Bangladesh Textile Energy Assessment - Plant Report Card

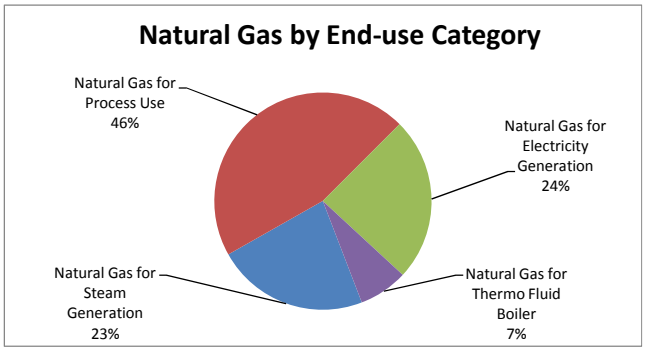
V1-2012

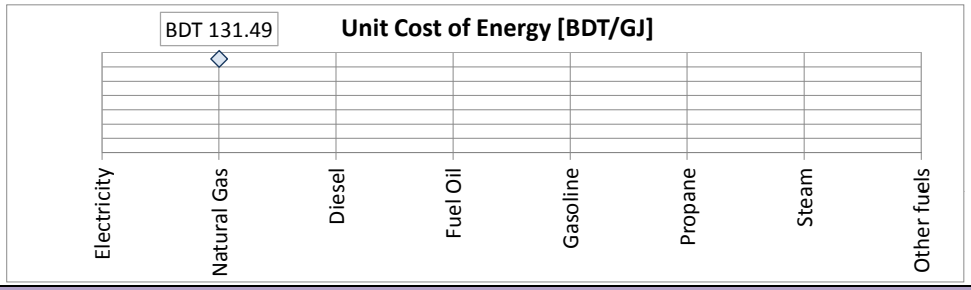
Sample Textile Report Card **(Confidential Plant Information Removed)**	This report provides a summary of the technical assessment completed for this facility. This includes the purchased energy use and cost profiles, a breakdown of energy consuming systems, a score of the technical best practices implemented, and useful links to Energy programs and benchmarking information.
Survey completed by: Paula Claudino Date:	

Report of Purchased Energy

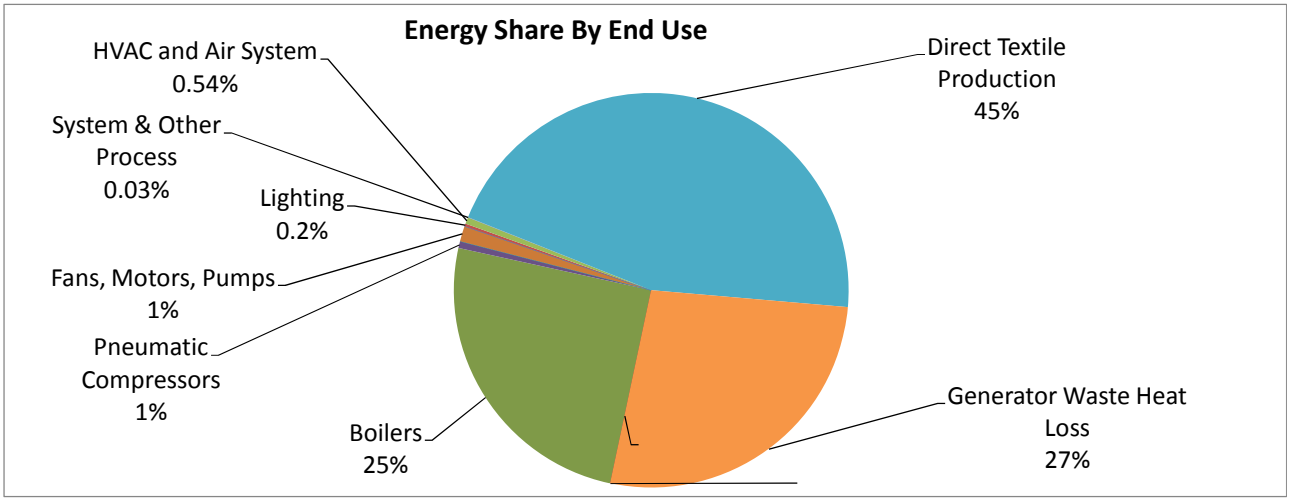
The charts below represent the purchased energy for your facility. The quantity of energy purchased has been converted to a common unit (GJ) to allow comparison between fuels.

Annual Purchased Energy Cost [BDT], 2011	22,582,655.76	Annual Net Purchased Energy [GJ], 2011	171,750.26





This chart shows energy use by end use as a percent of total purchased energy.

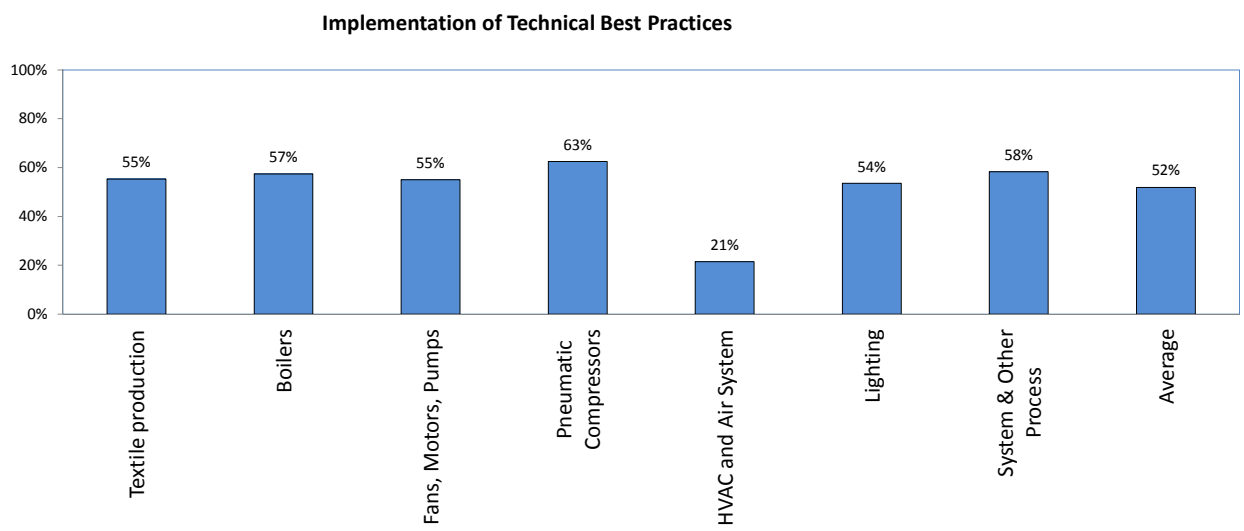


Scope of Energy Intensity	Main Product [units]	Calculated energy intensity (fuel per **total** unit of product) [GJ/unit]
Includes process and comfort energy[1]	Woven Printing and Dyeing [Meters]	0.03

[1]Comfort energy includes energy used for heating, ventilation, air conditioning and lighting

Best Practice Scores

The best practices below represent the scores out of a possible 100% of applicable best practices (not weighted)



Useful Information

Industry Best Practice Examples

Additional information on examples and experiences of international best practices in industry can be found on the website links below:

- Energy Star (US): www.energystar.gov
- Intelligent Energy e-Library (EU): www.iee-library.eu/
- Carbon Trust (UK): www.carbontrust.co.uk/cut-carbon-reduce-costs/products-services/technology-advice/
- Office of Energy Efficiency (CAN): http://oee.nrcan.gc.ca/industrial/technical-info/
- Industrial Technologies Program (US): www1.eere.energy.gov/industry/bestpractices/
- Sustainable Energy Authority of Ireland (IRL): www.seai.ie/Your_Business/Large_Energy_Users/Resources/
- Swedish Energy Agency (SWE): www.energimyndigheten.se/en/Energy-efficiency/Companies-and-businesses/Programme-for-improving-energy-efficiency-in-energy-intensive-industries-PFE/

Bangladesh Industrial Energy Assessment and Management Study - Opportunities Identification

Technical Energy Management Opportunities

The following table prioritizes energy savings opportunities[5] (high, medium and low energy savings potential in each area) in your facility, in terms of your current energy use and implementation of best practices. The opportunities listed include their approximate annual savings for each end use.

Press here to sort opportunities

Warning: any data entered in column B of this tab will be erased

The largest area of opportunity for energy savings in this facility is: ***Textile Production***

Textile Production	***Maximum potential Savings*** [7]	***Energy Savings*** [7]	***GHG*** [6]	***Maximum Potential Energy Cost Savings*** [7]	***Measure Lib Tab No.***	***Relative Implementation Difficulty***	***Relative Implementation Cost***
High Priority End-use	*[%]*	*[GJ]*	*[ton]*	*[BDT]*			
Use of automatic systems (valves) to cut off water and heat supply can reduce energy and water wastage. Savings of up to 5-10% of bleaching electrical energy use.	10.00%	117	19	42,684	T-6	Low	Low
Using covers or hoods in atmospheric wet batch machines can reduce evaporative losses by about half. Savings of up to 25% of dyeing steam energy use.	25.00%	1296	209	474,265	T-24	Low	Low
Use of directed air over the drying cylinders: Savings of up to 15-20% of drying steam energy use.	20.00%	622	101	227,647	T-32	Low	Medium
Use of 'Bleach Bath Recovery System', for reuse or other process needs, can lead to up to savings of up to 5-10% of bleaching steam energy use	10.00%	389	63	142,280	T-3	Low	Medium
With heat recovery systems in continous washing machines, energy intensity drops to almost 50% with heat recovery systems. Savings of up to 50% of bleaching steam energy use.	50.00%	1944	314	711,398	T-7	Medium	Low
Dyebath reuse offers a return on the investment in the form of dye, chemical, and energy savings and the reduction of waste water and waste water treatment. Savings of up to 5% of dyeing electrical energy use.	5.00%	78	13	28,456	T-16	Medium	Low
Recover condensate and flash steam in cylinder dryer: Savings of up to 10-15% of drying steam energy use.	15.00%	467	75	170,736	T-33	Medium	Medium
End panel insulation in cylinder dryer: Savings of up to 5% of drying steam energy use.	5.00%	156	25	56,912	T-34	Medium	Medium
Use of 'Cold-pad-batch treatment' can lead to savings of up to 50% of bleaching electricity use and 38% of bleaching steam energy use.	50.00%	1944	314	711,398	T-2	HIgh	High
Single rope Flow Dyeing machine in place of conventional rope dyeing machine: Savings of up to 50% of electrical dyeing energy use and up to 55% of dyeing steam energy use.	55.00%	2852	461	1,043,384	T-19	High	High
Microwave dyeing equipment: Savings of up to 90% of dyeing electrical energy use and up to 96% of dyeing steam energy use.	90.00%	1400	226	512,207	T-20	High	High
Conversion of 'Thermic fluid heaters' with 'Direct gas firing system' in stenters: Savings of up to 40% of finishing natural gas energy use.	40.00%	4202	679	1,537,649	T-40	High	High
Use of 'Cold-pad-batch dyeing system' with beam washing in place of winch: Savings of up to 75% of dyeing steam energy use.	75.00%	3888	628	1,422,796	T-14	High	High
Advanced winch machines bring about substantial savings in terms of water, chemicals and energy consumption. Savings of up to 30% of dyeing electrical energy consumption.	30.00%	467	75	170,736	T-17	Medium	Medium
Use of steam coil in batch dyeing machines (winch and jigger) in place of direct steam: Savings of up to 20-30% of dyeing steam energy use.	30.00%	1555	251	569,118	T-22	Medium	Medium
Reduction of rinse water temperature: Savings of up to 10% of dyeing steam energy use.	10.00%	518	84	189,706	T-30	Low	Low
Use of 'Counter flow current of water for fabric washing' technology leads to both water and energy savings. Save up to 40-50% of Washing Steam energy use.	50.00%	907	147	331,986	T-4	Medium	Medium
'New generation of jiggers with variable liquor ratio' in place of conventional jiggers: Savings of up to 26% of dyeing steam energy use.	26.00%	1348	218	493,236	T-26	High	High
Heat recovery from hot water waste from high temperature and high pressure autoclaves: Savings of up to 15-20% of dyeing steam energy savings.	20.00%	1037	168	379,412	T-27	Medium	Medium
Reuse of washing and rinse water: Savings of up to 5-10% of dyeing electrical energy use.	10.00%	156	25	56,912	T-29	Medium	Medium
Enzymatic scouring to replace alkaline scouring process: Savings of up to 5-10% of scouring steam energy use.	10.00%	389	63	142,280	T-11	High	High
Boilers	***Maximum potential Savings*** [7]	***Energy Savings*** [7]	***GHG*** [6]	***Maximum Potential Energy Cost Savings*** [7]	***Measure Lib Tab No.***	***Relative Implementation Difficulty***	***Relative Implementation Cost***
High Priority End-use	*[%]*	*[GJ]*	*[ton]*	*[BDT]*			
Minimize deaerator vent losses: savings of 1% of boiler energy use	1.0%	219	29	67,611	18	Medium	Low
Boiler combustion air preheat: savings of 5% of boiler energy use	5.0%	1096	144	338,054	13	Medium	Medium
Flue gas monitoring: savings of 2 to 15% of boiler energy use	15.0%	3289	433	1,014,163	124	Medium	Medium
Blowdown heat recovery: savings of 2% of boiler energy use	2.0%	439	58	135,222	14	Medium	Medium
Economizer: savings of 4% of boiler energy use	4.0%	877	115	270,443	11	Medium	Medium
Automated Blowdown control: savings of 1% of boiler use	1.0%	219	29	67,611	15	Medium	Medium
Process heat recovery to preheat makeup water: savings of 6% of boiler energy use	6.0%	1316	173	405,665	12	Medium	Medium
Efficient boiler system: savings of 5 to 10% of boiler energy consumption	10.0%	2193	288	676,108	117	Medium	High

Fans, Motors, Pumps	Maximum potential Savings [7]	Energy Savings [7]	GHG [6]	Maximum Potential Energy Cost Savings [7]	Measure Lib Tab No.	Relative Implementation Difficulty	Relative Implementation Cost
Medium Priority End-use	[%]	[GJ]	[ton]	[BDT]			
High/premium efficiency motors for fans: motor energy savings of 2%	2.0%	23	11	22,583	73	Low	Medium
High/premium efficiency motors for pumps: motor energy savings of 0.8 to 8%	8.0%	93	43	90,330	68	Low	Medium
High/premium efficiency motors for Textile equipment: motor energy savings of 2%	2.0%	106	11	22,583	79	Low	Medium
Premium efficiency control with ASD: save 20% in fan energy use	20.0%	232	108	225,826	76	Medium	Medium
Premium efficiency control with ASDs: save 20% in pumping energy use	20.0%	232	108	225,826	71	Medium	Medium
Correctly sized motors: savings of 2% of motor energy use	2.0%	23	11	22,583	80	Medium	Medium
HVAC and Air System	**Maximum potential Savings [7]**	**Energy Savings [7]**	**GHG [6]**	**Maximum Potential Energy Cost Savings [7]**	**Measure Lib Tab No.**	**Relative Implementation Difficulty**	**Relative Implementation Cost**
Low Priority End-use	[%]	[GJ]	[ton]	[BDT]			
Seasonal Temperature Setting Adjustments: savings of 7% of comfort HVAC energy use	7.0%	61	16	33,971	6	Low	Low
Free cooling: savings of up to 75% of HVAC energy consumption	75.0%	652	175	363,973	118	Medium	Medium
High efficiency non-packaged HVAC: savings of 25% of indirect heating energy use	25.0%	217	58	121,324	98	Medium	Medium
Ventilation heat recovery: savings of 20% of comfort heating energy use	20.0%	174	47	97,060	101	Medium	Medium
Premium efficiency ventilation control with VSD: save 30% in fan energy use	30.0%	261	70	145,589	128	Medium	Medium
Ground source heat pump: savings of 68%	68.0%	592	159	330,003	99	High	Medium
Pneumatic Compressors	**Maximum potential Savings [7]**	**Energy Savings [7]**	**GHG [6]**	**Maximum Potential Energy Cost Savings [7]**	**Measure Lib Tab No.**	**Relative Implementation Difficulty**	**Relative Implementation Cost**
Low Priority End-use	[%]	[GJ]	[ton]	[BDT]			
Minimize operating air pressure: savings of 20% of compressed air energy use	20.0%	88	49	102,766	86	Low	Low
Compressor heat recovery: savings as a % of comfort heating energy use and compressor energy use.		485	0	0	90	Low	Medium
Synchronous belts: savings of 2% of motor energy use	2.0%	9	5	10,277	141	Medium	Medium
Premium efficiency ASD compressors: save 5 to 20% in compressed air energy use	20.0%	88	49	102,766	84	Medium	Medium
Lighting	**Maximum potential Savings [7]**	**Energy Savings [7]**	**GHG [6]**	**Maximum Potential Energy Cost Savings [7]**	**Measure Lib Tab No.**	**Relative Implementation Difficulty**	**Relative Implementation Cost**
Low Priority End-use	[%]	[GJ]	[ton]	[BDT]			
High efficiency lights fixtures: savings of 20 - 75% of lighting energy use	75.0%	150	68	141,303	108	Low	Low
Efficient lighting design: savings of 15% of lighting energy use	15.0%	30	14	28,261	109	Low	Low
System Practice - Electricity	**Maximum potential Savings [7]**	**Energy Savings [7]**	**GHG [6]**	**Maximum Potential Energy Cost Savings [7]**	**Measure Lib Tab No.**	**Relative Implementation Difficulty**	**Relative Implementation Cost**
Low Priority End-use	[%]	[GJ]	[ton]	[BDT]			
Sub-metering and interval metering: save up to 5% for all fuel sources	5.0%	789	249	518,822	1	Medium	Medium
HE dry-type transformers: save 1% in electrical energy use	1.0%	158	50	103,764	3	High	High
Ovens / Dryers / Kilns / Furnaces	**Maximum potential Savings [7]**	**Energy Savings [7]**	**GHG [6]**	**Maximum Potential Energy Cost Savings [7]**	**Measure Lib Tab No.**	**Relative Implementation Difficulty**	**Relative Implementation Cost**
High Priority End-use	[%]	[GJ]	[ton]	[BDT]			
Exhaust gas heat recovery: savings of 15% of energy use	15.0%	6718	659	1,545,699	24,36, 44, 51	Medium	Medium
Preventative maintenance: savings of 5% of heating energy use	5.0%	2239	220	515,233	28, 33, 41, 55	Low	Low
Air curtains: savings of 15% of heating energy use	5.0%	2239	220	515,233	23, 50	Low	Medium
Control air-fuel ratio through flue gas monitoring: 2 to 15% savings in energy use	10.0%	4478	440	1,030,466	120,121,122,123	Medium	Medium
Combustion optimization: savings of 5% - 15% of heating energy use	15.0%	6718	659	1,545,699	27, 39, 47, 54	Low	Low

The potential savings presented are an estimate of ***maximum*** savings per individual opportunity and are not additive. Interactive effects will reduce the total potential savings if more than one opportunity is implemented.
General practices for implementation of energy efficiency opportunities:
a) Sequence of implementation i) Optimize the demand and output of equipment as a first step (eg. fix air leaks) ii) Properly size the supply equipment and, if possible, upgrade to more efficient equipment, at the same time.
b) If the equipment demand is low, then consider optimization of the equipment characteristics, such as efficiency. If demand is fluctuating, consider implementing measures to meet the fluctuating demand, such as variable speed drives or other controls.
c) When implementing control equipment to optimize energy use (such as VSDs or advanced control), consider the effects on the power factor of the facility.

Notes
5.The opportunities are based on both the energy consumed and the technical best practices for your facility. Please note that the values shown are approximations and are based on site specific conditions.
6.Greenhouse Gases (GHGs) factors are based on The Guidelines for Measurement, Reporting and Verification of GHG Emission Reductions in JBIC's GREEN (the "J-MRV Guidelines"). June 2010. Japan Bank for International Cooperation
7. Energy savings are maximum values based on all energy consumed by each grouped end use and does not consider equipment that is already efficient. More detailed analysis is required to determine precise energy and cost savings.
8. For compressors using steam derived from natural gas driven processes, the steam energy use is not corrected by a service factor. Savings for natural gas derived steam is based on natural gas costs.