




## Energy Conservation Measure implemented in 2006-2007

ID to be filled by BEE	Title of the measure	Sector : <b>Ceramic</b>
Year to be filled by BEE	Replacement of batch smelter by continuous smelter at HRJ Karaikal	Technology .....
<p><b>Description of the energy conservation measure:</b></p> <p>In the pre project scenario, HRJ used to manufacture frit with four natural gas fired batch type smelters each with a capacity of 3 tonnes per day (tpd). Batch smelters were inefficient on the account of high specific energy consumption which was in the tune of 7000 Kcal/kg of frit manufactured. The high energy consumption in batch type smelters is attributed to the heating and cooling of the smelter with each charge, loss of some material due to high velocity of the gases, inadequate heat recovery system and radiation losses.</p> <p>Under the project activity, HRJ had installed two natural gas fired continuous smelter with a capacity of 15tpd (installed in the year 05-06) and 27tpd (installed in the year 06-07), to enhance the energy efficiency of the system. Project uses highly efficient regenerative type continuous smelter unit to manufacture frit which was earlier manufactured by batch smelter. The waste heat recovery system installed with the continuous smelter delivers inlet air at a temperature of about 1100 deg C and saves the use of additional fuel. Energy consumption in continuous smelter is approximately 2000 Kcal/kg of frit manufactured, around 70% less than equivalent batch smelter. Water used for cooling is recycled in continuous process removing the wastage compared to batch process.</p>		
<b>Picture/ sketch/ drawing before modification</b> (if available)	<b>Picture/ sketch/ drawing after modification</b>	
		
<p>Agency that executed the project (with complete address and email) :</p> <p>FOSHAN KEXINDA AOSIBO CERAMIC TECHNOLOGY CO. LTD          Add: 2F, Hongjing Bldg.No 129, Fenjiang South Road, Foshan, Guangdong, China          Tel : 0086-757-83317827          Fax : 0086-757-83839935          E-mail : <a href="mailto:sales@kexinda.com">sales@kexinda.com</a></p>		
Total investment, Rs.: 2.3 crore	Year of implementation: 2006	


First year energy cost savings, Rs.: 98 lacs					
First year other savings, Rs.: Nil					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm <sup>3</sup>	Oil (kL)	Other
Energy consumption before	1171.36		2985076		
Energy consumption after	1440.64		972841		
Energy tariff, Rs/ kWh/ Ton/ Nm <sup>3</sup> / kL ...	Rs. 3.30		Rs. 5		
Company complete address: H. & R. Johnson (India) Limited Plot No – 143, Thirunallar, Ambagarathur, Thennangudi, P.O. Sellur, Karaikal – 609607, Pondicherry.				We authorise Bureau to use this information for dissemination	
Contact person who could be contacted for more information: Arghya Mukherjee, Sr. Manager (Energy), 022-30647356				Signature  Date : 15/11/2007	

## Energy Conservation Measure implemented in 2006-2007

ID to be filled by BEE	Title of the measure	Sector : <b>Ceramic</b>
Year to be filled by BEE	Replacement of electrically fired hot water generator by natural gas fired hot water generator for LPG vaporizer	Technology .....
<p><b>Description of the energy conservation measure:</b></p> <p>In the pre project scenario, HRJ used to vaporise LPG in a hot water generator operated with electricity. LPG was converted into vapour form with the help of vaporizer. In vaporizer, LPG pipe line (spiral form) was merged in hot water bath. Temperature maintained in hot water bath is at 60 - 85 Deg C. Hot water bath is heated by electrical heater fitted at the bottom of the vaporizer tank. As soon as water temperature reached 85 Deg C, heaters cut off &amp; heater starts again when water temperature drops down to 60 Deg C.</p> <p>Under the project activity the existing system has been modified in to a fuel fired hot water generator based system. Required hot water is generated with the help of a gas fired (NG) hot water generator. Hot water from the system is pumped to individual vaporizer to supply required heat for LPG vaporization.</p>		
<b>Picture/ sketch/ drawing before modification</b> (if available)	<b>Picture/ sketch/ drawing after modification</b>	
		
<p><b>Agency that executed the project (with complete address and email) :</b></p> <p>Hot water generator :</p> <p>Thermax ltd  Dhanjay Mahal, Chh, Shivaji Maharaj Road, Near Gate way of India, Colaba, Mumbai 39  Tel: 22045391  Fax: 22040859  E-mail: <a href="mailto:ccygnus@vsnl.net">ccygnus@vsnl.net</a></p> <p>Balance of plant :</p> <p>Nimotherm Engineering Pvt. Ltd.  3, Osia Arcade,  Near R.T.O., Shahunagar, Chinchwad, Pune - 411 019  Tel : 020 27490005  Fax : 020 27493900  E-mail: <a href="mailto:nimotherm@gmail.com">nimotherm@gmail.com</a></p>		

Total investment, Rs.: 8 lacs		Year of implementation: 2006			
First year energy cost savings, Rs.: 62 lacs					
First year other savings, Rs.: Nil					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm <sup>3</sup>	Oil (kL)	Other
Energy consumption before	1825		0		
Energy consumption after	0		184325		
Energy tariff, Rs/ kWh/ Ton/ Nm <sup>3</sup> / kL ...	Rs.4		Rs.5.5		
Company complete address:  H. & R. Johnson (India) Limited Village: Khar- Devli, Taluka- Pen, Dist- Raigad Bombay – Goa Road. Maharashtra – 402107  Contact person who could be contacted for more information: Arghya Mukherjee, Sr. Manager (Energy), 022-30647356				We authorise Bureau to use this information for dissemination  Signature  Date: 15/11/2007	

## Energy Conservation Measure implemented in 2006-2007

ID to be filled by BEE	Title of the measure	Sector : <b>Ceramic</b>
Year to be filled by BEE	Coal gasification project for spray drying application	Technology .....
<p><b>Description of the energy conservation measure:</b></p> <p>In the pre project scenario, HRJ used to operate its spray dryers (600 deg C) with LPG as a fuel. LPG fired hot air generator was attached to the spray dryer. Hot air generated in the same was used in the spray dryer.</p> <p>In the project activity two numbers of coal gasifiers have been installed where sized sub bituminous coal is used as fuel. In the gasifier, gasifying agents are steam and oxygen. Gasification exposes coal to temperature that would normally lead to combustion of coal but due to careful addition of gasifying agents it gets converted into coal gas ( CO – 23-30%, N<sub>2</sub> – 45-50% , CO<sub>2</sub>- 4-5%, H<sub>2</sub>—10-15%,CH<sub>4</sub>—2-3%,O<sub>2</sub>-0.2 -0.6% Calorific value – 1500 kcal/Nm<sup>3</sup>). One kg of coal (6000 kcal / kg) delivers 3.25 nm<sup>3</sup> of coal gas (4875 kcal), system efficiency is 81%. Around 15% of energy is used of generation of steam, which is used for captive consumption in the gassifier, making the combined efficiency to the tune of 96%. Coal gas produced through gasifier is transported to spray dryer hot air generator with the help of suitable ducting. Coal gas is then burned in the hot air generator for generation of hot air to be used in the spray dryer.</p>		
<b>Picture/ sketch/ drawing before modification</b> (if available)	<b>Picture/ sketch/ drawing after modification</b>	
		
<p><b>Agency that executed the project (with complete address and email) :</b></p> <p>FOSHAN YIDA IMPORT &amp; EXPORT CO.LTD  Room T, 10<sup>th</sup> Floor, Dongjian Mansion, No-38 Fenjiang South Road, Foshan,  Guangdong, China  Tel: 008675728300616  Fax: 008675728301108  E-mail : <a href="mailto:fsyida@vip.163.com">fsyida@vip.163.com</a></p>		
Total investment, Rs.: 7.5 crore	Year of implementation: 2007	


First year energy cost savings, Rs.: 9.28 crore					
First year other savings, Rs.: Nil					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm <sup>3</sup>	Oil (kL)	Other LPG (Ton)
Energy consumption before		0			6187.5
Energy consumption after		13707			0
Energy tariff, Rs/ kWh/ Ton/ Nm <sup>3</sup> / kL ...		Rs.8000			Rs.33000
Company complete address: H. & R. Johnson (India) Limited Village: Khar- Devli, Taluka- Pen, Dist- Raigad Bombay – Goa Road. Maharashtra – 402107  Contact person who could be contacted for more information: Arghya Mukherjee, Sr. Manager (Energy), 022-30647356				We authorise Bureau to use this information for dissemination  Signature  Date: 15/11/2007	

## Energy Conservation Measure implemented in 2006-2007

ID to be filled by BEE	Title of the measure  Coal gasification project for kiln application	Sector : <b>Ceramic</b>
Year to be filled by BEE		Technology .....
<p><b>Description of the energy conservation measure:</b></p> <p>In the pre project scenario, HRJ used to operate its both the kilns (1200 deg C) with LPG as a fuel.</p> <p>In the project activity one number of coal gasifier has been installed where sized sub bituminous coal is used as fuel. In the gasifier, gasifying agents are steam and oxygen. Gasification exposes coal to temperature that would normally lead to combustion of coal but due to careful addition of gasifying agents it gets converted into coal gas ( CO – 23-30%, N2 – 45-50% , CO2- 4-5%, H2—10-15%,CH4—2-3%,O2-0.2 -0.6% Calorific value – 1500 kcal/Nm3). One kg of coal (6000 kcal / kg) delivers 3.25 nm3 of coal gas (4875 kcal), system efficiency is 81%. Around 15% of energy is used of generation of steam, which is used for captive consumption in the gassifier, making the combined efficiency to the tune of 96%. Coal gas produced through gasifier is transported to kiln with the help of suitable ducting</p>		
<b>Picture/ sketch/ drawing before modification</b> (if available)	<b>Picture/ sketch/ drawing after modification</b>	
		
<p>Agency that executed the project (with complete address and email) :</p> <p>ZIBO Wanfeng Gas Equipments Co.,Ltd  Foshan, Guangdong, China  Tel: 0086-0533-2888108  Fax: 0086-0533-2884967  E-mail: <a href="mailto:Wanfeng@zbf.com.cn">Wanfeng@zbf.com.cn</a></p>		
Total investment, Rs.: 5.5 crore	Year of implementation: 2006	


First year energy cost savings, Rs.: 2.36 crore					
First year other savings, Rs.: Nil					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm <sup>3</sup>	Oil (kL)	Other LPG (Ton)
Energy consumption before		0			2880
Energy consumption after		9081			0
Energy tariff, Rs/ kWh/ Ton/ Nm <sup>3</sup> / kL ...		Rs.8500			Rs.35000
Company complete address:  H. & R. Johnson (India) Limited Plot no – 1-12 , KIDAB INDL. AREA Near Anchepalya Village Kunigal – 572 130 Dist – Tumkur, Karnataka				We authorise Bureau to use this information for dissemination  Signature  Date: 15/11/2007	
Contact person who could be contacted for more information: Arghya Mukherjee, Sr. Manager (Energy), 022-30647356					

## Energy Conservation Measure implemented in 2006-2007

ID to be filled by BEE	Title of the measure  Maximum demand controller	Sector : <b>Ceramic</b>
Year to be filled by BEE		Technology .....
<p><b>Description of the energy conservation measure:</b></p> <p>HRJ has installed three numbers of maximum demand controllers to manage the load at its plants. With the help of these devices maximum demand of the entire plant is controlled. Earlier the plant used to register a maximum demand of 7200 kva. On installation of these devices HRJ is able to manage restrict its maximum demand to the tune of 6750 kva. Alarm is sounded when demand reaches this pre set value, if corrective action is not taken the controller switches off the non critical ball mill loads in a predetermined logical sequence. The plant equipments are selected for load management are stopped and restarted as per desired load profile.</p>		
<b>Picture/ sketch/ drawing before modification</b> (if available)	<b>Picture/ sketch/ drawing after modification</b>	
		
<p><b>Agency that executed the project (with complete address and email) :</b></p> <p>Make : Enercon          Dealer :          Kunal Entreprise          Shop no 5, Groud Floor, Mepani House, SL Road, Mulund (W), Mumbai - 400080          M: 9322901098          Tele fax : 022-25934261          E-mail: shree_mani@yahoo.com, kunalenter@yahoo.co.in</p>		
Total investment, Rs.: 1 lacs	Year of implementation: 2007	


First year energy cost savings, Rs. 16 lacs					
First year other savings, Rs. Nil					
On annual basis	kva	Coal (Tons)	Gas Nm <sup>3</sup>	Oil (kL)	Other
Energy consumption before	7200				
Energy consumption after	6750				
Energy tariff, Rs/ kWh/ Ton/ Nm <sup>3</sup> / kL ...	Rs. 300				
Company complete address: H. & R. Johnson (India) Limited Village: Khar- Devli, Taluka- Pen, Dist- Raigad Bombay – Goa Road. Maharashtra – 402107  Contact person who could be contacted for more information: Arghya Mukherjee, Sr. Manager (Energy), 022-30647356				We authorise Bureau to use this information for dissemination  Signature  Date: 15/11/2007	

## Energy Conservation Measure implemented in 2006-2007


ID to be filled by BEE	Title of the measure  <b>Indirect hot air generator for vertical dryer</b>	Sector : <b>Ceramic</b>
Year to be filled by BEE		Technology .....
<p><b>Description of the energy conservation measure:</b></p> <p>In the pre project scenario, HRJ used to operate its vertical dryers (170 deg C) with LPG as a fuel.</p> <p>In the project activity HRJ has installed fluidised bed combustion based hot air generators, which can be operated with solid fuel like ground nut husk, soya husk, lignite, coal etc. Heat exchangers tubes are installed above the bed, where ambient air is being circulated with the help of a circulation fan. This ensure that the air used in the vertical dryer is clean. Hot air produced through this indirect hot air generator is transported to vertical dryer with the help of suitable ducting</p>		
<b>Picture/ sketch/ drawing before modification</b> (if available)	<b>Picture/ sketch/ drawing after modification</b>	
		
<p><b>Agency that executed the project (with complete address and email) :</b></p> <p>Radhe Renewable Energy Development Pvt. Ltd  D-111, Rajkot Industrial Address, 4 Umakanth Pandit Udyog Nagar,  Near Mavdi plot, Rajkot – 360004  Tel: 0281-2372567/ 2377823  Fax: 0281-2372557  E-mail: info@radhegroup.com</p>		
Total investment, Rs.: 1.3 crore	Year of implementation: 2006	

First year energy cost savings, Rs.: 3.79 crore					
First year other savings, Rs.: Nil					
On annual basis	kWh 000'	Coal + Biomass (Ton)	Gas Nm <sup>3</sup>	Oil (kL)	Other LPG (Ton)
Energy consumption before		0			1741.66
Energy consumption after		6583			0
Energy tariff, Rs/ kWh/ Ton/ Nm <sup>3</sup> / kL ...		Rs.3500			Rs.35000
<p>Company complete address:</p> <p>H. &amp; R. Johnson (India) Limited  Plot no – 1-12 , KIDAB INDL. AREA  Near Anchepalya Village  Kunigal – 572 130  Dist – Tumkur, Karnataka</p> <p>H. &amp; R. Johnson (India) Limited  Plot No 2, Industrial Area, Agra – Bombay Road  Dewas – 455001  Madhya Pradesh</p> <p>Contact person who could be contacted for more information:  Arghya Mukherjee, Sr. Manager (Energy), 022-30647356</p>				<p>We authorise Bureau to use this information for dissemination</p> <p>Signature</p> <p>Date: 15/11/2007</p>	

## Energy Conservation Measure implemented in 2006-2007


ID to be filled by BEE	Title of the measure  <b>Improvement furnace draft in continuous smelter</b>		Sector : <b>Ceramic</b>		
Year to be filled by BEE			Technology .....		
Description of the energy conservation measure:					
<p>The frit smelter uses the draft control from the exhaust opening which allows ambient air to enter the regenerator through 2 different ports within a time interval of 16 min. This air heats up in the regenerator and enters the furnace kiln. In pre project scenario it was seen that the air entering the 2 ports is unequal. This led to lower heat gained by the air before entering the furnace and subsequent increase in consumption of fuel. In the post project scenario after conducting a detail heat mass balance study it was planned to improve the draft controlled by increasing the damper opening to allow more suction in the regenerator. This increases the heat gained in regenerator, reduces fuel consumption and increases productivity.</p>					
<b>Picture/ sketch/ drawing before modification</b> (if available)			<b>Picture/ sketch/ drawing after modification</b>		
					
Agency that executed the project (with complete address and email) :					
In-house execution					
Total investment, Rs.: Nil			Year of implementation: 2007		
First year energy cost savings, Rs. 2.53 lacs					
First year other savings, Rs. Nil					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm <sup>3</sup>	Oil (kL)	Other
Energy consumption before			1201131		
Energy consumption after			1155066		
Energy tariff, Rs/ kWh/ Ton/ Nm <sup>3</sup> / kL ...			Rs.5.5		
Company complete address:				We authorise Bureau to use this information for dissemination	
H. & R. Johnson (India) Limited Plot No – 143, Thirunallar, Ambagarathur, Thennangudi, P.O. Sellur, Karaikal – 609607, Pondicherry.				Signature	
Contact person who could be contacted for more information:				Date: 15/11/2007	
Arghya Mukherjee, Sr. Manager (Energy), 022-30647356					

## Energy Conservation Measure implemented in 2006-2007

ID to be filled by BEE	Title of the measure  Control air system for compressed air	Sector : <b>Ceramic</b>
Year to be filled by BEE		Technology .....
<p><b>Description of the energy conservation measure:</b></p> <p>Control air system has been installed after compressors. It isolates supply side from demand side. An electronic PID based controller continuously monitor the down stream demand and directs the flow modules to increase or decrease the flow accordingly to correct the deviation form set point. The quick response to the modules paces the flow dynamics of the system; ensuring adequate supply of compressed air is available to the production facilities. Benefits achieved from this system are as below ---</p> <ol style="list-style-type: none"> <li>1. Saves energy consumed by the air compressor through reduction artificial demand.</li> <li>2. Reduces leakages</li> <li>3. Isolates compressors from demand side peak and troughs.</li> <li>4. Reduces load period of the compressor etc.</li> </ol>		
<b>Picture/ sketch/ drawing before modification</b> (if available)	<b>Picture/ sketch/ drawing after modification</b>	
		
<p><b>Agency that executed the project (with complete address and email) :</b></p> <p>Make : Godrej &amp; Boyce Mfg.Co.Ltd          Electrical &amp; Electronic Division, PL-35          Compressed air solutions          Pirojsha Nagar, Vikroli , Mumbai – 400079          Tel : 022-67962251          Fax : 022- 67961525          E-mail : <a href="mailto:kcp@godrej.com">kcp@godrej.com</a></p>		
Total investment, Rs.: 1.98 lacs	Year of implementation: 2007	

First year energy cost savings, Rs. 1.81 lacs					
First year other savings, Rs. Nil					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm <sup>3</sup>	Oil (kL)	Other
Energy consumption before	550				
Energy consumption after	494				
Energy tariff, Rs/ kWh/ Ton/ Nm <sup>3</sup> / kL ...	Rs. 3.3				
Company complete address: H. & R. Johnson (India) Limited Plot No – 143, Thirunallar, Ambagarathur, Thennangudi, P.O. Sellur, Karaikal – 609607, Pondicherry.				We authorise Bureau to use this information for dissemination	
Contact person who could be contacted for more information: Arghya Mukherjee, Sr. Manager (Energy), 022-30647356				Signature Date: 15/11/2007	

## Energy Conservation Measure implemented in 2006-2007

ID to be filled by BEE	Title of the measure	Sector : <b>Ceramic</b>
Year to be filled by BEE	Optimization of ball mill loading to reduce energy consumption	Technology .....
<p><b>Description of the energy conservation measure:</b></p> <p>Ball mills are used to grind the raw material to prepare ceramic slurry, which is further dried in spray dryer for power preparation. Material loading of ball mill is very critical parameter in terms of energy consumption. Energy consumption increases, if the mill is loaded below / above the critical loading point. During energy audit it was observed that energy consumption of the ball mill was very high due lower material loading in the ball mill. As a corrective measure, repeated numbers of trials were conducted to find the critical loading point and it was planned to increase the material loading of the ball mill to critical loading which gives the lowest specific energy consumption.</p>		
<b>Picture/ sketch/ drawing before modification</b> (if available)	<b>Picture/ sketch/ drawing after modification</b>	
		
Agency that executed the project (with complete address and email) : In – house execution.		
Total investment, Rs.: Nil	Year of implementation: 2007	

First year energy cost savings, Rs. 14.63 lacs					
First year other savings, Rs. Nil					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm <sup>3</sup>	Oil (kL)	Other
Energy consumption before	1074.81				
Energy consumption after	822.52				
Energy tariff, Rs/ kWh/ Ton/ Nm <sup>3</sup> / kL ...	Rs.5.80				
Company complete address: H. & R. Johnson (India) Limited Plot no – 1-12 , KIDAB INDL. AREA Near Anchepalya Village Kunigal – 572 130 Dist – Tumkur, Karnataka				We authorise Bureau to use this information for dissemination  Signature  Date: 15/11/2007	
Contact person who could be contacted for more information: Arghya Mukherjee, Sr. Manager (Energy), 022-30647356					