

Sundaram Auto Components Limited, Plastics Division - Hosur

Unit profile:

Sundaram Auto Components Ltd., Plastics Division has its roots in one of the India's most reputed business houses: the US\$ 2 billion TVS group. The company was established in the year 1988 as a captive unit to cater to the group requirements.

Over the years, the company has grown length and breadth and caters to wide customer base and has proved its credentials as a total solution provider for injection moulded plastic components.

SACL – Plastics Division, serves customers from different segments of industry like Automobile (four wheeler, two wheeler), Electrical and Electronics, Home appliances and Sports goods. SACL – Plastics Division continuously focuses on implementing new and innovative technologies in its manufacturing processes to meet ever-increasing customer expectations.

The manufacturing facility is a modern state-of-the-art unit equipped with electronically controlled injection moulding machines supported by auxiliary equipments, CAD/CAM/CAE facilities capable of developing and delivering products with high consistency and accuracy.

SACL- Plastics Division has been consistently growing right from inception from a level of Rs. 20.00 lakhs and closed the last financial year (FY04-05) with a figure of Rs. 65.69 crores of turnover.

2. Energy consumption:

The total cost of energy for the year 2004-05 was Rs. 234.29 Lakhs. Due to our continuous efforts in implementing energy conservation projects, there has been significant reduction in the consumption of energy over the years. The last three years data is as follows:

Description	Units	2002 - 03	2003 - 04	2004 - 05
Annual sales	Rs in Crores	33.49	46.22	65.69
Annual production (Processed output)	Tons	1342	2067	3223
Total energy consumption / annum	Lakhs kWh	24.22	36.42	49.88
Specific energy consumption - Electrical	kWh / Ton	1805.28	1761.72	1547.58
Energy cost as % of total manufacturing cost	Percentage	3.50	3.80	3.50
Compressed air utilisation	CFM / Ton	1350	1141	732

Reduction in specific energy consumption per ton processed in last three years:

Year	Specific energy consumption (kWh / Ton)	Percentage of reduction over 2002-03
2002 - 2003	1805.28	-
2003 - 2004	1761.72	2.41%
2004 - 2005	1547.58	14.27%

Various indicators of energy utilisation are shown in fig 2.1 to 2.4.

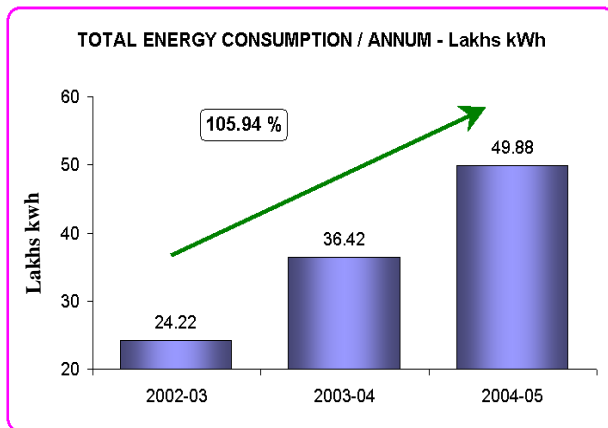


Fig: 2.1

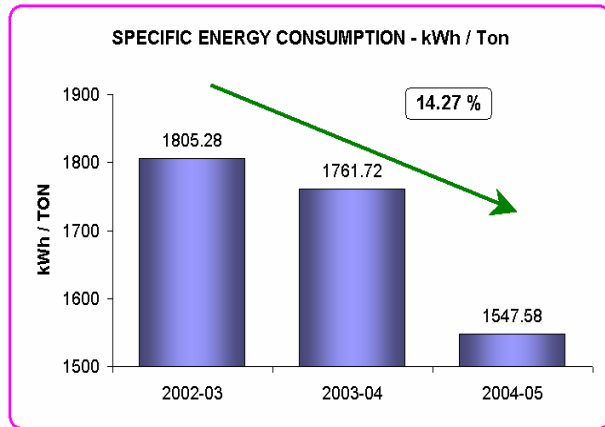


Fig: 2.2

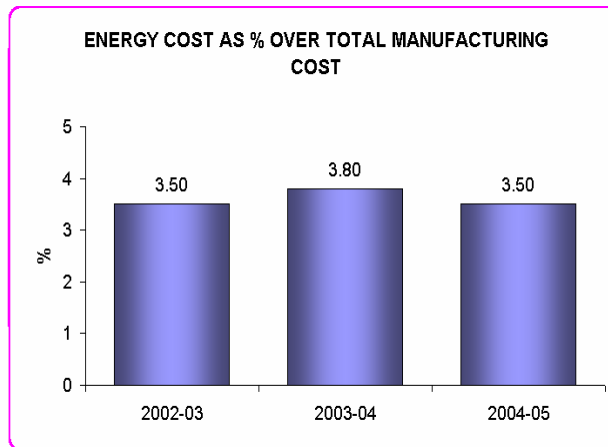


Fig: 2.3

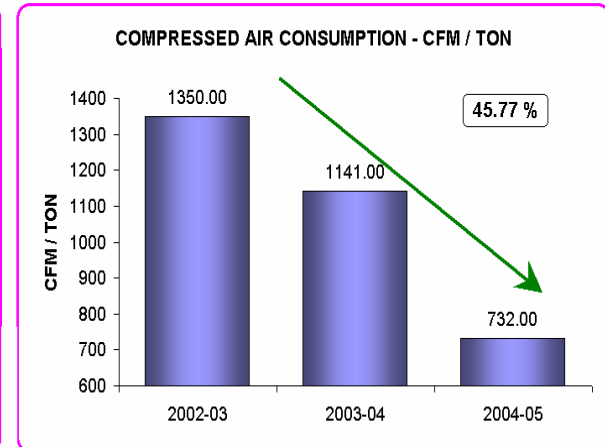


Fig: 2.4

3. Energy conservation commitment, policy and setup:

3.1 Commitment:

SACL – Plastics Division strongly believes in integrating the environment with every sphere of business activity by establishing a clear policy to ensure well being of the employees and the society at large.

Energy conservation is nurtured as a culture at SACL – Plastics Division and forms part of continuous improvement activities initiated towards this commitment.

3.2 Harita Units Environment, Health and Safety Policy:

We at Harita Seating Systems Limited (HSSL), Sundaram Auto Components Limited – Plastics Division (SACL – PD), Sundaram Auto Components Limited – Rubber Division (SACL – RD), and Sundaram Clayton Limited (SCL) located in Harita complex, Belagondapalli, Hosur, are involved in manufacturing of automotive seating systems, engineering rubber components, engineering plastic components and aluminium die casting products respectively.

We are committed to continually improve the environment, health and safety performance by

- ❖ Conservation and/or optimal utilisation of water, oils, energy, compressed air and raw materials such as
 - Polyurethane chemicals, rexine, fabric and epoxy polyester powder by HSSL;
 - Raw rubber and chemical additives by SACL -RD;
 - Plastic granules by SACL - PD and
 - Aluminium and die-coats by SCL.
- ❖ Minimise health and safety risks related to our activities / processes inside the premises.
- ❖ Controlling generation of emissions, effluents, solid wastes and noise.
- ❖ Complying with all applicable legal and other requirements related to Environment, Health and Safety.
- ❖ Training and building awareness on environment, health and safety for all people working for our organisation.
- ❖ Encouraging suppliers and contractors to become environmentally responsible.

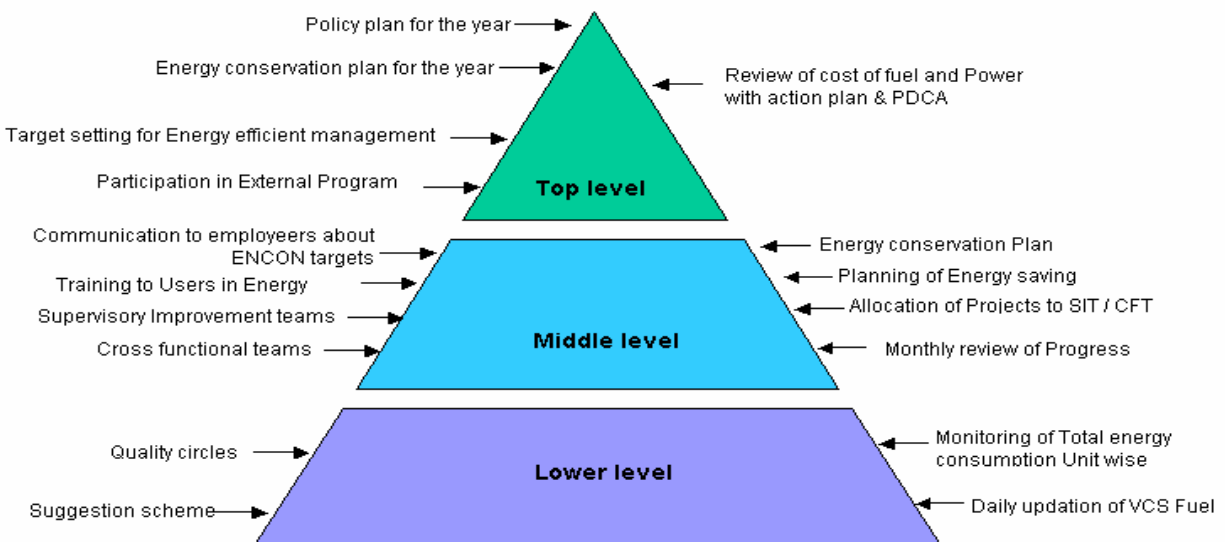
We will communicate this policy to all persons working for our organisation and make available to the public.

3.3 Energy conservation set up:

Working system of energy management

The energy management system works in a systematic and defined approach where the commitment is created across all levels of the organisation.

The energy management systems working at SACL – Plastics Division is shown in the figure below:



4. Energy conservation achievements:

SACL – Plastics Division has been actively initiating new projects towards energy conservation. During last three years, we have completed implementation of 47 projects, which has resulted in cumulative cost saving of RS 46.0 Lakhs. Some of the major energy conservation projects Implemented during the year 2004-05 are listed below:

4.1 Interconnection of cooling water lines:

Before:

- Individual cooling lines for each bays.
- Total connected pump capacity: 90 Hp

After:

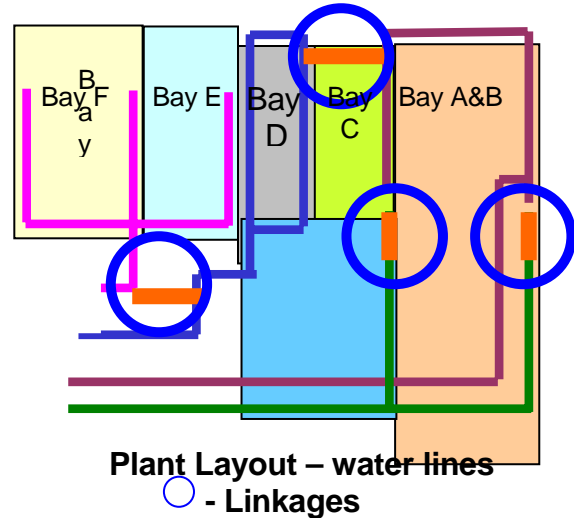
- All cooling lines are inter connected
- Total connected pump capacity: 60 Hp

Results:

- Power saved: 30 Hp
- Energy saved per annum: 1,50,281 kWh
- Cost saving per annum: Rs 7.06 Lakhs.

Investment:

- Interlinking cost: Rs. 30,000
- Pay back period: 16 days.



4.2 Interconnection of Different Water sumps:

Before:

- Individual water sumps for two cooling towers (150TR & 300TR)
- 15hp pumps for tower circulation
- 25hp Fans for cooling

After:

- Inter connected Water sumps
- One Cooling tower (300TR)
- 5 hp pump for tower circulation
- 15hp Fans for cooling

Results:

- Power saved: 20 Hp
- Energy saved per annum: 1,00,181 kWh
- Cost saving per annum: Rs 4.7 Lakhs.

Investment:

- Interlinking cost: Rs. 7,500
- Pay back period: 6 days.



4.3 Modifying the Pump design & Pipe design of entire Utility system:

Before:

- Cold water circulation Pump: 60 hp (Cold water pump: 20hp, 3Nos 70 meters head, 14.33 lps)
- Cooling tower circulation: 5hp (Hot water pump: 5hp, 28 meters head, 14lps)
- Main pipes are 2.5" diameter

After:

- Cold water circulation Pump: 30 hp (Cold water pump: 7.5hp, 4Nos 25 meters head, 17 lps)
- Cooling tower circulation: 3hp (Hot water pump: 3hp, 28 meters head, 14lps)
- Most of the pipes are 4.0" diameter

Results:

- Power saved: 32 Hp
- Energy saved per annum: 1,52,755 kWh
- Cost saving per annum: Rs 7.18 Lakhs.

Investment:

- Interlinking cost: Rs. 95,000
- Pay back period: 52 days

4.4 Pipe line modification in Centralized Chilling plant (27 TR x 2):

Before:

- Evaporator circulation: 2Nos of 5 hp pumps.
- Plant circulation: 2 Nos 20 hp Pumps

After:

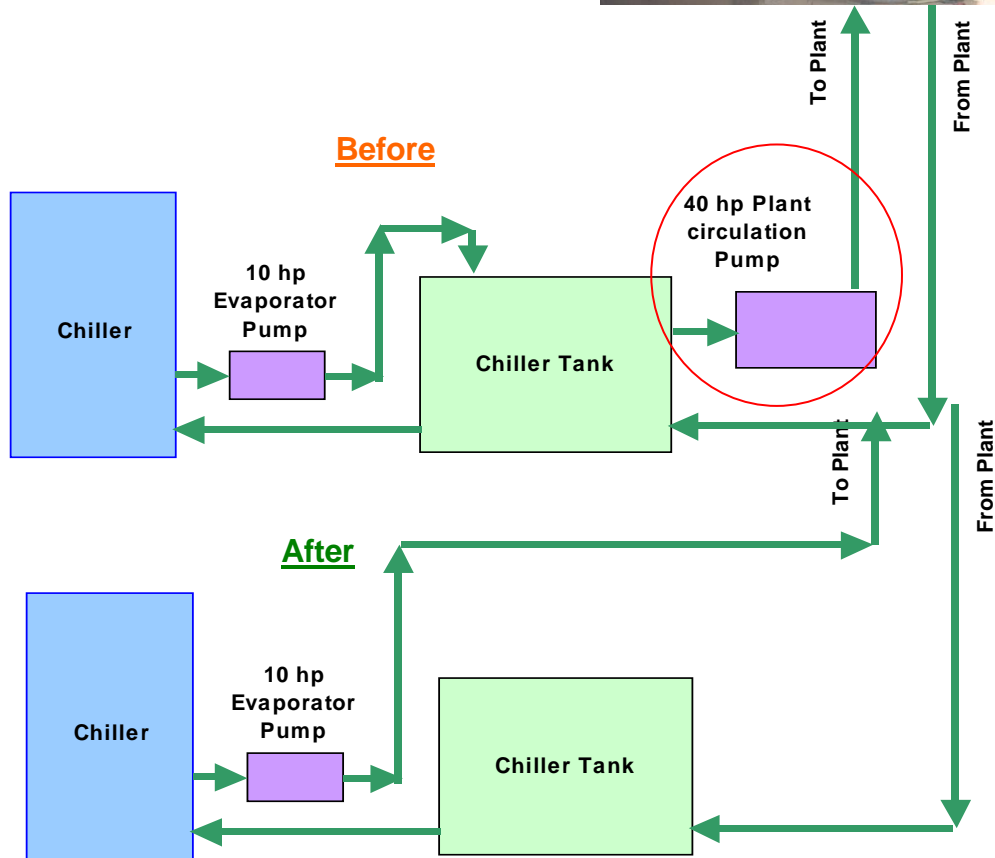
- Evaporator Pump made to circulate the water to Plant by pipeline modification
- Total connected pump capacity: 10 Hp

Results:

- Power saved: 40 Hp
- Energy saved per annum: 2,00,375 kWh
- Cost saving per annum: Rs 9.41 Lakhs.

Investment:

- Interlinking cost: Rs. 4,500
- Pay back period: 1.75 days.



4.5 Elimination of need for additional compressor

Before:

- Air pressure drop during power change.

Initial action proposed: Inclusion of additional Compressor

After:



- Inclusion of additional 1000 liters receiver
- Air leakage arresting at 45 points

Results:

- Power saved: 20 Hp by eliminating the compressor
- Energy saved per annum: 58,934 kWh
- Cost saving per annum: Rs 3.17 Lakhs.

Investment:

- Interlinking cost: Rs. 10,000
- Pay back period: 12 days.

4.6 Providing VFD drive for Injection Moulding machines

Before:

- Fixed displacement pumps
- Total pump load for 3 moulding machines 165 kw

After:

- VFD drive introduced for the Motors

Results:

- Power saved: 22%
- Energy saved per annum: 1,66,000 kWh
- Cost saving per annum: Rs 7.80 Lakhs.

Investment:

- Investment cost: Rs. 6.5 Lakhs
- Pay back period: 260 days.



4.7 Capacitors across the Pump motors of the Injection moulding machines:

Before:

- Capacitor banks across the SSB panels

After:

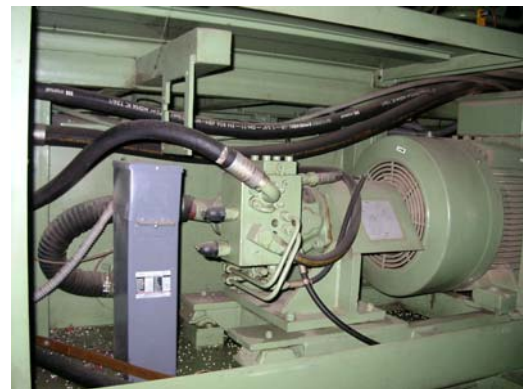
- Individual capacitors across the pump Motors

Results:

- Energy saved per annum: 32,000 kWh`
- Cost saving per annum: Rs 1.50 Lakhs.

Investment:

- Investment cost: Rs. 0.45 Lakhs
- Pay back period: 110 days.



4.7 Utilisation of Rainwater in Cooling tower

Before:

- Water pumped from borewell treated in softening plant
Then pumped to cooling tower

After:

- Rain water Collected in a tank & fed in to
Cooling tower by gravity



- **Results:**
- Energy saved per annum: 8,000 kWh`
- Cost saving per annum: Rs. 0.50 Lakhs.

Investment:

- Investment cost: Rs. 0.05 Lakhs
- Pay back period: 31 days.

5. Energy conservation plans and targets:

5.1 Plan and actual for the year 2004-05:

SI No	Project Description		
		Electricity in Lakhs KWH	Total savings in Rs. Lakhs
1	Energy conservation by providing VFD for motors	1.75	7.88
2	Optimise the water circulation by replacing the pipe line and pump	1.83	8.21
3	Energy saving by providing capacitors for individual motors	0.13	0.58
4	Reduction of Motor capacity of SP 80-II injection moulding machine from 18 KW to 11 kw	0.18	0.83
5	Reduction of Motor capacity of SP 130 injection moulding machine from 30KW to 22 kw	0.20	0.95
6	Pull card switch for Tube lights and fans	0.10	0.45
7	Conversion of Pneumatic screw drivers into electrical screw drivers	0.01	0.05
8	VFD drives for the cranes	0.01	0.05
9	Elimination of Compressed air for newly designed assembly Poka yoke cells	0.02	0.10
10	Replacement of existing tube lights by energy saving electronic control gear tube sets	0.03	0.15
11	Providing larger diameter Nozzle (6 - 8 mm in place of 3 - 5 mm) to reduce the cavity pressure	0.15	0.72
12	Pulse cooling system for Injection moulding machine	0.03	0.15
13	Elimination of compressed air requirement for dehumidifier by purchasing new series of Dehumidifiers (Non return valve, 4/2 valve technology)	0.10	0.45
14	Reduction of cooling time by using Beryllium copper material for Moulds (4 Moulds)	0.16	0.75
15	Utilisation of rain water for cooling tower	0.08	0.50
	Total for the year 2004- 05	4.77	21.82

5.2 Plan and actual for the year 2003-04:

SI No	Project Description	Electricity in Lakhs KWH	Total savings in Rs. Lakhs
1	Optimise process parameters in 20 components to reduce power consumption	1.33	6.26
2	All new machines will be purchased with electronically controlled variable displacement hydraulic pump	0.08	0.35
3	Energy saving by providing capacitors for individual motors	0.40	1.82
4	Provision of Mechanical seals for pumps in place of gland packing	0.01	0.05
5	Elimination of 0.5hp water circulation pump for Grinding machine by pipe line modification	0.01	0.06
6	Elimination of over head tank 2hp pump by linking Bore well pump to the Sintex tank	0.03	0.15
7	Cooling tower fan 15hp Motor Connection change from Delta to Star	0.03	0.15
8	Computers auto switch off when not in use	0.03	0.15
9	Elimination of 0.5hp pump for Regeneration unit pump by quick change system	0.03	0.15
10	Conversion of Zone light control system to independent switch Controlled lights	0.07	0.35
11	Arresting of Air leakages & pipe line modification	0.07	0.35
12	Cooling tower bleeding water utilisation for gardening	0.11	0.50
13	Automatic switching off of Motors in Moulding machines when machine is not in use	0.12	0.55
14	Mould conversion to hot runner system to reduce the power & save raw material	0.27	1.25
15	Redistribution of loads to reduce the Specific fuel consumption of the Genset	-	0.45
16	Replacement of all the Water pipe lines Elbow into Long bend	-	0.45
17	Provision of Machine specific tube lights	0.14	0.65
	Total for the year 2003- 04	2.75	13.69

5.3 Plan and actual for the year 2002-03:

SI No	Project Description	Electricity in Lakhs KWH	Total savings in Rs. Lakhs
1	DT 500, DT 325- 2Nos, DT 150 4 Nos, DT 650 - 2 Nos machines installed with electronically controlled variable displacement hydraulic pump to reduce energy consumption	1.85	7.77
2	Optimised process parameters in 7 components to reduce power consumption	0.12	0.51
3	Provided dosing delay option in SP machines to reduce power consumption	0.05	0.22
4	Provided interlock for 4 auxiliary equipment with machine to switch off the them when machines are switched off	0.01	0.05
5	Provided interlock for cooling pump in 500 and 650 Tons machines with main motor to reduce power consumption	0.07	0.27
6	Reduction of Motor capacity of SP 30 injection moulding machine from 11KW to 7.5 kw	0.09	0.42
7	Auxiliary equipment interlocking with Moulding machines to switch off when machine is switched off	0.01	0.05
8	Reduction of pump intake power by Electrostatic oil cleaner	0.01	0.06
9	Automatic level controller for Over head water pump	0.02	0.08
11	LED indicators for panels	0.05	0.25
12	Alternate switch On / off of the Street lights during peak time	0.05	0.25
13	Interlock for cooling pump in DT 500 & DT 650 series moulding machines with main motors to reduce power consumption	0.07	0.27
14	Automatic shut off valves for machine cooling circuit	0.07	0.32
15	Automatic switch On / off of the Street lights	0.07	0.35
Total for the year 2002- 03		2.55	10.88

The total cumulative saving for the last three years is

1. Electricity: 9.99 Lakhs kWh
2. Cost: Rs. 45.89 Lakhs

5.4 Plan and actual for the year 2005-06:

SI No	Energy Conservation Plan for 2005-06	Savings Expected		Approximate Investment Planned (Rs. Lakhs)
		Energy value in KWH	Rs. Lakhs	
1	VFD drive for Injection Moulding machine	287234	13.50	16.5
2	Cooling tower Fan switching control based on temperature	10638	0.50	0.35
3	Control of Cooling water system based on pressure controlling	13830	0.65	0.65
4	Replacing existing Cooling water pumps by high efficiency pumps	23868	1.12	1.2
5	Chiller pump replacement by high efficiency pump	9547	0.45	0.6
6	Energy conservation by Process fine tuning for 20 components	15000	0.71	
7	Increasing productivity to reduce machine idle loss for 25 components	10000	0.47	0.5
8	Elimination of need for compressed air by procuring new series Dehumidifier	-	0.25	-
9	Provision of Harmonic filter to get savings on demand charges & reducing losses	145000	6.82	18
	Total	5.15	24.46	37.8

Schematic diagram of the production process in our unit

