

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- 2006

Major focus on energy conservation was initiated since end 2001 & there has been continuous & major improvements during the last 5 years , highlights of which is detailed below:

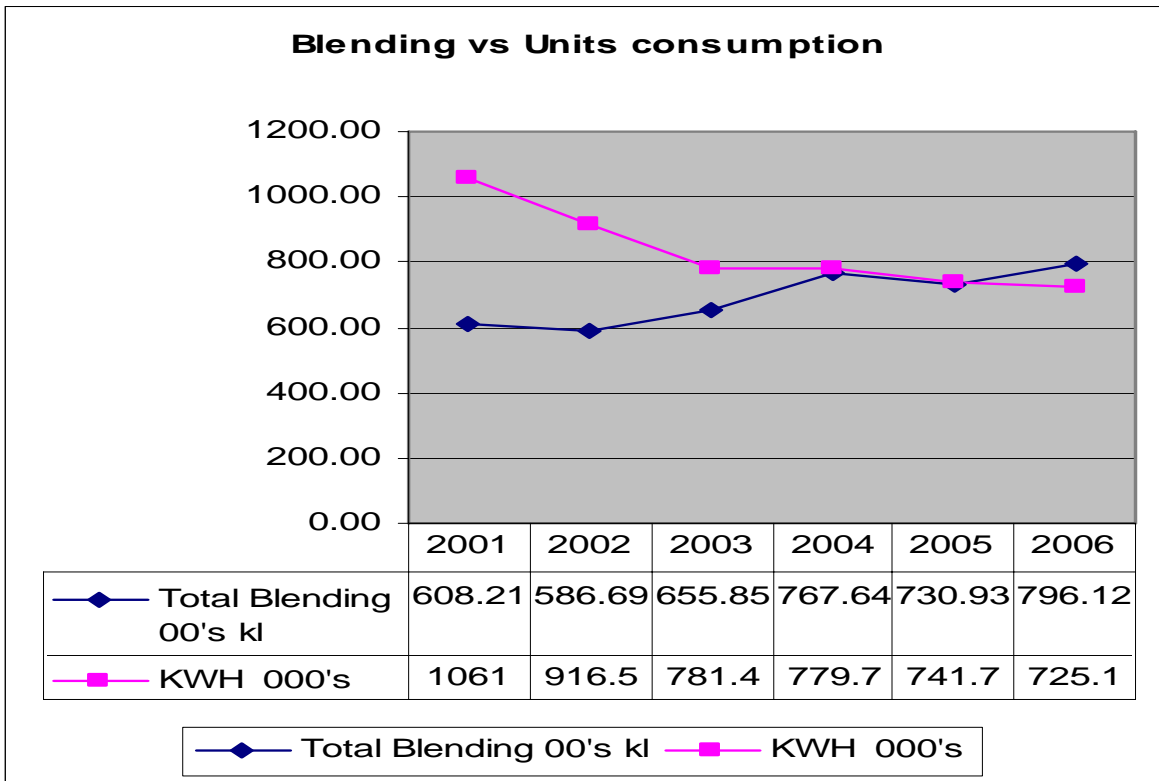
Energy Consumption Details	Unit	2001	2002	2003	2004	2005	2006	%change 2005 vs 06
Production-Blending(Auto+Intermediate)-B	KL	60821	58669	65585	76764	73093	79611	9%
Production-Filling(F)	KL	59053	57627	64211	73366	68891	74762	
Total production-Blending+filling(B+F)	KL	119874	116296	129796	150130	141984	154373	
Absolute Electricity consumption	KWH(Lac)	10.61	9.16	7.81	7.79	7.42	7.25	2.3%
Specific Electricity consumption(B+F)	KWH/KL	8.85	7.88	6.02	5.19	5.22	4.70	10.1%
Average Maximum Demand	KVA	405	364	313	329	321	290	9.7%
Specific fuel consumption(Automotive only)	Ltrs/kl	2.97	2.47	1.82	1.75	1.78	1.77	0.5%
Energy cost as % of Manufacturing cost	%	8.3	8.18	7.1	6.7	8.27	8.64	

Despite 31% increase in Production since 2001- 2006

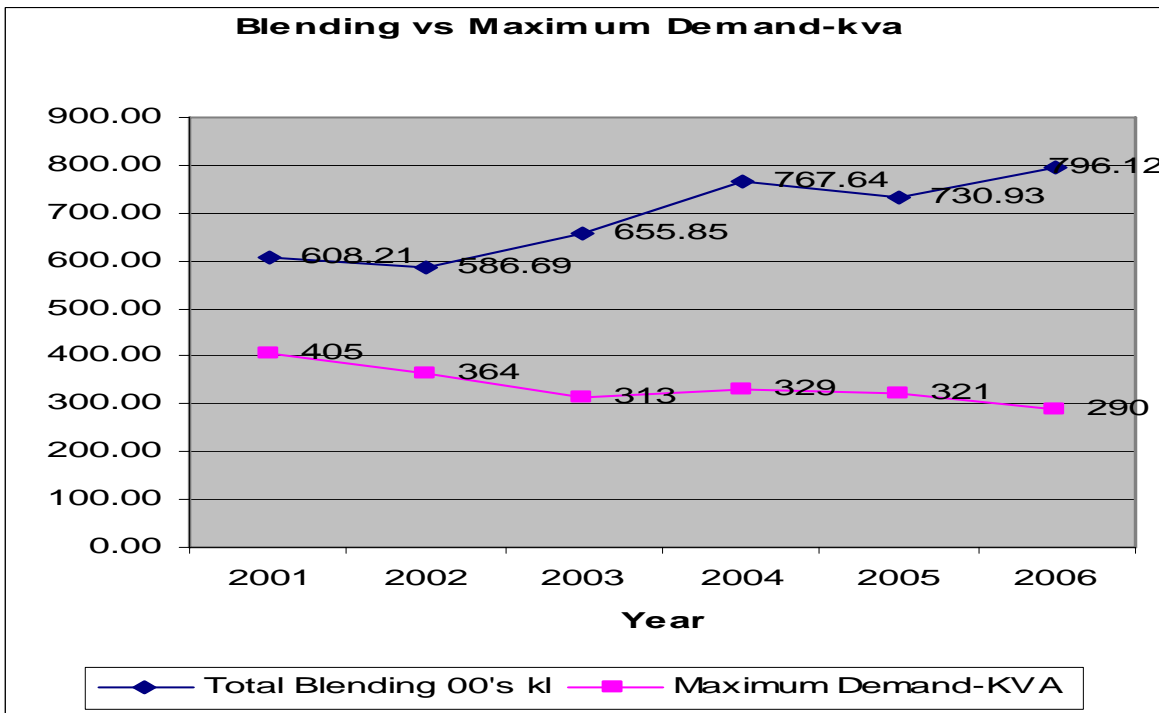
- Absolute electricity consumption reduced by 32 % from 10.61 to 7.25 kwh
- Specific Electricity Consumption (blending + filling) reduced by 47% from 8.85 to 4.7 kwh/kl
- Maximum Demand reduced by 28% from 405 to 290 kva
- Specific fuel consumption for Automotive blends reduced by 40% from 2.97 to 1.77 ltrs/kl.

Despite 9% increase in Production from 2005-2006

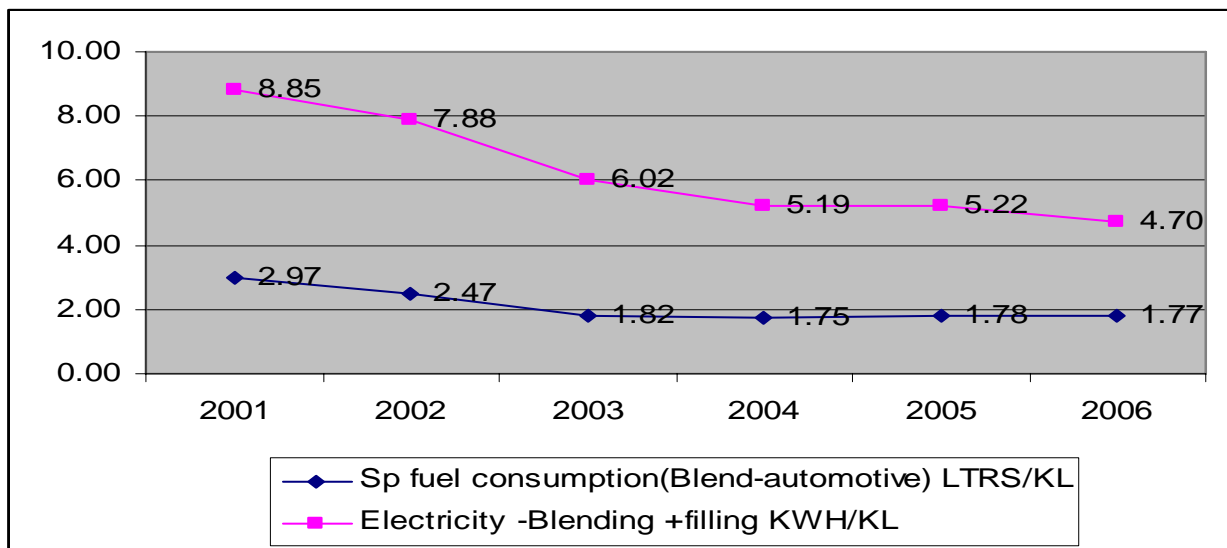
- Absolute electricity consumption reduced 2.3% from 7.42 to 7.25 kwh
- Specific Electricity Consumption (blending + filling) reduced by 10.1% from 5.22 to 4.7 kwh/kl
- Maximum Demand reduced by 9.7% from 321 to 290 kva due to load optimization & elimination of high power motors
- Reduction in batch 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(31% since 2001) the absolute electricity consumption has come down drastically (32% since 2001)



As can be seen from graph above ,despite production rising year on year(31% since 2001) the Maximum demand(MD) has come down drastically (28% since 2001)



As can be seen from graph above , electricity consumption (blending+ filling)has reduced by 47% and Specific fuel consumption for automotive blends has come down from 2.97 to 1.77 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.

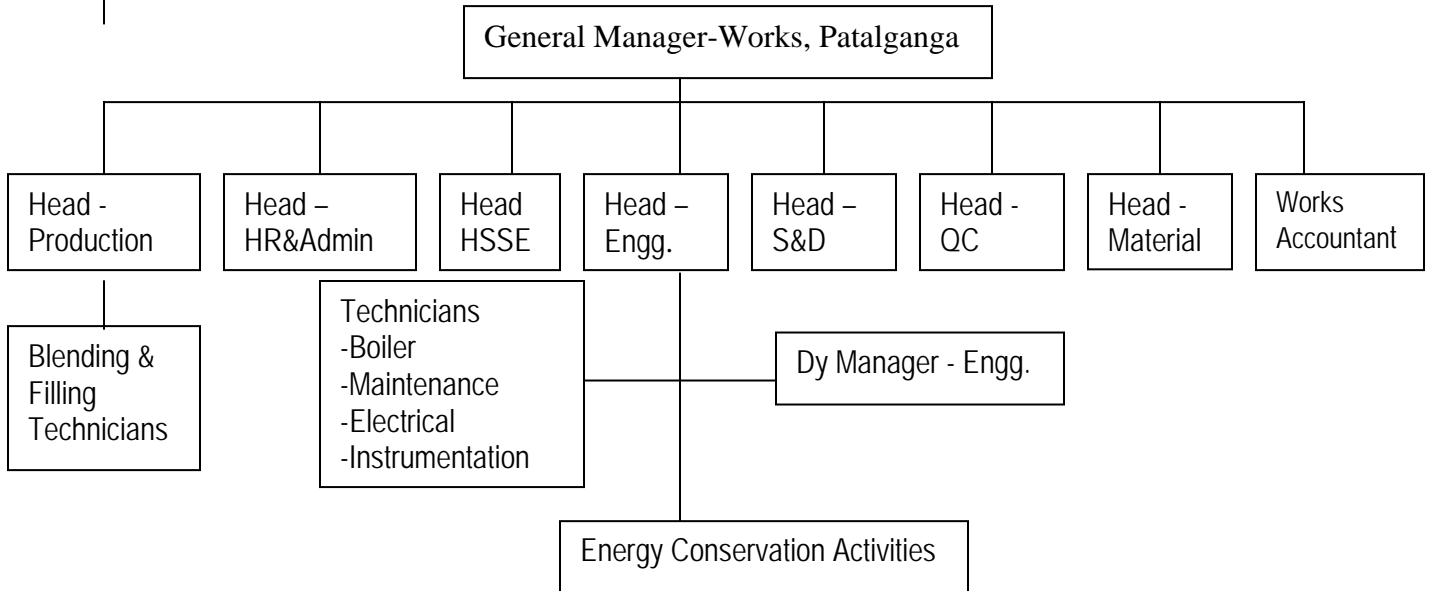
20(iii) Energy Conservation Policy, Commitment and Organisational set up:

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 2006.

1. Solar street lights 10 nos. were installed across the plant
2. Reduced Blend cycle time in blending process
3. Elimination of capping machine from the filling line.
4. Improving OEE and there by reducing electrical energy consumption.
5. Reduction of plant connected load by eliminating 60 hp capacity 2 nos. of motors in blending process

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**

RENEWABLE ENERGY USAGE:

Over the past 3 years the focus has been to drive renewable energy usage in the plant and hence Solar water heating for Canteen (2004) , Solar street lights installation (2005 and 2006) has been initiated as a commitment to Improve environmental performance.



Major Energy Conservation Projects implemented in the year 2006 (Point no.16(v))

1. Solar Lights (10 nos.) installed across the plant for illumination

Power Consumption of existing street light	:	0.15 KW
No. of hours usage	:	11
Power consumption per year per street light	:	$0.15 \times 11 \text{ Hrs} \times 365 \text{ days}$
	:	602.25 KWH

Total no. of street lights replaced with Solar lights	:	10 nos.
Total KWH saved per year	:	$10 \text{ nos.} \times 602.25 \text{ KWH}$
	:	6022.50 KWH



2. Reduction of Batch Cycle Time(BCT) for Viscosity Index Improver products

No. of hours agitator motor used for a batch	:	2 Hrs
Capacity of the motor	:	11.25 KW(15 HP)
By process improving the reduced BCT	:	1 Hr of agitator motor
Total KWH saved per batch	:	11.25
Total batches taken during 2006	:	463
Total KWH saved during 2006	:	463×11.25
	:	5208 KWH

3. Reduction of Batch Cycle Time (BCT) for engine oil (Product name: Activ 4T) by 4 Hrs

Actual Batch cycle time for Activ 4T product :12 Hrs
Energy consumption per batch of Activ 4T product : 12 X 16.5 KWH
: 198 KWH

Batch Cycle time reduction by 4Hrs after
process improvement : 132 KWH

Total KWH saving by process improvement : 198 – 132
: 66 KWH

No. of batches taken during 2006 : 19
Total energy (KWH) saving during 2006 : 19 X 66
: 1254 KWH

4. Reduction of Batch Cycle Time (BCT) for Hitec 5777 product by 18 Hrs

Actual Batch cycle time for Hitec 5777 product :36 Hrs
Energy consumption per batch of Hitec 5777 product : 36 X 11.25 KWH
: 405 KWH

Batch Cycle time reduction by 18 Hrs after
process improvement : 202.5 KWH

Total KWH saving by process improvement : 405 – 202.5
: 202.5 KWH

No. of batches taken during 2006 : 8
Total energy (KWH) saving during 2006 : 8 X 202.5
: 1620 KWH

5. Elimination of screw capping machine from 1 L filling line

Capacity of motor :1.5 KWH (2HP)
No. of working Hrs per day of this equipment : 15
Energy consumption per day : 22.5KWH
Energy consumption saved per year : 22.5 X 240 working days
: 5400 KWH

6. Elimination of 2 nos .of 60 hp motor connected with cutter unit of Viscosity Improver blenders by process improvement

Capacity of the motor : 45 KW(60HP)
No. of motors : 2 nos.
Time in Hrs of use of motor : 1.5 Hrs per batch
No .of batches taken during 2006 : 463 batches

Total KWH saved in 2006 : 45KW X 2Hrs X 463 batches : 41670 KWH



7. Reduction of Maximum Demand(MD) by eliminating 2 nos. of High speed 60 HP motor from Viscosity Improver blender by process improvement

Maximum Demand in Year 2005	: 3847 KVA
Max.Demand after elimination 2 no. of 60HP motor -2006	: 3487 KVA
Charge per maximum demand (MD)	:Rs.330
Cost on MD saved	:Rs.360 X 330
	: Rs.1.19 Lakh

8. Reduction of Changeover time in 5 Litre filling lines by process improvement

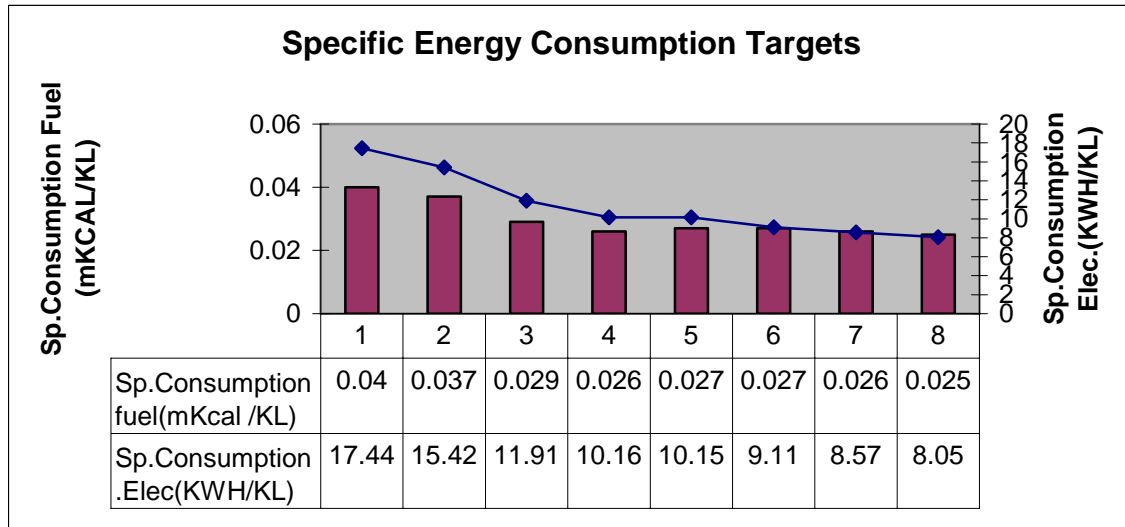
Time reduced for every product changeover in filling line	: 30 min
Average no. of changeovers in a month	: 20
Total reduction in changeover time for a month	: 600 min
Total reduction in changeover time for 4 months(Sep – Dec)	: 40 Hrs
Energy consumption per line per hour	: 25 KWH
Energy saved per filling line	: 1000 KWH
Energy saved for 2 filling lines	: 2000 KWH

20(v) Energy Conservation Plans & Targets

The following major Energy Conservation Projects are streamlined for the year 2007.

- 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 2007 & 2008, are as below.



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.