

Power Equipment: Disruptive changes ahead

L&T, TMX to emerge as winners; BHEL a key loser in new competitive landscape

New power emission norms would lead to tripling of BTG market size to USD 12 bn p.a.

New norms require existing power plants to reduce their SO_x and NO_x emission levels by 33-40% over 2 years and new plants (post 2017) to reduce by 67-80% from current levels. This implies additional capex of Rs 5 mn/MW for existing power plants and Rs 10-14mn/MW for new power plants. **This will result in BTG cost for a new build power plant rising from ~Rs 25 mn/MW to ~Rs 35 mn/MW.**

Of the current installed base of ~170 GW for coal-based power plants, ~35 GW of plants (largely >25 years old) would need to be scrapped as they are operating at alarmingly high emission levels. These scrapped plants would later come up with ~50% higher capacity over next 4-5 years. Moreover, ~10 GW of power plants orders in CY15 would need to be re-tendered with new norms. This will result in 60 GW of new capacity in next 4-5 years in addition to existing pipeline of ~20 GW. **Hence, volumes would rise to ~15 GW p.a. from 8-10 GW p.a. currently.**

Rise in volumes coupled with rising realization to ~Rs 35 mn/MW would lead to BTG market size doubling to ~USD 9bn p.a. In addition to new build plants, we anticipate market opportunity of ~USD 20 bn (USD 3 bn pa) for retrofitting existing power plants to meet new norms. This would imply **opportunity landscape of BTG market rising to ~USD 12 bn pa from USD 4 bn pa currently.**

Our channel checks indicate L&T would have a significant cost advantage over BHEL. Thermax would be the other winner due to new emission norms

- ◆ **L&T's boilers comply with new NO_x norms, resulting in significant cost advantage over BHEL and others:** Plants will need to install Selective Catalytic Reduction (SCR) equipment or modify burners in boilers to meet the new NO_x level of 100 mg/Nm³ for new plants post 2017 and 300 mg/Nm³ for plants installed from 2003-16. **L&T's boilers are currently at ~110 mg/Nm³ vs. BHEL at ~510 mg/Nm³.** While BHEL's boilers would comply with 2003-16 levels of 300 mg with modifications in burners, it would need to install SCR which costs Rs 6-7 mn/MW to lower NO_x level to 100 mg/Nm³. Thermax too will need to install SCR
- ◆ **Thermax' cost likely to be most competitive for FGD's to comply SO_x norms:** Plants will need to install Flue Gas Desulfurization (FGD) equipment. Our channel checks indicate it would cost Rs 4-5mn/MW for Thermax, which is lower than Rs 5-6 mn/MW for L&T and BHEL
- ◆ **L&T's supercritical boilers to have >25% cost advantage over BHEL:** Since L&T's boilers wouldn't need a SCR (cost of Rs 6-7 mn/MW for others), but need FGDs, its cost for supercritical boiler would rise to ~Rs 20 mn/MW from ~Rs 14 mn currently. While cost for BHEL would rise ~Rs 27 mn/MW and Thermax to ~Rs 25 mn/MW

Expect L&T's market share to rise significantly from FY17. We expect BHEL to lose significant market share from 70% currently and L&T and Thermax to be key beneficiaries. **L&T could garner a market share of 30-35% (from ~10% currently), which implies an order inflow of Rs 180-200 bn pa i.e ~15% of FY15 order inflow (ex-services).** For **Thermax**, order win of one set of 1.3 GW implies an order value of ~Rs 30 bn which is **~65% of FY15 order inflow.** Since super critical JV is currently loss-making for Thermax, maiden order win would be a rating trigger.

Exhibit 1: Cap goods companies - valuation matrix

Company	CMP (Rs)	TP (Rs)	Upside (%)	Rating	EPS (Rs)			P/E (x)			P/B (x)		RoE (%) FY17E
					FY15	FY16E	FY17E	FY15	FY16E	FY17E	FY16E	FY17E	
L&T	1,180	1,768	50	BUY	35.0	52.8	66.5	34	22	18	2.3	2.0	12
BHEL	154	166	8	HOLD	7.1	2.3	8.3	22	67	18	1.2	1.1	6
Thermax	881	922	5	HOLD	19.5	30.8	36.9	45	29	24	4.4	3.9	17

Source: Company, Axis Capital

Exhibit 2: New emission norms would lead to tripling of BTG market size

	FY13-16	FY17E	FY18E	FY19E
New Opportunity (GW)				
Re-bid - NTPC		8		
Re-bid - State gencons		2		
Pipeline for FY17-19		7	7	7
Re-Powering Opportunity		0	10.5	10.5
Total GW	10	17	17	17
Avg realization (Rsmn/MW)	25	35	35	35
Market size (in Rsbn)	250	596	596	596
Retrofitting existing plants assuming 5 years to comply rather than 2 yrs notified (GW)				
FGD - existing plants		96	96	96
FGD - under construction plants		24	24	24
SCR - under construction plants		105	105	105
Total retro-fitting market		225	225	225
Total market size(in Rsbn)	250	821	821	821
Total market size(in USD bn)	4	12	12	12

Source: Axis Capital

Exhibit 3: Retrofit opportunity with new emission norms

	GW	Capex (Rsmn/MW)	Opportunity (Rsbn)
Current coal based capacity	171		
OLD capacity to be replaced	35		
Capacity under 500 MW	56	NIL	
Capacity over 500 MW	80	6	480
Under construction			
Coming by Dec-16	20	6	120
Post 2017	60	12	720
Total opportunity			1,320
USDbn			20

Source: Axis Capital

Exhibit 4: Equipment pricing of various BTG manufacturers (Rsmn/MW)

Equipment pricing	Current	New pricing as per current norms				
		BHEL	L&T	Thermax	Alstom	Doosan
Boiler	14	27.5	20	24.5	26.5	26.5
% Change from current		96%	43%	75%	89%	33%
% Var. from BHEL			-27%	-11%	-4%	-4%
Turbine	10	10	10	10	10	10
Total BTG	24	37.5	30.0	34.5	36.5	36.5
% Change from current		56%	25%	44%	52%	52%

Source: Axis Capital

Exhibit 5: All India coal-based capacity

Coal based capacity (GW)	Up to Dec-03	Up to Nov-15
Central	23	49
State	37	59
Private	4	62
Total	65	171

Source: Central Electricity Authority, Axis Capital

Exhibit 6: Change in environmental norms for coal-based power plants

Parameter	Earlier norms	New norms		
		Up to 31-Dec-03	Between 1-Jan-04 to 31-Dec-16	From 1-Jan-17
Oxides of Nitrogen (NOx)	No mandatory norms Manufacturers specify 510 to 750 mg/Nm ³	600 mg/Nm ³	300 mg/Nm ³	100 mg/Nm ³
Sulphur Dioxide (SOx)	No mandatory norms Manufacturers specify 300 mg/Nm ³	1) 600 mg/Nm ³ for Units <500 MW, 2) 200 mg/Nm ³ for units >500 MW	1) 600 mg/Nm ³ for Units <500 MW, 2) 200 mg/Nm ³ for units >500 MW	100 mg/Nm ³
Mercury (Hg)	None	0.03 mg/Nm ³ (for units having capacity of 500MW and above)	0.03 mg/Nm ³	0.03 mg/Nm ³
Particulate Matter	150 mg/Nm ³ (for > 210 MW), 350 mg/Nm ³ (for < 210 MW)	100 mg/Nm ³	50 mg/Nm ³	30 mg/Nm ³
Water	None	<ul style="list-style-type: none"> Once Through Cooling (OTC) - Install Cooling Tower (CT) and achieve specific water consumption upto maximum of 3.5m³/MWh within a period of 2 years CT based plants - Achieve specific water consumption upto maximum of 3.5m³/MWh within a period of 2 years 	Meet specific water consumption upto maximum of 2.5 m ³ /MWh and achieve zero waste water discharged	

Source: Government of India, Central Pollution Control Board, Axis Capital

Exhibit 7: Capex required to meet new environmental norms

Parameter	Equipment	Cost (Rsmn/MW)	Comment
Oxides of Nitrogen (NOx)	Selective Catalytic Reduction (SCR)	6 - 7	<ul style="list-style-type: none"> ◆ Most existing plants can lower the emissions from 500 to 300 mn through modification in burner. ◆ However, new plants after 31-Dec-16 will require additional capex
Sulphur Dioxide (SO2)	Flue Gas Desulfurization (FGD)	5 - 6	<ul style="list-style-type: none"> ◆ Plants >500 MW (~80 GW) will have to install FGDs. However old inefficient plants (30-40 GW) may be de-commissioned in light of enhanced capex
Particulate Matter	Electrostatic Precipitator (ESP)	0.5	<ul style="list-style-type: none"> ◆ Minimal capex as only the size of existing ESPs will have to be enhanced
Mercury (Hg)	None	None	<ul style="list-style-type: none"> ◆ Installation of FGDs, SCR, and ESPs are expected to bring down the mercury levels within norms
Water	-	-	<ul style="list-style-type: none"> ◆ Limited data available on existing usage of water at plants, hence capex requirement is not known. However, if plants are asked to use sewage water then Tertiary treatment plants will need to be installed

Source: Axis Capital

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