

Real Time Market (RTM)

An Opportunity for Captive Consumers

- 1. CAPTIVE BRIEF**
- 2. CAPTIVE SCENARIO IN INDIA: POWER MIX**
- 3. RTM - ADVANTAGES over TRADITIONAL PRODUCTS (like DAM/TAM etc.)**
- 4. RTM – OPPORTUNITY**
 - a) CONSUMER’S PERSPECTIVE
 - b) GENERATOR’S/SELLER’S PERSPECTIVE
- 5. RISKS/ SCOPE OF IMPROVEMENT**

Need for Captive Power

- Captive power plants (CPPs) are viable option for industrial and commercial consumers for its exclusive consumption
- Industries are now increasingly **relying on their own generation rather than on grid supply**, for the following reasons:
 - Non-availability of adequate grid supply
 - Poor quality and reliability of grid supply
(can damage costly capital equipment, increase downtime and lead to production losses.)
 - High tariff as a result of heavy cross-subsidization
- Electricity cost is a significant component of total production cost in Energy Intensive industries like Aluminium, Steel etc. and accounts for : a) Reduction in their expenditures and b) Improvement in overall productivity and competitiveness.
- Sale of surplus power can provide additional revenue to CPP owners.

Need for External Power (Non-Captive Source)

- To meet Emergency requirement during Outages of Captive Units
- During Overhauling of own Units
- Electricity Cost Optimization

Country's Total Installed Capacity (IC) : 4,25,431 MW (including Captive)

Country's Total Captive IC : 54,932 MW (Nearly 13% of Total IC)

Major Fuel Source

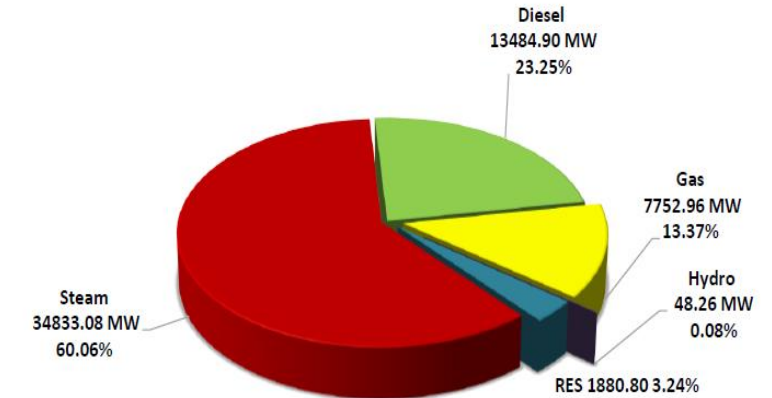
- Coal is the major fuel for power generation in CPPs
- Followed by Diesel, Gas, Renewable Energy Source (RES) and Hydro

- The share of these fuels in the captive power capacity stood at 60 % and 40 % approx. respectively.

Industry-wise :

- Metals and mining industry - accounted for a major share.
- Other major industries deploying CPPs are petrochemicals, Sugar, Cement etc.

Installed Generating Capacity of Captive Power Plants in Industries having Demand of 1MW & Above - Modewise
(As on 31.03.2019)@



BENEFITS

1. Ease through Exchange (IEX/PXIL) Platforms

(No need to search Traders/Gencos/Discoms/any other supply source for economical power and No need to approach SLDC/RLDCs separately for their consents for trading)

2. Transparent and Efficient marketplace

(Price Discovery through Closed Auction, lesser chances of commercial advantages, specially during Off peak)

3. Economical Option during High Contract Demand charges

(If the captive power plant (CPP) fails, charges for back-up or standby power from the grid are twice the normal rate for captive plants, which can be minimized through RTM)

4. Cost optimization specially during Off Peak

(Production cost can be optimized, if Cheaper power available w.r.t. Cost of Captive Generation)

5. Always available to meet Contingency requirement

RTM – Benefits over TRADITIONAL PRODUCTS.....Contd...

Sl.	Details/Function	Day/Term Ahead Market (DAM/TAM)	Real Time Market (RTM)
1	Trading Period	Previous Day from 10:00 to 12:00 Hrs. (1 Session only)	Every Alternate 15 Minutes (48 RTM sessions)
2	Delivery Time	Next day (<i>After 12 Hrs from Bid Closure</i>)	Same day (<i>After 1 Hour from Bid Closure</i>)
3	Contingency Feed	Not for Contingency requirement	Always available as a backup Source during Emergency
3	Bid approach	<ul style="list-style-type: none"> - Bid Planning required one day in advance - Advance planning required - Unable to cover Incidental Risks 	<ul style="list-style-type: none"> - Based on Real time scenario (More accuracy can be planned) - Captures sudden demand from surplus power/ available - Bid strategy can be changed as per the past session price trends For better economy/Sales realization
4	URS Power	Least Participation of URS/ Surrendered power (for ISGS)	<ul style="list-style-type: none"> - URS power can be traded in RTM (Beneficiary consent not required) - URS power comparatively Cheaper than other sources will result into lower Price discovery in RTM
5	Curtailement	Day Ahead Power will be curtailed prior to RTM	Curtailement Risk very low (DAM Power will be curtailed first, RTM later)
6	Supply Commitment (<i>during Outage of captive Units</i>)	<ul style="list-style-type: none"> - No schedule revision possible once bid is clear - Heavy DSM Charges in case of Unit Outage 	<ul style="list-style-type: none"> - Participation in upcoming bid session can be discontinued. (Hence, no bid, no-commitment/DSM/Under Injection penalty) - Also Generators may buy power under RTM under tripping/ reduced generation to avoid DSM penalty

Sale of Surplus Power Generation

1. **Incidental Surplus Power** : RTM provides opportunity for Sale if incidental surplus power is available, where advance planning not made
2. **Better Strategizing** : Since RTM is half hourly real time market with same day delivery, it will help us to better strategize the surplus sale for upcoming bids by taking reference of latest RTM traded prices.

1. Technical Glitches : Risk of Session Abort (Needs to be improved & Full proof transaction to be ensured)

2. Non-Continuous Bid Clearance: Risk of Loss due to Ramping Up/Down during sale of Surplus generation

3. Communication Delay :

Exchanges must ensure timely communication to consumers/generators in case of session abort to avoid:

- a) Risk of Over-drawl penalty from Contract Demand (in Import Mode)
- b) Risk of Excess generation/Inadvertent Power (during Export Mode)

4. Paradoxical Errors :

Risk of Bid rejection due to effect of any Seller/Buyer bid, which is hampering the market dynamics.

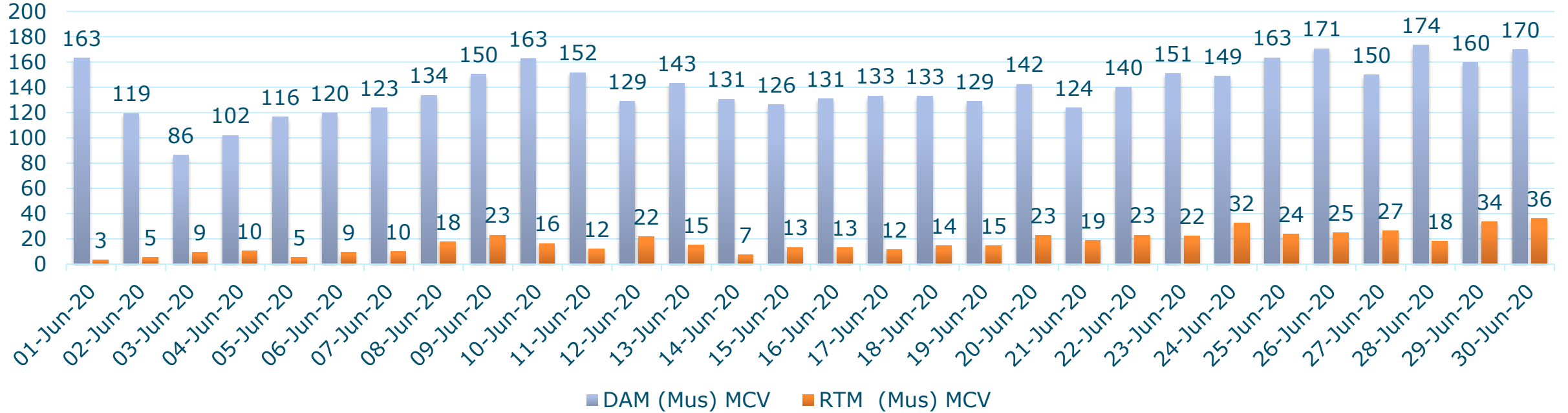
(IEX should improve its bid system to eliminate such bid rejection resulting loss to the Member participant)

5. Availability of Seller/Buyer :

- Risk of **Inadequate Seller/Buyer** (w.r.t. Day Ahead Market)
- Risk of **Higher Price Discovery** during high demand period (specially during Peak Hours)

DAM v/s RTM Traded Volumes (MUs)

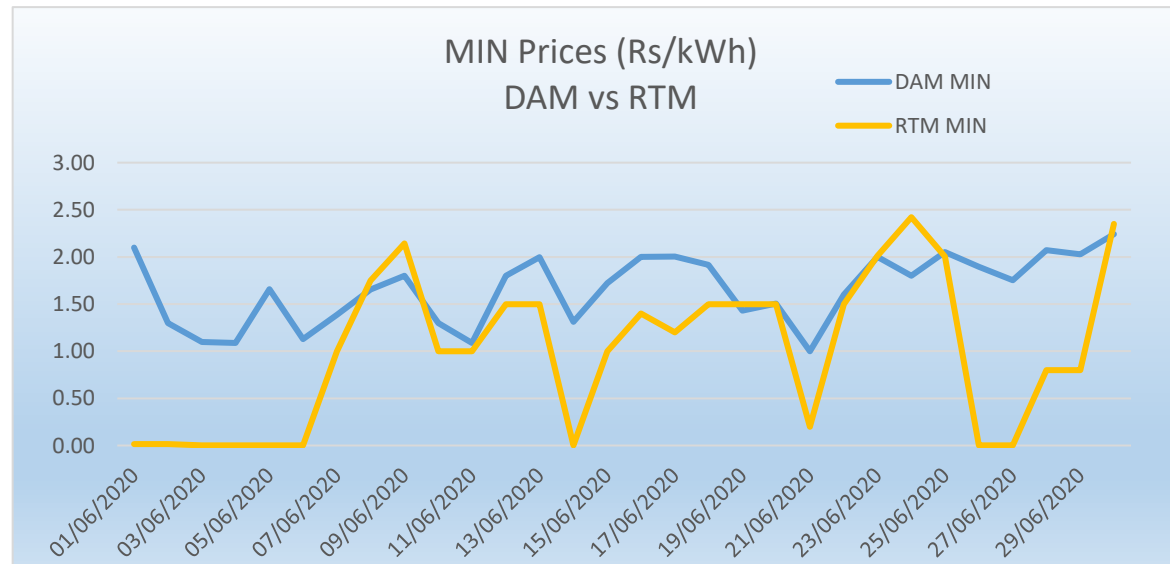
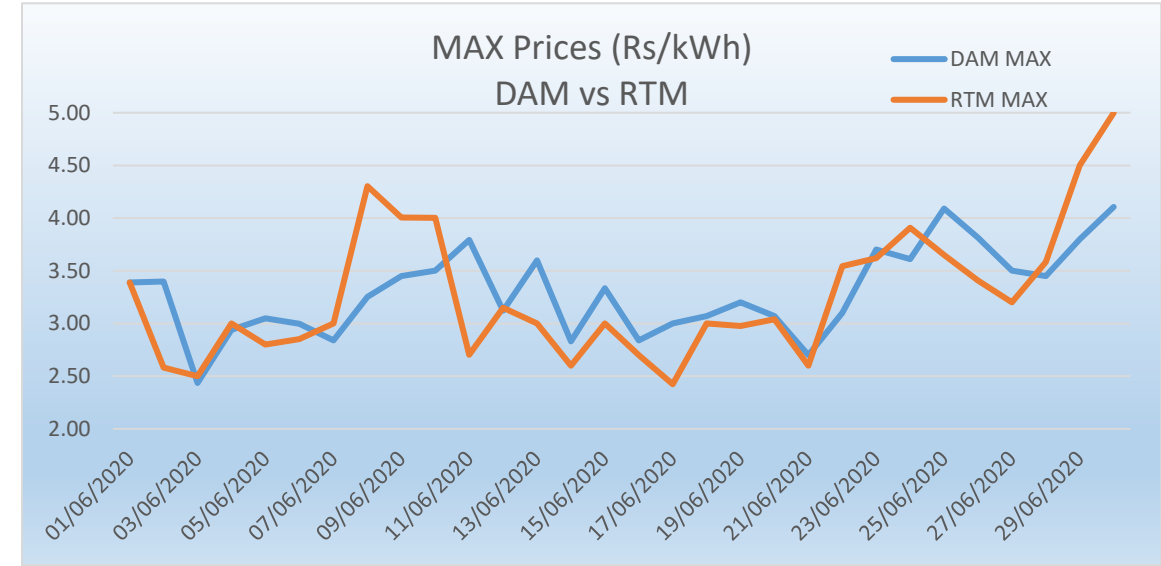
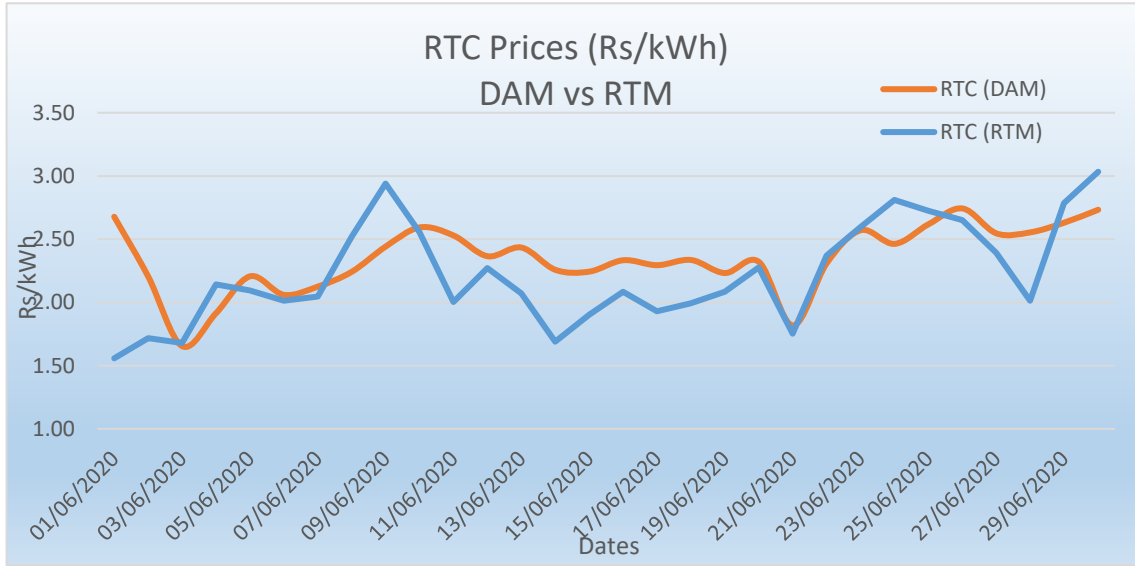
DAM vs RTM June 2020 RTC Volumes (MUs)



MAJOR BUYERS (June-2020)					
Product	ER	WR	NR	SR	NER
DAM	Bihar (78 MUs) Odisha (47 MUs) WB (22 MUs)	Maharashtra (865 MUs) Gujarat (501 MUs) Arcellor Mittal (123 MUs)	Punjab (438 MUs) Haryana (158 MUs) Rajasthan (106 MUs)	Telangana(752 MUs) AP (370 MUs) TN (222 MUs)	Assam (41 MUs) Meghalaya (9 MUs) Manipur (4 MUs)
RTM	WB (26 MUs) Bihar (6 Mus) Odisha (6 MUs)	Maharashtra (86 MUs) CG (12 MUs) Gujarat (9 MUs)	Rajasthan (43 MUs) Haryana (30 MUs) Delhi (11.4 MUs)	Telangana(181 MUs) AP (40 MUs) Karnataka (3.4 MUs)	Assam (23 MUs) Nagaland (8 MUs) Manipur (5 MUs)

MAJOR SELLERS (June-2020)					
Product	ER	WR	NR	SR	NER
DAM	Teesta III (697 MUs) Odisha (321 MUs) Dikchu (72 MUs)	Raipur Energen (171 MUs) MP (124 MUs) Jaypee Nigrie (86 MUs)	J&K (524 MUs) H P (269 MUs) UP (118 MUs)	Sembcorp (117 MUs) Karnataka (39 MUs) TN (10 MUs)	Assam (155 MUs) Meghalaya (39 MUs) Kameng HEP (24 MUs)
RTM	Odisha (33 MUs) Talcher (9 MUs) Teesta III (8 MUs)	MP(43 MUs) Raipur Energen (12 MUs) APL Mundra III (10 MUs)	J&K (94 MUs) UP (24 MUs) Delhi (14 MUs)	NLC (94 MUs) Sembcorp (18 MUs) Karnataka (16 MUs)	Assam (5 MUs) Palatana (3 MUs)

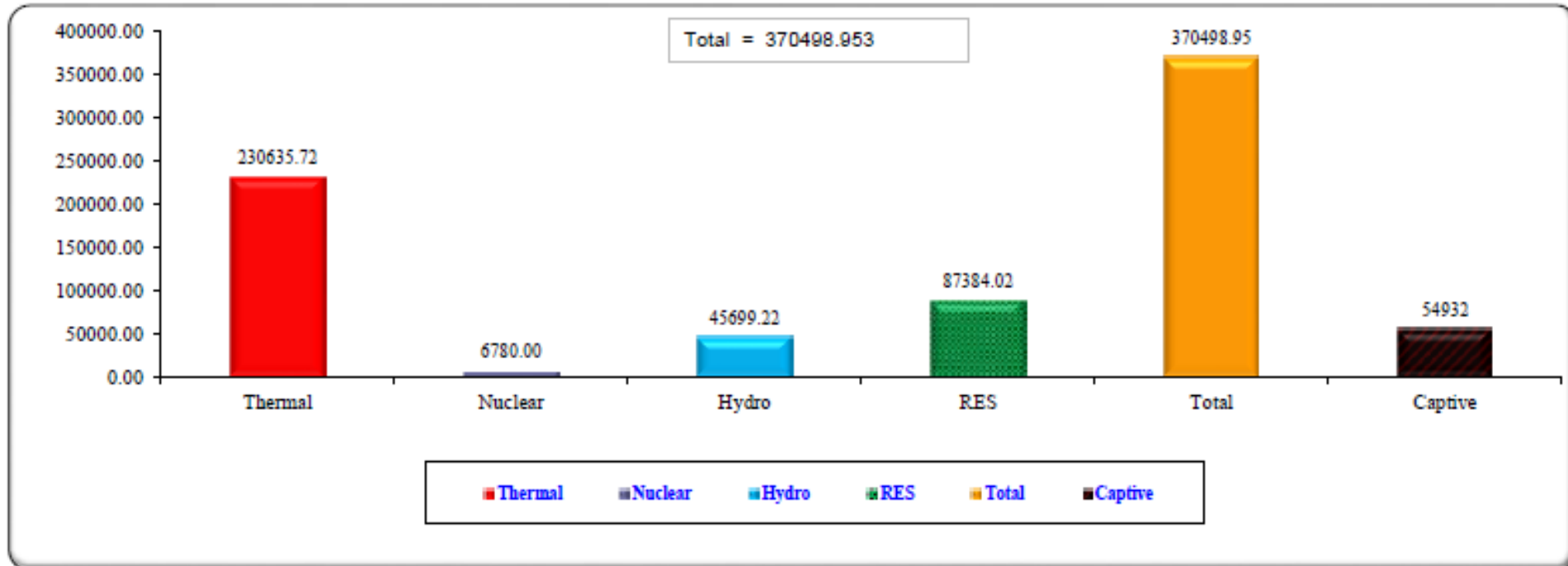
DAM v/s RTM Clearing Prices (Rs/kWh)



THANKS !!

All India Installed Capacity (MW) Region-wise as on 31-05-2020

Region	Thermal				Nuclear	Hydro	RES**	Grand Total	
	Coal	Lignite	Gas	Diesel					
Northern	53439.79	1580.00	5781.26	0.00	1620.00	20085.77	16933.26	99440.08	
Western	72935.12	1540.00	10806.49	0.00	1840.00	7622.50	26080.11	120824.22	
Southern	44094.52	3490.00	6491.80	433.66	3320.00	11774.83	42488.16	112092.98	
Eastern	27285.05	0.00	100.00	0.00	0.00	4639.12	1499.67	33523.83	
North-East	770.02	0.00	1811.96	36.00	0.00	1577.00	364.64	4559.61	
Islands	0.00	0.00	0.00	40.05	0.00	0.00	18.19	58.24	
ALL INDIA	198524.50	6610.00	24991.51	509.71	230635.72	6780.00	45699.22	87384.02	370498.95



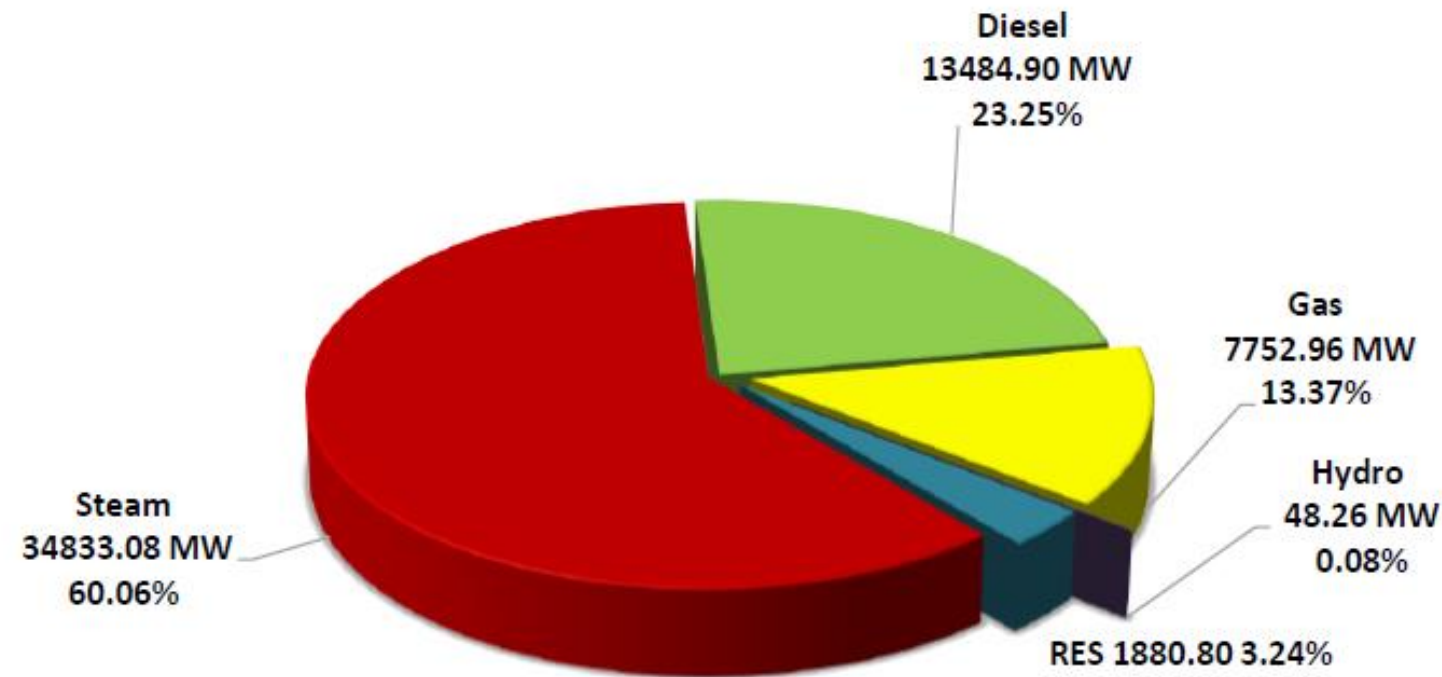
Plan wise Growth of Installed Capacity of Captive Power Plants in Industries having Demand of 1 MW & Above - Mode wise

								(MW)
Sl. No.	As on	Steam	Diesel	Gas	Hydro	RES	Railways	Total
1	2	3	4	5	6	7	8	9
								(3+4+5+6+7+8)
1	31.12.1947	**	**	**	**	**	0.00	410.00
2	31.12.1950	**	**	**	**	**	0.00	587.85
3	31.03.1956 (End of the 1st Plan)	**	**	**	**	**	0.00	759.65
4	31.03.1961 (End of the 2nd Plan)	**	**	**	**	**	0.00	1001.37
5	31.03.1966(End of the 3rd Plan)	**	**	**	**	**	0.00	1082.36
6	31.03.1969(End of the 3 Annual Plans)	**	**	**	**	**	0.00	1277.47
7	31.03.1974(End of the 4th Plan)	**	**	**	**	**	0.00	1732.70
8	31.03.1979(End of the 5th Plan)	1949.23	559.17	44.27	2.61	0.00	62.31	2617.59
9	31.03.1980(End of the 2 Annual Plans)	2021.61	720.58	54.27	2.61	0.00	60.44	2859.51
10	31.03.1985 (End of the 6th Plan)	2803.18	2077.06	155.31	2.91	0.00	81.80	5120.26
11	31.03.1990 (End of the 7th Plan)	4822.85	2754.48	425.51	3.60	0.00	109.29	8115.73
12	31.03.1992 (End of the 2 Annual Plans)	5377.10	3291.06	495.72	4.30	0.00	133.23	9301.41
13	31.03.1997(End of the 8th Plan)	6151.69	4529.91	1166.38	3.50	64.83	162.62	12078.93
14	31.03.2002(End of the 9th Plan)	8354.03	6521.95	2125.91	51.10	92.21	0.00	17145.20
15	31.03.07 (End of 10th Plan)	11397.52	7723.35	2976.00	60.50	177.67	0.00	22335.04
16	31.03.12(End of 11th Plan)	22615.39	9955.23	5884.95	47.59	872.21	0.00	39375.37
17	31.03.17 (End of 12th Plan)	30571.95	13349.69	6109.21	65.29	1433.06	0.00	51529.19
18	31.03.18	32854.41	13144.60	7156.37	50.96	1726.17	0.00	54932.51
19	31.03.19 @	34833.08	13484.90	7752.96	48.26	1880.80	0.00	58000.00

** Breakup Not Available

@ Estimated

Installed Generating Capacity of Captive Power Plants in Industries having Demand of 1MW & Above - Modewise (As on 31.03.2019)@



Energy intensity indicators across cement, steel and aluminium

	Cement	Crude steel	Aluminium
Total installed production capacity	502 Mt (2018)	128 Mt (2017)	4.1 Mt (2017)
Projected production capacity	550-600 Mt (by 2025)	300 Mt (by 2030)	10 Mt (by 2030)
Production in the past	217 Mt (2010)	69 Mt (2010)	1.7 Mt (2016/17)
Current production	280 Mt (2017)	106.5 Mt (2018)	1.67 Mt (2017/18)
Consumption per capita	210 kg (world average: 580 kg)	66.2 kg (world average: 212.3 kg)	8.5 kg (world average: 11 kg)

Sources: Information on cement from WBCSD (2018), *Low Carbon Technology Roadmap for the Indian Cement Sector: Status Review*, and IBEF (2019a), *Iron & Steel Industry in India*; information on steel from IBEF (2018a), *Steel*, and WSA (2018) *Statistics*, and WSA (2019), "Global crude steel output increases by 4.6% in 2018"; information on aluminium from IBEF (2018b), *Metals and Mining*, and IBEF (2019b), *Metals & Mining Industry in India*, NITI Aayog (2018), *Need for an Aluminium Policy in India*, and TOI (2019), "Steps being taken to treble country's aluminium production: Tomar".