

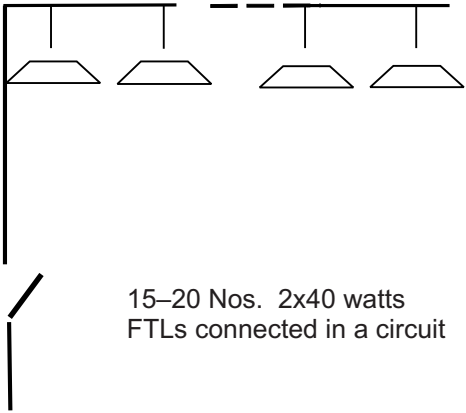
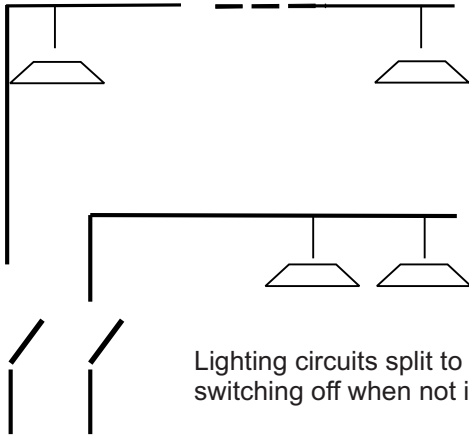


1.	ID: 69	Title of measure	Sector: Paper & Pulp Industry
2.	Survey Year: 2007	Installation of VFD on couch pit & seal pit pumps	Technology: Variable Frequency Drives
3.	Name of the Company : Ballarpur Industries Limited, Unit: Shree Gopal, Yamuna Nagar, Haryana, INDIA		
4.	Agency that executed the project : In-house		
5.	Year of Implementation : 2006-07		
6.	<p>Unit Profile:</p> <p>Ballarpur Industries Limited is one of the leaders in Pulp & Paper industry comprising of six Pulp & Paper mills and contributes 15% of country's overall paper production, with manufacturing 60% of country's value added and specialty paper. BILT- Unit Shree Gopal, Yamuna Nagar, was established in 1936 with 52 MT capacity is now producing 223 MT of specialty grade, high value added premium paper.</p>		
7.	<p>Description of Energy Conservation Measure:-</p> <p>In the unit couch pit & seal pit pumps are operated continuously irrespective of the level in the pit. It is observed that the liquid level varies according to paper breaks and running condition of the paper machine. To optimize the running of these pumps it was decided to install VFD with a feedback from level sensor in the pit. A considerable saving of 13 kW (9 kW for couch pit pump & 4 kW for seal pit pump) was achieved.</p>		
8.	<p>Ballarpur Industries</p> 	<p>Picture After Modification</p> 	
9.	Total investment:		11,250 US\$
10.	First year energy cost savings:		6,250 US\$
11.	First year additional savings beyond energy (i.e. water, raw materials etc.):		Not known
12.	Annual electricity consumption before, MWh		386
13.	Annual electricity consumption after, MWh		277
14.	First year electricity savings, MWh		109
15.	First year tons of CO ₂ mitigated		109
16.	Assumed sustainability, years		10
17.	Expected tons of CO₂ mitigated throughout life cycle		1,090

1	ID: 70	Title of measure	Sector: Paper & Pulp Industry
2	Survey Year: 2007	Splitting of electrical circuits	Technology: Lighting Systems
3	Name of the Company : Century Pulp & Paper, Lalkua, Nainital, INDIA		
4	Agency that executed the project : In-house		
5	Year of Implementation : 2006-07		
6	<p>Unit Profile:</p> <p>Century Pulp and Paper, a unit of Century Textiles and Industries Limited, is a flagship company of B.K. Birla group of industries. The company has established its brand very well in the domestic and overseas market. The company has installed capacities of Rayon Grade/ Paper Grade Pulp: 31320 TPA, Typewriting & Printing Papers (wood) 37250 TPA, and Writing & Printing Papers (Bagasse) 84600 TPA . The annual turnover of the unit for the year 2006-07 is reported as US\$ 0.16 billion.</p>		
7	<p>Description of Energy Conservation Measure:-</p> <p>Initially 15-20 luminaries were controlled by one switch. The requirement was studied in 22 locations. It was observed that in Motor Control Centre and Power Control Centre (MCC/PCC) rooms complete lighting was required during maintenance only. As an energy conservation measure, the in- house team recommended modifications in the lighting circuits. Accordingly the lighting circuits were modified to enable switching of lights when not in use. Similar exercise was done for some process areas also.</p>		
8	<p>Before Modification</p>  <p>15-20 Nos. 2x40 watts FTLs connected in a circuit</p>	<p>Picture After Modification</p>  <p>Lighting circuits split to enable switching off when not in use</p>	
9	Total investment :		675 US\$
10	First year energy cost savings :		5,200 US\$
11	First year additional savings beyond energy (i.e. water, raw materials etc.):		Not known
12	Annual electricity consumption before, MWh		227
13	Annual electricity consumption after, MWh		122
14	First year electricity savings, MWh		105
15	First year tons of CO ₂ mitigated		105
16	Assumed sustainability, years		5
17	Expected tons of CO₂ mitigated throughout life cycle		525

1. ID: 71	Title of measure	Sector: Paper & Pulp Industry
2 Survey Year: 2007	Utilization of Bamboo dust as secondary fuel in FBC Boiler	Technology: Boiler
3 Name of the Company	: Ballarpur Industries Limited, Unit Ashti, Maharashtra, INDIA	
4 Agency that executed the project	: In-house	
5 Year of Implementation	: 2006-07	
6	<p>Unit Profile: Ballarpur Industries Limited (BILT) is one of the India's largest manufacturers of writing and printing paper. BILT's subsidiaries include Sabah Forest Industries (SFI), Malaysia's largest pulp and paper company. BILT has six manufacturing units across India, which give the company geographic coverage over most of the domestic market. Its Ashti unit in Maharashtra produces white copier paper. With the recent expansion, the unit now has a capacity to manufacture bleached writing and printing paper up to 60,000 tonnes per annum.</p>	
7	<p>Description of Energy Conservation Measure:- The in-house team took the initiative of conserving the fossil fuel (coal) by using non-conventional fuel as Bamboo Dust for their FBC Boiler. The unit consumed about 6897 MT of bamboo dust which has gross calorific value of 2750 kCal/kg. This measure resulted in saving of coal with gross calorific value 4299kCal/kg as following.</p> <p>Saving in coal = $6897 \times 2750 / 4299$, Coal rate Rs /MT = 177, Dust rate Rs /MT = 400 Net Saving in Rs. = 4412×1374 = 6.06 Million p.a. = 4412 MT</p>	



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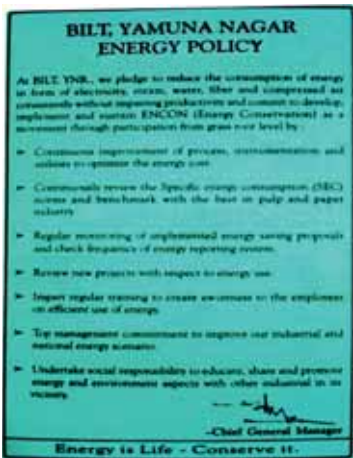




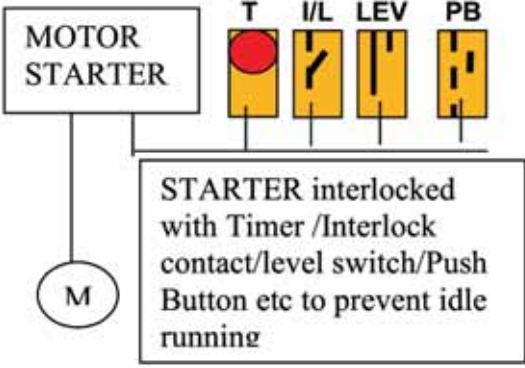
Picture After Modification






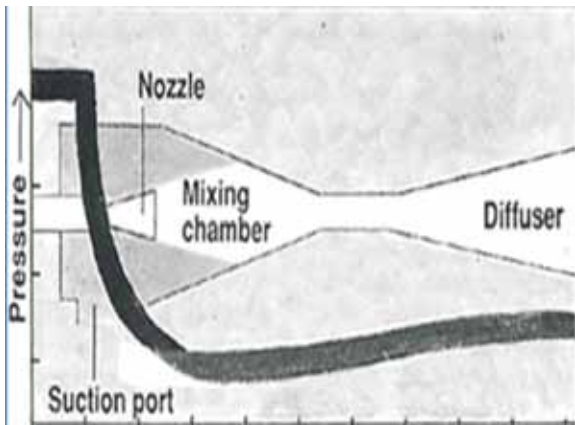
9	Total investment :	15,000 US\$
10	First year energy cost savings :	150,000 US\$
11	First year additional savings beyond energy (i.e. water, raw materials etc.):	Nil
12	Annual coal consumption before, tons	26,940
13	Annual coal consumption after, tons	22,582
14	First year coal savings, tons	4,412
15	First year tons of CO ₂ mitigated	6,265
16	Assumed sustainability, years	10
17	Expected tons of CO₂ mitigated throughout life cycle	62,650

1	ID: 72	Title of measure	Sector: Paper & Pulp Industry
2	Survey Year: 2007	Installation of Pith-cum-coal fired boiler	Technology: Pith- cum – coal fired boiler
3	Name of the Company : Century Pulp & Paper, Lalkua, Nainital,Uttarakhand, INDIA		
4	Agency that executed the project : In-house		
5	Year of Implementation : 2006-07		
6	<p>Unit Profile:</p> <p>Century Pulp and Paper, a unit of Century Textiles and Industries Limited, is a flagship company of B.K. Birla group of industries. The company has established its brand very well in the domestic and overseas market. The company has installed capacities of Rayon Grade/ Paper Grade Pulp: 31320 TPA, Typewriting & Printing Papers (wood) 37250 TPA and Writing & Printing Papers (Bagasse) 84600 TPA . The annual turnover of the unit for the year 2006-07 is reported as US\$ 0.16 billion.</p>		
7	<p>Description of Energy Conservation Measure:-</p> <p>Bagasse, a waste product of sugar industry is used for paper making after removal of short fibers called pith. Pith is a very light substance and occupies lot of space and its disposal is a problem. The pith has a heating value of 1500 Kcal/Kg so efforts were made to burn it in conventional coal fired boilers. The conventional boilers are not designed to handle such a light substance and the pith burning in them resulted in poor efficiency and frequent failures due to improper heat distribution. Pith alone can not be used as a fuel and requires a support fuel like coal. Hence, a coal cum pith fired boiler was thought of by the in-house team. The technology of burning this substance was not available so the manufacturers T B W had to do a lot of R&D with the unit's pith. A control combustion zone Boiler (patented design of Babcock & Wilcox, USA) was designed to burn pith and coal with varying proportions of pith, max being 80% pith.</p>		
8	<p>Century Paper Mill Inside view of Century Pulp & Paper Lolkur</p> 	<p>Picture After Modification</p> 	
9	Total investment :		5,875,000 US\$
10	First year energy cost savings :		1,984,000 US\$
11	First year additional savings beyond energy (i.e. water, raw materials etc.):		Nil
12	Annual coal consumption before,	tons	---
13	Annual coal consumption after,	tons	---
14	First year coal savings,	tons	42,896
15	First year tons of CO ₂ mitigated		60,912
16	Assumed sustainability, years		10
17	Expected tons of CO₂ mitigated throughout life cycle		609,120

1. ID: 73	Title of measure	Sector: Paper & Pulp Industry
2. Survey Year: 2007	Optimization of hot air flow through blowers at Laminating machine by installing VFDs	Technology: Variable Frequency Drives
3. Name of the Company	: Ballarpur Industries Limited, Unit: Shree Gopal, Yamuna Nagar, Haryana, INDIA	
4. Agency that executed the project	: In-house	
5. Year of Implementation	: 2006-07	
6. Unit Profile:	<p>Ballarpur Industries Limited is one of the leaders in Pulp & Paper industry comprising of six Pulp & Paper mills and contributes 15% of country's overall paper production, with manufacturing 60% of country's value added and specialty paper. BILT- Unit Shree Gopal, Yamuna Nagar, was established in 1936 with 52 MT capacity is now producing 223 MT of specialty grade, high value added premium paper.</p>	
7. Description of Energy Conservation Measure:-	<p>In the unit, 2 nos. hot air supply fans were operated at laminating machine with manual damper operation for air flow control. Both the fans were operated at the rated speed of 1480 rpm. and the power consumption was around 54 kW & 45 kW respectively.</p> <p>To eliminate the damper throttling, the in-house team decided to install VFD on both the fans to achieve the desired air flow. Trials were conducted for speed requirement at different operating conditions after installing VFDs on both the blowers. The fan speed reduced to 1200-1300 rpm for achieving desired production rate. A better control over the airflow was achieved with improved quality of product as well. The power saving achieved was 33 kW in both the fans. Higher power savings could be achieved during small deckle of paper.</p>	
8.	 <p>BILT, YAMUNA NAGAR ENERGY POLICY</p> <p>At BILT, YNR, we pledge to reduce the consumption of energy in form of electricity, steam, water, filter and compressed air continuously without impacting productivity and commit to doing, implement and sustain ENCON (Energy Conservation) as a movement through participation from grass root level by:</p> <ul style="list-style-type: none"> Continuous improvement of process, instrumentation and control to optimize the energy use. Continuously review the Specific energy consumption (SEC) norms and benchmark with the best in pulp and paper industry. Regular monitoring of implemented energy saving proposals and check frequency of energy reporting system. Review new projects to with respect to energy use. Impart regular training to create awareness to the employees on efficient use of energy. Top management commitment to improve our industrial and national energy scenario. Undertake social responsibility to educate, share and promote energy and environment aspects with other industrial in its vicinity. <p>-Chief General Manager Energy is Life - Conserve It.</p>	<p>Picture After Modification</p>  <p>VFD installed at Blower of Laminating Machine</p>
9. Total investment:		10,000 US\$
10. First year energy cost savings:		15,800 US\$
11. First year additional savings beyond energy (i.e. water, raw materials etc.):		Nil
12. Annual electricity consumption before, MWh		831
13. Annual electricity consumption after, MWh		554
14. First year electricity savings, MWh		277
15. First year tons of CO ₂ mitigated		277
16. Assumed sustainability, years		10
17. Expected tons of CO₂ mitigated throughout life cycle		2,770

1	ID: 74	Title of measure	Sector: Paper & Pulp Industry
2	Survey Year: 2007	Prevent idle running of equipment through Timers/ Interlock contact/ Level switch/Push Button	Technology: Process Control
3	Name of the Company : Century Pulp & Paper, Lalkua, Nainital, INDIA		
4	Agency that executed the project : In-house		
5	Year of Implementation : 2006-07		
6	<p>Unit Profile:</p> <p>Century Pulp and Paper, a unit of Century Textiles and Industries Limited, is a flagship company of B.K. Birla group of industries. The company has established its brand very well in the domestic and overseas market. The company has installed capacities of Rayon Grade/ Paper Grade Pulp: 31320 TPA, Typewriting & Printing Papers (wood) 37250 TPA, and Writing & Printing Papers (Bagasse) 84600 TPA . The annual turnover of the unit for the year 2006-07 is reported as US\$ 0.16 billion.</p>		
7	<p>Description of Energy Conservation Measure:-</p> <p>In the plant, several equipments are used for a certain function only and are operated for a short duration only. Ideally such equipments should be switched off when not in use but due to manual involvement, at times, such equipments are left running, resulting in wastage of power. In the plant, the inhouse team identified 9 such equipments like agitators, chippers, pumps, conveyors etc and provided with interlocks to ensure switching off when not in use.</p>		
8	<p>Before Modification</p> 	<p>Picture After Modification</p> 	
9	Total investment :		3,250 US\$
10	First year energy cost savings :		8,675 US\$
11	First year additional savings beyond energy (i.e. water, raw materials etc.):		Nil
12	Annual electricity consumption before,	MWh	395
13	Annual electricity consumption after,	MWh	200
14	First year electricity savings,	MWh	195
15	First year tons of CO ₂ mitigated		195
16	Assumed sustainability, years		10
17	Expected tons of CO₂ mitigated throughout life cycle		1,950

1. ID: 75	Title of measure	Sector: Paper & Pulp Industry
2. Survey Year: 2007	Compressed air system efficiency enhancement by installation of screw Compressor	Technology: Screw Compressor
3. Name of the Company	: Ballarpur Industries Limited, Unit: Shree Gopal, Yamuna Nagar, Haryana, INDIA	
4. Agency that executed the project	: In-house	
5. Year of Implementation	: 2006-07	
6. Unit Profile:	Ballarpur Industries Limited is one of the leaders in Pulp & Paper industry comprising of six Pulp & Paper mills and contributes 15% of country's overall paper production, with manufacturing 60% of country's value added and specialty paper. BILT- Unit Shree Gopal, Yamuna Nagar, was established in 1936 with 52 MT capacity is now producing 223 MT of specialty grade, high value added premium paper.	
7. Description of Energy Conservation Measure:-	Machine house 1 was supplied with compressed air generated from 2 nos. reciprocating air compressors. As, the specific power consumption for screw compressors is low as compared to reciprocating compressors, the in-house team decided to install new screw compressors. The power consumption for the system reduced by 40 kW with the installation of new screw compressors along with minor modification in piping and keeping one reciprocating compressor off.	
8.	Paper machine in Ballarpur Unit 	Picture After Modification  Screw Compressor
9. Total investment :		30,000 US\$
10. First year energy cost savings :		19,150 US\$
11. First year additional savings beyond energy (i.e. water, raw materials etc.):		Nil
12. Annual electricity consumption before, MWh		1386
13. Annual electricity consumption after, MWh		1050
14. First year electricity savings, MWh		336
15. First year tons of CO ₂ mitigated		336
16. Assumed sustainability, years		10
17. Expected tons of CO₂ mitigated throughout life cycle		3,360

1.	ID: 76	Title of measure	Sector: Paper & Pulp Industry
2.	Survey Year: 2007	Installation of Thermo compressor based steam condensate recovery system to reduce steam consumption at Paper Machine-5	Technology: Thermo Compressors
3.	Name of the Company	: Ballarpur Industries Limited, Unit: Shree Gopal, Yamuna Nagar, Haryana, INDIA	
4.	Agency that executed the project	: In-house	
5.	Year of Implementation	: 2006-07	
6.	Unit Profile:		
	Ballarpur Industries Limited is one of the leaders in Pulp & Paper industry comprising of six Pulp & Paper mills and contributes 15% of country's overall paper production, with manufacturing 60% of country's value added and specialty paper. BILT- Unit Shree Gopal, Yamuna Nagar, was established in 1936 with 52 MT capacity is now producing 223 MT of specialty grade, high value added premium paper.		
7.	Description of Energy Conservation Measure:-		
	In paper machine 5 steam and condensate system was modified to take maximum advantage of the cascading effect at paper machine and to reduce steam consumption by boosting steam pressure with thermo compressor. Earlier a study was carried out by M/s. Forbes Marshall for the system optimization and modifications were done based on the recommendations of the study. The modified system resulted in reduction in steam consumption by 0.6 tons / ton of paper and better process control was achieved along with saving of coal.		
8.	Paper Mill of the Unit	Picture After Modification	
			
9.	Total investment :	200,000 US\$	
10.	First year energy cost savings :	75,000 US\$	
11.	First year additional savings beyond energy (i.e. water, raw materials etc.):	Not known	
12.	Annual coal consumption before, tons	5,746	
13.	Annual coal consumption after, tons	4,884	
14.	First year coal savings, tons	862	
15.	First year tons of CO ₂ mitigated	1,224	
16.	Assumed sustainability, years	10	
17.	Expected tons of CO₂ mitigated throughout life cycle	12,240	