



सत्यमेव जयते



**Indian Railways**

Lifeline to the nation...

# **Energy Efficiency Initiatives in Railways**

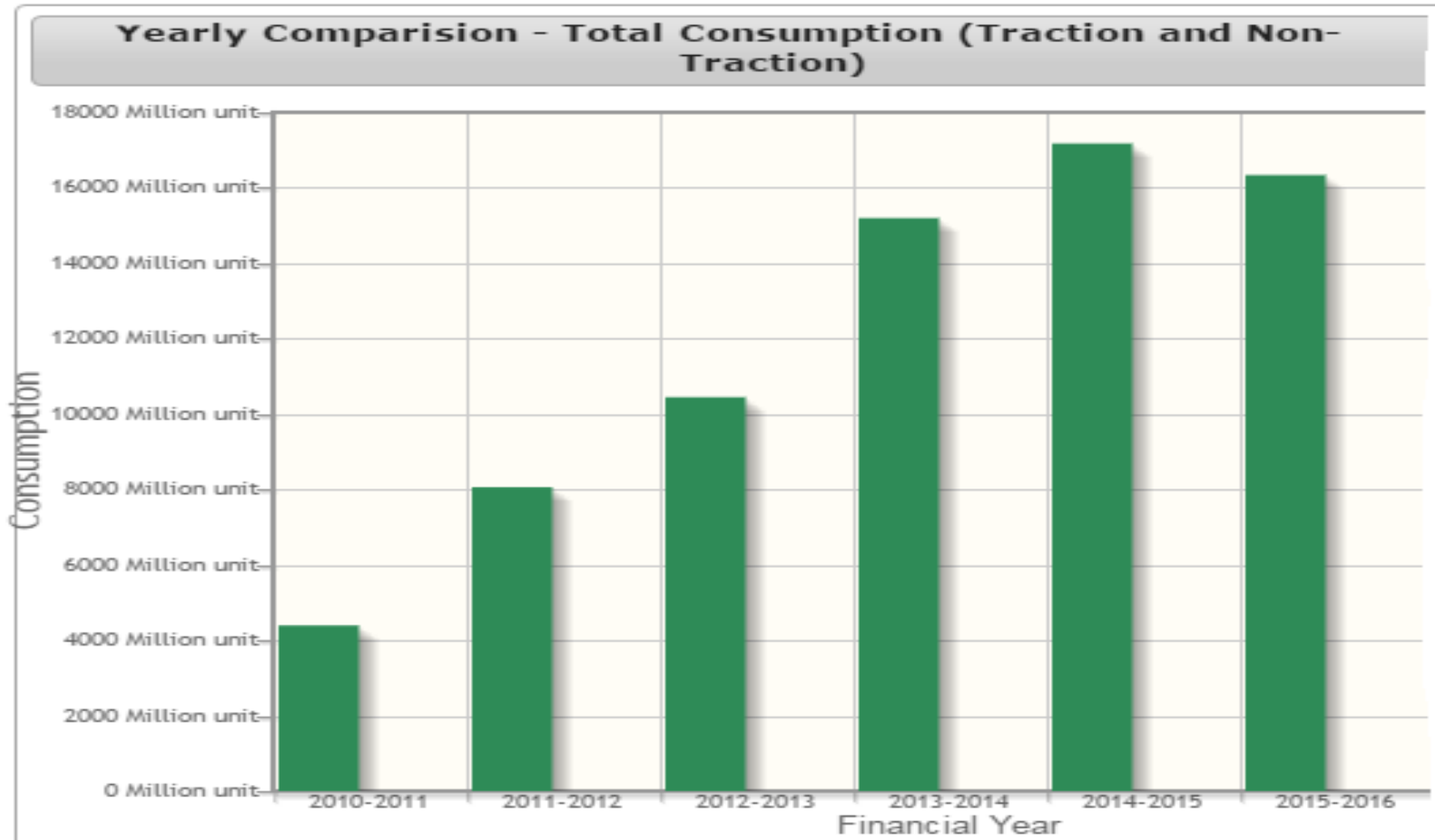
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Project Associate,  
IR-GEF-UNDP Project,  
Railway Board**

**14<sup>th</sup> June, 2016**

# **ELECTRIC TRACTION- Key Statistics of** **2015-16**

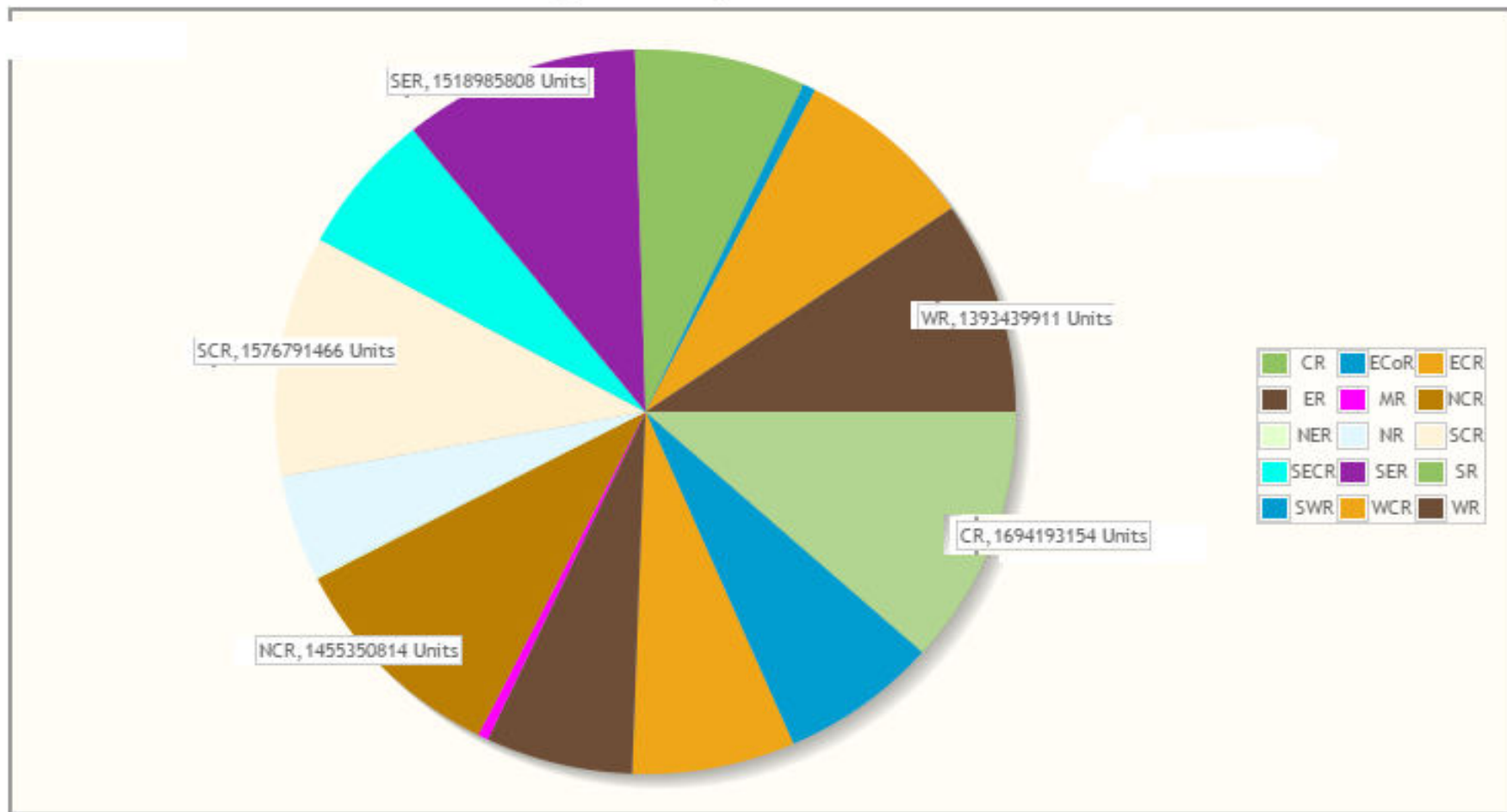
- **About 26000 RKM (39.92%) electrified.**
- **Fuel expenses 37% (Rs. 10963 Cr) out of Rs. 29234 Cr**
- **Consumes apprx.17 Billion units (1.9% of total consumption)**
- **Electricity bill (2015-16) provisional: Rs. 10300 Cr**
- **Requirement of power likely to double in next 5 yrs.**

# Railways Energy Consumption in last Six years

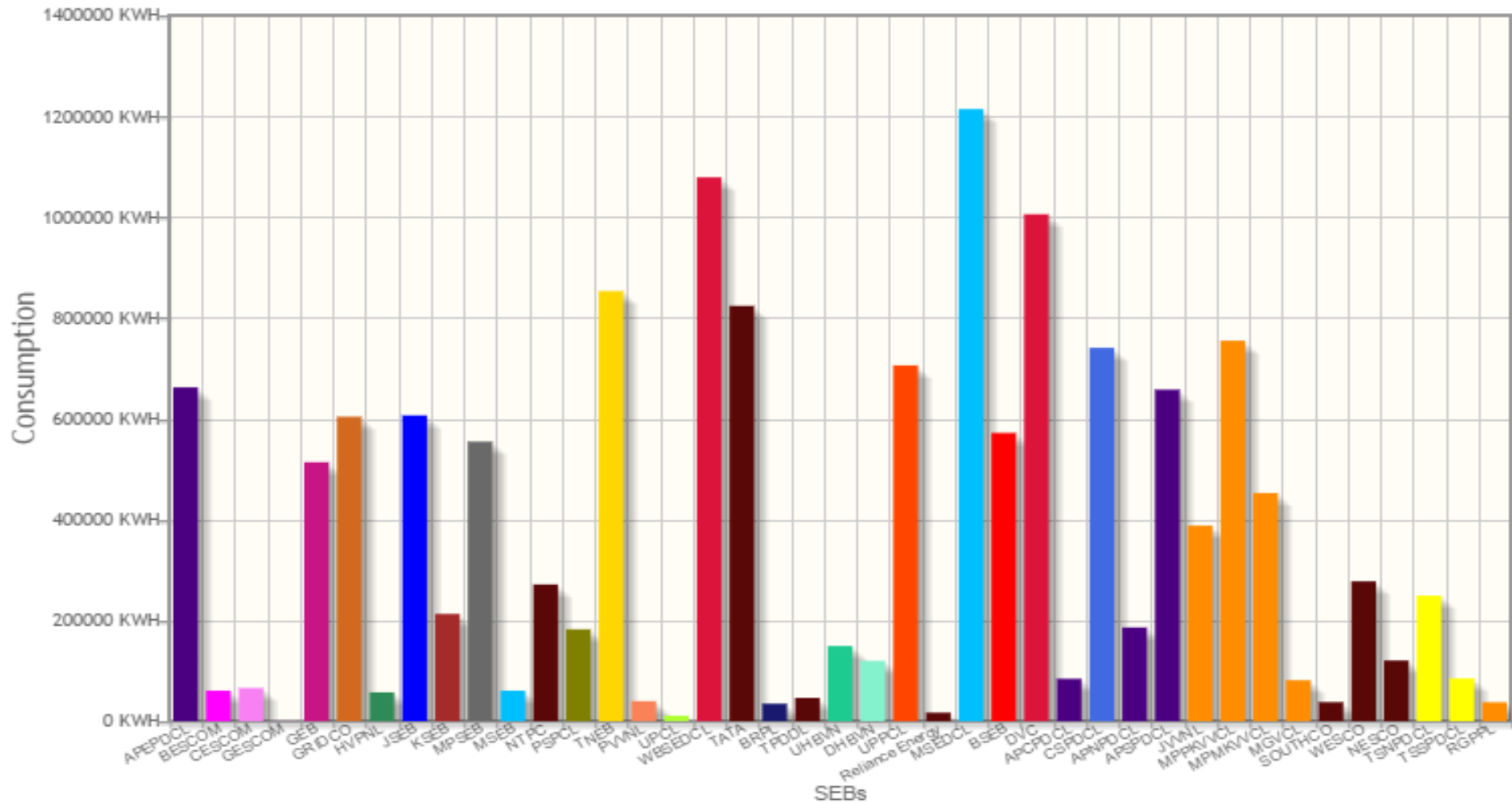


# Energy consumption in 2015-2016 (Traction)

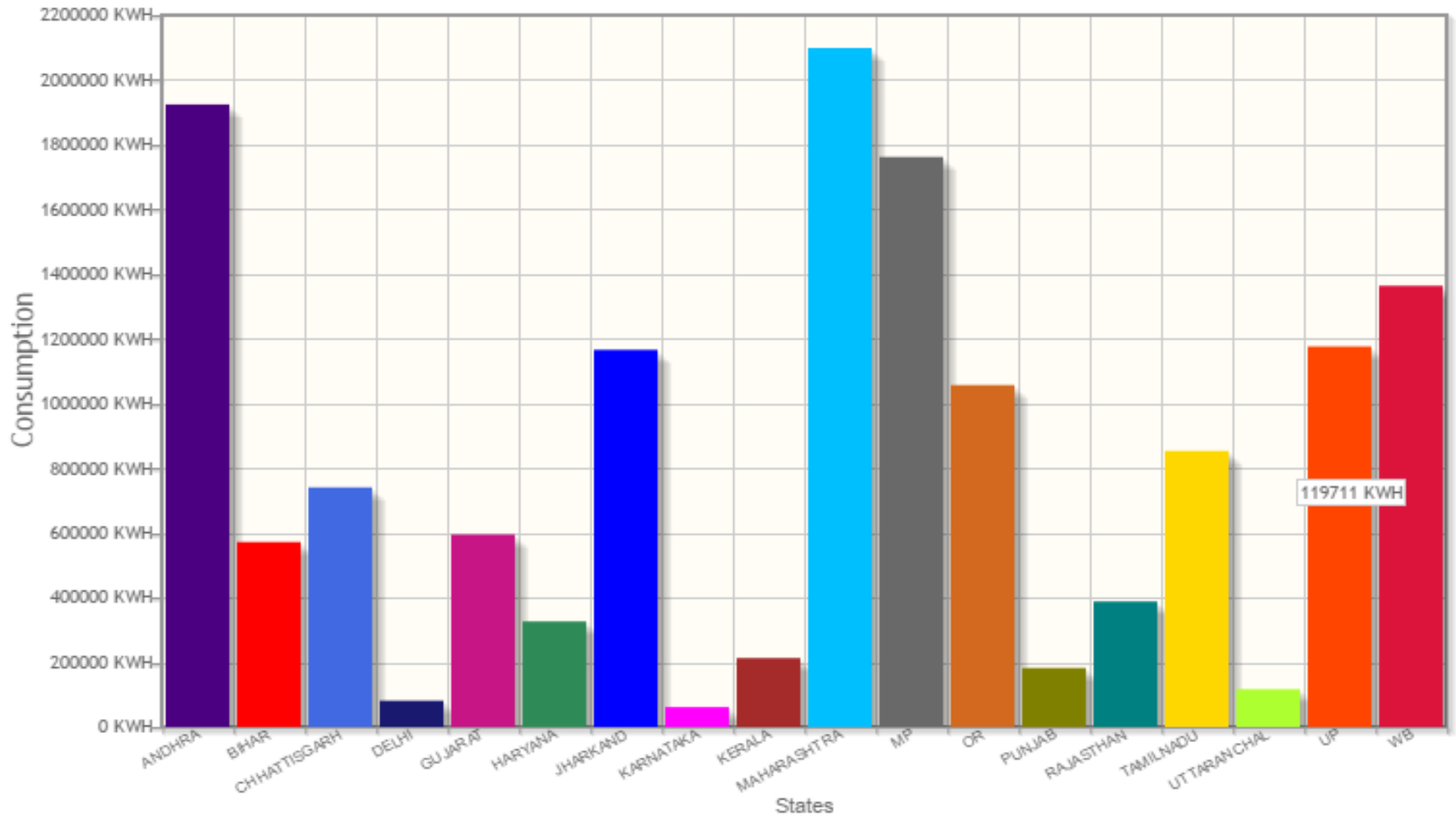
Total Energy Consumption is 14674 million Units



# Traction Energy consumption as per SEB (2015-2016)

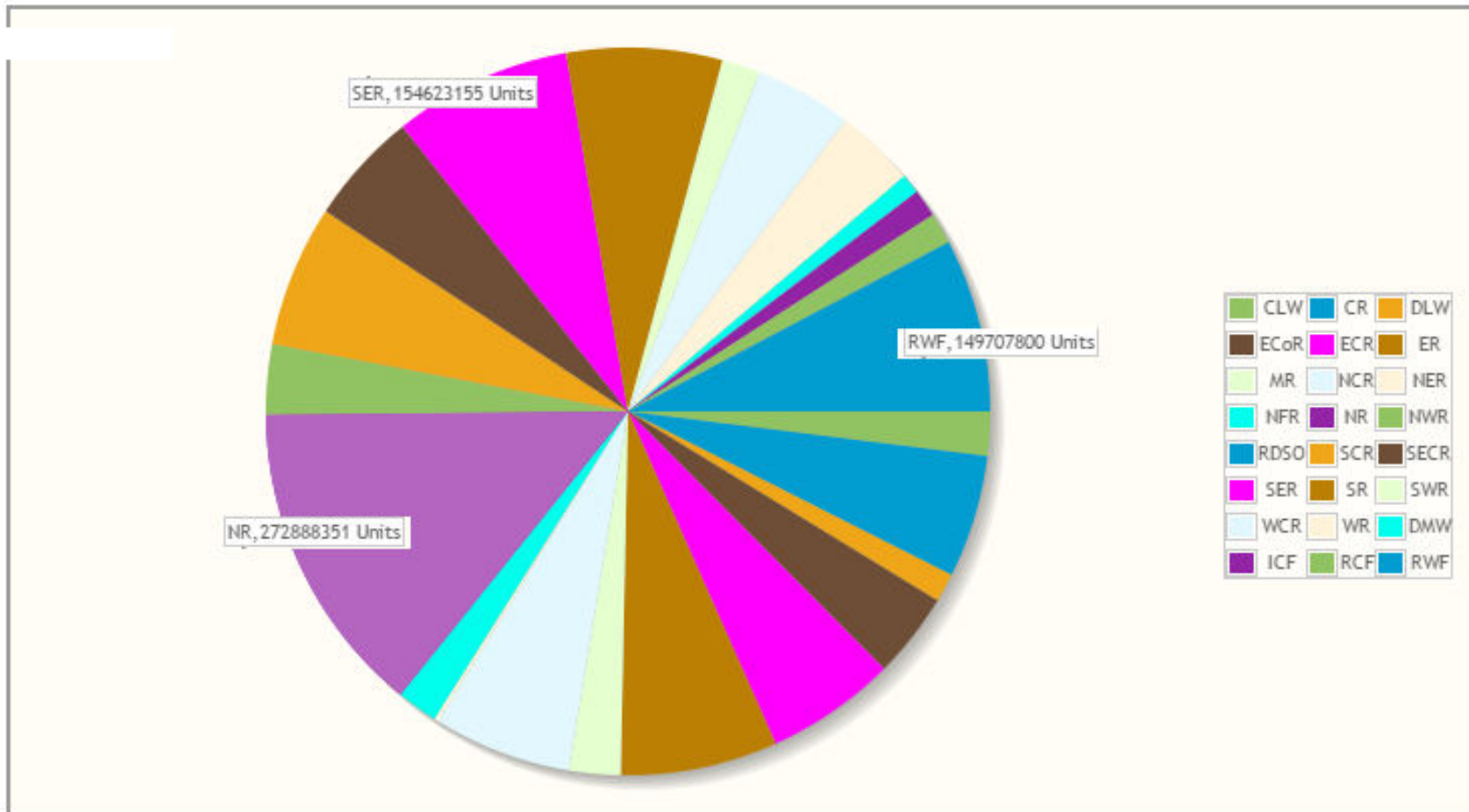


# Traction Energy consumption as per States (2015-2016)



# Energy consumption in 2015-16 (General Services/Non traction)

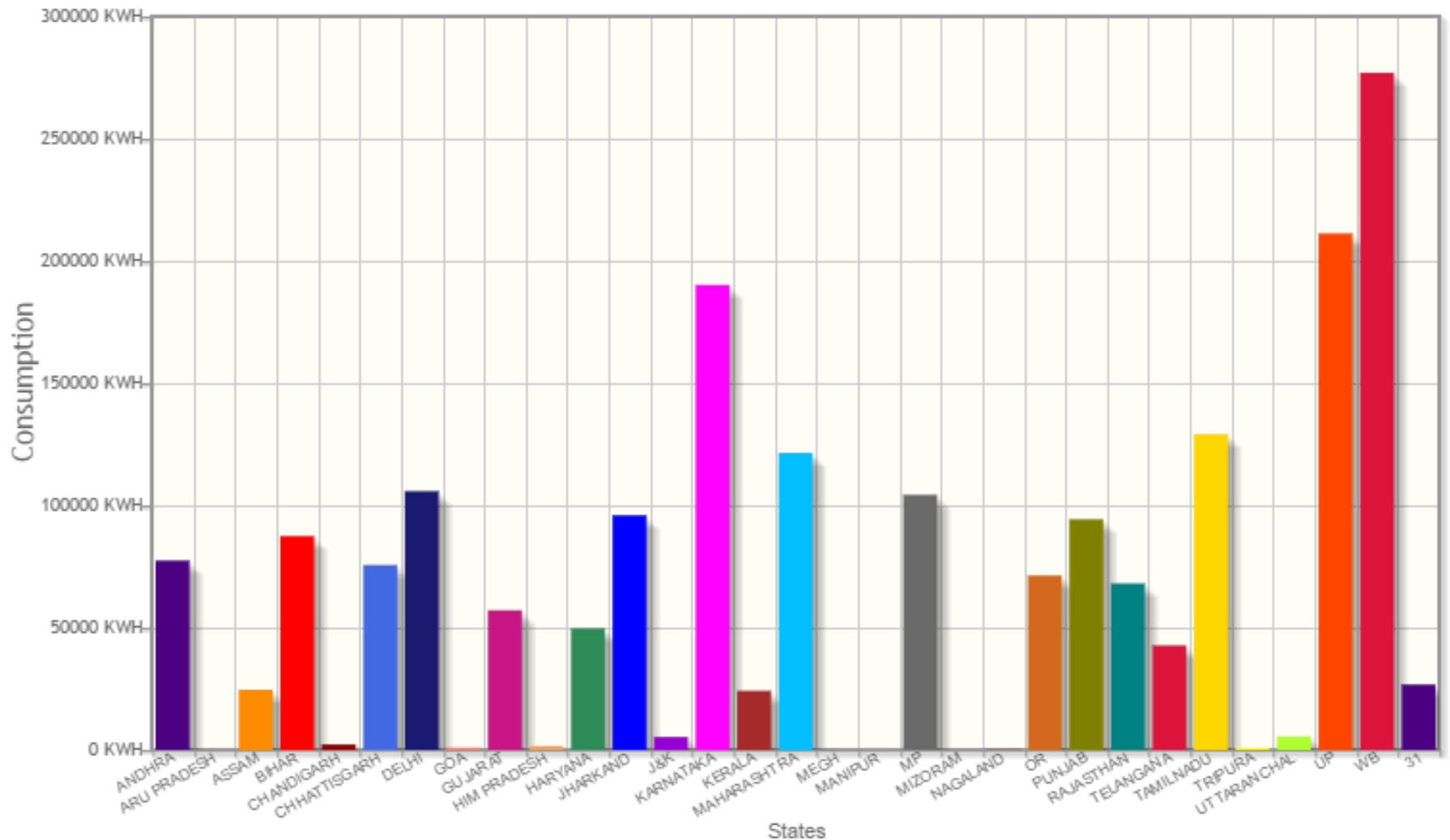
Total Energy Consumption is 1945 million Units







# Non-traction Energy consumption as per States (2015-2016)



# Highlights of Rail Budget 2016-17

- Through Power Procurement Contracts (using its status as Deemed Distribution Licensee) already signed and implemented will mean an annualized saving of Rs. 3000 crore by coming year.
- In addition, the saving of Rs. 300 crore is being targeted through demand side management and energy efficiency measures.
- All new light provisions will be LED luminaire and all Railway stations will be covered with LED luminaire in next 2 to 3 years.
- **Green Industrial Units:** To convert all production units as well as at least one workshop in each Zonal Railway as green industrial unit by obtaining relevant certification, **good energy management and sourcing energy from renewables**

# **Energy Conservation Achievements**

- **Total of Rs. 2656 crores (approx) saved in the last 5 years due to energy conservation measures**
- **87 No. of National Energy Conservation Awards bagged by Railways till 2015-16.**
- **Developed a web based portal '[Rail Saver](#)' & IRGREENRI.**
- **Issued [98 Policy Guidelines/](#) Circulars on General Power Supply Systems like use of LED lights etc**
- **Indian railways has carried out 643 energy audit of facilities till March, 2016.**
- **On 12 August 2015, IR has signed MOUs with Ministry of Power and BEE for co-operation to improve Energy Conservation on IR in the presence of Hon'ble Minister of Railways and Minister of State (Independent Charge) for Power, Coal and New & Renewable Energy.**

# **Energy Conservation Initiatives**

## **Measures initiated :**

- **Energy auditing of major load centers**
- **Segregating of 70:30 lighting circuits at platforms**
- **Use of energy efficient LED luminaries & fans**
- **Policy to Procure star rated equipment**
- **Automation of pumps**
- **Power factor Improvement measures**
- **Timers for high mast lighting and occupancy sensors in offices**
- **More than 8 lakhs LED purchased by Railway staff**
- **These measures have maintained Energy consumption over last 3 yrs despite increase in load @ 5% per yr.**

# Specific Energy Consumption (in kWh/000 GTKMs)

S.No.	Year	Specific Energy Consumption			
		Passenger	% Reduction	Goods	% <b>Reduction</b>
<b>1</b>	2009-10	19.6		7.29	
<b>2</b>	2010-11	19.4	1.02	6.79	<b>6.85</b>
<b>3</b>	2011-12	19.0	2.06	6.43	<b>5.30</b>
<b>4</b>	2012-13	18.9	0.52	6.13	<b>4.66</b>
<b>5</b>	2013-14	18.8	0	6.08	<b>2.12</b>
<b>6</b>	2014-15	18.9	0	6.86	
	<b>Imp For 6 years</b>		<b>3.57%</b>		<b>17.6%</b>

# Energy Conservation Initiatives

**Major initiatives :**

- **Facade LED lighting at Mumbai CST station**



# Energy Conservation Initiatives

Major initiatives :

- **LED Lights in 5 Rakes of 12 Coaches EMU (Churchgate to Virar)**



# Energy Conservation Initiatives

Major initiatives :

- **LED lights installed at Railway stations**





# Energy Conservation Initiatives

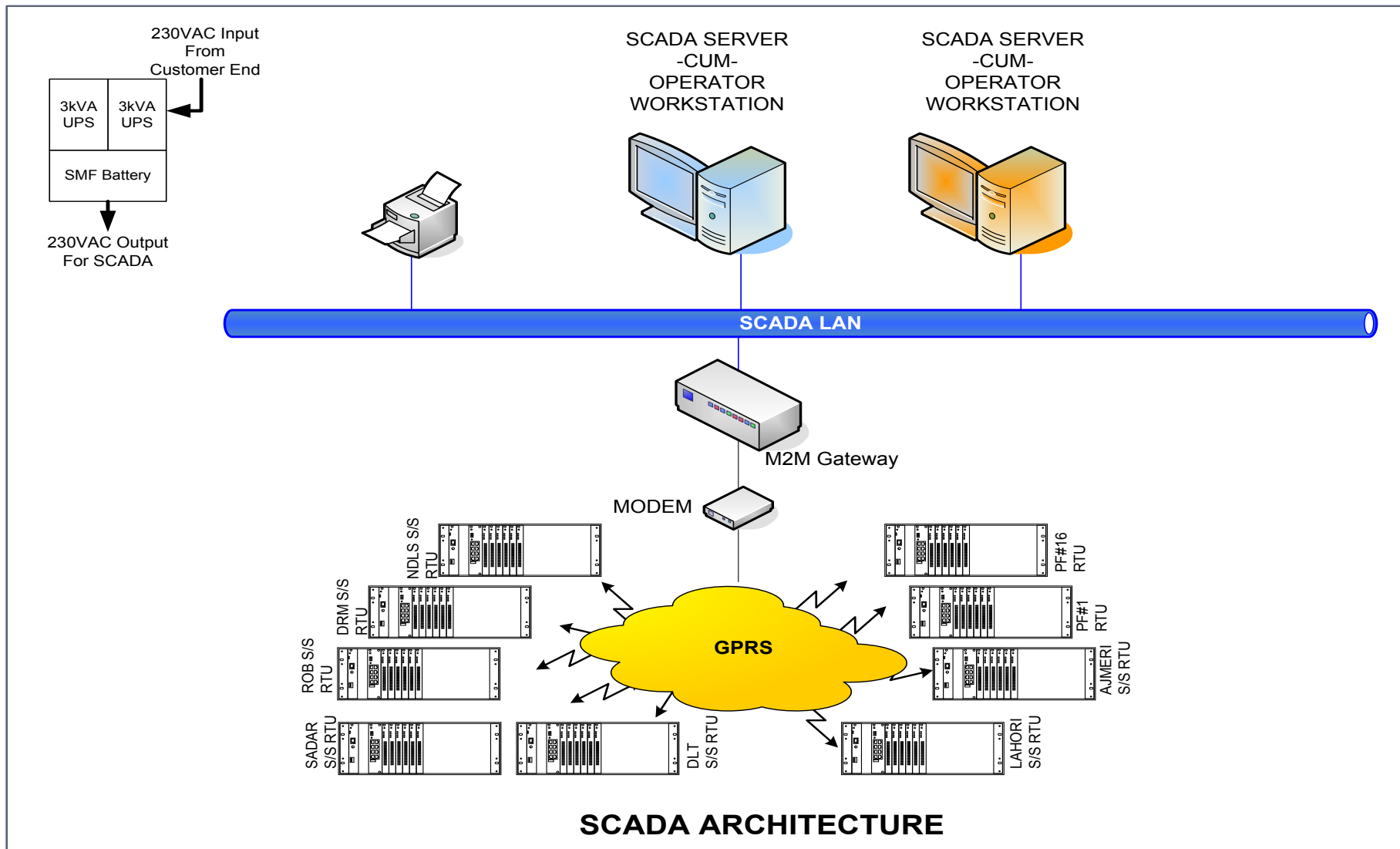
Major initiatives :

- 200 nos. 35 Watt Energy Efficient Ceiling Fans installed at Platform No 1 of NDLS & HNKM Railway Stations



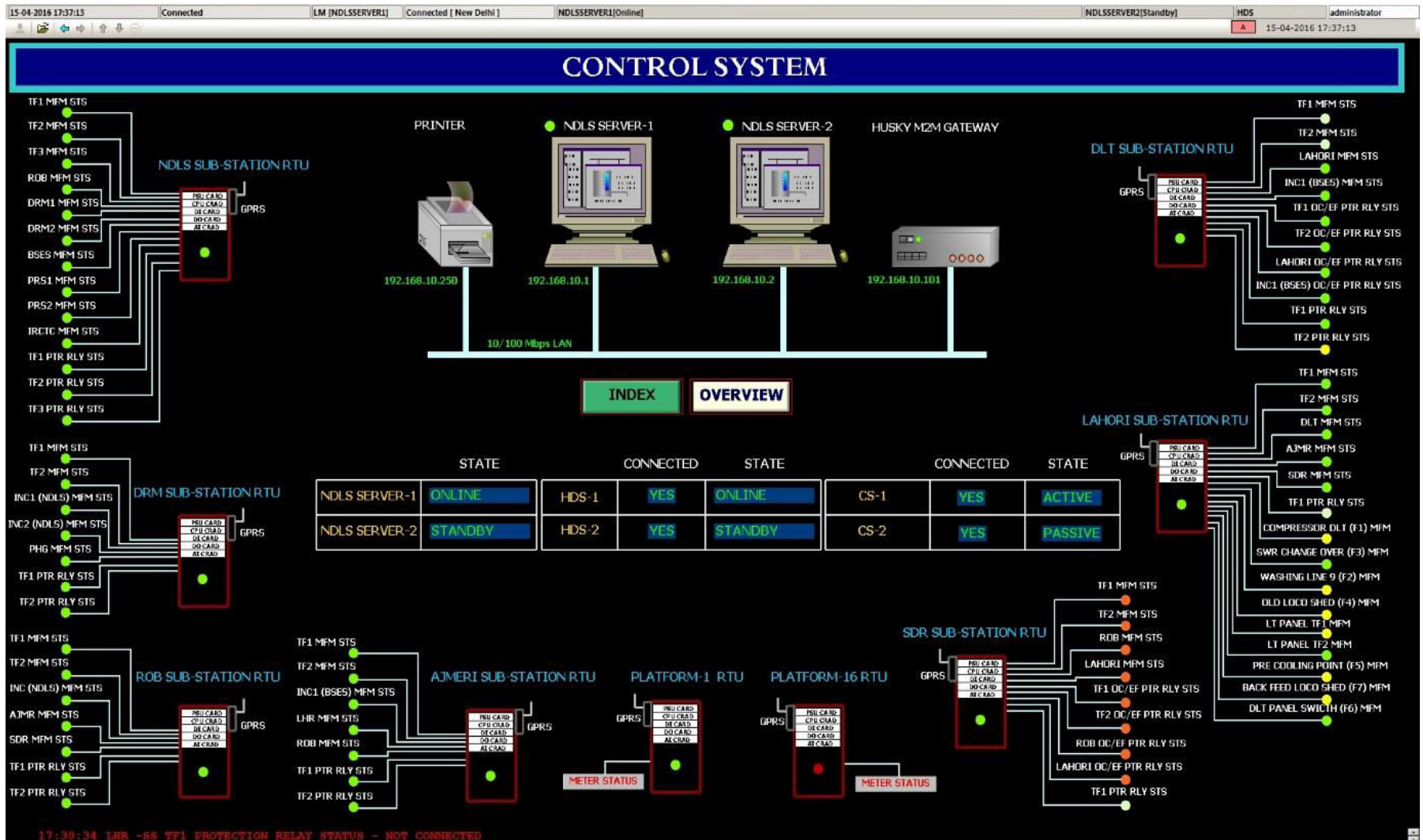
# Energy Conservation Initiatives

- Implementation of SCADA system at New Delhi Railway Station:



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# Energy Conservation Initiatives

- **Implementation of SCADA system at New Delhi Railway Station:**
- **Benefits:**
- **Increased Efficiency of operations:**
  - Increased efficiency of Power Operations
  - Lesser deployment of power due to centralized monitoring & Control
  - Better response time to any outage.
- **Better energy Management:**
  - Identification of major sources of power consumption and targeting these for load reduction
  - Identify losses and take action
  - Reports for Analysis
  - Maximum Demand Monitoring & Regulation

# Energy Conservation Initiatives

- Under **Indian Railway-GEF-UNDP project**, the following demonstration pilot projects on Energy Efficiency were implemented.
- Ministry of Railways is exploring to replicate the following energy efficient technologies across Indian Railways.

S.no	Interventions
1	Optimal light control system over DLI Division
2	Smart sense & smart Grid system at NR, Baroda House, New Delhi
3	Provision of automized light & fan control for New Delhi Railway Station
4	Implementation of SCADA on New Delhi Railway Station
5	Automation of pumping arrangement at Ghaziabad NR
6	Bay lighting in workshops & Loco sheds
7	Provision of 200 Super energy efficient fans at NDLS station
8	Installation of VVVF (Variable voltage variable frequency) drives for lifts
9	Provision of Solar pumps over DLI division

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S.no	Interventions
10	Supply, fixing, testing & commissioning of retro-fitment of LED lights in 150 non AC GSCN coaches of TL Depot in DLI Division
11	Energy efficient automation system for pumping installations for stations; workshops; hospitals; railway offices & colonies at Jaipur NWR.
12	Provision of building management system for stations & railway offices for implementing energy efficiency measures at Dadar Station , Central Railway
13	Transformation of Rail Bhawan building into Energy Efficient by Building Management Intelligent systems (BMIS) project.
14	Substations Metering Data Analysis Systems (MDAS) project at Northern Railways

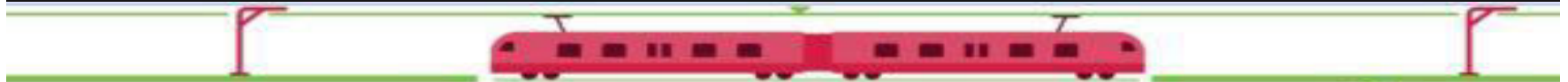
# Energy Conservation Initiatives

## Major initiatives :

As part of capacity building of railways staff on energy efficiency, [“International Summit on Energy Efficient Technologies in Railways”](#) was held on 6th November 2015 at Taj Palace, New Delhi to share several energy efficient technologies adopted by railways across other countries



# Thank you



A route to a climate-neutral train journey

