Bangladesh Frozen Food Energy Assessment - Plant Report Card

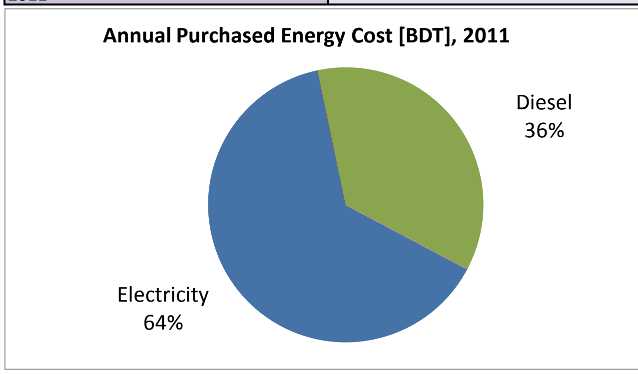
V1-2012

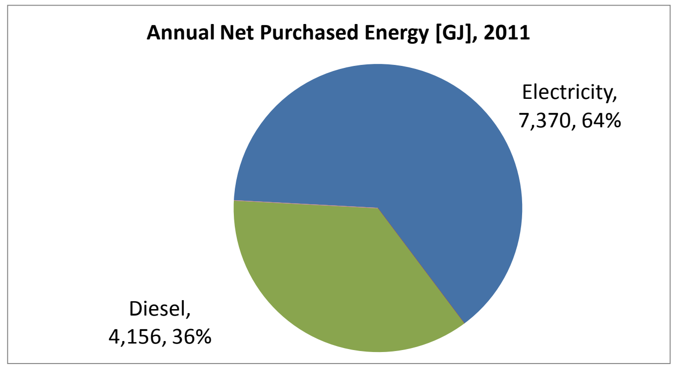
Sample Frozen Food Report Card (Confidential Plant Information Removed)	This report provides a summary of the technical assessment completed for this facility. This includes the purchased energy use and cost profiles, a breakdown of energy consuming systems, a score of the technical best practices implemented,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

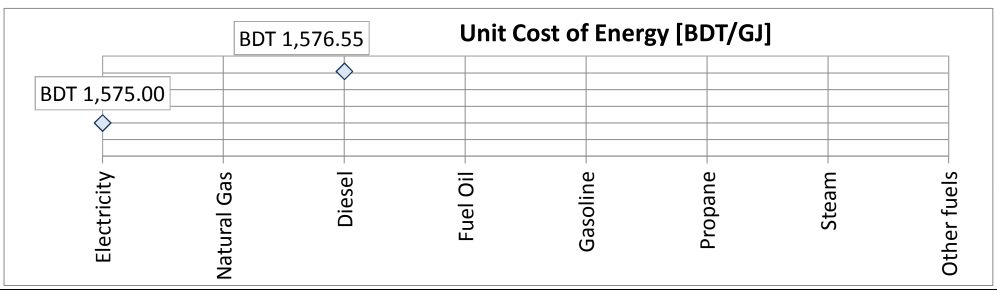
Report of Purchased Energy

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.

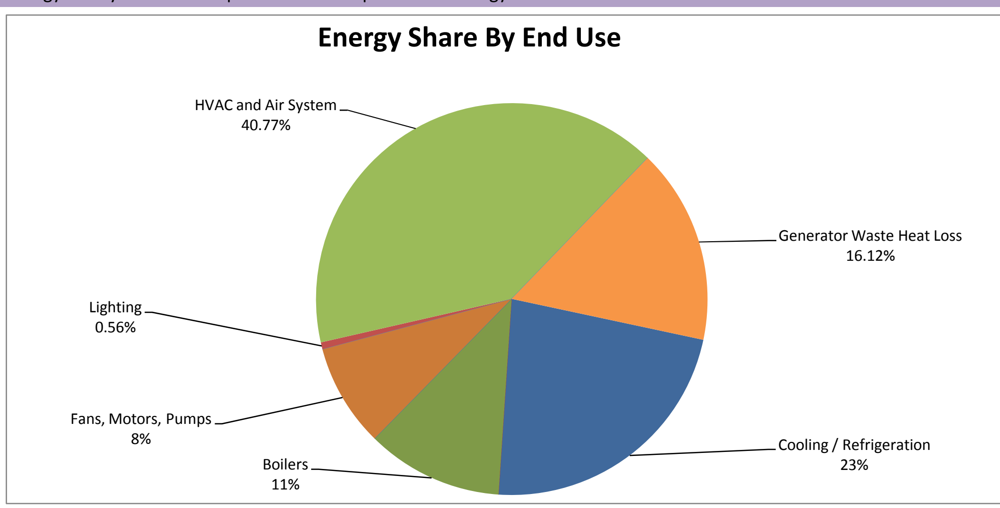
Annual Purchased Energy Cost [BDT], 2011	18,159,624.00	Annual Net Purchased Energy [GJ], 2011	11,525.83







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

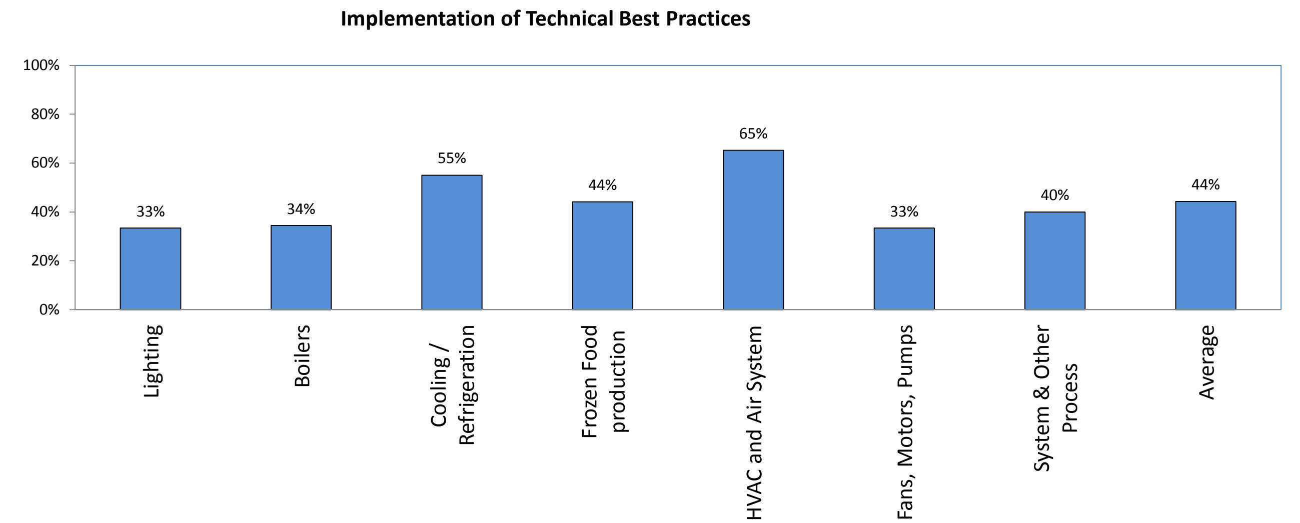


Scope of Energy Intensity	Main Product [units]	Calculated energy intensity (fuel per **main** unit of product) [GJ/unit]
Includes process and comfort energy[1]	Shrimp [ton]	5.9

[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

Press here to sort opportunities

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

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.

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

Frozen Food 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]*			
Reduce warmer air and moisture infiltration through seal could save around 1%.	1.00%	41	15	115,351	F-16	Low	Low
Energy Efficiency Operating Procedures: Savings of up to 0 - 5% of compressor electrical energy usage.	5.00%	205	77	576,753	F-1	Low	Low
VFD on evaporator fan can reduce cooling energy consumption between 0% and 5%, depending on its time on part load.	5.00%	73	28	206,624	F-15	Low	Medium
Installation of a refrigeration heat recovery system to preheat boiler make up water: Savings of up to 1-5% of electrical energy usage.	5.00%	36	5	102,508	F-9	Medium	Medium
Optimized cooling towers: Savings of up to 5-10% of compressor electrical energy usage.	10.00%	409	154	1,153,507	F-11	Medium	Medium
VFD on condenser fan can improve heat rejection, reducing energy requirement for cooling by 0% to 5%, depending on its time on part load.	5.00%	73	28	206,624	F-13	Medium	Medium
Floating suction pressure control can save between 2% to 10% of the energy required by the refrigeration compressor.	10.00%	147	55	413,247	F-14	Medium	Medium
Solar water pump for raw water: Savings of up to 1% of ice production electrical energy usage.	1.00%	1	0	2,335	F-7	Medium	High
High efficiency back up generators: Savings of up to 5% of diesel energy usage.	5.00%	318	42	897,309	F-22	Medium	High
An efficient compressor design can save between 5% to 15% of cooling energy savings.	15.00%	220	83	619,871	F-19	High	High
System Practice - Electricity	*Maximum potential Savings* [7]	*Energy Savings* [7]	*GHG* [6]	*Maximum Potential Energy Cost Savings* [7]			
High Priority End-use	*[%]*	*[GJ]*	*[ton]*	*[BDT]*			
Electricity demand management control system: cost savings only (no energy savings)		0	0	0	119	Medium	Low
Sub-metering and interval metering: save up to 5% for all fuel sources	5.0%	221	78	580,381	1	Medium	Medium
HE dry-type transformers: save 1% in electrical energy use	1.0%	44	16	116,076	3	High	High
Integrated control system: save up to 8% for all fuel sources.	8.0%	354	124	928,610	2	High	High
HVAC and Air System	*Maximum potential Savings* [7]	*Energy Savings* [7]	*GHG* [6]	*Maximum Potential Energy Cost Savings* [7]			
High Priority End-use	*[%]*	*[GJ]*	*[ton]*	*[BDT]*			
High/premium efficiency motors for fans: motor energy savings of 2%	2.0%	33	20	148,052	73	Low	Medium
Premium efficiency ventilation control with VSD: save 30% in fan energy use	30.0%	490	297	2,220,780	128	Medium	Medium
High efficiency non-packaged HVAC: savings of 25% of indirect heating energy use	25.0%	408	247	1,850,650	98	Medium	Medium
Boilers	*Maximum potential Savings* [7]	*Energy Savings* [7]	*GHG* [6]	*Maximum Potential Energy Cost Savings* [7]			
High Priority End-use	*[%]*	*[GJ]*	*[ton]*	*[BDT]*			
Automated Blowdown control: savings of 1% of boiler use	1.0%	9	1	20,502	15	Medium	Medium
Economizer: savings of 4% of boiler energy use	4.0%	34	4	82,007	11	Medium	Medium
Flue gas monitoring: savings of 2 to 15% of boiler energy use	15.0%	128	14	307,525	124	Medium	Medium
Process heat recovery to preheat makeup water: savings of 6% of boiler energy use	6.0%	51	6	123,010	12	Medium	Medium
High Efficiency Burner: savings of 5% of boiler energy use	5.0%	43	5	102,508	10	Medium	Medium
Boiler combustion air preheat: savings of 5% of boiler energy use	5.0%	43	5	102,508	13	Medium	Medium
Blowdown heat recovery: savings of 2% of boiler energy use	2.0%	17	2	41,003	14	Medium	Medium
Advanced boiler controls: savings of 3% of boiler energy use	3.0%	26	3	61,505	9	Medium	Medium
Condensate return: savings of 2% of steam-generator energy use	2.0%	17	2	41,003	16	Medium	Medium
Load Management Assessment: savings of up to 50% of boiler energy use	50.0%	427	48	1,025,085	7	Medium	High
Efficient boiler system: savings of 5 to 10% of boiler energy consumption	10.0%	85	10	205,017	117	Medium	High
Boiler load management: savings of up to 50% of boiler energy use	50.0%	427	48	1,025,085	8	Medium	High
Cooling / Refrigeration	*Maximum potential Savings* [7]	*Energy Savings* [7]	*GHG* [6]	*Maximum Potential Energy Cost Savings* [7]			
Medium Priority End-use	*[%]*	*[GJ]*	*[ton]*	*[BDT]*			
Improve insulation of refrigeration system: savings of 5% of chiller energy use	5.0%	59	28	206,624	67	Low	Low
High efficiency chiller: savings of 19% of chiller energy use	19.0%	224	105	785,169	56	Medium	Medium
Smart defrost controls: savings of 10% of chiller energy use	10.0%	118	55	413,247	60	Medium	Medium
Floating head pressure controls: savings of 3% -10% of chiller energy use	10.0%	0	55	413,247	58	Medium	Medium
Optimized distribution system: savings of 3% of chiller energy use	3.0%	35	17	123,974	57	High	Medium

Fans, Motors, Pumps	***Maximum potential Savings*** [7]	***Energy Savings*** [7]	***GHG*** [6]	***Maximum Potential Energy Cost Savings*** [7]			
Medium Priority End-use	***[%]***	***[GJ]***	***[ton]***	***[BDT]***			
High/premium efficiency motors for pumps: motor energy savings of 0.8 to 8%	8.0%	52	17	123,711	68	Low	Medium
High/premium efficiency motors for equipment: motor energy savings of 2%	2.0%	13	4	30,928	79	Low	Medium
Premium efficiency control with ASDs: save 20% in pumping energy use	20.0%	131	41	309,277	71	Medium	Medium
Correctly sized motors: savings of 2% of motor energy use	2.0%	13	4	30,928	80	Medium	Medium
Premium efficiency control with ASDs: save 20% in motor energy use	20.0%	131	41	309,277	35	Medium	Medium
Optimization of pumping system: savings of up to 17% of pumping energy use	17.0%	111	35	262,886	70	High	Medium
Lighting	***Maximum potential Savings*** [7]	***Energy Savings*** [7]	***GHG*** [6]	***Maximum Potential Energy Cost Savings*** [7]			
Low Priority End-use	***[%]***	***[GJ]***	***[ton]***	***[BDT]***			
Use of electronic ballasts saving 20-30% of lighting energy use	30.0%	13	4	30,549	29	Low	Low
High efficiency lights fixtures: savings of 20 - 75% of lighting energy use	75.0%	32	10	76,373	108	Low	Low
Lighting controls: occupancy sensors: savings of 15% of lighting energy use	15.0%	6	2	15,275	125	Low	Low
Lighting controls: on/off timers: savings of 15% of lighting energy use	15.0%	6	2	15,275	110	Medium	Medium

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.