Southern Railway.

1. Unit Profile

As a result of integration process, after independence, Southern Railway was formed on 14th April 1951 by merging the Railway systems administered by the erstwhile Madras and Southern Mahratta, South Indian and Mysore State Railways. Subsequently in 1966, with the formation of South Central Railway a portion of Southern Railway was transferred to South Central Railway. Again in 2003 South Western Railway was formed transferring two divisions from Southern Railway. Southern Railway now serves the entire states of Tamil Nadu, Kerala & Pondicherry and a small part of Andhra Pradesh and Karnataka.

The journey that began on April 14, 1951 has been truly rewarding one, marked with memorable milestones, remarkable achievements and path breaking innovations. The pioneering sprit of Southern Railway has been translated into many a first of its kind service, and its customer-oriented philosophy has resulted in many passenger friendly amenities.

Southern Railway has 5159 route kilometers comprising 3,418 kms of BG and 1741 kms of MG. Out of this 1674 Rkm is electrified on 25 kV AC. Southern Railway holds 265 electric locomotives and 314 Diesel locomotives.

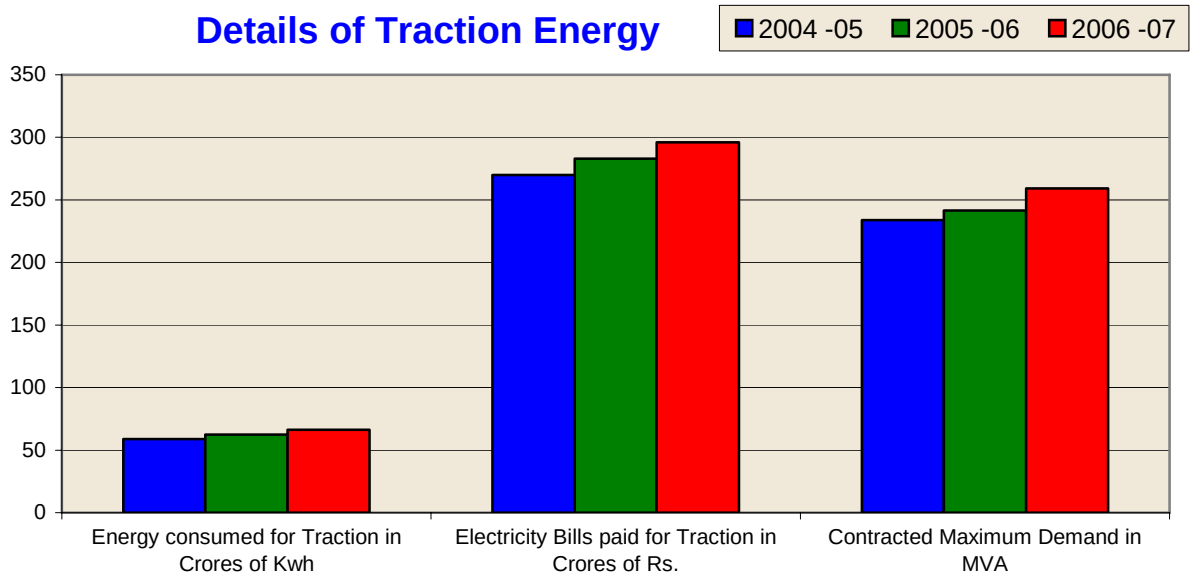
This Railway has a 104,665 strong workforce and it has 5 divisions located at Chennai, Palghat, Trivandrum, Tiruchchirappalli and Madurai.

2. Energy Consumption

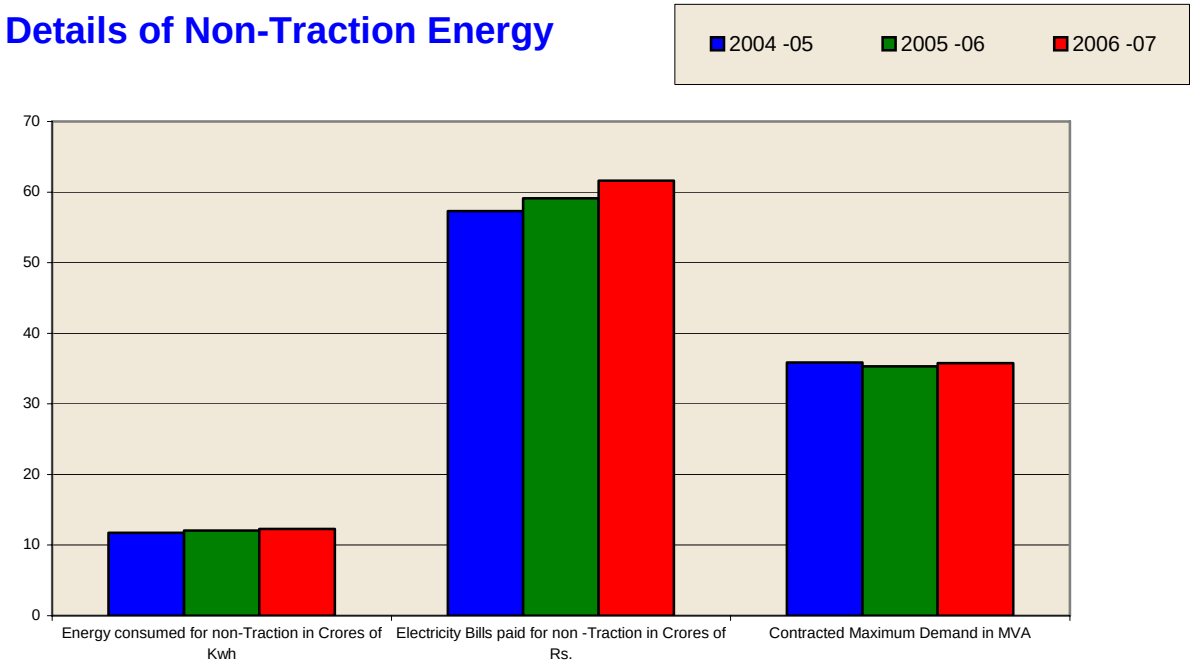
It may be observed that the energy consumption has gone up from year to year because of expanded activities requiring more consumption of energy due to additional train services. However, by following various energy conservation measures as enumerated at Para 4 below, the specific energy consumption i.e. consumption of oil/electricity for 1000 GTKM of traffic has come down over the years.

Southern Railway is consuming an average of 6975 Laksh units per year on electric traction at a cost of about Rs. 311 Crores. The consumption on account of non- traction energy is about 1230 Lakhs unit per year at cost of about 61.62 Crores. The details of energy consumed, the total bill paid for the last three years is given in a graph.

Details of Traction Energy



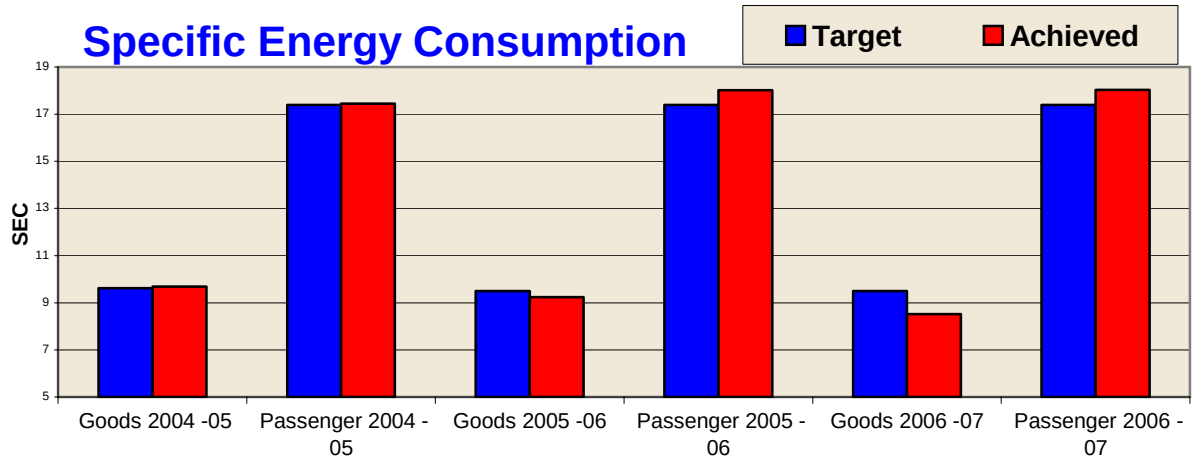
Details of Non-Traction Energy



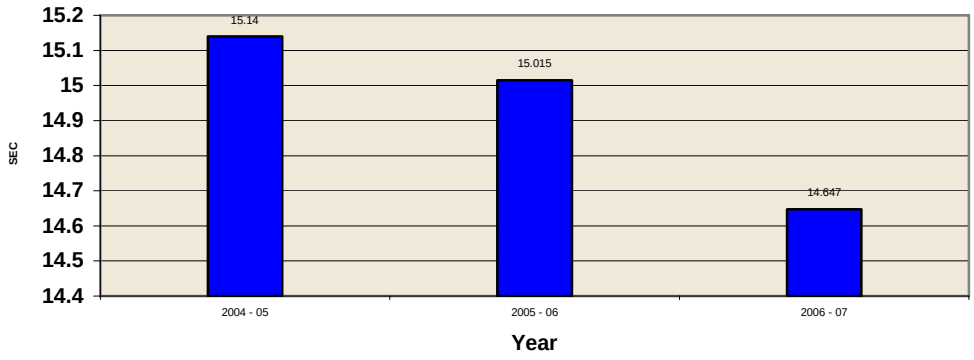
3. Energy Conservation Commitment, Policy and Organizational set up.

This Railway is committed for energy savings through various measures. The energy consuming departments like electrical, mechanical are always engaged for implementing various measures as well as process techniques for saving energy and thus achieving savings in cost. The department heads of electrical and mechanical are responsible for monitoring the energy consumption and deciding on various energy saving measures. The Chief Electrical Services Engineer is designated as **"Head of the Energy Conservation Cell".** The Divisional Officers Act as **"Energy Managers"** in their respective field.

As regards specific energy consumption (SEC) for electricity consumed on electric traction, there is a deterioration of 3.27% for the year 2005-06 over 2004 –05 for passenger traffic and there is a deterioration of 0.11% for the year 2006 –07 over 2005 –2006. In the case of Goods traffic there is improvement of 4.64% for the year 2005-06 over 2004-05 and there is a improvement of 7.79% for the year 2006-07 over 2005-06. However considering the combined GTKMs of both goods & passenger, there is overall improvement during the last 2 years over the years 2003-04 which is depicted on a graph below:

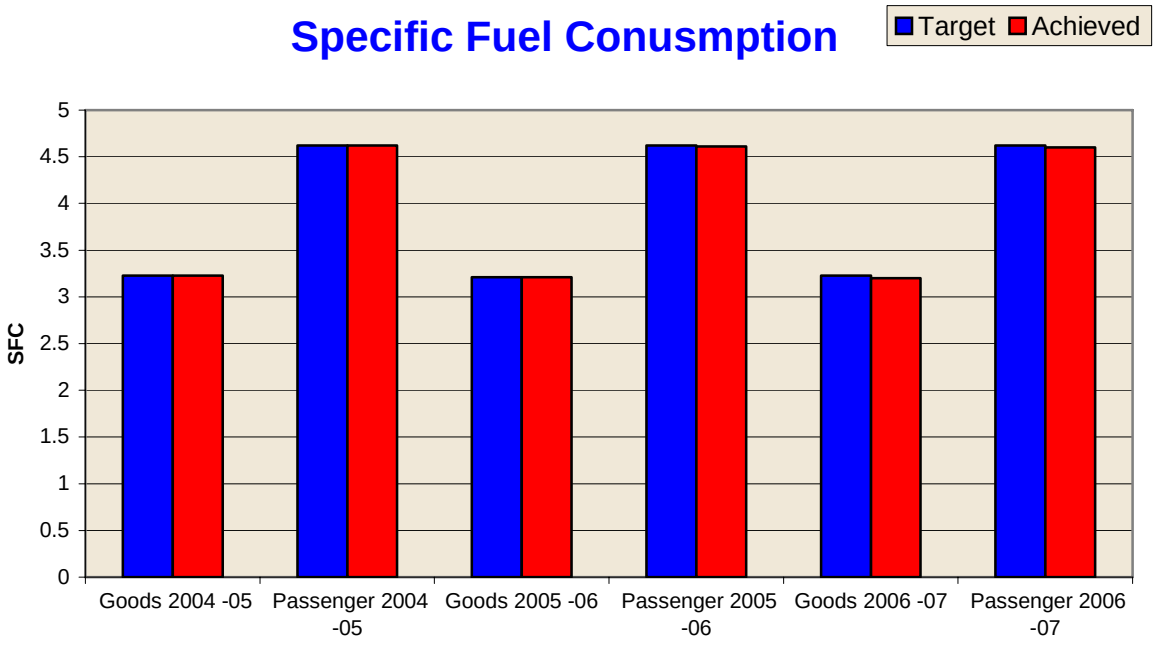


Improvement in Over all SEC



As regards specific Fuel consumption (SFC) for diesel traction, there is a improvement of 0.22% and **0.22%** for the year 2005-06 over 2004 –05 and 2006-07 over 2005 –06 respectively for passenger traffic and 0.62% and 0.31% for the year 2005-06 over 2004 –05 and 2006-07 over 2005 –06 respectively for Goods traffic. The details of SFC for the last three-year is given below.

Specific Fuel Conusmption



4. Energy conservation achievements

The following Energy conservation measures have been implemented in Southern Railway during the year 2006-07

4.1 Improved driving technique.

In the Madras Beach – Tambaram and Chennai Central - Thiruvallur suburban sections the consumption of energy used to be in the region of 12 million units per month. Sustained efforts were made to train the drivers in improving the driving techniques like coasting, avoiding sudden brake application, etc and monitoring the performance through the microprocessor based energy meters. There was continuous reduction in the unit consumption at TBM. The SEC for EMU has come down from 36.96 to 32.32 kWh/1000GTkm in the section. This has resulted in a saving of Rs. 3.88 crores onwards.

4.2 Provision of static invertors in place of Arno converters.

Arno converters feeds 3 phase power supply to the auxiliary motors in a locomotive and an efficiency of 80%. During the year 2005-06 18 Nos**.** and during 2006-07 8 Nos of locomotives are provided with static invertors in place of Arno converters. The static invertors have a efficiency of 92% and thus 12% more energy efficient than a Arno converter. This has resulted in a saving of 11.98 Lakhs units during the year, which amounts to a money value of Rs. 52 Lakhs.

4.3 Provision of Automatic Timers

Electronics static timers having known for fine and coarse settings have been provided at 23 stations during the year 2004-05, 32 stations during the year 2005 – 06 and at 30 locations during 2006-07. These timer are provided to control the 80% lighting load circuit in wayside stations according to the arrival/departure times of trains. The time settings can be changed by station manager by opening the timer control wherever need arises.

An average of 10% of Electrical energy will be saved with the provision of these timers.

The total saving on account of this is 300 kWh per location. Approximate saving in cost per Annum for 85 locations - 300 x 12 x 5.01 x 85 = Rs. 15.33Lakhs

5. Energy Conservation Plans and Targets

Board has fixed the following target for SEC of Electric traction SFC for diesel traction.

Electric Traction		Diesel traction.	
SEC for Goods	**SEC for Passenger**	**SFC for Goods**	**SFC for Passenger**
9.06	17.64	3.15	4.53

Efforts shall be made to achieve the above target during the year 2007 –08.

6. Environment and safety

Environment

Southern Railway has pioneered production of Bio diesel; one pilot Trans-electrification plant of 150 liter capacity has been set up indigenously by producing bio diesel. With this bio diesel, one MG diesel Loco and 20 Road vehicles are being operated. Solar water heaters 22 locations 5 Level crossings have been electrified through solar power.

Safety

The Safety Branch of the Railway was created and grew out of the recommendations of Kunzru and Sikri Committees' inquiry reports into serious accidents on the Indian Railway. The Scope and functions of the Safety Department have been defined over the years and basically include.

1. To audit the safety consciousness of the Railway through a well defined schedule of inspections.
2. Analyze accidents and recommend corrective action so as to curb accidents.
3. Seek to increase the capacity and capabilities of Railway staff by training and monitoring.
4. To create awareness in persons other than Railway men on safe use of Railway crossings and safe Railway travel.

The details of accident for the last three years are given below.

Type of accident	2004 –05	2005 -06	2006 –07
Collision	0	0	0
LC Accidents	3	4	11
Derailments	2	3	4

Energy Audit Conducted by Accredited Energy Auditors during 2006-07

Sl.No	Division	Location	Energy Audit done by
1	Chennai	MMC, NGO & NGO annex building	M/s ELBI consultancy (India) Private Ltd., Chennai
2	Tiruchchirappalli	1.Tiruchchirapplai Railway Station 2. Sarcarpalayam Pump house	M/s Thiagarajar College of Engineering, Madurai
3.	Madurai	Madurai Railway station	M/s Thiagarajar College of Engineering, Madurai
4.	Trivandrum	Trivandrum Central Railway stations	V. Shanmugavel & Associates, Chennai
5	Palghat	Erode Railway Station	M/s Esspee Engineers, Coimbatore
6	Perambur Workshop	Carriage work shops	M/s Durga Electric Company, Chennai
7.	Golden Rock workshop	Workshops	M/s Tuticorin Alkali Chemicals and Fertilizers Ltd., Tuticorin