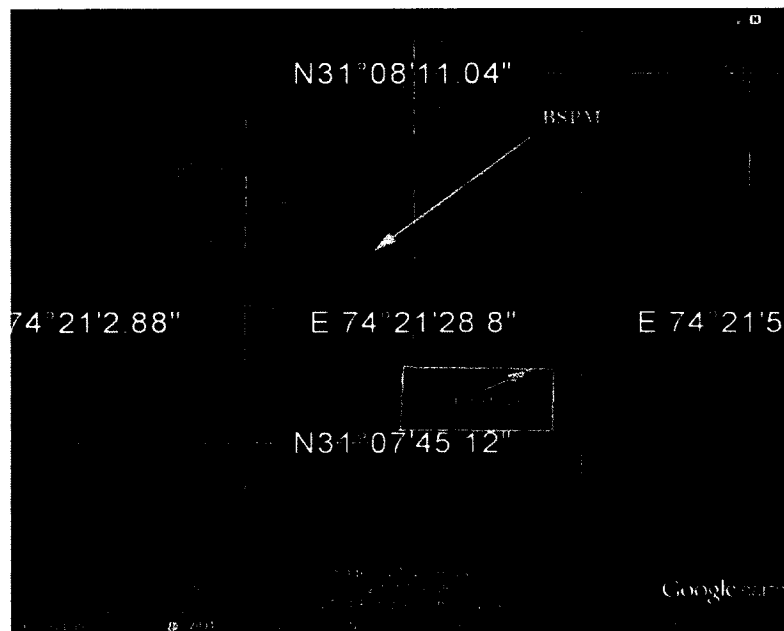


Figure – E.1

[Courtesy: Google Earth]

All land is owned by Packages Group and Project's layout plan is as below:

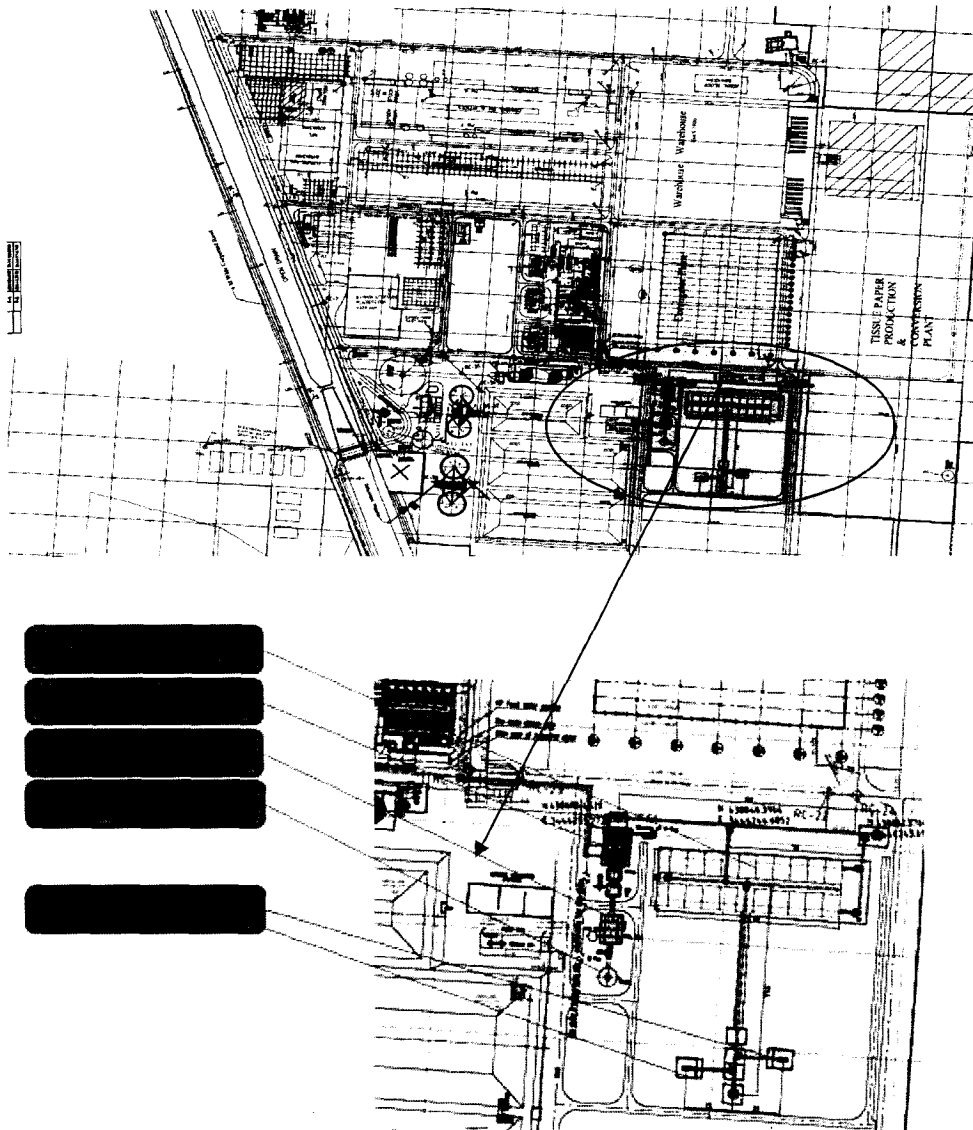


Figure – E.2

[Source: COWI A/S Study]

1.2 Products Processed

The proposed plant has installed capacity to generate 41 MW. The steam will be supplied to BSPPL for generation of electricity through an existing steam turbine and for process requirements.

Simplified mass balance of the Proposed Project is indicated in Figure – E.3, below:

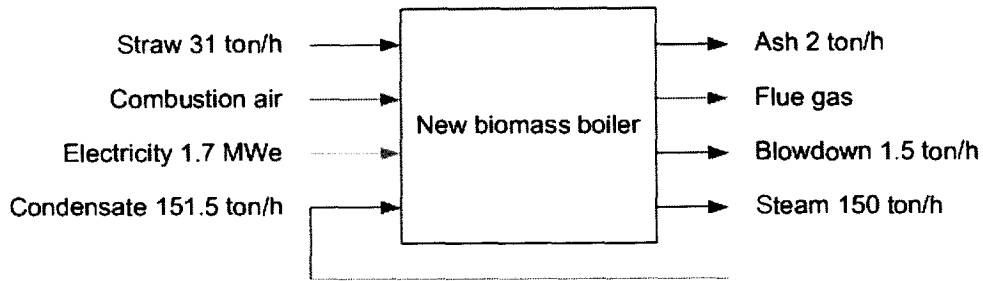


Figure – E.3
Simplified Mass Balance of Biomass Boiler
 [Source: COWI A/S]

1.3 Fuel

BSP Mill Feasibility titled “**Feasibility Study for Biomass Cogeneration at Bulleh Shah Packaging Private Limited (BSPPL)**” (December 2011), prepared by **COWI Consulting Group** was selected the following biomasses for use as fuel for the Proposed Project:

- Wheat straw
- Corn Stover
- Cottons stalks

This study has recommended the following requirement of biomass based on harvesting times and minimizations of storage needs as well as transportation distance (based on 100% capacity utilization and 120 MW thermal inputs):

Table – E.1
Residual Biomass and Consumption

Operating year	Feedstock	Amounts (tonnes per year)
1 - 3	Wheat	250,000
4 - rest of planning period	Wheat	48,000
	Corn stover	150,000
	Cotton stalks	52,000
	Total	250,000

[Source: AEIA/COWI Studies]

Packages Group has been using agricultural residual waste (wheat & rice straws) as primary feedstock for their paper & pulp mills at Packages Limited, Lahore and

BSPPL (Kasur). The collection of feedstock has been earlier established since inception of Packages Limited plant at Lahore and later on for BSPPL.

Availability of biomass at 100 – 300 kilometers radius from plant site is shown in Table – E.2

Table – E.2

Crop	Distance from BSPPL		
	100 km	200 km	300 km
	Availability of Biomass, Tonnes		
Corn Stovers	566,000	1,762,000	2,148,000
Cotton Stalks	23,000	281,000	909,000
Rice Straw	222,000	666,000	727,000
Wheat Straw	217,000	821,000	1,322,000
Sugar Cane – Trash	87,000	439,000	579,000
TOTAL	1,115,000	3,969,000	5,685,000

[Source: Punjab Agriculture Department]
(70 % biomass residue collection efficiency assumed)

Collection and delivery system for the feedstock has been well established. Biomass deliveries are being made both in bulk and baled form by large and small road trucks as well as tractor trolleys. At present BSPPL consumes about 300,000 tonnes per annum of biomass when operating at 100% capacity.

AEIA Study analysis shows that within a 100 km radius of BSPPL about 1.4 million tonnes/year of agricultural waste is available. At present the biomass in this area is being used for animal fodder, fuel for brick kilns and small scale biomass boilers.

It has been proposed by AEIA and COWI A/S (Project Consultants) that the Proposed Project should establish biomass collection centers, most with baling arrangement at the center for ease of handling and cost of delivery. Such arrangement will also reduce generation of fugitive dust during transportation and will be environmental friendly. Calorific values of various biomass is shown below:

Table – E.3
Calorific Value of Biomasses

Calorific Value		
	HHV(MJ/kg)	LHV(MJ/kg)
	Experiment	Experiment
Cotton Stalks	16.42	15.01
Corn Straw	16.35	14.96
Cane Trash	15.30	13.92
Rice Straw	14.04	12.86
Wheat Straw	15.5	14.14
Corn Cob	16.66	15.24

[Source: DANAK Study]

Biomass fuel data:	Unit	Data, nominal	Data, worst case
Type:		Wheat straw Corn stover Cotton stalks	Wheat straw Corn stover Cotton stalks
Calorific Value:	MJ/kg	14	11.7
Bale data:			
length:	M	0.6-2.5	0.6-2.5
width:	M	0.5-1.2	0.5-1.2
height:	M	0.5-0.875	0.5-0.875
Bale Volume:	m ³	0.15-2.6	0.15-2.6
Baled Density:	kg/m ³	150-250	150-250
Bale weight:	Kg	30-700	30-700
Loose (bulk) Density:	kg/m ³	55	55
Boiler data:			
Biomass consumption	MW	120	120
Operating hours (fuel handling design)	hours/year	8,000	8,000
Biomass per hour:	Ton	30.9	36.9
Biomass pr. Day	Ton	741	886
Biomass per year	Ton	247,000	295,000
A-shed storage capacity	Days	1.5	1.5
Nearby store capacity	Days	9	9
Shredder capacity	%	2 x 100	
Main conveyor capacity	%	2 x 100	

Source: COWI Feasibility Study

Presently, Packages Group operates seven collection centers and also receives wheat straw directly at both the BSPPL and Packages Limited. This delivered

wheat straw is utilized for the pulp & paper production. The collection system is working very well. Packages Group enters into an annual agreement with a farmer's broker to deliver the wheat biomass at a fixed price. This agreement is renewed annually and a fair price for delivery of the wheat straw is negotiated.

1.5 Steam Generation Process

The Proposed Project will install Biomass Fired High Pressure Boilers. Simplified process scheme is presented below:

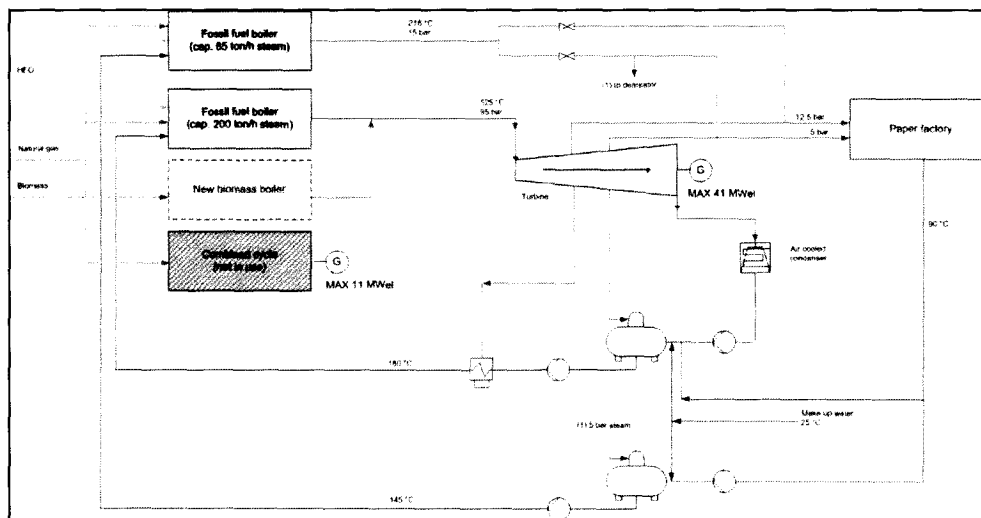


Figure – E.4

The proposed boiler will have a stack with a height of 100 meters. Fabric bag filters will be installed to bring the particulate matter to less than 50 mg/Nm^3 as set by the IFC/World Bank standards. All the ash will be collected in storage silo having a suitable capacity & will be disposed-off by, for use as fertilizer and refractory brick manufacture.

1.6 Water

The site will require make up and cooling water for the operation. The water requirement of the proposed plant is to be met from existing sources as the Biomass Boiler will replacing the operation of existing boilers at BSPPL.

1.7 Waste Water Treatment

Liquid effluents generated in the Biomass Boiler including boiler blowdown water, water from washrooms etc. will be treated in BSPPL existing waste water treatment plant to meet the requirements of IFC and NEQS Pakistan.

2. DESCRIPTION OF THE ENVIRONMENT

2.1 Climate

The climate of the Kasur district area (the project site) experiences the mean monthly temperature 26.80°C (minimum) and 41.0°C (maximum) during hottest month while mean monthly minimum temperature is registered to be 5.10°C and maximum temperature is 19.30°C during the coldest month. The area under reference falls in the tropical arid or desert climate region.

The area receives 250 – 500 mm mean annual rainfall. The rainfall during July to December is registered between 200 – 400 mm and during December to March 50 – 100 mm

2.2 Land Use

Area around the project site is under agriculture use up to over large distances. A few brick kilns operate. A few small scale industries, including cotton yarn manufacturing, exist near the project site. The future trend is showing industrialization as encouraged by the Government also.

2.3 Ecology

There is no endangered species of flora and fauna noticed in this area. The area does not shelter any specific wildlife.

2.4 Hydrological Conditions

2.4.1 Surface water

The run-off during monsoon period contributes to the surface water. There is no perennial stream or river in the surrounding villages. These villages get water from open wells and bore wells which get recharged in rainy season and nearby irrigation canal system.

2.4.2 Ground Water

The proposed Biomass Boiler will be located in the area which is being fed by an elaborate irrigation canal system and rain water, with the result that ground water aquifer is being regularly replenished. Shortage of ground water is not expected. Moreover, the Proposed Project will not be requiring water as it will be replacing existing boilers at BSPPL.

2.5 Ambient Air Quality & Noise Level

The ambient air quality was studied at six locations on and around the BSPPL & Project site. The data is presented below.

Table – E.4

Ambient Monitored Data from Project Site

Range	PM ($\mu\text{g}/\text{m}^3$)	SO ₂ ($\mu\text{g}/\text{m}^3$)	NO ₂ ($\mu\text{g}/\text{m}^3$)	CO (mg/m^3)
Lowest	45.90	15.30	20.30	0.12
Highest	85.40	36.40	48.60	0.42
Average	66.52	26.27	33.83	0.23
NEQS Limits	550.00	120.00	80.00	10.00

Noise level data, collected at 26 points at BSPPL and surroundings, ranges at 46.26 to 78.16 dB(A) with an average of 65.15 dB(A). This data is in compliance with the prescribed limit of 85 dB(A) by the National Environment Quality Standards (NEQS), Pakistan and 70 dB(A) by the World Bank.

Air Dispersion Modeling (ADM):

Detailed air dispersion modeling has been undertaken using “SCREEN 3” Model. SCREEN 3 uses a Gaussian plume model that incorporates source related factors and meteorological factors to estimate pollutant concentration from point sources continuously.

Data used for ADM is presented below:

Table – E.5

Fuel	Biomass		
	PM ₁₀	NO _x	SO ₂
Parameters			
<u>Air Dispersion Model - Input Data</u>			
- Source Type	Point	Point	Point
- Stack Height, meters	100.00	100.00	100.00
- Stack Diameter, meters	2.00	2.00	2.00
- Stack Exit Velocity, m ³ /s	42.72	42.72	42.72
- Emission Rate, gm/s	2.14	17.09	10.68
- Stack Gas Temperature, °K	413.15	413.15	413.15
- Rural/Urban Option	Rural	Rural	Rural

The air dispersion model was run using the above mentioned data. A consolidated statement of the results of model run, using various average ambient temperatures, is presented in Table – E.6.

Table – E.6

Summary Results of "AIR DISPERSION MODELLING"

Average Ambient Temperature	30 °C			45 °C			10 °C		
Parameters	PM ₁₀	NO _x	SO ₂	PM ₁₀	NO _x	SO ₂	PM ₁₀	NO _x	SO ₂
A - Air Dispersion Model - Input Data									
- Source Type	Point	Point	Point	Point	Point	Point	Point	Point	Point
- Stack Height, meters	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
- Stack Diameter, meters	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
- Volume Flow Rate, M3/s	42.72	42.72	42.72	42.72	42.72	42.72	42.72	42.72	42.72
- Emission Rate, gm/s	2.14	17.09	10.68	2.14	17.09	10.68	2.14	17.09	10.68
- Stack Gas Temperature, K	413.15	413.15	413.15	413.15	413.15	413.15	413.15	413.15	413.15
- Ambient Air Temperature, K	303.00	303.00	303.00	318.15	318.15	318.15	283.15	283.15	283.15
- Rural/Urban Option	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural
B - Air Dispersion Model - Output Data									
- Final Stable Plume Height, meters	365.50	365.50	365.50	337.61	337.61	337.61	400.63	400.63	400.63
- Distance to Final Rise, Meters	193.67	193.67	193.67	185.23	185.23	185.23	204.26	204.26	204.26
- Stack Velocity, M/S	13.60	13.60	13.60	13.60	13.60	13.60	13.60	13.60	13.60
- Buoyancy Flux, M ⁴ /S ³	35.55	35.55	35.55	30.66	30.66	30.66	41.96	41.96	41.96
- Momentum Flux, M ⁴ /S ²	135.61	135.61	135.61	142.39	142.39	142.39	126.73	126.73	126.73
- Meteorology	Full	Full	Full	Full	Full	Full	Full	Full	Full
- Terrain	Simple	Simple	Simple	Simple	Simple	Simple	Simple	Simple	Simple
- Terrain Height, meters	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
- Max. Concentration, 1-Hour, µg/m ³	9.76	77.94	48.71	11.03	88.12	55.07	8.46	67.54	42.21
- Max. Concentration, 24-Hour, µg/m ³	3.90	31.18	19.48	4.41	35.25	22.03	3.38	27.02	16.88
- Distance to Maximum, meters	835.00	835.00	835.00	804.00	804.00	804.00	873.00	873.00	873.00
IFC /WHO Ambient Air Quality Guidelines, 24-Hours, µg/m ³ (1) (2)	100	(*) 200	50	100	(*) 200	50	100	(*) 200	50
Pakistan - NEQS, at Source, 24-Hours, µg/Nm ³	550.00	80.00	120.00	550.00	80.00	120.00	550.00	80.00	120.00
Note: (*) NO ₂ , 1-Hour									
Note: (1) Ref: IFC Environmental, Health and Safety Guidelines, "General EHS Guidelines", April 30, 2007									
Note: (2) Ref: WHO Air Quality Guidelines Global Update, 2005									

The air dispersion modeling indicates that the emissions of SO₂, NO_x, and Particulate matter in all cases, from the project are in compliance with the requirement of IFC with respect to IFC's Emission Guidelines and Pak-NEQS. BSP have also submitted its compliance reports which indicated the all parameters are below the emission guidelines.

It is worth mentioning here that the project site is located in the “Non-degraded Air Shed” because there is no industry which may pollute the ambient air.

3. IMPACTS AND ENVIRONMENT MANAGEMENT PLAN

Impacts depends on the nature and size of activity being undertaken and also on the type of pollution control measures that are envisaged as part of the project. However, the following management practices are being followed to ensure that the environmental pollutants concentrations remain within the limits. Since the plant construction has already taken place, it will have no further impacts. Moreover, The operational impacts are also being monitored may cause impact on the surrounding environment in two phases.

- During construction phase
- During Operation phase

Mitigations of these likely impacts are described in the following sub-sections.

3.1 Impact on Air Quality and Management

Construction Phase

Increase is likely in PM₁₀, SO₂, NO_x, & CO levels due to construction activities and movement of vehicles. The impact of these activities would be temporary and will be confined within the plant boundary.

Operational Phase

Air pollution generating sources at proposed plant will be due to emissions on account of operation of biomass fired boiler. The important air pollutant to be generated during biomass operation from the proposed plant is mainly particulate matter (PM). Fabric bag filters will be installed to maintain PM below Pak-NEQS and IFC Standards.

3.2 Impact on Water Quality & Management

Construction Phase

The impact on water environment during construction phase is likely to be short term and insignificant.

Operational Phase

All liquid effluents from Proposed Biomass Boiler will be treated at BSPPL existing waste water treatment plant. The new Biomass Boiler will be replacing the operation of existing boilers.

3.3 Solid Waste

Construction Phase

Generation of solid waste during this phase shall be controlled by mitigation measures and impact will be insignificant.

Operational Phase

Main solid waste during operation phase shall be fly and bottom ash, which will be properly collected and monitored. Ash will be disposed off as manure/fertilizer and raw material for refractory bricks. However, in case none of the options work, then a duly secured landfill, to be constructed and operated in accordance with the internationally accepted practices, will be required for the ultimate disposal of ash.

3.4 Impact on Noise Levels and Management

Construction Phase

The impact of noise due to construction activities are insignificant, reversible and localized in nature and mainly confined to the day hours.

Operational Phase

All rotating items shall be well lubricated and provided with enclosures as far as possible to reduce noise transmission. In general, noise generating items such as fans, blowers, compressors, pumps, motors etc. are so specified as to limit their speeds and reduce noise levels. Operators will be provided with necessary safety and protection equipment such as ear plugs, ear muffs etc.

3.5 Social Aspects

- During construction, the project will provide employment to local personal.
- During the operational phase also, the project will generate employment opportunity.
- Increase in employment opportunities and reduction in migrants to outside for employment, increase in literacy rate, growth in service sectors.
- Improvement in socio-cultural environment of the project area
- Improvement in transport and communication services
- Increase in employment due to increased business, trade commerce and service sector.
- This project does not involve any displacement of local people.
- Some people have concerns about the environmental aspects of the project.
- Public invasion by the outsiders to take place due to the project has also very minor concern for the people.

4. ENVIRONMENTAL MONITORING PROGRAMME

The environment, safety and health-monitoring programme in the factory are as follows:

1. Regular monitoring of stack emissions through on-line instruments.
2. Daily monitoring of water and wastewater
3. Quality monitoring of ambient air, noise and work place air
4. Monitoring of occupational safety

The project management, being aware and conscious of its responsibilities to environment, is committed that the project operations will be made keeping in line with the internationally accepted sustainable measures/practices and methods thus leaving negligible adverse impacts on any segment of environment due to proposed activity.

5. ENVIRONMENTAL MANAGEMENT COSTS

Estimated Environmental Management and Monitoring Cost of the project are described:

- Fly ash cleaning and collection system = US\$ 2.0 millions
- Bottom ash collection system = US\$ 1.5 millions
- An emission measurement system to check the environmental performance (CEMS) = US\$ 0.1 millions
- Operators training for safe and reliable operation = US\$ 0.15 million
- Fire fighting system = US\$ 1.3 millions
- Equipments for monitoring of emissions, water analysis and personal safety are:

- a. Spectrophotometer

- b. PH meter
- c. Conductivity meter
- d. Flue gas analyzer
- e. Personal Protective equipment (goggles, face masks, safety shoes and safety helmets)
- f. Water treatment lab equipment (burette, pipette, water sampler, glass apparatus, chemicals)

Green House Gases (GHGs), Carbon Dioxide (CO₂), Carbon Credits:

The use of biomass as fuel ensures that overall global mass emissions of CO₂ per kWh produced are comparatively low. Furthermore, the relatively low carbon intensity of biomass when compared with fossil fuels reinforces such benefits. The proposed Biomass Boiler being renewable energy project will contribute to Green House Gases (GHGs) avoidance.

The biomass based boiler will result in some carbon emission but in overall terms the plant is carbon neutral. All carbon emitted is effectively reabsorbed within the re-growth of the biomass used as the fuel source.

Categorization of the Project:

With the use of biomass, air pollution will decrease especially with respect to NO_x and SO₂ emissions and can be further reduced very efficiently, conveniently and cost effectively. In the first place, there seems no possibility of NO_x emissions exceeding the IFC/World Bank standards. Secondly, if at all so required then NO_x can be reduced to the desired levels by use of Selective Catalytic Reduction (SCR) or Selective Non-Catalytic Reduction (SNCR). Efficient system of Fiber Filter Bags (FFB) will be used to remove around 99.9 % of the particulate matter. In view of the situation the project merits for its placement in IFC **“Category B”**.

The project, besides many other advantages, will result in:

- Greenhouse gases reduction,
- Reduction in air pollution from the present practices of burning the biomass on the fields,
- Addition to the economic development of farmers through the sale of their agriculture wastes presently either of no use/value or fetching just bare minimum price,

- Creation of more labour jobs in the entire supply chain circuit including also demand for labour around biomass collection stations and on the factory premises,
- Potential for self-employment by way of opening small scale tea stalls, road side autos repair workshops, opening of petrol pumps and gas stations along the routes of the vehicles carrying the biomass from the collection stations to the factory,
- Fly ash being rich in Potassium (K) will be used as K-fertilizer, as partial substitute for synthetic costly K fertilizer, thus reducing cost of production of agriculture products,
- Improvement of existing infrastructure especially roads, development and creation of infrastructure facilities between the biomass collection centres and the factory.
- Development/improvement of social and economic status of the people through addition to their income resulting also in enabling the people to fulfill desire to get their children educated.

The Proposed Project will operate in compliance with IFC's Performance Standards for Environmental and Social Sustainability, effective January 1, 2012.

1

Introduction

SECTION – 1 INTRODUCTION

1.1 INTRODUCTION

Despite severe challenges, economy of Pakistan has shown resilience in the year 2010. Gross Domestic Product (GDP) growth for the year 2009-10 was recorded at a provisional 4.1% on an inflation-adjusted basis. The long term forecast for economy are promising through productivity in agriculture and industrial sectors, but the objective of expected developmental growth needs commensurate rise in energy use. Considering the strong correlation between economic growth and energy demand, there is an imperative need for sustained increase in energy supply not only to maintain the growth momentum but also to protect the economy from disruptions, caused by energy deficiency during the years 2008 up to date.

Government of Pakistan (GoP) is making concerted efforts to ensure development of energy resources by encouraging private sector to meet energy demand and has liberalized investment policies. The policy has resulted not only in investments in power production sector from local resources, but also foreign investments are pouring in large amounts.

As a result of serious power shortage, load sheddings are so frequent in Pakistan. The gap between power supply and demand is further on the increase. Consequently, all walks of life are being adversely affected. Pakistan has an installed electric generating capacity of about 19,400 MW. Projection for the demand in year 2030 is forecast to be 100,000 MW.

Pakistan is energy deficit country. Fossil fuels are already in short supply, and their local availability is fastly depleting alongwith price hike taking place during very short intervals of time. On the other hand, their industrial, domestic and other multifarious usages are also fast on the increase. Import bills of the fossil fuels are

swelling at a very fast rate due to their fast increasing demand in the country. Pakistan's fragile economy cannot afford to continue with the present situation. Consequently, the present state demands to explore other fuels which could fully or partially replace the fossil fuels presently in use.

In 2005, Packages Limited, Lahore initiated a new project under the name Bulleh Shah Pulp and Paper Mill (BSPPL), which later on became Bulleh Shah Packaging Private Limited (BSPPL) after joint venture with Stora Enso (Finnish pulp and paper manufacturer), located at 50 km south of Lahore in Kasur. BSPPL site spreads over 300 acres and consists of two paper machines PM-6 and PM-7 enabling Packages to increase paper and paperboard production from 100,000 to 300,000 tones per year.

Operation of BSPPL is contingent on reliable supply of electricity from Water and Power Development Authority (WAPDA) and gas fuel supply from Sui Northern Gas Pipe Lines (SNGPL) limited. However, as mentioned above, since the last two years Pakistan has significant ongoing energy sector challenges including reduction in gas deliveries to industrial units and load shedding of electricity due to lack of power generation capacity in the country.

Packages Ltd. is one of the premier paper mills in the country and its paper production is directly dependent on electricity supply. Currently, BSPPL is equipped with one gas / Heavy Furnace Oil (HFO) fired 200 tph steam (about 41-MW) and one smaller gas / Heavy Furnace Oil (HFO) fired boiler (about 65 tph) to meet its internal plant power and steam needs.

The on-going power supply shortage in the country and also compounded by scarcity of natural gas deliveries by SNGPL are causing a significant loss of production at BSPPL resulting in a negative economic impact for the company.

Increase in energy cost i.e. the gas price escalation from Rs. 172.0/mmbtu to Rs.400-/mmbtu during July 2003 to July 2010 and exuberantly price hike in electricity rate besides their acute shortage/non availability, has compelled the management of BSPPL to seek alternative options to be self-sufficient in their present electricity needs.

Consequently, the management of BSPPL has decided to install boiler to produce 150 tons per hour (tph) steam producing biomass-fired boiler for cogeneration of 30 MW of electricity. This biomass fired boiler will replace existing ones being operated on natural gas and HFO.

Of the targeted bio-mass to be used as alternative fuel include agricultural wastes being produced in the region of the project such as rice hulls and straw, corn husks, wheat stalks/straw, cotton stalks, sugar cane trash etc.

This SEIA report is being prepared alongwith concurrent preparation of the feasibility study of the project.

The spirit of the Equator Principles (EPs) - "seeking to ensure that the projects we finance are developed in a manner that is socially responsible and reflect sound environmental management practices" has been adopted by and large by almost all national and international Development Finance Institutions (DFIs) and as such it has become just an important prerequisite for getting loan for the project from any quarters whatsoever. This spirit has also been kept in mind while preparing this report. This SEIA Report has been prepared for the Proposed Project keeping in line with the IFC Guidelines for such SEIA reports.

1.2 SCOPE OF EIA STUDY

The purpose of this SEIA study is identification of key environmental and social issues which will likely arise during construction and operation of the power plant

along with the assessment of the significant negative impacts and mitigation measures to be adopted for their minimiation.

The ultimate goal of this SEIA report, among others, is also to produce an Environmental Management Plan (EMP) and Environmental Monitoring Plan (EMtP) for the Construction and Operation Stages of the proposed project. Compliance of EMP together with the provisions for mitigation measures for the significant negative impacts will ensure the implementation of this project in an environmentally sustainable manner both at Construction as well as Operation stages of the Project.

The SEIA report ensures compliance to all national and local regulations enforced in Pakistan as well as the IFC/World Bank Guidelines for such report. However, taking into consideration the international requirements due attention has also been given to Equator Principles (EPs) and the International Finance Corporation (IFC) Performance Standards on Environmental and Social Sustainability (effective January 1, 2012). While taking into consideration the EPs, it was further sought to ensure that the project to be financed under reference of this SEIA report, is to be developed in a manner that is socially responsible and reflects sound environmental management practices.

This SEIA report also discusses the legal and administrative framework within which the SEIA is prepared. A brief project description is included in the SEIA report together with a description of the baseline environmental conditions and the actual environmental situation at the proposed site for the project.

The technical section of the report and the environmental baseline situation form the basis for the detailed impact assessment during construction and operation phases of the project. Based on the findings of this report, an environmental

management system has been devised, outlining necessary mitigation and compensation measures together with monitoring practices.

1.3 APPROACH AND METHODOLOGY

This SEIA report has been accomplished after carrying out thorough reconnaissance to identify the following Environmental and Social areas of concern:

- To achieve the desired environmental compliance standards under the IFC Guidelines as applicable to the project.
- Plans and activities to remedy/mitigate any potential adverse impacts and the gaps that could probably remain after implementation.
- Any other points/steps to be taken which could be beneficial to mitigate environmental adverse impacts that may accrue both during construction and regular operation of the power plant.

The format/contents of this EIA report are listed as below:

1. Introduction
2. Policy, Legal and Administrative Framework
3. Description of the Project
4. Baseline Conditions & Public Consultations/ Disclosure
5. Social Impacts and Mitigation/Remedial Measures
6. Potential (Unmitigated) Environmental, Health & Safety Impacts
7. Proposed Environmental Prevention and Mitigation Measures
8. Environmental Management & Monitoring Plan
9. Analysis of Alternatives
10. IFC Performance Standards 1 to 8
11. Grievance Redress Mechanism (Formal and Informal Channels)

In addition to the evaluation and review of the available records, data and the facts for the project feasibility studies, detailed discussions were held with the concerned members of the project management as well as other project stakeholders.

Notes and proposals for measures to be taken to mitigate and compensate for any determined/detrimental environmental impacts are contained in the Environmental Management Plan (EMP) as well as a Monitoring Plan, including all parameters that need to be measured, and the frequency of monitoring actions.

A comprehensive qualitative and semi-quantitative methodology was adopted to conduct this study inter-alia in due compliance with the SEIA requirements. The study included collection of both primary and secondary data regarding environmental status and other relevant factors.

1.4 IDENTIFICATION OF THE PROJECT AND THE PROPONENT

- Contact person:

Mr. Azhar Ali,
Project Manger,
Packages Limited,
Shahrah-e- Roomi, P.O. Amer Sidhu,
Lahore 54760.
Phone: 92 42 35811541-46

- Consultants who prepared the report:

ECTECH-Environment Consultants;
Suite 4, 2nd Floor, Link Arcade,
Model Town Link Road, Lahore, Pakistan.
Phone: 92 42 35887517, 35925693;
Fax: 92 42 35855508
Email: ectech_ectech@yahoo.com.

The proposed project, belongs to Bulleh Shah Packaging Private Limited, Kasur.

1.5 STUDY TEAM

BSPPL hired services of ECTECH Environmental Consultants, Lahore, Pakistan to undertake preparation of “**Social & Environmental Impact Assessment (SEIA)**” of the proposed project. A brief introduction of the experts who prepared the SEIA report is given in the Annexure – 1.1.

Among others, Dr. Muhammad Hanif and Mr. Aftab Ahmad from ECTECH Environment Consultants team members kept close liaison with the Packages Ltd Corporate Office in Lahore & BSPPL in Kasur through out the preparation of this SEIA report and comprehensively discussed various aspects of the project.

The team members also visited the proposed plant site, carried out environmental monitoring of the project site, held Public Consultations/ Scoping and attended to various other important aspects related to the project for synthesis of a realistic SEIA report of the project.

1.6 IMPORTANCE & BACKGROUND OF THE PROJECT

The on-going power supply shortage in the country besides scarcity of natural gas deliveries by Sui Northern Gas Pipelines Limited (SNGPL) are causing a significant loss of production at BSPPL resulting in negative economic impact for the company. Consequently, the Management of BSPPL has decided to install 150 tons per hour (tph) steam producing biomass-fired boiler for cogeneration of 30 MW of electricity to meet the power demand of BSPPL.

Increase in energy cost i.e. the gas price escalation from Rs. 172.0/mmbtu to Rs. 400-/mmbtu during July 2003 to July 2010 and exuberantly price hike in

electricity rate besides their acute shortage/non availability, has compelled the BSPPL management to seek alternative options for BSPPL to be self-sufficient in their electricity needs.

The bio-mass to be used as alternative fuel include agricultural wastes/residues being generated in the region of the project such as wheat and rice straw, corn husks, cotton stalks, sugar cane trash etc. The tentative project estimated cost is **US\$ 53 million.**

1.7 OBJECTIVES OF THE PROJECT

The main object of the Proposed Project is to generate cleaner, economical and reliable energy from indigenous biomass fuel which will not only provide a better alternate source of energy but also cause a boost to agriculture sector. It will also reduce environmental hazards caused by burning natural gas & furnace oil as fuel for producing electricity.

2

Policy, Legal & Administrative Framework

SECTION 2 - POLICY, LEGAL & ADMINISTRATIVE FRAMEWORK

2.1 - APPLICABLE HOST COUNTRY ENVIRONMENTAL AND OCCUPATIONAL SAFETY AND HEALTH LAWS AND REGULATIONS

A. National Environmental Regulatory/Legal Requirements

After the 18th Amendment to the Constitution of The Islamic Republic of Pakistan-1973, the regulation & management of environment has largely been delegated to the Provinces. The Federal Ministry of Environment has been abolished and instead the Ministry of Climate change has been created under the federal EPA is being operated.

The Pakistan Environmental Protection Agency (Pak EPA) looks after the environment related issues for the federally controlled areas and territories. Lacking laws at the provincial levels; the laws, rules, regulations etc., those already available at the federal level and operational at the provincial levels will continue as such.

A.1 National Conservation Strategy (NCS) - Pakistan

The National Conservation Strategy (NCS) – Pakistan, as approved by the Federal Cabinet in March 1992 is the guiding document on the environmental issues in the country (Ref. EUAD/IUCN, 1992). The NCS outlines the country's primary approach towards encouraging sustainable development, conserving natural resources, and improving efficiency in the use and management of resources.

The NCS has 68 specific programs in 14 core areas in which policy intervention is considered crucial for the preservation of Pakistan's natural and physical environment. The core areas that are relevant in the context of the envisaged

project are pollution prevention and abatement, restoration of supporting forestry and plantations, and preservation of cultural heritage. A mid-term review of the achievements, impacts and prospects of Pakistan's NCS was undertaken between years 1999 - 2000.

The Government of Pakistan promulgated "Pakistan Environmental Protection Act" in 1977. Two organizations, the Pakistan Environmental Protection Council (Pak-EPC) and the Pakistan Environmental Protection Agency (Pak-EPA), are primarily responsible for administering the provisions of the Act. The Pak-EPC oversees the functioning of the Pak-EPA. Among its major members include representatives of the Federal and Provincial Governments especially the Provincial Environmental Protection Agencies, industry, non-governmental organizations, academia, environment experts, Federation of Chamber of Commerce and Industry and the private sector.

The Pak-EPA, through the Provincial EPAs, is required to ensure compliance with the National Environmental Quality Standards (NEQS) and establish monitoring and evaluation systems. As a primary implementing agency in the hierarchy, it is responsible for identifying the need for, as well as initiating legislation whenever necessary. Pak-EPA is also authorized to delegate powers to its provincial counterparts, the provincial EPAs. One of the functions delegated by the Pak-EPA to provincial EPA is the review and approval of Environmental Impact Assessment (EIA) and Initial Environmental Examination (IEE) reports of the projects undertaken in their respective jurisdictions.

A.2 Pakistan Penal Code (1860)

The Pakistan Penal Code usually called PPC is a penal code for all offences charged in Pakistan. It was originally prepared by Lord Macaulay in 1860 on the behalf of the Government of British India as the Indian Penal Code. After the

partition of British India in 1947, Pakistan inherited the same code and subsequently after several amendments [e.g. Protection of Women (Criminal Laws Amendment) Act, 2006, Criminal Laws (Amendment) Act, 2004 (I of 2005), Criminal Law (Amendment) Ordinance (LXXXV of 2002), Criminal Laws (Reforms) Ordinance (LXXXVI of 2002), etc.] it is now mixture of Islamic and English Law.

Pakistan Penal Code is a general criminal law, applies all over the country, and contains specific provisions on the subject. Thus it prohibits mischief by killing or maiming animals, or damaging works of irrigation or a river or a road or a bridge or drain or firing explosive substances with intent to cause damage. The Code also prohibits public nuisance by acting negligently to spread the infection of disease or disobeying quarantine rule or causing adulteration of food or drink or drug, or fouling water or making the atmosphere noxious to health etc.

A.3 Pakistan Environmental Protection Act, 1997 and The Punjab Environmental Protection Act (Amendment) Bill 2011

The promulgation of the **Environmental Protection Ordinance, 1983** was the first codifying legislation to the issue of environmental protection. Later, the Government passed the **Pakistan Environmental Protection Act (PEPA), 1997** [The Punjab Environmental Protection Act (Amendment) Bill 2011], which is the basis of IEE/EIA studies carried out for the projects in Pakistan.

PEPA, 1997 is a fairly comprehensive legislation and provides protection, conservation, rehabilitation and improvement of the environment. It contains concrete action plans and programs for the prevention of pollution and promotes sustainable development. The salient features of the law are:

- It covers the air, water, soil, marine and noise pollution including pollution caused by motor vehicles.
- The Act provides National Environmental Quality Standards (NEQS) for wastewater, air emissions and noise.
- Law provides clear cut guidelines for IEE/EIA for various projects as per their magnitude and anticipated impacts.
- Law also empowers Federal Government to issue notices and to enforce them for the protection of the environment.

For the effective implementation of the provisions of PEPA, 1997, Pakistan Environmental Protection Agency, headed by a Director General was constituted. On the same pattern, Provincial Environmental Protection Agencies (EPA's) were created in all the provinces.

Environmental Tribunals were also constituted according to PEPA, 1997.

A.4 Policy and Procedures for the Filing, Review and Approval of Environmental Assessments

This document sets out the key policies and procedural requirements. It contains a brief policy statement on the purpose of environmental assessment and the goal of sustainable development and requires that environmental assessment be integrated with feasibility studies. It also defines the jurisdiction of the Federal and Provincial EPA's. It lists down the responsibilities of the proponent and states the duties of responsible authorities. It provides schedules of proposals that require either an IEE or EIA.

A.5 Guidelines for the preparation and review of Environmental Reports **(November 1997/2000)**

These guidelines are descriptive documents regarding the format and content of IEE/EIA reports to be submitted to EPA for “No-Objection Certificate (NOC)/Environmental Approval (EA)”. Following are the major areas, which are covered by these guidelines:

- The IEE report (scope, alternatives, site selection, format of IEE report)
- Assessing impacts (identification, analysis and production, baseline data, significance)
- Mitigation and impact management (and preparing an environmental management plan)
- Reporting (drafting style, main features, shortcomings, other forms of presentation)
- Review and decision making (role, steps, remedial options, checks and balances)
- Monitoring and auditing (systematic follow up, purpose, effective data management)
- Project Management (inter-disciplinary teams, programming and budgeting)

A.6 Guidelines for Public Consultations

These guidelines deal with possible approaches to public consultation (PC) and techniques for designing an effective program of consultation that reaches out to all major stakeholders and ensures the incorporation of their legitimate concerns in any impact assessment study. These guidelines cover:

- Consultation, involvement and participation of Stakeholders

- Techniques for public consultation (principles, levels of involvements, tools, building trust)
- Effective public consultation (planning, stages of EIA where consultation is appropriate)
- Consensus building and dispute resolution
- Facilitation involvement (including the poor, women, building community and NGO capacity)

A.7 National Environmental Quality Standards (NEQS)-1993, Amended August 2000

The National Environmental Quality Standards (NEQS) were first promulgated in 1993 and have been amended in August, 2000.

The following standards are specified therein:

- Maximum allowable concentrations of pollutants (32 parameters) in municipal and liquid industrial effluents discharged to inland waters, sewage treatment facilities, and the sea (three separate sets of numbers)
- Maximum allowable concentrations of pollutants (16 parameters) in gaseous emissions from the industrial sources

The Guidelines for “Self-Monitoring and Reporting” (SMART) [attached as Annexure– 2.1] for the industry as approved by the Pakistan Environmental Protection Council (PEPC).

A copy of the Government of Pakistan, Gazette Notification dated August 10, 2000 regarding NEQS is attached as Annexure – 2.2.

A.8 National Environmental Quality Standards for Ambient Air- November- 2010

The Ministry of Environment, Government of Pakistan vide its Notification, Islamabad, the 18th October, 2010 under S.R.O. 102 (1)/2010 established standards which provide the maximum allowable limits, in the ambient air, of Sulphur Dioxide (SO₂), Oxides of Nitrogen as (NO_x) and as (NO), Suspended Particulate Matter-(SPM), Respirable Particulate Matter-PM₁₀, Respirable Particulate Matter-PM_{2.5}, Lead and Carbon Monoxide (CO) [Annexure-2.2]

A-9 National Standards for Drinking Water Quality - November, 2010

The Ministry of Environment, Government of Pakistan vide its Notification, Islamabad, the 18th October, 2010 under S.R.O. 102(1)/2010 established standards for Drinking Water Quality [Annexure-2.2] The major quality parameters fixed depend upon Bacterial, Physical and Chemical ones.

A-10 National Environmental Quality Standards for Noise - November, 2010

The Ministry of Environment, Government of Pakistan vide its Notification, Islamabad, the 18th October, 2010 under S.R.O. 102(1)/2010 established standards for Noise [Annexure-2.2]. These standards are based on Category/zone i.e. Residential area, Commercial area, Industrial area and Silence zone. The limiting values for day and night have also been fixed for all categories/zones.

A.11 Sectorial Guidelines for Environmental Reports

These guidelines [Annexure-2.3] identify the key environmental issues that need to be assessed as well as mitigation measures and project alternatives to be considered in the actual EIA. These guidelines include:

Sector overview of the industry and the processes

- Potential impacts on the environment
- Mitigation measures
- Monitoring and reporting
- Management and training
- Checklist of likely environmental impacts and mitigation measures

A.12 Guidelines for Sensitive and Critical Areas

These guidelines identify sensitive and critical areas in Pakistan, in relation both to the natural environment and the cultural aspects.

A.13 National Resettlement Policy and Ordinance

At this point, the only legislation relating to land acquisition and compensation is the Land Acquisition Act (LAA) of 1894. Following a national consultative process, a national resettlement policy and a related ordinance were drafted. The draft policy and the ordinance are presently being reviewed by the provinces, and have yet to be approved and notified by the government. The salient applicable features of the Draft Resettlement Policy are given below:

- The Pak-EPA will be responsible for both environment-related as well as resettlement-related matters,
- The responsibilities for implementation at a provincial level are to be delegated to the concerned provincial EPAs with overall control of the provincial Planning and Development (P&D) Departments.
- All categories of 'loss' arising from development projects that entail resettlement, need to be addressed: these include not only loss of land, built-up

property, other infrastructure, and crops and trees, but also loss of income, job opportunities, and access to natural resources, etc.

- Vulnerable groups whose issues need to be addressed in particular include: women, children, destitute persons, tribal communities, squatters, those with usurper rights, and landless groups.
- There should be a special emphasis on consultation with affected groups when preparing a Resettlement Action Plan (RAP).

The provisions of the Draft Resettlement Policy are consistent with the requirements of the World Bank OD 4.30 on involuntary resettlement.

A.14 Forest Act, 1927

All India Forest Act, 1927 was adopted by the Government of Pakistan, which was subsequently implemented by the respective provinces. Basically, the law was enacted to conserve and protect the forest resources of the country for sustainable development. It lays down Rules and Regulations for exploitation of various categories of forests such as reserved, protected or unclassified. Further, the Act spells out the licensing method for timber cutting, grazing, hunting etc. It also gives the details of magisterial powers of Forest Department officers and penalties for offences committed with regard to forest resources and products.

A.15 Industrial Relation Ordinance, 2002

The ordinance has been promulgated to amend, consolidate and rationalize the law relating to formation of trade unions, regulation and improvement of relations between employers and workmen and avoidance and settlement of any differences or disputes arising between them

Pakistan's labour laws trace their origination to legislation inherited from India at the time of partition of the Indo-Pak subcontinent. The laws have evolved through a continuous process of trial to meet the socio-economic conditions, state of industrial development, population and labour force explosion, growth of trade unions, level of literacy, Government's commitment to development and social welfare. To meet the above named objectives, the government of the Islamic Republic of Pakistan has introduced a number of labour policies, since its independence to mirror the shifts in governance from martial law to democratic governance.

While Article 18 of the Constitution affords every citizen with the right to enter upon any lawful profession or occupation, and to conduct any lawful trade or business, the Industrial and Commercial Employment (Standing Orders) Ordinance was enacted in 1968 to address the relationship between employer and employee and the contract of employment. The Ordinance applies to all industrial and commercial establishments throughout the country employing 20 or more workers and provides for security of employment. In the case of workers in other establishments, domestic servants, farm workers or casual labour engaged by contractors, their labour contracts are generally unwritten and can be enforced through the courts on the basis of oral evidence or past practice.

The Constitution of Pakistan contains a range of provisions with regards to labour rights found in Part II: Fundamental Rights and Principles of Policy.

- **Article 11** of the Constitution prohibits all forms of slavery, forced labour and child labour;
- **Article 17** provides for a fundamental right to exercise the freedom of association and the right to form unions;
- **Article 18** proscribes the right of its citizens to enter upon any lawful profession or occupation and to conduct any lawful trade or business;

- **Article 25** lays down the right to equality before the law and prohibition of discrimination on the grounds of sex alone;
- **Article 37(e)** makes provision for securing just and humane conditions of work, ensuring that children and women are not employed in vocations unsuited to their age or sex, and for maternity benefits for women in employment.

A.16 Punjab Industrial Relations Bill 2010

In December 2010 Punjab Assembly passed new legislation that will govern the formation of trade unions, relations between industries and their workers, and the process for the settlement of labour disputes.

A.17 Industrial Relations Ordinance 2011 Promulgation

The Government has promulgated Industrial Relations Ordinance 2011. The Ordinance has been approved by the President on the Advice of the Prime Minister. The Government has promulgated Industrial Relations Ordinance, 2011 in view of the current legal vacuum created due to deletion of the concurrent Legislative List through the 18th Constitutional Amendment. The Industrial Relations has also been transferred to the Provinces which have promulgated provincial laws to regulate industrial relations. However, there is no law in place to deal with Industrial Relations in the Islamabad Capital Territory or in respect of national level trade federations and for resolutions of trans-provincial industrial issues. The Parliament has yet to promulgate the Ordinance as law.

A.18 Other Relevant Laws

Some of the other relevant laws and legislations are listed below:

- Canal and Drainage Act, 1873
- The Explosives Act, 1884
- The Fire Wood and Charcoal (Restriction) Act, 1964
- Motor Vehicles Ordinance, 1965
- The West Pakistan Regulation and Control of Loudspeaker and Sound Amplifier Ordinance, 1965
- Agriculture Pesticides Ordinance, 1971
- The Antiquities Act, 1975

A-19 National Electric Power Regulatory Authority (NEPRA) Act 1997

The NEPRA Act was approved by Parliament and signed into law in December 1997. It seeks to create an autonomous, independent regulatory authority, which will be solely responsible for the power sector. It will be responsible for the oversight of the power sector and will exercise control through its power to license power generation, transmission and distribution. It will regulate tariffs for all these activities. It will perform its functions through transparent processes to be enshrined in rules that are being framed in a transparent manner through appropriate rules.

A-20 Power Policy 1998

The revised power policy was implemented in 1998. The objective and intentions of the Government of Pakistan (GOP) to new policy is to move towards the creation of a competitive power market in Pakistan. It proposes to do so by restructuring and privatizing the existing thermal power generation, the power transmission and distribution functions and assets of existing public sector utilities

(WAPDA/KESC), by the creation of a fully autonomous regulatory authority, the National Electric Power Regulatory Authority (NEPRA), and through its future IPP policy.

The salient features of the Policy are;

- The basis for selection of private power project will be minimum levelized tariff through International Competitive Bidding. Variable tariffs over the life of the project will be permitted under terms specified prior to bidding. The process of selection will involve pre-qualification, issuance of a Request for Proposals (RFP), bidding and evaluation of bids against bid criteria clearly laid out in the RFP.
- It is recognized that without a proper feasibility study for a particular site-specific hydel or indigenous coal based project, it will not be possible to invite competitive bids and receive firm offers. Thus, detailed feasibility studies for such projects will be prepared before bids are invited.
- Hydel projects will be implemented on a Build-Own-Operate-Transfer (BOOT) basis; to be transferred to the province in which it is situated at the end of the concession period, and thermal projects on a Build-Own-Operate (BOO) basis.
- Competitive Tariffs will comprise an Energy Purchase price and a Capacity Purchase Price with adequate provisions for escalation.

A-21 Provincial Local Government Ordinances, 2001

These ordinances, issued following the devolution process, establish regulations for land use, the conservation of natural vegetation, air, water, and land pollution, the disposal of solid waste and wastewater effluents, as well as matters related to public health and safety.

A-22 Factories Act, 1934 (Amended 2012)

There is no independent legislation on occupational safety and health issues in Pakistan. The main law, which governs these issues, is the Chapter 3 of Factories Act, 1934. All the provinces, under this act, have devised Factories Rules. The Hazardous Occupations Rules, 1963 under the authority of Factories Act is another relevant legislation. These rules not only specify some hazardous occupations but also authorize the Chief Inspector of Factories to declare any other process as hazardous.

The other related laws are:

- Workmen Compensation Act, 1923
- Provincial Employees Social Security Ordinance, 1965
- West Pakistan Shops and Establishments Ordinance, 1969
- Boilers and Pressure Vessels Ordinance, 2002

Chapter 3 of the Act has general provisions on health and safety at the workplace. Provincial governments are allowed to make rules under this Act and inspectors under this Act also have discretion in defining the rules. Chapter 3 talks about various safety arrangements. This list is being provided just to show how meticulously labor law covers these issues.

- Cleanliness
- Disposal of wastes and effluents
- Ventilation and temperature
- Dust and fume
- Artificial humidification.
- Overcrowding
- Lighting

- Drinking water
- Latrines and urinals
- Spittoons
- Precautions against contagious or infectious disease
- Compulsory vaccination and inoculation
- Power to make rules for the provision of canteens
- Welfare officer
- Precautions in case of fire
- Fencing of machinery
- Work on or near machinery in motion
- Employment of young persons on dangerous machines
- Striking gear and devices for cutting off power
- Self-acting machines
- Casing of new machinery
- Prohibition of employment of women and children near cotton openers
- Cranes and other lifting machinery
- Hoists and lifts
- Revolving machinery
- Pressure plant
- Floors, stairs and means of access
- Pits, sumps, opening in floors, etc.
- Excessive weights
- Protection of eyes
- Power to require specifications of defective parts or tests of stability
- Safety of building, machinery and manufacturing process
- Precautions against dangerous fumes
- Explosive or inflammable dust, gas, etc.
- Notice of certain accidents

A.23 Land Use

The project site is situated in the area where agriculture and industrial activities are going on side by side. The land from agriculture use is rapidly coming under industry due speedy industrialization of the area.

Government policies for land use encourage industrialization. And permission for installation of the under reference industrial unit is a clear proof of the Government policy of encouraging industrialization of the area.

A-24 Regulatory/ Institutional/Administrative Framework

Government of Pakistan is facilitating investment, both local and foreign, in industrial sector in Pakistan. Liberalization and industrialization in the country, as a policy of the Government are well reflected from her following initiatives:

A-25 Deregulation of the economy

Deregulation is the prioritized policy of the Government of Pakistan. Under same policy there is a systematic movement towards deregulation of the economy and privatization of the state owned companies.

A-26 Import policy

Import policy has been largely liberalized to a great extent through the provision of various incentives. And it is being further liberalized at a quicker pace. There is an increased reliance on development of the industrial sector and enhancement of international trade.

A-27 Infrastructure facilities

In order to facilitate fast industrialization basic infrastructure facilities like roads network, natural gas, water and power supply, means of transportation and communications etc. are available.

A-28 Incentives

In order to maintain Pakistan's competitiveness in international markets and support viability of local and foreign investments in the country, the following incentives are available equally to both the foreign and the local investors:

- a- initial depreciation allowance (IDA),
- b- amortization and
- c- normal tax rates.

The capability of regulatory institutions for environmental management largely, ensures the success of environmental assessment for ensuring that development projects are environmentally sound and sustainable. For decision-making and policy formulation in the environmental and conservation issues, the institutional framework, as it exists in Pakistan, is described below:

2.2 - APPLICABLE INTERNATIONAL ENVIRONMENTAL AND OCCUPATIONAL SAFETY AND HEALTH LAWS AND REGULATIONS

B. International and National Non-Governmental Organizations

International and national Non-Government Organizations (NGOs), such as the International Union for Conservation of Nature and Natural Resources (IUCN) and the World Wide Fund for Nature (WWF), have been active in Pakistan for

some time. Both of these NGOs have worked closely with the governments at the federal as well as provincial levels and have positively contributed to the cause of environment. They have played significant role with regard to the formulation of environmental and conservation policies. And last but not the least, another the most prominent NGO namely "Sustainable Development Policy Institute (SDPI)" has also played very significant role in upholding the cause of environmental protection in Pakistan.

Environmental NGOs have been particularly active in the advocacy for promoting sustainable development approaches. Most of the government's environmental and conservation policies, even at the provincial and federal levels, has been formulated in consultation with these leading NGOs, who have also been involved in drafting new legislation on conservation.

International Framework

For the assessment of the environmental impacts of the proposed project on air, water and noise according to the international legal framework, this report has also incorporated the requirements of the "Pollution Prevention and Abatement Handbook" by the World Bank Group- effective July 1998.

Within this handbook, different guidelines are mentioned for the purpose of assessing industrial facilities with respect to their environmental compliance. In the present case, the guidelines for new thermal power plants are applicable for the preparation of the environmental impact assessment.

C. (ENVIRONMENT) RELATED RELEVANT INTERNATIONAL AGREEMENTS IN PAKISTAN'S CONTEXT

Pakistan is a party to the following treaties and agreements in furtherance of its environmental goals and programme.

Treaty	Pakistan Status
Convention on the Protection of Ozone Layer on Dec 18, 1992.	Ratified
The Amendment to Montreal Protocol on Substance that Depleting Ozone layer	Signed
UN Framework Convention on Climate Change on June 13, 1992	Signed
Convention on the Continental Shelf on October 31, 1958	Signed
The Convention on High Seas on October 31, 1958	Signed
Convention on the Fishing and Conservation of the living Resources of the High Seas on October 1958.	Signed
The UN Convention on Law of the Sea on December 10, 1982	Signed
The Convention on Territorial Sea and the Contagious Zone and the Agreement for the establishment of Network of Aquaculture Centers in Asia and the Pacific	Signed
The Convention on Wetlands of the International Importance on July 23, 1976	Ratified
The Convention on protection of the World Cultural and Natural Heritage on July 23, 1976	Ratified
The Convention on International Trade in Endangers Spice of Wild Fauna and Flora .	Signed
The Convention on Conservation of Migratory Specie of Wild Animal on Dec 01, 1987	Signed

The Convention on Biological Diversity in 1994 and became party to the CBD, Convention duly recognizes the intrinsic value of biological diversity, genetic, social, economic, cultural, educationist, recreational and esthetic values of biodiversity and its components	Ratified
The International Plant Protection Convention.	Signed
The Plant Protection Agreement for Area & pacific region	Signed
The Agreement for the establishment of a convention for controlling the desert lost in eastern region of its Distribution Area in South East Asia	Signed
The Treaty Banning Nuclear Weapon Test in the Atmosphere, in Outer Space and under Water on March 3, 1988	Signed
The International Convention on Oil Pollution Preparedness Response and Corporation	Signed
The Convention on prohibition of Military or any other Hostile Use of Environmental Modification Techniques and Accession of Feb 27, 1986	Acceded
Pakistan became a party to Montreal Protocol by Ratifying the protocol and its London amendment on Dec 18, 1982.the subsequent amendments known as Copenhagen Amendment which, accelerate the phase out for rectified in Jan 1995.	Signed
Convention of International trade Endangerous Species (CITS)	Signed
World heritage Convention Ramsar Convention	Signed
United Nation Convention to Combat Ozone Depletion (CCD). The convention signed and ratified in 1996	Signed
Stockholm Convention for Phasing out Persistent Organic pollutants (POPs) in 2001.	Signed

D. Requirements Of Potential Investors, Lenders And Insurers

The client intends to get finances for the project under reference from International Finance Corporation - IFC/WB (World Bank), therefore, requirements of potential investors; lenders and insurers are to be followed as described hereunder:

D-1 International Finance Corporation's (IFC) Policy on Environmental and Social Sustainability, Effective January 1, 2012

International Finance Corporation (IFC) is the private sector arm of the World Bank Group. Summarily, it aims at fighting poverty with passion and professionalism for lasting results and to help people help themselves and their environment by providing resources, sharing knowledge, building capacity, and forging partnerships in the public and private sectors.

International Finance Corporation's (IFC) Policy on Environmental and Social Sustainability, Effective January 1, 2012 supersedes the IFC Disclosure of Information Policy (April 2006) in its entirety. This Policy is not an express or implied waiver of IFC's privileges and immunities under its Articles of Agreement, international conventions, or any applicable law, nor does it provide any contractual or other rights to any party.

At IFC while transparency and accountability are fundamental to fulfilling its development mandate, IFC encourages its clients to be more transparent about their businesses and believes that when clients are committed to transparency and accountability they help promote the long-term profitability of their investments.

IFC strives for positive development outcomes in the activities (including (i) investments financed directly by IFC; (ii) investments implemented through financial intermediaries (FIs) or managed by IFC's Asset Management Company

or any other IFC subsidiary, as well as investments funded in part or in whole by donors; and (iii) advisory services) it supports in developing countries.

IFC believes that an important component of achieving positive development outcomes is the environmental and social sustainability of these activities, which IFC pursues and expects to achieve through the application of this Policy on Environmental and Social Sustainability (the Sustainability Policy or the Policy), and a comprehensive set of environmental and social Performance Standards. Through this Policy, IFC puts into practice its commitments to environmental and social sustainability. Activities supported and financed by IFC include a wide range of investment and advisory products including technical, financial and/or regulatory advice, project structuring as well as training to companies, industries, and governments.

Within the scope of an agreed advisory activity, all advice and training will be consistent with the Performance Standards. The Performance Standards consist of the followings:

Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts

Performance Standard 2: Labor and Working Conditions

Performance Standard 3: Resource Efficiency and Pollution Prevention

Performance Standard 4: Community Health, Safety, and Security

Performance Standard 5: Land Acquisition and Involuntary Resettlement

Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources

Performance Standard 7: Indigenous Peoples

Performance Standard 8: Cultural Heritage

These Performance Standards help IFC investment and advisory clients manage and improve their environmental and social performance through a risk and outcomes based approach. While managing environmental and social risks and impacts in a manner consistent with the Performance Standards is the responsibility of the client, IFC seeks to ensure, through its due diligence, monitoring, and supervision efforts, that the business activities it finances are implemented in accordance with the requirements of the Performance Standards. As a result, the outcome of IFC's environmental and social due diligence of a proposed business activity is an important factor in its approval process, and will determine the scope of the environmental and social conditions of IFC financing.

IFC's development mission are its efforts to carry out investment and advisory activities with the intent to "do no harm" to people and the environment, to enhance the sustainability of private sector operations and the markets they work in, and to achieve positive development outcomes. IFC is committed to ensuring that the costs of economic development do not fall disproportionately on those who are poor or vulnerable, that the environment is not degraded in the process, and that renewable natural resources are managed sustainably.

IFC recognizes that climate change is a serious global challenge and that climate-related impacts may impede economic and social well-being and development efforts. Working with the private sector and other parties to address climate change is therefore a strategic priority for IFC. IFC will engage in innovative investments and advisory services to support climate-friendly solutions and opportunities for business.

IFC support for low-carbon economic development is one dimension of a balanced approach to development, including supporting access to modern, clean, and reliable energy services. IFC pursues this objective through the use and development of relevant products, instruments, markets, and advisory services as

well as through the adoption of appropriate technologies, processes, and practices in the activities it supports.

The desired outcomes are very briefly described in the objectives of each Performance Standard as below:

Performance Standard 1

Assessment and Management of Environmental and Social Risks and Impacts

Performance Standard 1 underscores the importance of managing environmental and social performance throughout the life of a project. An effective Environmental and Social Management System (ESMS) is a dynamic and continuous process initiated and supported by management, and involves engagement between the client, its workers, local communities directly affected by the project (the Affected Communities) and, where appropriate, other stakeholders. Drawing on the elements of the established business management process of “plan, do, check, and act,” the ESMS entails a methodological approach to managing environmental and social risks and impacts³ in a structured way on an ongoing basis.

Business should respect human rights, which means to avoid infringing on the human rights of others and address adverse human rights impacts business may cause or contribute to. This Performance Standard applies to business activities with environmental and/or social risks and/or impacts.

Performance Standard 2

Labor and Working Conditions Introduction

Performance Standard 2 recognizes that the pursuit of economic growth through employment creation and income generation should be accompanied by protection of the fundamental rights of workers through a constructive worker-management relationship, and by treating the workers fairly and providing them with safe and

healthy working conditions, clients may create tangible benefits, such as enhancement of the efficiency and productivity of their operations.

Performance Standard 3

Resource Efficiency and Pollution Prevention Introduction

Where on the one hand increased economic activity and urbanization often generate increased levels of pollution to air, water, and land, and consume finite resources in a manner that may threaten people and the environment at the local, regional, and global levels; there on the other hand the current and projected atmospheric concentration of greenhouse gases (GHG) threatens the public health and welfare of current and future generations.

This Performance Standard outlines a project-level approach to resource efficiency and pollution prevention and control in line with internationally disseminated technologies and practices.

Performance Standard 4

Community Health, Safety, and Security Introduction

Performance Standard 4 recognizes that project activities, equipment, and infrastructure can increase community exposure to risks and impacts. In addition, communities that are already subjected to impacts from climate change may also experience an acceleration and/or intensification of impacts due to project activities. While acknowledging the public authorities' role in promoting the health, safety, and security of the public, this Performance Standard addresses the client's responsibility to avoid or minimize the risks and impacts to community health, safety, and security that may arise from project related-activities, with particular attention to vulnerable groups.

This Performance Standard addresses potential risks and impacts to the Affected Communities from project activities.

Performance Standard 5

Land Acquisition and Involuntary Resettlement Introduction

Performance Standard 5 recognizes that project-related land acquisition and restrictions on land use can have adverse impacts on communities and persons that use this land. Involuntary resettlement refers both to physical displacement (relocation or loss of shelter) and to economic displacement (loss of assets or access to assets that leads to loss of income sources or other means of livelihood¹) as a result of project-related land acquisition² and/or restrictions on land use.

Unless properly managed, involuntary resettlement may result in long-term hardship and impoverishment for the Affected Communities and persons, as well as environmental damage and adverse socio-economic impacts in areas to which they have been displaced. For these reasons, involuntary resettlement should be avoided and where unavoidable, it should be minimized and appropriate measures to mitigate adverse impacts should be carefully planned and implemented.

Performance Standard 6

Biodiversity Conservation and Sustainable Management of Living Natural Resources I

Performance Standard 6 recognizes that protecting and conserving biodiversity, maintaining ecosystem services, and sustainably managing living natural resources are fundamental to sustainable development. The requirements set out in this Performance Standard have been guided by the Convention on Biological Diversity, which defines biodiversity as “the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species, and of ecosystems.”

This Performance Standard addresses how clients can sustainably manage and mitigate impacts on biodiversity and ecosystem services throughout the project’s lifecycle.

Performance Standard 7

Indigenous Peoples Introduction

Performance Standard 7 recognizes that Indigenous Peoples, as social groups with identities that are distinct from mainstream groups in national societies, are often among the most marginalized and vulnerable segments of the population. In many cases, their economic, social, and legal status limits their capacity to defend their rights to, and interests in, lands and natural and cultural resources, and may restrict their ability to participate in and benefit from development. Indigenous Peoples are particularly vulnerable if their lands and resources are transformed, encroached upon, or significantly degraded. Their languages, cultures, religions, spiritual beliefs, and institutions may also come under threat. As a consequence, Indigenous Peoples may be more vulnerable to the adverse impacts associated with project development than non-indigenous communities. This vulnerability may include loss of identity, culture, and natural resource-based livelihoods, as well as exposure to impoverishment and diseases.

Private sector projects can create opportunities for Indigenous Peoples to participate in, and benefit from project-related activities that may help them fulfill their aspiration for economic and social development. Furthermore, Indigenous Peoples may play a role in sustainable development by promoting and managing activities and enterprises as partners in development. Government often plays a central role in the management of Indigenous Peoples' issues, and clients should collaborate with the responsible authorities in managing the risks and impacts of their activities.

Performance Standard 8

Cultural Heritage Introduction

Performance Standard 8 recognizes the importance of cultural heritage for current and future generations. Consistent with the Convention Concerning the Protection of the World Cultural and Natural Heritage, this Performance Standard aims to

ensure that clients protect cultural heritage in the course of their project activities. In addition, the requirements of this Performance Standard on a project's use of cultural heritage are based in part on standards set by the Convention on Biological Diversity.

Courtesy: IFC

D-2 The World Bank Environmental Assessment Process

The principal international guidance utilized in assessing the significance of impacts from the proposed development, and for determining content and form of reporting from the World Bank was also utilized.

World Bank Operational Policies OP4.01 Environmental Assessment (January 1999):

This sets out the World Bank's policy on projects requiring an EIA and defines what the assessment is designed to achieve and what issues must be considered. It also sets out guidance for screening projects and identifies other World Bank guidance and policies that may be relevant.

World Bank – Pollution Prevention and Abatement Handbook (1998):

This handbook sets out the basic principles that are considered appropriate to evaluating and controlling pollution from any defined project. The handbook provides guidance on pollution management and sets out generic environmental standards for air, water and soil pollution. This handbook also provides sector guidance. Of most significance to this project is the guidance for Thermal Power: Guidelines for new plant (July 1998).

The environmental assessment undertaken in this report also utilizes, as a precautionary measure only, The World Bank guidelines presented in the "Pollution Prevention and Abatement Handbook" effective July 1998.

D-3 International Finance Corporation, Environmental, Health, and Safety (EHS) Guidelines for Thermal Power Plants (2008)

The EHS Guidelines contain the performance levels and measures that are generally considered to be achievable in new facilities by existing technology at reasonable costs. The applicability of the EHS Guidelines should be tailored to the hazards and risks established for each project on the basis of the results of an environmental assessment in which site-specific variables, such as hot country context, assimilative capacity of the environment and other project factors, are taken into account.

E- Categorization of the Project

Bulleh Shah Packaging Pvt. Ltd. (BSPPL), the already operational project, is situated in the agriculture land around. The project site is surrounded by populated human settlements in the form of villages. Kasur city, District Headquarter, is situated at about 10 kilometers from distance from the project site with approximate population of approximate 2 354,806. There is no element of environmental sensitivity including biodiversity around the project site. With the use of biomass, air pollution will decrease especially with respect to NO_x and SO₂ emissions and can be further reduced very efficiently, conveniently and cost effectively. In the first place, there seems no possibility of NO_x emissions exceeding the IFC/World Bank standards. Secondly, if at all so required then NO_x can be reduced to the desired levels by use of Selective Catalytic Reduction (SCR). For, SO₂ removal, a dry or semi-dry scrubber can be used. Efficient system of Fiber Filter Bags (FFB) will be used to remove around 99.9 % of the particulate matter. In view of the situation the project merits for its placement in IFC "**Category B**".

The project, besides many other advantages, will result in:

- Greenhouse gases reduction,
- Reduction in air pollution from the present practices of burning the biomass on the fields on massive scale,
- Addition to the economic development of farmers through the sale of their agriculture wastes/residues presently either of no use/value or fetching just bare minimum price,
- Creation of more labour jobs in the entire supply chain circuit including also demand for labour around biomass collection stations and on the factory premises,
- Potential for self-employment by way of opening small scale tea stalls, road side autos repair workshops, opening of petrol pumps and gas stations along the routes of the vehicles carrying the biomass from the collection stations to the factory,
- Fly ash for the time being will be land filled for about one to two years, with the ultimate aim of its introduction as being rich in Potassium (K) will be used as K rich-fertilizer, to substitute partially for synthetic costly K fertilizer, thus reducing cost of production of agriculture products,
- Increase in revenue for the Government in the form of additional taxes,
- Improvement of existing infrastructure especially roads, development and creation of infrastructure facilities between the biomass collection centres and the factory,
- Development/improvement of social and economic status of the people through addition to their income resulting also in enabling the people to fulfill desire to get their children educated.

F. Hierarchy of obtaining Environmental Approval (EA) from the EPA, Government of the Punjab, Lahore:

According to The Punjab Environmental Protection Act 1997 (Amendment) Bill 2011 Section 12, sub-section 1&4:

“(1) No proponent of a project shall commence construction or operation unless he has filed with the Government Agency designated by Federal Environmental Protection Agency or Provincial Environmental Protection Agencies, as the case may be, or, where the project is likely to cause an adverse environmental effects an environmental impact assessment, and has obtained from the Government Agency approval in respect thereof.”

“(4) The Government Agency shall communicate its approval or otherwise within a period of four months from the date the initial environmental examination or environmental impact assessment is filed complete in all respects in accordance with the prescribed procedure, failing which the initial environmental examination or, as the case may be, the environmental impact assessment shall be deemed to have been approved, to the extent to which it does not contravene the provisions of this Act and the rules and regulations.”

For the project falling in “Category A”, the hierarchy of obtaining the EA involves submission of EIA report to the EPA. The EIA report is to be examined by the officials of the EPA. In case any further clarification is needed, it will be provided by consultant preparing the report and the project proponent. After satisfying the concerned EPA, the project proponent according to the directions of the EPA, will publish two public notices in two separate daily newspapers of the choice of EPA inviting all concerned and stakeholders to give their written comments on the project while going through the EIA reports to be made public by the EPA. The invitation of comments period will be 30 days as required under the Pakistan Environmental Protection Act- 1997. On the 31st day, Public Hearing (PH) will be held at a place to be declared by the EPA. The environment consultants are to present the EIA report to the participants of the Public Hearing and reply to their questions. After PH, in case EPA has any objection/question, they will be

answered by the environment consultants and the project proponent. And lastly, EA will be issued by the EPA.

For the project falling in "Category B", Initial Environmental Examination (IEE) report is required for getting EA from the EPA. Since the present project falls under this category, therefore, IEE will be submitted to the EPA. The IEE report will be scrutinized at their end and by their panel of experts, after whose satisfaction an internal meeting of the concerned committee of the EPA will further scrutinize the report. And thereafter EA for the construction phase will be awarded.

In either case whether it is Category A or B project, the EA is in the first stage is issued for the construction phase of the project with conditions as required to maintain the environment and other segments of the natural settings unaffected during construction phase. The project proponent is required to submit environmental monitoring reports on monthly basis showing that all the conditions laid down in the EA are being fulfilled. After the construction phase is completed, the project proponent is required to request the EPA for issuance of EA for the operational phase of the project. The concerned EPA official will visit the project site and ascertained if the required conditions as required to be fulfilled have been complied with. In case every thing is in accordance with the requirement of the EA for the Operational Phase then the concerned EPA will issue EA for the regular operation of the project, off course, with various conditions for the environmentally safe operation of the project. In case some conditions are not fulfilled then the project proponent is required to fulfill the condition unfulfilled. Thereafter, EA will be awarded for the operation phase. Of the other conditions to be fulfilled during the regular operation, the most important one is monthly environment monitoring of the project by a third party and submit the environment monitoring reports regularly to the concerned EPA.

However, the EPA has the right to monitor the project any time of its own choice. In case, the project does not operate in compliance with required national environment quality standards, the concerned EPA will serve a notice under section 16 of the PEPA -1997 to show compliance with in thirty days of the issuance of the notice. In case the project is still found in non-compliance with the NEQS, then the case is refer to the Environment Tribunal (ET) which after satisfaction i.e. the project is not in compliance with the NEQS, will impose a fine of Rupees One Million with the condition that if the project continues in violation of the required standards, then a fine of Rupees Hundred thousand for each day of default will be imposed. After 30 days, in case the project is still operates against the require NEQS, then the project will be closed till the proponent practically demonstrate compliance with the NEQS.

G. Status of the Project Approval for EA from the EPA Punjab

The IEE report prepared according to the required format of the Environmental Protection Agency, Government of Punjab was submitted to the said agency and after it's processing No Objection Certificate (NOC)/Environmental Approval (EA) was issued by the said agency.

3

Description of the Project

SECTION – 3 DESCRIPTION OF THE PROJECT

3.1 EXISTING SITUATION AT BSPPL

Packages Limited installed a new pulp and paper mill facility near Kasur previously called Bulley Shah Paper Mills after joint venture with Stora Enso is now renamed as Bulleh Shah Packaging Pvt. Ltd. (BSPPL). This facility consists of two paper machines, PM6 and PM7, able to produce up to 300,000 tonnes of paper and paperboard per year.

BSPPL requirement of steam and electricity is being met through two main boilers:

- 200 tonnes per hour (tph) – high pressure boiler (natural gas & heavy fuel oil fired).
- 65 tph – medium pressure boiler (natural gas & heavy fuel oil fired).

The 200 tph boiler is utilized for generation of electricity and provision of process steam. With operation of 65 tph boiler BSPPL has to import nearly half of its requirement from national grid. BSPPL operation is directly dependent on reliable and continuous supply of natural gas and electricity.

3.2 PROPOSED BIOMASS FIRED BOILER PROJECT

Packages Group is proposing to install, in the vicinity of BSPPL, a 150 tph biomass based boiler to supply high pressure super-heated steam at 525 °C temperature and 95 bar pressure. The proposed Biomass Boiler will be using water cooled vibrating grate technology. At 100% capacity utilization of the boiler the mass and energy balance is presented in Figure 3.1 and 3.2 below:

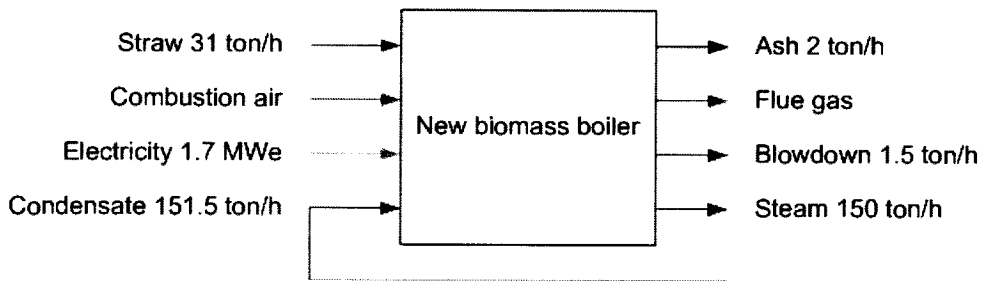


Figure – 3.1

Simplified Mass Balance of Biomass Boiler

[Source: COWI A/S, "CONCEPTUAL DESIGN STUDY FOR NEW BIOMASS POWER PLANT"]

	Value	Unit
Fuel input	121	MW
Heat load	-109	MW
Heat losses	-12	MW
Own electricity consumption	1.7	MW

	Value	Unit
Fuel input	31	ton/h
Combustion air	200	ton/h
Bottom ash	-0.4	ton/h
Fly ash	-1.6	ton/h
Flue gas	229	ton/h
Feedwater flow	151.5	ton/h
Blowdown	-1.5	ton/h
Steam flow	150.0	ton/h

Figure – 3.2

Energy & Mass Balance of New Biomass Boiler

[Source: COWI A/S Study]

New biomass based boiler, to be installed in the vicinity of BSPPL, will be environmentally friendly, replacing the present use of fossil fuels and providing optimum supply of steam and electricity for BSPPL’s two paper & board manufacturing plants. BSPPL energy & mass balance diagram is presented as Figure – 3.3.

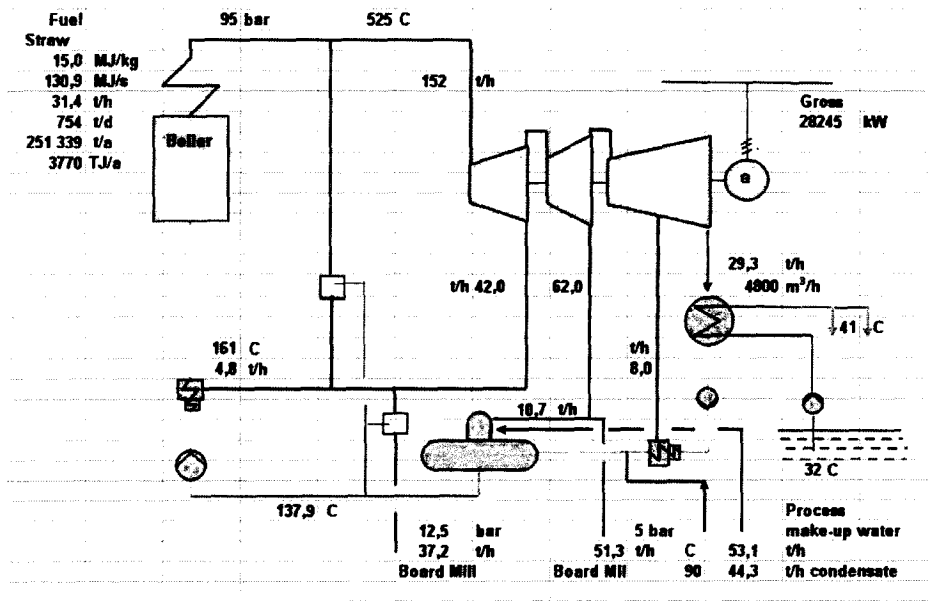


Figure – 3.3

BSPPL - Energy & Mass Balance with 150 TPH New Biomass Boiler
 [Source: COWI A/S Study]

The proposed simplified process flow diagram prepared by COWI A/S is presented as Figure-3.4, below:

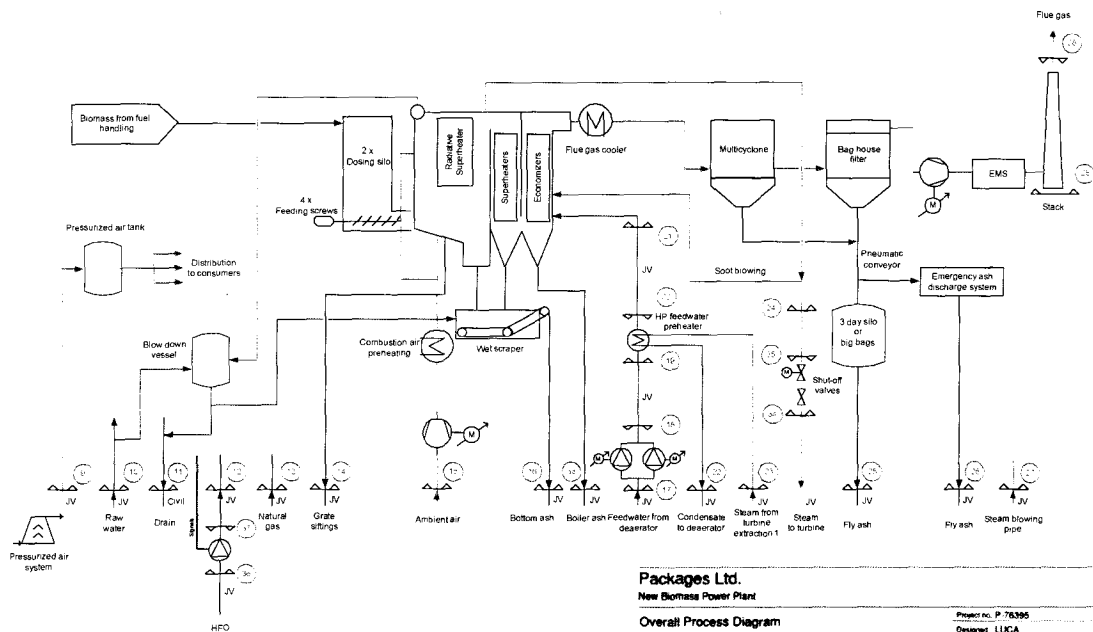


Figure – 3.4, Biomass Boiler – Process Flow

It is proposed to install stack with height of 100 meters and 2 meters diameter. The Biomass Boiler will be equipped with bag filters to remove Particulate Matter (mostly flyash) from the flue gases to less than 50 mg/Nm³ on dry basis. Expected analysis and temperature are as follow:

- Temperature = 130 °C
- Particulate Matter (mostly flyash)= Less than 50 mg/Nm³
- SO₂ = Less than 250 mg/Nm³
- NO_x (as NO₂) = Below 400 mg/Nm³
- Carbon Monoxide (CO) = Less than 100 mg/Nm³
- Carbon Dioxide (CO₂) = 0.1 tonnes per hour

NO_x can be further reduced to 150 mg/Nm³ with future installation of Selective Non-Catalytic Reduction (SNCR) system.

Table – 3.1 shows the volume of flue gases at 100% capacity utilization of the Biomass Boiler.

Table – 3.1
Biomass Boiler - Flue Gases Volume

	Value	Unit
Thermal fuel input (LHV)	121	MW
Excess air	40	%
Lambda of combustion	1.4	
Oxygen content in the flue gas, wet	5.2	%vol
Oxygen content in the flue gas, dry	6.0	%vol
Flue gas amount, wet	229	ton/h
Flue gas amount, wet	176,800	Nm ³ /h
Flue gas amount, dry	153,800	Nm ³ /h

[Source: COWI A/S Study]

3.3 SITE FOR THE PROPOSED PROJECT & PLANT LAYOUT

BSPPL is located off Kasur – Madina Town – Raiwind Road. The proposed Biomass Boiler will be located in the vicinity of existing BSPPL. Annexure - 3.1 presents BSPPL location on Google Map, whereas Annexure 3.2 shows BSPPL site on Google Earth picture.

The project site, located in the vicinity of BSPPL, is at an altitude of about 205 meters above mean sea level. The global co-ordinates of the plant is $31^{\circ}07'45.12''$ N (latitude) and $74^{\circ}21'28.8''$ E (Longitude) as indicated in Figure – 3.5.

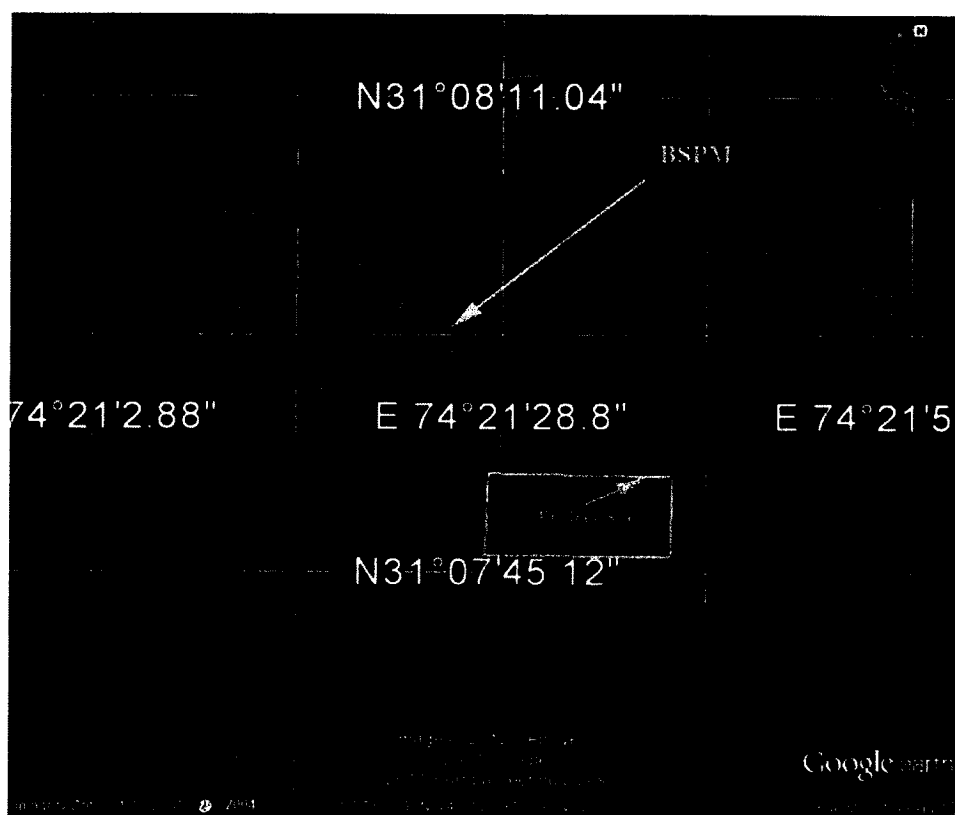
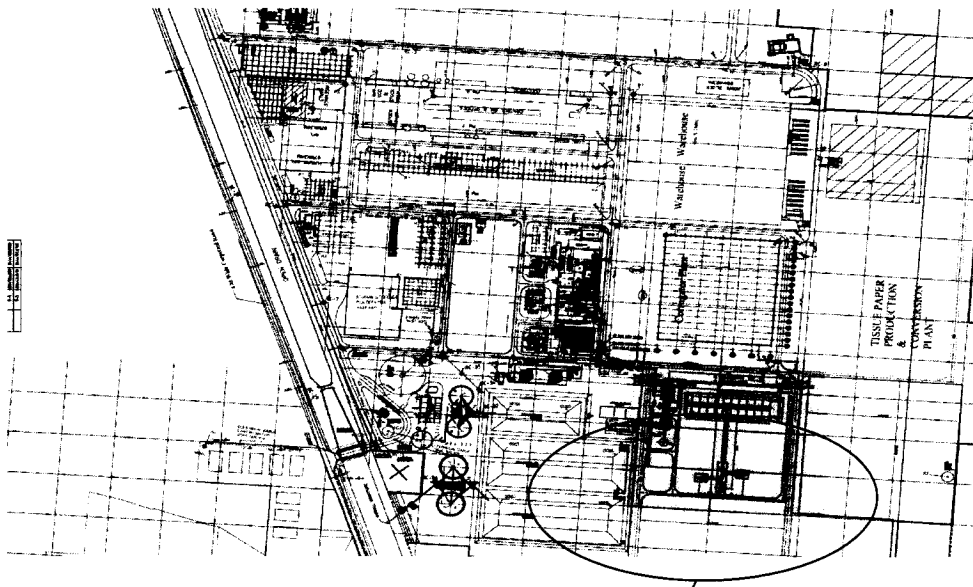


Figure – 3.5 [Courtesy: Google Earth]

The proposed project site is located south-west of the BSPPL operational plant site, but within the folds of the battery limits of the existing plant. Sufficient land, owned by Packages Group is available for the Biomass Boiler installation. The Proposed Project’s layout plan is presented as Figure – 3.6



BSPPL Plant Site – Indicating Location of Biomass Boiler Project Site

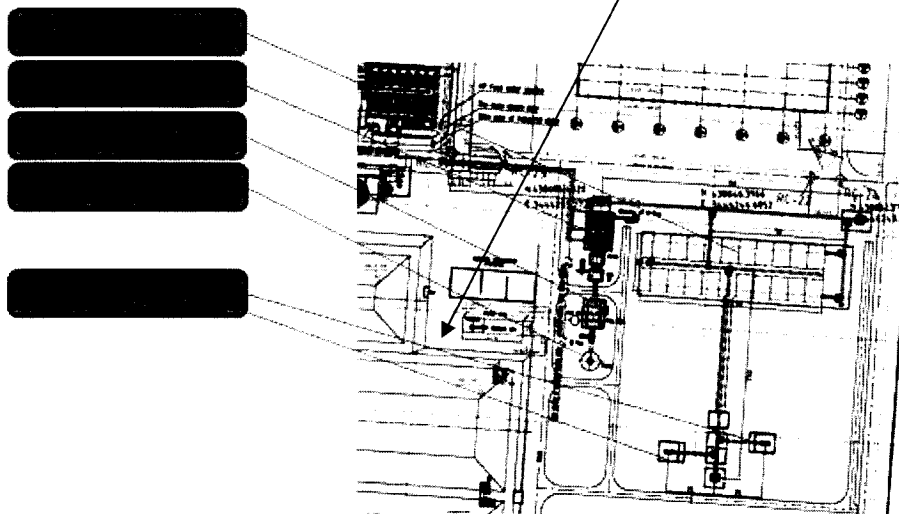


Figure – 3.6 [Source: COWI A/S Study]
Proposed Biomass Project Layout Plan

Above mentioned layout and process details are based on Conception Design Study carried out by COWI A/S, Denmark. The final design of the plant will be determined during the detailed engineering works to be conducted prior to construction. However, the main features will be the biomass bales storage, Biomass handling facilities, conveyors, Biomass bunkers, boiler plant and stack, Biomass shredder, ash handling & bunker facilities, induced draft fan, flue gases

cleaning equipment, boiler feed water facilities, and fire-fighting & safety facilities. The most prominent feature of the site within the surrounding areas is likely to be the boilers chimney (stack).

3.4 BASIC INFRASTRUCTURE AND FACILITIES:

All basic infrastructure like roads; transport; water; repair and maintenance workshops and technicians; communication facilities like telephone, fax and email; utilities required to run the plant smoothly, office buildings, medical facilities, security etc., already exist at BSPPL.

Packages Group is planning to construct a separate link road, from Kasur – Madina Town – Raiwind Road, for the Biomass Boiler Project fuel (biomass) transportation to plant site.

3.5 PROJECT WATER REQUIREMENT AND SUPPLY

The site will require makeup boiler feed water and cooling water for the operation. Water requirement of the proposed Biomass Boiler is to be met from the existing BSPPL facilities. Water requirement for the Biomass Project will be replacing the water requirement of existing BSPPL boilers.

Steam condensate, from power generation steam turbines of BSPPL, will be recycled back to the New Biomass Boiler.

Analyses of ground (raw) and drinking waters at BSPPL have been presented in Section – 4 of this Report.

3.6 WASTEWATER TREATMENT PLANT

Boiler blowdown and other liquid effluents from the Biomass Project will be treated at the existing elaborate waste water treatment facilities of BSPPL.

3.7 FUEL AVAILABILITY, REQUIREMENT & SUPPLY

Project feasibility titled “**Feasibility Study for Biomass Cogeneration at Bulleh Shah Packaging Private Limited (BSPPL)**” (December 2011), prepared by **COWI Consulting Group** has selected the following biomasses for use as fuel for the Proposed Project:

- Wheat straw
- Corn Stover
- Cottons stalks

This study has recommended the following requirement of biomass based on harvesting times and minimizations of storage needs as well as transportation distance (based on 100% capacity utilization and 120 MW thermal inputs):

**Table – 3.2
Residual Biomass and Consumption**

Operating year	Feedstock	Amounts (tonnes per year)
1 - 3	Wheat	250,000
4 - rest of planning period	Wheat	48,000
	Corn stover	150,000
	Cotton stalks	52,000
	Total	250,000

[Source: AEIA/COWI Studies]

The study has considered that during the first three years (2014-2017) of operation, wheat straw will be the sole feed stock. After which period when further biomass collection centers and logistic are developed the shift needs to be

towards use of corn stover and cotton sticks. It is recommended that then corn stover will be the primary residual fuel.

Packages Group has already been using agricultural residues/waste (wheat & rice straws) as primary feedstock for their paper & pulp mills at Packages Limited, Lahore and BSPPL (Kasur). The collection of feedstock system has been earlier established since inception of Packages Limited plant at Lahore and later on for BSPPL.

Collection and delivery system for the feedstock has been well established. Biomass deliveries are being made both in bulk and baled form by large and small road trucks as well as tractor trolleys. At present BSPPL consumes about 300,000 tonnes per annum of biomass when operating at 100% capacity.

Figure – 3.7 shows the potential availability of biomass at 100 and 300 kilometers radius from BSPPL plant site.

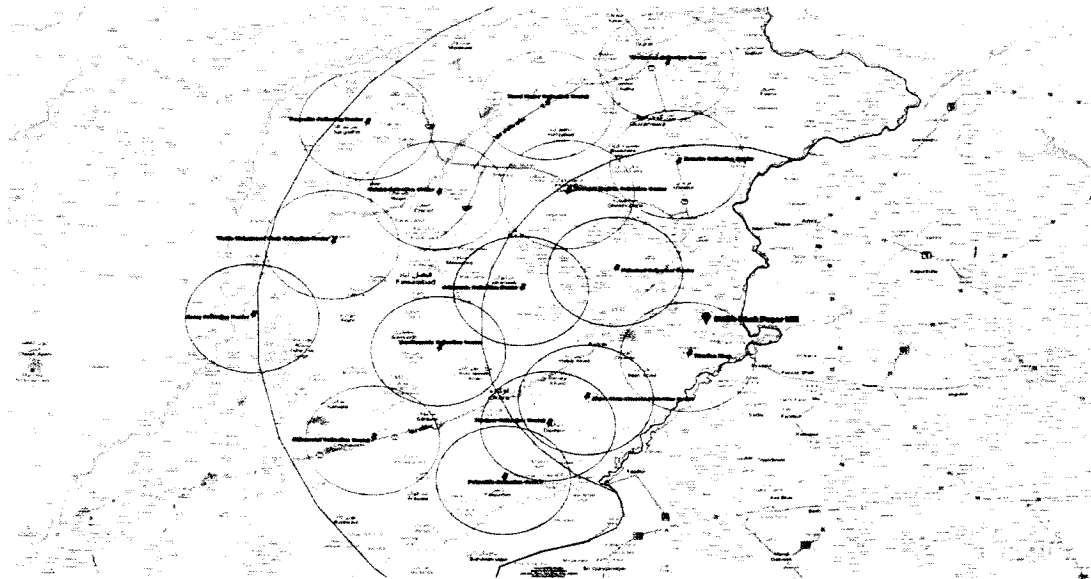


Figure 3.7
Potential Location of Biomass Collection Sites
 [Source: AEIA Study]

Availability of biomass at 100 – 300 kilometers radius from plant site is shown in Table – 3.3

Table – 3.3

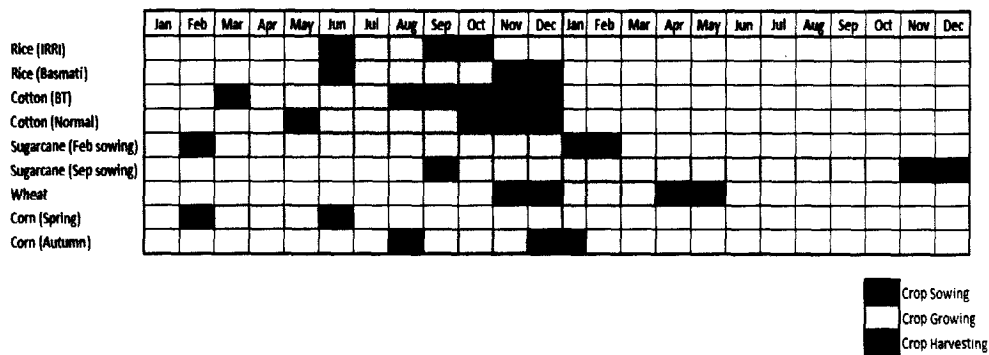
Crop	Distance from BSPPL		
	100 km	200 km	300 km
	Availability of Biomass, Tonnes		
Corn Stovers	566,000	1,762,000	2,148,000
Cotton Stalks	23,000	281,000	909,000
Rice Straw	222,000	666,000	727,000
Wheat Straw	217,000	821,000	1,322,000
Sugar Cane – Trash	87,000	439,000	579,000
TOTAL	1,115,000	3,969,000	5,685,000

[Source: Punjab Agriculture Department]
(70 % biomass residue collection efficiency assumed)

AEIA Study analysis shows that within a 100 km radius of BSPPL about 1.4 million tonnes/year of agricultural waste is available. At present the biomass in this area is being used for animal fodder, fuel for brick kilns and small scale biomass boilers. Table – 3.3 shows the net availability biomass as future fuel after deduction of present use from total generation.

Table – 3.4 shows the biomass availability schedules for the various crops:

Table – 3.4
Biomass Availability & Harvesting Schedule



[Source: AEIA Study]

It has been proposed by AEIA and COWI A/S that the Proposed Project should establish biomass collection centers, most with baling arrangement at the center for ease of handling and cost of delivery. Such arrangement will also reduce generation of fugitive dust during transportation and will be environmental friendly.

Tables 3.5 and 3.6, below, show the proximate & ultimate analysis of various biomasses:

Table – 3.5
Biomass – Proximate Analysis

Proximate Analysis (Weight %)						
	Corn Straw	Cane Trash	Rice Straw	Wheat Straw	Corn Cob	Cotton Stalks
Moisture	12.0	13.6	9.4	9.2	11.1	12.6
Volatile Matter	66.7	62.9	58.8	63.6	72.4	65
Ash	4.4	9.5	16.9	11.1	1.4	4.1

[Source: DANAK Study]

Table – 3.6
Biomass – Ultimate Analysis

Ultimate Analysis (Weight %)						
	Corn Straw	Cane Trash	Rice Straw	Wheat Straw	Corn Cob	Cotton Stalks
C	41.7	38.5	35.9	39.5	42.5	41.5
H	5.0	4.8	4.6	5.0	5.3	5.0
N	0.75	0.63	0.69	0.40	0.29	0.66
O	35.0	32.4	31.4	33.9	39.1	35.6
S	0.06	0.24	0.16	0.11	0.02	0.12

[Source: DANAK Study]

Calorific values of the residual biomass are indicated below in Table – 3.7:

Table – 3.7
Calorific Value of Biomasses

Calorific Value		
	HHV(MJ/kg)	LHV(MJ/kg)
	Experiment	Experiment
Cotton Stalks	16.42	15.01
Corn Straw	16.35	14.96
Cane Trash	15.30	13.92
Rice Straw	14.04	12.86
Wheat Straw	15.5	14.14
Corn Cob	16.66	15.24

[Source: DANAK Study]

Presently, Packages Group operates seven collection centers and also receives wheat straw directly at both the BSPPL and Packages Limited. This delivered wheat straw is utilized for the pulp & paper production. The collection system is working very well. Packages Group enters into an annual agreement with a farmers' broker to deliver the wheat biomass at a fixed price. This agreement is renewed annually and a fair price for delivery of the wheat straw is negotiated.

Tables 3.8 indicates the existing operational biomass collection centers:

Table – 3.8

Packages Group – Existing Biomass Collection Centers

Center Name	Year Established	Land Ownership Status	Storage Area (acres)	Distance from BSPPL-Kasur (Km)	Distance from PKG - Lahore (Km)	Storage Capacity (tons)	Number of Balers	Baling Capacity (tons)	Wheat Straw Purchased in 2008 (tons)	Wheat Straw Purchased in 2009 (tons)	Wheat Straw Purchased in 2010 (tons)
PAKPATTAN	1988	Own	21.5	140	180	20,000	4	8,000	13,364	6,831	11,900
DEPALPUR	1992	Own	13.25	105	145	6,200	0	0	6,112	808	3,910
HUJRA SHAH	1986	Own	10	80	120	14,000	2	4,000	12,143	10,068	11,043
MANDI FAIZABAD	1993	Own	8.25	120	65	2,000	0	0	3,614	2,219	4,782
JARANWAL	2005	Lease	25	175	120	9,000	0	0	8,666	9,052	8,079
TANDLIANWALA	2007	Lease	12.25	225	170	14,000	2	4000	9,288	8,899	10,878
JHANG	1998	Lease	10	320	265	12,000	3	6,000	9,536	8,826	10,429
SHORKOT	2008	Lease	0	370	315	0	0	0	2,579	Centre dlosed	Centre dlosed
PACKAGES PLANT LAHORE	1966	Own	7	40	0	7,000	0	0	21,340	22,111	12,225
PAPER MILL KASUR	2006	Own	4	0	40	4,000	0	0	5,125	1,818	4,594
									91,767	70,627	77,840

Proposed new collecting and already existing centers, which will be required to meet the future biomass demand, are shown in Tables 3.9 and 3.10.

Table – 3.9

Proposed new Primary & Already Existing Biomass Collection Centers within 200 km radius of BSPPL

Collecting Center	Status	Distance from the mill
Faizabad	Existing	120 km
Jaranwala	Existing	175 km
Hujra Shah Muqem	Existing	80 km
Depalpur	Existing	105 km
Kamoke	Proposed	120 km
Khanqah Dogran	Proposed	146km
Khudian Khas	Proposed	36 km

[Source: COWI A/S Study]

Table – 3.10
Secondary Biomass Collection Centers within 300km radius of BSPPL

Collecting Center	Status	Distance from the mill
Pakpattan	Existing	140 km
Tandlianwala	Existing	225 km
Jhang	Existing	320 km
Wazirabad	Proposed	105 km
Rasulnagar	Proposed	187 km
Sargodha	Proposed	258 km
Chiniot	Proposed	211 km
Thatta Muhammad Shah	Proposed	266 km
Chichawatni	Proposed	197 km

[Source: COWI A/S Study]

This incoming wheat straw is baled on site and then transported to BSPPL or Packages Limited, Lahore. The transportation of the wheat straw to the mills is also subcontracted out. Typically 40 feet flatbeds are utilized to deliver the straw to BSPPL or Lahore sites. Average loading on the flatbed is close to 40 tonnes.

Packages is planning to expand and open up new collection centers based on the same successful approach as operations of the existing wheat straw collection centers. As per existing operations the baling and transportation components could be subcontracted to minimize infrastructure expenditure or any other economical and convenient approach to be worked out after adoption of feasibility study. It is pertinent to note that whatever the approach is followed the environment related facts will remain the same which are duly addressed in the later sections of this report.

Collection centers will be used to collect the biomass available as close to BSPPL as possible to mitigate transportation costs. Figure-3.7, shows potential collections centers about 30 km apart to capture required quantities of biomass. A major consideration is for the collection center to be close to a highway. Assumptions were made on biomass availability in top five districts of each crop and then collection centers in each district are proposed. Figure-3.7 shows the location of

BSPPL, major transportation routes, and potential locations of the biomass collection centers.

3.8 ASH HANDLING

Biomass Boiler will generate the following three (3) types of ashes:

- Bottom ash
- Boiler ash
- Filter ash

The bottom ash from the grate is collected in a wet scraper. It serves the purpose of putting out possible glowing particles in the ash, air sealing between the boiler and the surrounding and serve as basis for transport of ashes. The wet scraper is a water filled scraper, and a certain water level will be maintained. Water for the scraper will be primarily blow down water from the boiler, which is cooled and condensed.

Boiler ashes, which are ashes collected from the bottom of the 2nd/3rd pass and possible additional passes, are collected in hoppers at the bottom of the boiler. Rotary locks in the system ensure gas tightness between the boiler and the surroundings. Boiler ashes are mixed with the bottom ashes in the wet scraper, as they will constitute rather coarse material. From the wet scraper the mixture of bottom ashes and boiler ashes are conveyed to an ash bunker or container from where further transport is arranged.

Bottom ash and Boiler Ash will be used to manufacture refractory and the left over will be sent to cement factories.

The filter/fly ash will be used as fertilizer because it contains P&K and as such it will partly cut upon the use of synthetic P&K fertilizer.

According to some studies carried out in India, “Fly ash holds a potential to improve the physical health of the soil. It can serve as a soil modifier and also enhance the water retaining capacity and fertility of the soil. It improves the plants water and nutrient uptake; helps in development of roots and soil binding, stores carbohydrates and oils for use when needed, protects the soil from soil borne diseases and detoxifies contaminated soil”.

Use of Fly ash in agriculture can increase the yield of cereals, oil seeds, pulses, cotton and sugarcane by 10-15%, vegetables by about 20-25% and root vegetables by 30-40%. Waste lands, degraded lands, saline alkaline soils, eroded soils etc., can be successfully reclaimed by fly ash.”

Some of the other uses include use of fly ash in mine filling, construction of roads/ flyover embankments, hydraulic structures, raising of dykes, manufacture of several building components like bricks, blocks, tiles and use in agriculture.

It is also used as a pozzolanic substitute for cement in Roller Compacted Concrete dams-an innovative dam technology developed as a result of efforts to design more economical concrete dams that could be constructed rapidly with designed performance. Fly ash in R.C.C. is used not only for saving cement cost but also for enhancing strength and durability.

Fly ash can also be used in Portland cement concrete to enhance the performance of the concrete.

Utilizing fly ash in roads saves top soil, avoids creation of low lying areas, does not deprive the nation of the productivity of top soil and reduces the demand of land for fly ash disposal.

The use of fly ash in the Nizamuddin bridge road embankment at Delhi, India for about 2 Kms. and a height of 8 meters in a flood zone has demonstrated the use of

fly-ash in adverse conditions. This has not only saved the top soil and used fly ash which was otherwise a waste but also saved Rs. 1.4 crores in a total project of Rs. 10 crores.

Fly ash-Lime-Gypsum bricks are manufactured using the properties of the mixture as an 'Hydraulic Cement' meaning thereby that it sets and hardens in the presence of moisture and on the lines of Portland cement, gets stronger with age but unlike clay bricks does not need sintering.

Cellular light weight concrete blocks are used as a substitute to bricks and conventional concrete blocks. This is a foaming agent based technology from Germany using Fly-ash (to the extent of 1/3rd to 1/4th of the total materials constitution), sand, water and foam manufactured from biodegradable foaming agents.

Fly ash based polymer products are also being used as wood substitutes. They have been developed by using fly ash as the matrix and jute cloth as the reinforcement.

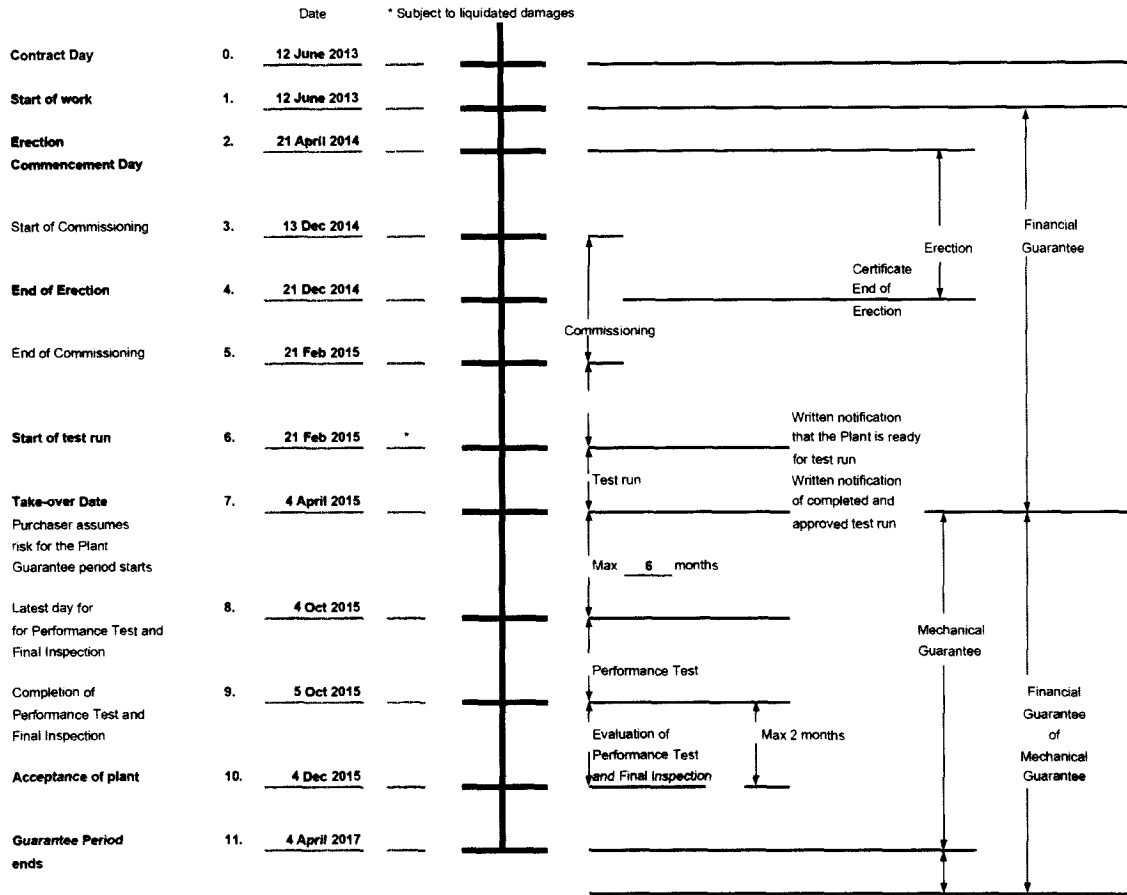
The Government of India has withdrawn a 8% **excise duty** imposed earlier on fly ash products. Now no excise duty is levied on manufacture of goods in which a minimum of 25% w/w fly ash is used.

3.9 PROJECT IMPLEMENTATION SCHEDULE

Tentive Project implementation schedule is presented below:

Table – 3.10

Contract designation. Equipment and erection



3.10 POTENTIAL CDM CREDITS

- **The Current Situation**

With the current commitment period of the Kyoto Protocol drawing to a close in 2012, future demand for carbon emission reductions is expected to be driven by the outcome of agreements, and from emerging national and regional climate policies. The required commitments of Annex 1 countries (industrialized and countries in transition which have ratified the Kyoto Protocol) beyond 2012 are currently unclear and therefore the future market for Certified Emission Reductions (CERs).

Participants of the World Bank's present set of Carbon Funds are primarily interested in buying CERs from projects that will generate sizeable CERs before the end of 2012.

With the regulatory period of the Kyoto Protocol ending in 2012, and discussions between the Parties to the UNFCCC on a long-term framework for the post-2012 period not concluded, there is a period of uncertainty regarding the future international climate regime. The challenge along with the lack of regulatory framework has created a limited demand for post-2012 carbon assets.

As a response to these challenges, the new proposed Carbon Partnership Facility is designed to develop emission reductions and support their purchase over long periods after 2012. "Learning by doing" approaches will be an essential aspect of the "Carbon Partnership Facility" as it moves from individual projects to programmatic approaches, including methodologies needed for such approaches.

Because this project will not be formally registered before 2013 (at the earliest), preliminary discussions with staff from the World Bank Carbon Finance Unit indicates that the project cannot rely on the European CER market, in particular in the case of Pakistan which is considered a Low Income Country, rather than an

LDC. This will limit the market for CERs to perhaps the Japanese market. Unfortunately, this uncertainty will persist for the next couple of years. However, as the proposed Carbon Partnership Facility is implemented, there should be opportunities to enter the CERs marketplace.

- **The Kyoto Protocol**

Basically the Kyoto Protocol is an agreement under which industrialized countries agree to reduce their collective greenhouse gas (GHG) emissions by 5.2% below 1990 levels for the period from January 2008 until 2012. Countries have been divided into two general categories: Annex I countries which are developed countries who have accepted GHG obligations and Non-Annex I countries which are developing countries who have no GHG obligations. Pakistan falls into this latter category.

The Kyoto Protocol includes three “flexible mechanisms” which are intended to lower the overall costs of achieving emission targets. The flexible mechanisms enable Annex I countries to meet emission targets by taking credit for carbon reductions in other countries. The three flexible mechanisms are:

- i- ET (Emissions Trading),
- ii- JI (joint Implementation) and
- iii- CDM (Clean Development Mechanism).

Emissions Trading: Each Annex I country is given a certain number of AAUs (Assigned Amount Units), which represent the total amount of GHG that the country is allowed to emit in the first commitment period (2008-2012). The AAUs are tradable units that represent 1 tCO₂e (ton of CO₂ equivalent). Countries can trade AAUs to help meet emissions targets. Alternatively an individual firm can purchase AAUs to meet its own emissions targets.

Clean Development Mechanism: The CDM allows industrialized countries to meet their domestic emissions targets by purchasing GHG reduction credits from *non-industrialized* countries as an alternative to achieving 100% of the required emissions reductions within its own borders. Since non-industrialized countries have no emissions reduction targets, they have nothing to lose by allowing another country to take credit for emissions reductions. In order to take credit for the reduction, the project developer must demonstrate that the total emissions have been reduced below the business as usual scenario.

Joint Implementation: Joint Implementation (JI) allows industrial countries to meet their domestic emission reduction targets by purchasing GHG credits from other *industrialized* countries as an alternative to achieving 100% of the required emission reductions within their own borders. Most JI projects are expected to take place in countries with economies in transition in Eastern Europe and the former Soviet Union for example, where the cost of reducing emissions is considerably lower. JI projects are much less common than CDM projects. This is especially the case for Pakistan.

- **CDM Overview**

There are many steps to taking a CDM project from an idea to eventually generating cash. Hereunder, are outlined different types of CDM projects, the project cycle, and the methods for calculating emissions reduction, and the various ways the CERs can be monetized?

Biomass Boiler Project can fall into one of several types of projects.

Types of CDM Projects:

There are seven types of CDM projects:

1. Energy Efficiency -Increase energy efficiency of buildings or commercial/industrial facilities.

2. Switch to less carbon intensive fuels
3. Methane Recovery - Recover methane from animal waste, coal mines, landfills, wastewater sludge, or other sources
4. Industrial Process Change - Change an industrial process resulting in reduced GHG emissions
5. Cogeneration - Make use of waste heat from electric generation
6. Transport - Improve fuel efficiency, Switch to less carbon intensive transport mode, and Reduce frequency of transport
7. Agricultural - Any agricultural change that results in the reduction of GHG emissions
8. Land Use - A forestation or reforestation

- **The Project Development Cycle**

The CDM development cycle consists of the following steps.

1. **Project Identification:**

To qualify as a CDM project, the project must establish “additionality”. Additionality refers to the incremental improvement over the business as usual scenario. Any project that would have been developed without the CDM process would not be considered additional. So the art in CDM projects is to fully justify this position.

2. **Project Idea Note:**

The developer can submit a project idea note (PIN) to potential carbon credit buyers to gauge the level of interest in the project. The PIN typically includes information on project size anticipated GHG reductions, suggested CER price, financing structure, other economic effects, etc.

3. Stakeholder Participation and Validation:

Local stakeholders are invited to comment on the Project Design Document (PDD) over a 30 day period. The PDD gives a description of the project and outlines the methods for measuring and calculating emission reductions. A report is created to show how relevant concerns were addressed.

4. Host Country Approval:

Host countries are given a great deal of leeway in choosing to accept or reject CDM projects. This approval is required.

5. Validation by Designated Operational Entity (DOE):

In the validation process, the DOE confirms that all the information and assumptions in the PDD are reasonable. DOEs are domestic or international entities that have been accredited by the CDM Executive Board. Typically the project developer is responsible for contracting with and paying the DOE. Validation does not guarantee the issuance of credits.

6. Registration:

Registration of the project with the CDM Executive Board is the act of final acceptance of the project.

7. Implementation and Monitoring:

Once the project is implemented, the project developer needs to monitor the project performance and submit monitoring results to the DOE for verification and certification. The monitoring results are used to determine the number of credits granted. Monitoring must be in accordance with validated monitoring plans.

8. Verification, Certification, and Issuance:

Verification is the periodic review and ex-post determination of GHG reductions. To avoid a conflict of interest, the DOE contracted for verification will generally be different from the DOE contracted for validation.

Certification is the written assurance by a DOE that the project has achieved a given reduction in GHG emissions. The DOE is liable for eventual mistakes, misrepresentations, and fraud. Certification is effectively a form of liability transfer. After certification, the CDM registry administrator will issue CERs by forwarding them to the appropriate accounts.

- **Current Configuration of BSPPL**

Specification of current equipments is as follows:

Equipment	High pressure boiler
Manufacturer	Descon Engineering Pvt. Ltd. Pakistan
Type	Water tube
Steam production	200 tph
Steam parameters	T=525degC, P=95bar
Fuel	Natural gas (main) or HFO
Current status	Main supplier of steam to the turbine / generator
Post-project role	Additional supplier of steam to the turbine / generator

Equipment	Steam turbine and generator
Manufacturer	Siemens Czech Republic
Type	Condensing Extraction Type
Generating capacity	41MW
Generating voltage	11kV
Current status	Supplier of electricity and heat to the paper machines.
Post-project role	Supplier of electricity and heat to the paper machines.

Equipment	Low pressure boiler
Manufacturer	Descon Engineering Pvt. Ltd. Pakistan
Type	Water tube
Steam production	65tph
Steam parametera	T=198degC, P=13bar
Fuel	Natural gas (main) or HFO
Current status	Backup supplier of heat to the paper machines.
Post-project role	Backup supplier of heat to the paper machines.

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Quantity of fuel used historically is as follows.

Gas (Hm³)	2008	2009	2010	2011
41MW SPP	582	356,022	409,319	155,703
65 tph Boiler	267,998	183,462	101,054	48,568

HFO(Tonne)	2008	2009	2010	2011
41 MW SPP	0	0	1699	8,559
65 tph Boiler	0	683	6880	3,741

Quantity of electricity generated and imported historically is as follows:

Unit:	2008	2009	2010	2011 till Aug
MWh				
Generated	29,363	80,426	65,356	30,684
Imported	56,555	46,949	65,596	52,469

- **Calculation of Emissions Reduction**

Based on the above historical data of existing equipment, **Packages CDM developer Mitsubishi Corporation Ltd. Japan** calculated the basic reduction in GHG emissions for the Bulleh Shah Paper Mill as follows:

(Net Emission Reduction) = (Baseline Emissions) – (Total Project Emissions) – (Leakage)

CERs = 224,316 - 5,158 - 0 = 219,158 tCO₂

Where, Baseline Emissions = GHG emissions from the combustion of natural gas and from purchased electric power,

Total Project Emissions = GHG emissions from the combustion of biomass (set to zero) and from purchased electric power

Leakage = additional GHG from the collection, transport, storage and preparation of biomass clearly, the more natural gas we replace with biomass, the more CERs are available.