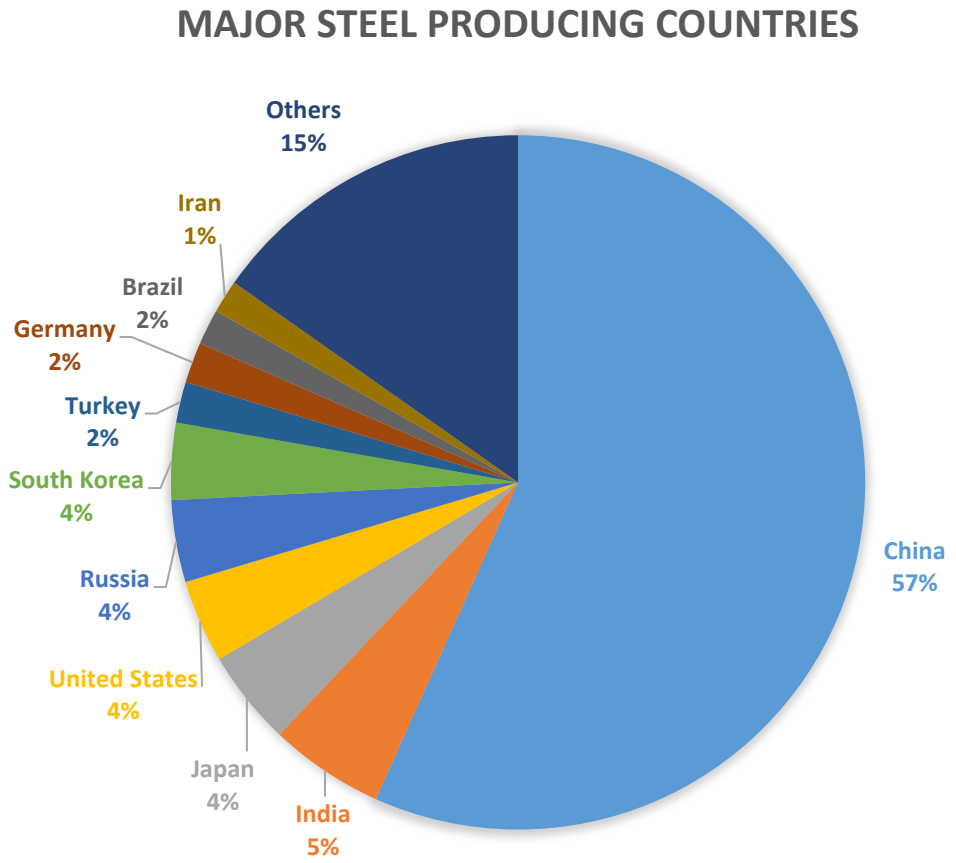
Perform, Achieve and Trade (PAT) Scheme for Iron & Steel Sector

Overview of Steel Industry

Crude Steel Production in Million Tonnes		
Sr. No.	**Country**	**Year 2022**
1	China	1064.8
2	India	120
3	Japan	83.2
4	United States	72.7
5	Russia	71.7
6	South Korea	67.1
7	Turkey	35.8
8	Germany	35.7
9	Brazil	31
10	Iran	29
11	Others	286



Total Crude Steel production worldwide in FY 2022- 1878 Million Tonnes.

Overview of Direct Reduction Iron (DRI)

Total DRI production worldwide in 2022- ***106 Million Tonnes.***

India is leading in coal based DRI production.

DRI contribution about 33 % of the total steel production.

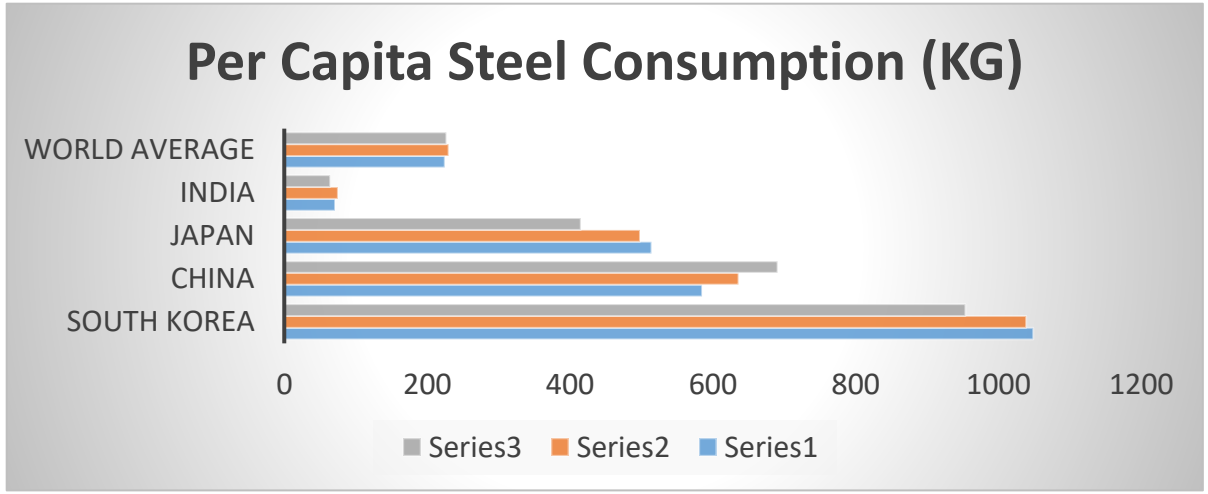
DRI production is ***39 Million Tonnes***

DRI Production in Million Tonnes				
Sr. No.	**Zones**	**Year 2019**	**Year 2020**	**Year 2021**
1	Asia	37.5	34.3	39.8
2	Middle East	43.6	42.4	43.5
3	Africa	7.5	8	9.5
4	Others	22.7	21.3	21.05

Overview of Steel Industry

Rank	Company	Tonnage
1	China Baowu Group [1]	115.29
2	ArcelorMittal [2]	78.46
3	HBIS Group [3]	43.76
4	Shagang Group	41.59
5	Nippon Steel Corporation [4]	41.58
6	POSCO	40.58
7	Ansteel Group	38.19
8	Jianlong Group	36.47
9	Shougang Group	34.00
10	Shandong Steel Group	31.11
11	Delong Steel Group	28.26
12	Tata Steel Group	28.07
13	Valin Group	26.78
14	JFE Steel	24.36
15	Nucor Corporation	22.69
16	Hyundai Steel	19.81
17	Fangda Steel	19.60
18	IMIDRO [5] [e]	18.90
19	Benxi Steel	17.36
20	Liuzhou Steel	16.91
21	Jingye Steel	16.30
22	NLMK	15.75
23	Baotou Steel	15.61
24	SAIL	14.97
25	JSW Steel	14.86

Worldwide Per Capita Steel Consumption (KG)				
SR.	Country	2018	2019	2020
1	South Korea	1049	1039	954
2	China	585	636	691
3	Japan	514	498	415
4	India	71	75	64
5	World Average	224.5	230	227



Perform Achieve and Trade (PAT): A **regulatory instrument** to reduce specific energy consumption in energy intensive industries, with an associated **market based mechanism** to enhance the cost effectiveness through certification of excess energy saving which can be traded.

Steel Sector in PAT Scheme

Threshold Limit:

20,000 (TOE) per annum

Total Energy Consumption

66.62MTOE

Iron & Steel Sector

[Total Notified DCs:**204** Nos.

Total Active DCs: **197** Nos.]Till Cycle VII

Iron & Steel Sector under PAT Scheme				
S.R.	**Category**	**No. of DCs**	**Production (Million tonne)**	**Energy Consumption (Mtoe)**
1	ISP	17	67.79	47.36
2	Sponge Iron	50	46.13	2.33
3	SI+SMS	59	87.25	4.88
4	SI+SMS+others	28	85.34	4.78
5	Ferro Chrome	6	91.03	1.10
6	Ferro Alloys	11	42.01	0.56
7	Mini Blast Furnace	12	80.59	4.89
8	SPU	14	14.21	0.68
	Total	**197**	**113.26**	**66.62**

Additional 66 Nos. of DRI units comes in next Notification.

Sector Performance

Sr. no.	Description	Unit	Cycle-I	Cycle-II	Cycle-III
1			**Baseline year (2007-10)**	**Baseline year (2014-15)**	**Baseline year (2015-16)**
1.1	Designated consumers	nos	67	71	29
1.2	Baseline production	Million tonnes	42.56	64.49	10.67
1.3	Total energy consumption	Million toe	25.32	40.44	7.64
2	Targeted energy consumption in Assessment year	Million toe	23.84	38.3	7.19
			Achievement in Assessment year (2014-15)	**Achievement in Assessment year (2018-19)**	**Achievement in Assessment year (2019-20)**
3	Target Year Production	Million tonnes	59.8	80.04	14.73
3.1	Total energy consumption (Actual)	Million toe	39.38	48.92	9.1
3.2	Total energy consumption on (Pro-rata)	Million toe	23.22	37.735	7.067
3.2	Additional achievement over the target (Pro–rata)	Million toe	0.62	0.565	0.123

1.48 mtoe

2.14 mtoe

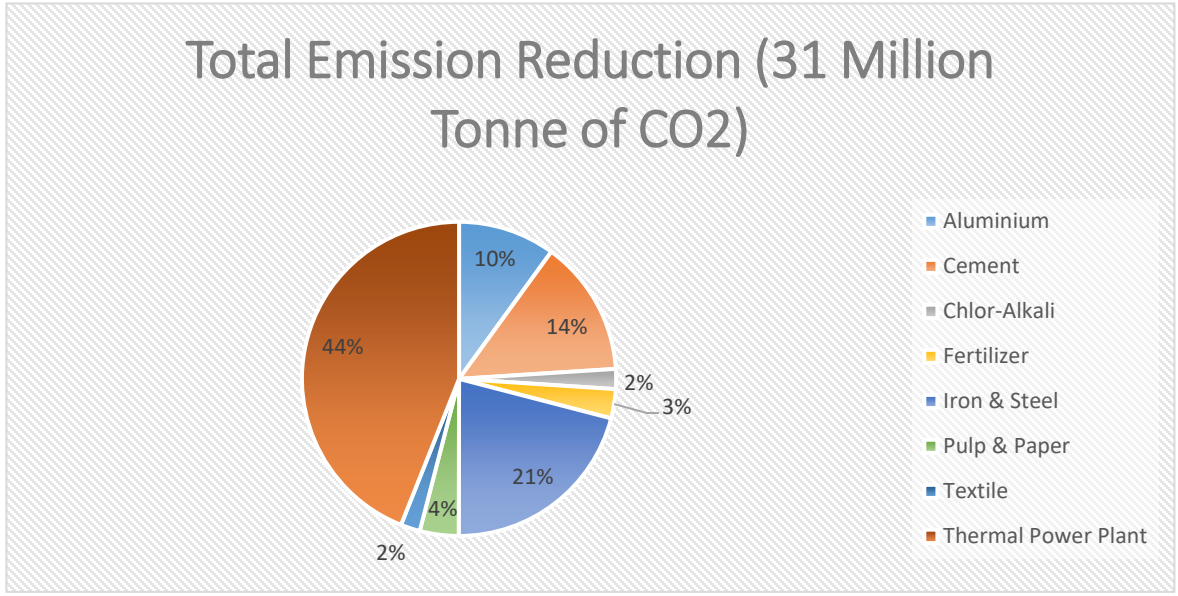
0.457 mtoe

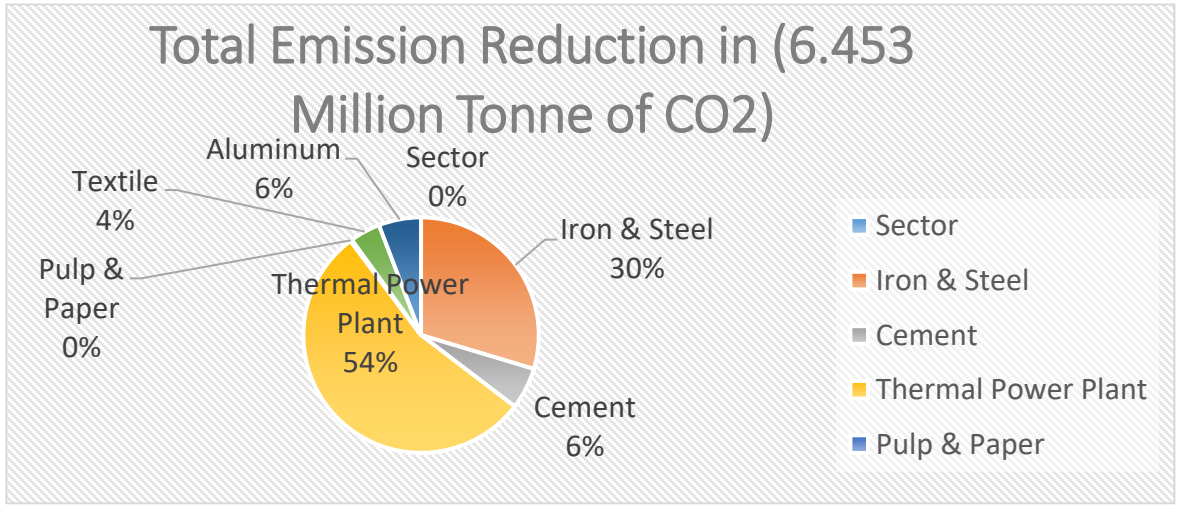
2.10 mtoe

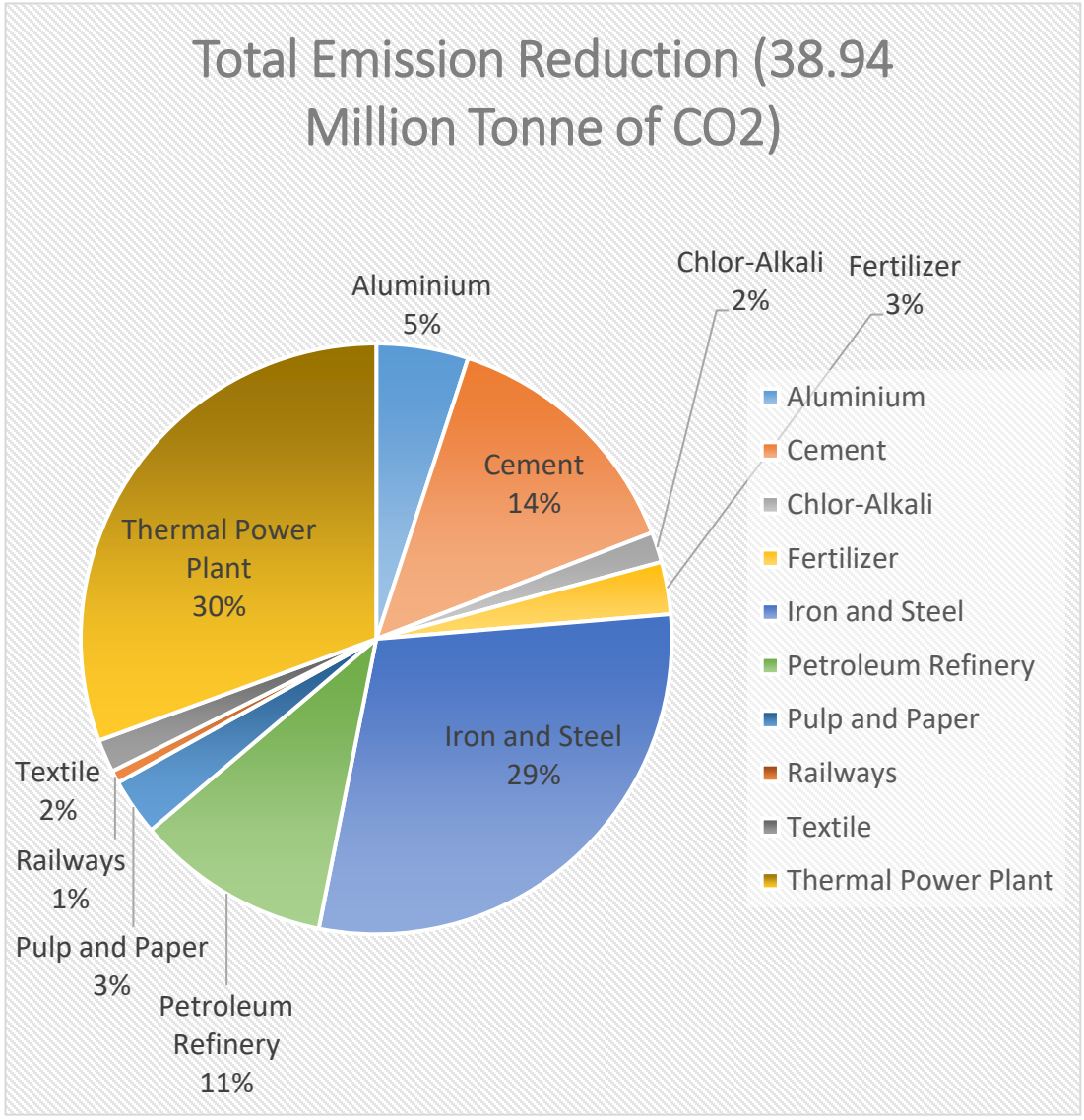
2.705 mtoe

0.573 mtoe

Cycle wise Eq. Emission Saving







Realized Impacts: PAT (2012-2019)

Energy Saving

22.75 mtoe

2.56 % of India's

Total primary energy supply

Emission Reduction

99.43 million tonnes of CO_2

3.49% of India's

emissions

Skill Development

Capacity building:

12000+ Engineers and operators

17975 Energy Auditors & Managers

285 Accreditation

ESCerts Trading

95.63 lakhs ESCerts were awarded.

50.71 lakhs ESCerts entitled to Purchase.

12.98 lakhs ESCerts traded in PAT-I

Investment

Encouraged investments for energy efficient technologies for domestic manufacturing

Rs 56,100 Crore invested

Savings

Rs 51520 Crores

from saved **energy consumption**

Total PAT DCs Cycle wise

Sector / No. of DCs	Annual energy consumption Norm to be DC (TOE)	PAT Cycle I (Apr'12)	PAT Cycle II (Apr'16)	PAT Cycle-III (Apr'17)	PAT Cycle-IV (Apr'18)	PAT Cycle- V (Apr'19)	PAT Cycle-VI (Apr'20)	PAT Cycle-VII (Apr'22)	PAT Cycle-VII A (Apr'22)	Total Notified DCs as on date
Thermal Power Plant	30000	144	154	37	17	17	-	119	33	239
Iron & Steel	20000	67	71	29	35	23	5	69	65	204
Cement	30000	85	111	14	1	12	37	106	14	175
Aluminium	7500	10	12	1	-	1	-	11	1	14
Fertilizer	30000	29	37	-	-	-	-	-	-	37
Paper & Pulp	20000	31	29	1	2	8	2	23	1	48
Textile	3000	90	99	34	7	16	7	90	30	168
Chlor- Alkali	12000	22	24	-	2	2	-	24	-	28
Refinery	90000	-	18	-	-	-	20		-	20
Railways	70000	-	22	-	-	-	-	24	2	26
DISCOMs	All	-	44	-	-	-	-	43	52	96
Petrochemical	100000	-	-	-	8	-	-	-	-	8
Buildings	500	-	-	-	37	31	64	-	-	133
Total	**-**	**478**	**621**	**116**	**109**	**110**	**135**	**509**	**198**	**1196**

Initiatives of BEE

- BEE is developing Advanced Industrial Technology Development Centre (AITDC) at NPTI Badarpur where 13 Nos. of technologies non-working models from 05 Nos. of sectors shall be demonstrated and displayed for training purpose.The technologies selected in Iron & Steel sector for demonstration are:
    1. Waste Heat Recovery through Sinter Plant.
    2. Oxy-fuel burners.

- BEE in association with IIT-Roorkee is executing R&D cum demonstration project for sponge Iron plant-" Optimization of the performance of rotary kiln to maximize %metallization including use of natural gas/syngas as reductant"

- To capture CO2 emissions in Sector Specific Pro-forma (Form Se-1) has been modified with the support of SAIL RDCIS.

Initiatives of BEE ….

- As per the direction of Hon'ble MoP **Sectoral Advisory Group** has been constituted to assist BEE in identification and implementation of Low carbon and Energy Efficient technologies in 8 Nos. of sectors Cement, **Iron & Steel**, P&P, Chlor-Alkali, Textile, Petrochemicals, Petroleum refinery and Aluminium.

Following Expects on which SAG will work.

- Deliberate on Sectoral Low Carbon and Energy Efficient technologies available Nationally and Internationally.
- Suggest action to collaborate with technology provider for transfer of emerging clean technologies for Indian Industries.
- Recommend policy measures and incentives for faster adoption of technologies.
- Advise on Sectoral Research and Development areas and undertaking demo projects across the industries.
- Identify best practices implemented in I&S industry for improving Energy Efficiency (Thermal and Electrical)
- Explore the manufacturing of low carbon steel making process through R&D work.

Thank You !