

BSE SENSEX
44,618

S&P CNX
13,114



Stock Info

Bloomberg	COAL IN
Equity Shares (m)	6,207
M.Cap.(INRb)/(USDb)	799 / 10.6
52-Week Range (INR)	215 / 110
1, 6, 12 Rel. Per (%)	0/-41/-46
12M Avg Val (INR M)	1813
Free float (%)	33.9

Financials Snapshot (INR b)

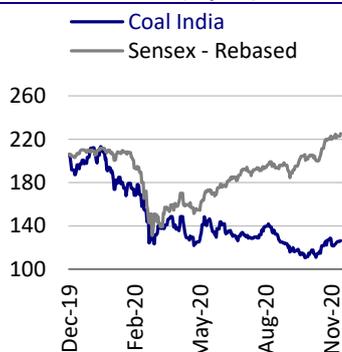
Y/E Mar	2020	2021E	2022E
Net Sales	960.8	906.9	1,041.4
EBITDA	219.2	152.8	223.0
PAT	167.0	110.2	157.3
EPS (INR)	22.8	16.9	21.4
Gr. (%)	27.1	17.9	25.5
BV/Sh (INR)	-4.4	-34.0	42.7
RoE (%)	51.9	30.6	35.5
RoCE (%)	56.4	30.3	36.9
P/E (x)	4.8	7.3	5.1
EV/EBITDA (x)	2.3	3.3	1.7

Shareholding pattern (%)

As On	Sep-20	Jun-20	Sep-19
Promoter	66.1	66.1	69.3
DII	22.0	22.3	19.2
FII	7.2	7.9	8.7
Others	4.7	3.7	2.8

FII Includes depository receipts

Stock Performance (1-year)



CMP: INR130

TP: INR193 (+49%)

Buy

Volumes rise as power demand recovers

Valuations attractive; dividend yield of ~9%

Dispatches rise 8% YoY in November; YTFY21 down just ~2% YoY

- Coal India (COAL)'s dispatches reported an 8% YoY increase at 51.3mt for November. This marked the fourth straight month of YoY growth – highlighted by continued recovery in power demand. *As per initial data from POSOCO, India's power demand / coal-based generation has risen 3.5%/5.2% YoY.*
- YTFY21, Coal India's off-take is now down just ~2% YoY (1HFY21: -8% YoY). With continued recovery in power demand, we conservatively raise our FY21 off-take estimates to 580mt (flat YoY) v/s 565mt earlier (-3% YoY). Our estimates imply ~2% YoY off-take growth for the remainder of FY21.

Worst likely behind as demand continues to recover

- A large proportion of Coal India's costs are fixed in nature, with employee costs accounting for ~55% of the company's expenses. Furthermore, the company has focused on OBR (overburden removal) activities, thereby utilizing contractual employees as well (~20% of company expenses). Thus, with lower dispatches, sharp negative operating leverage has kicked in (1HFY21 volume: -8% YoY; EBITDA (ex-OBR): -47% YoY).
- India's power demand, though, has been on an improving trend (see Exhibits 2, 3) and bodes well for COAL, given the high operating leverage play. India's COVID-19-led lockdown came at a time when inventory at both of COAL's mines and power plants was at already high levels. The situation has also eased with decline in inventory at both the mine and power plant levels (see Exhibits 4, 5) – albeit it remains higher than usual.
- Furthermore, global thermal coal prices have also been inching up (Exhibit 7), which – combined with a subsequent increase in domestic demand – is encouraging for e-auction realizations. We build in e-auction realizations of INR1,540/t for FY21 v/s (FY20: INR2,177 / FY19: INR2,632). Expect the same to rise to INR1,700/t in FY22.

Valuations attractive as market cap implies just nine years of FCF

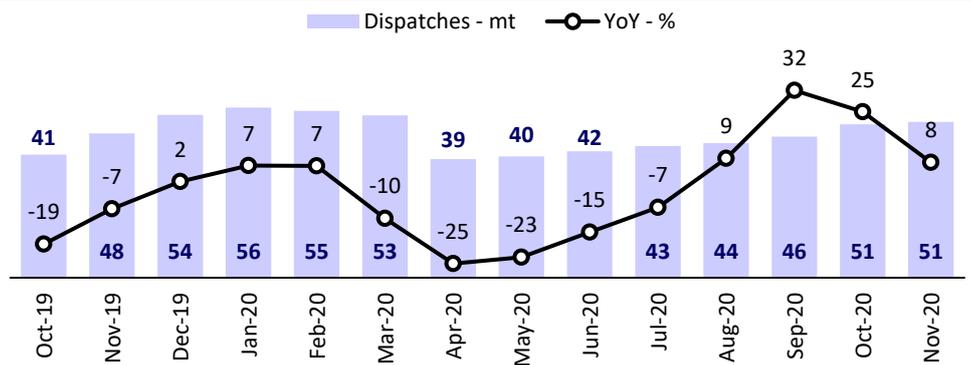
- We raise our FY21E adj. EBITDA/PAT by 9%/11% given the higher off-take. With the normalization of power demand, we expect COAL's off-take and profitability to recover in FY22. At 1.7x FY22E EV/EBITDA and 5.0x FY22 P/E, along with dividend yield of ~9%, Coal India remains attractively valued and implies PV of just nine years of its future cash flows.
- Over the previous two years, market cap for coal mining cos. has plummeted, led by issues over the sustainability of coal, in our view. While the share of coal in power generation has declined across regions, India remains a different case in point given 1) increasing power demand and 2) the lack of other substantial conventional sources for displacement. We maintain Buy on COAL, with Target Price of INR193/sh based on 4x Sep'21 EV/EBITDA.

Coal India’s volumes recover as power demand grows

- Off-take at Coal India’s mines saw another month of YoY growth, with continued recovery in power demand. Off-take at the mines grew 8% YoY, with overall power demand / coal-based generation estimated to have risen 3.5%/5.2% YoY.
- This would also be the third straight month of growth in power demand (albeit off a low base); this bodes well for Coal India, given the large operating leverage. In the past 6–8 months, COAL has also focused on OBR activity, owing to which it is well-positioned to increase production and meet any spurt in power demand.
- With improving off-take and recovery in power demand, inventory at both the mine and power plant levels has also been declining – albeit it remains higher than usual. Furthermore, global thermal coal prices have been inching up, which – along with an increase in domestic demand – bodes well for e-auction realizations.
- We expect Coal India’s off-take to continue its recovery as power demand recovers. Expect volumes for Coal India to be flat on a YoY basis in FY21, implying 2% YoY growth for the remainder of the year. We build in a 15% YoY increase in coal volumes for FY22 with the normalization of power demand.

Coal India’s volumes increased 8% YoY in Nov – its fourth straight month of YoY growth

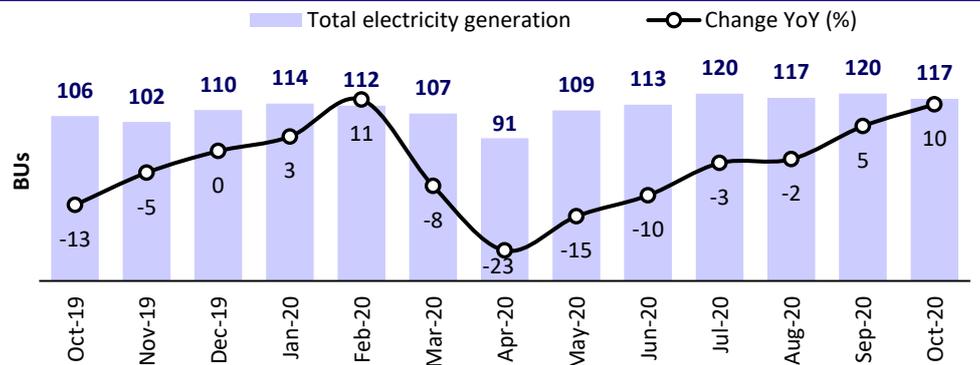
Exhibit 1: Coal off-take for Coal India



Source: Company, MOFSL

India’s electricity generation has recovered; while we await the final data, initial data from POSOCO suggests a 3.5% YoY rise for Nov

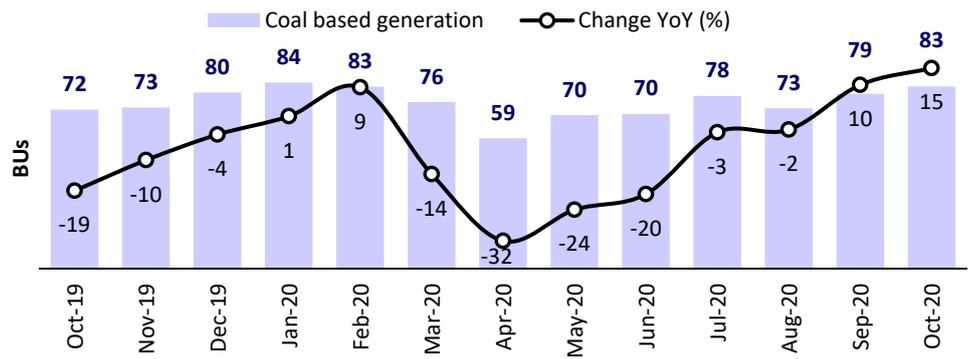
Exhibit 2: India’s electricity generation



Source: CEA, MOFSL

Accordingly, coal-based generation has also picked up

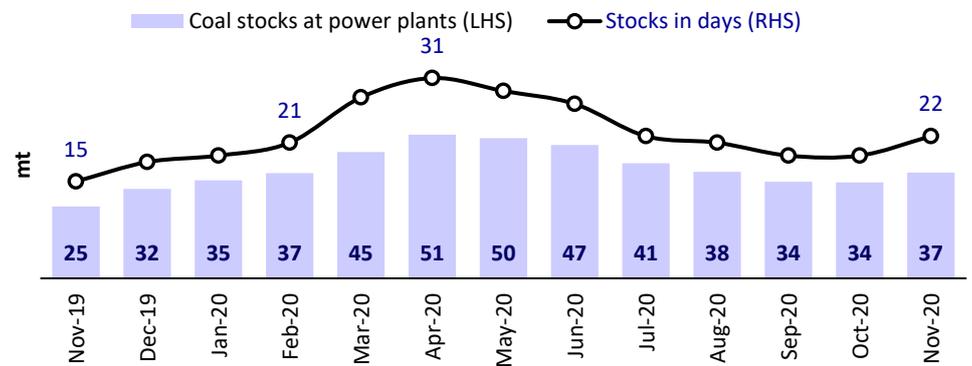
Exhibit 3: India's coal-based generation



Source: CEA, MOFSL

With the uptick in demand, coal stocks at power plants have begun to deplete...

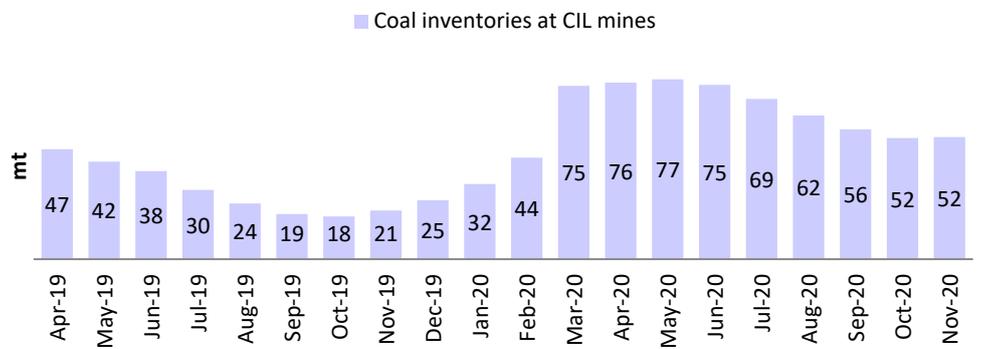
Exhibit 4: Coal stocks at power plants



Source: CEA, MOFSL

...As has inventory at Coal India's mines – albeit it remains high v/s usual levels

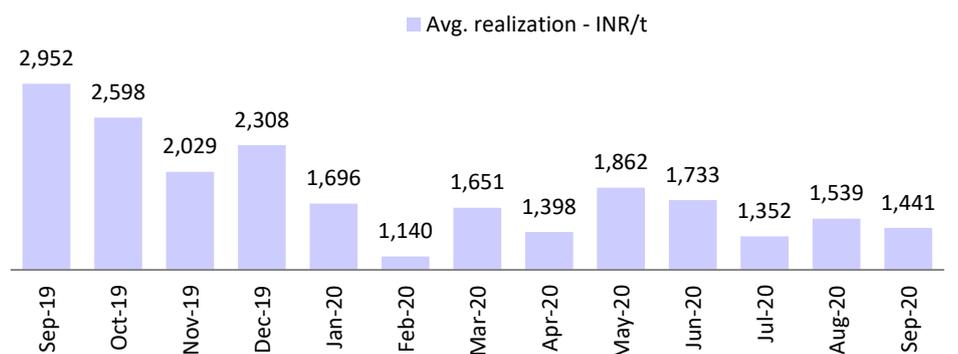
Exhibit 5: Coal stocks at Coal India's mines



Source: Company, MOFSL

E-auction realizations declined amid lower power demand

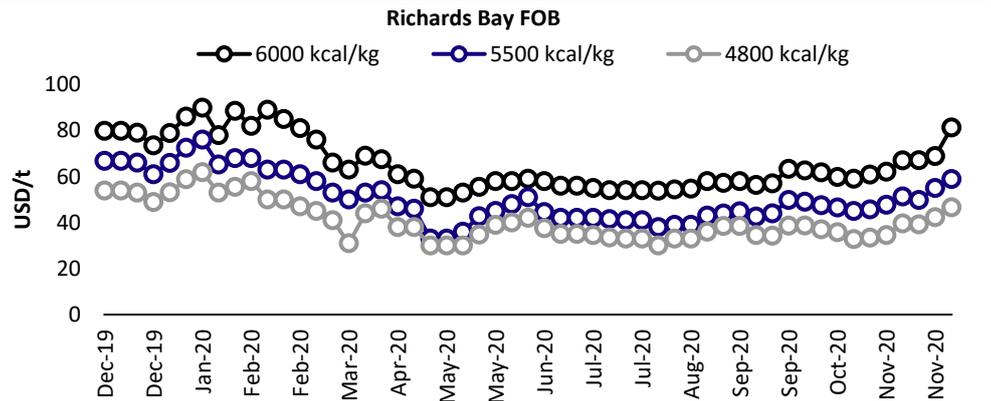
Exhibit 6: E-auction realizations (INR/t)



Source: Industry, MOFSL

Global thermal coal prices, though, have started inching up

Exhibit 7: Thermal coal prices



Source: Steelmint, MOFSL

We expect dispatches for Coal India to remain flat YoY in FY21; expect 15% YoY growth in FY22 as demand normalizes

Exhibit 8: Expect Coal India's volumes to recover as power demand normalizes

	FY16	FY17	FY18	FY19	FY20	FY21E	FY22E	FY23E
Power Generation	1,169	1,236	1,303	1,372	1,378	1,379	1,577	1,680
YoY (%)	4.5%	5.8%	5.4%	5.2%	0.5%	0.1%	14.3%	6.5%
Coal based gen. (b kwh)	862	910	953	989	962	940	1,102	1,166
YoY (%)	7.8%	5.6%	4.7%	3.7%	-2.7%	-2.3%	17.2%	5.9%
Coal India Volumes (mt)	531	543	580	608	582	580	665	698
Growth YoY	8.6%	2.2%	6.8%	4.9%	-4.3%	-0.2%	14.7%	5.0%

Source: Ministry of Power, MOFSL

Exhibit 9: Coal India: Adjusted P&L

	FY19	FY20	FY21E	FY22E	FY23E
Revenue	995,469	960,803	906,903	1,041,403	1,090,235
Power FSA	640,826	624,312	616,388	749,137	783,796
Non Power FSA	124,788	142,822	117,743	158,175	158,160
E-auction/MoU	229,856	193,669	172,772	134,090	148,279
Sales (mt)	608	581	580	665	698
YoY (%)	4.9	-4.5	-0.2	14.7	5.0
Power FSA	458	426	422	515	540
Share (%)	75	73	73	77	77
Non Power FSA	67	75	65	85	85
E-auction/MoU	83	80	93	65	73
Revenue per ton	1,637	1,653	1,564	1,566	1,561
YoY (%)	10.6	1.0	-5.4	0.2	-0.3
Power FSA	1,399	1,465	1,461	1,456	1,451
Non Power FSA	1,851	1,904	1,811	1,861	1,861
E-auction/MoU	2,777	2,418	1,853	2,049	2,032
Cost of Mining (ex. OB)	694,986	686,176	718,219	756,439	767,004
CoP per ton	1,143	1,181	1,238	1,138	1,098
YoY (%)	1.1	3.3	4.9	-8.1	-3.4
Labor & social OH	644	688	680	616	602
Contract	220	239	288	235	244
R&M	144	146	152	144	150
Others	134	108	120	142	102
Adjusted EBITDA	300,483	274,627	188,684	284,964	323,231
EBITDA per ton	494	473	325	429	463

Source: Company, MOFSL

Exhibit 10: Coal India: Valuation

	FY18	FY19	FY20E	FY21E	FY22E
Adjusted EBITDA	203,089	300,483	274,627	188,684	284,964
Target EV/EBITDA (x)			4.0	4.0	4.0
Target EV			1,098,509	754,735	1,139,856
Net debt	-311,085	-316,302	-230,793	-183,892	-304,529
Equity value			1,329,302	938,627	1,444,386
Target equity value (Sep '21)					1,191,506
TP (INR/share)					193

Source: Company, MOFSL

Share of coal in power generation has decreased globally, but India a different case in point

- In the past 24 months, the market capitalization for coal mining companies has plummeted. While local factors (such as regulations) may have played a part, the fall in market cap comes at a time when questions over the sustainability of thermal coal have heightened.
- Since 2011, coal-based electricity generation in the US has declined ~45%, and Europe has seen ~34% decline in the same. While China has seen an increase in coal-based electricity generation, its share in the overall generation mix has also been on the decline. Notably, India has not just seen an increase in coal generation but the share of coal in the generation mix has actually risen from 2011 levels.
- Two key factors come into play from an Indian context. 1) Electricity demand in India continues to grow at >5% (on a normalized basis). In such a scenario, replacing coal-based capacities is difficult as other generation sources would have to not just replace the existing generation but also cater to incremental demand. This is not the case in the US and Europe, wherein electricity demand has largely been flat over the past decade. 2) Other conventional sources are not in a position to displace coal. For e.g., in the US Electricity market, coal-based generation has largely been displaced by gas on the back of favorable economics for gas-based plants.
- Thus, despite the increased focus on renewables, coal would continue to dominate India's electricity production. Notably, per capita electricity consumption in India remains low (1/16th that in the US; 1/5th in China, and 1/3rd as per the world average), implying significant room for coal and renewables to co-exist and grow. Assuming a 6.5% power demand CAGR over FY20–25 and avg. annual 14GW of renewable capacity addition (at ~20% PLF), incremental renewable generation would be just 118BU – which would not be sufficient to meet even overall incremental demand (513 BU) over FY21–25.
- We expect coal-based generation to increase at a 6.4% CAGR over the same period, driving the need for coal in India. From a domestic perspective, we do not expect the government initiative to increase participation in commercial coal mining to dent production for Coal India. Given the procedural hurdles, such as land acquisition and EC/FC clearances, output from such commercial mines would take time. Moreover, although Coal India accounts for ~80% of domestic coal production, it meets 65–70% of domestic demand. Thus, there is massive opportunity for import substitution (110–150mt of imported coal can be substituted). As and when commercial mines come up, it would likely displace these imports.

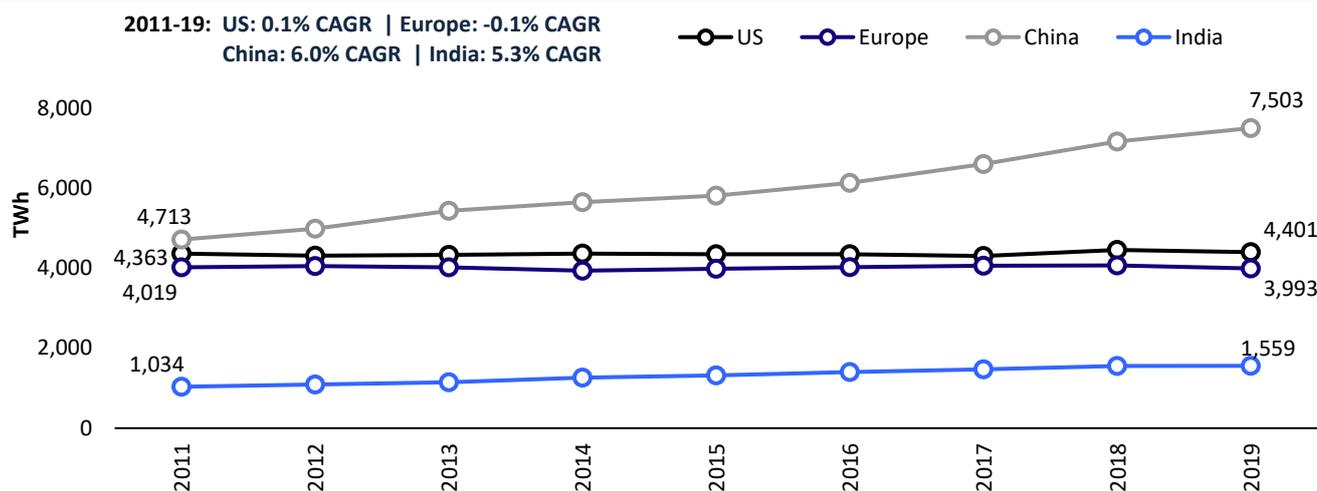
- Moreover, even if one were to make conservative assumptions such as (1) the capping of COAL’s production at 726mt in FY24 and (2) decline in its share of domestic coal consumption to 58% in FY29 (66% in FY20), the PV of COAL’s nine-year cash flows would be equivalent to its current market cap.

Exhibit 11: Valuations of key coal mining companies

	Mar'18			Mar'19			Mar'20			Current		
	M Cap (USD m)	P/E	EV/ EBITDA	M Cap (USD m)	P/E	EV/ EBITDA	M Cap (USD m)	P/E	EV/ EBITDA	M Cap (USD m)	P/E	EV/ EBITDA
Coal mining cos												
India												
Coal India	26,996	10.0	5.8	21,240	8.7	5.7	11,451	8.7	4.8	10,661	5.3	2.4
China												
China Shenua	62,757	10.8	6.3	55,930	10.4	4.6	44,286	8.9	4.6	51,197	10.5	4.9
China Coal	9,000	13.9	10.6	8,681	14.5	8.6	6,295	8.7	7.1	7,085	9.9	7.0
Yanzhou	8,459	9.2	10.4	6,596	8.2	8.6	5,142	5.6	7.7	5,986	7.0	8.6
Indonesia												
Adaro	4,746	11.3	4.5	3,018	6.6	3.5	1,950	5.1	3.0	2,699	8.7	4.0
Indo Tambangaya	2,311	7.9	3.9	1,897	7.2	3.4	564	4.5	1.6	737	11.0	3.8
US												
Arch Coal	1,872	15.0	5.3	1,590	8.6	4.2	438	2.0	1.7	453	55.9	3.9
Peabody	4,732	45.1	5.3	3,066	22.1	4.1	282	-2.1	1.8	112	-0.1	3.5
Others												
Exxaro	3,198	8.4	6.1	4,088	7.4	6.6	1,995	5.5	6.2	2,994	6.3	7.8
Avg. coal mining cos.	124,070	14.6	6.5	106,105	10.4	5.5	72,401	5.2	4.3	81,925	12.7	5.1
Global miners with exposure to coal												
BHP Billiton	111,640	18.3	7.7	131,199	18.4	8.9	84,877	16.6	7.8	125,858	18.2	8.5
Glencore	71,857	8.3	4.3	57,231	7.6	4.2	20,451	7.0	3.5	34,326	12.8	4.7
Avg. global mining cos.	183,498	13.3	6.0	188,430	13.0	6.5	105,329	11.8	5.6	160,184	15.5	6.6

Source: MOFSL, Bloomberg

Exhibit 12: Electricity generation across US, Europe, China, and India

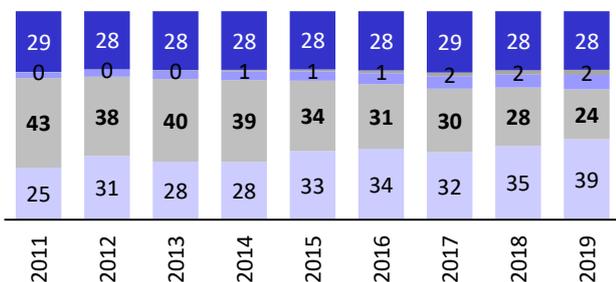


Source: BP, MOFSL

Exhibit 13: US: Electricity generation mix

US : Fuel wise - Electricity generation mix

Gas - % Coal - % Wind - %
Solar - % Others - %

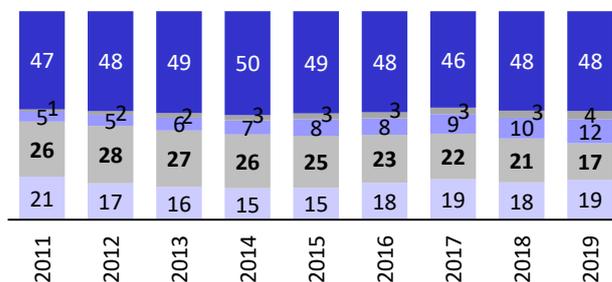


Source: MOFSL, BP

Exhibit 14: Europe: Electricity generation mix

Europe : Fuel wise - Electricity generation mix

Gas - % Coal - % Wind - %
Solar - % Others - %

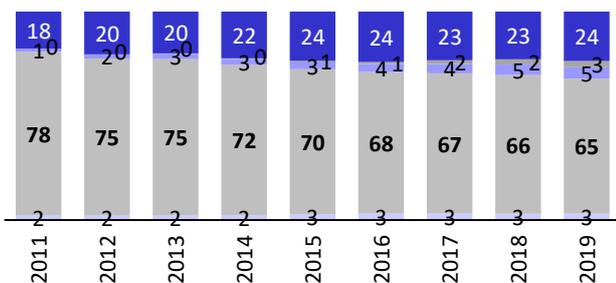


Source: MOFSL, BP

Exhibit 15: China: Electricity generation mix

China : Fuel wise - Electricity generation mix

Gas - % Coal - % Wind - %
Solar - % Others - %

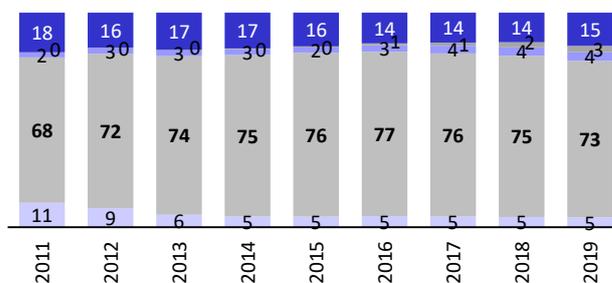


Source: MOFSL, BP

Exhibit 16: India: Electricity generation mix

India : Fuel wise - Electricity generation mix

Gas - % Coal - % Wind - %
Solar - % Others - %



Source: MOFSL, BP

Exhibit 17: Coal India: Free cash flows (FY21–29)

		FY19	FY20	FY21E	FY22E	FY23E	FY24E	FY25E	FY26E	FY27E	FY28E	FY29E	
Vols.	mt	608	581	580	665	698	726	726	726	726	726	726	
<i>Adj. EBITDA</i>	<i>INR/t</i>	494	473	325	429	463	446	427	420	412	404	396	
EBITDA	INR b	300	275	189	285	323	324	310	305	299	294	288	
Operating cash flow*	INR b	212	110	111	274	285	272	264	259	253	248	243	
Capex	INR b	73	56	95	95	95	95	95	95	95	95	95	
Loan repayment	INR b	0	0	0	64	0	0	0	0	0	0	0	
FCFE	INR b	139	54	16	115	190	177	169	164	158	153	148	
Discount rate	%	12											
NPV of FCFE over FY21-29	INR b	806											

*includes net other income

Source: MOFSL, Company

Financials and valuations

Income Statement										(INR m)
Y/E March	FY15	FY16	FY17	FY18	FY19	FY20	FY21E	FY22E	FY23E	
Net Sales	741,201	780,073	783,719	858,624	995,469	960,803	906,903	1,041,403	1,090,235	
Change (%)	5.0	5.2	0.5	9.6	15.9	-3.5	-5.6	14.8	4.7	
EBITDA	173,354	187,309	123,912	169,507	249,771	219,209	152,840	223,001	255,780	
% of Net Sales	23.4	24.0	15.8	19.7	25.1	22.8	16.9	21.4	23.5	
Depreciation	23,198	28,259	29,101	30,664	34,504	34,508	35,933	37,358	38,783	
Interest	73	3,862	4,117	4,318	2,750	5,029	5,079	5,130	5,182	
Other Income	65,706	59,406	55,156	46,583	58,737	61,054	35,487	29,758	37,629	
Extra Ordinary	-50	0	0	73,844	0	0	0	0	0	
PBT	215,839	214,594	145,850	107,264	271,255	240,725	147,314	210,271	249,444	
Tax	78,573	71,719	51,660	37,067	96,625	73,710	37,123	52,988	62,860	
Rate (%)	36.4	33.4	35.4	34.6	35.6	30.6	25.2	25.2	25.2	
PAT before Min. Int.	137,266	142,876	94,190	70,198	174,630	167,015	110,191	157,282	186,584	
Minority Interest										
Reported PAT	137,266	142,876	94,190	70,198	174,630	167,015	110,191	157,282	186,584	
Change (%)	-9.2	4.1	-34.1	-25.5	148.8	-4.4	-34.0	42.7	18.6	
Adjusted PAT	137,266	142,876	94,190	118,942	174,630	167,015	110,191	157,282	186,584	
Change (%)	-14.1	4.1	-34.1	26.3	46.8	-4.4	-34.0	42.7	18.6	

Balance Sheet										(INR m)
Y/E March	FY15	FY16	FY17	FY18	FY19	FY20	FY21E	FY22E	FY23E	
Share Capital	63,164	63,164	62,074	62,074	61,627	61,627	61,627	61,627	61,627	
Reserves	340,367	285,168	183,194	136,392	202,912	259,942	298,509	381,868	480,758	
Net Worth	403,531	348,332	245,268	198,466	264,539	321,569	360,136	443,496	542,385	
Minority Interest	658	1,048	3,459	3,625	4,068	3,941	3,941	3,941	3,941	
Loans	4,019	11,921	30,078	15,309	22,027	64,260	64,260	64,260	64,260	
Deferred tax Liability	-19,591	-20,445	-27,328	-53,551	-42,692	-33,110	-33,110	-33,110	-33,110	
Capital Employed	388,617	340,855	251,477	163,849	247,943	356,660	395,227	478,587	577,476	
Gross Fixed Assets	448,080	234,137	276,883	325,733	401,631	473,802	568,802	663,802	758,802	
Less: Depreciation	286,929	26,824	55,984	84,805	115,888	150,397	186,330	223,689	262,472	
Net Fixed Assets	161,150	207,314	220,900	240,928	285,742	323,405	382,472	440,113	496,330	
Capital Work in Progress	51,594	59,044	103,078	137,710	136,984	127,714	127,714	127,714	127,714	
Investments		73	106	3,443	4,622	9,144	9,144	9,144	9,144	
Current Assets	873,074	841,406	809,377	839,286	857,149	1,006,843	1,005,590	1,101,413	1,215,880	
Inventory	61,838	75,692	89,453	64,439	55,839	66,189	69,571	74,182	77,661	
Debtors	85,219	114,476	107,359	86,892	54,986	144,082	186,350	156,924	149,347	
Other Current Assets	61,808	241,078	285,187	351,324	391,553	490,106	490,106	490,106	490,106	
Loans and Advances	105,150	1,024	358	10,238	16,441	11,412	11,412	11,412	11,412	
Cash	559,060	409,137	327,021	326,394	338,330	295,053	248,151	368,789	487,354	
Current Liabilities	697,201	766,982	881,984	1,057,518	1,036,554	1,110,445	1,129,692	1,199,797	1,271,591	
Payables	9,208	32,972	39,002	45,169	68,155	101,076	84,479	92,621	96,964	
Other current liabilities	687,994	734,010	842,981	1,012,348	968,399	1,009,370	1,045,214	1,107,177	1,174,628	
Net Curr. Assets	175,873	74,424	-72,607	-218,232	-179,405	-103,602	-124,102	-98,384	-55,711	
Application of Funds	388,617	340,855	251,477	163,849	247,943	356,660	395,227	478,587	577,476	

Financials and valuations

Cash Flow Statement									(INR m)
Y/E March	FY15	FY16	FY17	FY18	FY19	FY20	FY21E	FY22E	FY23E
Adj EBITDA*	211,621	215,423	150,634	203,089	300,483	274,627	188,684	284,964	323,231
Non cash exp. (income)	21,428	21,565	37,046	-54,587	10,718	9,569	9,557	9,129	8,722
(Inc)/Dec in WC	6,487	-26,697	60,216	138,450	-48,918	-123,268	-62,246	32,957	8,441
Taxes paid	-95,721	-78,754	-89,427	-74,329	-95,329	-119,463	-37,123	-52,988	-62,860
CF from Operations	143,815	131,538	158,469	212,623	166,955	41,465	98,872	274,061	277,534
Capex	-49,014	-57,857	-86,761	-85,293	-73,393	-56,120	-95,000	-95,000	-95,000
Free Cash Flow	94,801	73,681	71,707	127,330	93,561	-14,654	3,872	179,061	182,534
(Pur)/Sale of Investments	9,615	-1	-50	-3,332	-1,184	-4,539	0	0	0
Interest/dividend	52,871	50,349	34,642	24,044	31,410	34,573	25,930	20,630	28,907
Other investing activity	-9,615	-3,344	-209	-297	9,054	9,055			
CF from Investments	3,857	-10,852	-52,379	-64,878	-34,114	-17,032	-69,070	-74,370	-66,093
Equity raised/(repaid)	0	0	-45,531	0	0	0	0	0	0
Debt raised/(repaid)	1,935	9,902	18,169	-14,778	6,718	22,776	0	0	0
Interest paid	-73	-207	-306	-370	-96	-686	-5,079	-5,130	-5,182
Dividend (incl. tax)	-155,963	-208,302	-151,031	-123,238	-112,110	-96,760	-71,624	-73,923	-87,695
Other financing	3,844	2,732	2,720	2,513	3,972	5,169			
CF from Fin. Activity	-150,257	-195,874	-175,980	-135,873	-101,516	-69,502	-76,703	-79,053	-92,876
Inc/Dec of Cash	-2,585	-75,188	-69,890	11,872	31,325	-45,068	-46,902	120,638	118,565
Add: Beginning Balance	561,644	559,060	409,137	327,021	326,394	338,330	295,053	248,151	368,789
Closing Balance	559,060	483,872	339,247	338,893	357,719	293,262	248,151	368,789	487,354

Ratios

Y/E March	FY15	FY16	FY17	FY18	FY19	FY20	FY21E	FY22E	FY23E
Basic									
Adjusted EPS	21.7	22.6	15.2	19.2	28.3	27.1	17.9	25.5	30.3
Cash EPS	31.5	31.5	24.2	29.5	42.2	41.7	29.5	41.6	47.5
Book Value	63.9	55.1	39.5	32.0	42.9	52.2	58.4	72.0	88.0
DPS	20.7	27.4	19.9	16.5	13.1	12.0	11.6	12.0	14.2
Payout (incl. Div. Tax.)	112.9	145.5	160.3	103.3	55.5	53.3	65.0	47.0	47.0
Valuation (x)									
P/E	16.7	12.9	19.3	14.8	8.4	5.2	7.3	5.1	4.3
Cash P/E	11.5	9.3	12.1	9.6	5.6	3.4	4.4	3.1	2.7
P/BV	5.7	5.3	7.4	8.9	5.5	2.7	2.2	1.8	1.5
EV/Adj. EBITDA	8.2	6.7	10.1	7.1	3.8	2.3	3.3	1.7	1.2
Dividend Yield (%)	5.7	9.4	6.8	5.8	5.5	8.6	9.0	9.3	11.0
EV /ton of Reserves	79.7	66.6	69.9	66.6	52.7	29.1	28.3	22.7	17.3
Profitability Ratios (%)									
Debtor (Days)	42.0	53.6	50.0	36.9	20.2	54.7	75.0	55.0	50.0
Inventory (Days)	30.5	35.4	41.7	27.4	20.5	25.1	28.0	26.0	26.0
Payables (Days)	4.5	15.4	18.2	19.2	25.0	38.4	34.0	32.5	32.5
Asset turnover(x)	1.9	2.3	3.1	5.2	4.0	2.7	2.3	2.2	1.9
Profitability Ratios (%)									
RoE	34.0	41.0	38.4	35.4	66.0	51.9	30.6	35.5	34.4
RoCE	34.5	39.9	32.7	58.4	85.7	56.4	30.3	36.9	36.1

NOTES

Explanation of Investment Rating	
Investment Rating	Expected return (over 12-month)
BUY	>=15%
SELL	< - 10%
NEUTRAL	< - 10 % to 15%
UNDER REVIEW	Rating may undergo a change
NOT RATED	We have forward looking estimates for the stock but we refrain from assigning recommendation

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