Perform Achieve and Trade(PAT) Scheme- An Opportunity to reduce energy intensity and associated cost

Western Region Workshop on
"Capacity Building of Officers from Petroleum Refinery Sector on Efficient Use of Energy" on 7th July,2017, IOCL, Gujarat Refinery, Vadodara

Knowledge Exchange Platform
Transmitting Knowledge through Best Practices

ENERGY IS LIFE
BEE
CONSERVE IT

Institute for Industrial Productivity

K. K. Chakarvarti, Expert Consultant

1

Perform Achieve and Trade scheme

PAT- Salient features

- **Regulatory instrument linked with market mechanism**
  - Certification of energy saving
- **Consultative approach**
  - Ministries/DCs/Associations/FIs/Research Organizations
- **Outreach/ Capacity Development**
  - Workshops/Seminars/ Visits
- **“Self – competing”**
  - Unit specific targets
- **Relative responsibility**
  - Less target for more efficient and more for less efficient
- **Supports improvement in energy management system**

  measurement, recording and reporting

PAT Overview

- **PAT Cycle – I** Covered 478 plants in 8 energy intensive industrial sectors
- **PAT Cycle-II**, covers 621 plants in 11 energy intensive industrial sectors (three new sector, Refinery, DISCOMS and Railway has been added, with addition of new DCs in existing as well)
- **Key Goal** :Mandatory Specific Energy Consumption reduction
- **PAT Cycle-III**, covers 116 plants from 6 sectors

Impact - PAT Cycle I (8.67 Million toe)

- **Monetary Savings- Rs 37,685 Crores**
- **Investment made in energy conservation measures- Rs20,783 Crores**
- **21 million tonnes savings in Coal (6600 Rakes)**
- **1.25% of savings in total primary energy supply in India**
- **2.38% of savings in total energy consumed by Industries**
- **5.24% of savings in total energy consumed by PAT industries**

Reduction of 31 million tonnes of CO_2 against target of 24 million tonnes of CO_2

PAT-II Overview and Status

Sr. No	Sector	No. of DCs in PAT I	Total no. of DCs PAT -2
1	Aluminium	10	12
2	Chlor-Alkali	22	24
3	Textile	90	99
4	Pulp & Paper	31	29
5	Iron & Steel	67	71
6	Fertilizer	29	37
7	Cement	85	111
8	Thermal Power Plants	144	154
9	**Refinery**	**NA**	**18**
10	DISCOMS	NA	44
11	Railway	NA	22
Total		487	621

PAT Cycle II
Baseline Year: 2014-15
PAT Cycle year 2016-2019
Assessment Year: 2018-19
M&V period: Apr-2019 to 31st July2019

Total Energy Consumption from 11 sectors 227 mtoe

National Target = 8.869 mtoe at the end of 2nd PAT Cycle (by 2018-19)

PAT-II Overview and Status

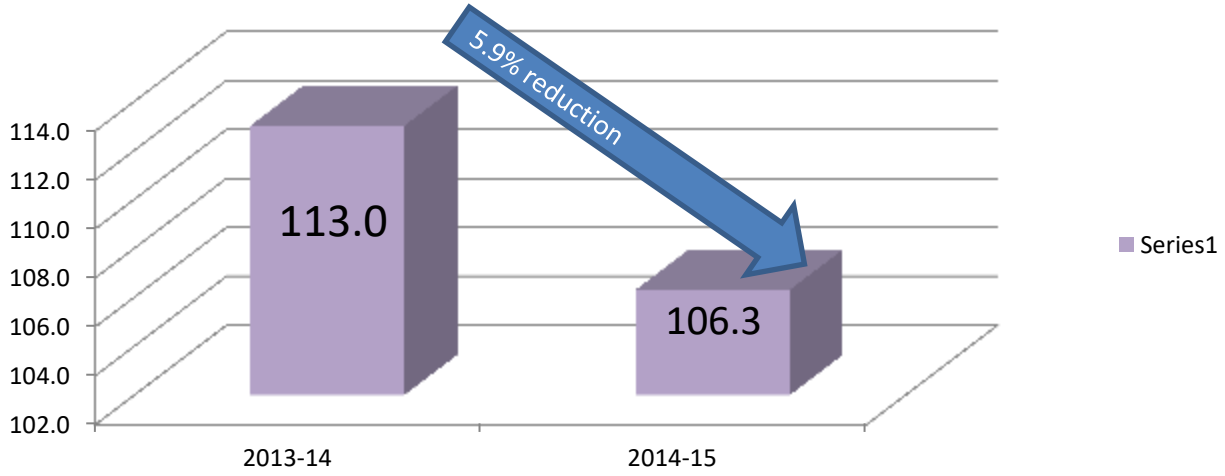
Sr No	Sector	Notified Nos	Energy Consumption	Old DCs	Nos	Energy Consumption	Target 2018-19
		Old			New		
1	Aluminium	10	7.71	10	12	10.66	0.57
2	Cement	85	15.01	84	111	21.43	1.12
3	Chlor- Alkali	22	0.88	21	24	1.77	0.101
4	Fertilizer	29	8.2	29	37	8.25	0.45
5	Iron & Steel	67	25.32	62	71	40.44	2.14
6	Paper & Pulp	31	2.09	25	29	2.68	0.15
7	Textile	90	1.2	85	99	1.48	0.087
8	Thermal Power Plant	144	104.56	132	154	120.16	3.13
9	Refinery				18	18.50	1.10
10	Railways				22	1.39	0.033
11	Discom				44		
	Total	478	164.97	448	621	226.76	8.869

Reduction in Energy Intensity

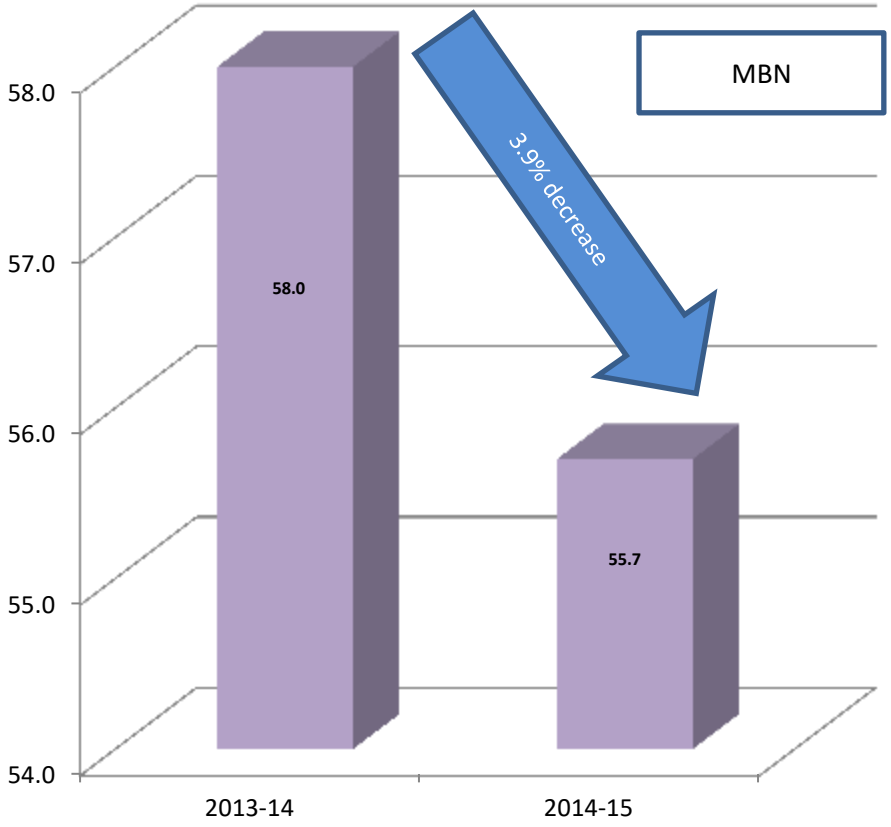
- A large variety of opportunities exist within the Refinery Sector to reduce energy consumption while maintaining or enhancing the productivity of the plant.
- Various Studies have demonstrated the existence of a substantial potential for energy efficiency improvement.
- Areas for energy efficiency improvement can be identified ,such as utilities, fired heaters, process optimization, steam from waste heat and others for conserving energy in these areas which will result in lesser fuel consumption.

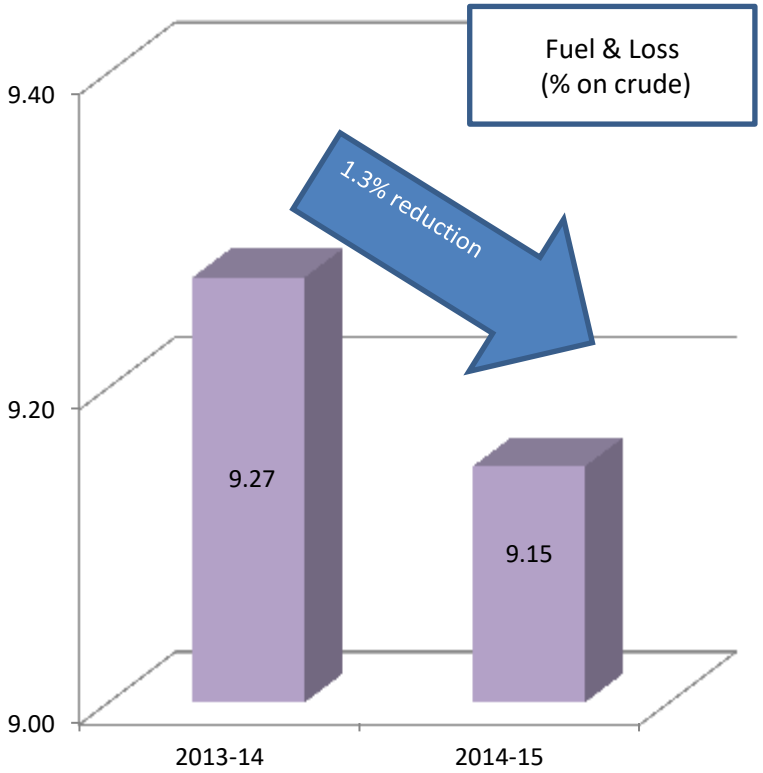
Examples- Gujarat Refinery, Vadodara-Winner of 1st Prize, National EC Award 2015

- Gujarat refinery has implemented various energy conservation measures over the years and has successfully reducd its energy intensity index (EII) from 151 in 2010-11 to 106 in 2014-15.
- 22 Nos. of ENCON measures were taken up in 2014-15 which has resulted in saving of 39556 SRFT on an annual basis.



Examples- Gujarat Refinery, Vadodara-Winner of 1st Prize, National EC Award 2015



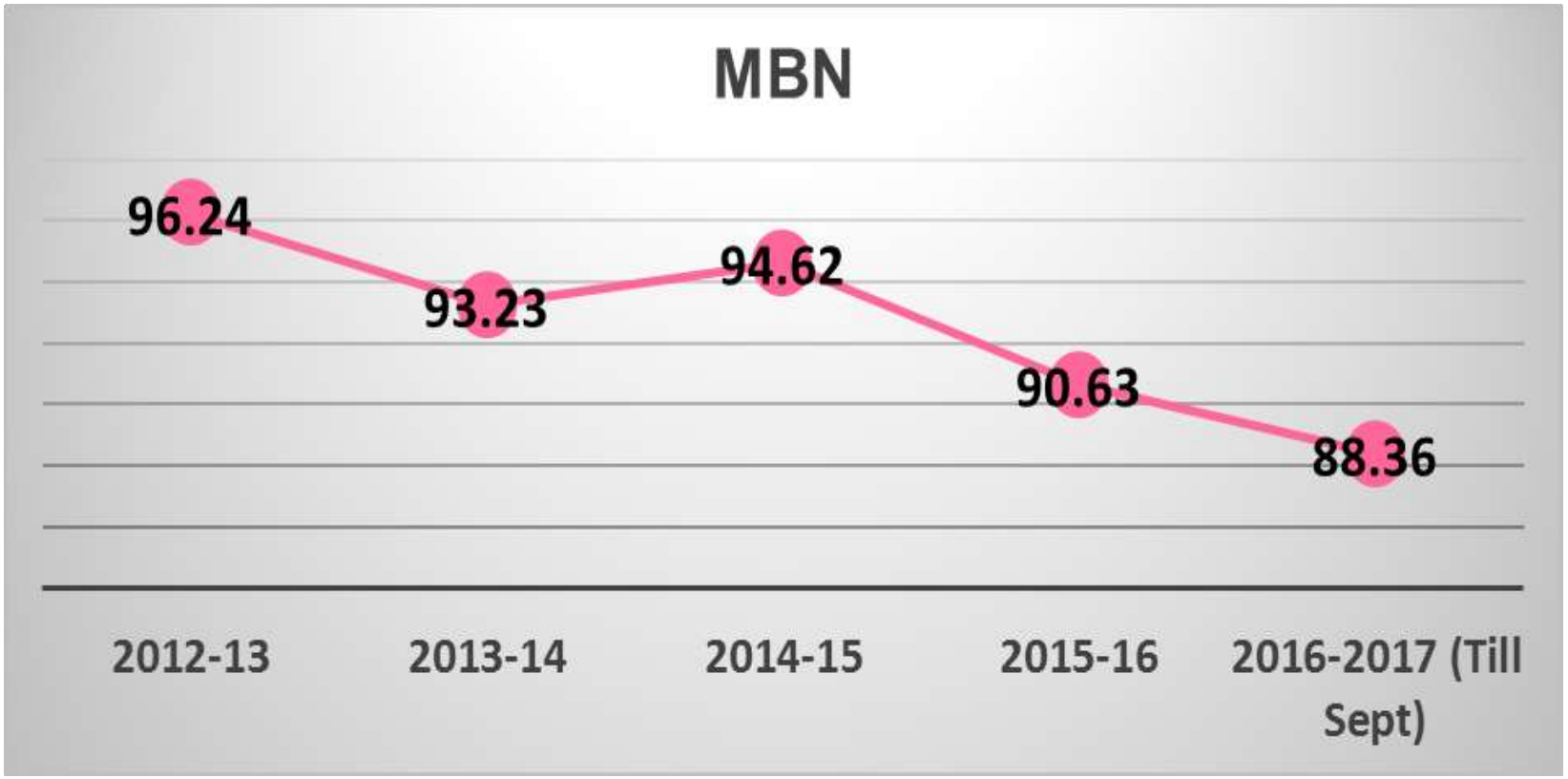


Examples- HPCL - MITTAL ENERGY LIMITED (HMEL) Bathinda– Winner of 1st Prize, National EC Award 2016

Specific Energy Consumption- MMBTU/BBL/NRGF (MBN)

Attributes	MBN
FY 2014 - 15	66.01
FY 2015 - 16	62.10

Examples- HINDUSTAN PETROLEUM CORPORATION LIMITED, Mumbai Refinery – Winner of 2nd Prize, National EC Award 2016



Importance of Capacity Building for achieving PAT Targets

- Capacity buildings of plant personals is paramount in achieving PAT Targets
- Capacity building programme will benefit plant to develop and sustain programmes to achieve PAT Targets
- Focus on the priority areas identified at the department level and identify the areas to reduce plant energy intensity.
- This to be followed by the development of road map/action plan at the Department level to achieve PAT Targets

All win situation

- **For Designated Consumers**
  - Improvement in Energy Intensity will bring down the specific input energy cost and ultimately triggers higher profit in company's balance sheet
  - The DCs can trade over achieved Energy efficiency in the trading platform to the under achiever
  - Capacity building of Man power
- **For Technology Suppliers**
  - Business opportunities in terms of lower payback period of energy efficient technologies.
- **For Service Company's**
  - Opportunities in terms of Energy Auditing, capacity buildings, Implementation of projects as ESCO model

2

Conclusions

A Scheme to incentivize the industry to achieve better energy efficiency

CONCLUSIONS

- **The PAT scheme is a unique and innovative programme with no precedence anywhere else in the world.**
- **PAT would become a valuable model for other emerging economies to adopt for their own energy efficiency programmes with a business perspective.**
- **The PAT scheme also sets an innovative approach of introducing market-based instruments within a regulatory framework to encourage compliance.**
- **PAT has encouraged adoption of energy efficient and Low carbon technology, use of renewable , waste heat recovery and use of Alternate fuel and raw materials (AFR) in Indian industry.**
- **Knowledge Exchange Platform has now established its name in India and supporting PAT industry through promotion of knowledge transfer on best practices, information exchange on innovative technologies, Energy Management System, facilitating policy discussion forums and friendly energy efficiency exchange visits.**

Visit us at www.knowledgeplatform.in