







1	ID: 77	Title of measure	Sector: Petrochemicals
2	Survey Year: 2007	Installation of timer for stopping the fan during off peak hours	Technology: Control Systems
3	Name of the Company : Castrol India Limited, Silvassa, Dadra & Nagar Haveli,INDIA		
4	Agency that executed the project : In-house		
5	Year of Implementation : 2006-07		
6	<p>Unit Profile:</p> <p>Castrol India Limited is a Public Limited Company with 70.92% of the equity held by Castrol Limited UK (part of BP Group). Castrol, Silvassa plant is capable of producing 140,000 KL per annum of lubricating oil. Castrol India manufactures and markets a range of automotive and industrial lubricants. It markets its automotive lubricants under two brands - Castrol and BP. The annual turnover of the Silvassa Plant in 2006 was US\$ 0.43 billion</p>		
7	<p>Description of Energy Conservation Measure:-</p> <p>The site has two Induced Draft cooling towers, one of them operating at a time, to cool the cooling water. The rating of each cooling tower fan is 11 kW. On monitoring of usage the in-house team identified that cooling tower fan was running for the entire two shifts @ 15 hrs. On measuring the temperature at the inlet of the cooling tower, it was observed that temperature after 4 PM is considerably low as most of the blending operations that requires cooling is over before 4 pm.</p> <p>The team took the initiative 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. Now a timer is connected to this circuit which switches off the cooling tower at 4.00 pm. With this measure, total running hours saved is around 9 hrs and energy savings of 79 units per day.</p>		
8	<p>Castrol Unit, Silvassa</p> 	<p>Picture After Modification</p>  <p>Timer In Circuit</p>	
9	Total investment :		150 US\$
10	First year energy cost savings :		1,180 US\$
11	First year additional savings beyond energy (i.e. water, raw materials etc.):		Nil
12	Annual electricity consumption before,	MWh	42
13	Annual electricity consumption after,	MWh	18
14	First year electricity savings,	MWh	24
15	First year tons of CO ₂ mitigated		24
16	Assumed sustainability, years		10
17	Expected tons of CO₂ mitigated throughout life cycle		240

1	ID: 78	Title of measure	Sector: Petrochemicals
2	Survey Year: 2007	Utilization of waste heat	Technology: Restriction Orifice Plate (ROP)
3	Name of the Company : Reliance Industries Limited, Hazira, Surat, Gujarat, INDIA		
4	Agency that executed the project : In-house		
5	Year of Implementation : 2006-07		
6	<p>Unit Profile:</p> <p>Reliance Industries Limited is organized in 3 major business's segments viz Exploration and Production of oil & Gas, Refining/marketing of petroleum products, Petrochemicals, including manufacturing & marketing of Polymer, Polyester, Polyester intermediates, Chemicals and is one of the top companies in India with a gross turnover of US\$ 29.5 billion in the year 2006-07. Hazira Manufacturing Division of Reliance is one of the largest petrochemicals and polymers complexes</p>		
7	<p>Description of Energy Conservation Measure:-</p> <p>Purification Section of purified terephthalic acid (PTA) plant involves preheating the feed from 95°C to 283°C in a series of exchangers. As a part of heat integration, waste heat from process is used in first three exchangers and then final heating is carried out using High Pressure (90 kg/cm²g) steam in last two exchangers. This steam is derived from Superheated Stream (SHP) steam at 110 kg/cm² g steam through pressure reducing de-superheating station (PRDS) at PTA plant</p> <p>Use of intermediate pressure (IP) steam for flushing instrument tapings in crystallizers vapor line had restricted free recovery of waste heat which was then being vented to atmosphere. Requirement of fresh steam for flushing was assessed and accordingly Restriction Orifice plate (ROP) provided. After this modification, it was possible to fully recover the waste heat in crystallizer vapors resulting in fresh superheated and pressured steam (SHP) steam (110 kg/cm² g) usage by 1.2 TPH.</p>		
8	<p>Reliance Industries Hazira</p> 	<p>Picture After Modification</p> 	
9	Total investment :		Negligible
10	First year energy cost savings :		30,000 US\$
11	First year additional savings beyond energy (i.e. water, raw materials etc.):		Nil
12	Annual gas consumption before,	thousands of m ³	1395
13	Annual gas consumption after,	thousands of m ³	558
14	First year gas savings,	thousands of m ³	837
15	First year tons of Co ₂ mitigated		2,331
16	Assumed sustainability, years		10
17	Expected tons of Co₂ mitigated throughout life cycle		23,310

1	ID: 79	Title of measure	Sector: Petrochemicals
2	Survey Year: 2007	Rationalisation of Air conditioners in Administrative building by layout modification	Technology: Air Conditioning
3	Name of the Company : Castrol India Limited, Silvassa, Dadra & Nagar Haveli, INDIA		
4	Agency that executed the project : In-house		
5	Year of Implementation : 2006-07		
6	<p>Unit Profile:</p> <p>Castrol India Limited is a Public Company with 70.92% of the equity held by Castrol Limited UK (part of BP Group). Castrol, Silvassa plant is capable of producing 140,000 KL per annum of lubricating oil. Castrol India manufactures and markets a range of automotive and industrial lubricants. It markets its automotive lubricants under two brands-Castrol and BP. The annual turnover of the Silvassa Plant in 2006 was US\$ 0.43 billion.</p>		
7	<p>Description of Energy Conservation Measure:-</p> <p>The unit's administrative building had 22.5TR (Tons of refrigeration) centralized Air-conditioning system. On an average daily consumption of these AC's was 138kWh. The in-house team felt that keeping in view the total occupancy rate of this building, there was a huge scope of rationalizing the AC network. The air conditioning could be improved by converting the centralized into split AC's by minor modification to office layouts. The layout modification was done and the total TR has come down from 22.5 to 9 saving 62kWh units per day.</p>		
8	<p>Picture Before Modification</p>  <p>7.5 TRx3 no's AC Panel for complete building</p>	<p>Picture After Modification</p>  <p>Modified into independent cabins with standalone 1.5 TR split A/C's</p>	
9	Total investment :		8,750 US\$
10	First year energy cost savings :		1,258 US\$
11	First year additional savings beyond energy (i.e. water, raw materials etc.):		Nil
12	Annual electricity consumption before, MWh		31
13	Annual electricity consumption after, MWh		12
14	First year electricity savings, MWh		19
15	First year tons of CO ₂ mitigated		19
16	Assumed sustainability, years		10
17	Expected tons of CO₂ mitigated throughout life cycle		190