





## Energy Conservation Measure Implemented in 2006 - 2007

<b>ID to be filled by BEE</b>	<b>Title of the Measure</b>				<b>Sector</b>
	<b># Installation of additional CPH module in HRSG - 1 and Replacement of 2nd stage Buckets of Gas Turbine - 1</b>				Power / General
<b>Year to be filled by BEE</b>					
<b>Description of the energy conservation measures</b>					
<p>Condensate Preheater ( CPH ) is last heat transfer element of HRSG before the flue gas being let into the atmosphere. Earlier there were 2 modules in which the temperature of condensate coming from condenser hotwell was heated from 46 deg c. to 98 deg c, before going to Deareator.</p> <p>After installation of an extra one module of CPH with existing two modules , the CPH outlet temperature of water was increased to 107 deg c.</p> <p>Also due to replacement of 2nd stage rotating blades of Gas Turbine o/p of GT was increased by 5 MW and Heat Rate gain was 1.5 %.</p>					
<b>Picture /Sketch/ drawing after modification</b>					
					
<b>Agency that executed the project ( with complete address and email ) :</b> Mechanical Dpt. Essar Power Ltd.					
<b>Total investment Rs.:</b> 87300000			<b>Year of implimentation:</b> 2006 - 2007		
<b>First year energy cost saving Rs:</b> 59010000					
<b>First Year other savings Rs:</b>					
<b>On annual basis</b>	<b>KWh</b>	<b>Coal ( Tons)</b>	<b>Gas ( Nm3)</b>	<b>Oil ( KL )</b>	<b>Other</b>
<b>Energy consumption before</b>	NA				
<b>Additional Energy Generated due to increase in GTG &amp; HRSG thermal efficiency .</b>					
<b>Saving of Gas Fuel</b>	NA		6448851.1		
<b>Energy Tarrif, Rs/KWh/Ton/Nm3/KL</b>	NA				
<b>Company complete Address</b>				<b>We authorise Bureau to use this information for dissemination</b>  <b>Signature</b>  <b>Date</b>	
Essar Power Ltd. 27th KM , Surat-Hazira Road , Hazira, Surat - 394270, Gujarat					
<b>Contact Person Who could contacted for more information</b>					
Mr. Nilesh B. Narain Dy. GM ( Efficiency), Essar Power Ltd. Ph: 0261/6682605      Mo: 09879102848					



## Energy Conservation Measure Implemented in 2006 - 2007

<b>ID to be filled by BEE</b>	<b>Title of the Measure</b> <b>*** Trend Setter Project</b> # Steam Turbine Cooling Tower fill height increased by 2" for better cooling in the Cooling Tower				<b>Sector</b> Power / General
<b>Year to be filled by BEE</b>					<b>Technology</b> Combined Cycle Plant
<b>Description of the energy conservation measures</b> Height of the fills in 16 cells of Cooling Tower are 3" and height of fills in 2 cells are 4". Approach of Cooling Tower in Rainy season is 9 deg C and Range is 7.5 deg C with the vaccume of 674 - 676 mm of Hg.  Fills height is being increased in 16 cells by additional 2" and in 2 cells by 1" , resulting into decrease in cooling water temperature by 3 deg C.  Vaccume Improvement of 9 mm of Hg and increase of 3 MW in STG output is expected Payback period is 10 months and heat rate improvement by 0.2 %.					
<b>Picture /Sketch/ drawing after modification</b>					
					
<b>Agency that executed the project ( with complete address and email ) :</b> Mechanical Dpt. Essar Power Ltd.					
<b>Total investment Rs.:</b> 12000000		<b>Year of implimentation:</b> 2006 - 2007			
<b>First year energy cost saving Rs:</b> 14640000					
<b>First Year other savings Rs:</b>					
<b>On annual basis</b>	<b>KWh</b>	<b>Coal ( Tons)</b>	<b>Gas ( Nm3)</b>	<b>Oil ( KL )</b>	<b>Other</b>
<b>Energy consumption before</b>	NA				
<b>Additional Energy Generated due to reduced back pressure of STG</b>					
<b>Saving of Gas Fuel</b>	NA		1600316.2		
<b>Energy Tarrif, Rs/KWh/Ton/Nm3/KL</b>	NA				
<b>Company complete Address</b> Essar Power Ltd. 27th KM , Surat-Hazira Road , Hazira, Surat - 394270, Gujarat				We authorise Bureau to use this information for dissemination  Signature  Date	
<b>Contact Person Who could contacted for more information</b> Mr. Nilesh B. Narain Dy. GM ( Efficiency), Essar Power Ltd. Ph: 0261/6682605 Mo: 09879102848					



## Energy Conservation Measure Implemented in 2006 - 2007

<b>ID to be filled by BEE</b>	<b>Title of the Measure</b>		<b>Sector</b> Power / General		
<b>Year to be filled by BEE</b>	# Radiator fans removed and instead used existing cold air from Turbine Accessory compartment fans		<b>Technology</b> Combined Cycle Plant		
<b>Description of the energy conservation measures :</b> For continuous cleaning of GT inlet air filters air is extracted from GT compressor which is at 350 deg c. and cooled by using two fans in radiators before being used for filter cleaning. This is round the clock operation. The radiator has been shifted to new location where air at a temperature of 35 - 40 deg. is already being blown from Gas Turbine accessory compartment and discharge into atmosphere. The filter unit radiators installed in the discharge air path of these fans which were already in use continuously. This eliminates the use of two fans each of 3 KWh capacity.					
<b>Picture /Sketch/ drawing before modification</b> ( if available)		<b>Picture /Sketch/ drawing after modification</b>			
					
<b>Agency that executed the project ( with address and email ) :</b>			Mechanical Dpt. Essar Power Ltd.		
<b>Total investment Rs.:</b> 0.00		<b>Year of implimentation:</b> 2006 - 2007			
<b>First year energy cost saving Rs:</b> 160483.2					
<b>First Year other savings Rs:</b> NA					
<b>On annual basis</b>	<b>KWh 000'</b>	<b>Coal ( Tons)</b>	<b>Gas ( Nm3)</b>	<b>Oil ( KL )</b>	<b>Other</b>
<b>Energy consumption before</b>	70080	NA	NA	NA	NA
<b>Energy consumption after</b>	0	NA	NA	NA	NA
<b>Energy Tarrif, Rs/KWh/Ton/Nm3/KL</b>	2.29	NA	NA	NA	NA
<b>Company complete Address</b> Essar Power Ltd. 27th KM , Surat-Hazira Road , Hazira, Surat - 394270, Gujarat			We authorise Bureau to use this information for dissemination  Signature  Date		
<b>Contact Person Who could contacted for more information</b> Mr. Nilesh B. Narain Dy. GM ( Efficiency), Essar Power Ltd. Ph: 0261/6682605                      Mo: 09879102848					


## Energy Conservation Measure Implemented in 2006 - 2007

<b>ID to be filled by BEE</b>	<b>Title of the Measure</b>		
	<b># Gas Turbine Auxiliary coling water Cooling Tower fan blade angle changed</b>		<b>Sector</b> Power / General
<b>Year to be filled by BEE</b>			<b>Technology</b> Combined Cycle plant
<p><b>Description of the energy conservation meaures</b></p> <p>Auxiliary cooling water in Gas Turbine is required for cooling the Hydrogen in Generator , Lube oil cooling, liquid fuel atomising air cooling. Cooling Tower is of Induced draft cross flow type.( 3 in operation and 1 in stand by)</p> <p>Blade angle of each fan has been reduced from 45 deg to 40 deg. Thechange in cooling water temperature was only 1 deg c. with out affecting the cooling of Generator Hydrogen, lube oil and liquid fuel atomising air temp. The effect was , current drawn by each fan was reduced from 42 amps to 32 amps with saving of @ 7 KWh per fan.</p>			
<b>Picture /Sketch/ drawing before modification</b> ( if available)		<b>Picture /Sketch/ drawing after modification</b>	
			
<b>Agency that executed the project ( with address and email) :</b>			<b>Mechanical Dpt. Essar Power Ltd.</b>
<b>Total investment Rs.:</b> 0.00		<b>Year of implimentation:</b> 2006 - 2007	
<b>First year energy cost saving Rs:</b> 3.89			
<b>First Year other savings Rs:</b>			
<b>On annual basis</b>		<b>Coal</b>	<b>Gas</b>
		<b>NA</b>	<b>NA</b>
<b>Energy consumption before</b>	714024.55	<b>Kwh</b>	<b>NA</b>
<b>Energy consumption after</b>	544018.71	<b>Kwh</b>	<b>NA</b>
<b>Energy Tarrif, Rs/KWh/Ton/Nm3/KL</b>	2.29		<b>NA</b>
<b>Company complete Address</b>			<p><b>We authorise Bureau to use this information for dissemination</b></p> <p><b>Signature</b></p> <p><b>Date</b></p>
Essar Power Ltd. 27th KM , Surat-Hazira Road , Hazira, Surat - 394270, Gujarat			
<b>Contact Person Who could contacted for more information</b>			
Mr. Nilesh B. Narain Dy. GM ( Efficiency), Essar Power Ltd. Ph: 0261/6682605 Mo: 09879102848			


## Energy Conservation Measure Implemented in 2006 - 2007

ID to be filled by BEE	<b>Title of the Measure</b>	<b>Sector</b>
	# Replacement of Tubine hall roof extraction fans with wind spin Turbines	Power / General
Year to be filled by BEE		<b>Technology</b>
		Combined Cycle Plant
<p><b>Description of the energy conservation meaures</b></p> <p>Roof extraction fans earlier was motor driven of 7 KWh capacity in total                  These roof extractions fans were succesfully replaced with wind spin tubines that does not require any external drive motor to operate.</p>		
<p><b>Picture /Sketch/ drawing before modification</b> ( if available)</p>		
		
<p>Agency that executed the project ( with address and email ) : <span style="float: right;">Mechanical Dpt. Essar Power Ltd.</span></p>		
Total investment Rs.:		Year of implimentation: <span style="float: right;">2006 - 2007</span>
First year energy cost saving Rs: <span style="float: right;">140422.8</span>		
<b>First Year other savings Rs:</b>		
On annual basis	KWh	Coal ( Tons)
	Gas ( Nm3)	Oil ( KL )
Other		
Energy consumption before	61320	NA
Energy consumption after	0	NA
Energy Tarrif, Rs/KWh/Ton/Nm3/KL	2.29	NA
<p><b>Company complete Address</b></p> <p>Essar Power Ltd.                  27th KM , Surat-Hazira Road , Hazira,                  Surat - 394270,                  Gujarat</p> <p><b>Contact Person Who could contacted for more information</b></p> <p>Mr. Nilesh B. Narain                  Dy. GM ( Efficiency), Essar Power Ltd.                  Ph: 0261/6682605 <span style="float: right;">Mo: 09879102848</span></p>		<p>We authorise Bureau to use this information for dissemination</p> <p>Signature</p> <p>Date</p>

## Energy Conservation Measure Implemented in 2006 - 2007

<b>ID to be filled by BEE</b>	<b>Title of the Measure</b>				<b>Sector</b>
	<b># Installation of Automatic Power Factor controller for Water Treatment MCC</b>				Power / General
<b>Year to be filled by BEE</b>					
Combined Cycle Plant					
<b>Description of the energy conservation measures</b>					
<p>Water Treatment MCC feeds small drives of DM plant, Softening plant, Acid/Caustic Area, which used to run with low power factor drawing more current due to voltage drop.</p> <p>An Automatic Power Factor controller having dry type capacitor banks was installed at MCC end due to which power factor at the down stream has been improve upto 0.99.</p>					
<b>Picture /Sketch/ drawing before modification</b> ( if available)					
					
<b>Agency that executed the project ( with address and email) :</b> Mechanical Dpt. Essar Power Ltd.					
<b>Total investment Rs.:</b>		700000		<b>Year of implimentation:</b> 2006 - 2007	
<b>First year energy cost saving Rs:</b>		2.11992			
<b>First Year other savings Rs:</b>					
<b>On annual basis</b>	<b>KWh</b>	<b>Coal ( Tons)</b>	<b>Gas ( Nm3)</b>	<b>Oil ( KL )</b>	<b>Other</b>
<b>Energy consumption before</b>	1966424.30	NA	NA	NA	NA
<b>Energy consumption after</b>	1870064.30	NA	NA	NA	NA
<b>Energy Tarrif, Rs/KWh/Ton/Nm3/KL</b>	2.20	NA	NA	NA	NA
<b>Company complete Address</b>				We authorise Bureau to use this information for dissemination  Signature  Date	
Essar Power Ltd. 27th KM , Surat-Hazira Road , Hazira, Surat - 394270, Gujarat					
<b>Contact Person Who could contacted for more information</b>					
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## Energy Conservation Measure Implemented in 2006 - 2007

<b>ID to be filled by BEE</b>	<b>Title of the Measure</b>				<b>Sector</b>
	# Installation of Variable Frequency Drive for Raw water Pump no. 2				Power / General
<b>Year to be filled by BEE</b>					
<b>Description of the energy conservation measures</b>					
Requirement of raw water flow varies as per the Plant loading as Steam turbine cooling water Requirement varies with load. Requirement varies from 500 m3/hr to 1000 m3/hr and rated flow of pump was 1200 m3/hr To cater this variable flow and to reduce power consumption VFD was installed and an average of 35 KWh saving is achieved					
<b>Picture /Sketch/ drawing before modification</b> ( if available)					
					
<b>Agency that executed the project</b>			Essar Power Ltd.		
<b>Total investment Rs.:</b>			2007		
<b>First year energy cost saving Rs:</b>			6.7452		
<b>First Year other savings Rs:</b>					
<b>On annual basis</b>	<b>KWh</b>	<b>Coal ( Tons)</b>	<b>Gas ( Nm3)</b>	<b>Oil ( KL )</b>	<b>Other</b>
<b>Energy consumption before</b>	425014614	NA	NA	NA	NA
<b>Energy consumption after</b>	424708014	NA	NA	NA	NA
<b>Energy Tarrif, Rs/KWh/Ton/Nm3/KL</b>	2.2	NA	NA	NA	NA
<b>Company complete Address</b>				We authorise Bureau to use this information for dissemination  Signature  Date	
Essar Power Ltd. 27th KM , Surat-Hazira Road , Hazira, Surat - 394270, Gujarat					
<b>Contact Person Who could contacted for more information</b>					
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