



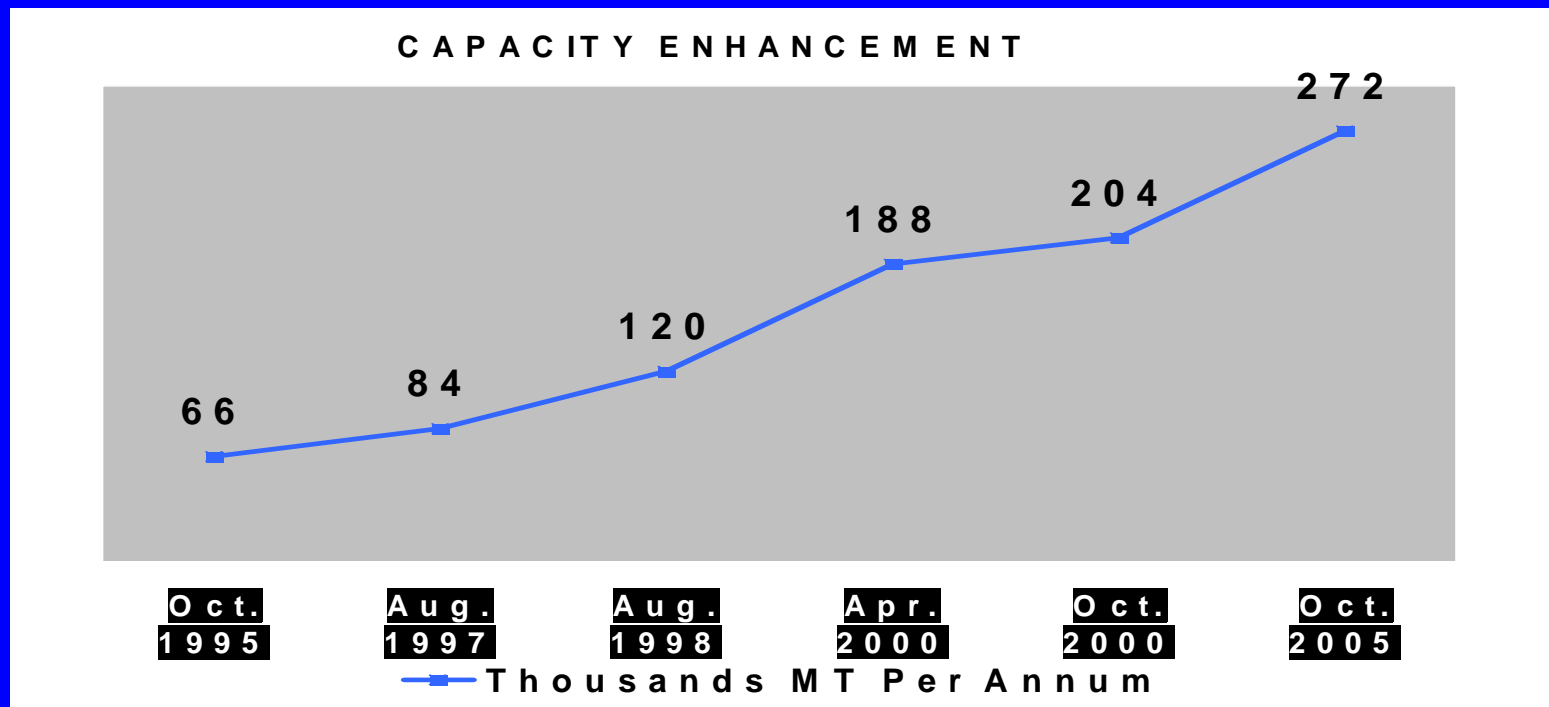
SUPREME PETROCHEM LTD.

Welcomes you ...



THE GROWTH STORY

- 1) Commercial production started in October, 1995.
- 2) Initial capital outlay of Rs. 151.64 Crores with installed capacity of 66000 MTA of polystyrene was enhanced to 272,000 MTA with capital outlay of Rs. 375 Crores
- 3) Stages of Capacity enhancement.



- Largest producer of Polystyrene in India with an installed capacity of 272,000 MTA
- Market leaders in Polystyrene business in India.
- Global presence with export of almost 50% of the product to about 85 different countries across the world.
- Recipient of “ Business Leader of the Year - Petrochemical ” award of Chemtech foundation for the year 2005.



QUALITY LEADERSHIP.....

ALL OUR BUSINESS OPERATIONS ARE GUIDED BY FOLLOWING FOUR POLICIES:

- QUALITY POLICY
- HEALTH & SAFETY POLICY
- ENVIRONMENTAL MANAGEMENT POLICY
- ENERGY MANAGEMENT POLICY



Quality Leadership

Sr. No.	Certifications / Awards since commencement of Commercial Production in October 1995	Year
1	Second Prize Winner- Petrochemical Sector. at the competition for “State Level Award for Excellence in Energy Conservation & Management “for the Year 2004	2006
2	“Shreshta Suraksha Puraskar -2005 “ by National Safety Council	2005
3	Runners up in the competition for “Best Responsible Care Committed Company “ held by ICMA ,Mumbai.	2005
4	First Prize Winner- Petrochemical Sector. at the competition for “State Level Award for Excellence in Energy Conservation & Management “for the Year 2004	2005
5	Greentech Environment Excellence Award -2005	2005
6	Occupational Health & Safety Management System OHSAS 18001 : 1999 by BVQI	2003
7	Quality Management System, ISO 9001:2000 by BVQI	1999
8	Environment Management System, ISO 14001 : 1996 by DNV	1998
9	5 Star rating by British Safety Council, UK for excellence in Occupational Health & Safety.	1997



Energy Conservation -- a Business Objective

Sustainable Business Growth & Environment Protection, by effective management of all natural resources including Energy is an integral part of our business model of achieving Leadership in an increasingly competitive global business environment.

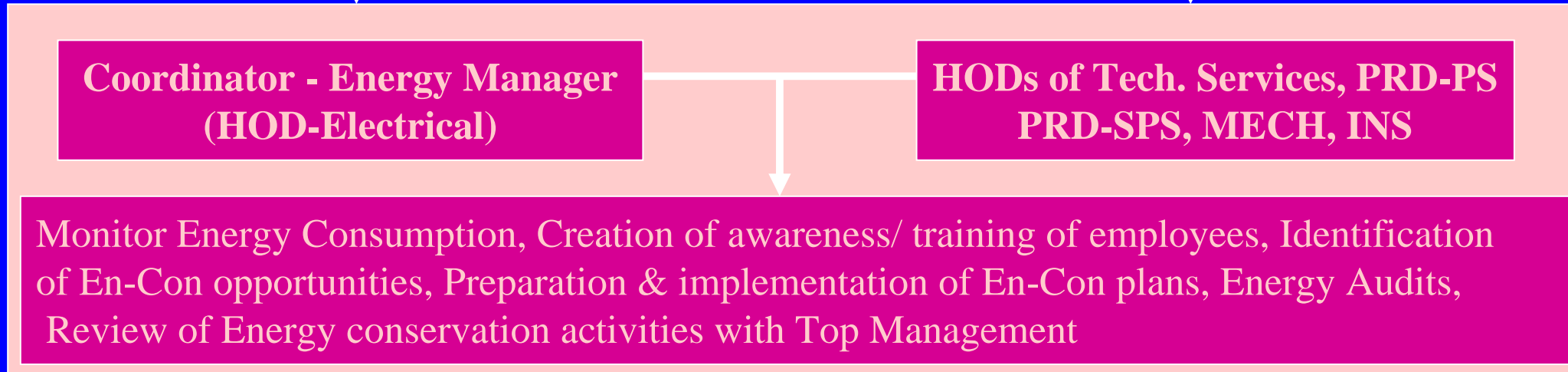
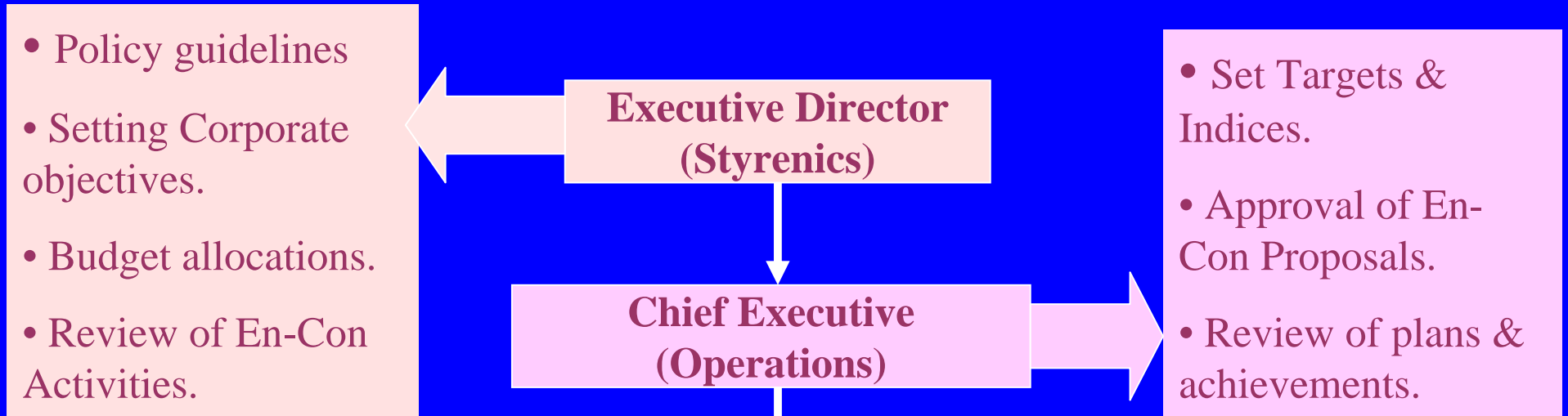


MANAGEMENT OF ENERGY CONSERVATION PLANS

At Supreme Petrochem Ltd , Energy Conservation plans are always considered as important aspect of its overall strategy to remain globally competitive. In order to manage energy conservation activities in a systematic manner, our organization has set up a Energy Conservation Cell headed by our Executive Director (Styrenics).
Organizational management setup of EC cell is ...



Organizational Setup For Energy Management





MANAGEMENT OF ENERGY CONSERVATION PLANS

Energy Conservation is planned in four phases

1) Energy Audits : By team of engineers from various departments.

➤ Energy audit of each plant twice a year.

➤ Identification of areas for improvement with respect to energy conservation & also equipment which are causing production constraints for capacity building.

2) Feasibility studies : Preparation of feasibility reports of proposals identified during Energy audits, Case histories of successful energy conservation measures implemented by other organizations, Suggestions received from operating & technical personnel.

3) Employee Participation : By imparting training & refresher training, Suggestion schemes, Creating awareness.

4) Management Review : Review of En-Con proposals implemented, progress of En-Con proposals being implemented, Set Indices & targets achieved, Resource requirements.



Energy Conservation Target setting & Monitoring

Target Setting :

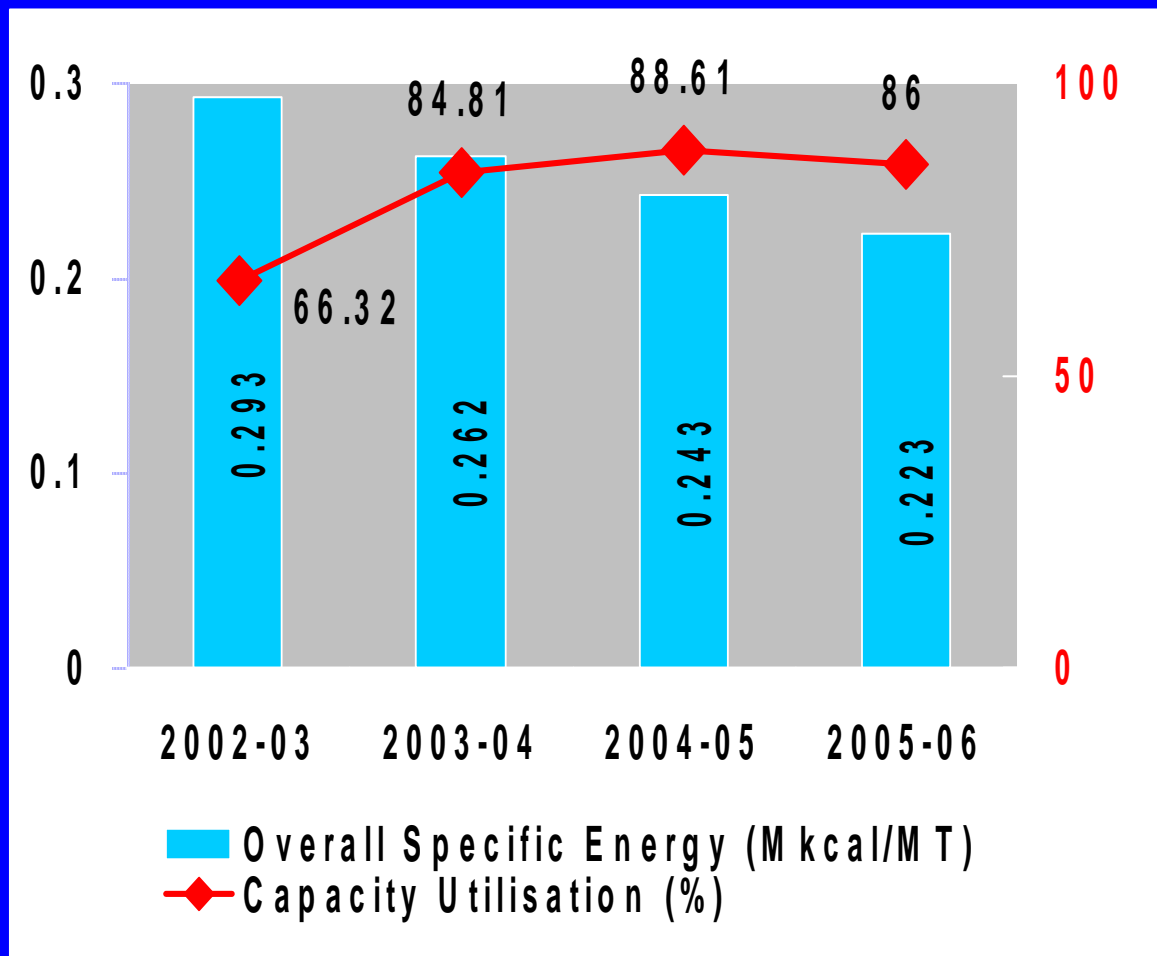
Energy conservation targets are set by obtaining inputs from Energy Audits , monitoring power consumption of major equipment on weekly basis , benchmarking data , investment required , energy saving potential etc.

Monitoring :

- 1) Once targets are set , a detailed Energy Management Programme is prepared specifying action(s) to be taken , person(s) responsible for taking action , planned completion date , review frequency to monitor the progress of the EMP
- 2) Every month progress of the EMPs is reviewed by Top Management.
- 3) After completion of the EMP , a close out report is prepared specifying actual energy Saving achieved versus estimated energy saving & further action needed if any.
- 4) Similarly all the operating area personnel are made aware of & trained about the implemented EMP , various parameters to be monitored to continue effectiveness of the Implemented EMP.
- 5) Effectiveness of the implemented EMP is checked during half yearly Energy audits.



Reduction in Overall Specific Energy Consumption

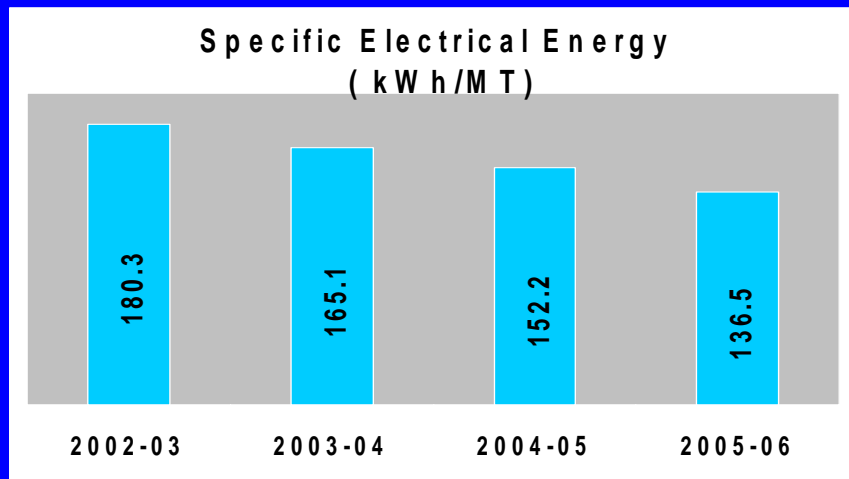


**17.06 %
Reduction in
Overall Energy
Consumption
over year 2002 –
03**

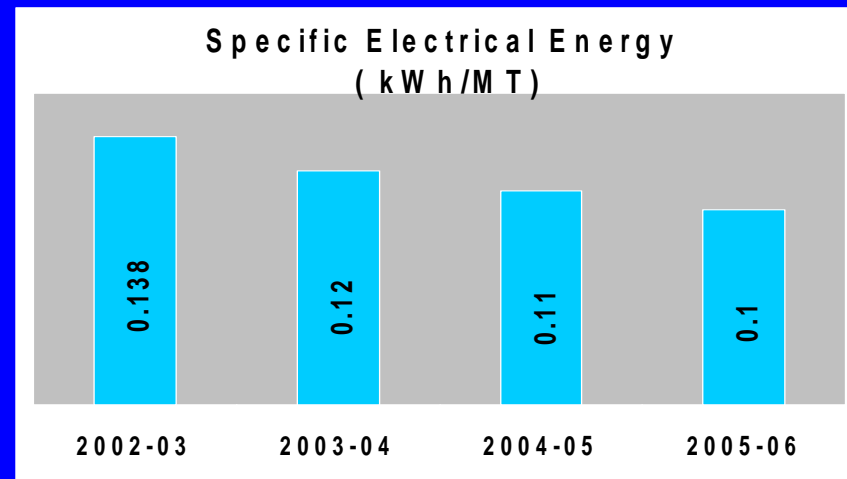


Reduction in Specific Electrical & Thermal Energy

Reduction in Electrical Energy by 15.6 %



Reduction in Thermal Energy by 18.4 %



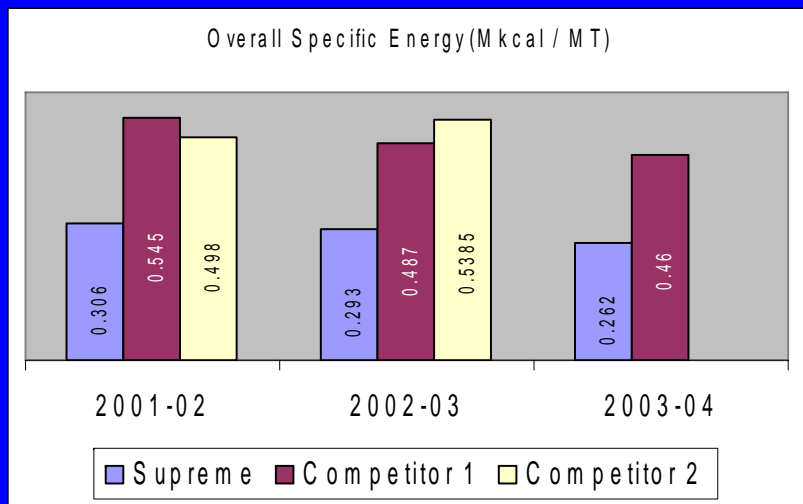
Reduction in Specific Electrical & Thermal Energy

Year	Product	kWh/MT	% Reduction over 2002-03	Mkcal/MT	% Reduction over 2002-03
2002-03	Polystyrene	180.33	-	0.138	-
2003-04	Polystyrene	165.05	8.473	0.1202	13.224
2004-05	Polystyrene	152.2	15.599	0.1126	18.4
2005-06 (till date)	Polystyrene	136.5	-	0.107	-



NATIONAL BENCHMARKING

Lowest Specific Energy Consumption in Polystyrene Business at National Level



Overall Specific Energy - Mkcal per MT

Year	Supreme	Competitor 1	Competitor 2
2001-02	0.306	0.545	0.498
2002-03	0.293	0.487	0.5385
2003-04	0.262	0.46	NA
2004-05	0.245	NA	NA

N A : Data Not Available

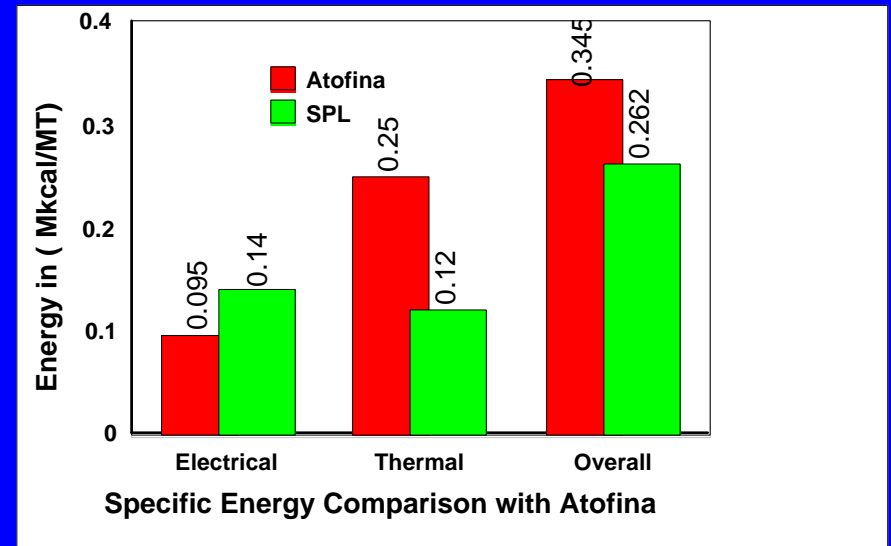
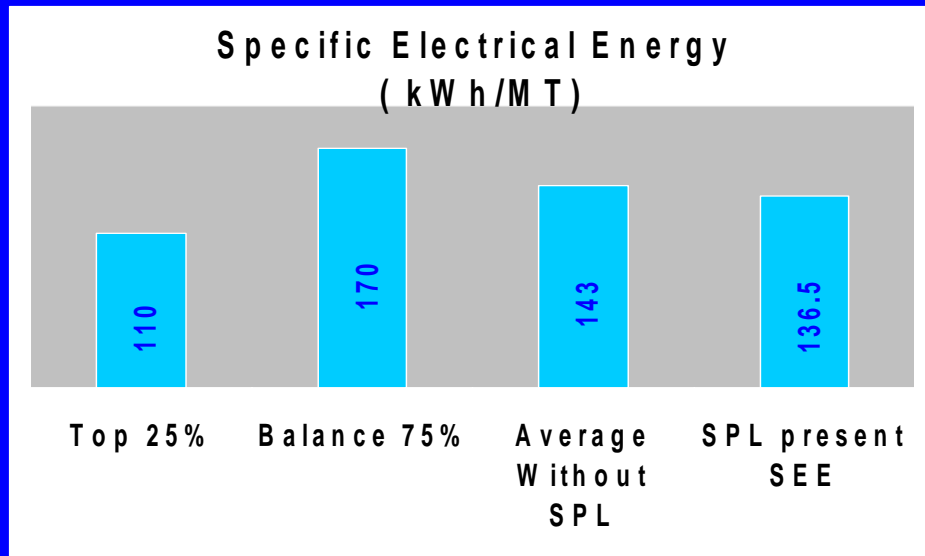
Our Specific Energy Consumption is lower by 43% in comparison to our competitor

Source :BEE Website



INTERNATIONAL BENCHMARKING

:Our organization carried out benchmarking of various business aspects with the help of M/S Phillip Townsend Inc. USA amongst major Asian Polystyrene Manufacturers .Specific Energy consumption was one of the business aspect. (Data Pertains to year 2004-2005)

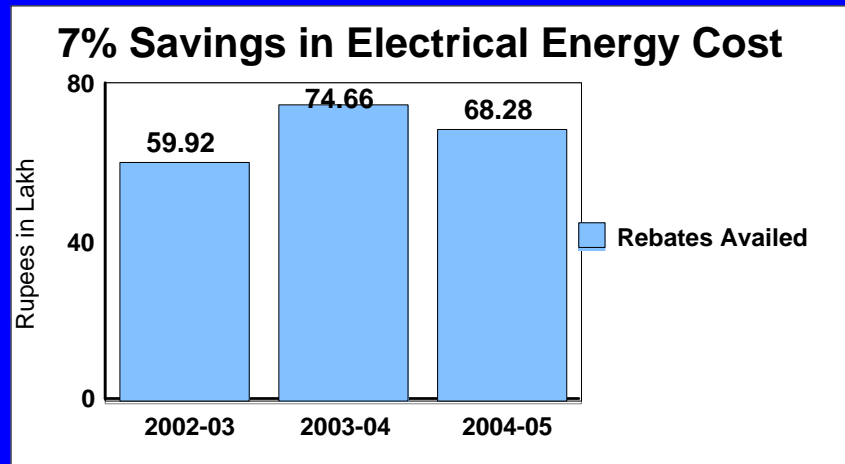
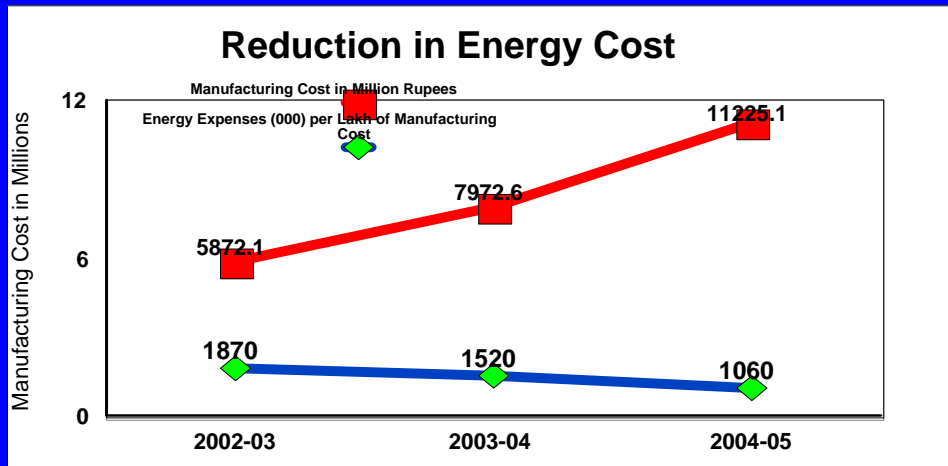


➤ Our Specific Electrical Energy Consumption is 136.5 kWh/MT as against Best Performance of 110 kWh /MT amongst polystyrene manufacturers across asian region.

➤ Our overall specific energy consumption is 24 % lower than M/S Atofina who are one of the major Polystyrene manufacturer having approximately 1 million MTPA manufacturing capacity.(This data is published by CMAI ,USA for the year 2003)



Reduction in Energy Cost

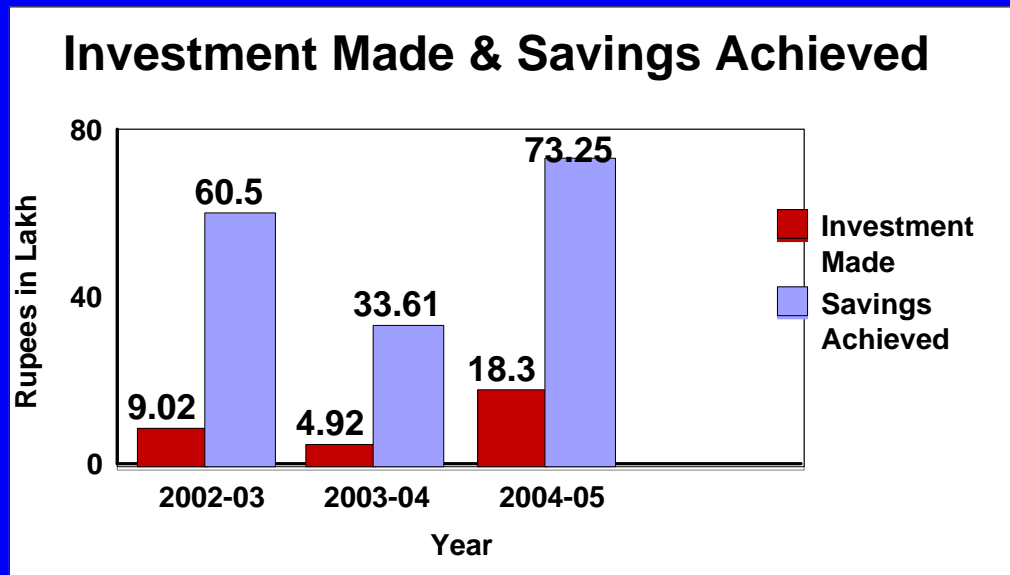


Description	Unit	2002-03	2003-04	2004-05	Total
Manufacturing Cost	Rs. Lakh	58721	79726	112251	250698
Electrical energy Consumption	Lakh kWh	258.51	300.21	289.3	848.02
Thermal Energy Consumption	Mkcal	18742.5	20798.46	20398.81	59939.77
Total Energy Bill	Rs. Lakh	1098.1	1211.85	1189.87	3499.82
Energy Expenses per Lakh of Manufacturing Expenses	Rupees	1870	1520	1060	
Energy Expenses as % of Manufacturing Cost	%	1.87	1.52	1.06	
Reduction in Energy expenses compared to previous year	Rs. Lakh	-	279.04	516.35	795.39

Total savings in Electricity Bill Rs. 202 Lakh during last three years.



Investment Made & Savings Achieved



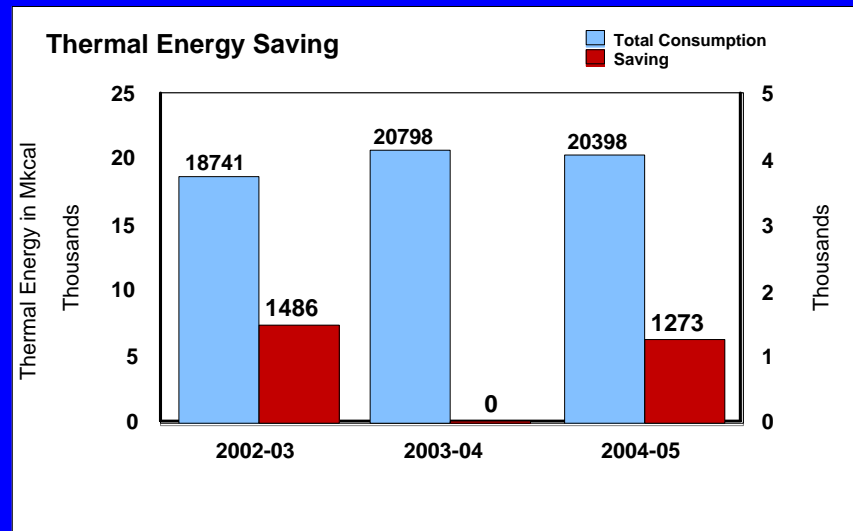
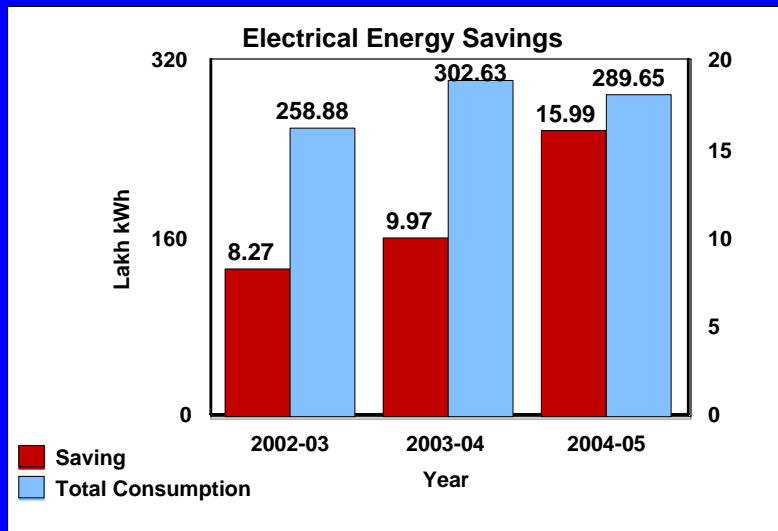
Savings of Rs. 167.36 lakh with an investment of Rs.32.24 lakh in last 3 years

ENERGY SAVINGS ACHIEVED & INVESTMENT MADE

YEAR	No. of Measures Implemented	Investment Made (Rs. Lakh)	Savings Achieved Rs. Lakh/Year	Energy Cost Rs. Lakh/Year	% Savings of Energy Cost
2002-03	11	9.02	60.5	1098.06	5.51
2003-04	9	4.92	33.61	1211.81	2.77
2004-05	10	18.3	73.25	1189.87	6.15



Absolute Energy Savings



Energy Savings
Electrical =
34.23 Lakh kWh

Thermal =
2760.17 Mkcal

ABSOLUTE ENERGY SAVINGS IN LAST THREE YEARS						
Year	Electrical Savings Lakh kWh	Thermal (Fuel) Savings Mkcal	Electrical Consumption Lakh kWh	Thermal (fuel) Consumption Mkcal	% Elect. Saving	% Thermal (Fuel) Saving
2002-03	8.27	1486.40	258.8867	18741.75	3.19	7.93
2003-04	9.97	0	302.63	20798.5	3.29	0
2004-05	15.99	1273.77	289.64	20398.8	5.52	6.24
Total	34.23	2760.17	851.2	59939	4.02	4.6

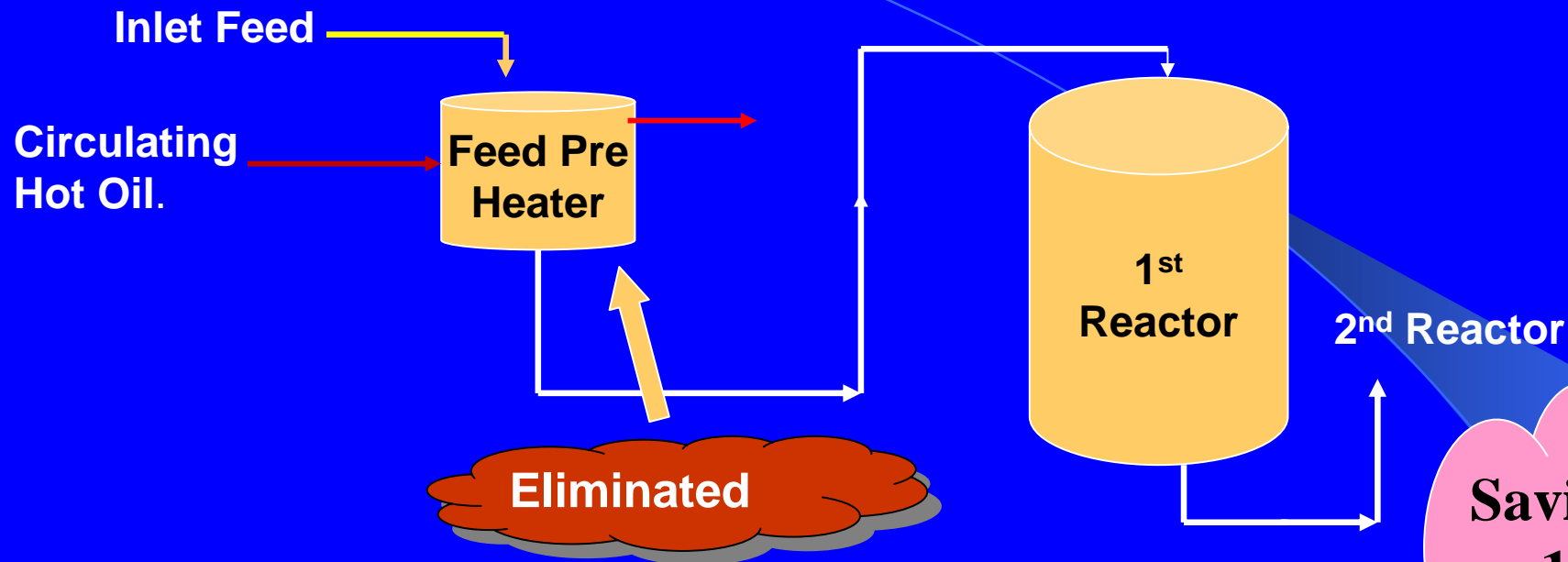


ENERGY CONSERVATION

CASE STUDIES



Elimination of “Feed Preheater “ by utilising “Heat of Reaction “ For feed Preheating in GPPS Production



**Savings of
1140
Mkcal &
Rs.10.15
Lakhs per
Year**

	Before Implementation	After Implementation
FO Consumption per MT of PS	2.28 Kg/ MT	Nil
FO saved for Average GPPS production of 50000 MT/ Annum	Nil	114 MT
Savings Rs per Annum	Nil	1015740

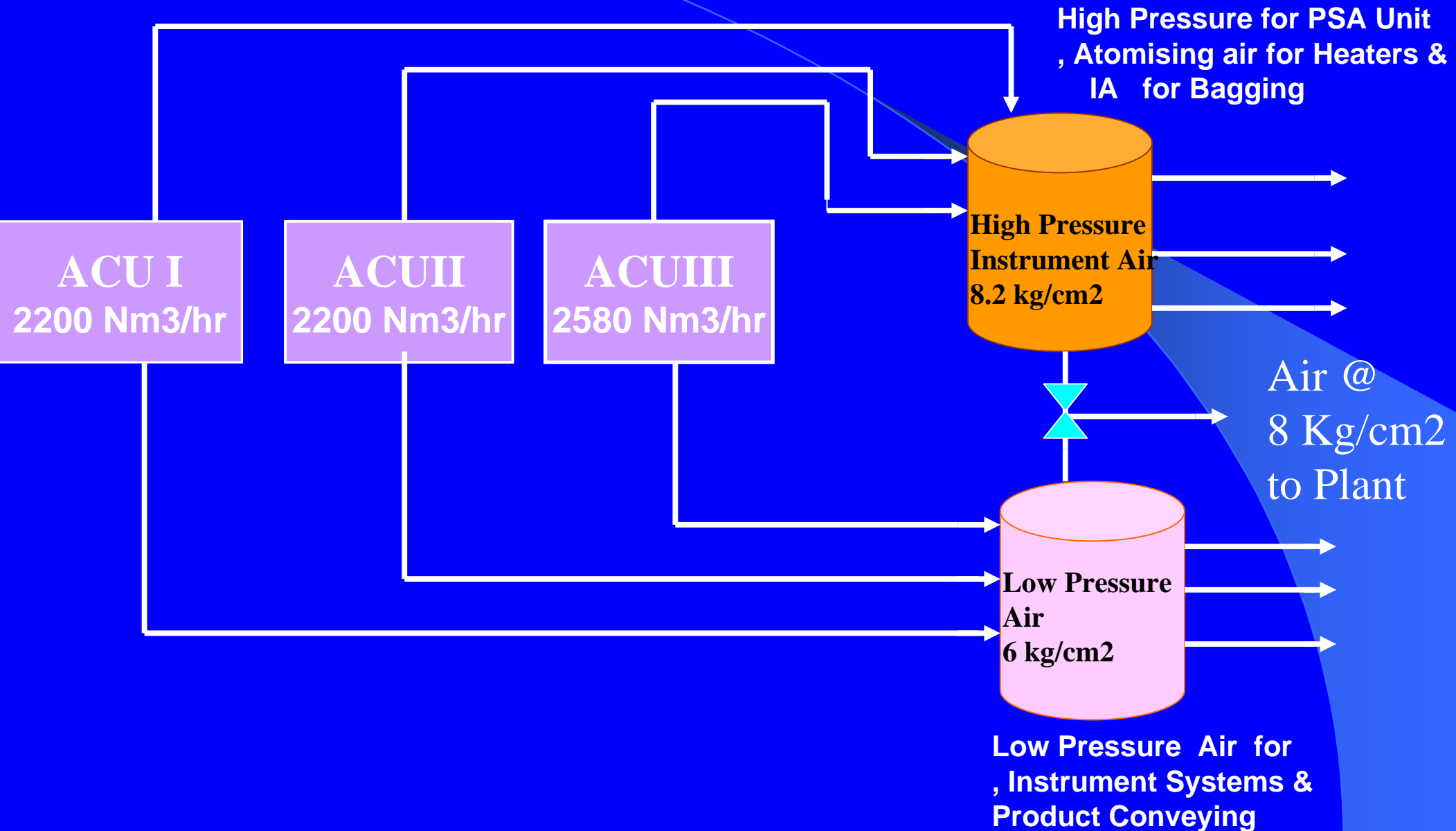


Utilization of Hydrocarbon Waste(Purge) from Main Plant used as Fuel for Hot oil Heaters by modification of Burner system to fire heater with Furnace oil as well as with PS Purge.

Year	2002-03	2003-04	2004-05
Quantity of Purge used as fuel (KL)	772.77	307.8	483.82
Cost of Purge fuel (Rs. / KL)	2000	2000	2000
Cost of FO (Rs. / KL)	8400	9990	9899
Differential cost (Rs.)	6400	7990	7899
Net Savings (Rs.)	4945728	2459322	3821694.2

**Saving of Rs. 1.122
Crores in last 3 years**

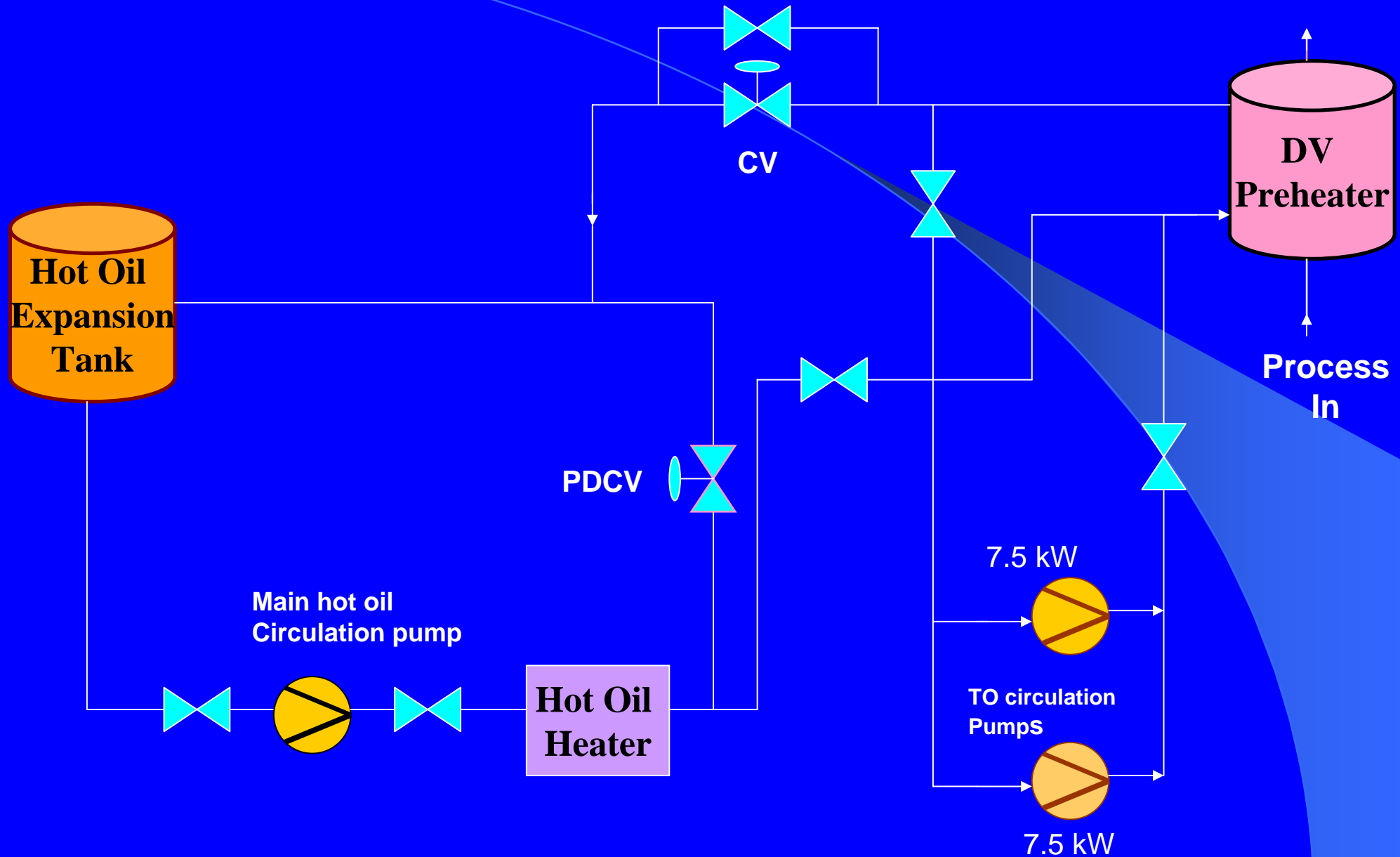
Optimisation of Compressed Air Pressure



Air Consumer	Flow Nm ³ /hr	Pressure Before optimisation	Pressure after optimisation	% Total Air Required	Energy saved after optimisation
Air required for product conveying & Instrumentation	2200	8 kg/cm ²	6 kg/cm ²	61%	14 kWh per kg/cm ² reduction in pressure
Air Required for N ₂ PSA unit	1000	8 kg/cm ²	8 kg/cm ²	27.8%	
Air for thermic fluid heater atomisation	200	8 kg/cm ²	8 kg/cm ²	5.55%	
Instrument air for Bagging machines	200	8 kg/cm ²	8 kg/cm ²	5.55%	
Total Air	3600				

- Total Energy Saving per Annum: 2.10 lakh kWh
- Monetary Saving per annum : Rs.7.10 Lakh
- Investment Made : Rs. 1.62 Lakh , Payback period :3 Months

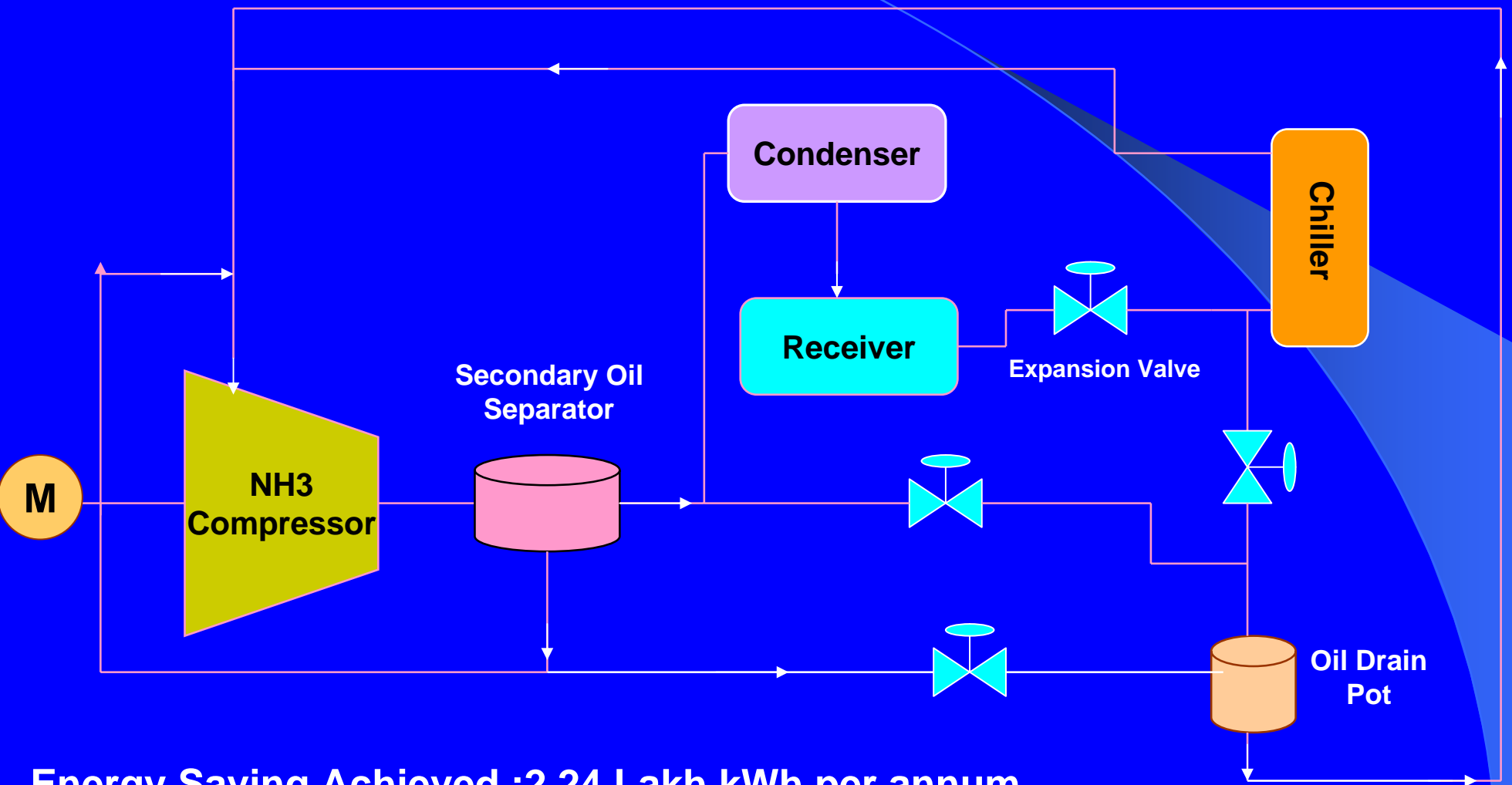
Deletion of Tempered Oil Circulation Loop for DV Preheater



Details of Savings

Description	Unit	Savings Achieved
Saving in electrical energy for 6 nos. of 7.5 kW pumps	kWh	33
Elimination of heat loss through circulating cooling water through the pumps	Kcal/hr	18000
Elimination of heat loss through TO loop	Kcal/hr	45000
Elimination of steam required for pump seal quenching	Kcal/hr	22000
Total Electrical Energy Saving per Annum	kWh	2.74 Lakh
Total Thermal Energy Saving per Annum	Mkcal	705
Total Monetary Saving per annum	Rupees	16 Lakh

Efficiency Improvement of Refrigeration System by Modifying Oil Draining System



Energy Saving Achieved :2.24 Lakh kWh per annum
Monetary saving :7.48 Lakh Rupees

Efficiency Improvement of Air Compressor Units (Screw Compressors)

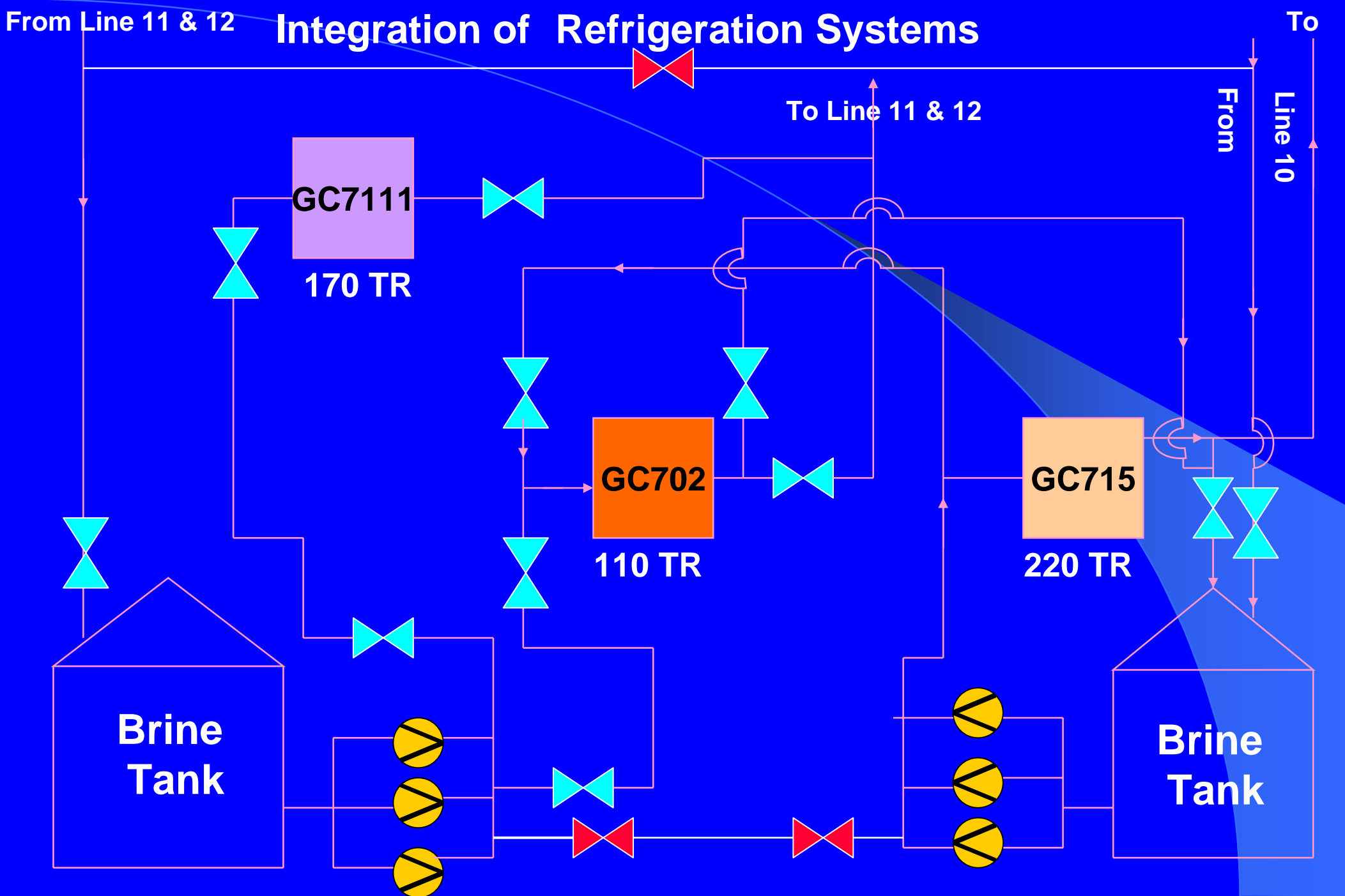
During one of the Energy audit , it was noticed that air compressor units are drawing higher power & delivering less FAD than the design figures. As can be seen from the table below ,efficiency of the compressors was deteriorated by almost

Compressor Unit	Performance Parameter	Design	Actual observed	% deterioration in efficiency
Compressor Unit no.3	FAD	2580 Nm ³ /hr	2300 Nm ³ /hr	
	Power Drawn	258 kW	296 kW	
	Power Consumption	0.1 kW/Nm ³	0.12 kW/Nm ³	20%
Compressor unit no.2	FAD	2200 Nm ³ /hr	1600 Nm ³ /hr	
	Power Drawn	220 kW	270 kW	
	Power Consumption	0.1 kW/Nm ³	0.17 kW/Nm ³	70%

After through study of the system & discussion with compressor manufacturer, it was concluded that deterioration in efficiency is due to deterioration in performance of compressor screw elements. Hence compressor screw elements were replaced for one compressor & after observing the performance of the compressor for six months , screw elements of other compressor were also replaced with new one.

Performance of the compressors after replacement of screw elements

Compressor Unit	Performance Parameter	Before Screw replacement	After Screw replacement	Efficiency Improvement
Compressor Unit no.3	FAD	2300 Nm ³ /hr	2470 Nm ³ /hr	Increase in FAD by 170 Nm ³ /hr
	Power Drawn	296 kW	265 kW	Reduction in power by 31 kW
	Power Consumption	0.12 KW/Nm ³	0.107kW/Nm ³	
Compressor unit no.1	FAD	1600 Nm ³ /hr	2150 Nm ³ /hr	Increase in FAD by 550 Nm ³ /hr
	Power Drawn	270 kW	240 kW	Reduction in power by 30 kW
	Power Consumption	0.17 kW/Nm ³	0.11kW/Nm ³	



No. of units running before integration of system :03 Nos.

Available TR capacity :490 TR

Total required TR capacity for average daily production of 705 MT :390 TR

Unit No.	TR Capacity	Unit Running status	Loading of unit before integration	Specific Energy Consumption
GC711	170	Yes	100%	1.65 kWh/TR
GC702	100	Yes	100%	1.94 kWh/TR
GC715	220	Yes	56%	1.4 kWh/TR

After Integration

Unit No.	TR Capacity	Unit Running status	Loading of unit after integration	Specific Energy Consumption	Energy Saving
GC711	170	Yes	100%	1.65 kWh/TR	0.5 kWh/TR Total Energy Saving for 100 TR=1200 kWh/day
GC702	100	No	Spare		
GC715	220	Yes	100 %	1.4 kWh/TR	

Various other energy conservation measures implemented

Sr.No.	Project Description	Electrical Energy Saved Lakh kWh	Thermal Energy saved MKcal	Total Monetary Savings	Investment incurred
1	Optimisation of chilled brine circulation system	0.99		3.50	0
2	Provision of VFDs for combustion air blowers , die fume exhaust blowers in pelletiser section & in SPS plant , cooling tower fan etc.	5.58		19.01	8.13
3	Shifting of safety shower header from drinking water header to proces water header	0.91		3.23	0
4	Bypassing 1 st prepoly reactor during GPPS production in line 10/12	2.14		7.59	0
5	Use of common styrene charge pump for two production lines instead of two separate pumps for each line	1.76		6.22	0
6	Running of boiler tank make up water pump as per level	0.13		0.48	0
7	Optimisation of lighting energy	1.56		5.3	0

Sr.No.	Project Description	Electrical Energy Saved Lakh kWh	Thermal Energy saved MKcal	Total Monetary Savings	Investment incurred
8	Provision of automatic timer based system for product conveying in SPS plant	0.82		2.92	0.10
9	Simultaneous use of two rubber dissolvers without use of gorator	1.21		4.08	
10	Optimisation of agitator rpm for one of the reactor in line 12 plant	1.27		4.28	0
11	Optimisation of screen changer heating system	0.70		2.34	0
12	Optimisation of MP steam required for furnace oil tank heating		963.90	14.99	0
13	Reduction of losses through spare thermic fluid heater which is normally kept on warm up		309.87	4.82	0
14	Optimisation of chilled brine temperature for -15°C refrigeration systems	3.63	12.12		0
15	Integration of -15°C refrigeration systems	5.79		23.16	2
16	Optimisation of cooling water system for Cooling tower no.2	6.81		27.24	0

Thank You



Energy Management Policy

Supreme Petrochem Limited will endeavour it's utmost & commits necessary resources to –

- Achieve leadership in an increasingly competitive business environment by striving to be the lowest specific energy consumer in the industry it operates.
- Establishment of appropriate Energy management system.
- Training & Involvement of employees in the field of energy conservation.
- Identification, implementation & monitoring of specific energy management plans for conservation of energy & reduction in cost of energy.
- Periodic management review of the energy conservation programs.

N. GOPAL

Executive Director (Styrenics)

January 1st, 2002