

Energy Conservation Measure implemented in 2007-2008

	Title of the measure Maximization of GT load based on marginal cost advantage	Sector : Refinery
		Technology: Optimization
<p>In Kochi Refinery, there are three power generating machines available - the Gas Turbine (GT) of 21.98 MW, the Steam turbine (STG) of 17.8 MW, which is of double extraction and condensing type and the back pressure type steam turbine (TG) of 2.5 MW. About 3 MW power is imported from state grid to run non- critical plants. The available maximum load of TG is 1.5 MW. Rest of the load is shared between GT and STG.</p> <p>STG has 3 stages, HP to MP, HP to LP and HP to condensing. As the latent heat of steam is lost to cooling water, HP to condensing is the costliest stage. Both the extractions (MP as well as LP steam) from STG are always maximized within the constraints of demand for steam in each pressure level and is more or less steady. So marginal cost of power (cost of additional MW generated) from STG is the cost of condensing power. The marginal cost of generating 1 MW additional power from GT is less than the marginal cost of power generation from STG through HP condensing route. Hence the proposal to maximize GT load by shifting 1.22 MW load from STG to GT.</p>		
Picture/ sketch/ drawing before modification (if available)	Picture/ sketch/ drawing after modification	
Agency that executed the project (with complete address and email): Process Engineering, BPCL Kochi Refinery Ambalamugal, Kochi 0484-2821316/1333		
Total investment : Nil	Year of implementation: 2007-2008	
First year energy cost savings, Rs.: 553 lakhs		
First year other savings, Rs.: Nil		
On annual basis	kWh 000'	Coal (Tons)
Energy Savings		Gas Nm ³
Energy tariff, Rs/ kWh/ Ton/ Nm ³ / kL ...		Oil (kL)
		Other
Company complete address: BPCL Kochi Refinery, Post Bag No:2, Ambalamugal, Kochi Ph: 0484-2722061-69 Fax: 0484-2720855 <i>Contact person who could be contacted for more information:</i> Mr. Sengottaiyan.P, Senior Manager(E&E) BPCL Kochi Refinery, Ambalamugal, Ph: 0484-2821304 sengottaiyanp@bharatpetroleum.in		We authorise Bureau to use this information for dissemination Signature Date 22.10.2008

Energy Conservation Measure implemented in 2007-2008

	Title of the measure Optimization of deaerator systems	Sector : Refinery
		Technology: Optimization
<p>a)</p> <p>In boilers UB7 and UB10, boiler feed water is heated initially to about 105 deg C for de aeration utilizing LP steam and is further heated to about 145 deg C (160 deg C in UB7) in boiler feed water heaters using MP steam, before admitted to the economizer section of the boilers. We have tried to shift the swap the heating pattern between the de aerator and boiler feed water heater to reduce the MP steam consumption.</p> <p>Originally, de aerator pressure was kept around 0.3 kg/cm² in UB7 and 0.36 kg/cm² in UB10. The idea was to increase de aerator pressure and consequently the feed water temperature ex de aerator. At the same time, economizer inlet temperature was kept unchanged. This measure has increased LP steam consumption in de aerator and reduced MP steam consumption in feed water heater. UB7 de aerator pressure was increased to 1.9 kg/cm² and UB10 de aerator pressure was increased to 1.6 kg/cm². Total increase in LP steam consumption was approximately 7.08 T/ Hr, where as reduction in MP steam was 7.23 T/ Hr.</p> <p>Increased consumption of LP steam is routed through the LP extraction from STG, there by reducing approximately 2.76 MT of condensing load per hour.</p> <p>b)</p> <p>In UB3 boiler, feed water pump turbine was in operation continuously. Being an old design, exhaust of this turbine was let to atmosphere. Even when this boiler was stand by, the pump was operated continuously, supplying feed water to nearby boilers UB4 and UB5. Reason behind this was for utilizing return condensate connected to UB3 de aerator. The condensate connected to UB3 de aerator was re routed to ARU condensate line, which is going to CPP and the UB3 de aerator was isolated. Feed water to UB3, 4 and 5 now is being supplied centrally from CO boiler de aerator, where spare capacity is available. This measure has enabled us to save approximately 2 T/ Hr of MP steam.</p>		
Picture/ sketch/ drawing before modification <small>(if available)</small>		Picture/ sketch/ drawing after modification
Agency that executed the project (with complete address and email): Process Engineering, BPCL Kochi Refinery Ambalamugal, Kochi 0484-2821316/1333		
Total investment : Nil		Year of implementation: 2007-2008
First year energy cost savings, Rs.: 592 lakhs		
First year other savings, Rs.: Nil		
On annual basis	kWh 000'	Coal (Tons)
Energy Savings		Gas Nm ³
Energy tariff, Rs/ kWh/ Ton/ Nm ³ / kL ...		Oil (kL)
		Other
Company complete address: BPCL Kochi Refinery, Post Bag No:2, Ambalamugal, Kochi Ph: 0484-2722061-69 Fax: 0484-2720855 <i>Contact person who could be contacted for more information:</i> Mr. Sengottaiyan.P, Senior Manager(E&E) BPCL Kochi Refinery, Ambalamugal, Ph: 0484-2821304 sengottaiyanp@bharatpetroleum.in		We authorise Bureau to use this information for dissemination Signature Date 22.10.2008

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	Title of the measure Reduction of steam to amine regenerator reboiler in DHDS ARU	Sector : Refinery
		Technology: Optimization
<p>The centralized amine regeneration unit in BPCL-Kochi Refinery, having a capacity of 250 m³/h was commissioned along with the DHDS facilities in the year 2000. Originally, the DEA concentration was kept at around 22.5 %wt. The total solvent circulation rate was maintained at 150 m³/h in Diesel case and 175 m³/h in VGO case. The stripping steam used was in the range of 65 kg/m³ of DEA. By increasing the DEA concentration to approximately around 29 %wt, the amine circulation rate could be reduced to 115m³/h in diesel and 125 m³/h in VGO with the same stripping steam ratio. This caused a net savings of approximately 2-3 tph of LP steam.</p>		
Picture/ sketch/ drawing before modification (if available)	Picture/ sketch/ drawing after modification	
Agency that executed the project (with complete address and email): Process Engineering, BPCL Kochi Refinery Ambalamugal, Kochi 0484-2821316/1333		
Total investment : Nil		Year of implementation: 2007-2008
First year energy cost savings, Rs.: 262 lakhs		
First year other savings, Rs.: Nil		
On annual basis	kWh 000'	Coal (Tons)
		Gas Nm ³
		Oil (kL)
		Other
Energy Savings		
Energy tariff, Rs/ kWh/ Ton/ Nm ³ / kL ...		
Company complete address: BPCL Kochi Refinery, Post Bag No:2, Ambalamugal, Kochi Ph: 0484-2722061-69 Fax: 0484-2720855 <i>Contact person who could be contacted for more information:</i> Mr. Sengottaiyan.P, Senior Manager(E&E) BPCL Kochi Refinery, Ambalamugal, Ph: 0484-2821304 sengottaiyanp@bharatpetroleum.in		We authorise Bureau to use this information for dissemination Signature Date 22.10.2008

Energy Conservation Measure implemented in 2007-2008

	Title of the measure	Sector : Refinery			
	Maximization of crude circulating refluxes for increasing crude preheat	Technology: Optimization			
<p>The objective of the scheme was to optimize the crude column circulating refluxes with the objective of maximizing the crude preheat temperature with out affecting product quality and minimize crude column operating pressure to reduce crude furnace duty.</p> <p>Earlier the Advanced Control program in CDU-2 was not set to maximize the bottom circulating reflux but to improve separation between various fractions. It was observed that, while there is a benefit in improving separation between naphtha and Heavy Naphtha there was no real margin in improving separation between other products as Kerosene stream is not limited by flash specification and heavy naphtha stream is blended into diesel. This was translated in to an opportunity, where in we could maximize the bottom circulating refluxes by reducing other upper circulating refluxes, with out compromising on requisite product quality by ensuring sufficient internal reflux from the top tray for naphtha / heavy naphtha separation. The results were improved crude preheat temperature and a reduced crude furnace duty. In CDU-2 we have maximized HGO and LGO circulating refluxes by reducing upper kerosene reflux to maximize preheat. This has enabled a reduction of 0.89 T/ Hr of fuel in the crude charge heater.</p> <p>Minimizing crude column operating pressure would result in a net reduction in Crude furnace duty. Earlier, the crude column in CDU-2 was operated at a fixed pressure. This was resulting in sending out valuable products from crude column overhead to fuel gas during the day-time when the ambient temperature is higher. During the night time, when the ambient temperatures are lower, we could reduce the operating pressure. A new philosophy was adopted to operate crude column at lowest pressure just sufficient to suppress any flaring and use advanced control to adjust the operation so that the operating pressure is minimized during night time and increased during day time so that flaring is minimized and crude furnace duty is also reduced.</p>					
Picture/ sketch/ drawing before modification (if available)		Picture/ sketch/ drawing after modification			
Agency that executed the project (with complete address and email): Process Engineering, BPCL Kochi Refinery Ambalamugal, Kochi 0484-2821316/1333					
Total investment : Nil			Year of implementation: 2007-2008		
First year energy cost savings, Rs.: 158 lakhs					
First year other savings, Rs.: Nil					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm ³	Oil (kL)	Other
Energy Savings				1305	
Energy tariff, Rs/ kWh/ Ton/ Nm ³ / kL ...				18409/kL	
Company complete address: BPCL Kochi Refinery, Post Bag No:2, Ambalamugal, Kochi Ph: 0484-2722061-69 Fax: 0484-2720855 <i>Contact person who could be contacted for more information:</i> Mr. Sengottaiyan.P, Senior Manager(E&E) BPCL Kochi Refinery, Ambalamugal, Ph: 0484-2821304 sengottaiyanp@bharatpetroleum.in				We authorise Bureau to use this information for dissemination Signature Date 22.10.2008	

Energy Conservation Measure implemented in 2007-2008

	Title of the measure		Sector : Refinery			
	Operation of recycle gas compressor in DHDS in LP extraction mode		Technology: Optimization			
<p>The DHDS unit of BPCL- Kochi Refinery operates a 4 MW turbine driven centrifugal compressor for circulating the recycle gas. HP steam drive is used for the turbine. The machine is normally operated at a speed range of 7800-9000 rpm, depending upon process requirements. When the compressor is operated ≥ 9000 rpm LP steam is extracted to improve the efficiency of the system. This caused a net savings of approximately 3 tph of HP steam.</p>						
Picture/ sketch/ drawing before modification (if available)			Picture/ sketch/ drawing after modification			
Agency that executed the project (with complete address and email): Process Engineering, BPCL Kochi Refinery Ambalamugal, Kochi 0484-2821316/1333						
Total investment : Nil			Year of implementation: 2007-2008			
First year energy cost savings, Rs.: 346 lakhs						
First year other savings, Rs.: Nil						
On annual basis	kWh 000'	Coal (Tons)	Gas Nm ³	Oil (kL)	Other	
Energy Savings				1878		
Energy tariff, Rs/ kWh/ Ton/ Nm ³ / kL ...				18409/kL		
Company complete address: BPCL Kochi Refinery, Post Bag No:2, Ambalamugal, Kochi Ph: 0484-2722061-69 Fax: 0484-2720855 <i>Contact person who could be contacted for more information:</i> Mr. Sengottaiyan.P, Senior Manager(E&E) BPCL Kochi Refinery, Ambalamugal, Ph: 0484-2821304 sengottaiyanp@bharatpetroleum.in				We authorise Bureau to use this information for dissemination Signature Date 22.10.2008		

Energy Conservation Measure implemented in 2007-2008

	Title of the measure Preheat improvement in DHDS due to LCO processing	Sector : Refinery			
		Technology: Optimization			
<p>After the catalyst change over in the DHDS unit, the LCO processing has been increased to 15% of the total DHDS charge. Since the olefin saturation reactions are exothermic, an increase in the pre heat of 8 deg C could be achieved at the heater inlet. This has saved about 1440 Tons 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): Process Engineering, BPCL Kochi Refinery Ambalamugal, Kochi 0484-2821316/1333					
Total investment : Nil			Year of implementation: 2007-2008		
First year energy cost savings, Rs.: 270 lakhs					
First year other savings, Rs.: Nil					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm ³	Oil (kL)	Other
Energy Savings				1469	
Energy tariff, Rs/ kWh/ Ton/ Nm ³ / kL ...				18409/kL	
Company complete address: BPCL Kochi Refinery, Post Bag No:2, Ambalamugal, Kochi Ph: 0484-2722061-69 Fax: 0484-2720855 <i>Contact person who could be contacted for more information:</i> Mr. Sengottaiyan.P, Senior Manager(E&E) BPCL Kochi Refinery, Ambalamugal, Ph: 0484-2821304 sengottaiyanp@bharatpetroleum.in				We authorise Bureau to use this information for dissemination Signature Date 22.10.2008	

Energy Conservation Measure implemented in 2007-2008

	Title of the measure Steam Optimization in MAB compressor using advanced control	Sector : Refinery
		Technology: Optimization
<p>In Fluidized Catalytic Cracking Unit (FCCU), Steam driven Main Air Blower (MAB) supplies air to regenerator for regenerating catalyst by burning of the coke deposited over the catalyst. MAB is provided with anti surge controller to protect the blower from surge by venting the air. The objective of FCCU APC is to maximize catalyst circulation rate for the available feed rate and minimize the MAB airflow rate. The minimum required MAB airflow rate corresponding to coke produced is controlled based on the regenerator model developed in the APC program.</p> <p>The MAB trip set value for the surge ratio is 40% and normal operating value was maintained at 60% with the margin of safety 20 %. Subsequent to the introduction of PDMR (Proportional Derivative Manual Reset) controller for anti surge ratio control in April 2007, we were able to reduce the normal operating value of surge ratio to 52% by reducing the margin of safety. This has resulted in lower air vent requirement and subsequently lower steam consumption in the MAB turbine.</p>		
Picture/ sketch/ drawing before modification (if available)	Picture/ sketch/ drawing after modification	
Agency that executed the project (with complete address and email): Process Optimization, BPCL Kochi Refinery, Ambalamugal, Kochi, 0484-2821812/13		
Total investment : Nil		Year of implementation: 2007-2008
First year energy cost savings, Rs.: 351 lakhs		
First year other savings, Rs.: Nil		
On annual basis	kWh 000'	Coal (Tons)
Energy Savings		Gas Nm ³
Energy tariff, Rs/ kWh/ Ton/ Nm ³ / kL ...		Oil (kL)
		Other
Company complete address: BPCL Kochi Refinery, Post Bag No:2, Ambalamugal, Kochi Ph: 0484-2722061-69 Fax: 0484-2720855 <i>Contact person who could be contacted for more information:</i> Mr. Sengottaiyan.P, Senior Manager(E&E) BPCL Kochi Refinery, Ambalamugal, Ph: 0484-2821304 sengottaiyanp@bharatpetroleum.in		We authorise Bureau to use this information for dissemination Signature Date 22.10.2008

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	Title of the measure Running extraction turbine in place of motor in UB 10	Sector : Refinery			
		Technology: Optimization			
<p>In UB10 boiler, there are two auxiliary drive turbines for boiler feed water pump and FD fan. For the same service, two motor drives also are available. The operation practice previously was to operate FD fan on turbo drive and feed pump on motor drive. There was a constraint for evacuating the MP steam, if both equipments were on turbo drive. It was observed that HP steam needed to be let down through PRDS elsewhere, as MP steam demand was more.</p>					
Picture/ sketch/ drawing before modification (if available)			Picture/ sketch/ drawing after modification		
Agency that executed the project (with complete address and email): Process Engineering, BPCL Kochi Refinery Ambalamugal, Kochi 0484-2821316/33					
Total investment : Nil			Year of implementation: 2007-2008		
First year energy cost savings, Rs.: 141 lakhs					
First year other savings, Rs.: Nil					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm ³	Oil (kL)	Other
Energy Savings				807	
Energy tariff, Rs/ kWh/ Ton/ Nm ³ / kL ...				18409/kL	
Company complete address: BPCL Kochi Refinery, Post Bag No:2, Ambalamugal, Kochi Ph: 0484-2722061-69 Fax: 0484-2720855 <i>Contact person who could be contacted for more information:</i> Mr. Sengottaiyan.P, Senior Manager(E&E) BPCL Kochi Refinery, Ambalamugal, Ph: 0484-2821304 sengottaiyanp@bharatpetroleum.in				We authorise Bureau to use this information for dissemination Signature Date 22.10.2008	


Energy Conservation Measure implemented in 2007-2008

	Title of the measure Pre heat temperature optimization in FCCU	Sector : Refinery			
		Technology: Optimization			
As part of the FCCU revamps, the pre heat exchanger network was reconfigured using pinch technology and an additional exchanger FE-103 added to the network. This resulted in an improvement of preheat from around 290 deg C to 310 deg C (i.e. an increase of 20 deg C).					
Picture/ sketch/ drawing before modification (if available)	Picture/ sketch/ drawing after modification				
Agency that executed the project (with complete address and email): Process Engineering, BPCL Kochi Refinery Ambalamugal, Kochi 0484-2821316/33					
Total investment : Nil			Year of implementation: 2007-2008		
First year energy cost savings, Rs.: 391 lakhs					
First year other savings, Rs.: Nil					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm ³	Oil (kL)	Other
Energy Savings				2123	
Energy tariff, Rs/ kWh/ Ton/ Nm ³ / kL ...				18409/kL	
Company complete address: BPCL Kochi Refinery, Post Bag No:2, Ambalamugal, Kochi Ph: 0484-2722061-69 Fax: 0484-2720855 <i>Contact person who could be contacted for more information:</i> Mr. Sengottaiyan.P, Senior Manager(E&E) BPCL Kochi Refinery, Ambalamugal, Ph: 0484-2821304 sengottaiyanp@bharatpetroleum.in				We authorise Bureau to use this information for dissemination Signature Date 22.10.2008	

Energy Conservation Measure implemented in 2007-2008

	Title of the measure Heater efficiency improvement using stack draught adjustment	Sector : Refinery			
		Technology: Optimization			
<p>In our process heater, stack draughts were optimized by the operation of stack dampers and air louvers in individual burners, to minimize the excess air to the practically possible levels. This exercise was done in April 2008 and the net fuel savings achieved from this exercise was 1242 tonnes for the year of fuel oil, which is equivalent to 233 lakhs of financial savings per year.</p>					
Picture/ sketch/ drawing before modification (if available)			Picture/ sketch/ drawing after modification		
Agency that executed the project (with complete address and email): Process Engineering, BPCL Kochi Refinery Ambalamugal, Kochi 0484-2821316/33					
Total investment : Nil			Year of implementation: 2007-2008		
First year energy cost savings, Rs.: 233 lakhs					
First year other savings, Rs.: Nil					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm ³	Oil (kL)	Other
Energy Savings				1267	
Energy tariff, Rs/ kWh/ Ton/ Nm ³ / kL ...				18409/kL	
Company complete address: BPCL Kochi Refinery, Post Bag No:2, Ambalamugal, Kochi Ph: 0484-2722061-69 Fax: 0484-2720855 <i>Contact person who could be contacted for more information:</i> Mr. Sengottaiyan.P, Senior Manager(E&E) BPCL Kochi Refinery, Ambalamugal, Ph: 0484-2821304 sengottaiyanp@bharatpetroleum.in				We authorise Bureau to use this information for dissemination Signature Date 22.10.2008	

Energy Conservation Measure implemented in 2007-2008

	Title of the measure	Sector : Refinery			
	New condensate recovery system in VR/PF tank farm and improvement of existing condensate recovery scheme at VGO tank farm.	Technology: Waste Heat Recovery			
<p>A condensate recovery system was commissioned in VR/Plant fuel tank farm to recover 1.4 t/hr of condensate and route it to the UB6/CO boiler deaerator. The condensate recovery system is a package system consisting of a flash vessel, accumulator and a MP steam powered condensate pump. Similarly the existing condensate recovery system at VGO tank farm was put back online after trouble shooting of it's pressure reducing valve technical issues.</p>					
Picture/ sketch/ drawing before modification (if available)		Picture/ sketch/ drawing after modification			
					
Agency that executed the project (with complete address and email): Energy & Environment, BPCL Kochi Refinery, Ambalamugal, Kochi, 0484-2821304/11/17					
Total investment : 14 lakhs			Year of implementation: 2007-2008		
First year energy cost savings, Rs.: 26 lakhs					
First year other savings, Rs.: Nil					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm ³	Oil (kL)	Other
Energy Savings				142	
Energy tariff, Rs/ kWh/ Ton/ Nm ³ / kL ...				18409/kL	
Company complete address: BPCL Kochi Refinery, Post Bag No:2, Ambalamugal, Kochi Ph: 0484-2722061-69 Fax: 0484-2720855 <i>Contact person who could be contacted for more information:</i> Mr. Sengottaiyan.P, Senior Manager(E&E) BPCL Kochi Refinery, Ambalamugal, Ph: 0484-2821304 sengottaiyanp@bharatpetroleum.in				We authorise Bureau to use this information for dissemination Signature Date 22.10.2008	

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	Title of the measure	Sector : Refinery			
	Optimization of power consumption in utility boiler drives and auxiliaries	Technology: Optimization			
<p>After conducting a study on utilizing the spare capacities of the drives in utility systems, we could switch off a few drives from service, by combining the flow requirements for a few boilers. Through this measure, we could save 1443 tonnes of fuel oil per year and in financial terms Rs. 271 lakhs per year.</p>					
Picture/ sketch/ drawing before modification (if available)			Picture/ sketch/ drawing after modification		
Agency that executed the project (with complete address and email): Process Engineering, BPCL Kochi Refinery Ambalamugal, Kochi 0484-2821316/33					
Total investment : Nil			Year of implementation: 2007-2008		
First year energy cost savings, Rs.: 271 lakhs					
First year other savings, Rs.: Nil					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm ³	Oil (kL)	Other
Energy Savings				1472	
Energy tariff, Rs/ kWh/ Ton/ Nm ³ / kL ...				18409/kL	
Company complete address: BPCL Kochi Refinery, Post Bag No:2, Ambalamugal, Kochi Ph: 0484-2722061-69 Fax: 0484-2720855 <i>Contact person who could be contacted for more information:</i> Mr. Sengottaiyan.P, Senior Manager(E&E) BPCL Kochi Refinery, Ambalamugal, Ph: 0484-2821304 sengottaiyanp@bharatpetroleum.in				We authorise Bureau to use this information for dissemination Signature Date 22.10.2008	

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	Title of the measure	Sector : Refinery			
	Reduction in STG condensation due to increase in LP extraction	Technology: Optimization			
<p>After the stoppage of UB5 feed water turbine, additional LP extraction from STG was resorted due to the available cushion in LP steam balance. Through this measure, we could save 965 tonnes of fuel oil per year and in financial terms Rs. 181 lakhs per year.</p>					
Picture/ sketch/ drawing before modification (if available)			Picture/ sketch/ drawing after modification		
Agency that executed the project (with complete address and email): Process Engineering, BPCL Kochi Refinery Ambalamugal, Kochi 0484-2821316/33					
Total investment : Nil			Year of implementation: 2007-2008		
First year energy cost savings, Rs.: 181 lakhs					
First year other savings, Rs.: Nil					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm ³	Oil (kL)	Other
Energy Savings				985	
Energy tariff, Rs/ kWh/ Ton/ Nm ³ / kL ...				18409/kL	
Company complete address: BPCL Kochi Refinery, Post Bag No:2, Ambalamugal, Kochi Ph: 0484-2722061-69 Fax: 0484-2720855 <i>Contact person who could be contacted for more information:</i> Mr. Sengottaiyan.P, Senior Manager(E&E) BPCL Kochi Refinery, Ambalamugal, Ph: 0484-2821304 sengottaiyanp@bharatpetroleum.in				We authorise Bureau to use this information for dissemination Signature Date 22.10.2008	


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	Title of the measure	Sector : Refinery			
	Fuel savings due to improved heat recovery in EE11 heat exchanger	Technology: Optimization			
<p>EE11 heat exchanger is used for pre heat of boiler feed water to UB-6 in exchange with hot HVG0 stream from FPU unit. The UB-6 boiler water stream alone was unable to absorb all the heat available in the hot HVG0 stream. Hence, the boiler feed water to UB-4/5 boiler were also combined with the UB-6 boiler feed water and sent to EE-11. Hence all the heat available at EE-11 could be absorbed. The scheme could save 983 tonnes of fuel oil, which is 185 lakhs per year, in financial terms.</p>					
Picture/ sketch/ drawing before modification (if available)			Picture/ sketch/ drawing after modification		
Agency that executed the project (with complete address and email): Process Engineering, BPCL Kochi Refinery Ambalamugal, Kochi 0484-2821316/33					
Total investment : Nil			Year of implementation: 2007-2008		
First year energy cost savings, Rs.: 185 lakhs					
First year other savings, Rs.: Nil					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm ³	Oil (kL)	Other
Energy Savings				1003	
Energy tariff, Rs/ kWh/ Ton/ Nm ³ / kL ...				18409/kL	
Company complete address: BPCL Kochi Refinery, Post Bag No:2, Ambalamugal, Kochi Ph: 0484-2722061-69 Fax: 0484-2720855 <i>Contact person who could be contacted for more information:</i> Mr. Sengottaiyan.P, Senior Manager(E&E) BPCL Kochi Refinery, Ambalamugal, Ph: 0484-2821304 sengottaiyanp@bharatpetroleum.in				We authorise Bureau to use this information for dissemination Signature Date 22.10.2008	

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	Title of the measure	Sector : Refinery			
	Optimization of boiler blow down in utility boilers	Technology: Optimization			
<p>The blow down from the HP boilers was reduced from 6.9% to 4.4% by closer monitoring of drum silica. The measure has resulted in around 1760 tonnes of fuel oil savings per year and correspondingly 331 lakhs per year.</p>					
Picture/ sketch/ drawing before modification (if available)			Picture/ sketch/ drawing after modification		
Agency that executed the project (with complete address and email): Process Engineering, BPCL Kochi Refinery Ambalamugal, Kochi 0484-2821316/33					
Total investment : Nil			Year of implementation: 2007-2008		
First year energy cost savings, Rs.: 331 lakhs					
First year other savings, Rs.: Nil					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm ³	Oil (kL)	Other
Energy Savings				1796	
Energy tariff, Rs/ kWh/ Ton/ Nm ³ / kL ...				18409/kL	
Company complete address: BPCL Kochi Refinery, Post Bag No:2, Ambalamugal, Kochi Ph: 0484-2722061-69 Fax: 0484-2720855 <i>Contact person who could be contacted for more information:</i> Mr. Sengottaiyan.P, Senior Manager(E&E) BPCL Kochi Refinery, Ambalamugal, Ph: 0484-2821304 sengottaiyanp@bharatpetroleum.in				We authorise Bureau to use this information for dissemination Signature Date 22.10.2008	

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	Title of the measure	Sector : Refinery			
	Desulphurization of vacuum column off gases	Technology: Waste Heat Recovery			
<p>In November 2007, we installed an amine absorption system for desulphurisation of low pressure vacuum column off gases, based on in house technology, at a cost of approximately 1.75 crores. The desulphurised offgas is then burnt in the vacuum heater furnace. Apart from the very significant reduction of 765 tonnes of sulphur dioxide emissions per year, the energy conservation angle of this project is the enhanced heat recovery from the EH1 air pre heater due to the elevation of dew point.</p> <p>The process involves scrubbing the H₂S rich offgases with diethanol amine in an absorber and the absorption of H₂S gas in amine. The H₂S rich amine is then regenerated in the centralised amine regeneration unit in the refinery and H₂S is converted to elemental sulphur in sulphur recovery unit. The real challenge to the success of the process is the low pressure (about 100 mmwc) available for amine scrubbing and design of system for such a lower pressure drop. Such low pressure amine absorption systems are not known to be offered or commercialised by consultants. The additional advantages are increase in heat recovery in process heater due to enhancement of flue gas dew point, improved reliability of heater system due to less cold end corrosion in heater and air preheater system.</p>					
Picture/ sketch/ drawing before modification (if available)	Picture/ sketch/ drawing after modification 				
Agency that executed the project (with complete address and email): Process Engineering, BPCL Kochi Refinery, Ambalamugal, Kochi, 0484-2821316/33					
Total investment : 175 lakhs			Year of implementation: 2007-2008		
First year energy cost savings, Rs.: 39 lakhs					
First year other savings, Rs.: Nil					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm ³	Oil (kL)	Other
Energy Savings				211	
Energy tariff, Rs/ kWh/ Ton/ Nm ³ / kL ...				18409/kL	
Company complete address: BPCL Kochi Refinery, Post Bag No:2, Ambalamugal, Kochi Ph: 0484-2722061-69 Fax: 0484-2720855 <i>Contact person who could be contacted for more information:</i> Mr. Sengottaiyan.P, Senior Manager(E&E) BPCL Kochi Refinery, Ambalamugal, Ph: 0484-2821304 sengottaiyanp@bharatpetroleum.in				We authorise Bureau to use this information for dissemination Signature Date 22.10.2008	

Energy Conservation Measure implemented in 2007-2008

	Title of the measure	Sector : Refinery			
	Reduction in purge gas flaring from Hydrogen unit	Technology: Replacement of in efficient equipment			
<p>The purge gas formed during the hydrogen production contains CO, CO₂, CH₄ and Hydrogen. Since, it contains significant calorific value (approximately 1200 Kcal/Kg), it is utilized in the reformer heater as fuel. Due to the loss in activity of catalyst in Pressure Swing Adsorption Unit (PSA) in Hydrogen unit, the hydrogen content in the purge gas was found to be higher than the normal content. Hence, to avoid reformer heater skin temperatures going beyond the safe limits, we had to limit the purge gas utilization in reformer heater and flare some quantity of purge gas. We replaced the entire batch of PSA catalyst with a new batch at a total investment of approximately Rs. 420 lakhs. This led to the complete utilization of purge gas in reformer heater and elimination of purge gas flaring.</p>					
Picture/ sketch/ drawing before modification (if available)			Picture/ sketch/ drawing after modification		
Agency that executed the project (with complete address and email): Process Engineering, BPCL Kochi Refinery Ambalamugal, Kochi 0484-2821316/33					
Total investment : 420 lakhs			Year of implementation: 2007-2008		
First year energy cost savings, Rs.: 418 lakhs					
First year other savings, Rs.: Nil					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm ³	Oil (kL)	Other
Energy Savings				1811	
Energy tariff, Rs/ kWh/ Ton/ Nm ³ / kL ...				23100/kL	
Company complete address: BPCL Kochi Refinery, Post Bag No:2, Ambalamugal, Kochi Ph: 0484-2722061-69 Fax: 0484-2720855 <i>Contact person who could be contacted for more information:</i> Mr. Sengottaiyan.P, Senior Manager(E&E) BPCL Kochi Refinery, Ambalamugal, Ph: 0484-2821304 sengottaiyanp@bharatpetroleum.in				We authorise Bureau to use this information for dissemination Signature Date 22.10.2008	

Energy Conservation Measure implemented in 2007-2008

	Title of the measure	Sector : Refinery			
	Reduction in steam requirement by raising 5 deg C of inlet steam temperature in STG	Technology: Optimization			
<p>By increasing the inlet temperature of STG by 5 deg C, it was found that we could increase the power generation by around 0.174 MW. This is equivalent to fuel savings of 652 tonnes per year (Rs. 123 lakhs per year).</p>					
Picture/ sketch/ drawing before modification (if available)			Picture/ sketch/ drawing after modification		
Agency that executed the project (with complete address and email): Process Engineering, BPCL Kochi Refinery Ambalamugal, Kochi 0484-2821316/33					
Total investment : Nil			Year of implementation: 2007-2008		
First year energy cost savings, Rs.: 123 lakhs					
First year other savings, Rs.: Nil					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm ³	Oil (kL)	Other
Energy Savings				665	
Energy tariff, Rs/ kWh/ Ton/ Nm ³ / kL ...				18409/kL	
Company complete address: BPCL Kochi Refinery, Post Bag No:2, Ambalamugal, Kochi Ph: 0484-2722061-69 Fax: 0484-2720855 <i>Contact person who could be contacted for more information:</i> Mr. Sengottaiyan.P, Senior Manager(E&E) BPCL Kochi Refinery, Ambalamugal, Ph: 0484-2821304 sengottaiyanp@bharatpetroleum.in				We authorise Bureau to use this information for dissemination Signature Date 22.10.2008	