CASTROL INDIA LIMITED
Patalganga Plant, Dist. Raigad, (Maharashtra).

Unit Profile

Patalganga Plant of Castrol India Limited, one of the flagship lubricants blending and filling unit is situated at Patalganga Industrial Area, in Raigad District, approx. 60 kms from Mumbai in Maharashtra State. The plant manufactures Automotive and Industrial lubricants, Brake Fluids and Coolants .

The plant produces about 36 % of automotive lubricants volume of Castrol India . The plant is the only unit of Castrol India which has the high temperature Viscosity improver(intermediate) dissolution operation.

This Viscosity improver is being supplied to other Castrol India plants and this being a energy intensive operation is being continued at Patalganga plant due to the high energy efficiencies exhibited in this process by the plant .

The Plant is ISO 9001-2000 and ISO 14001-2004, OHSAS Certified. This Plant is a part of the global Lubricants Supply Chain business of BP Group, with unique Quality, HSSE and Environmental Policies.

20(ii) Energy Consumption & trends from 2001- 2007
Major focus on energy conservation was initiated since end 2001 & there has been continuous & major improvements during the last 6 years , highlights of which is detailed below:

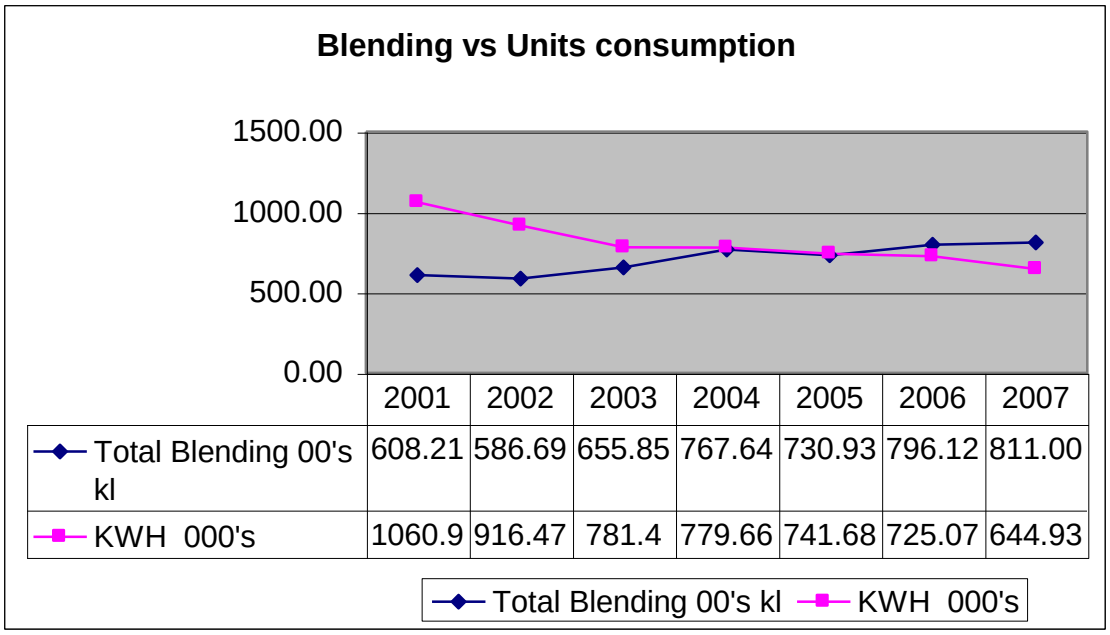
Energy Consumption details	Unit	2001	2002	2003	2004	2005	2006	2007	%change 06 vs 07
Blending(Auto +Industrial)	kl	52266	50311	54998	66362	62497	67864	70225	2.5%
Blending - Intermediates	kl	6787	8358	10587	10402	10596	11748	10875	-7.4%
Total Blending	kl	60821	58669	65585	76764	73093	79612	81100	1.9%
Absolute Electricity consumption	KWH	1060929	916471	781399	779659	741682	725070	644933	-11.1%
Specific electricity consumption	**kwh/kl**	**17.44**	**15.62**	**11.91**	**10.16**	**10.15**	**9.11**	**7.95**	**-12.7%**
Total Furnace oil	Ltrs	255141	227034	195460	206148	204742	227030	222700	-1.9%
Sp fuel consumption	**Ltrs/kl**	**4.19**	**3.87**	**2.98**	**2.69**	**2.80**	**2.85**	**2.74**	**-3.8%**
Average Maximum Demand	**Kvah**	**405**	**364**	**313**	**329**	**321**	**290**	**277**	**-4.5%**

Despite 33% increase in Production since 2001- 2007

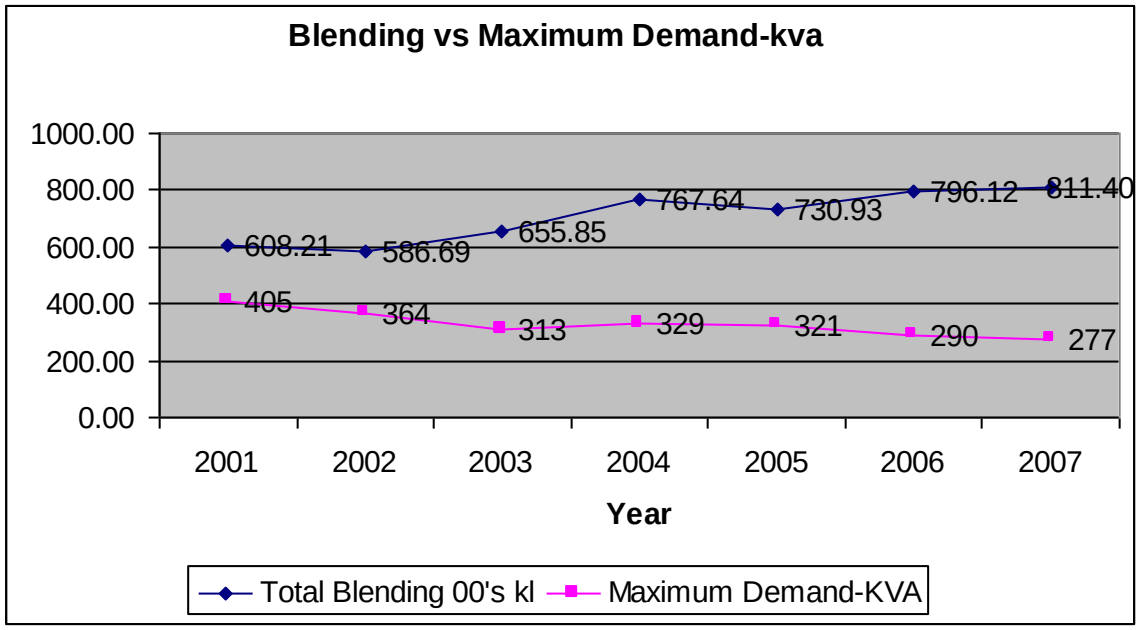
- Absolute electricity consumption reduced by 39 % from 10.61 to 6.45 kwh
- Specific Electricity Consumption reduced by 54% from 17.44 to 7.95 kwh/kl
- Maximum Demand reduced by 32% from 405 to 277 kva
- Specific fuel consumption for Automotive blends reduced by 34.6% from 4.19 to 2.74 ltrs/kl.

Despite 1.9% increase in Production from 2006-2007

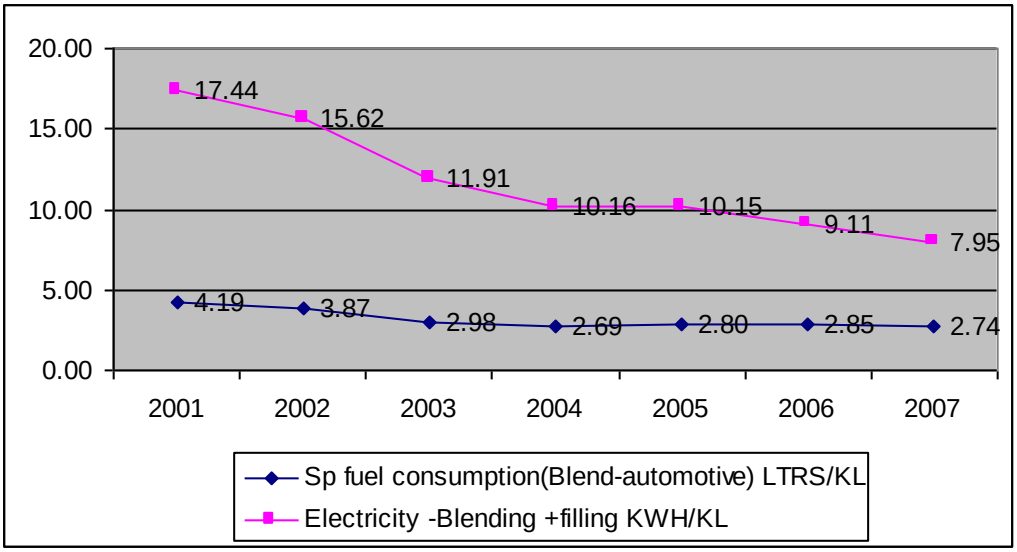
- Absolute electricity consumption reduced 11% from 7.25 to 6.45 kwh
- Specific Electricity Consumption reduced by 12.7% from 9.11 to 7.95 kwh/kl
- Maximum Demand reduced by 4.5% from 290 to 277 kva due to load optimization &elimination of high power motors
- Reduction in batch cycle time, maintenance cost and higher performance reliability.
- Compliance of environmental management system requirements as committed in Environmental Policy



As can be seen from graph above ,despite production rising year on year(33% since 2001) the absolute electricity consumption has come down drastically (39% since 2001)



As can be seen from graph above ,despite production rising year on year(33% since 2001) the Maximum demand(MD) has come down drastically (32% since 2001)



As can be seen from graph above , electricity consumption (blending+ filling)has reduced by 35% and Specific fuel consumption for automotive blends has come down from 4.19 to 2.74 since 2001.

The Patalganga plant continues to focus over the years towards energy savings as can be seen above , thereby actively contributing to the National initiative of Energy Conservation.

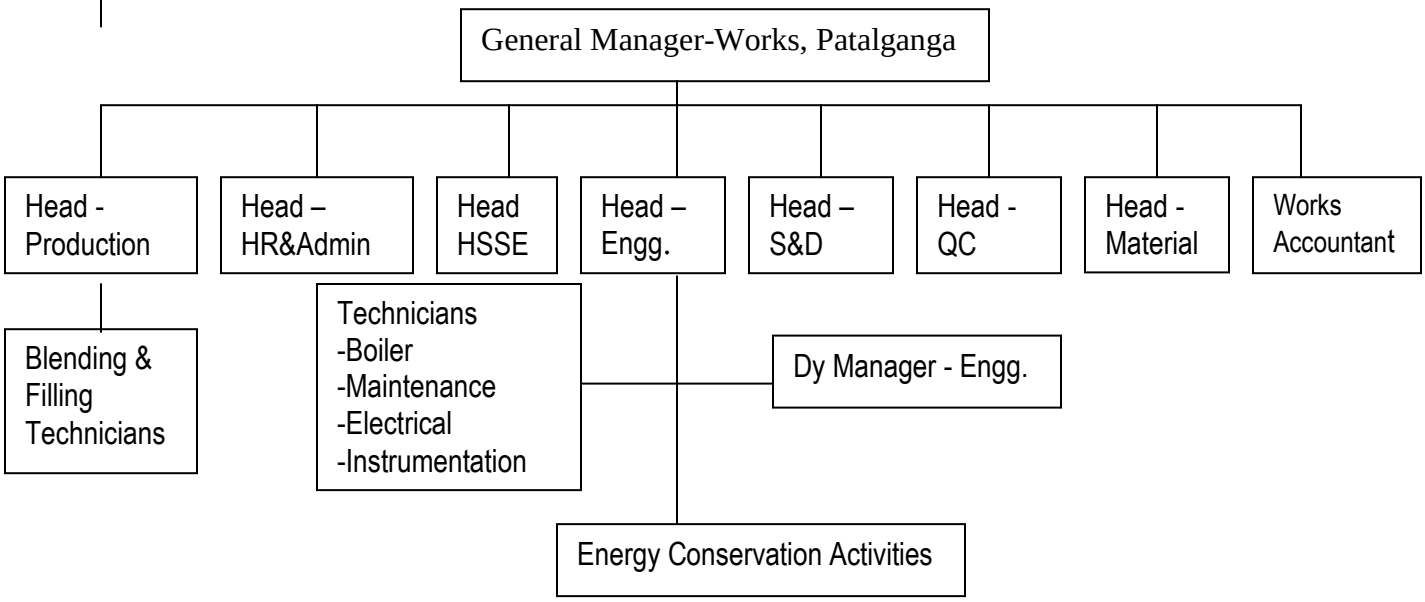
20(iii) Energy Conservation Policy, Commitment and Organisational set up:

In order to look at ways and means to reduce the energy cost, it was decided to initiate Small Group Activities since 2001 with the following objectives :

- Minimize energy cost through energy conservation measures.
- Comply with Environmental Management System requirements.
- Initiate continual improvement drive towards energy conservation.
- Improve awareness amongst employees towards energy conservation.
- Maximize capacity utilization by upgrading operational & maintenance standards
- Monitoring for continuous improvement in energy conservation
- Introduction of six sigma and Lean MFG concept in 2006 for improving boiler efficiencies and process improvements, to address energy savings despite introduction of some high temperature operations since 2005

Organizational Set up-Energy conservation

The unit is headed by the General Manager-Works, Patalganga , who drives the Energy conservation activities along with the Engineering Manager and the various departmental heads. The improvements and initiatives to be taken are reviewed in the monthly meetings. The organogram of the unit is as under:



20(iv)Energy Conservation Achievements

The plant has participated and won the National Energy Conservation Awards 2004 & 2005, Certificate of Merit in the Petrochemical Sector.

The plant has also participated and won the Maharashtra State Level Energy Conservation Awards 2005, Certificate of Appreciation in the Petrochemical Sector in July-2006.

Some of the major projects executed in the year 2007.

1. Reduction of batch cycle times
2. Reduction of polymer size in Viscosity Index Improver dissolution
3. Optimisation of blending temperatures
4. Higher capacity pumps
5. Additive supplies from barrels to bulk
6. Pipeline and tank rationalisation
7. Moving to single shift operations-Tanker unloading
8. Gear oil batch time reduction from 9 hrs to 6 hrs
9. Change overtime reduction on filling lines 57 min on 5 ltr line to 27 min
10. Quality control testing time reduction from 35 min to 25 min

The energy conservation initiatives are recognized by the top management on a regular basis and the drivers of energy conservation projects are duly rewarded .

Director – Supply Chain rewarding the lead participants in energy conservation initiatives

Major Energy Conservation Projects implemented in the year 2007 (Point no.16(v)

1) Reduction of Batch Cycle Time (BCT) for gear oil (Product name: BP ener gear EP 90) by 3 Hrs

Actual Batch cycle time for Energear EP 90	: 9 Hrs
Energy consumption per batch of Energear EP 90	: 9 X 11 KWH
	: 99 KWH
Batch Cycle time reduction by 3Hrs after process improvement	: 66 KWH
Total KWH saving by process improvement	: 99 – 66
	: 33 KWH
No. of batches taken during 2007	: 70
Total energy (KWH) saving during 2007 (70 X 33)	: **2310 KWH**

2) Installation of new screw pump in place old inefficient pump of 600LPM.

Reduction in transfer time of Hitec 5777 additive per batch	: 20 min
Electrical energy saving with above reduction in time/batch	: 6.5 KWH
Avg no. of batches per month	: 15
Electrical energy saving from the said pump per month	: 15 X 6.5 KWH
	: 98 KWH
Electrical energy saving per year	: 98 X 12 months
	: 1176 KWH
Energy saving from the same pump during tanker loading	: 6.5 KWH
Average no. of tanker loading in a month	: 4
Electrical energy saving during tanker loading in a month	: 26 KWH
Electrical energy saving while tanker loading /year	: 26 X 12 months
	: 312 KWH
Total energy saving by replacing the old inefficient pump	: 1176 + 312
	: **1488 KWH**

3) Elimination of motorized conveyor from 5L new filling line

Reduction in Units = 0.75 KW X 240 Working days X 8 Hr.
= 1440 KWH.

4) Reduction of electrical consumption by providing auto shut off valves on air compressed lines entry point of each filling line.

Motor rating	: 45 KWH
Energy consumption per day (45 KWH X 15 Hrs)	: 675 KWH
Energy saving with reduced air losses (considering 1 hr a day)	: 45 KWH
Energy saving per month (45 KWH X 22 working days)	: 990 KWH
Energy saving per year (45KWH * 22 working days *12 months)	: 11880 KWH

5) Reduction of Pack Changeover time in 3L filling lines by process improvement

Time reduced for every product changeover in filling line	: 30 min
Average no. of changeovers in a month	: 10
Total reduction in changeover time for a month	: 300 min
Total reduction in changeover time for a year	: 60 Hrs
Energy consumption per line per hour	: 25 KWH
Energy saved per filling line	: 1500 KWH

6) Tank Rationalisation of T-214

Drive motor rating (Differential Power)	: 2 KWH
Average loaded time of pump in a day	: 6 Hr
Electrical energy saving per day	: 12 KWH
Electricity energy saving per month (33 KWH * 22 working days)	: 264 KWH
Average energy saving per year	: 3168 KWH

20(v) Energy Conservation Plans & Targets

The following major Energy Conservation Projects are streamlined for the year 2008.

1.Focus on renewable energy projects - Solar Street Lights.

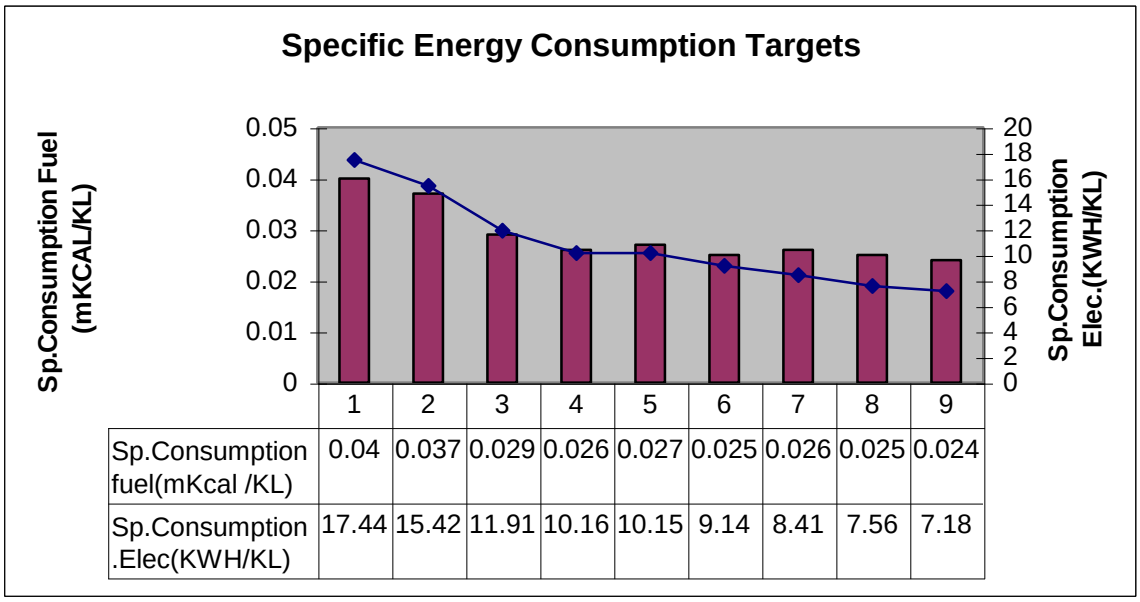
2.Replacement of old inefficient pumps by efficient pumps.

3.Efficient heat exchanger for base oil heating for reduction in blend time

4.Batch cycle reduction by 40% for major blenders through Lean Manufacturing concepts

5.Improvement of OEE on filling lines for better energy efficiencies through Lean Manufacturing and 6 sigma tools

The Specific Energy Conservation targets set by the plant for the year 2008 & 2009, are as below.



Sp.Consumption fuel(mKcal /KL)	0.04	0.037	0.029	0.026	0.027	0.025	0.026	0.025	0.024
Sp.Consumption .Elec(KWH/KL)	17.44	15.42	11.91	10.16	10.15	9.14	8.41	7.56	7.18

20(vi) Environment and Safety

Environmental Policy

Patalganga Plant of Castrol India Limited manufactures world class lubricants undertaking operations of blending, filling, packing and dispatch in a responsible manner so as to cause no harm to environment.

Accordingly, we at Patalganga Plant are committed to :

- Comply with all relevant legal and other corporate requirements applicable to the environmental aspects of our activities, products and services.
- Continually improve our environmental performance by reducing leakage and spills, hazardous and non hazardous solid waste.
- Prevent pollution, encourage re-use/recycling and use energy and natural resources efficiently.
- Maintain an environmental management system for setting, reviewing and achieving measurable environmental objectives and targets.
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Company's major focus towards spill prevention has improved the environmental conditions in plant premises with respect to elimination of soil pollution & reduction in waste oil generation

HSSE Policy

Everybody who works for BP, anywhere, is responsible for getting HSE right. Good HSE performance and the health, safety and security of everyone who works for us are critical to the success of our business.

Our goals are simply stated - no accidents, no harm to people, and no damage to the environment.

We will continue to drive down the environmental and health impact of our operations by reducing waste, emissions and discharges, and using energy efficiently. We will produce quality products that can be used safely by our customers.
We will :

- Consult, listen and respond openly to our customers, employees, neighbours, public interest groups and those who work with us.

- work with others – our partners, suppliers, competitors and regulators – to raise the standards of our industry.

- openly report our performance, good and bad.

- recognize those who contribute to improved HSE performance.

Our business plans include measurable HSE targets. We are all committed to meeting them.

With all the efforts put by the team , Patalganga Plant has achieved 9 years of ZERO Days Away From Work Case(DAFWC)

Castrol: Patalganga Plant.