


Energy Conservation Measure implemented in 2006

ID to be filled by BEE	Title of the measure <u>Substitution of HSD with furnace oil in thermic fluid heater</u>	Sector Petrochemicals
Year to be filled by BEE		Technology : Lubricants
<p>Before: Silvassa site used to run on high speed diesel @ Rs 28 per litre</p> <p>Improvement: Furnace oil is cheaper by Rs 5/. In consultation with thermax and various other neighbouring industries, site converted the fuel to furnace oil. Further to this, site got in touch with Reliance and came to know that they have a special furnace oil named Low sulphur furnace oil which is cheaper by Rs 9/. Without any additional modification HSD was converted to Low sulphur furnace oil.</p> <p>Result: By converting to Low sulphur furnace oil site is saving around 18.96 lakhs per annum.</p>		
Picture/ sketch/ drawing before modification (if available)	Picture/ sketch/ drawing after modification	
Agency that executed the project (with complete address and email): In house Engineering team, Dinesh Mishra, Sr Executive, Projects and Engineering, Dinesh_mishra@castrol.co.in		
Total investment, Rs.:0.0 Lakhs	Year of implementation: 2006	

First year energy cost savings, Rs.737721.00					
First year other savings, Rs.:					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm ³	Oil (kL)	Other (COST)Rs (lakhs)
Energy consumption before	NA	NA	NA	NA	54.79
Energy consumption after	NA	NA	NA	NA	35.82
Energy tariff, Rs/ KL	NA	NA	NA	NA	Diff cost of Rs 9/-
Company complete address: Castrol India Limited, Survey 374/2/1, Rakholi Saily Raod,Silvassa, Pin 396230. Contact person who could be contacted for more information: Sr Manager Projects and Engg: AV Rajesh Ph: 0260-2640141, Fax: 2640139, Mobile:09825000667				We authorise Bureau to use this information for dissemination Signature Date	

Energy Conservation Measure implemented in 2006

ID to be filled by BEE	Title of the measure <u>Auto drain system for compressed air receivers eliminating manual draining</u>	Sector Petrochemical
Year to be filled by BEE		Technology Lubricants
<p>Before: Site has one big air receiver storing compressed air. In the earlier system, the moisture from the receiver was drained manually. Irrespective of the quantity of the moisture the operator used to drain the receiver for a limited time in a limited frequency.</p> <p>Improvement: A automatic trap and drain system was installed on air receiver.</p> <p>After: Whenever there moisture level increases automatically valve opens and drains. There is no operator intervention and frequency of draining has reduced saving air loss.</p> <p>Savings: 19 units of power per day (@ 0.2 KW/ CFM of air)</p>		
Picture/ sketch/ drawing before modification (if available)	Picture/ sketch/ drawing after modification	
	<p align="center"><u>Autodrain System for Air receiver</u></p> 	
Agency that executed the project (with complete address and email): In house Resource, Dinesh Mishra, Sr Executive, Projects and Engineering, Dinesh_mishra@castrol.co.in		
Total investment, Rs.:0.1 Lakhs	Year of implementation: 2006	


First year energy cost savings, Rs.:15105.00					
First year other savings, Rs.:					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm ³	Oil (kL)	Other
Energy consumption before	7.2	NA	NA	NA	NA
Energy consumption after	1.52	NA	NA	NA	NA
Energy tariff, Rs/ kwh	2.65	NA	NA	NA	NA
<p>Company complete address: Castrol India Limited, Survey 374/2/1, Rakholi Saily Raod,Silvassa, Pin 396230.</p> <p>Contact person who could be contacted for more information: Sr Manager Projects and Engg: AV Rajesh Ph: 0260-2640141, Fax: 2640139, Mobile:09825000667</p>				<p>We authorise Bureau to use this information for dissemination</p> <p>Signature</p> <p>Date</p>	

Energy Conservation Measure implemented in 2006

ID to be filled by BEE	Title of the measure <u>Changing of power cut day to Sunday after close liasoning with Gujarat Electricity board reducing running hours of DG and saving fuel</u>	Sector Petrochemical
Year to be filled by BEE		Technology: Lubricants
<p>Before: Silvassa site runs 6 days a week with Sunday as a holiday. For industries there was a power cut on Thursdays. On Thursday site used to run on Diesel generator. Grid power is costlier than captive power due to low cost of grid power in this region.</p> <p>Improvement: Factory made a representation to GEB and after consistent persuasion the GEB rescheduled the power cut from Thursday to Sunday.</p> <p>Result: With this change site now runs on grid power on Thursday. Fuel savings to the tune of 5 KL/ Month (@ 4 Thursdays in a month).</p> <p>Net savings: (taking additional purchased unit into consideration) is Rs 10.8 lakhs per annum</p>		
Picture/ sketch/ drawing before modification (if available)		Picture/ sketch/ drawing after modification
Agency that executed the project (with complete address and email): In house Electrical Resource, Dinesh Mishra, Sr Executive, Projects and Engineering, Dinesh_mishra@castrol.co.in		
Total investment, Rs.:0.0 Lakhs		Year of implementation: 2006


First year energy cost savings, Rs.90720.00					
First year other savings, Rs.:					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm ³	Oil (kL)	Other
Energy consumption before	NA	NA	NA	60	NA
Energy consumption after	NA	NA	NA	0	NA
Energy tariff, Rs/ KL	NA	NA	NA	26	NA
<p>Company complete address: Castrol India Limited, Survey 374/2/1, Rakholi Saily Raod,Silvassa, Pin 396230.</p> <p>Contact person who could be contacted for more information: Sr Manager Projects and Engg: AV Rajesh Ph: 0260-2640141, Fax: 2640139, Mobile:09825000667</p>				<p>We authorise Bureau to use this information for dissemination</p> <p>Signature</p> <p>Date</p>	

Energy Conservation Measure implemented in 2006

ID to be filled by BEE	Title of the measure <u>Timer in cooling tower fan stopping fan during off peak hours</u>	Sector Petrochemical
Year to be filled by BEE		Technology: Lubricants
<p>Before: Site has two Induced Draft cooling towers to cool cooling water. KW rating of each cooling tower fan is 11 and at a time the requirement is only for one cooling tower. On monitoring of usage, it was identified that cooling tower fan runs entire two shifts @ 15 hrs. On temperature measurement of inlet to cooling tower it was observed that temperature after 4 PM is considerably low because most of the blending operations that requires cooling is over before 4 pm.</p> <p>Improvement: It was decided to conduct trials by switching off the cooling tower after 4.00 pm. This system was monitored for a week and was not impacting the process operations.</p> <p>After: Now a timer is connected to this circuit which switches off the cooling tower at 4.00 pm. With this total running hours saved is around 9 hrs</p> <p>Savings of 79 units per day</p>		
Picture/ sketch/ drawing before modification (if available)	Picture/ sketch/ drawing after modification	
	<p><u>Timer in circuit</u></p> 	
Agency that executed the project (with complete address and email): In house Electrical Resource, Dinesh Mishra, Sr Executive, Projects and Engineering, Dinesh_mishra@castrol.co.in		
Total investment, Rs.:0.06 Lakhs	Year of implementation: 2006	



First year energy cost savings, Rs.:47223.00					
First year other savings, Rs.:					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm ³	Oil (kL)	Other
Energy consumption before	42.24	NA	NA	NA	NA
Energy consumption after	18.48	NA	NA	NA	NA
Energy tariff, Rs/ kwh	2.65	NA	NA	NA	NA
<p>Company complete address: Castrol India Limited, Survey 374/2/1, Rakholi Saily Raod,Silvassa, Pin 396230.</p> <p>Contact person who could be contacted for more information: Sr Manager Projects and Engg: AV Rajesh Ph: 0260-2640141, Fax: 2640139, Mobile:09825000667</p>				<p>We authorise Bureau to use this information for dissemination</p> <p>Signature</p> <p>Date</p>	

Energy Conservation Measure implemented in 2006

ID to be filled by BEE	Title of the measure Replacement of Pump of drum decanting system with an energy efficient pump	Sector Petrochemical
Year to be filled by BEE		Technology Lubricants
<p>Description of the energy conservation measure:</p> <p>Before: One of the drum decanting system had a 5.5 KW pump. This pump is being used to pump a wide range of viscosity products at two different speeds through a 2 Speed Motor. A few of the products were taking longer time to pump.</p> <p>Improvement: The pump was replaced with a new vane pump with VFD Controlled motor which can take this wide variation of viscosity. The vane pump for the same fluid had the capacity to pump at lower speeds, which is governed by a VFD. Because of this overall KWH taken by pump per day</p> <p>Result: A savings of 6 units per day.</p>		
Picture/ sketch/ drawing before modification (if available)		Picture/ sketch/ drawing after modification
		<p><u>New Pump which can run at lower speeds efficiently</u></p> 
Agency that executed the project (with complete address and email): In house Electrical Resource, Dinesh Mishra, Sr Executive, Projects and Engineering, Dinesh_mishra@castrol.co.in		
Total investment, Rs.:1.0 Lakhs		Year of implementation: 2006


First year energy cost savings, Rs.:2716.00					
First year other savings, Rs.:					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm ³	Oil (kL)	Other
Energy consumption before	11.85	NA	NA	210	NA
Energy consumption after	10.09	NA	NA	202	NA
Energy tariff, Rs/ kwh	2.65	NA	NA	17000	NA
Company complete address: Castrol India Limited, Survey 374/2/1, Rakholi Saily Raod,Silvassa, Pin 396230. Contact person who could be contacted for more information: Sr Manager Projects and Engg: AV Rajesh Ph: 0260-2640141, Fax: 2640139, Mobile:09825000667				We authorise Bureau to use this information for dissemination Signature Date	

Energy Conservation Measure implemented in 2006

ID to be filled by BEE	Title of the measure	Sector Petrochemical
Year to be filled by BEE	<u>Rationalisation of Air conditioners in Administrative building by layout modification</u>	Technology : Lubricants
<p>Description of the energy conservation measure:</p> <p>Before: Administrative building had 22.5 TR centralized Air-conditioning system. On an average daily consumption of these AC's were 138 KWH, There was a huge scope of rationalizing the AC network in view of the total occupancy and occupancy rate of this building.</p> <p>Improvements: The opportunity here was to convert centralized into split AC's by minor modification to office layouts.</p> <p>After: The layout modification was done and with this the total TR has come down from 22.5 to 9 saving 62 KWH units per day</p>		
Picture/ sketch/ drawing before modification (if available)	Picture/ sketch/ drawing after modification	
7.5 TRx 3 no's AC Panel for complete building	Modified into independent cabins with standalone 1.5 TR split A/C's	
		
Agency that executed the project (with complete address and email): In house Project team (Air conditioners purchased from Voltas through shree krishna chill air , Silvassa)		
Total investment, Rs.:3.5 Lakhs	Year of implementation: 2006	

First year energy cost savings, Rs.16528.00					
First year other savings, Rs.:					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm ³	Oil (kL)	Other
Energy consumption before	31	NA	NA	NA	NA
Energy consumption after	12	NA	NA	NA	NA
Energy tariff, Rs/ kWh/ Ton/ Nm ³ / kL ...	2.65	NA	NA	NA	NA
<p>Company complete address: Castrol India Limited, Survey 374/2/1, Rakholi Saily RoAd,Silvassa, Pin 396230.</p> <p>Contact person who could be contacted for more information: Sr Manager Projects and Engg: AV Rajesh Ph: 0260-2640141, Fax: 2640139, Mobile:09825000667</p>				<p>We authorise Bureau to use this information for dissemination</p> <p>Signature</p> <p>Date</p>	

Energy Conservation Measure implemented in 2006

ID to be filled by BEE	Title of the measure	Sector Petrochemical
Year to be filled by BEE	<u>Replacement of halogen lamps with energy efficient metal halide lamps (8 no's of 1000W halogen with 250 W metal halide lamps)</u>	Technology : Lubricants
<p>Description of the energy conservation measure:</p> <p>Before: Boundary wall periphery near administration building was installed with 10 Nos of 1000 W halogen lamps. On an average daily consumption of units by these lights were 96 KWH (@12 hours).</p> <p>Improvement: There was a scope of reduction in these units by replacing these with energy efficient metal halide luminaries.</p> <p>After: Site replaced these bulbs with 250W metal halide luminaries without compromising on the overall lux level. Daily grid consumed has come down to 24 KWH</p> <p>Savings: 72 units per day</p>		
Picture/ sketch/ drawing before modification (if available)	Picture/ sketch/ drawing after modification	
	<p><u>250 W Metal Halide Lamps (8 No's)</u></p> 	
Agency that executed the project (with complete address and email): In house Electrical Resource, Dinesh Mishra, Sr Executive, Projects and Engineering, Dinesh_mishra@castrol.co.in		
Total investment, Rs.:0.6 Lakhs	Year of implementation: 2006	


First year energy cost savings, Rs.51516.00					
First year other savings, Rs.:					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm ³	Oil (kL)	Other
Energy consumption before	35	NA	NA	NA	NA
Energy consumption after	8.5	NA	NA	NA	NA
Energy tariff, Rs/ kWh	2.65	NA	NA	NA	NA
<p>Company complete address: Castrol India Limited, Survey 374/2/1, Rakholi Saily Raod, Silvassa, Pin 396230.</p> <p>Contact person who could be contacted for more information: Sr Manager Projects and Engg: AV Rajesh Ph: 0260-2640141, Fax: 2640139, Mobile:09825000667</p>				<p>We authorise Bureau to use this information for dissemination</p> <p>Signature</p> <p>Date</p>	

Energy Conservation Measure implemented in 2006

ID to be filled by BEE	Title of the measure	Sector Petrochemical
Year to be filled by BEE	<u>Modification of Heating system of fuel line to thermic fluid heater:</u>	Technology: Lubricants
<p>Description of the energy conservation measure:</p> <p>Before: Site converted the fuel of thermic fluid heater from Light Diesel oil to furnace oil in mid 2006. Furnace oil is thick and needs heating to make it flow to the pump. The day tank was not heated. Every day morning the boiler used to run for at least 20 minutes to stabilize because the only heat that was available was from the heater before the burner and the fuel in the inlet line was in cold condition. During the stabilization period the fuel was getting burnt but was not giving any heat value because of inadequate combustion.</p> <p>Improvement: The fuel inlet pipeline was modified in such a way that the residual fuel also gets heated up in the morning.</p> <p>After: The 20 minutes stablisation has come down to 15 minutes saving 8 KL of fuel on an annual basis.</p> <p>Savings of 8 KL of fuel per annum</p>		
Picture/ sketch/ drawing before modification (if available)		Picture/ sketch/ drawing after modification
Agency that executed the project (with complete address and email): In house Electrical Resource, Dinesh Mishra, Sr Executive, Projects and Engineering, Dinesh_mishra@castrol.co.in		
Total investment, Rs.:0.02 Lakhs		Year of implementation: 2006


First year energy cost savings, Rs.:23375.00					
First year other savings, Rs.:					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm ³	Oil (kL)	Other
Energy consumption before	NA	NA	NA	210	NA
Energy consumption after	NA	NA	NA	202	NA
Energy tariff, Rs/ kl	NA	NA	NA	17000	NA
<p>Company complete address: Castrol India Limited, Survey 374/2/1, Rakholi Saily Raod,Silvassa, Pin 396230.</p> <p>Contact person who could be contacted for more information: Sr Manager Projects and Engg: AV Rajesh Ph: 0260-2640141, Fax: 2640139, Mobile:09825000667</p>				<p>We authorise Bureau to use this information for dissemination</p> <p>Signature</p> <p>Date</p>	

Energy Conservation Measure implemented in 2006

ID to be filled by BEE	Title of the measure <u>Rationalisation of lighting circuit in plant.</u>	Sector Petrochemical
Year to be filled by BEE		Technology : Lubricants
<p>Before: Night shift Plant internal lighting consumption was as follows.</p> <p>10.30 pm to 6.00 am: 213 units</p> <p>Internal Lighting load of the site: 40 KW(out of which 4.15 KW is consumed throughout the night)</p> <p>External lighting load of the site: 6KW</p> <p>Improvement: Where as external lighting load is required due to security reasons; internal plant lighting is required only on need basis. The requirement of internal plant lighting during night was required only during security beats. Based on a risk assessment, site re-designed the entire lighting switching system. In the re-designed system, a common switch was provided at the entrance of the plant. Before security person enters the plant, he switches on the entire plant internal lights. After the beat round, he switches of the lights.</p> <p>After: With the above modification, the average lighting load during per night has come down to 189 Units.</p> <p>Savings of 24 units per day</p>		
Picture/ sketch/ drawing before modification (if available)	Picture/ sketch/ drawing after modification	
	<p align="center"><u>On/off switch installed at entrance to Plant. Switched on only during security beats.</u></p> 	
Agency that executed the project (with complete address and email): In house Electrical Resource, Dinesh Mishra, Sr Executive, Projects and Engineering, Dinesh_mishra@castrol.co.in		
Total investment, Rs.:0.06 Lakhs	Year of implementation: 2006	


First year energy cost savings, Rs.:18063.00					
First year other savings, Rs.:					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm ³	Oil (kL)	Other
Energy consumption before	10.6	NA	NA	NA	NA
Energy consumption after	1.5	NA	NA	NA	NA
Energy tariff, Rs/ kwh	2.65	NA	NA	NA	NA
Company complete address: Castrol India Limited, Survey 374/2/1, Rakholi Saily Raod,Silvassa, Pin 396230. Contact person who could be contacted for more information: Sr Manager Projects and Engg: AV Rajesh Ph: 0260-2640141, Fax: 2640139, Mobile:09825000667				We authorise Bureau to use this information for dissemination Signature Date	

Energy Conservation Measure implemented in 2006

ID to be filled by BEE	<p style="text-align: center;">Title of the measure</p> <p style="text-align: center;"><u>Installation of timer street light circuit switching off street lights automatically</u></p>	Sector Petrochemicals
Year to be filled by BEE		Technology : Lubricants
<p>Before: Switching off lights after night shift was done by security. Total street light load of the site is 6 KW. Even an hour delay in switching off the light takes away 6 KWH. Invariably it was observed that the lights are switched off only by 6.30 am in spite of adequate day light.</p> <p>Improvement: It was decided to install timer in street light switching circuit. The timers will switch of the street light at 5.30 a.m and switch on automatically at 7.30 pm.</p> <p>After: With the timer, the unit consumption of the night has come down to 10 units per day</p>		
Picture/ sketch/ drawing before modification (if available)	Picture/ sketch/ drawing after modification	
	<p style="text-align: center;"><u>Timer in street light circuit</u></p> 	
Agency that executed the project (with complete address and email): In house Electrical Resource, Dinesh Mishra, Sr Executive, Projects and Engineering, Dinesh_mishra@castrol.co.in		
Total investment, Rs.:0.3 Lakhs	Year of implementation: 2006	


First year energy cost savings, Rs.: 6448.00					
First year other savings, Rs.:					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm ³	Oil (kL)	Other
Energy consumption before	21.63	NA	NA	NA	NA
Energy consumption after	18.03	NA	NA	NA	NA
Energy tariff, Rs/ kwh	2.65	NA	NA	NA	NA
<p>Company complete address: Castrol India Limited, Survey 374/2/1, Rakholi Saily Raod, Silvassa, Pin 396230.</p> <p>Contact person who could be contacted for more information: Sr Manager Projects and Engg: AV Rajesh Ph: 0260-2640141, Fax: 2640139, Mobile:09825000667</p>				<p>We authorise Bureau to use this information for dissemination</p> <p>Signature</p> <p>Date</p>	

Energy Conservation Measure implemented in 2006

ID to be filled by BEE	Title of the measure VFD in cooling tower pump reducing KW and eliminating two pump running	Sector Petrochemical
Year to be filled by BEE		Technology: Lubricants
<p>Silvassa Site has two cooling water pumps of 50 hp each and these pumps were installed in the year 1996. These pumps are used for</p> <ul style="list-style-type: none"> • Cooling of blended oil in Heat exchangers • Blender cooling • Compressed air cooling • Diesel Generator engine cooling <p>Any one of the two pumps runs for full two shifts continuously irrespective of cooling water requirement for the above processes. As a part of energy study site had identified this pump as one of the major gulpers of energy and there was an opportunity to reduce this. During investigation it was observed that during normal conditions only one of the pumps is required to cater to process requirement. But it was also observed that one pump is not enough when there is a requirement in family-6 blending and when Diesel generator is running. On further investigation it was observed that these pump runs with delivery half throttled thus reducing the capacity. This reduced capacity was just enough for process cooling inside main plant building but was insufficient for family-6 blending and diesel generator cooling.</p> <p>A capex for vector controlled VFD was raised this was installed in Dec 2006. The speed of the pump was fixed just above critical speed.</p> <p>With installation of this the following benefits are being realized.</p> <ol style="list-style-type: none"> 1. Pump taking a load of 58 amps is now taking 45 amps: savings to the tune of Rs.89000 per annum 2. Earlier site used to run two pumps when f-6 and dg were running. Now only one pump runs. Savings to the tune of Rs. 58000 per annum 		
Picture/ sketch/ drawing before modification (if available)	Picture/ sketch/ drawing after modification	
	<p>VFD in cooling tower pump</p> 	
Agency that executed the project (with complete address and email): In house Electrical Resource, Dinesh Mishra, Sr Executive, Projects and Engineering, Dinesh_mishra@castrol.co.in		
Total investment, Rs.:1.25 Lakhs	Year of implementation: 2006	

First year energy cost savings, Rs.: 12935.00					
First year other savings, Rs.:					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm ³	Oil (kL)	Other
Energy consumption before	202	NA	NA	NA	NA
Energy consumption after	144	NA	NA	NA	NA
Energy tariff, Rs/ kwh	2.65	NA	NA	NA	NA
<p>Company complete address: Castrol India Limited, Survey 374/2/1, Rakholi Saily Raod, Silvassa, Pin 396230.</p> <p>Contact person who could be contacted for more information: Sr Manager Projects and Engg: AV Rajesh Ph: 0260-2640141, Fax: 2640139, Mobile:09825000667</p>				<p>We authorise Bureau to use this information for dissemination</p> <p>Signature</p> <p>Date</p>	

Energy Conservation Measure implemented in 2006

ID to be filled by BEE	Title of the measure Installation of VFD in raw water pump reducing KW of the pump	Sector Petrochemical
Year to be filled by BEE		Technology : Lubricants
<p>Before: Raw water pump irrespective of the water requirement used to run continuously at full load. The motor power of raw water pump is 5.5 KW and used to take 5.5 KW under running conditions.</p> <p>Improvement: A VFD was installed which in this pump.</p> <p>Result: The pump is running a reduced rpm but still catering to the water requirement of the plant without any increase in running hours. Due to reduced speed, the KW consumption has come down to 3.6 KW leading to a savings of 1.9 KW.</p> <p>Savings of 9100 units per annum</p>		
Picture/ sketch/ drawing before modification (if available)	Picture/ sketch/ drawing after modification	
	<p align="center"><u>VFD For Raw Water Pump</u></p> 	
Agency that executed the project (with complete address and email): In house Electrical Resource, Dinesh Mishra, Sr Executive, Projects and Engineering, Dinesh_mishra@castrol.co.in		
Total investment, Rs.:0.3 Lakhs	Year of implementation: 2006	

First year energy cost savings, Rs.:10070.00					
First year other savings, Rs.:					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm ³	Oil (kL)	Other
Energy consumption before	26.4	NA	NA	NA	NA
Energy consumption after	17.28	NA	NA	NA	NA
Energy tariff, Rs/ kwh	2.65	NA	NA	NA	NA
Company complete address: Castrol India Limited, Survey 374/2/1, Rakholi Saily Raod,Silvassa, Pin 396230. Contact person who could be contacted for more information: Sr Manager Projects and Engg: AV Rajesh Ph: 0260-2640141, Fax: 2640139, Mobile:09825000667				We authorise Bureau to use this information for dissemination Signature Date	