



USAID
FROM THE AMERICAN PEOPLE

BANGLADESH



Bangladesh Industrial Energy Efficiency Opportunities Assessment

Task 1: Industry Profile – Sectors Selection Report

March 9, 2012

March 2012

This document was prepared for the United States Agency for International Development (USAID) by ICF International under Cooperative Agreement No. AID-OAA-L-11-00003-00.

The contents are not the responsibility of USAID and do not necessarily reflect the views of the United States Government.

Bangladesh Industrial Energy Efficiency Opportunities Assessment

Task I: Industry Profile – Sectors Selection Report

March 2012

This document was prepared for the United States Agency for International Development (USAID) by ICF International under Cooperative Agreement No. AID-OAA-L-11-00003.

The contents are not the responsibility of USAID and do not necessarily reflect the views of the United States Government.

TABLE OF CONTENTS

| | | |
|-------|--|----|
| I.1 | Introduction | 1 |
| I.2 | Task I – Industry Profiles – Sector Selection Process..... | 1 |
| I.3 | Desktop Research of Bangladesh Industries..... | 2 |
| I.3.1 | Ministry of Commerce Data..... | 2 |
| I.3.2 | Export Promotion Bureau, Bangladesh – Export Data | 3 |
| I.3.3 | Bangladesh Bank – Exports during April to September 2011 | 3 |
| I.3.4 | Various Sources- Industry Sectors..... | 4 |
| I.3.5 | Short-listed Sectors and Criteria for Selection..... | 5 |
| I.4 | Profile of Eight Sectors | 6 |
| I.4.1 | Textile Sector..... | 6 |
| I.4.2 | Jute Sector..... | 8 |
| I.4.3 | Frozen Foods..... | 9 |
| I.4.4 | Steel Re-rolling Sector | 10 |
| I.4.5 | Fertilizer Sector | 11 |
| I.4.6 | Tea | 12 |
| I.4.7 | Leather and Leather Goods..... | 13 |
| I.4.8 | Ceramics..... | 14 |
| I.5 | Criteria and Selection of Four Industry Sectors..... | 15 |
| I.6 | Industrial Sectors and their Associations | 16 |
| I.7 | Summary Conclusion | 17 |

1.1 Introduction

This draft report represents early efforts to profile key industry sectors under USAID’s **“Industrial Energy Efficiency Opportunities Assessments in Bangladesh,”** a project under ICF’s current Leader with Associates Cooperative Agreement with USAID entitled “Energy Efficiency for Clean Development Program, No. AID-OAA-L-11-00003. The objectives of this project in Bangladesh are to:

- Identify, analyze, and prioritize opportunities for energy efficiency improvements in private industrial sectors in Bangladesh.
- Determine the industrial sectors with the greatest opportunities for energy efficiency (EE).
- Identify the key interventions within the selected sectors to advance improvement in EE.
- Identify options and strategies on the way in which donor assistance and existing credit facilities can help industries implement these interventions and realize EE potential.

This report presents the project team’s data profile and selection process for the export-oriented industry sectors that this assessment will target over the next few months. This report will be integrated into the more comprehensive Industry Opportunities and Profile Report to be submitted in late March 2012 to USAID.

1.2 Task I – Industry Profiles – Sector Selection Process

The first of six key Tasks for this project is to develop a broad industry profile of industrial sectors within Bangladesh, from which four sectors will be selected for more detailed analysis. Industry sector profiles are presented in terms of productive output, percent of GDP, number of facilities, number of employees, ownership (local vs. international), presence/strength of industrial associations, and geographic location of facilities. The sectors would be ranked in the order of energy consumption. Since mid-January 2012, the project team has:

- Developed profile template for the Task I industry profiling
- Conducted early research on broad industrial sectors
- Compiled information on eight key sectors
- Developed early profiles of eight sectors and selected four sectors for further analysis

The project team has gathered early data through desktop research and early outreach and has shortlisted eight industry sectors to profile, selecting four sectors for more detailed analysis based on overall energy consumption levels. The project team will continue to engage with industry associations and the selected industries to understand energy use patterns in production/manufacturing, and develop the profiles. The early research relied on publicly available documentation, including through internet and published information. Reports published by international agencies such as World Bank, Asian Development Bank (ADB), the International Energy Agency (IEA), United Nations, and others will be identified and reviewed to collect information about the industrial sectors. The profiling was conducted for industrial

sectors that are export-oriented and privately-owned (e.g., textiles, ready-made garments, etc.). Detailed profiles will be developed for the eight industrial sectors, which will include information such as:

- Number of plants, capacity, productive output, etc.
- Demography of plants – geographical location, member of industrial association, etc.
- Total exports, GDP contribution, and related economic indicators.

Following this initial desktop research, the team traveled to Bangladesh from February 11-16, 2012, to meet with key stakeholders, collect additional data and verify early information from the desktop review. These include visits to industry associations such as the Textile Mills Association, the Jute Mills Association, Fertilizer Associations, and the Bangladesh Fisheries Development Corporation, in addition to Titas Gas, and donors such as GIZ and USAID. The team also met with the Center for Energy Studies at the Bangladesh University for Engineering and Technology (BUET). Ongoing data gathering and follow-up visits to Bangladesh are planned in March 2012.

1.3 Desktop Research of Bangladesh Industries

This section presents industry sector data compiled from a variety of government and other sources, including the Bangladesh Bureau of Statistics within the Ministry of Commerce, the Bangladesh Bank, the Export Promotion Bureau and others. This data was used by the team as part of the criteria for selection of the four focal sectors for this assessment.

1.3.1 Ministry of Commerce Data. Focused on major export oriented sectors (2009-2010 data) arranged as per the contribution to exports

| SL No. | Exports of selected principal commodities | Exports in Million BDT (2009-2010) | Exports in Million USD* |
|--------|---|------------------------------------|-------------------------|
| 1 | Readymade Garments (RMG) | 790,042 | 11,368 |
| 2 | Jute Goods (except carpet) | 41,440 | 596 |
| 3 | Fish | 26,514 | 381 |
| 4 | Footwear | 16,366 | 235 |
| 5 | Raw Hides, Skins & Leather | 15,665 | 225 |
| 6 | Naphtha & Furnace Oil | 13,891 | 200 |
| 7 | Raw Jute | 12,760 | 184 |
| 8 | Terry Towels | 10,527 | 151 |
| 9 | Pharmaceutical Products | 2,761 | 40 |
| 10 | Fertilizer | 2,667 | 38 |
| 11 | Vegetables, fresh/chilled | 2,492 | 36 |
| 12 | Hats and other Headgear | 2,329 | 34 |
| 13 | China/Ceramic Table Ware | 1,961 | 28 |
| 14 | Tea | 391 | 6 |
| | Total | 939,806 | 13,522 |

* 1 USD = 69.5 BDT (Average Exchange rate for 2009-10, South Asian Microfinance Network)

1.3.2 Export Promotion Bureau, Bangladesh – Export Data

| SL No. | Export of Principal Commodities | Value in USD (2010-2011) |
|--------|---------------------------------|--------------------------|
| 1 | Knitwear Garments | 9,482,061 |
| 2 | Woven Garments | 8,432,397 |
| 3 | Other Sectors | 2,530,211 |
| 4 | Jute Goods | 757,650 |
| 5 | Frozen Foods | 625,041 |
| 6 | Raw Jute | 357,284 |
| 7 | Agri-Products | 333,943 |
| 8 | Leather | 297,832 |
| 9 | Chemical Products | 104,760 |
| 10 | Tea | 3,201 |
| | Total | 22,924,380 |

1.3.3 Bangladesh Bank – Exports during April to September 2011

| SL No. | Commodity group | Amount in Million BDT | Amount in million USD | % of total export |
|-----------|--|-----------------------|-----------------------|-------------------|
| 1 | Readymade garments | 616,926 | 8,428 | 79.1% |
| 1.1 | Knitwear | 378,086 | 5,156 | 48.5% |
| 1.2 | Woven garments | 238,840 | 3,263 | 30.6% |
| 2 | Jute manufactures | 23,708 | 324 | 3.0% |
| 3 | Fish, shrimps and prawns | 22,190 | 303 | 2.8% |
| 3.1 | Fish | 5,536 | 76 | 0.7% |
| 3.2 | Shrimp and prawns | 16,654 | 228 | 2.1% |
| 4 | Leather and leather manufactures | 20,069 | 274 | 2.6% |
| 4.1 | Leather | 12,243 | 167 | 1.6% |
| 4.2 | Leather manufactures | 7,826 | 107 | 1.0% |
| 5 | Home Textile | 19,876 | 272 | 2.5% |
| 6 | Raw jute | 10,095 | 138 | 1.3% |
| 7 | Petroleum & petroleum products | 5,635 | 77 | 0.7% |
| 8 | Terry Towel | 4,026 | 55 | 0.5% |
| 9 | Bicycle | 1,697 | 23 | 0.2% |
| 10 | Pharmaceutical products | 1,589 | 22 | 0.2% |
| 11 | Handicraft | 195 | 2.7 | 0.0% |
| 12 | Tea | 102 | 1.4 | 0.0% |
| 13 | Fertilizer | 621 | 8.5 | 0.1% |
| 14 | Others | 52,971 | 724 | 6.8% |
| | <i>A. Sub-total</i> | 779,700 | 10,652 | 100% |
| | <i>B. Exports from Export Processing Zones (EPZ)</i> | 130,317 | 1,780 | |
| | Grand total:(A+B) | 910,017 | 12,432 | |

1.3.4 Various Sources- Industry Sectors. The table below presents information compiled from various sources and serves as the initial pool for the short-listing of the eight industry sectors.

| SL No. | Bangladesh Bureau of Statistics | Export Promotion Bureau | Bangladesh Bank | Main sectors form different reports | List of thrust (priority) manufacturing sectors in Sixth five year plan (2011-2015) |
|--------|---------------------------------|-------------------------|----------------------------------|-------------------------------------|---|
| 1 | Readymade garments (RMG) | Knitwear Garments | Readymade garments | Textiles, RMG | Agro-based and agro-processing industry |
| 2 | Jute goods (except carpet) | Woven Garments | Jute manufactures | Footwear | Ship Building |
| 3 | Fish | Others | Fish, shrimps and prawns | Glass | Basic chemicals/dye and chemicals |
| 4 | Footwear | Jute Goods | Leather and leather manufactures | Ceramics | Readymade Garments Industry |
| 5 | Raw hides, skins & leather | Frozen Foods | Home Textile | Food products | Pharmaceuticals |
| 6 | Naphtha & furnace oil | Raw Jute | Raw jute | Pulp and Paper | Polymer Industry |
| 7 | Raw Jute | Agri-Products | Petroleum and petroleum products | Sugar | Jute and Jute products |
| 8 | Terry towels | Leather | Terry Towel | Fertilizer | Leather and Leather products |
| 9 | Pharmaceutical products | Chemical Products | Bicycle | Plastic forming and Recycling | Light engineering industry (LEI) |
| 10 | Fertilizer | Tea | Pharmaceutical products | Paper and board | Plastic |
| 11 | Vegetables, fresh/chilled | | Handicraft | Foundry | Frozen Fish |
| 12 | Hats and other headgear | | Tea | Raw jute and Jute Goods | Tea |
| 13 | China/Ceramic Table ware | | Fertilizer | Tea | Home Textiles |
| 14 | Tea | | Others | Frozen foods | Ceramics |
| | | | | | Energy efficient appliances and electronic goods |

1.3.5 Short-listed Sectors and Criteria for Selection. Sectors highlighted below have been shortlisted for profiling.

| SL No. | Sectors | Export Oriented | Ownership | Rationale for Short listing / Rejection |
|--------|---|---|--|---|
| 1 | Textile (Textiles, RMG, Home textiles) | Yes | Mainly Private | Highest contribution in exports (About 80% of total export). One of the major consumer of natural gas among industrial consumers |
| 2 | Jute (Raw Jute and Jute Products) | Yes | Mainly Private | Features second in exports after textiles (About 4.9% of total export). Process similar to textile (spinning, weaving, etc) and hence assumed to be energy consuming. Power shortage is a major problem for attaining desired level of production |
| 3 | Frozen Foods (Fish and Shrimps mainly) | Yes | Mainly Private | Fish processing plants, Ice plants and cold storage are energy intensive. Different reports suggest inefficiency in existing ice plants. "Thrust sector" ¹ for development under sixth five year plan. |
| 4 | Steel re-rolling mills | No. Supports domestic construction and Light Engineering Industry (LEI) | Private | Steel Rolling mills are highly energy intensive. They support machinery and LEI which are identified as "Thrust sector" under sixth five year plan. |
| 5 | Fertilizer | No. Overall Net importer. One plant is export oriented. | Mainly Govt. Two plants are private held | Major consumer of gas after power sector. Gas reserves are declining and hence need focus. Plants are of old vintage. Three plants are temporarily shut due to gas supply shortage |
| 6 | Leather and Leather Good | Yes | Private | 1.4% contribution to exports, identified as a "Thrust sector" under the sixth Five Year Plan for Development (2011-2015), which would be given priority for growth, incentives, and others. |
| 7 | Tea | Yes | Mainly Private | Small contribution to exports but many Tea industries are consumer of natural gas. Some of the processes of tea processing are inherently energy intensive |
| 8 | Ceramics | Yes | Mainly Private | Inherently energy intensive. Gas supply is becoming a concern. Thrust area for export under sixth five year plan. |
| 9 | Pulp and Paper | No | Public and Private | There are few plants in Bangladesh. No contribution to exports |
| 10 | Sugar | No | Public and Private | Already targeted for energy efficiency under GIZ program |
| 11 | Ship Building | No | - | Priority in future for export. |
| 12 | Pharmaceuticals | Yes | - | 0.2% contribution to exports. It is not energy intensive. |

¹ Thrust Sectors –mentioned here and elsewhere in the report – is the term used in the local government reports and refers to priority or focus sectors

I.4 Profile of Eight Sectors

I.4.1 Textile Sector

| | |
|--|--|
| Type of Products Produced (Segmentation of the Sector) | Yarn, Fabric, Knitwear garments, Woven garments |
| Main export oriented product | Knitwear Garments (Jacket, Sweater, T-shirt), Woven Garments (Shirt, Trouser), Textile clothing |
| Economic Impact (including Production Output in Terms of Volume and Value, and Percent of GDP) | Contribution to GDP – 12% (Source BTMA) |
| Export Market Characteristics (Including Export as Portion of Total Industrial Export) | Total Ready Made Garments (RMG) export in 2010-11: 17.91 billion USD (US Dollars) Ready Made Garments – 78.1% of total export from Bangladesh in 2010-11 (41.4% knitwear, 36.8% woven) |
| Ownership (Including Local versus International Ratio) | Local: 95%, International 5% |
| Geographic Location of Facilities (Including Description of Clusters) | Dhaka, Chittagong, Narayanganj |
| Employment Characteristics (Including Number of Employees and Male to Female Ratio) | Source: BTMA director's report Textile spinning – 400,000 employees Textile weaving – 80,000 employees Knitting knit dyeing – 324,000 employees Dyeing and finishing – 33,000 Export oriented Ready Made Garments (RMG) – 2 million employees 80% female in textile industry |
| Sector Demographics (Including Number of Facilities, and Ratio of Large versus Medium/Small Plants) | Source: BTMA Yarn Manufacturer (Textile spinning) – 385 facilities (Production Capacity 1,932 million kg p.a.) Fabric Manufacture (Textile weaving) – 743 facilities (2,327 million meter p.a., 5,772 million kg) Textile Processing – 238 facilities (1521 million meter woven, 596 million kg Knit, 361 million kg Yarn) |
| Energy Use (in Terms of Volume, Portion of Total Industry Energy Use, and Profile of Energy Use by Source) | As per different reports, there is high gas use in textile sector. The garments, dyeing, knitting, spinning and textile mills together comprise the leading consumer of gas within the industrial sector. The textile processing units are energy intensive and offer several energy savings opportunities; and hence this sector is targeted for energy efficiency assessment under the project. Energy consumption is in the form of electricity and steam, and natural gas is primarily used for captive power generation and for raising steam in the boilers. Almost 98% of units are generating captive power based on natural gas. As per BTMA - Textile sector alone uses about 10% of the total natural gas consumption in the country. The industry has 985 gas based generators with installed capacity of 879 MW and 242 diesel generators with installed capacity of 422 MW. The textile industry is estimated to suffer from a production loss of about 35-40% due to energy shortage. |

| | |
|--|--|
| Environmental Impact (Including contribution to GHG emissions, water use, and wastewater and waste generation) | Major environment issues – effluent discharge pollution. |
| Expected Future Growth of Sector (Short, Medium and Long Term, and Drivers/Challenges) | Growth – 13.1% average annual growth projection from FY 2010 to FY 2015 (Source: Planning Commission) Challenges – competition from neighboring countries, cotton price volatility |
| Industrial Association(s) (Presence and Strength) | Bangladesh Textile Mills Association Bangladesh Garment Manufacturers and Exporters Association Bangladesh Knitwear Manufacturers and Exporters Association Bangladesh Textile Dyeing & Printing Industrial Association |

1.4.2 Jute Sector

| | |
|--|---|
| Type of Products Produced (Segmentation of the Sector) | Raw Jute, Jute goods (Hessian, Sacking, Yarn/Twine, Carpet backing cloth) |
| Main export oriented product | Raw Jute, Yarn/Twine |
| Economic Impact (including Production Output in Terms of Volume and Value, and Percent of GDP) | Total production in 2010-11 : 729,069 tons Total export in 2010-11 : 594,423 tons |
| Export Market Characteristics (Including Export as Portion of Total Industrial Export) | Raw Jute – 1.6% of total exports from Bangladesh in 2010-11 worth 0.357 billion USD dollars Jute Goods – 3.3% of total exports from Bangladesh in 2010-11 worth 0.757 billion USD dollars. Total export earnings from Jute –in 2010-11 is 1.1 billion USD. |
| Ownership (Including Local versus International Ratio) | 205 facilities (27 under public sector company Bangladesh Jute Mills Corporation, 178 under private sector) Out of 178 mills under private sector, 81 under Bangladesh Jute Mills Association members and 97 under Bangladesh Jute Spinners Association members |
| Geographic Location of Facilities (Including Description of Clusters) | Dhaka, Khulna, Chittagong |
| Employment Characteristics (Including Number of Employees and Male to Female Ratio) | Bangladesh Jute Spinners Association: 55,868 employees Bangladesh Jute Mills Association: 39,000 employees Bangladesh Jute Mills Corporation: 61,681 employees |
| Sector Demographics (Including Number of Facilities, and Ratio of Large versus Medium/Small Plants) | 205 facilities. 175,114 installed spindles in jute spinning mills out of which 147,124 are operated; Looms in jute mills: BJMC: 7,320 installed, 5,805 operated BJMA: 12,861 installed, 4,334 operated |
| Energy Use (in Terms of Volume, Portion of Total Industry Energy Use, and Profile of Energy Use by Source) | Energy use figure not available. Through various discussions, it has been learnt that Jute sector consumes significant energy. Power shortage is a major problem for attaining desired level of production. Machineries used in jute mills are of old vintage. Most of the mills have been set up in the 1960s – 1970s. As per a report, jute production in India (largest jute producer) consumes 3.75 – 8.02 GJ/tonne energy which can be taken as a reference. |
| Environmental Impact (Including contribution to GHG emissions, water use, and wastewater and waste generation) | Not available |
| Expected Future Growth of Sector (Short, Medium and Long Term, and Drivers/Challenges) | Future Growth – identified as a Thrust Sector for development Challenges – Competition from man-made fibers, power shortage |
| Industrial Association(s) (Presence and Strength) | Bangladesh Jute Association, Bangladesh Jute Goods Association Bangladesh Jute Mills Association(108 members) Bangladesh Jute Spinners Association |

I.4.3 Frozen Foods

| | |
|--|---|
| Type of Products Produced (Segmentation of the Sector) | Shrimp, Fish |
| Main export oriented product | Frozen Shrimp & Prawn, Frozen Fish, Fresh and Chilled Fish, Value added Shrimp and Fish Products |
| Economic Impact (including Production Output in Terms of Volume and Value, and Percent of GDP) | Total Production: Contribution to GDP: |
| Export Market Characteristics (Including Export as Portion of Total Industrial Export) | 2.7% of total export Shrimp exported in 2009-10 = 108.84 million lbs Fish exported in 2009-10 = 20.97 million lbs Export earnings from Shrimp in 2009-10 = 348.28 million USD Export earnings from Fish in 2009-10 = 89.12 million USD |
| Ownership (Including Local versus International Ratio) | Mostly owned by domestic (Local) players |
| Geographic Location of Facilities (Including Description of Clusters) | Chittagong, Khulna, Cox's Bazar, Jessore, Dhaka |
| Employment Characteristics (Including Number of Employees and Male to Female Ratio) | More than 1 million employees |
| Sector Demographics (Including Number of Facilities, and Ratio of Large versus Medium/Small Plants) | - 148 shore based export oriented fish processing plants most of which are owned by private players. - Out of 148 plants, 74 plants are approved by the EU to supply frozen seafood to its member states. . - 4 fish processing plants and 12 freezing plants are owned by BFDC, which is a public sector company |
| Energy Use (in Terms of Volume, Portion of Total Industry Energy Use, and Profile of Energy Use by Source) | Energy use in Chillers/freezing plants/frozen storage. Primary energy source is electricity in fish processing plants. Plants also have diesel based generators which are also used regularly due to erratic grid power supply. |
| Environmental Impact (Including contribution to GHG emissions, water use, and wastewater) | Solid waste generation, waste water generation, during the production, exhaust emissions from diesel generators. Environment Policy of Bangladesh covers fisheries sector |
| Expected Future Growth of Sector (Short, Medium and Long Term, and Drivers/Challenges) | Identified as thrust sector for development. BFFEA has set a target of 1.5 billion dollar from export of shrimp and fish by 2015. |
| Industrial Association(s) (Presence and Strength) | Bangladesh Frozen Foods Exporters Association (BFFEA) |

I.4.4 Steel Re-rolling Sector

| | |
|--|---|
| Type of Products Produced (Segmentation of the Sector) | Steel re-rolling - Process steel ingots into rods and bars, etc. These products are used in construction and also by Light Engineering Industry (LEI) to produce machinery/components. |
| Main export oriented product | Auto parts, bicycle, pumps, etc. |
| Economic Impact (including Production Output in Terms of Volume and Value, and Percent of GDP) | Not available |
| Export Market Characteristics (Including Export as Portion of Total Industrial Export) | Not available |
| Ownership (Including Local versus International Ratio) | Not available |
| Geographic Location of Facilities (Including Description of Clustering) | Rerolling mill cluster near Narayanganj, Chittagong |
| Employment Characteristics (Including Number of Employees and Male to Female Ratio) | Not available |
| Sector Demographics (Including Number of Facilities, and Ratio of Large versus Medium/Small Plants) | Rerolling mills - 250 plants, 2.5 million ton capacity per year 25 plants are modern, 5 are large automatic units, 15 plants are medium size, 150 plants are small Capacity of big and medium plants ~ 50% of total capacity Capacity of smaller plants ~ 50% of total capacity Bangladesh re-rolling mill association has 146 members |
| Energy Use (in Terms of Volume, Portion of Total Industry Energy Use, and Profile of Energy Use by Source) | Energy use data not available Furnaces and Motors in rerolling are energy intensive. Natural gas is used as fuel primarily All big plants have captive generation According to GIZ report, specific energy consumption of steel re-rolling mills in cubic-meters of gas per ton of steel are 75-90 for classical mills, 45-60 for mills with recuperators, 30-40 for modern mills |
| Environmental Impact (Including contribution to GHG emissions, water use, and wastewater and waste generation) | Not Available |
| Expected Future Growth of Sector (Short, Medium and Long Term, and Drivers/Challenges) | 6.75% annual average manufacturing sector growth projected , LEI is a priority sector for export oriented growth |
| Industrial Association(s) (Presence and Strength) | Bangladesh Re-rolling mills association Bangladesh Steel Mill Owners Association |

I.4.5 Fertilizer Sector

| | |
|--|--|
| Type of Products Produced (Segmentation of the Sector) | Urea, Ammonium sulphate, TSP (triple super phosphate) and DAP (diammonium phosphate) MOP (muriate of potash) fertilizer is 100% imported |
| Main export oriented product | Bangladesh is net importer of fertilizer. Average annual export of fertilizer from 2006-07 to 2009-10 is 0.5% of total export from Bangladesh. But it is not clear which fertilizer type was exported |
| Economic Impact (including Production Output in Terms of Volume and Value, and Percent of GDP) | Urea demand in 2010-11 is 2.83 million ton Total domestic production in 2010-11 is 0.7 million ton Total Import in 2010-11 is 1.8 million ton |
| Export Market Characteristics (Including Export as Portion of Total Industrial Export) | Net importer |
| Ownership (Including Local versus International Ratio) | 8 plants owned by Bangladesh Chemical Industries Corporation (BCIC) which is fully owned by the Government. Single plant owned by KAFCO (joint venture between Govt. (47%) and foreign companies) 1 TSP plant owned by the private sector (Hussain Chemicals) |
| Geographic Location of Facilities (Including Description of Clustering) | Plants located at Fenchugonj, Ghorasal, Ashugonj, Polash, Chittagong, Rangadia, Tarakandi. Of the total six plant, three fertilizer plants are about 40 years old. The remaining three urea plants were established in the late 1980s. BCIC plants at Polash, Ghorasal and Chittagong have been temporarily shut due to gas shortage. |
| Employment Characteristics (Including Number of Employees and Male to Female Ratio) | Not Available |
| Sector Demographics (Including Number of Facilities, and Ratio of Large versus Medium/Small Plants) | BCIC – 8 plants (6 urea, 2 DAP, 1 TSP) Private Sector – 1 urea, 1 TSP Urea capacity – 2,895,700 tonnes per year (tpy), Ammonia – 1,886,700 tpy, Ammonium Sulphate – 10,000 tpy, DAP – 489,600 tpy TSP capacity – 697,000 tpy |
| Energy Use (in Terms of Volume, Portion of Total Industry Energy Use, and Profile of Energy Use by Source) | Fertilizer is a major consumer of natural gas. This sector is given gas at very cheap price. Fertilizer sector consumed about 11.85% of total gas production in 2009-2010 |
| Environmental Impact (Including contribution to GHG emissions, water use, and wastewater and waste generation) | Not Available |
| Expected Future Growth of Sector (Short, Medium and Long Term, and Drivers/Challenges) | Average 7% growth per year in next 5 years as per the Sixth Plan Challenges – gas availability |
| Industrial Association(s) (Presence and Strength) | Bangladesh Fertilizer Association. BFA membership compulsory for fertilizer manufactures, importers and dealers for better monitoring of performance |

I.4.6 Tea

| | |
|--|---|
| Type of Products Produced (Segmentation of the Sector) | Tea leaves, Powdered tea |
| Main export oriented product | Tea leaves, Powdered tea |
| Economic Impact (including Production Output in Terms of Volume and Value, and Percent of GDP) | Not Available |
| Export Market Characteristics (Including Export as Portion of Total Industrial Export) | 3.2 million USD in 2010-2011 |
| Ownership (Including Local versus International Ratio) | Private companies: Sterling Companies – 28 estates Bangladeshi Private Limited Companies – 61 estates Bangladeshi Proprietors – 58 estates Public companies: National Tea Company – 13 estates Bangladesh Tea Board - 3 estates |
| Geographic Location of Facilities (Including Description of Clustering) | Clusters of tea estates: Maulvibazar (90), Habiganj (23), Sylhet (19), Chittagong (22) |
| Employment Characteristics (Including Number of Employees and Male to Female Ratio) | |
| Sector Demographics (Including Number of Facilities, and Ratio of Large versus Medium/Small Plants) | Number of tea estates - 163, number of tea factories -116 Total garden area – 115820 ha, Total tea area – 54106 ha, area suitable for tea – 61334 ha |
| Energy Use (in Terms of Volume, Portion of Total Industry Energy Use, and Profile of Energy Use by Source) | About 0.1% of total gas consumption. From different reports it is found that tea manufacturing has high specific energy consumption. SEC for orthodox tea: 4.3 – 6.9 kWh/kg, for CTC tea: 6.5 – 7 kWh/kg Type of energy source use – mix of biomass, gas and electricity. Major energy use process – withering, rolling/sieving, drying, sorting and grading |
| Environmental Impact (Including contribution to GHG emissions, water use, and wastewater and waste generation) | Rejected green leaves, flue gas, waste fibers, noise |
| Expected Future Growth of Sector (Short, Medium and Long Term, and Drivers/Challenges) | Not available |
| Industrial Association(s) (Presence and Strength) | Bangladesh Tea Association |

1.4.7 Leather and Leather Goods

| | |
|--|--|
| Type of Products Produced (Segmentation of the Sector) | Leather, Leather products (footwear, carry bags, wallets etc) |
| Main export oriented product | Leather, Leather products (footwear, carry bags, wallets etc) |
| Economic Impact (including Production Output in Terms of Volume and Value, and Percent of GDP) | Not Available |
| Export Market Characteristics (Including Export as Portion of Total Industrial Export) | 1.3% of total export from Bangladesh in 2010-2011 |
| Ownership (Including Local versus International Ratio) | Majority by local private companies, about 4 tanneries by multinational companies, few by govt. |
| Geographic Location of Facilities (Including Description of Clustering) | Tanneries - Hazaribagh (in Dhaka city) has more than 80% of tanneries, Govt is trying to move tanneries to Savar (outskirt of Dhaka city) Leather footwear – Dhaka city (siddique bazaar, bongshal) |
| Employment Characteristics (Including Number of Employees and Male to Female Ratio) | Not Available |
| Sector Demographics (Including Number of Facilities, and Ratio of Large versus Medium/Small Plants) | Leather Tanneries – 214 tanneries (about 100 are modern) 15 export oriented shoe units in and around Dhaka. More than 2000 shoe making units |
| Energy Use (in Terms of Volume, Portion of Total Industry Energy Use, and Profile of Energy Use by Source) | Energy use not available |
| Environmental Impact (Including contribution to GHG emissions, water use, and wastewater and waste generation) | Soaking and liming, tanning, post tanning and processing – solid and liquid wastes. For the purpose of granting Environmental Clearance Certificates, industrial units are classified into four categories depending upon their potential environmental impact. The Red category requires a gradually higher level of regulatory compliance and environmental mitigation measures. Leather processing is in Red category and detailed EIA is required along with effluent treatment plant and environment management plant before getting environment clearance certificate from department of environment |
| Expected Future Growth of Sector (Short, Medium and Long Term, and Drivers/Challenges) | Average annual growth of 9.9% per year is projected in next 5 years for leather products |
| Industrial Association(s) (Presence and Strength) | Leather Goods and Footwear Manufacturers and Exporters Association of Bangladesh (LFMEAB) |

I.4.8 Ceramics

| | |
|--|--|
| Type of Products Produced (Segmentation of the Sector) | Tableware, Sanitary Ware (i.e., standard toilet and bathroom accessories) and Insulators (used in high-voltage electrical equipment) |
| Main export oriented product | Tableware |
| Economic Impact (including Production Output in Terms of Volume and Value, and Percent of GDP) | Not Available |
| Export Market Characteristics (Including Export as Portion of Total Industrial Export) | The export of ceramic products registered an average growth of 20% during the last decade |
| Ownership (Including Local versus International Ratio) | Exact number not known. Recent plants are international owned |
| Geographic Location of Facilities (Including Description of Clustering) | Not Available |
| Employment Characteristics (Including Number of Employees and Male to Female Ratio) | About 500,000 workers 40% women |
| Sector Demographics (Including Number of Facilities, and Ratio of Large versus Medium/Small Plants) | 40 plants in operation 5-6 new plants planned There are over a dozen of ceramic factories in Bangladesh, which produce over 40,000 tonnes of ceramic products a year |
| Energy Use (in Terms of Volume, Portion of Total Industry Energy Use, and Profile of Energy Use by Source) | Energy use not available. Sector is energy intensive and gas is used in kilns |
| Environmental Impact (Including contribution to GHG emissions, water use, and wastewater and waste generation) | Not Available |
| Expected Future Growth of Sector (Short, Medium and Long Term, and Drivers/Challenges) | Growth – emphasis on ceramics for export in 6 th five year plan Challenge – uninterrupted power supply and gas availability at desired pressure |
| Industrial Association(s) (Presence and Strength) | Bangladesh ceramic ware manufacturers association |

1.5 Criteria and Selection of Four Industry Sectors

The following four sectors (highlighted in color) have been shortlisted based on consultations with USAID Bangladesh, government agencies, industry associations, and academic institutes such as the Bangladesh University of Engineering and Technology's Center for Energy Studies, with whom ICF team met in February 2012. The energy savings opportunity assessment will be carried out for these selected four sectors under this project.

| SL No. | Sectors | Export Oriented | Information on Number of Plants | Ownership | Energy Consumption | Industry Association | Focus segment for detailed study |
|--------|---|--|--|--------------------|---|--|---|
| 1 | Textile (Textiles, RMG, Home textiles) | Yes (Largest exporter) | Yes. Recent information available. | Mainly Private | High due to large number of plants. Textile processing plants are energy intensive (primarily natural gas) | Association exists. Maintain information on website. Keep publishing reports | Textile Processing Plants – Dyeing, Bleaching, Printing |
| 2 | Jute | Yes (Second largest exporter, after textile) | Yes. Recent information available. | Mainly Private | Composite mills – Spinning, weaving, processing etc. are energy consuming (Primarily natural gas and electricity) | Association exists. | Composite Jute Mills |
| 3 | Frozen Foods (Fish and Shrimps mainly) | Yes (third largest exporter) | Yes. Recent information | Mainly Private | Energy use in cooling/freezing. (Primarily electricity and diesel) | Association exists. Information available | Fish Processing Plants |
| 4 | Steel Re-rolling mills | Yes | Information gathered from previous study reports | Private | Highly energy intensive due to use of furnaces and motors (primarily natural gas and electricity) | Association Exist. Website not available | Steel Re-rolling Mills |
| 5 | Leather & Leather Goods | Yes | Dated information available | Private | Labor intensive | Association exists. Limited information | |
| 6 | Tea | Yes (low contribution) | Yes. Recent information available. | Mainly Private | Inherently energy intensive. Primary energy source is natural gas or biomass | Association exists. Updated information on website | |
| 7 | Ceramics | Yes (low contribution) | Dated information available | Mainly Private | Energy Intensive, uses natural gas | Association exists. Limited information | |
| 8 | Fertilizer | No | Yes. Recent information available. | Public and Private | Energy Intensive. High consumption of natural gas | Association exists. Companies maintain websites | |

I.6 Industrial Sectors and their Associations

In Bangladesh, there is an association for practically every industry sector, some better organized, structured, and funded than others. The associations **highlighted** under each sector are the more active and effective ones and have been approached by the project team to engage in the project's detailed energy consumption assessment. They all serve as important means to access industry data and contacts. The project team continues to conduct outreach to them as part of this assessment. Following is a list of relevant associations in Bangladesh.

| |
|---|
| Textile sector |
| <ol style="list-style-type: none"> 1. Bangladesh Textile Mills Association 2. Bangladesh Textile Mill Owners Association 3. Bangladesh Garment Manufacturers' and Exporters Association 4. Bangladesh Knitwear Manufacturers and Exporters Association 5. Bangladesh Terry Towel & Linen Manufacturers and Exporters Association 6. Bangladesh Textile Dyeing & Printing Industrial Association 7. Bangladesh Grey & Finished Fabrics Mills Association 8. Bangladesh Specialized Textile Mills & Power loom Industries Association 9. Bangladesh Twisting Mills Association 10. Bangladesh Weavers Products & Manufacturers Business Association 11. Bangladesh Dress Makers Association 12. Bangladesh Hosiery Association |
| Jute Sector |
| <ol style="list-style-type: none"> 1. Bangladesh Jute Association 2. Bangladesh Jute Goods Association 3. Bangladesh Jute Exporters Association 4. Bangladesh Jute Mills Association 5. Bangladesh Jute Spinners Association |
| Fertilizer Sector |
| <ol style="list-style-type: none"> 1. Bangladesh Fertilizer Association |
| Frozen Food Sector (Cold Storage/Ice Plants) |
| <ol style="list-style-type: none"> 1. Bangladesh Frozen Food Exporters Association 2. Bangladesh Cold Storage Association 3. Bangladesh Marine Fisheries Association 4. Sea Food Export Buying Agents Associations of Bangladesh |
| Leather Tannery |
| <ol style="list-style-type: none"> 1. Bangladesh Tanners Association 2. Bangladesh Leather Goods Manufacturers Association 3. Bangladesh finished Leather, Leather goods & Footwear Exporters Association |
| Steel Re-rolling Sector |
| <ol style="list-style-type: none"> 1. Bangladesh Re-rolling Mills Association 2. Bangladesh Steel Mill Owners Association 3. Bangladesh Auto- Re-rolling & Steel Mills Association |
| Scrap Steel Sector |
| <ol style="list-style-type: none"> 1. Foundry Owners Association of Bangladesh 2. Bangladesh Ship Breakers Association |
| Ceramic Sector |
| <ol style="list-style-type: none"> 1. Bangladesh Ceramicware Manufacturers Association |

I.7 Summary Conclusion

Based on the team's data gathering and research under Task I, and in consultation with key stakeholders, the team recommends the following four industry sectors to focus on in the detailed energy efficiency opportunities assessment:

- Textile (textiles, ready-made garments, home textiles);
- Jute;
- Frozen Foods (fish and shrimp mainly); and
- Steel Re-rolling mills

The selection criteria focused on privately-owned, high energy-consuming, and export-oriented industrial sectors. For the remainder of Phase I of this assessment, the project team will: (1) continue to engage industry to obtain commitment of a representative sample of plants in the four sectors to participate in the remote and/or on-site data collection efforts; (2) analyze energy consumption at plants and benchmark their performance; (3) analyze energy savings potentials; and (4) prepare a cost-benefit analysis for the opportunities ranked in the top third of the identified set of potential opportunities. The team will then prepare a consolidated Phase I Report that will include:

- The industry profiles of the eight sectors developed in Task I.
- The energy use profile of the four selected sectors.
- The preliminary aggregated results of the best practices implementation benchmarking of the four sectors. This will provide an indication of the opportunities within each sector.
- The technical energy savings potential analysis and an identification of the top ranked energy efficiency opportunities.
- Cost/benefit analysis of the opportunities with greatest technical potential.
- A specific, detailed work plan for Phase II based on findings and recommendations stemming from Phase I activities.

Phase II will include targeted follow up with industries to identify barriers and challenges and to develop potential solutions to adopt and implement opportunities identified during Phase I. This will lead to the development of a framework and strategies for financing options and potential donor intervention. A combined Phase I and Phase II report will be developed and submitted for review by USAID as a final deliverable for this assessment.