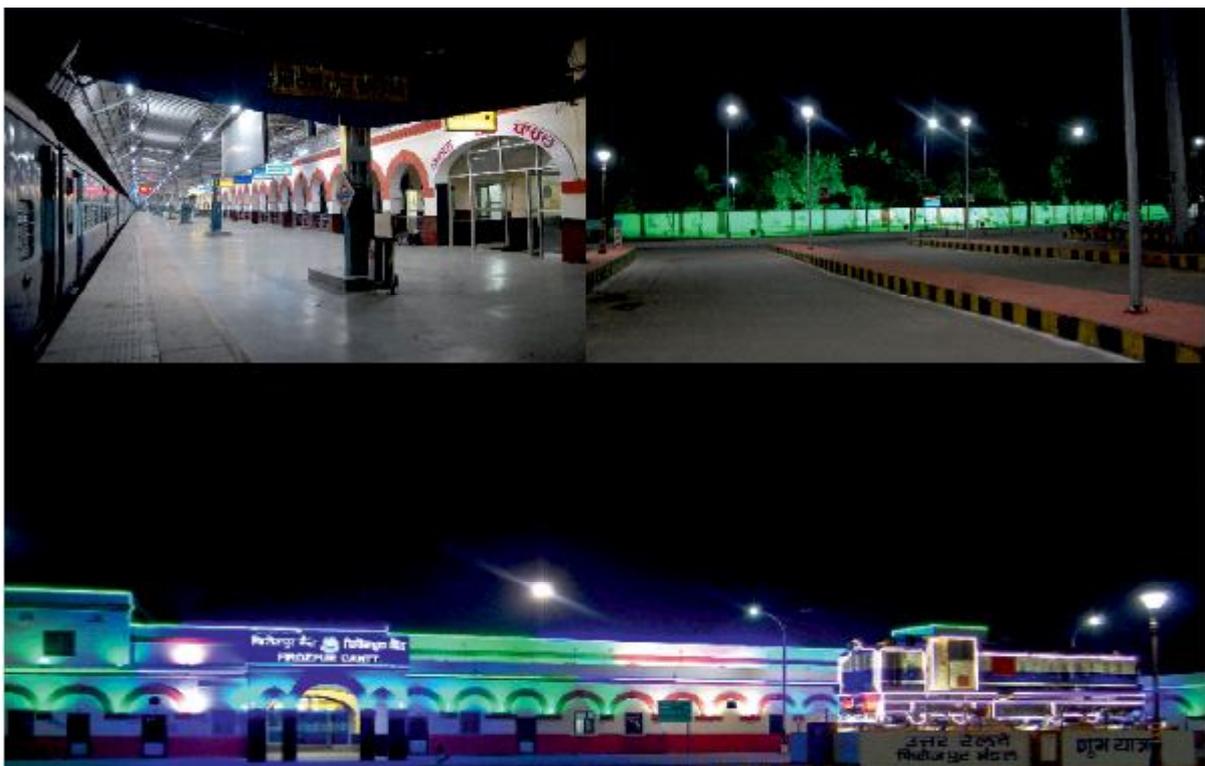


FIROZPUR CANTT. RAILWAY STATION FIROZPUR DIVISION Northern Railway (Punjab)

Unit Profile

Firozpur Cantt. Railway station is a major station of Firozpur division. Being a terminating station and having Divisional Office at Firozpur Cantt., this station is a major load centre.

To reduce the energy consumption, various energy conservation measures were taken during 2015-16 like use of Energy efficient 18 Watt LED based TL fitting in place of T-8/T-5 TL fittings, 1x120 Watt LED flood light in place of 2x400 Watt MH fitting on high mast, 30 Watt LED based façade light in place of 250 watt MH/HPSV fitting, 25 Watt LED based street light in place of 70 watt MH/HPSV fitting, 40 Watt LED based post top street light in place of 250 watt MH fitting, 45 Watt LED based street light in place of 150 watt MH/HPSV fitting, 4x24 Watt T-5 fitting in place of 250 watt MH/HPSV fitting, 65 Watt CFL fitting in place of 150 watt MH/HPSV fitting, 60 Watt ceiling fans in place of 90 watt ceiling fans, 35 Watt ceiling fans in place of 90 watt ceiling fans, occupancy sensors in offices & LED based station name board in place of FTL based boards.



During 2014-15, building had a connected load of 140 kW. Due to energy conservation measures, connected load has reduced to 102 kW

Due to this, electric consumption of station building for the year 2015-16 has reduced by 34.74% as compared to 2014-15.

Energy consumption

Description	2014 - 15	2015-16
Total Built up Area (in m ²)	8542	8542
Total Connected Load (in kW)	140	102
Average power factor for the period	0.90	0.97
Total Electricity Consumption (Lac KWh)	11.22	7.32
Total electricity consumption/ Total built-up area (in kWh/m ²)	131.30	85.69

Major Energy Conservation Initiatives taken during the year 2015-16:

S N	Project description	Achievement of Annual energy savings in 2015-16					Investment incurred on the project (Rs. Lakh)
		Electricity (Lakh kWh)	Fuels			Total savings (Rs. Lakh)	
			FO/HSD (KL)	Gas (Lakh Nm ³)	Total fuel (M kCal)		
1	Use of Energy efficient 1x120 Watt LED flood light in place of 2x400 Watt MH fitting on high mast.	1.07	Nil	Nil	Nil	11.44	4.32
2	Use of Energy efficient 18 Watt LED FTL fitting in place of T - 8/T-5 F TL fitting.	0.91	Nil	Nil	Nil	9.67	13.80
3	Use of Energy efficient 30 Watt LED based façade light in place of 250 watt MH/HPSV fitting.	0.66	Nil	Nil	Nil	6.99	2.38
4	Use of Energy efficient 25 Watt LED based street light in place of 70 watt MH/HPSV fitting.	0.11	Nil	Nil	Nil	1.16	1.53
5	Use of Energy efficient 40 Watt LED based post top street light in place of 250 watt MH fitting.	0.09	Nil	Nil	Nil	0.98	1.95
6	Use of Energy efficient 45 Watt LED based street light in place of 150 watt MH/HPSV fitting.	0.37	Nil	Nil	Nil	3.93	3.88
7	Use of Energy efficient 4x24 Watt T-5 fitting in place of 250 watt MH/HPSV fitting.	0.27	Nil	Nil	Nil	2.88	2.72
8	Use of Energy efficient 65 Watt CFL fitting in place of 150 watt MH/HPSV fitting.	0.17	Nil	Nil	Nil	1.79	0.50

9	Use of Energy efficient 60 Watt ceiling fans in place of 90 watt ceiling fans.	0.03	Nil	Nil	Nil	0.28	0.21
10	Use of Energy efficient 35 Watt ceiling fans in place of 90 watt ceiling fans.	0.02	Nil	Nil	Nil	0.26	0.32
11	Use of occupancy sensors in offices	0.35	Nil	Nil	Nil	3.74	0.84
	Use of LED based station name board in place of FTL based boards	0.02	Nil	Nil	Nil	0.21	1.92
TOTAL		4.06	Nil	Nil	Nil	43.32	34.37

With the implementation of energy efficiency measures, the target for reducing carbon emission has also been achieved.

DWARKA RAILWAY STATION RAJKOT DIVISION WESTERN RAILWAY

Rajkot (Gujarat)

Station Profile

Dwarka Railway station is in Devbhoomi Dwarka district, Gujarat. It serves as an entry point to the pilgrim visiting Dwarka city. It is located on the western shore of the Okhamandal Peninsula on the right bank of the Gomti River. Dwarkadhish temple is approx 2 kms away from Railway Station and Nageshwar Jyotirling is 15 kms away from Railway Station. Dwarka lies on the Jamnagar-Okha meter gauge line which was opened for traffic in 1922 by Jamnagar & Dwarka Railway & converted into broad gauge in 1984.



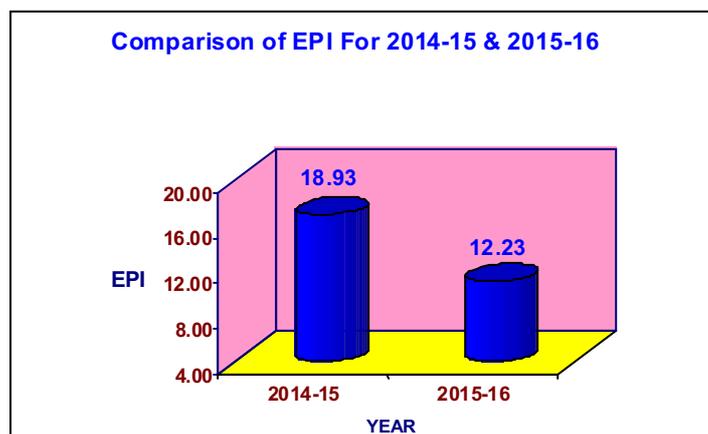
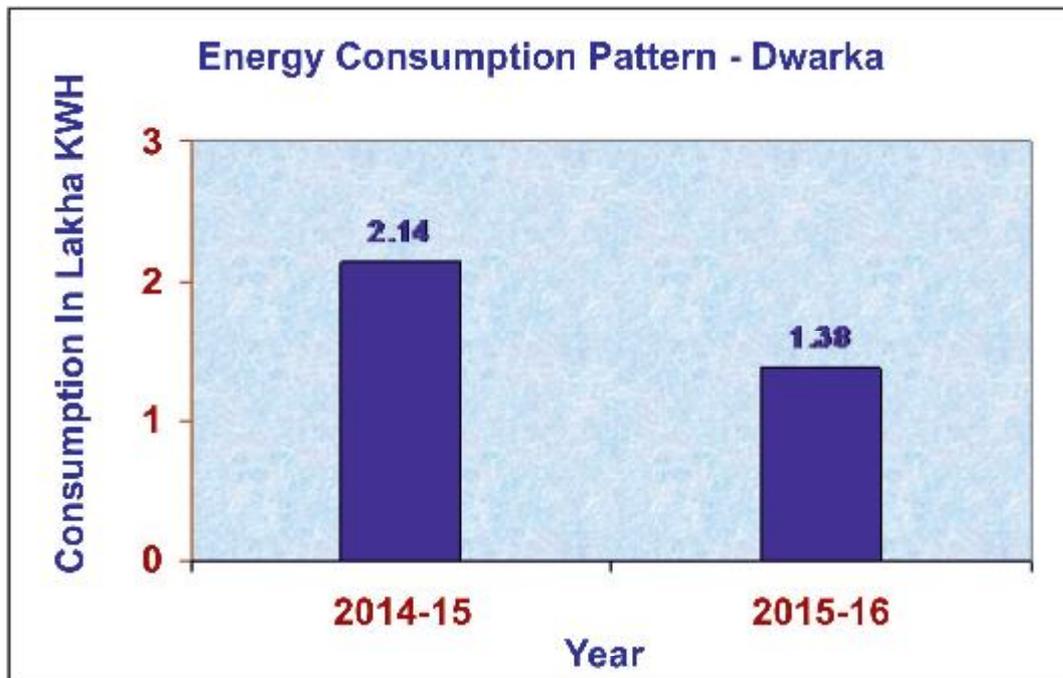
Energy Conservation:

Dwarka Station has achieved the objective of reduction in energy consumption as well as reduction in specific energy consumption, despite many constraints. The energy consumption during the year 2015-16 was 34.83% less as compared to the energy consumption of 2014-15.

Further the EPI during the period of 2014-15 was 18.93, which has now reduced to 12.23 in 2015-16. This was possible only by adopting various energy conservation measures and creating general awareness in the staff/users.

Energy Consumption

Sr No	Energy used	Units	2014-15	2015-16
1	Electricity purchased	Lakh kWh	2.12360	1.36743
2	Self generated	Lakh kWh	0.01992	0.01696
3	Total Electricity Consumption	Lakh kWh	2.14352	1.38441
4	Energy saving	Lakh kWh	-	0.75911
5	Saving over previous year	%age		35.41



Energy Conservation Measures implemented

- 1 Replacement of 36W fitting by LED Fittings 20 W (239 nos.)**



- 2 Replacement of 90W fan by 50W energy efficient fan (136 nos.)**



- 3 Replacement of Conventional AC by star rated ACs.(7 Nos.)**



- 4 Provision of LED Fittings in High mast in lieu of Metal Halide fitting with timer**



**PATHANKOT CANTT. RAILWAY STATION
FIROZPUR DIVISION
Northern Railway (Punjab)**

Unit Profile

Pathankot Cantt. Railway station is one of the major stations of Firozpur division on Ludhiana-Jammu Tawi section.

Various energy conservation measure were taken during 2015-16 like use of Energy efficient 1x120 Watt LED flood light in place of 2x400 Watt MH fitting on high mast, 18 Watt LED FTL fitting in place of T-8/T-5 FTL fitting, 45 Watt LED based street light in place of 150 watt MH/HPSV fitting, 36 Watt LED based post top street light in place of 250 watt MH fitting, Energy efficient 4x24 Watt T-5 fitting in place of 250 watt MH/HPSV fitting, 65 Watt CFL fitting in place of 150 watt MH/HPSV fitting, 60 Watt ceiling fans in place of 90 watt ceiling fans and LED based station name board in place of FTL based board. During 2014-15, station had a connected load of 266 Kw. Due to energy conservation measures, connected load has reduced to 206 Kw.

Due to this, electric consumption of station building for the year 2015-16 has reduced by 32.20% as compared to 2014-15.



Energy Consumption

Description	2014 - 15	2015-16
Total Built up Area (in m ²)	2256	2256
Total Connected Load (in kW)	266	206
Average power factor for the period	0.90	0.97
Total Electricity Consumption (Lac KWh)	2.14	1.45
Total electricity consumption/ Total built-up area (in kWh/m ²)	94.82	64.29

Major Energy Conservation Initiatives taken during the year 2015-16

S N	Project description	Achievement of Annual energy savings in 2015-16				Total savings (Rs. Lakh)	Investment incurred on the project (Rs. Lakh)
		Electricity (Lakh kWh)	Fuels		Total fuel (M kCal)		
			FO/HSD (KL)	Gas (Lakh Nm ³)			
1	Use of Energy efficient 1x120 Watt LED flood light in place of 2x400 Watt MH fitting on high mast.	0.24	Nil	Nil	Nil	2.54	0.96
2	Use of Energy efficient 18 Watt LED FTL fitting in place of T-8/T-5 FTL fitting.	0.10	Nil	Nil	Nil	1.04	1.49
3	Use of Energy efficient 45 W att LED based street light in place of 150 watt MH/HPSV fitting.	0.11	Nil	Nil	Nil	1.18	1.16
4	Use of Energy efficient 36 Watt LED based post top street light in place of 250 watt MH fitting.	0.06	Nil	Nil	Nil	0.60	1.17
5	Use of Energy efficient 4x24 Watt T-5 fitting in place of 250 watt MH/HPSV fitting.	0.15	Nil	Nil	Nil	1.58	1.50
6	Use of Energy efficient 65 Watt CFL fitting in place of 150 watt MH/HPSV fitting.	0.07	Nil	Nil	Nil	0.79	0.22
7	Use of Energy efficient 60 Watt ceiling fans in place of 90 watt ceiling fans.	0.03	Nil	Nil	Nil	0.28	0.21
8	Use of LED based station name board in place of FTL based board.	0.02	Nil	Nil	Nil	0.21	2.28
TOTAL		0.77	Nil	Nil	Nil	8.23	8.99

**SURENDRANAGAR RAILWAY STATION
RAJKOT DIVISION
WESTERN RAILWAY
Rajkot (Gujart)**

Station Profile

The Surendranagar railway station belongs to Western Railway of Rajkot Division. It is located in Surendranagar district of Gujarat State. This station was started by Sir Lakhdhiraji Waghji, who ruled Saurashtra Area from 1922 until 1948. Surendranagar-Rajkot section was laid in 1905. Gauge conversion of Viramgam-Hapa section via Surendranagar, Wankaner was completed by 1980. About 35 passenger trains arrive at this station daily. There were trains Mumbai, Delhi, Visakhapatnam, Secunderabad, Nagpur, Howrah, Kamakhya, Rajkot, Gandhidham, Wankaner etc.,



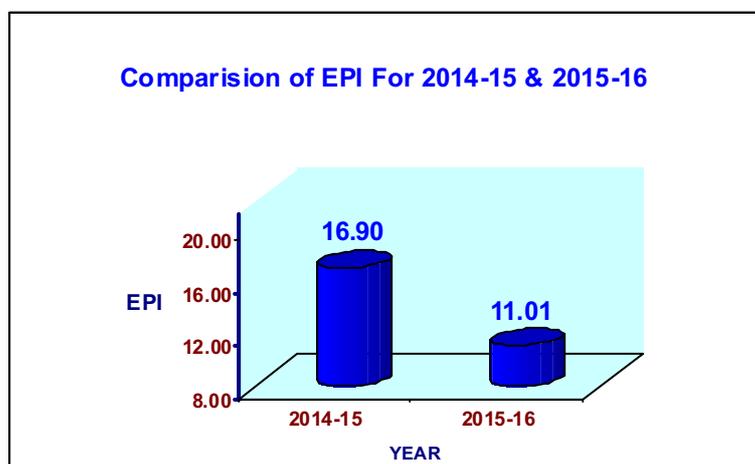
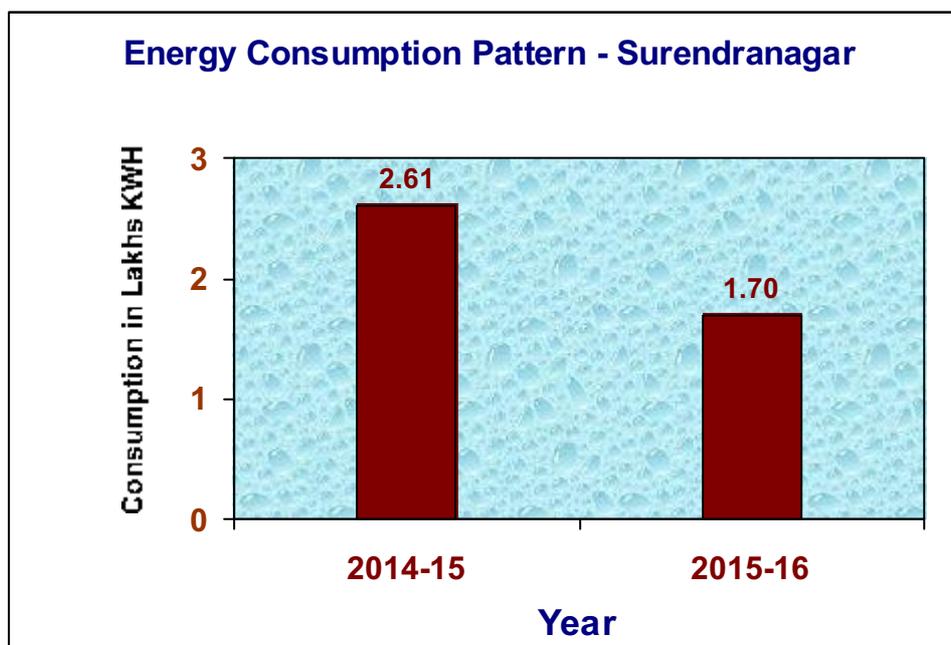
Energy Conservation :

Surendranagar Station has achieved the objective of reduction in energy consumption as well as reduction in specific energy consumption, despite many constraints. The energy consumption during the year 2015-16 was 34.83% less as compared to the energy consumption during the year 2014-15.

Further the EPI during the period of 2014-15 was 16.90, which has now reduced to 11.01 in 2015-16. This was possible only by adopting various Energy Conservation measures and creating general awareness in the staff/users.

Energy Consumption Pattern:

Sr No	Energy used	Units	2014-15	2015-16
1	Electricity purchased	Lakh kWh	2.58	1.67
2	Self generated	Lakh kWh	00.039	0.031
3	Total Electricity Consumption	Lakh kWh	2.61	1.70
4	Energy saving	Lakh kWh	-	0.91229
5	Saving over previous year	%age	-	34.83



Energy Conservation Measures implemented

- 1 Replacement of 36W fitting by LED Fittings 20 W (311 nos.)**



- 2 Replacement of 90W fan by 50W energy efficient fan (116)**



- 3 Replacement of Conventional AC by star rated ACs.(5 nos)**



- 4 Provision of LED Fittings in High mast in lieu of Metal Halide fitting with timer**



**LUDHIANA RAILWAY STATION
FIROZPUR DIVISION
Northern Railway (Punjab)**

Unit Profile

Ludhiana Railway station is a major station of Firozpur division on Sahnewal-Amritsar section.

During 2014-15, station had a connected load of 950 kW. Due to energy conservation measures, connected load has reduced to 810 kW.

Due to this, electric consumption of station building for the year 2015-16 has reduced by 22.29% as compared to 2014-15.



Energy Consumption

Description	2014 - 15	2015-16
Total Built up Area (in m ²)	16090	16090
Total Connected Load (in kW)	950	810
Average power factor for the period	0.91	0.97
Total Electricity Consumption (Lac KWh)	19.01	14.77
Total electricity consumption/ Total built-up area (in kWh/m ²)	118.14	91.80

Major Energy Conservation Initiatives taken during the year 2015-16

S N	Project Description	Achievement of Annual energy savings in 2015-16					Investment incurred on the project (Rs. Lakh)
		Electricity (Lakh kWh)	Fuels			Total savings (Rs. Lakh)	
			FO/HSD (KL)	Gas (Lakh Nm ³)	Total fuel (M kCal)		
1	Use of Energy efficient 1x120 Watt LED flood light in place of 2x400 Watt MH fitting on high mast.	2.03	Nil	Nil	Nil	21.61	8.16
2	Use of Energy efficient 18 Watt LED FTL fitting in place of T-8/T5 FTL fitting.	1.13	Nil	Nil	Nil	12.00	17.12
3	Use of Energy efficient 25 Watt LED based street light in place of 70 watt MH/HPSV fitting.	0.10	Nil	Nil	Nil	1.05	1.39
4	Use of Energy efficient 45 Watt LED based street light in place of 250 watt MH/HPSV fitting.	0.31	Nil	Nil	Nil	3.35	1.70
5	Use of Energy efficient 40 Watt LED based post top street light in place of 250 watt MH fitting.	0.55	Nil	Nil	Nil	5.89	11.70
6	Use of Energy efficient 4x24 Watt T-5 fitting in place of 250 watt MH/HPSV fitting.	0.17	Nil	Nil	Nil	1.80	1.70
7	Use of Energy efficient 65 Watt CFL fitting in place of 150 watt MH/HPSV fitting.	0.56	Nil	Nil	Nil	5.96	1.65
8	Use of Energy efficient 60 Watt ceiling fans in place of 90 watt ceiling fans.	0.11	Nil	Nil	Nil	1.12	0.84
9	Use of Energy efficient 35 Watt ceiling fans in place of 90 watt ceiling fans.	0.05	Nil	Nil	Nil	0.51	0.64
10	Use of occupancy sensors in offices	0.29	Nil	Nil	Nil	3.12	0.70
11	Use of day light pipe	1.90	Nil	Nil	Nil	20.28	3.85
12	Use of LED based station name board in place of FTL based board	0.02	Nil	Nil	Nil	0.21	2.16
TOTAL		7.21	Nil	Nil	Nil	76.91	51.61

**JALANDHAR CITY RAILWAY STATION
FIROZPUR DIVISION
Northern Railway (Punjab)**

Unit Profile

Jalandhar City Railway station is a major station of Firozpur division on Ludhiana-Amritsar section.

Various energy conservation measure were taken during 2015-16. During 2014-15, station had a connected load of 250 kW. Due to energy conservation measures, connected load has reduced to 170 kW.

Due to this, electric consumption of station building for the year 2015-16 has reduced by 34.40% as compared to 2014-15.



Energy Consumption

Description	2014 - 15	2015-16
Total Built up Area (in m ²)	14650	14650
Total Connected Load (in kW)	250	170
Average power factor for the period	0.90	0.98
Total Electricity Consumption (Lac KWh)	16.21	10.63
Total electricity consumption/ Total built-up area (in kWh/m ²)	110.62	72.57

Major Energy Conservation Initiatives taken during the year 2015-16:

S N	Project Description	Achievement of Annual energy savings in 2015-16				Investment in curred on the project (Rs. Lakh)	
		Electricity (Lakh kWh)	Fuels		Total savings (Rs. Lakh)		
			FO/HSD (KL)	Gas (Lakh Nm ³)			Total fuel (M kCal)
1	Use of Energy efficient 1x120 Watt LED flood light in place of 2x400 Watt MH fitting on high mast.	2.14	Nil	Nil	Nil	22.88	8.64
2	Use of Energy efficient 18 Watt LED FTL fitting in place of T - 8/T 5 FTL fitting.	0.99	Nil	Nil	Nil	10.52	15.00
3	Use of Energy efficient 25 Watt LED based street light in place of 70 watt MH/HPSV fitting.	0.11	Nil	Nil	Nil	1.18	1.56
4	Use of Energy efficient 45 Watt LED based street light in place of 250 watt MH/HPSV fitting.	0.74	Nil	Nil	Nil	7.86	3.98
5	Use of Energy efficient 4x24 Watt T-5 fitting in place of 250 watt MH/HPSV fitting.	0.27	Nil	Nil	Nil	2.88	2.72
6	Use of Energy efficient 40 Watt LED based post top street light in place of 250 watt MH fitting.	0.18	Nil	Nil	Nil	1.96	3.90
7	Use of Energy efficient 65 Watt CFL fitting in place of 150 watt MH/HPSV fitting.	0.58	Nil	Nil	Nil	6.16	1.71
8	Use of Energy efficient 60 Watt ceiling fans in place of 90 watt ceiling fans.	0.12	Nil	Nil	Nil	1.33	1.00
9	Use of Energy efficient 35 Watt ceiling fans in place of 90 watt ceiling fans.	0.05	Nil	Nil	Nil	0.51	0.64
10	Use of occupancy sensors in offices	0.29	Nil	Nil	Nil	3.12	0.70
11	Use of LED based station name board in place of FTL based board.	0.02	Nil	Nil	Nil	0.21	2.04
TOTAL		5.49	Nil	Nil	Nil	58.60	41.88

**PAKALA RAILWAY STATION
GUNTAKAL DIVISION
South Central Railway (Andhra Pradesh)**

Railway Station Profile

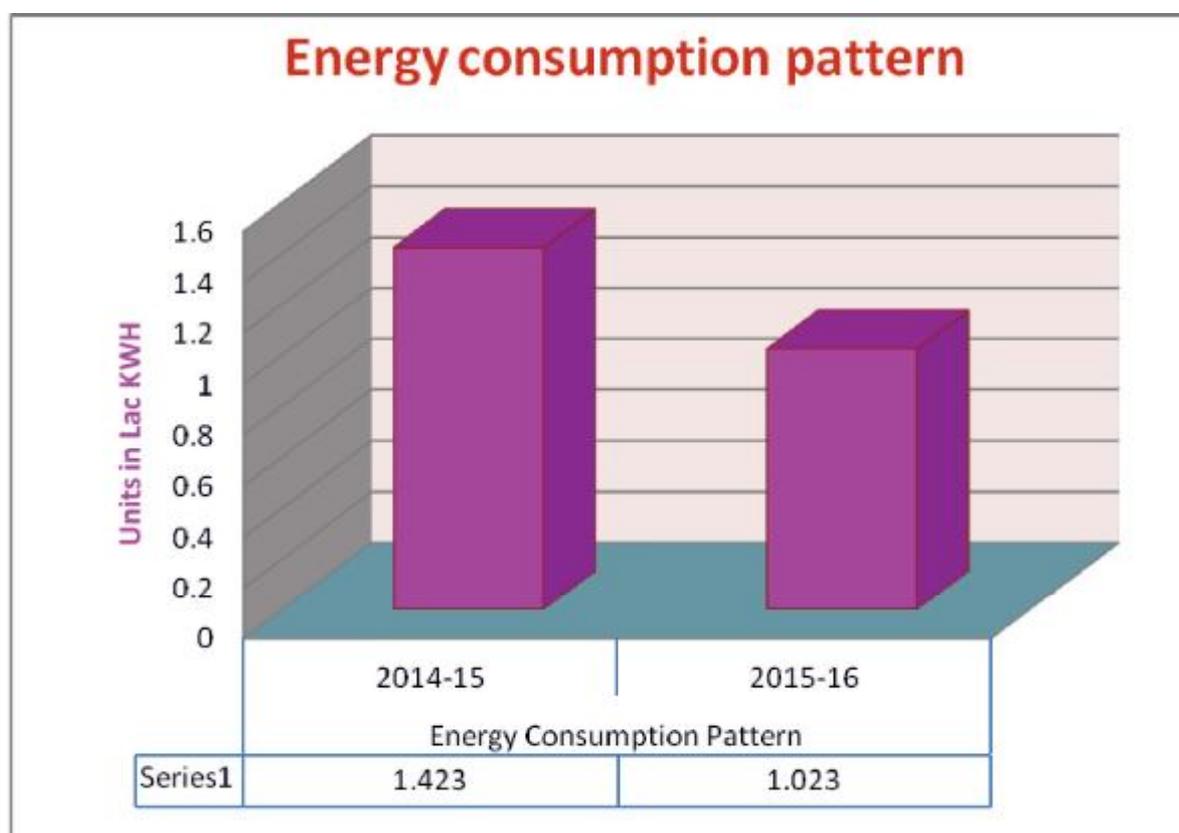
Pakala Railway station is a standalone station and supply is availed from APSPDCL at 11KV and further stepped down to 440V by 100 KVA transformers.

Pakala Junction is the primary railway station serving Pakala, Chittoor district, Andhra Pradesh. The station comes under the jurisdiction of Guntakal division of South Central Railways. The station has three platforms. Pakala is a major town in the Chittoor District of the state of Andhra Pradesh. It is the Mandal headquarters of Pakala Mandal. Pakala is well connected with Tirupati and Chittoor by Road as well as Railways. The nearest airport is Tirupati Airport. The village is served by the PAKALA junction Railway station electrified on 02-12-1959.



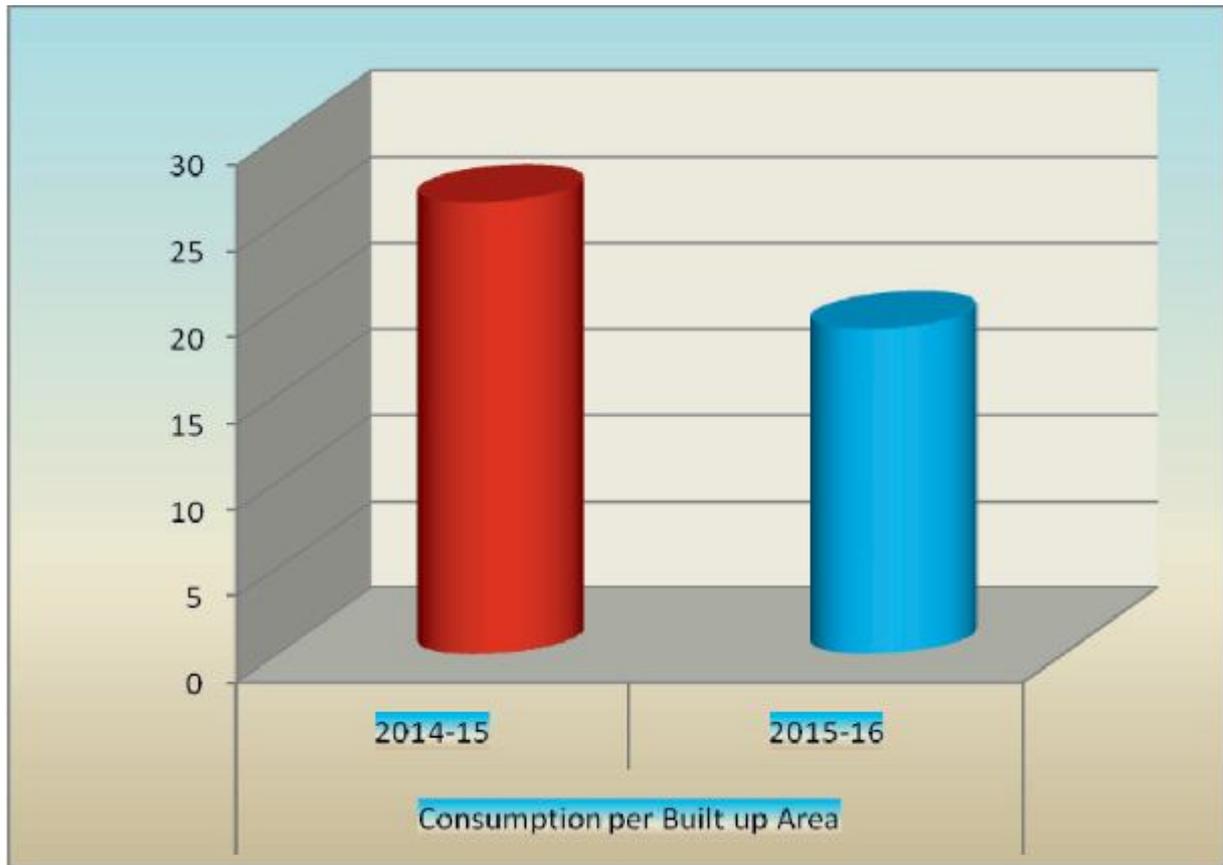
ENERGY CONSUMPTION PATTERN:

S. No	Energy used	Units	2014-15	2015-16
1.	Electricity purchased	Lac. kWh	1.410	1.020
2.	Generated	Lac. kWh	0.013	0.003
3.	Total Electricity Consumption	Lac. kWh	1.423	1.023
4.	Energy saving	Lac. kWh	—	0.400
5.	% Saving previous year consumption	%	—	28.10 %



Energy consumption in Building :

S. No	Item	2014-15	2015-16
1.	Connected load in kW	143.618	127.158
2.	Consumption in lac kWh	1.423	1.023
3.	Built up area in sq.mtrs.	5427.38	5427.38
4.	Consumption per built up area	26.21	18.84



Energy conservation Measures Implemented:

S. No	Items	
1	Replacement of old station name signage boards with LED station name boards -03 nos ., leading to 3445 Units amounting to Rs.23,770/- per Annum.	
2.	On delay timers provided for 30 % and 70% lighting on PF NO: 1, 2&3. , leading to saving of 7,947 units amounting to Rs.54,834/- per annum.	
3	03 Nos timers provided for water cooler leading to saving of 1332 units amounting to , Rs.9,191/- per annum	
4	30 nos. of replacement of conventional type high wattage AC ceiling fans with 5 Star rated energy efficient AC ceiling fans, leading to saving of 3,329 units amounting to Rs.18,075/- per annum.	

<p>5</p>	<p>01 No 1.5 ton old and over aged window AC plants have been replaced with 3 star rated 1.5 ton split AC Plant. Leading to saving of 1460 units amounting to Rs. 10,074/- per annum.</p>	
<p>6</p>	<p>06 Nos. of 2x250 High mast Lights have been replaced with 06 Nos. of 2x150W LED. Leading to saving of 2857 units amounting to Rs. 19,713/- per annum.</p>	
<p>7</p>	<p>40 Nos. of T5-28W Street lights have been replaced with 18 W LED Street lights. Leading to saving of 876 units amounting to Rs. 6,044/- per annum.</p>	

KATHGODAM RAILWAY STATION

North Eastern Railway

Izatnagar (Uttar Pradesh)

Unit Profile

Kathgodam station comes in Izatnagar Division of North Eastern Railway. It is A category station located at the base of Kumaon hills and is the nearest rail head to tourist places like Nainital, Ranikhet, etc. It is in district Nainital of Uttarakhand.

The station building has a connected load of 410 kW. It is fed at 11 kV which is stepped down to 415 V by 2x500 kVA transformers installed in Railway premises. There are 250 kVA, 125 kVA generators available which cater to the requirement of station and coaching complex. Station has taken several energy conservation measures detailed below which has resulted in substantial energy savings without compromising in any way on passenger comfort. With continuous training of staff and awareness generation among members of public, energy conservation consciousness has been cultivated.



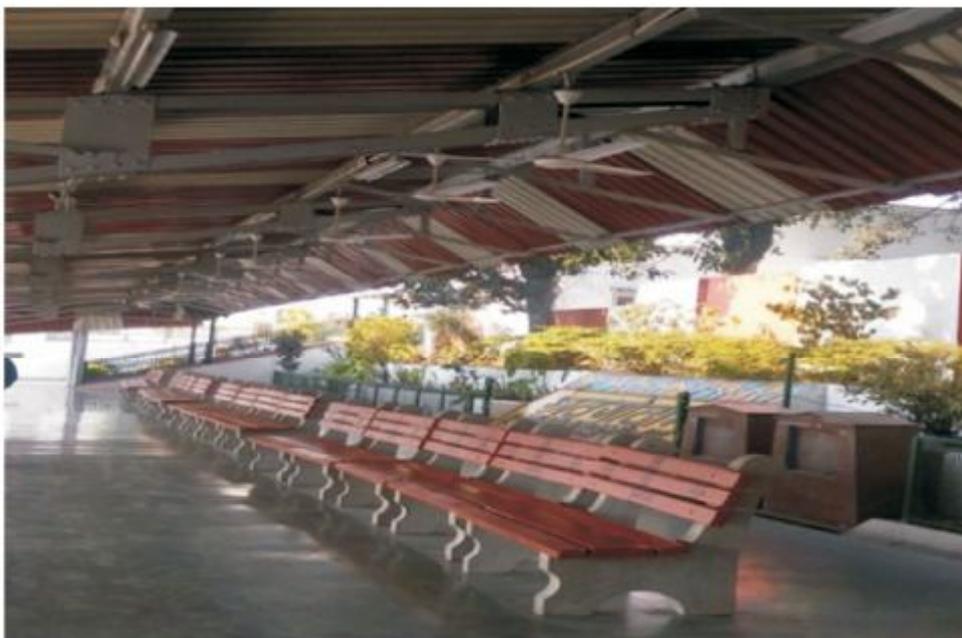
Kathgodam Station

Energy Conservation projects implemented:-

- 1) **Use of LED fittings** : 20W LED fittings (456 nos.), 13W LED lamps, 36 W recess type LED fittings were used in place of 40W FL fittings at platform shelters, Foot Over Bridge, station building resulting in energy saving of about 69000 units in the last year.



- 2) High wattage 90W ceiling fans (150 nos.) were replaced with energy efficient 60W fans. This helped in reduction of energy consumption by 27000 units.



- 3) Solar Water Heaters (3x500 LPD) have been made functional resulting in energy saving of about 11500 units.
- 4) High wattage metal body exhaust fans were replaced by low wattage exhaust fans. This helped not only in reduction of energy consumption by 31500 units but also resulted in noise reduction.
- 5) 40W FL fittings (550 nos.) were replaced by 28W T-5 fittings resulting in energy saving of about 60000 units.
- 6) For general outdoor lighting 85W CFLs were put in place of 150W MH fittings (100 nos.) resulting in energy saving of about 33700 units.
- 7) For rolling in/out examination of coaches and wagons, instead of 40W FL fittings 28W T-5 fittings were put which helped in further reduction in energy consumption of about 12000 units.
- 8) Lighting circuit of platforms has been segregated in two parts. 30% of lighting circuit is put on at all times during night whereas remaining 70% lighting circuit is put on only when any train is about to arrive and is switched off after train departure.
- 9) For façade lighting of station building instead of 150W MH fittings used earlier, LED wall washer lights were put resulting in energy saving of about 1750 units.
- 10) Automatic Power Factor Controller (APFC) of 70 kVAR has helped in improvement of power factor from 0.88 to 0.92.



11) Energy Saver (200 kVA) has further resulted in energy saving of 15%.



12) Station focused on awareness generation amongst hospital staff be it doctors, nurses, operation and maintenance staff about the need and ways to be conscious about energy saving. Rigorous counselling of staff was undertaken about the importance of simple things like switching off of ACs, fans and lights when not required. Banners, stickers and posters were displayed time to time for wide publicity amongst staff and users.

With adoption of above mentioned energy saving measures, the station was able to save about 3.63 lakh units in 2015-16 as compared to 2014-15. All out efforts are being made to make not only equipments more energy efficient but the manpower and users also efficient in their working.