











1	ID: 21	Title of measure	Sector: Chemical Industry
2	Survey Year: 2007	Condensate Recovery by installing Pressured Power Pump	Technology: Pumps
3	Name of the Company	: Bilag Industries Private Limited, Vapi, Gujarat , INDIA	
4	Agency that executed the project	: In-house	
5	Year of Implementation	: 2006-07	
6	Unit Profile: Bilag Industries Private Limited is a highly successful joint venture company of Bayer CropScience AG, a chemical conglomerate from Germany and Bilakhia Group a first generation Indian entrepreneur. Bilag is an agrochemical manufacturing company engaged in the production of Synthetic Pyrethroids active ingredients and their intermediates for use in a wide array of agriculture and environmental science products. BILAG is one of India's largest exporters of agrochemicals and its turnover (Year 2006) is US\$ 125 million.		
7	Description of Energy Conservation Measure:- The in-house team took the following initiative as the Energy Efficiency measure. <ul style="list-style-type: none"> ✍ Installation of Pressured Power Pump. ✍ Recovery of condensate at 85 °c. ✍ DM water recovery. 		
8	Bilag Industries, Vapi	Picture After Modification	
			
9	Total investment :	13,125 US\$	
10	First year energy cost savings :	15,500 US\$	
11	First year additional savings beyond energy (i.e. water, raw materials etc.):	Nil	
12	Annual oil consumption before, kl	77	
13	Annual oil consumption after, kl	30	
14	First year oil savings, kl	47	
15	First year tons of CO ₂ mitigated	142	
16	Assumed sustainability, years	10	
17	Expected tons of CO₂ mitigated throughout life cycle	1,420	

1	ID: 22	Title of measure	Sector: Chemical Industry
2	Survey Year: 2007	Installation of Screw Compressors for Compressed Air in place of inefficient Reciprocating Air Compressors	Technology: Compressors
3	Name of the Company	: Excel Industries Limited, Raigad, Maharashtra, INDIA	
4	Agency that executed the project	: M/s Airkom Agencies (I) Private Limited, Mumbai, INDIA	
5	Year of Implementation	: 2007	
6	<p>Unit Profile:</p> <p>Excel Industries Limited, Roha is a pioneer in the field of manufacturing industrial chemicals, intermediates, specialty chemicals and agricultural chemicals and one of the leading global manufacturer of Di-ethyl Thiophosphoryl Chloride, Phosphorous Pentasulphide and Glyphosate. Although Excel has a very diversified range in chemicals manufacturing, its main strength lies in chlorine & phosphorous based chemicals. Presently twelve industrial & agrochemicals are being manufactured at Roha unit and the turnover in fiscal 2007 is US\$ 49.17 million.</p>		
7	<p>Description of Energy Conservation Measure:-</p> <p>At the Roha site, previously the unit had 3 nos. of Reciprocating air compressors to serve production plants process requirement until January – 2007. The volumetric efficiency of these air compressors was reduced by 30% and maintenance frequency was also increased. The energy requirement of compressing air with reciprocating compressors was 0.138 KW per Nm³/ Hour compressed air flow rate and with 686.56 Nm³ per hour capacity of each compressor.</p> <p>The in-house team decided to replace reciprocating air compressors with screw air compressors to reduce the energy requirement of compressed air in January 2007. The Screw air compressor requires less energy and lesser maintenance. The energy requirement of air compression with screw compressor comes out to be 0.106 KW per Nm³/ Hour of compressed air flow. The capacity of screw air compressor is 898.81 Nm³ per hour of each compressor. So there was reduction of 0.032 KW per Nm³/ hour.</p>		
8	<p>Picture Before Modification</p> 		<p>Picture After Modification</p> 
9	Total investment :	50,000 US\$	
10	First year energy cost savings :	18,129 US\$	
11	First year additional savings beyond energy (i.e. water, raw materials etc.):	10,304 US\$	
12	Annual electricity consumption before, MWh	750	
13	Annual electricity consumption after, MWh	582	
14	First year electricity savings, MWh	168	
15	First year tons of CO ₂ mitigated	168	
16	Assumed sustainability, years	10	
17	Expected tons of CO₂ mitigated throughout life cycle	1,680	

1	ID: 23	Title of measure	Sector: Chemical Industry
2	Survey Year: 2007	Replacement of conventional Agitators by Economix Agitators	Technology : Agitators
3	Name of the Company	: IOL Chemicals and Pharmaceuticals Limited, Barnala, Punjab, INDIA	
4	Agency that executed the project	: In-house	
5	Year of Implementation	: 2006-07	
6	Unit Profile: IOL Chemicals and Pharmaceuticals Limited (Formerly known as Industrial Organics Limited), is a chemical manufacturing industry located in Barnala in Punjab. IOLCP began with a small project of Rs. 650 lacs to manufacture 4500 TPA of Acetic Acid and has now diversified into a multi product company having the facility to manufacture 50000 TPA of Acetic Acid, 33000 TPA of Ethyl Acetate, 12000 TPA of Acetic Anhydride and 3600 MTPA of Ibuprofen. The annual turnover of the unit for the year 2006-07 is reported to be US\$ 58 million		
7	Description of Energy Conservation Measure:- In the unit's Ibuprofen Division, the conventional Agitators along with worm Reducer Gear box have been operating for many years. In this conventional system, motors used were of 15 HP rating because of heavy Shaft & Blades. These conventional agitators have been replaced by specially designed Economix Agitators along with Helical gearbox. These Agitators are designed as per the process requirement which has resulted in lighter weight Shaft & Blades & Hence motor requirement has been reduced to 3-5 HP.		
8	IOL Chemicals and Pharmaceuticals Ltd. Barnala	Picture After Modification	
			
		Economix Agitators along with helical Gearbox	
9	Total investment :		232,000 US\$
10	First year energy cost savings :		231,000 US\$
11	First year additional savings beyond energy (i.e. water, raw materials etc.):		Nil
12	Annual electricity consumption before,	MWh	5,238
13	Annual electricity consumption after,	MWh	3,155
14	First year electricity savings,	MWh	2,083
15	First year tons of CO ₂ mitigated		2,083
16	Assumed sustainability, years		10
17	Expected tons of CO₂ mitigated throughout life cycle		20,830

1	ID: 24	Title of measure	Sector: Chemical Industry
2	Survey Year: 2007	Installation of Ammonia Screw Compressors in place of Reciprocating Compressors in Brine & CHW Refrigeration Unit with Evaporative Condenser	Technology: Refrigeration Compressors
3	Name of the Company : Excel Industries Limited, Raigad, Maharashtra, INDIA		
4	Agency that executed the project : M/s Systems And Components, Mumbai, INDIA		
5	Year of Implementation : 2007		
6	<p>Unit Profile:</p> <p>Excel Industries Limited, Roha is a pioneer in the field of manufacturing industrial chemicals, intermediates, specialty chemicals and agricultural chemicals and one of the leading global manufacturer of Di-ethyl Thiophosphoryl Chloride, Phosphorous Pentasulphide and Glyphosate. Although Excel has a very diversified range in chemicals manufacturing, its main strength lies in chlorine & phosphorous based chemicals. Presently twelve industrial & agrochemicals are being manufactured at Roha unit and the turnover in fiscal 2007 is US\$ 49.17 million.</p>		
7	<p>Description of Energy Conservation Measure:-</p> <p>The unit had Reciprocating ammonia compressors with shell & tube type condenser to serve production plants refrigeration requirement with brine and chilled water. The energy requirement of refrigeration for Brine as secondary refrigerant was 3.33 kW per TR and Chilled water as secondary refrigerant was 1.31 kW per TR with reciprocating compressors.</p> <p>The Screw compressor with evaporative condenser is an energy efficient technology in Refrigeration field, which requires lesser maintenance. The energy requirement of refrigeration with screw compressor for Brine as secondary refrigerant comes out to be 2.01 KW per TR at – 22°C temperature and the energy requirement of refrigeration with screw compressor for Chilled water as secondary refrigerant comes out to be 1.22 KW per TR at + 5°C.</p> <p>The unit replaced reciprocating ammonia compressors with Screw compressors with Evaporative Condensers to reduce the cost of refrigeration.</p>		
8	<p>Picture Before Modification</p> 	<p>Picture After Modification</p> 	
9	Total investment :	250,000 US\$	
10	First year energy cost savings :	187,283 US\$	
11	First year additional savings beyond energy (i.e. water, raw materials etc.):	8,000 US\$	
12	Annual electricity consumption before, MWh	3,708	
13	Annual electricity consumption after, MWh	1,470	
14	First year electricity savings, MWh	2,238	
15	First year tons of CO ₂ mitigated	2,238	
16	Assumed sustainability, years	10	
17	Expected tons of CO₂ mitigated throughout life cycle	22,380	

1	ID: 25	Title of measure	Sector: Chemical Industry
2	Survey Year: 2007	Effective operation of MEG Brine system by consistent monitoring and reducing run hours	Technology: Process Control
3	Name of the Company : Syngenta India Limited, Corlim(Ilhas),GOA , INDIA		
4	Agency that executed the project : In-house		
5	Year of Implementation : 2006-07		
6	<p>Unit Profile:</p> <p>Syngenta, commissioned in 1972, is one of the leading agribusiness. The company is one of the leaders in crop protection products range which comprises-Insecticides for control of pests affecting food and cash crops-Fungicides against pest diseases-Herbicides for weed control, particularly in food crops. Syngenta employs some 19,000 people in over 90 countries. Syngenta is listed on the Swiss stock exchange (SYNN) and in New York (SYT). The annual sales turnover of the Santa Monika works at corlim is US\$ 0.18 billion.</p>		
7	<p>Description of Energy Conservation Measure:-</p> <p>The in house team of the unit monitored the MEG Brine chilling system operating parameters & its auxiliaries through Data Acquisition system. Due to low load conditions, unit was operating for about 14 to 15 hrs per day on Auto mode based on the MEG brine outlet temperature input. Compressor was running in unloading condition due to lower temperature settings. These loading, unloading & trip parameters were analyzed and all the settings have been revised to run the compressor in full load for shorter duration. This resulted in reducing the running hours to average 8 hrs per day. Also previously the cooling water supply to this system was on for 24 hrs irrespective of compressor operation. The same was made manual ON /OFF during compressor trip condition.</p>		
8	<p>Syngenta India Limited</p> 	<p>Picture After Modification</p> 	
9	Total investment :		500 US\$
10	First year energy cost savings :		15,196 US\$
11	First year additional savings beyond energy (i.e. water, raw materials etc.):		Nil
12	Annual electricity consumption before, MWh		201
13	Annual electricity consumption after, MWh		125
14	First year electricity savings, MWh		76
15	First year tons of CO ₂ mitigated		76
16	Assumed sustainability, years		10
17	Expected tons of CO₂ mitigated throughout life cycle		760

1	ID: 26	Title of measure	Sector: Chemical Industry
2	Survey Year: 2007	Use of Di-Methyl Ether as fuel in the boiler	Technology: Fuel Substitution
3	Name of the Company : Gharda Chemicals Limited, Ratnagiri, Maharashtra, INDIA.		
4	Agency that executed the project : In-house		
5	Year of Implementation : 2006-07		
6	<p>Unit Profile:</p> <p>Gharda Chemicals Limited established in 1967, is a research-based private limited company and is among the leading chemical companies in India. Gharda Chemicals has four manufacturing units, one each at Dombivli and Lote in Maharashtra and other two are at Panoli and Ankaleshwar in Gujrat. The sales turnover reported by Gharda for the year 2006-07 is US\$ 101 million.</p>		
7	<p>Description of Energy Conservation Measure:-</p> <p>DME (dimethyl ether) is an LPG-like synthetic fuel that is produced through gasification of various renewable substances or fossil fuels. The synthetic gas is then catalyzed to produce DME. DME is a gas that becomes a liquid under low pressure (i.e., like LPG). It has excellent characteristics as a compression ignition fuel; the primary work that needs to be done is on the fuel-injection system because of the different handling characteristics of the gas.</p> <p>The DME gas is being generated as bi-product during manufacturing of the Dicamba product in the plant. The in-house team used the same as fuel in the boiler and was able to reduce the consumption of the oil and electricity.</p>		
8	<p>Picture Before modification</p> 	<p>Picture After Modification</p> 	
9	Total investment :		1,550 US\$
10	First year energy cost savings :		11,868 US\$
11	First year additional savings beyond energy (i.e. water, raw materials etc.):		Nil
12	Annual electricity consumption before, MWh		-
13	Annual electricity consumption after, MWh		-
14	First year electricity savings, MWh		117
15	First year oil savings, kl		22
16	First year tons of CO ₂ mitigated		183
17	Assumed sustainability, years		10
18	Expected tons of CO₂ mitigated throughout life cycle		1,830