NOMURA

VA Tech Wabag VATE.NS VATW IN

EQUITY: ENGINEERING & CONSTRUCTION

Initiate at Buy, TP INR1,958 and 23% upside

Strong growth prospects in a niche but growing water treatment sector

Action: Initiate at Buy and TP of INR1,958, a 23% upside potential

VA Tech Wabag (VATW) is one of India's largest water treatment companies, with a strong global presence as well. VATW derives its roots from the Austria-based water business of Siemens, which it acquired in 2007. With rising focus of the government and multi-lateral funding agencies on an escalating water shortage and ~68% of sewage being untreated in India, we think the water treatment sector is poised for secular long-term growth. While constantly-evolving technologies to efficiently capture incremental sources of clean water create an entry barrier in an otherwise fragmented industry, we believe VATW brings in strong project management experience, a global client reference list and technological understanding. Despite the frail financial health of municipalities (its primary customers, which often delay payments), VATW has maintained a debt-free balance sheet and negligible bad debt. We estimate 22% revenue CAGR over FY14-17F and ~18% over the next 10 years. We initiate at Buy and TP of INR1,958 with 23% upside potential. *(India market size and details on Ganga cleaning opportunity on page* 17-27*).*

Catalysts: A strong pipeline of orders

- Upcoming award from Tamil Nadu for two new desalination plants, and Mumbai for three sewage treatment plants;
- Ganga cleaning to offer a multi-year waste-water treatment opportunity.

Valuation: Strong growth justifies 23.5x FY16F P/E, initiate with Buy

Trading at 23.5x FY16F P/E, VATW still offers value (comparison table on page 5), given its strong orderbook (TTM book: bill of 2.9x), new order visibility, EPS CAGR of ~30% over FY14-17F, reasonable ROE of ~15% despite being net cash and 10-year revenue CAGR of >18%. Despite 50/50 revenue mix (India/overseas), VATW carries negligible FX risks as most of the cost is in local currency. We value VATW at 22.5x FY17F P/E (fair value range of 15-25x benchmarked to ENGR/NBCC) to derive our TP of INR1,958.

Year-end 31 Mar	FY14		FY15F		FY16F		FY17F
Currency (INR)	Actual	Old	New	Old	New	Old	New
Revenue (mn)	22,386	N/A	26,775	N/A	33,014	N/A	40,563
Reported net profit (mn)	1,134	N/A	1,386	N/A	1,881	N/A	2,410
Normalised net profit (mn)	1,083	N/A	1,386	N/A	1,881	N/A	2,410
FD normalised EPS	39.78	N/A	50.04	N/A	67.90	N/A	87.01
FD norm. EPS growth (%)	17.8	N/A	25.8	N/A	35.7	N/A	28.1
FD normalised P/E (x)	40.1	N/A	31.9	N/A	23.5	N/A	18.3
EV/EBITDA (x)	21.3	N/A	15.4	N/A	11.3	N/A	8.5
Price/book (x)	5.3	N/A	3.8	N/A	3.0	N/A	2.6
Dividend yield (%)	0.6	N/A	0.6	N/A	1.0	N/A	1.4
ROE (%)	14.6	N/A	13.8	N/A	14.3	N/A	15.3
Net debt/equity (%)	net cash	N/A	net cash	N/A	net cash	N/A	net cash

Source: Company data, Nomura estimates

Key company data: See page 2 for company data and detailed price/index chart

Global Markets Research

27 January 2015

Rating Starts at	**Buy**
Target price Starts at	INR 1958
Closing price 23 January 2015	INR 1596
Potential upside	+22.7%

Anchor themes

VA Tech Wabag is a niche play on the emerging water and waste water treatment opportunity, both in India as well as in other emerging markets. With rising focus on clean water for drinking as well as on better effluent treatment, we believe there is a strong long-term growth opportunity for VATW.

Nomura vs consensus

Our TP is significantly ahead of consensus; however, we note that the stock is not well covered.

Research analysts

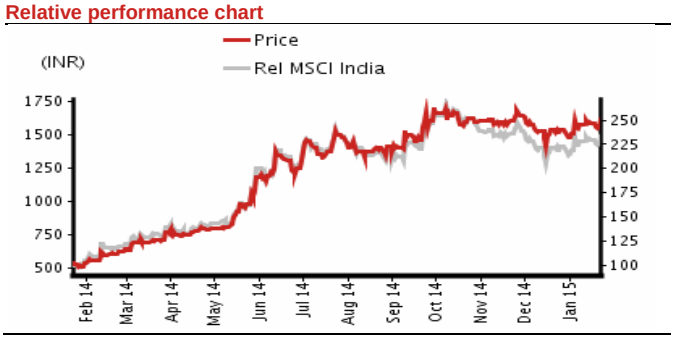
India Engineering & Construction

Amar Kedia - NFASL
amar.kedia@nomura.com
+91 22 4037 4182

Vineet Verma - NFASL
vineet.verma@nomura.com
+91 22 4037 4487

Key data on VA Tech Wabag

Relative performance chart



Source: Thomson Reuters, Nomura research

Notes:

Performance

(%)	1M	3M	12M		
Absolute (INR)	3.8	-1.8	198.1	M cap (USDmn)	702.1
Absolute (USD)	6.9	-2.4	200.3	Free float (%)	70.9
Rel to MSCI India	3.8	-8.8	169.2	3-mth ADT (USDmn)	1.3

Income statement (INRmn)

Year-end 31 Mar	FY13	FY14	FY15F	FY16F	FY17F
Revenue	16,189	22,386	26,775	33,014	40,563
Cost of goods sold	-11,876	-17,129	-20,842	-25,942	-32,065
Gross profit	4,313	5,257	5,933	7,072	8,499
SG&A	-824	-1,304	-1,239	-1,391	-1,564
Employee share expense	-2,058	-2,217	-2,444	-2,742	-3,197
Operating profit	1,431	1,735	2,250	2,939	3,738
EBITDA	1,540	1,885	2,444	3,159	3,998
Depreciation	-109	-150	-194	-220	-261
Amortisation					
EBIT	1,431	1,735	2,250	2,939	3,738
Net interest expense	-212	-252	-331	-369	-414
Associates & JCEs	8	6	8	10	12
Other income	132	129	144	230	265
Earnings before tax	1,360	1,618	2,072	2,810	3,600
Income tax	-456	-526	-666	-914	-1,182
Net profit after tax	904	1,092	1,407	1,896	2,418
Minority interests	0	-9	-20	-16	-8
Other items					
Preferred dividends					
Normalised NPAT	903	1,083	1,386	1,881	2,410
Extraordinary items	0	51	0	0	0
Reported NPAT	903	1,134	1,386	1,881	2,410
Dividends	-217	-249	-264	-433	-627
Transfer to reserves	686	885	1,122	1,448	1,783
Valuations and ratios					
Reported P/E (x)	47.3	38.3	31.9	23.5	18.3
Normalised P/E (x)	47.3	40.1	31.9	23.5	18.3
FD normalised P/E (x)	47.3	40.1	31.9	23.5	18.3
Dividend yield (%)	0.5	0.6	0.6	1.0	1.4
Price/cashflow (x)	60.7	54.7	61.3	34.7	18.0
Price/book (x)	6.0	5.3	3.8	3.0	2.6
EV/EBITDA (x)	26.0	21.3	15.4	11.3	8.5
EV/EBIT (x)	28.0	23.2	16.7	12.1	9.0
Gross margin (%)	26.6	23.5	22.2	21.4	21.0
EBITDA margin (%)	9.5	8.4	9.1	9.6	9.9
EBIT margin (%)	8.8	7.7	8.4	8.9	9.2
Net margin (%)	5.6	5.1	5.2	5.7	5.9
Effective tax rate (%)	33.5	32.5	32.1	32.5	32.8
Dividend payout (%)	24.1	21.9	19.1	23.0	26.0
ROE (%)	na	14.6	13.8	14.3	15.3
ROA (pretax %)	na	10.0	10.9	12.2	12.6
Growth (%)					
Revenue		38.3	19.6	23.3	22.9
EBITDA		22.4	29.7	29.2	26.6
Normalised EPS		17.8	25.8	35.7	28.1
Normalised FDEPS		17.8	25.8	35.7	28.1

Source: Company data, Nomura estimates

Cashflow statement (INRmn)

Year-end 31 Mar	FY13	FY14	FY15F	FY16F	FY17F
EBITDA	1,540	1,885	2,444	3,159	3,998
Change in working capital	-169	-324	-715	-597	44
Other operating cashflow	-668	-767	-1,009	-1,289	-1,592
Cashflow from operations	703	795	721	1,273	2,450
Capital expenditure	-410	-1,046	-400	-500	-750
Free cashflow	293	-251	321	773	1,700
Reduction in investments	3	-199	200	0	0
Net acquisitions					
Dec in other LT assets		0	0	0	0
Inc in other LT liabilities					
Adjustments	132	179	144	230	265
CF after investing acts	429	-270	666	1,004	1,965
Cash dividends	-217	-249	-264	-433	-627
Equity issue	1	2	0	0	0
Debt issue	-426	761	0	0	0
Convertible debt issue					
Others	56	408	2,224	1,460	491
CF from financial acts	-587	922	1,960	1,027	-137
Net cashflow	-158	651	2,625	2,031	1,828
Beginning cash	3,983	3,825	4,476	7,101	9,132
Ending cash	3,825	4,476	7,101	9,132	10,961
Ending net debt	-3,003	-2,894	-5,519	-7,550	-9,378

Balance sheet (INRmn)

As at 31 Mar	FY13	FY14	FY15F	FY16F	FY17F
Cash & equivalents	3,825	4,476	7,101	9,132	10,961
Marketable securities	0	200	0	0	0
Accounts receivable	11,464	15,070	16,468	20,305	24,949
Inventories	405	350	563	702	868
Other current assets	2,076	2,238	2,650	3,241	3,955
Total current assets	17,770	22,335	26,782	33,380	40,733
LT investments	33	32	32	32	32
Fixed assets	988	1,884	2,090	2,370	2,859
Goodwill	0	0	0	0	0
Other intangible assets					
Other LT assets					
Total assets	18,791	24,250	28,903	35,781	43,624
Short-term debt	822	1,583	1,583	1,583	1,583
Accounts payable	6,890	8,620	9,248	11,836	15,489
Other current liabilities	4,018	5,679	6,357	7,740	9,655
Total current liabilities	11,730	15,881	17,188	21,158	26,727
Long-term debt					
Convertible debt					
Other LT liabilities	-112	-70	-70	-70	-70
Total liabilities	11,618	15,810	17,117	21,088	26,656
Minority interest	19	28	49	64	73
Preferred stock					
Common stock	54	55	55	55	55
Retained earnings	7,100	8,356	11,682	14,574	16,839
Proposed dividends					
Other equity and reserves					
Total shareholders' equity	7,154	8,412	11,737	14,630	16,895
Total equity & liabilities	18,791	24,250	28,903	35,781	43,624
Liquidity (x)					
Current ratio	1.51	1.41	1.56	1.58	1.52
Interest cover	6.8	6.9	6.8	8.0	9.0
Leverage					
Net debt/EBITDA (x)	net cash	net cash	net cash	net cash	net cash
Net debt/equity (%)	net cash	net cash	net cash	net cash	net cash
Per share					
Reported EPS (INR)	33.77	41.64	50.04	67.90	87.01
Norm EPS (INR)	33.77	39.78	50.04	67.90	87.01
FD norm EPS (INR)	33.77	39.78	50.04	67.90	87.01
BVPS (INR)	267.44	303.67	423.72	528.14	609.92
DPS (INR)	8.13	8.98	9.53	15.63	22.65
Activity (days)					
Days receivable		216.3	215.0	203.8	203.6
Days inventory		8.0	8.0	8.9	8.9
Days payable		165.2	156.5	148.7	155.5
Cash cycle	0.0	59.1	66.5	64.0	57.0

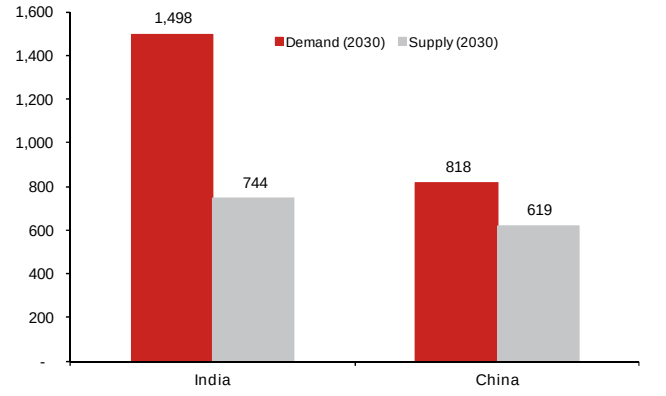
Source: Company data, Nomura estimates

Focus charts

- Charts below present a snapshot of the key theme presented in this report.
- Please refer to the report, China water and environment - Rising tides lift all boats, published on 28 August 2014 for our China water & environment analyst Thomas Tang's views.
- Company section on VA Tech Wabag (VATW) begins from page 21 below.

Fig. 1: Water demand-supply gap to reach alarming levels by 2030

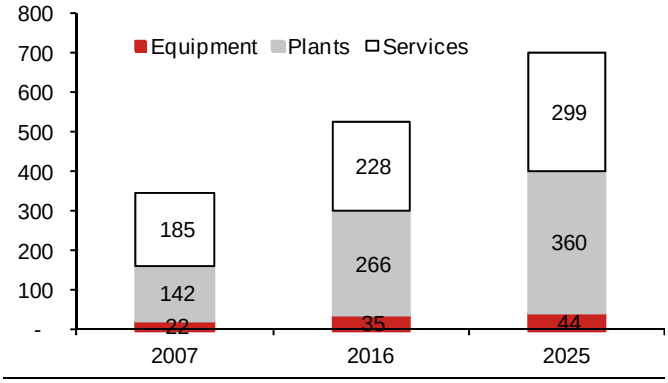
Bn cubic metres of water



Source: Global Water Resource

Fig. 2: Estimated world water treatment market size

USD bn



Source: Ministry of Economy, Trade and Industry, Japan, 2008 White Paper on International Economy and Trade

Fig. 3: Opportunity across the value chain: key players and market size in India (E&Y estimates)

USD bn

		Companies		Market size		
Key processes	Key success factors	Design & manufacturing	O&M	2010	2030	CAGR
Water collection and treatment	1) Collection of fresh water, 2) Freshwater / groundwater treatment plant, 3) Desalination plant	Hindustan Dorr Oliver, Waster Water Engg, Thermax, Degremont, Ramky Infrastructure, Ion Exchange, VA Tech Wabag	Hindustan Dorr Oliver, Waster Water Engg , Subash Projects, Degremont , Ramky Infrastructure, JUSCO	1	32	20%
Distribution and supply	1) Domestic consumers, 2) Industrial consumers	Gammon, Aquatech, Siemens, VA Tech Wabag, Morf, Driplex	Subash Projects, JUSCO, Wipro	30	1,750	23%
Sewage & sanitation services	Waste water collection, treatment, reuse and disposal	Hindustan Dorr Oliver, Waster Water Engg , Thermax, Degremont , Ramky Infrastructure, VA Tech Wabag	Hindustan Dorr Oliver, Waster Water Engg , Subash Projects, Degremont , Ramky Infrastructure, JUSCO	12	1,304	26%

Source: E&Y report

Fig. 4: VATW: We estimate ~18% revenue CAGR over the next 10 years

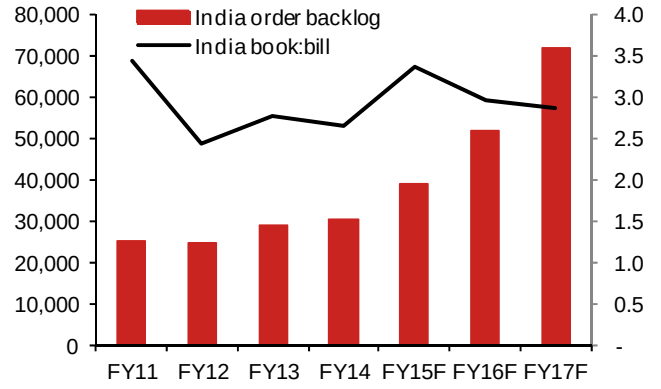
INR mn

	FY14F	FY24F	CAGR
EPC Market opportunity (INR mn)	33,603	83,558	10%
O&M Market opportunity (INR mn)	45,764	114,435	10%
Industrial sector opportunity (INR mn)	31,250	79,421	10%
Total sector opportunity	**110,617**	**277,414**	**10%**
VA Tech Wabag India revenues			
EPC India - Municipalities	5,937	29,245	17%
O&M India - Municipalities	3,047	22,887	22%
Industrial	4,556	15,884	13%
Total	**13,540**	**68,017**	**18%**
VA Tech Wabag Market share			
EPC India - Municipalities	18%	35%	
O&M India - Municipalities	7%	20%	
Industrial	15%	20%	
Total	**12%**	**25%**	

Source: Nomura estimates

Fig. 5: VATW: India orderbook to grow 2.4x by FY17F

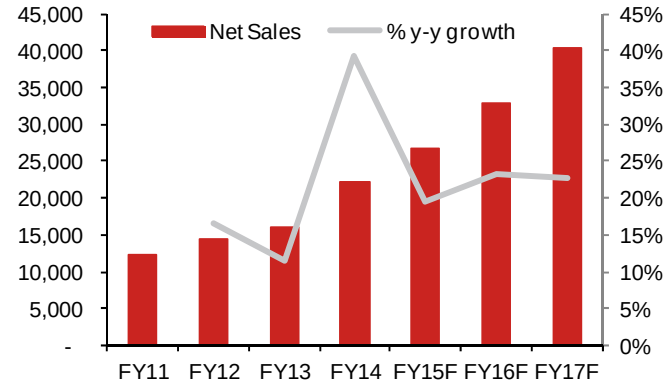
INR mn



Source: Company data, Nomura estimates

Fig. 6: …leading to 22% revenue CAGR over FY14-17F

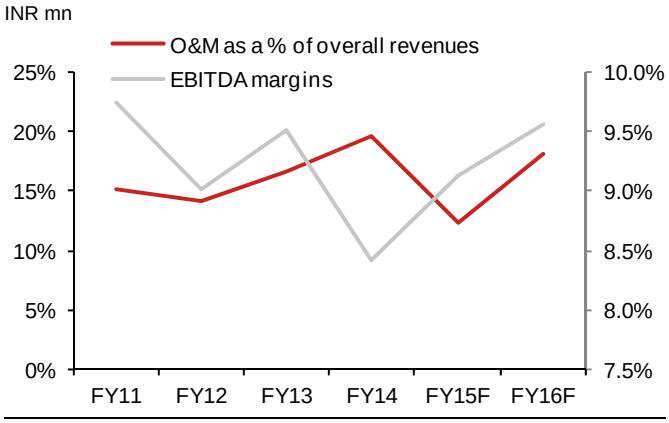
INR mn



Source: Company data, Nomura estimates

Fig. 7: VATW: Rising O&M revenues positive for EBITDA margins

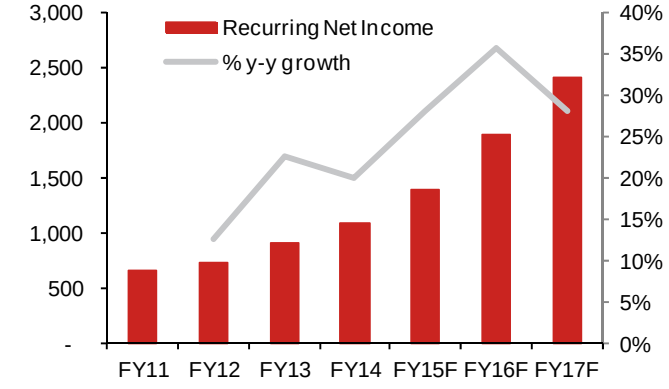
INR mn



Source: Company data, Nomura estimates

Fig. 8: …thus, driving a 30% PAT CAGR over FY14-17F

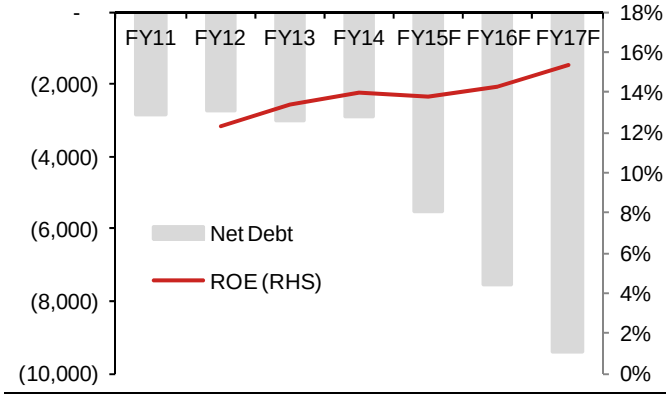
INR mn



Source: Company data, Nomura estimates

Fig. 9: Rising ROEs, despite increasing net cash on books

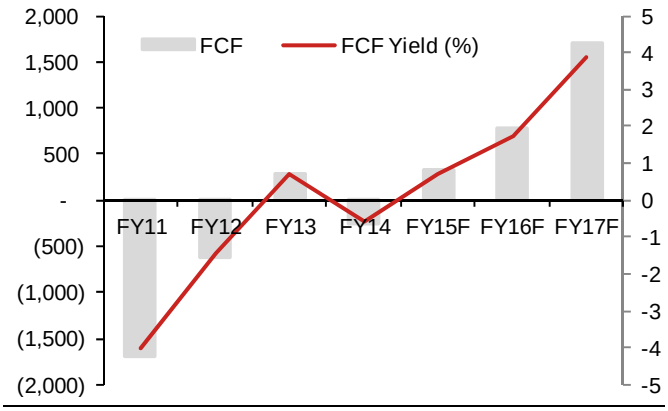
Net debt is negative, implying net cash on books



Source: Company data, Nomura estimates

Fig. 10: VATW to turn FCF-positive in FY15/16F

INR mn



Source: Company, Nomura estimates

Fig. 11: Regional valuation comparison

Stock prices in local currency

			Price	Mkt Cap	P/E (x)			EV/EBITDA (x)			P/BV (x)			ROE (%)			CAGR (FY14-17F)	
Company	Tickers	Rating	(local)	(bn USD)	FY15F	FY16F	FY17F	FY15F	FY16F	FY17F	FY15F	FY16F	FY17F	FY15F	FY16F	FY17F	EBITDA	EPS
Europe & US water & environment																		
Suez Environment	SEV FP	Not Rated	16	10.0	20.7	18.3	16.2	7.0	6.6	6.2	1.7	1.7	1.6	8.0	8.3	7.8	5%	13%
Veolia Environment	VIE FP	Not Rated	17	10.4	22.5	17.8	15.4	8.0	7.5	7.0	1.1	1.1	1.1	4.9	6.2	6.3	10%	34%
American Water Works	AWK US	Not Rated	57	10.1	21.7	20.2	19.4	10.4	9.9	9.1	2.0	1.9	2.2	9.1	9.4	9.3	7%	6%
Acciona SA	ANA SM	Not Rated	64	4.1	28.3	21.4	18.7	9.1	8.8	8.7	1.1	1.0	0.9	3.7	5.3	6.0	3%	22%
ACS	ACS SM	Not Rated	32	11.4	13.5	12.1	10.4	6.5	6.2	5.8	2.5	2.3	2.0	19.3	19.0	16.1	5%	11%
Abengoa	ABG SM	Not Rated	3	2.7	11.5	11.5	13.7	7.4	6.8	6.8	1.7	1.5	NA	13.0	13.7	11.1	7%	14%
Average					**19.7**	**16.9**	**15.6**	**8.1**	**7.6**	**7.3**	**1.7**	**1.6**	**1.6**	**9.7**	**10.3**	**9.4**	**6%**	**17%**
China/SG water & environment																		
Sound Global	967 HK	Buy	7.8	1.5	15.3	12.0		8.2	6.0		2.1	1.5		14.9	14.4		33%	22%
Beijing Enterprises Water	371 HK	Buy	5.2	5.8	26.9	18.7		24.2	18.0		2.9	2.6		12.0	15.5		32%	43%
CT Environmental	1363 HK	Buy	7.8	1.4	31.4	21.2		23.8	14.6		6.3	5.0		23.8	26.1		59%	35%
China Everbright Int'l	257 HK	Buy	11.5	6.7	26.1	20.9		18.1	15.5		3.5	3.1		14.0	15.5		25%	30%
Kangda Environmental	6136 HK	Buy	3.3	0.9	17.8	12.6		12.7	11.1		1.8	1.6		14.0	13.5		29%	NA
Guangdong Investment	270 HK	Reduce	10.8	8.7	20.8	19.6		12.7	12.2		2.2	2.1		11.5	10.9		3%	6%
Hyflux Ltd	HYF SP	Not Rated	1.0	1.0	122.5	20.4		19.1	11.8		0.9	0.8		0.6	5.3		NA	NA
Average ex-Hyflux					**23.0**	**17.5**		**16.6**	**12.9**		**3.1**	**2.6**		**15.0**	**16.0**		**30%**	**27%**
India E&C																		
Hindustan Construction	HCC IN	Not Rated	29	0.3	NA	44.3	11.6	21.2	19.6	16.8	1.5	1.4	1.2	2.4	5.4	10.4	15%	NA
Nagarjuna Construction	NJCC IN	Not Rated	72	0.7	42.5	21.2	13.2	12.5	10.7	8.7	1.3	1.2	1.1	2.7	5.3	8.2	-2%	75%
Simplex Infra	SINF IN	Not Rated	367	0.3	26.3	15.3	8.8	7.7	6.8	5.9	1.2	1.2	1.0	4.9	7.8	12.1	12%	51%
J Kumar Infra	JKIL IN	Not Rated	479	0.3	15.0	11.5	9.2	7.3	6.0	5.0	2.0	1.8	1.4	14.9	16.0	16.8	24%	20%
Supreme Infra	SPII IN	Not Rated	265	0.1	6.5	4.8	4.6	11.8	10.3	9.3	0.8	0.7	0.7	12.2	14.0	13.8	7%	0%
Ahluwalia Contractors	AHLU IN	Not Rated	243	0.2	24.1	18.1	13.5	14.4	11.1	8.5	4.9	3.9	3.0	23.1	23.2	24.4	71%	NA
KNR Construction	KNRC IN	Not Rated	376	0.2	16.9	13.7	10.8	10.9	9.1	7.6	1.8	1.6	1.4	11.4	12.6	14.1	16%	26%
Thermax	TMX IN	Reduce	1,102	2.1	44.7	33.5	24.4	27.0	21.3	15.9	5.8	5.1	4.4	14.0	17.1	19.7	23%	22%
Engineers India Ltd (consol)	ENGR IN	Not Rated	224	1.2	20.9	15.6	15.1	22.6	12.7	12.4	2.8	2.6	2.5	14.7	18.2	16.6	-1%	-1%
NBCC	NBCC IN	Buy	820	1.6	30.3	21.3	14.4	25.6	17.9	11.7	7.2	5.8	4.5	26.1	30.3	35.1	46%	38%
VA Tech Wabag		Buy	1,596	1.6	31.9	23.5	18.3	17.6	13.6	10.8	3.8	3.0	2.6	13.8	14.3	15.3	28%	29%
Average					**25.9**	**20.2**	**13.1**	**16.2**	**12.7**	**10.2**	**3.0**	**2.6**	**2.2**	**12.7**	**14.9**	**16.9**	**22%**	**29%**

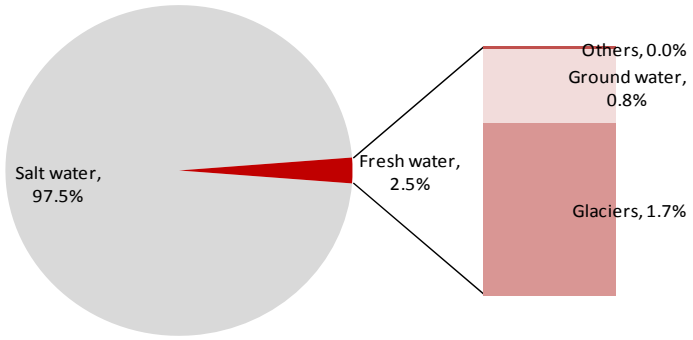
Source: Bloomberg consensus for Not Rated stocks, Nomura estimates. Note: Prices as on 23 January 2015

Water treatment sector presents a significant market, both in India and globally

Uneven distribution of fresh water reserves poses a challenge of water availability in developing nations

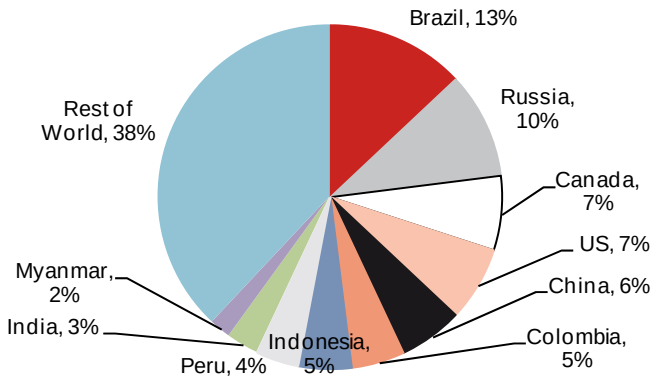
Globally, demand for water is driven by factors such as population growth, industrialisation and urbanisation. According to Global Water Resource estimates, globally demand for water is recording a 2% CAGR. As such, the world has enough water reserves, but there are two-fold challenges while addressing global demand for water. First, of the total global water reserves, only 2.5% is that of freshwater and the rest is seawater and undrinkable. Second, these fresh water reserves are unevenly distributed globally, creating regional imbalances in the availability of water per capita. Notably, more than 60% of accessible fresh water supply is limited to only 10 countries, which results in water stress situation for emerging countries such as China and India, which account for nearly 40% of the global population but have only 9% of total fresh water reserves. Specifically for India, it accounts for nearly 16% of world's population but only 3% of the world's water reserves. Due to these regional imbalances, India, China including countries in Middle East and North Africa are more succumbed to challenges of water availability.

Fig. 12: Current global freshwater reserves



Source: United Nations World Water Development Report 2

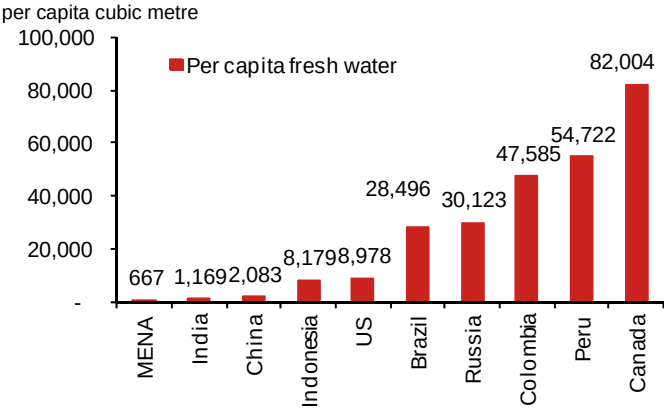
Fig. 13: Top 10 countries account for 62% of the world's fresh water availability



Based on 2009 data

Source: World Bank

Fig. 14: Internal fresh water availability per capita



Based on 2012 census;

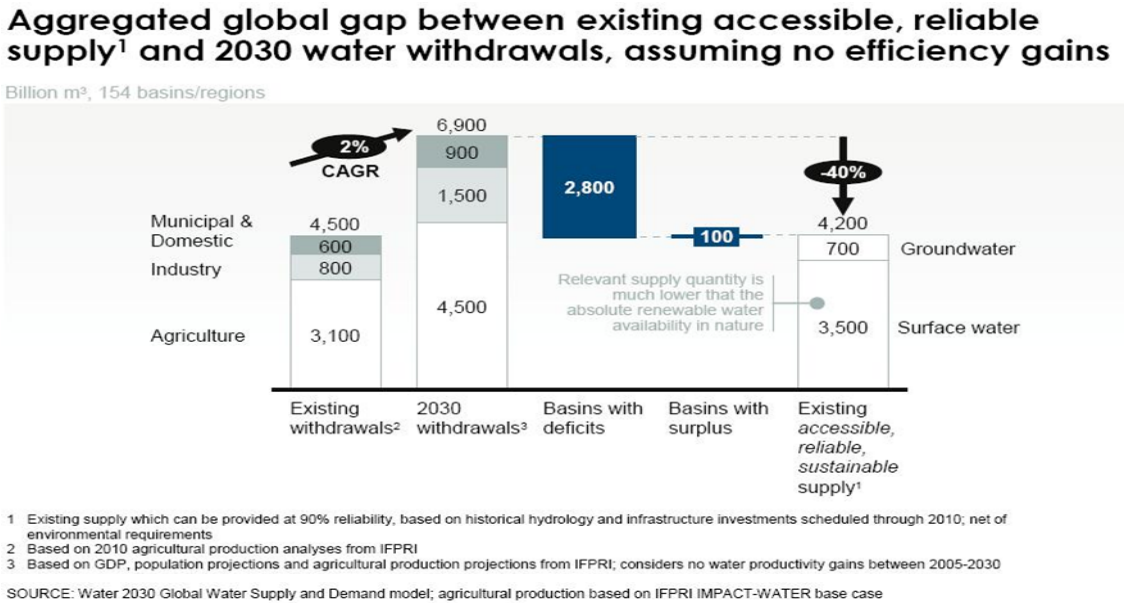
Source: World Bank

Demand-supply gap set to increase in developing nations, led by the increase in industrialization and energy demand

Due to increasing population and urbanisation, rapid industrial growth and changing consumption patterns, water withdrawals in developing nations have increased in the past few years, which in contrast have relatively remained constant for developed nations such as the US and Japan. We believe this trend will remain unchanged as increasing per capita energy consumption in developing nations would continue to push the demand for water. According to Global Water Resources (GWR), water demand from various industries is expected to record a higher pace of ~3% CAGR vs. ~2% demand CAGR from agriculture and municipal/domestic use. According to GWR, by 2030, global water requirement would grow from 4,500bn cubic metres to 6900bn cubic metres. Assuming there is no efficiency gain, the demand-supply gap would increase to ~40%, with the situation becoming more severe in counties such as India and China. According to GWR, demand from India for water is expected to increase to 1,500bn cubic metres in 2030, while the supply of water would be limited to 740bn cubic metres, which would result in a large gap between current supply and projected demand — amounting to 50% of demand or 754bn cubic metres.

Fig. 15: Demand-supply gap could increase to 40% by 2030

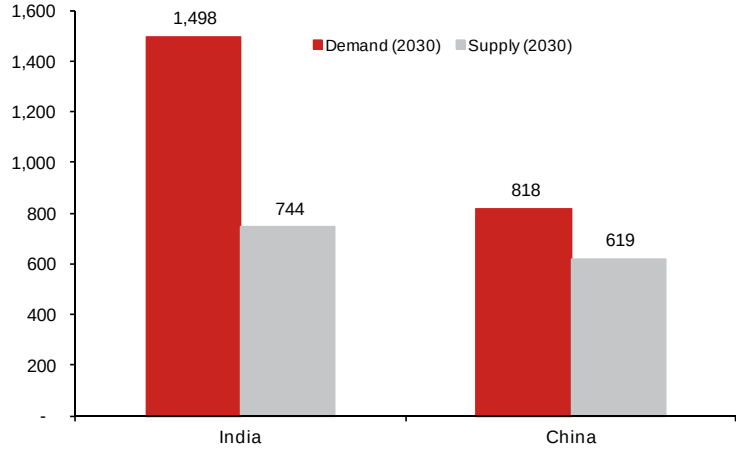
Bn cubic metres of water



Source: Global Water Resource

Fig. 16: Water demand-supply gap (assuming no efficiency improvement)

Bn cubic metres of water



Source: Global Water Resource

India demand-supply gap necessitates investments in building water infrastructure

With growing demand from India's population, coupled with a steady industrial growth, we estimate the water growth rate contributed by residential, industrial, agriculture and commercial use will be in a robust range of 2.0% CAGR. For India, there are different water demand estimates available; we highlight the estimates by two different government agencies — the Ministry of Water Resources (MoWR) and the National Commission on Integrated Water Resources Development (NCIWRD) which put water demand at 813bn cubic metres per year and 710bn cubic metres per year, respectively. In contrast, based on official estimates of the Ministry of Water Resources (MoWR), total utilisable water reserves stand at 1,123bn cubic metres (BCM) per year, which imply currently there is a water surplus scenario. However, based on the demand projections of MoWR, the situation could turn around in the next 10 years when supply would just be matching demand.

We note that various studies have highlighted that the utilisable water resources of India have been over estimated. We highlight figures from Global Water Resources, which estimate India's current water reserves at 754bn cubic metres (BCM) vs. MoWR's estimate of 1,123bn cubic metres. If we consider utilisable reserves of 754bn cubic metres, even the current water supply situation looks alarming and necessitates significant investments in building water infrastructure, i.e. spending on increasing water supply, along with improving the efficiency of water usage.

Fig. 17: Water demand in India (billion cubic metres)

MoWR estimates					
Year	2010	2025	2050	CAGR% (2010-25)	CAGR% (2025-40)
Irrigation	688	910	1,072	1.9%	0.7%
Drinking Water	56	73	102	1.8%	1.3%
Industry	12	23	63	4.4%	4.1%
Energy	5	15	130	7.6%	9.0%
Others	52	72	80	2.2%	0.4%
Total	**813**	**1,093**	**1,447**	**2.0%**	**1.1%**
CAGR					

NCIWRD					
Year	2010	2025	2050	CAGR% (2010-25)	CAGR% (2025-40)
Irrigation	557	611	807	0.6%	1.1%
Drinking Water	43	62	111	2.5%	2.4%
Industry	37	67	81	4.0%	0.8%
Energy	19	33	70	3.7%	3.1%
Others	54	70	111	1.7%	1.9%
Total	**710**	**843**	**1,180**	**1.2%**	**1.4%**

Source: Ministry of Water Resources, Govt. of India, National Council for Integrated Water Resource and Development (NCIWRD)

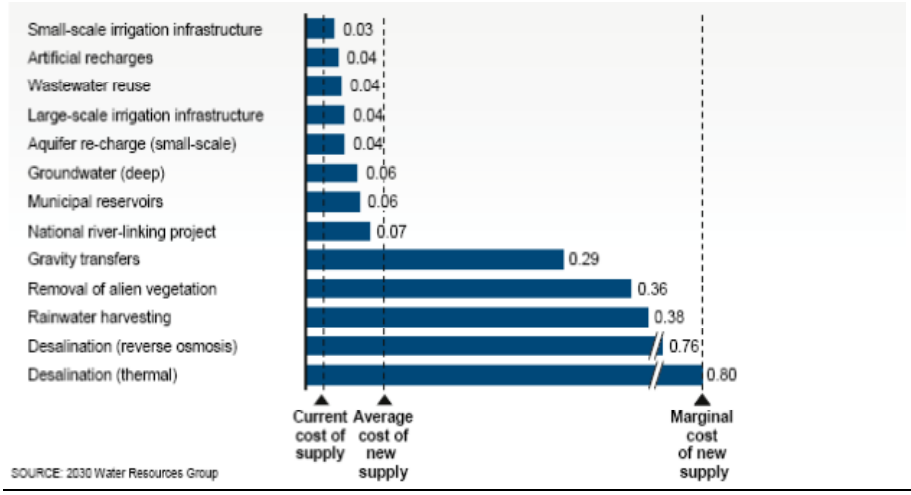
Cost curve of improving water availability from waste water reuse to desalination

Water gets consumed by agricultural, domestic and industrial sectors but agriculture dominates the water demand globally as well as in India. In India, the percentage of water consumed by agriculture is far higher compared to other developing nations/developed nations as agricultural yield is lower in India, plus there is inefficient usage of water as electricity is usually given to farmers at highly subsidised rates. Even for Industries, compared to other countries, India also has one of the lowest industrial outputs per unit of water. In our view, this implies a part of this demand-supply mismatch

could be bridged by the increasing efficiency of water. Nevertheless, such a wide gap would entail higher investments in building water infrastructure over the next few years.

The figure below highlights various supply measures which could be adopted to address these supply side and the cost required to increase supply. At the lower end of the cost spectrum, water supply can be increased through measures such as the reuse of waste water, inter-linking of rivers, whereas on the other hand, desalination is the most expensive method to increase water supply. In India, cities such as Chennai have set up desalination plants to address the supply shortage.

Fig. 18: Cost curve for increasing water supply

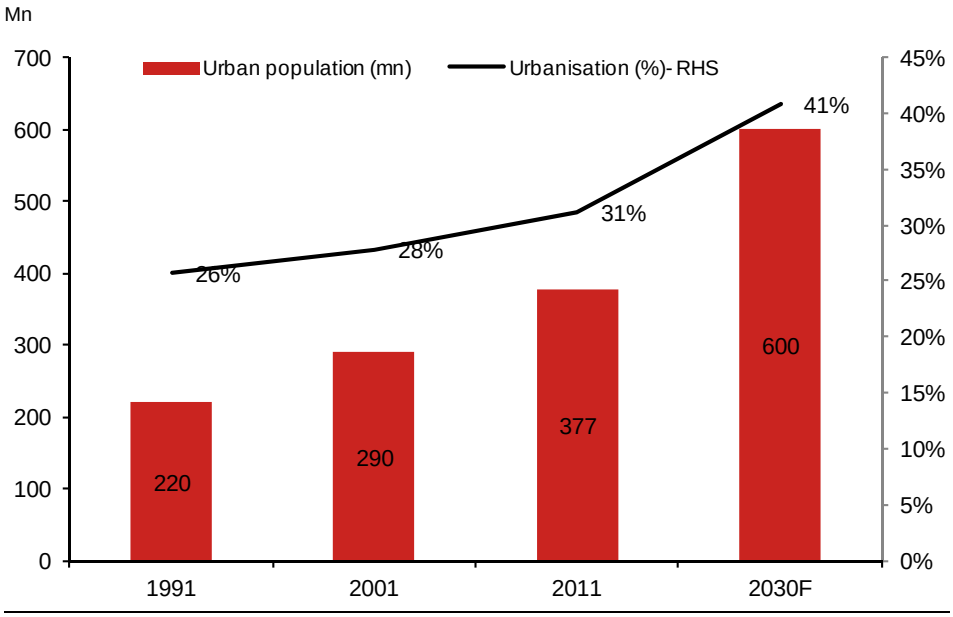


Source: 2030 Water Resources Group

Poor waste water treatment increases woes over water availability

As discussed above, India faces the challenge of limited water supply, but this is further aggravated by the non-treatment of waste water which pollutes the source of water bodies. The lack of treatment results in two challenges -- first, non-treatment of wastewater (sewage) before discharging into water bodies pollutes the source and makes water unusable for drinking. Secondly, the water intended for drinking withdrawn from the same source is again not adequately treated. As a result, providing enough clean water for a rapidly growing population along with increasing consumption per capita (due to growing needs) has become a challenge. The increasing urbanisation trend in India is further leading to more pressure on the water and sanitation infrastructure in cities. As per McKinsey estimates, India's urban population is expected to reach close to 600mn by 2031, more than double that in 2001 (around 290mn). Even the number of metropolitan cities with a population of 1mn and above has increased from 35 in 2001 to 50 in 2011 and is expected to increase further to ~87 by 2031. Clearly, this trend calls for increasing the capacity of water treatment plants.

Fig. 19: Increasing urbanisation – adding pressure on water and sanitation infrastructure



Source: Mckinsey

Deficient waste water treatment capacity; nearly 68%-91% of waste water is left untreated

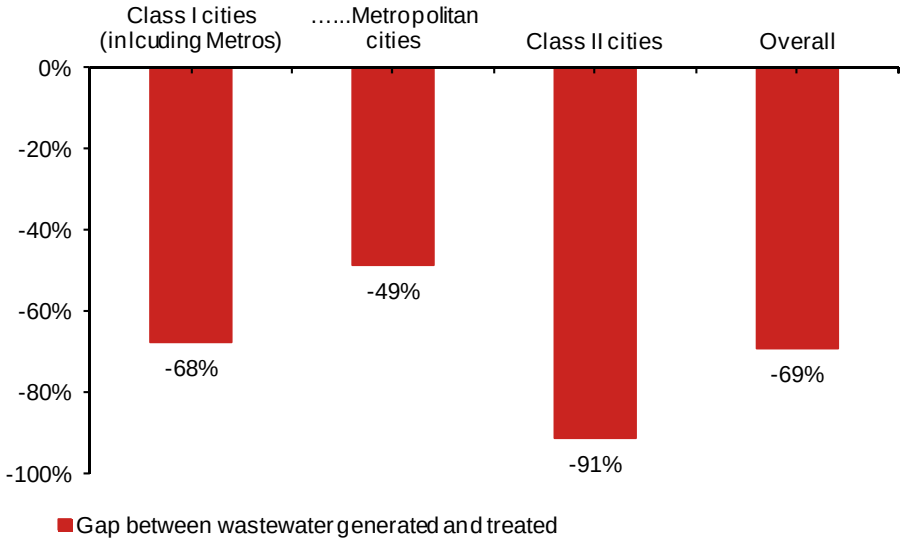
With the expansion of cities, the quantity of wastewater is increasing proportionately. As per CPHEEO estimates, c.70-80% of total water supplied for domestic use end up generating wastewater. Maharashtra, Delhi, Uttar Pradesh, West Bengal and Gujarat are the major contributors of wastewater. As per CPCB estimates, the total wastewater generation from Class I cities (498) and Class II (410) towns in the country is around 35,558 million litre per day (MLD) and 2,696 MLD, respectively, compared to the installed sewage treatment capacity of just 11,553 MLD and 233 MLD, thereby leading to a gap of 26,468 MLD in sewage treatment capacity. This means, overall in Class I cities, nearly 68% of waste water sewage goes untreated, which is even worse in Class II cities where nearly 90% of waste water is discharged untreated.

CPCB further highlights that even larger metropolitan cities have significant shortfall in STP capacity as follows:

- 15,644 MLD sewage is generated from 35 metropolitan cities (>1 mn population), but STP capacity exists for only 8,040 MLD, i.e. 51% treatment capacity.
- Among metropolitan cities, Delhi has the highest capacity of STP at 2,330 MLD but still witnessing a shortfall of ~40%.
- Mumbai has the second highest capacity at 2,130 MLD, which is 20% short of requirement.
- Treatment capacity meets the volume of generation in some cities such as Hyderabad, Vadodara, Chennai, Ludhiana and Ahmadabad.
- Most other metropolitan cities have STP capacities to cater to <50% of sewage generation.

Fig. 20: Status of waste water treatment in India

As of 2009



Source: Central Pollution Control Board

Study suggests sub-par performance of even installed sewage treatment plants

Not only do cities in India have inadequate sewage treatment capacities, but existing plants have sub-par performance. This is reflected by a study conducted by CPCB which evaluates the performance of 152 STPs (funded under National River Conservation Plan) spread over 15 states in the country with a total treatment capacity of 4,716 MLD. According to the study:

- Actual treatment capacity utilization is only 66% (around 3126 MLD).
- Of the 152 STPs, 30 STPs were non-operational; 28 STPs' performance was not satisfactory.
- Of the 152 STPs, the treated effluent from 49 STPs exceeds BOD standards and with respect to COD, seven STPs are violating the general standards of discharge.

Poor financial health of municipalities -- one reason for the poor state of water infrastructure in cities

The error in metering, unbilled water consumption and theft lead to high levels of non-revenue water for municipalities. The challenge for municipalities is not only high levels of commercial and physical losses in the distribution network but also the unwillingness of local/state governments to levy adequate user charges (because of political reasons). In India, water utilities are typically able to recover only 30-35% of the operations and maintenance (O&M) cost, leaving municipalities in poor financial conditions. In comparison, other countries such as the Philippines and Cambodia, most water utilities are able to recover the full O&M cost.

Fig. 21: Water balance in a typical Indian city (estimated as of 23 January 2015)

INR mn

<table>
<tr><td rowspan="7">Water Produced (100%) 164 mld</td><td rowspan="2">Authorised Consumption (30%) 50 mld</td><td rowspan="2">Billed & Authorised Consumption (26%) 42 mld</td><td>Billed & Metered (4%) 6 mld</td><td rowspan="2">Revenue Water (26%) 42 mld</td><td rowspan="2">Collected (20%) 33 mld</td></tr>
<tr><td>Billed & Un-metered (22%) 36 mld</td></tr>
<tr><td></td><td>Unbilled Authorised</td><td>Public Standpost (5%) 8 mld</td><td rowspan="5">Non-revenue Water (74%) 122 mld</td><td rowspan="5">Not Collected (80%) 131 mld</td></tr>
<tr><td rowspan="5">Unaccounted for Water Losses (70%) 114 mld</td><td rowspan="2">Apparent Losses</td><td>Theft</td></tr>
<tr><td>Customer Meter Errors, Data Errors</td></tr>
<tr><td rowspan="3">Real Losses</td><td>Storage Leakage</td></tr>
<tr><td>Transmission Main Leakage</td></tr>
<tr><td>Service Connection Leakage</td></tr>
</table>

Source: Nomura research

Water spend competes with other urban infrastructure requirements

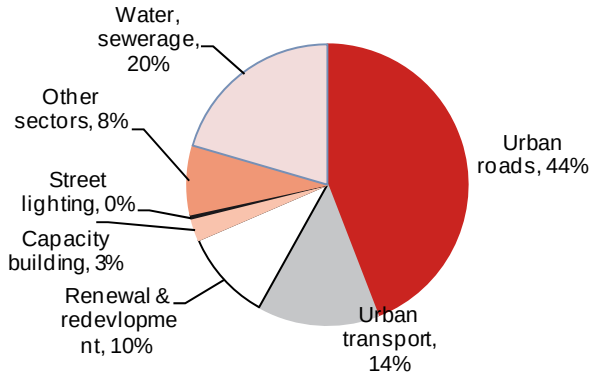
In the past few years, both central and state governments have been spending in improving the supply of clean drinking water, but still, quality as well as accessibility are issues in urban areas. Some investment in improving the sanitation and water infrastructure that has happened in cities is being funded through JNNRUM.

According to a report from JNNURM, the investment requirement for urban infrastructure over the next 20-year period is estimated at INR39tn at 2009-10 prices. Of this, INR17.3tn (or 44%) is accounted for by urban roads. The backlog for this sector is very large, ranging from 50% to 80% across cities of India. Sectors delivering urban services such as water supply, sewerage, solid waste management, and storm water drains will need INR8tn (or 20%). The O&M requirements for new and old assets are projected at INR20tn over the 20-year period, according to the report.

Investment requirement is further estimated to increase at 15% p.a. during the Twelfth Plan period (2012-13 to 2016-17), 12% p.a. during the Thirteenth Plan period (2017-18 to 2021-22), and 8% p.a. during the Fourteenth and Fifteenth Plan period (2022-23 to 2031-32).

Fig. 22: Urban infrastructure investment required: 2012-31

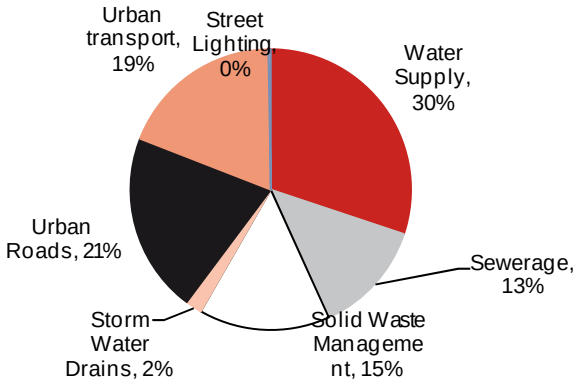
Share of sectors



Source: Report on Indian Urban Infrastructure and Services, MoUD

Fig. 23: O&M expenditure by sector, 2012-31

Share of sectors



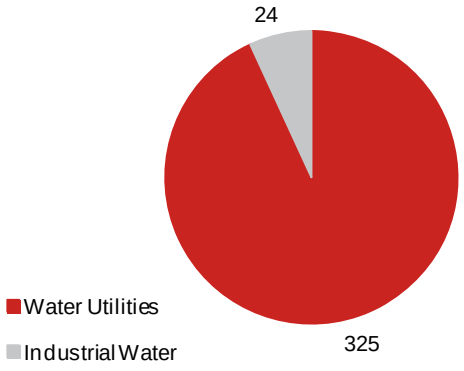
Source: Report on Indian Urban Infrastructure and Services, MoUD

Key addressable areas in the water segment and market opportunity

According to Global Water Markets, the global water industry was at USD349bn in 2007. Water utilities, which mainly comprise municipal drinking water and waste water treatment, shared almost 93% of the market or about USD325bn market and it is expected to grow to USD529bn by 2016 and further to USD702bn by 2025 (as per Ministry of Economy, Trade and Industry, Japan).

Fig. 24: Market size break-up

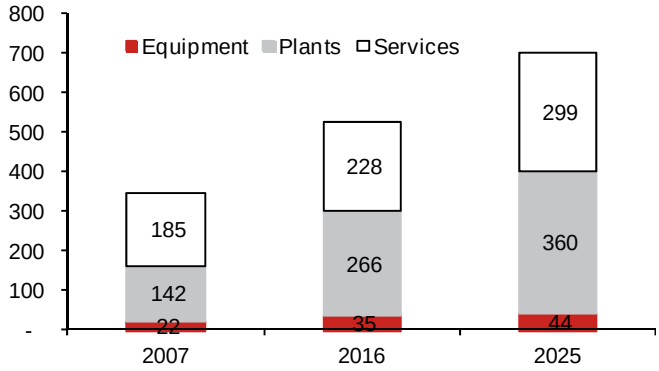
USDbn



Source: Global Water Markets 2008

Fig. 25: Estimated world water treatment market size

USD bn



Note: 1) Equipment denotes the total cost of chemicals and equipment used for industrial water supply and equipment for industrial effluent treatment. 2) Plants denote the total amount of investment in water supply and sewerage facilities. 3) Services denote the total cost of operating water supply and sewerage facilities.

Source: Ministry of Economy, Trade and Industry, Japan, 2008 White Paper on International Economy and Trade

Moreover, water is a very regional business – locally-oriented, and driven by local regulations, local water supply, local demand and local contracts. Players' knowledge of local regulations and environment is very important. Therefore, currently the water industry is highly fragmented with very few global players.

Four key addressable opportunities within the water segment

In the market for water-related services, major clients are governments and government-owned utilities which provide water to the people, or industries which treat water either for input requirements or to meet output water conditions. The water treatment industry can be further classified into four kinds of water plants, namely water treatment, desalination, wastewater treatment and water recycling. Designing and engineering of projects in the water and wastewater treatment segment is technically complex and the technology is a critical part of such projects. There is a wide array of technologies to fulfill water or the wastewater treatment needs of municipal and industrial customers.

Fig. 26: Opportunity across the value chain: key players and market size in India

USD bn

		Companies		Market size		
Key processes	Key success factors	Design & manufacturing	O&M	2010	2030	CAGR
Water collection and treatment	1) Collection of fresh water, 2) Freshwater / groundwater treatment plant, 3) Desalination plant	Hindustan Dorr Oliver, Waster Water Engg, Thermax, Degremont, Ramky Infrastructure, Ion Exchange, VA Tech Wabag	Hindustan Dorr Oliver, Waster Water Engg , Subash Projects, Degremont , Ramky Infrastructure, JUSCO	1	32	20%
Distribution and supply	1) Domestic consumers, 2) Industrial consumers	Gammon, Aquatech, Siemens, VA Tech Wabag, Morf, Driplex	Subash Projects, JUSCO, Wipro	30	1,750	23%
Sewage & sanitation services	Waste water collection, treatment, reuse and disposal	Hindustan Dorr Oliver, Waster Water Engg , Thermax, Degremont , Ramky Infrastructure, VA Tech Wabag	Hindustan Dorr Oliver, Waster Water Engg , Subash Projects, Degremont , Ramky Infrastructure, JUSCO	12	1,304	26%

Source: E&Y report

Fig. 27: Variety of treatment technologies on offer

Segments	Conventional technologies	Advance technologies
		Biological denitrification
Drinking water treatment	Chemical precipitation, filtration, disinfection	Lamella Clarification
Waste water treatment	Activated sludge process (ASP) Sequential Batch Reactor (SBR)	Aerobic Sludge Filtration
Sludge treatment	Upflow Anaerobic Sludge Blanket Reactor (UASB)	Moving Bed Bio Reactor (MBBR)
Sewage treatment	Bio Active Fixed Film Technology Stablisation pond	Membrane Bio Reactor (MBR)
Recycling		Reverse Osmosis Ultra filtration Micro filtration and Membrane Bio Reactors

Source: Company data

Municipal water treatment: large multi-year opportunity

Whether it is the requirement of fresh water for drinking purpose or the need to treat sewage/waste water before it is let out into rivers/tributaries, municipalities are the key users of water treatment plants for the same.

De-salination plants and sewage treatment plants are growing as a concept and more and more local bodies are gearing up to set up more of these in India. As a company operating in this sector, players not only vie for contracts relating to the set up of these treatment plants but also look forward to O&M contracts for the same, which usually last from 10-20 years.

O&M opportunity for WTP/STP in the Municipal sector

According to a CPCB study, water treatment plants managed by private O&M contractors are in a much better shape than those which are managed by municipalities. Thus, there is growing focus on involving private companies on BOT or contract basis to manage the O&M of WTP/STPs across the country. We see this as a growing opportunity for the sector and moreover, this is also an asset-light and margin lucrative business compared to EPC. Back-of-the envelope calculations suggest that a typical STP would require almost 3x the capex spent on annual O&M alone, thus suggesting that the O&M opportunity is even bigger than the EPC opportunity.

Industry water treatment: smaller opportunity, but penetration is low

Water is an important input for manufacturing across various industries such as power, steel, chemicals, food, paper and oil & gas, which make the treatment of water quintessential. The non-treatment of industrial wastewater discharge causes pollution and thereby reduces the availability of fresh water reserves. The degree of treatment could vary depending upon the process, i.e., cooling and boiler feed of water in power stations, process water for a wide range of industrial uses to ultra pure water for electronics and pharmaceutical industries.

Industrial water consumption accounts for ~6% of annual water consumption, which is expected to reach 18% of total water consumption by 2050, according to CPCB.

Overall, however, the industrial water market is considered to be smaller than the municipal water market. The industrial water market is less homogenous than the municipal water treatment market. Although the same water treatment technologies (reverse osmosis, ultra-filtration, ion exchange, and membrane filtration) are used across many different industries, each application is specific to the industrial process in which it is used. The players having relevant technical expertise and reference list are preferred by industrial customers. As a result, the industry is polarised between large international groups on the one hand, and niche players with successful applications serving particular market segments on the other.

Fig. 28: Wastewater generation and water use by different Industries in India

%

	Proportion of total water consumed in industry
Thermal power plants	88%
Engineering	5%
Pulp and paper	2%
Textiles	2%
Steel	1%
Sugar	0%
Fertilizer	0%
Others	1%
Total	**100%**

Source: CSE (2004).

Fig. 29: Industry water treatment too has variety of technologies to choose from

Segments	Conventional technologies	Advance technologies
Desalination	Multi Stage Flash	Thermal Desalination
	Multi-Effect Distillation	Electrodialysis
	Reverse Osmosis	
Process water treatement	Fluid Bed- Counter Current Regenerated Demineralisation	High pressure Condensate Polishing
	Co and counter current regenerated Demineralization	
Waste water treatment	Physio-Chemical Treatment - Oil removal system using DAF / API / CPI separators	
Water resue/reclamation	Neutralisation and Sedimentation	
	Aerobic Biological Treatment	
Effluent treatment	Tertiary treatment - Activated Carbon Filtration, Disinfection	Bio-Methanation and Wet Air Oxidation
Recycling		Reverse Osmosis Ultra filtration Micro filtration and Membrane Bio Reactors

Source: Company data

We believe demand for water by industries is only bound to rise in coming years. Most demand has been seen in industries such as pharmaceuticals, food and beverage processing plants, port sector, textiles and refineries. Advanced water treatment systems like the reverse osmosis membranes are preferred by growing industries. Companies manufacturing water treatment equipment are, thus, in our view set to witness a distinct increase in demand for their products. Pollution control boards from respective states are also pushing industries to adopt water-recycling systems for granting environmental clearances. Stringent quality standards are also demanding for the upgrade of existing plants.

In view of the significant demand for water, expected shortage and likely reforms, we believe the water sector provides vast opportunities for water management companies. Key business drivers for the water engineering business in India are summarized below:

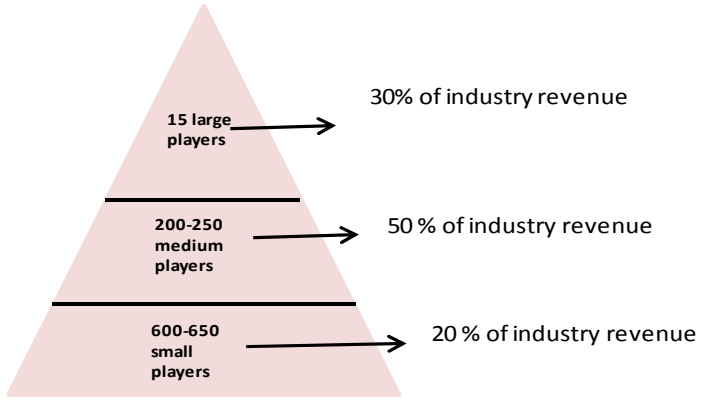
- Significant gap in safe water supply and sanitation infrastructure availability in the country.
- Large budgetary allocation from the government in water supply and sanitation.
- Increased funding from multilateral agencies such as World Bank and ADB, with emphasis on private participation.
- Stricter disposal norms for industrial waste water.
- Need to recycle treated waste water to resolve the problem of disposal and fresh water availability simultaneously.
- Increasing trend to outsource O&M services.
- Higher private participation through the BOT/BOOT route.

Key players engaged in the sector globally

Suez Environment and Veolia Environment are the only two global players present throughout the entire value chain, as other companies active in this market typically have narrow geographical focus and lower revenues.

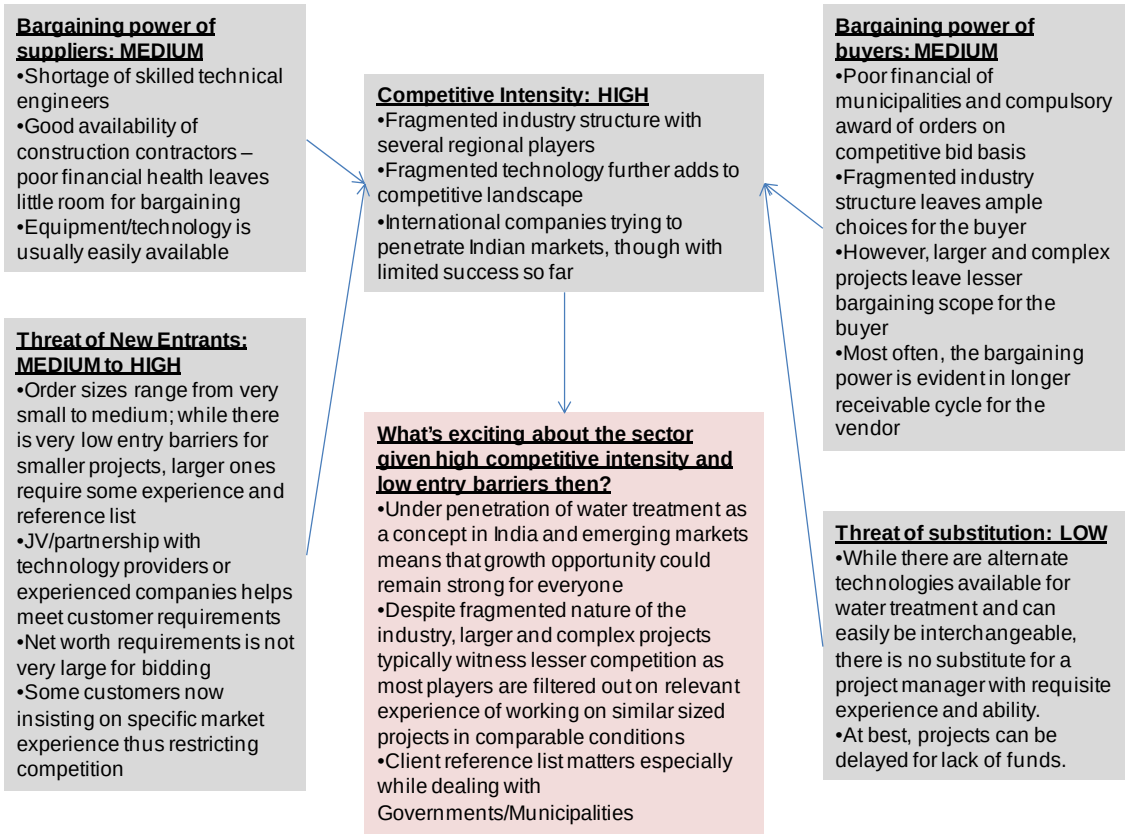
In the US, American Water Works (a subsidiary of RWE) is the largest player, but is only active in that country; in Asia, competition derives primarily from local conglomerates developing their water business on a partnership basis. In North Africa, Middle East, Chinese and Indian markets, the main competitors are Asian companies (Singaporean companies such as Hyflux, Japanese companies such as Marubeni and Mitsui and Malaysian companies such as Ranhill and the Philippine group Manila Water) and Spanish companies (Acciona, Aqualia-FCC and ACS), as well as conglomerates, notably General Electric and Siemens, which have long shown their international ambitions in the market for water treatment technologies.

Fig. 30: Industry structure



Source: Nomura research

Fig. 31: Water/wastewater treatment industry on Porter's Five Forces



Source: Nomura research

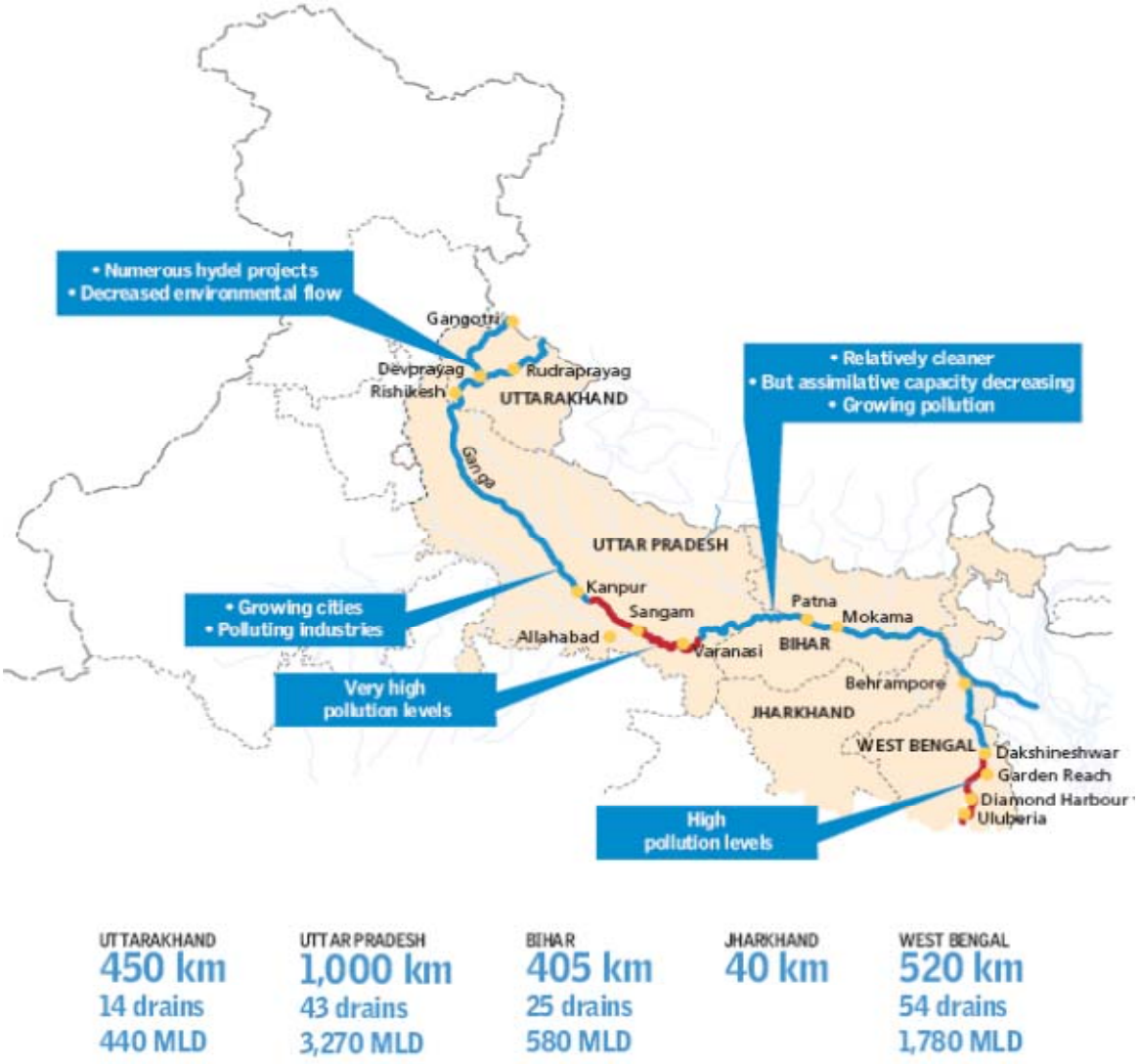
Ganga river cleaning: hype or reality?

Need for cleaning the Ganga

Ganga is the largest and the most sacred river in India with enormous spiritual, cultural, and physical influence. It provides water to c.40% of India's population in 11 states. Based on our rough estimates, the livelihoods of more than 500mn people in India are dependent upon the river, and one-third of India's population lives within the Ganga basin. Despite this magnitude of influence and control by the river over present and future population of the country, river Ganga faces immense pollution through the dumping of untreated domestic sewage, industrial waste, etc. apart from natural environmental issues.

River Ganga flows through the most densely populated regions of India, passing through 29 cities with population >0.1 mn, 23 cities with population between 50,000-100,000 and about 48 towns. A sizeable proportion of the effluents in Ganga are caused by this population through domestic usage like bathing, laundry and public defecation. A number of tanneries, chemical plants, textile mills, distilleries, slaughterhouses, and hospitals contribute to the pollution of the Ganga by dumping untreated toxic and non-biodegradable waste into it.

Fig. 32: Map of Ganga's flow and causes of pollution



Note: MLD: million litre per day (the figures refer to the collective discharge from the drains into the river)

Source: CPCB, MOEF

Supreme Court of India raps the government for no progress in Ganga cleaning over the past 30 years

The Supreme Court of India, on the back of a public interest litigation (PIL) filed by an NGO, has come out strongly on the government for slow/no progress in the cleaning of Ganga over the past 30 years despite huge money already being spent.

In its affidavit in September, the Narendra Modi government had responded saying that it is committed to cleaning the river, and that it was an election promise and has also recently been deemed as a national priority. It also said a group of professionals from IITs have been tasked with finalising the plan by the end of this year.

The government response also mentioned that 118 more towns have been identified by the government and things have started moving. Municipalities and other concerned authorities have been asked to wake up.

As per the government, ~70 STPs are likely to come up in the five Ganga basin states and are at various stages currently, of which the bidding process for 15 STPs is currently on. The government also mentioned that it proposes to conclude the Ganga cleaning within the current elected term itself, i.e. by 2018.

Cleaning the Ganga and what are the opportunities ahead

The map above (Fig. 32) depicts the flow of Ganga and the key states dependent on the same as well as how geographically at every stage the river gets polluted.

Ganga's pollution takes two primary forms: 1) domestic sewage dumped untreated into the river; and 2) industrial pollution through untreated waste-water let into the river.

Domestic sewage treatment opportunity alongside the banks of Ganga

Domestic sewage is the major cause of contamination in the rivers in India. According to the Central Pollution Control Board (CPCB), 2,723 million litre a day (MLD) of sewage is generated by 50 cities located along the Ganga, which adds up to over 85% of the river's pollution load.

Growing gap between STP capacity and need

The key problem comes from the main cities on the Ganga. The 36 Class 1 cities contribute 96% of the wastewater generation and also have 99% of the treatment capacity installed in these same cities. However, there is a growing gap between installed capacity and treatment. The most recent assessment by CPCB shows that there is a massive gap between the generation of domestic sewage and treatment capacity in the main stretch of the Ganga. The 2013 CPCB estimate shows that generation is ~2,723 MLD, while treatment capacity lags at ~1,209 MLD. It is important to compare this with the 2009 estimate of CPCB, which shows that even as the states have invested in sewage treatment capacity, the gap still remains the same.

According to this estimate, over half of the sewage goes untreated into the river or other water bodies.

Fig. 33: Sewage generation vs. capacity along Ganga

MLD

	2009	2012
Sewage generation (MLD)	2,638	2,723
Treatment capacity (MLD)	1,174	1,208
Gap (MLD)	1,464	1,514
% gap: treated vs. untreated	**55**	**55**

Source: CPCB 2009 and 2013

Fig. 34: Existing sewage treatment capacity along the banks of Ganga is grossly insufficient

MLD

	MLD
Installed Capacity of STPs	1,208
Official Sewage load	2,723
% Gap	56%
Measured sewage load	6,087
Actual % Gap	**80%**

Source: CPCB 2013, Pollution Assessment: River Ganga, Central Pollution Control Board, MoEF, July

The utilisation level of existing STPs too is low

Apart from insufficient capacity, even the utilisation levels of existing STPs is low, resulting in a further gap between actual need and actual utilised capacity, thus forcing more and more untreated sewage to be dumped into the river. The sewage treatment utilisation is poor because of factors ranging from lack of electricity to the operation of the plant, to the lack of sewage that reaches the plant for treatment.

The 2013 CPCB report inspected 51 of the 64 sewage treatment plants (STPs) to find that less than 60% of the installed capacity was utilised, and 30% of the plants were not even in operation.

Among the reasons for STPs not being utilised properly include lack of power availability and hence **power efficient STPs become all the more important.**

Fig. 35: Even existing STPs' capacities are not working to best utilisation levels

States	# of STPs inspected	Installed capacity (MLD)	Actual utilsied capacity (MLD)	% utilisation	STPs not in operation (#)	% STPs not working
Uttarakhand	4	54	0	0%	0	0%
Uttar Pradesh	8	358	287	80%	1	13%
Bihar	5	140	100	71%	1	20%
West bengal	34	457	214	47%	13	38%
Total	**51**	**1,009**	**602**	**60%**	**15**	**29%**

Note: The CPCB inspected 51 out of 64 STPs on the Ganga in 2012-13

Source: CPCB 2013, Pollution Assessment: River Ganga, Central Pollution Control Board, MoEF, July

Potential opportunity of USD1bn for STP capex alone

Rough estimates by the Centre of science and Environment suggests that these STPs would need a capital cost of INR10-12.5mn/MLD, which means that the sector presents an opportunity of INR61bn (USD1bn) in terms of STP projects alone if the entire gap in STP capacity vs. actual sewage generated is to be eradicated. This does not include the cost of drainage and pumping stations that would be required in addition to the STP itself. If the government were to stick to its proposed timeline to the Supreme Court, this would mean that the USD1bn of STP opportunity is up for grabs over the next five years.

Who funds the STP capex?

Funding of the capex for building a new sewage system (including STP, sewage network, pumping stations, etc.), both capital and O&M, is a key issue of debate between the Central and state governments. As per the Centre of science and Environment, when these initiatives began, the programme was funded 100% by the Centre. Thereafter, there have been many changes to this arrangement from a mixed funding model to 100% funding by the Centre again.

In 2001, a new cost-sharing formula was evolved: 70% of the project cost to be funded by the Centre and 30% by the states. Local bodies (municipalities) were expected to contribute one-third of the state's share. Further, O&M was also the responsibility of the state and the local body. But, this too did not work because of the poor financial state of municipal bodies. Under the National Clean Ganga Mission, the payment formula has again been re-visited. The Centre will now build projects through a PPP route, which will require the concessionaire to design-build-operate the plants for five years. The Centre will bear the full cost for the first five years, after which the plant will be handed over to the state government, assuming that in five years, funds will be available to run the plant.

Industrial pollution is the other key source of pollution into the Ganga

Industrial pollution into the main Ganga has been another issue of attention and focus area for the government but without much success. The problem is that many of the industries that discharge chemical pollutants into the river are small-scale, for which technologies for treatment are inadequate or unaffordable.

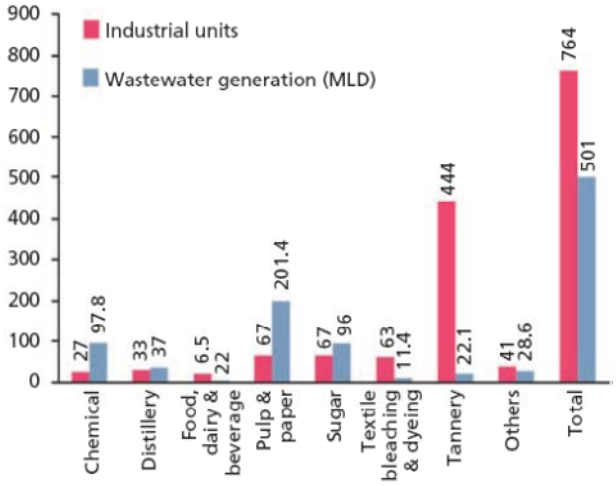
According to the 2013 CPCB estimates, the 764 industries around Ganga (and its two tributaries, Kali and Ramganga) consume 1,123 MLD of water and discharge 500 MLD of effluent. Bulk of these industries (~90%) operates in the Uttar Pradesh stretch of the river.

On a sector-specific basis, bulk of the industrial pollution happens from the pulp and paper sector. Tanneries on the Ganges are the highest in number (vs. other industries),

but have a lower wastewater generation in comparison, though still very toxic because of its high chemical load.

Fig. 36: # of Industrial units and waste water generation along the banks of Ganga

and MLD respectively



Source: CPCB 2013, Pollution Assessment: River Ganga, Central Pollution Control Board, MoEF, July

Over the past many years, efforts have been made by the government to reduce the pollution impact of these industries, but with little success. As a result, the real difference is seen only when industries are given closure or stop-work notices. But, since this is not a permanent solution, clearly more needs to be done to find ways to reduce the pollution from these industries, urgently and effectively, in our view.

UP leads the list of states with maximum industrial pollution into the river

Uttar Pradesh (UP), which has 1,000km of the river's length and big cities to boot, also has 687 grossly polluting industries that pollute the Ganga. These tannery, sugar, pulp and paper and chemical industries contribute 270 MLD of wastewater.

While tanneries are large in number in UP – 442 – they only contribute 8% of the wastewater, but this is highly toxic and concentrated in the Kanpur belt. Sugar, pulp and paper and distillery plants add up to 70% of the wastewater.

Inspections by CPCB suggest that of the 404 units, only 23 required no-action. The rest were non-compliant in terms of the laws of the country.

Controlling industrial pollution in Ganga: the way ahead

In our view, controlling industrial pollution should be an easier task as compared to creating new sewage systems in cities. Our view assumes that stricter legislation on pollution/effluent discharge from industries (large or small) and even stricter monitoring of the same only require political will power and is relatively easier to handle.

Compared to a sewage system creation, which affects large population and needs massive planning and operational challenges, checking industrial pollution is far easier, in our view. From a funding perspective, too, while sewage systems call for state/centre/local bodies' funding, industrial pollution control puts the onus on the respective user industry to fund the capex and ongoing expense.

Given the highly diverse and fragmented nature of industries which cause pollution, it is impractical to estimate the opportunity for VATW from the Ganga cleaning mission. Nevertheless, the number of industries polluting the Ganga (as mentioned in CPCB reports) suggests that this remains an exciting area to look forward to.

VATW: A solid global play on water and waste water treatment opportunity

VA Tech Wabag is a global player in the water treatment industry with market presence in India, the Middle East, North Africa, Central and Eastern Europe, China and South East Asia through its geographically spread-out offices worldwide.

While the company is headquartered in Chennai, it conducts its global operations through its several subsidiaries and branch and representative offices. VATW shares strategic and technical expertise across all its subsidiaries such that it allows research, operational and marketing synergies.

VATW offers complete life cycle solutions including conceptualization, design, engineering, procurement, supply, installation, construction and O&M services for sewage treatment, processed and drinking water treatment, effluent treatment, sludge treatment, desalination and reuse for institutional clients like municipal corporations and companies in the infrastructure sector such as power, steel and oil and gas companies.

Given the highly-fragmented nature of the water/wastewater treatment industry and its associated technologies, VATW strives to be on top of technology through its R&D centres located in Chennai, India and at Vienna, and Winterthur in Austria and Switzerland, respectively.

In 2007, VATW acquired Wabag Austria and hence took over the Wabag group, which gave it a project reference list of more than 2,250 projects built over the past three decades. VATW's association with the Wabag brand name facilitates entry into newer markets and helps it to pre-qualify for complex and large projects.

VATW's acquisition of Wabag Austria brought along:

• Technical know-how: Access to over 100 patents and experienced manpower

• Perennial rights to "WABAG" brand - established in 1924

• Project references in more than 19 countries that help in re-qualification

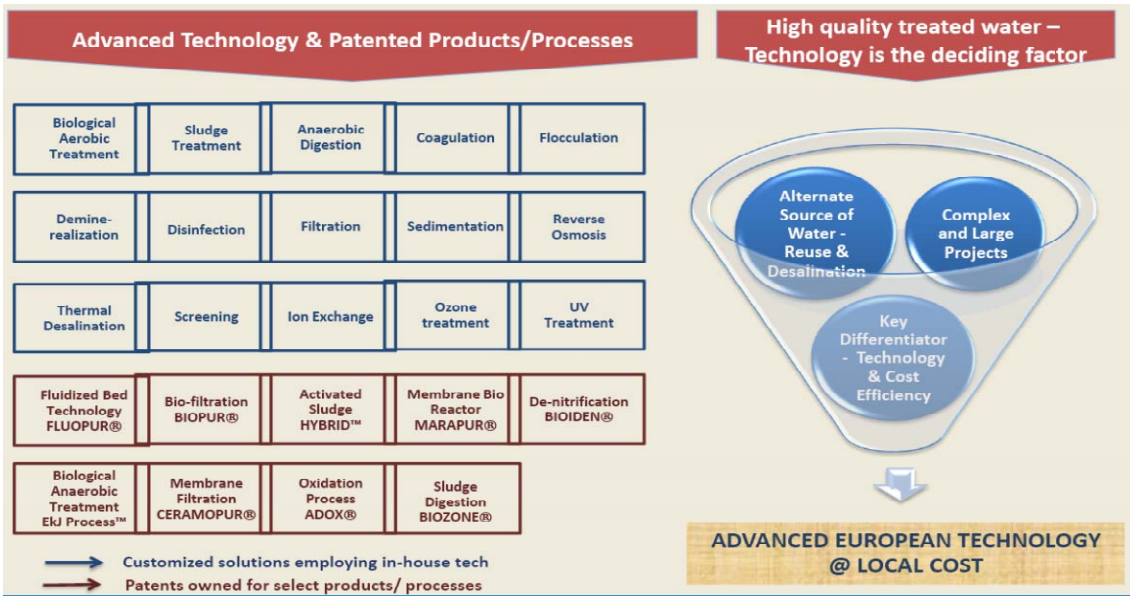
• Access to global geographies

• Acceptance of WABAG India in the overseas market

• Opportunity to leverage low-cost economic advantage in the global market

All of these have facilitated in recording a multi-fold jump in revenue for VATW since the acquisition of Wabag.

Fig. 37: VATW excels in its understanding of technology and has 100 patents to its name



Source: Company data

Three strategic focus markets to drive growth

Overseas markets

The overseas markets are jointly catered by Wabag India and Wabag Austria. While VATW already has its presence through Wabag Austria in major markets through its subsidiaries, it has recently started expanding its regional footprint through modular expansion. The company has now set up subsidiaries in its major markets such as Turkey and South East Asia so as to reduce overhead costs associated with the expensive Austrian operations.

We estimate ~12% revenue CAGR in overseas markets for VATW over FY14-17F

On the back of its expanding footprint into emerging markets, we estimate VATW to record ~12% revenue CAGR in the overseas business over FY14-17F. Note that this compares with ~30% revenue CAGR recorded over the past three years for the company as it has successfully established presence in markets such as Turkey and South East Asia.

Our discussion with a competitor operating in the water and renewable sector in India, suggests that countries such as Sri Lanka and Bangladesh are on the verge of a major uplift in water spending and could be potentially worth USD700mn-1bn markets each, spread over three-four years. Bangladesh, for instance, is already throwing huge opportunity, mostly funded by Japan International Cooperation Agency (JICA), according to the competitor.

Fig. 38: VATW is present in the fastest growing markets in water globally

Market size and growth rates for key global markets; shaded regions are where VATW is present

Countries	Market Size (US$ bn)	Expected CAGR	Countries	Market Size (US$ bn)	Expected CAGR
USA	107.0	10-15%	Algeria	4.0	6-10%
China	47.0	6-10%	Iran	3.8	10-15%
Italy	16.0	10-15%	Egypt	3.5	6-10%
Brazil	15.0	10-15%	Indonesia	2.5	10-15%
Spain	11.0	15%+	Hungary	1.8	15%+
Saudia Arabia	8.5	6-10%	Malaysia	1.7	10-15%
Mexico	7.3	6-10%	Morocco	1.6	10-15%
South Africa	6.1	6-10%	Argentina	1.3	15%+
India	5.9	10-15%	Romania	0.9	15%+
UAE	4.4	10-15%	Tunisia	0.8	10-15%

Source: Company

Municipal corporations

VATW focuses on water and wastewater treatment for municipal corporations and provides complete EPC and O&M services. Municipalities are the largest customer base for VATW and most of these projects are funded by bilateral and multilateral agencies. Not only are the projects received from municipalities larger in size, but also happen to be technology-focused and complex. Along with the EPC opportunity, most such projects also involve O&M contracts for 10-20 years, which is a high-margin area.

VATW's scope of activities for municipalities would typically include the following:

- Drinking water treatment plants;
- Sewage schemes;
- Industrial wastewater treatment plants; and
- Pumping stations and pipelines networks.

Potential 19% revenue CAGR from municipalities for VATW over FY14-24F

We estimate VATW to record 19% revenue CAGR from municipalities over the next 10 years on the back of a pick-up in new projects, strong O&M opportunity, rising project value on the back of newer technology adoption by customers as well as increasing market share for VATW. In the near term, we estimate a 33% revenue CAGR from municipalities for VATW over FY14-17F.

Fig. 39: Key projects executed by VATW for municipalities in India

INR mn

Project	Client	Project value (INR mn)
75 MLD and 20 MLD STPs at Mailasandra and Nagasandra	Bangalore Water Supply & Sewerage Board	641
50 MLD STP at Kadbesinahalli	Bangalore Water Supply & Sewerage Board	400
110 MLD STP at Kodungaiyur	Chennai Metropolitan Water Supply & Sewerage Board	383
54 MLD STP at Perungudi	Chennai Metropolitan Water Supply & Sewerage Board	327
Plant water system package	The Durgapur Projects Ltd	666
Plant water system for thermal	An Indian steel plant	1,344
111 MLD WTP at Cherthala	Kerala Water Authority	1,864
Plant water system package for 2 x 500 MW power plant at Durgapur	Damodar Valley Corporation	1,345
45 MGD STP at Kondli	Delhi Jal Board	1,907
54.6 MLD STP at Keshorpur	Delhi Jal Board	1,875
100 MLD sea-water RO desalination plant, Chennai	Chennai Metropolitan Water Supply & Sewerage Board	5,334
50 MGD WTP at Dwarka	Delhi Jal Board	1,490

Source: Company data

Industrial customers

VATW undertakes the execution of projects for large industrial clients such as oil refineries, steel plants and power plants, and provides solutions such as de-mineralization plants, reverse osmosis plants, thermal-based desalination plants, condensate polishing units, wastewater recycle plants and zero liquid discharge plants. These projects are directly linked to industries setting up new refineries, steel plants and power plants or their expansions.

VATW's scope of work typically includes design and engineering, equipment supply and retrofitting, installation and site supervision, start-up and commissioning and the completion of turnkey contracts.

Potential 13% revenue CAGR from industrial customers for VATW over FY14-24F

Industrial sector is pre-dominantly led by the power sector as a key user of water/waste water treatment. As highlighted earlier, almost 88% of the industrial opportunity comes from the power sector. We estimate new power projects to grow at a moderate rate of 5% p.a., while rest of the industrial base should record 20% growth to arrive at a blended revenue CAGR of 13% over FY14-24F for VATW's industry segment. In the near-term, we estimate ~14% revenue CAGR from the industry segment for VATW over FY14-17F.

Fig. 40: VATW's moment of glory in India – 100 MLD desalination plant, Chennai

Source: Company data

Strong visibility on EPC segment revenues

With a TTM book: bill ratio of 2.6x in the EPC segment as of Mar-14, VATW has a reasonable near-term revenue visibility. Moreover, we foresee good prospects on order inflow both near-term as well as over the longer term as described below, which further lends credibility to the company's growth outlook.

Strong near-term order pipeline

Two new desalination plants in Tamil Nadu

The Tamil Nadu Infrastructure Development Board (TNIDB) has approved a series of projects including two sea water reverse osmosis (SWRO) desalination plants with a capacity of 400 MLD and 150 MLD to be located at Perur and Nemmeli, respectively, near Chennai and would be built at a cost of ~INR40.7bn and INR13.71bn. Both these projects would be built on design-build-operate (DBO) basis.

BMC to award three sewage treatment plants in Mumbai shortly

After years of delay, the Brihanmumbai Municipal Corporation (BMC), Mumbai, has started the tender process for the construction of the Bhandup STP. This move comes on the back of repeated warning and notices issued by the Maharashtra Pollution Control Board (MPCB) and the Central Pollution Control Board (CPCB) to the BMC to construct the treatment plants at the earliest, especially for the Bhandup and Ghatkopar ones. The cost of the Bhandup STP is likely to be ~INR3.65bn, while the Ghatkopar STP is likely to be worth INR5bn, we estimate. Separately, the BMC has also invited pre-qualification bids for another STP/WWTP at Colaba, Mumbai, which is likely to be an INR6bn project.

That apart, based on our talks with competitors, we believe BMC has also outlined plans for awarding five more STPs over the next two-three years, for which the bidding process is yet to start.

Fig. 41: List of pre-qualified bidders for the upcoming Mumbai STP/WWTP projects

Bhandup	Ghatkopar	Colaba
Doshion Veolia Water Solutions + Veolia Water India – JV	Doshion Veolia Water Solutions + Veolia Water India – JV	Doshion Veolia Water Solutions + Veolia Water India – JV
VA Tech Wabag	VA Tech Wabag	VA Tech Wabag
Degremont	Degremont	Degremont
Cadagua SA and SPML Infra - JV	Cadagua SA and SPML Infra - JV	Cadagua SA and SPML Infra - JV
Enviro Control and KEC – JV	Enviro Control and KEC – JV	Accicona Agua Spain + HCC JV
UEM India and Geo Miller – JV	Sound Global + UPL + Gharpure	Constructora Sanjose, SA + Unity Infra + Mekorcot JV

Source: MCGM

West Bengal, Gujarat, Mumbai and Vishakhapatnam considering desalination plants

Our discussion with competitors suggest that there are upcoming opportunities for desalination plants in West Bengal, Gujarat, Mumbai and Vishakhapatnam where these projects are being actively considered by respective state governments.

Delhi Jal Board has recently drafted an INR195bn Sewage Master Plan until 2031

The Delhi government in June 2014 had published its Master Plan for a requirement of INR195bn worth of investment in upgrading the sewage network in Delhi by 2031. The draft aims to fix the Capital's failing wastewater management system and reduce pollution in Yamuna. As per the master plan, Delhi's existing 35 wastewater treatment plants (WWTPs) can at best deal with only 40% of the total sewage generated every day. The rest of the discharge flows directly into the Yamuna through rainwater drains. The blueprint proposes a 10,000-km pipe network, 75 WWTPs and integration of various ongoing sewerage projects. Of the total investment proposed, ~25% is proposed towards the capex of new STP/WWTP, while 65% is for the new/upgrading sewer network and 10% for pumping stations.

New Industrial Water Allotment Policy in Andhra Pradesh

In December 2014, the Andhra Pradesh government had announced an exclusive Industrial Water Allotment Policy for speedy and sustainable industrial development in the state. As per the policy framework, industries which draw treated sewage water for industrial purposes will be provided infrastructure assistance on a priority basis. Further, Municipal Administration and Urban Development Departments will prepare a comprehensive plan for the recycling of sewage water for non-potable industrial use. The government will also promote desalination plants in coastal areas to meet the increasing water demand of various industrial nodes planned in the Vizag-Chennai Industrial Corridor (VCIC) and Bangalore-Chennai Industrial Corridor (BCIC).

Telangana's industrial policy lays focus on the Common Effluent Treatment Plant (CETP) for industrial zones

As per the Industrial Policy Framework 2014 document by the newly formed state of Telangana, every industrial park will be provided with a common effluent treatment plant, depending on the nature of effluents expected from the specified industrial activity. The Telangana State Government will also encourage the development of CETP through a joint venture/PPP model, since it is possible to operate and maintain a CETP on commercial lines.

Separately, Telangana has also outlined an INR150bn worth water programme.

Ganga Rejuvenation Project

The Ganga rejuvenation project is by far the most exciting and largest project among all the upcoming opportunities in the sector, given that it is also one of the pet projects of the new government. While we have detailed this opportunity in earlier pages, in a nutshell, this project entails ~INR510bn of investment to clean the river over the next five years.

In a recent communication to the Supreme Court, the government informed that it has proposed to spend this amount over the next five years to completely stop the discharge of untreated sewer and waste water from 118 towns into Ganga river. The 118 towns fall in the states of Uttarakhand, Uttar Pradesh, Jharkhand, Bihar and West Bengal. The Ministry of Environment and Forests as well as the Central Pollution Control Board have been tasked to enforce zero liquid discharge by grossly polluting industries located in the river basis of states, including Kanpur and other cities.

As part of this larger initiative as well as to include other important rivers such as Yamuna and Ramganga, special teams have been set up by the Ministry of Water Resources, River Development and Ganga Rejuvenation, which have already started submitting their reports. 120 such teams were constituted to study various aspects of 118 places along the rivers Ganga, Yamuna and Ramganga.

These teams were asked to find out the latest position of sewage treatment plants located at these places and the types of plantation required along the rivers. The teams were also directed to find out the latest available techniques to modernize these treatment plants to obtain quicker results. Old and non-functional treatment plants will be replaced by new ones. These teams will also recommend necessary measures to be taken to contain pollution in these rivers to the Central Pollution Control Board.

Potentially an 18% India revenue CAGR story over FY14-24F

Data availability on the sector is difficult (in terms of existing treatment capacity/annual spend) given the fragmented nature of the sector and frail health of municipalities. Nevertheless, we have tried to estimate the current market size for water/wastewater treatment services in India as well as the market size after 10 years. Based on our estimates, the water/wastewater treatment sector in India has the potential to grow at >10% CAGR over the next 10 years. We base our estimates on the following key assumptions:

- Our estimates are based only on the data for Class I and Class II cities that account for 70% of India's urban population;
- We assume 3% p.a. population growth, assuming that urbanisation trends will continue to lead to higher population growth for these centers vs. the national average;

- We do not assume any change in water supply per capita / day for Class I cities, while for Class II cities, we assume that by FY24F, they will tend to move closer towards targeted numbers of 150 litres per capita per day (lpcd);
- We assume similar rate of wastewater generation as now (i.e. ~80% of water supplied);
- We assume that waste water treatment as a percentage of wastewater generated will rise from 32% and 9% currently to 40% and 20% by FY24F in class I and II cities, respectively.

Together with sector growth of >10% over FY14-24F and market share gains, VATW is likely to record an 18% revenue CAGR over the next 10 years

We expect VATW to double its market share in the EPC segment over the next 10 years from 18% currently to 35%, as incremental projects will be larger and more complex, thus benefitting larger players with requisite experience. Further, even as other foreign companies such as Veolia and Suez (through Degremont) have been active in the Indian markets, we think that with their foreign overheads, they are less price-competitive compared to VATW (which has an Indian cost structure).

We believe that O&M opportunity will grow further for private participation vs. the current model where municipalities operate plants themselves. Thus, this is likely to lead to a market share gain from 7% currently to 20% for VATW by 2024F.

As industrial growth revives and larger plant capex is re-drawn, we believe water/wastewater treatment will now be among the key priorities for user industries. This should also lead to more orders flowing through to organised layers such as VATW, and thus likely improve market share growth from 15% currently to 20% by FY24F.

Fig. 42: We estimate ~18% revenue CAGR over the next 10 years for VATW

INR mn

	FY14F	FY24F	CAGR
EPC Market opportunity (INR mn)	33,603	83,558	10%
O&M Market opportunity (INR mn)	45,764	114,435	10%
Industrial sector opportunity (INR mn)	31,250	79,421	10%
Total sector opportunity	**110,617**	**277,414**	**10%**
VA Tech Wabag India revenues			
EPC India - Municipalities	5,937	29,245	17%
O&M India - Municipalities	3,047	22,887	22%
Industrial	4,556	15,884	13%
Total	**13,540**	**68,017**	**18%**
VA Tech Wabag Market share			
EPC India - Municipalities	18%	35%	
O&M India - Municipalities	7%	20%	
Industrial	15%	20%	
Total	**12%**	**25%**	

Source: Nomura estimates

Additional upsides to this growth rate are possible

- In our assumptions, we only consider the O&M for incremental projects being commissioned. However, the O&M of existing plants could also come up as local bodies are increasingly realising that privately managed WTP/STPs are performing better.
- The decline in water availability from current resources should lead to a shift towards treatment processes that are increasingly complex and expensive as traditional sources run out.
- Even as the quality of currently available water is also worrying, we only assume an incremental water supply or waste water addition for this opportunity. If the focus on

quality rises, even existing plants/sources could come up under the opportunity landscape.

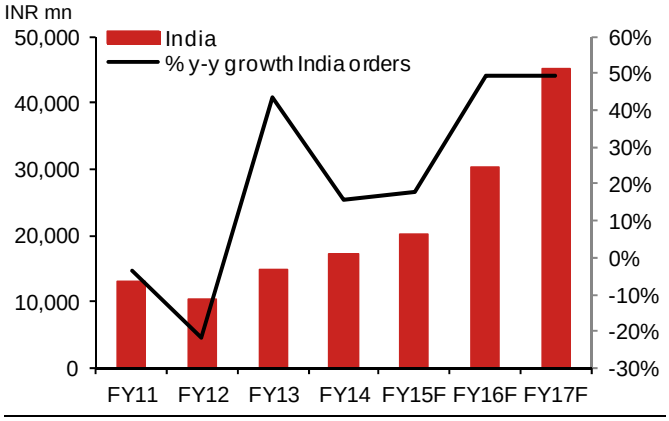
- Our analysis is based only on Class I and II cities as defined by CPCB and that cover 70% of urban population and ~30-35% of overall India population, thereby leaving a large scope of opportunity outside the purview. As these smaller cities mature and demand treated water, the opportunity landscape could grow even further.
- There remain additional opportunities in the form of Ganga cleaning, smart cities, DMIC, and the creation of new cities or urban agglomerations.

VATW: Financials

Strong opportunity in both domestic and overseas markets to drive 39-45% order inflow CAGR over FY14-17F

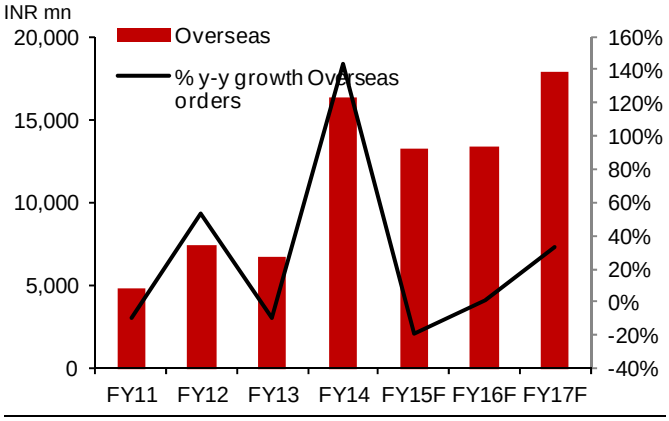
Policy paralysis in India and a slowdown in rest of the world impacted VATW's growth over FY10-13 in new order inflow. The company, however, revived in FY14, helped by the contribution from international orders led by VATW's strategy of diversifying into newer global markets. Going ahead, we expect a revival in India order inflows, led by the strong pipeline of projects already in the making coupled with VATW's expansion into newer geographies to drive 45% and 39% order inflow CAGR over FY14-17F in the India and overseas markets, respectively.

Fig. 43: We estimate 45% CAGR in VATW's India order inflow



Source: Company data Nomura estimates

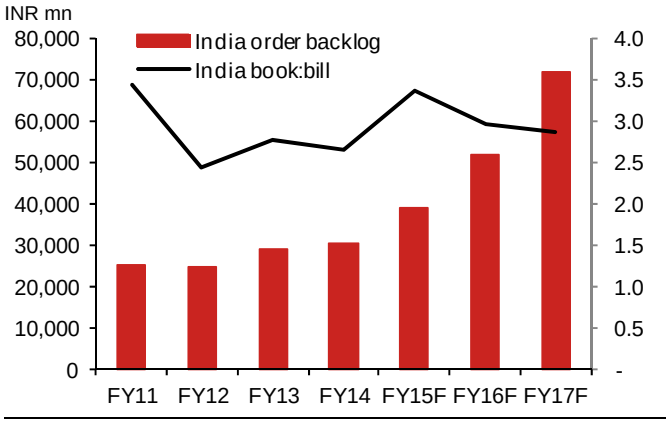
Fig. 44: …and a 39% CAGR in its overseas order inflow



Source: Company data, Nomura estimates

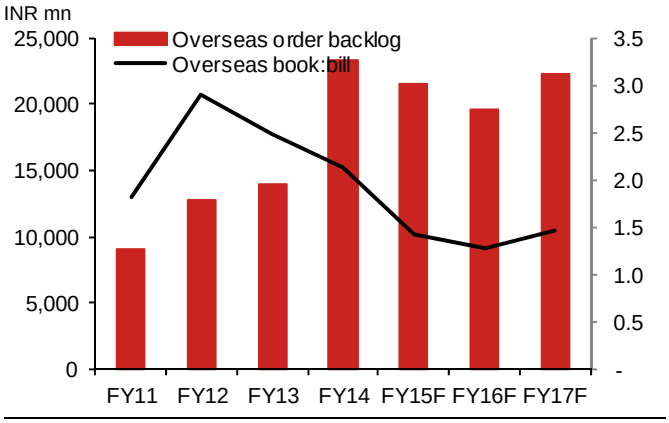
Strong order inflow over FY14-17F is likely to drive order backlog up to 2.4x of the current size in India, while we estimate the overseas backlog to remain largely flat. The blended book: bill ratio of 2.9x TTM revenues does lend reasonable revenue visibility over the near-term, in our view.

Fig. 45: India order backlog estimated to grow 2.4x by FY17F



Source: Company, Nomura estimates

Fig. 46: …while overseas order backlog could remain flat

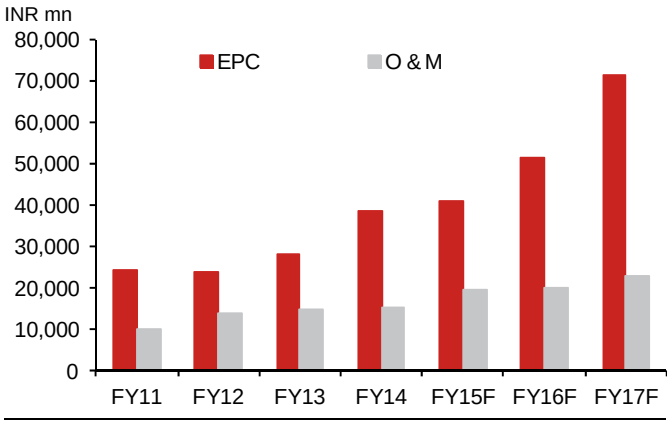


Source: Company, Nomura estimates

Rising share of O&M revenues to drive near-term margin upsides

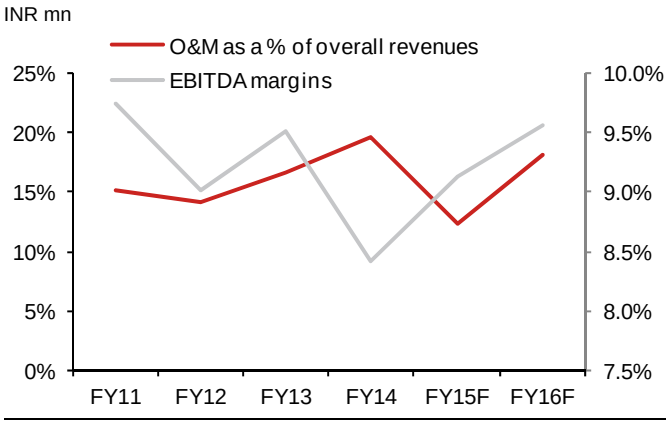
In the near-term, we expect O&M revenue to rise on the back of existing order backlog. However, given that some of the large orders that are in the pipeline are primarily EPC, we expect the order mix to again shift in favour of EPC after FY16F. O&M contracts generally tend to have a higher margin component and are thus margin-accretive. We, thus, expect VATW to report EBITDA margins recovery over FY14-16F.

Fig. 47: Both EPC and O&M segments to drive order backlog growth, with EPC likely to bring larger delta



Source: Company, Nomura estimates

Fig. 48: EBITDA margins expected to move up as the share of O&M revenue to rise in the near-term



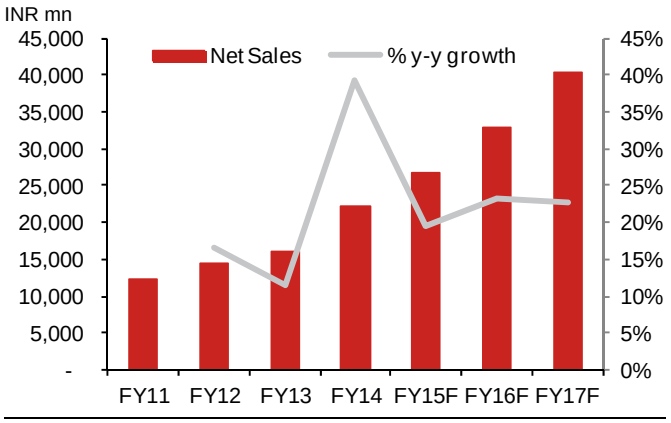
Source: Company, Nomura estimates

22% revenue CAGR over FY14-17F and margin recovery…

Overall, we estimate 22% revenue CAGR for VATW (consolidated) over FY14-17F, driven both by the execution of existing order backlog as well as strong order pipeline. This is compared with ~15% revenue CAGR that the company had posted over FY09-14.

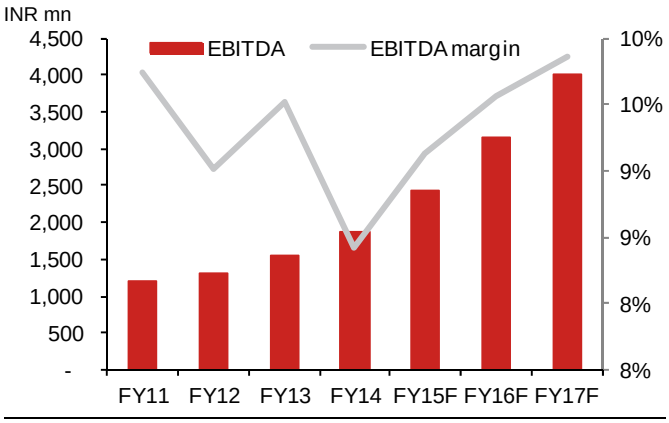
The rising proportion of O&M revenue as well as economies of scale as newer subsidiaries start contributing to revenues are likely to drive better EBITDA margins, in our view. We, thus, estimate 150bps improvement in consolidated EBITDA margins by FY17F over FY14, thus taking it back to the margin levels recorded during FY11.

Fig. 49: We estimate 22% revenue CAGR over FY14-17F…



Source: Company, Nomura estimates

Fig. 50: …along with margin recovery



Source: Company, Nomura estimates

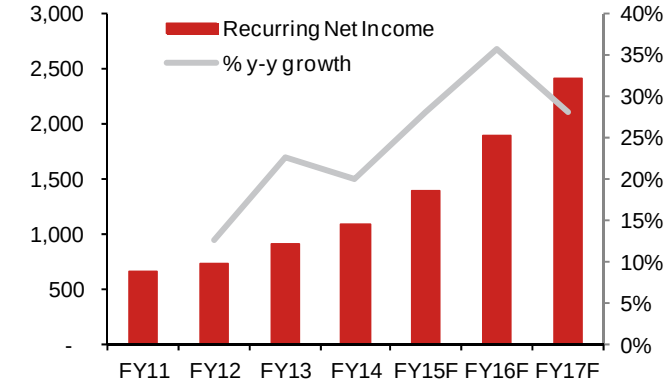
…to drive a 30% PAT CAGR

Together with the 22% revenue CAGR and EBITDA margin recovery, we estimate VATW to record a 30% PAT CAGR over FY14-17F. In our view, there could be further catalysts to this growth trend to continue beyond FY17F as water treatment remains an under-penetrated opportunity and will likely unfold over next several years.

Given the strong visibility of the India order pipeline, we are currently more confident on the India revenue driving this profit growth, while in our assumptions, we factor in a flat overseas revenue over FY15-17F. However, given that VATW has surprised the markets positively in FY14 in terms of its order inflow from overseas markets, we do not rule out similar surprises going ahead, too, especially since VATW continues to expand into new territories.

Fig. 51: PAT CAGR at ~30% over FY14-17F

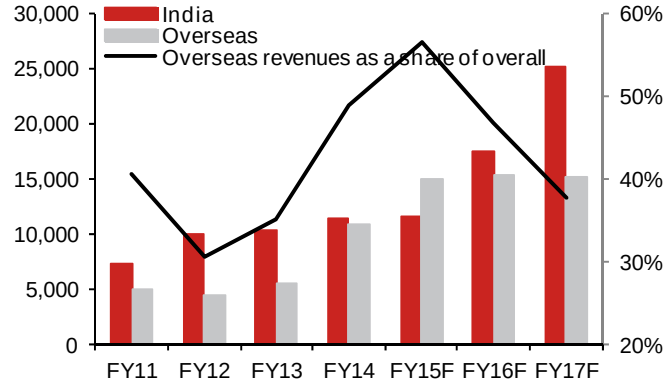
INR mn



Source: Company, Nomura estimates

Fig. 52: Balanced share of India and overseas revenues

INR mn



Source: Company, Nomura estimates

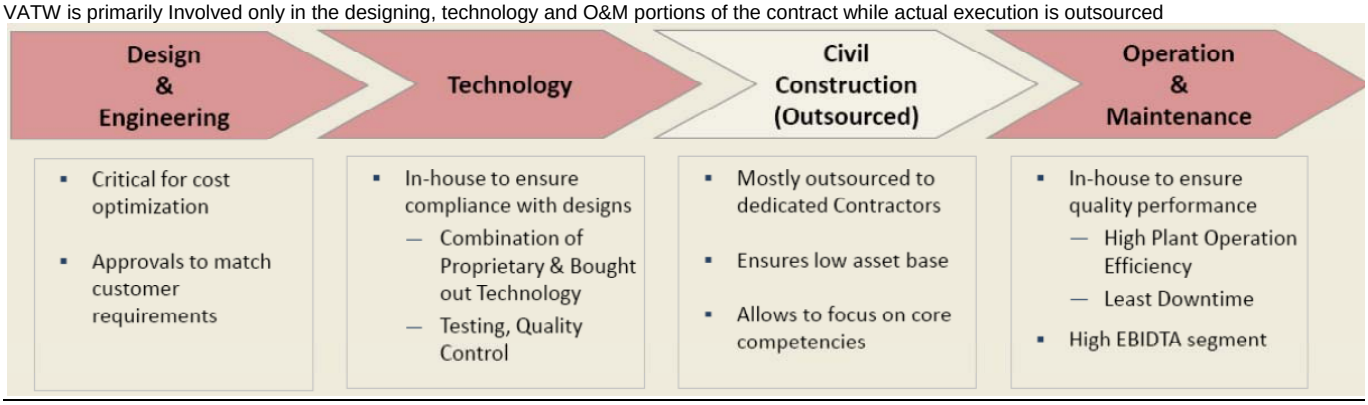
Asset-light business model ensures a debt-free balance sheet and reasonable returns

VATW operates with a fairly asset-light business structure, though its working capital cycle is long. On the positive side, bad debts have remained low as bulk of the receivables is from multilateral funding agencies such as JICA and World Bank.

On the back of the limited involvement in the stressful civil component of a typical contract, VATW is able to remain asset-light and only focuses on value-added and high-margin work processes. Most capital employed in the business is, thus, working capital, which it tries to push down to civil contractors.

Fig. 53: Typical work flow for VATW

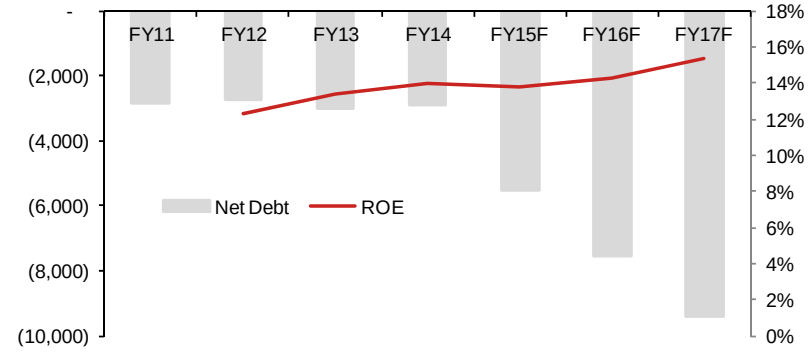
VATW is primarily Involved only in the designing, technology and O&M portions of the contract while actual execution is outsourced



Source: Company data

Fig. 54: Rising ROE even as VATW continues to increase net cash on the books

Net debt is negative, implying net cash on the books



Source: Company, Nomura estimates

Dupont analysis of ROE

The ROE breakdown based on the Dupont framework suggests that bulk of our estimated ROE improvement is premised on margin recovery, which in turn is on the back of rising O&M revenue and economies of scale. We hardly assume any improvement in asset turnover or leverage. In fact, in our model, net cash on the books keeps rising, thus leading to a lower asset multiplier. If the company pays out higher dividend than our estimates, ROE could improve further.

Fig. 55: VATW: Du Pont framework breakdown of consolidated ROE

ROE breakdown

Dupont Analysis	FY11	FY12	FY13	FY14	FY15F	FY16F	FY17F
PAT/PBT	68%	66%	67%	67%	67%	67%	67%
PBT/EBIT	82%	81%	86%	86%	86%	88%	90%
EBIT Margin	9.5%	9.5%	9.7%	8.3%	8.9%	9.6%	9.9%
Asset Turnover (x)		2.2	2.1	2.5	2.3	2.3	2.4
Assets/Equity (x)		1.11	1.14	1.14	1.15	1.11	1.10
ROE		12.3%	13.4%	14.0%	13.8%	14.3%	15.3%

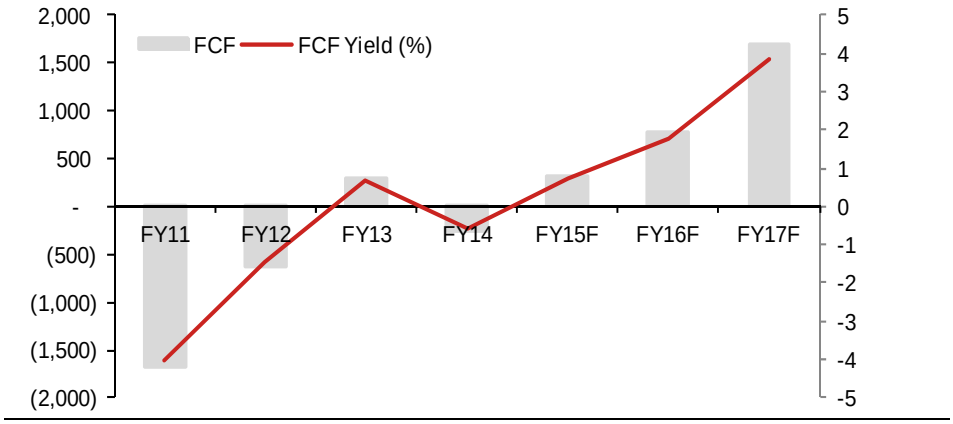
Source: Nomura estimates

VATW likely to turn FCF-positive in FY15/16F

On the back of improving EBITDA margins and stable working capital cycle, we estimate VATW to turn FCF-positive in FY15/16F, with a reasonable FCF yield of 1.8%/3.9% in FY16/17F. Notably, the FCF trend for VATW is already on an improving trend, despite a deteriorating WC cycle over FY11-14F. In the latest quarterly results conference call, management has clearly stressed on its focus on the collection of outstanding receivables and thus should help in boosting FCF generation further, in our view.

Fig. 56: Free cash flow generation to turn positive in FY15/16F

INR mn



Source: Company, Nomura estimates

Nomura vs. consensus

While we are in line with consensus on our FY15F estimates, we are 5-12% higher on FY16/17F earnings estimates. This is primarily led by our belief that order inflows will remain strong over the medium-term, thus driving revenue and margin up for VATW.

Fig. 57: Our FY16/17F earnings forecasts is 5-12% higher than consensus

INR mn

	FY15F			FY16F			FY17F		
	Nomura	Consensus	% difference	Nomura	Consensus	% difference	Nomura	Consensus	% difference
Revenues	26,775	26,934	-1%	33,014	32,036	3%	40,563	37,057	9%
EBITDA	2,444	2,476	-1%	3,159	3,047	4%	3,998	3,665	9%
PAT	1,386	1,419	-2%	1,881	1,784	5%	2,410	2,161	12%

Source: Bloomberg consensus, Nomura estimates

VATW: Valuations

Since VATW doesn't have a long trading history to arrive at an appropriate valuation multiple, we compare it with other construction companies and also with specialised construction companies such as NBCC (Buy, NBCC IN) and Engineers India (Not Rated, ENGR IN) as we see lots of similarities between these two companies.

We believe VATW deserves to trade at premium multiples vs. other construction companies

We believe that VATW is the only pure-play on the emerging water and waste water treatment opportunity in India. Given its niche play status and strong growth opportunity, we think VATW deserves to trade at a premium over other construction companies in India as most of the companies operating in the construction sector are struggling with debt-laden balance sheets and an elongated working capital cycle.

We note that VATW's standalone entity is already reporting ROEs similar to what these construction companies have delivered during the past upcycle, despite the latter taking up huge debt in contrast to VATW, which remains debt-free.

In our view, VATW's valuation multiples could be benchmarked to specialised E&C companies such as NBCC and Engineers India, which again operate in niche segments, respectively, and are pure-plays within that.

Fig. 58: Expected ROEs of construction companies over upcycles and downcycles (2005-17F)

%

Company	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15F	FY16F	FY17F
Simplex Infra	26.3	29.1	32.5	18.6	15.6	14.5	12.6	8.2	5.9	4.7	5.1	8.9	12.2
J Kumar Infra				28.5	24.3	27.5	20.3	17.3	15.2	14.7	15.2	15.8	15.0
Supreme Infra						28.4	34.8	26.2	26.8	20.4	16.8	15.6	
Ahluw alia Contractors					37.9	41.1	28.4	-3.2	-33.1	-2.4	19.5	22.6	
KNR Construction							18.0	17.0	11.1	10.2	10.6	12.6	15.0
Hindustan Construction			9.4	9.6	8.3	8.1	5.5	-5.9	-10.2	-7.9	0.4	3.4	11.1
Nagarjuna Construction		16.8	15.4	14.2	10.5	9.7	8.5	2.8	2.7	1.4	3.1	5.6	9.2
IVRCL			16.9	13.6	12.2	11.6	9.7	0.9	-4.1	-25.2	-29.9	-35.8	
Engineers India Ltd (consol)			14.8	17.4		35.3	38.0	37.4	28.9	20.7	18.1	20.3	18.9
NBCC						23.1	23.3	26.2	25.7	24.9	26.1	30.3	35.1
Average (ex-EIL & NBCC)	26.3	22.9	18.5	16.9	18.1	20.1	17.2	7.9	1.8	2.0	5.1	6.1	12.5
VA Tech Wabag (Standalone)			7.8	1.2	11.3	20.3	16.9	17.2	18.0	15.5	12.7	15.4	18.5

Source: Bloomberg, Nomura estimates. Bloomberg consensus for not rated companies

Regional peers are primarily into BOT models vs. VATW is primarily focused on design and engineering

We note that most of the European and China peers in the water segment are primarily BOT-centric businesses where they own the WTP/STP or even water supply/distribution businesses, in some cases. Not only does this entail significant balance sheet funding and is thus an asset-heavy business model, but also exposes the companies to higher leverage, tariff and collection risks. In contrast, VATW primarily being a design and engineering company with an asset-light business model provides negligible balance sheet risk apart from working capital cycle.

Fig. 59: Chinese peers are primarily BOT heavy

%

Company	Ratio of Construction / Operation 2015F	2016F
Sound Global	30/70	35/65
Beijing Enterprises Water	50/50	43/57
CT Environmental	0/100	0/100
China Everbright Int'l	0/100	0/100
Kangda Environmental	0/100	0/100
Guangdong Investment	0/100	0/100

Source: Nomura estimates

Better ROE and growth profile vs. regional peers too

In Fig. 60 below, we note that European and China peers are trading at average EV/EBITDA of 7.6x and 12.9x and P/E of 16.9x and 17.5x, respectively, on FY16F consensus estimates. We believe that VATW deserves a higher multiple as it generates better ROE despite being debt-free (vs. most peer groups being heavily leveraged) and also for a much superior earnings growth profile of VATW over the next few years. We estimate VATW's operating profit/net profit to record CAGRs of 28%/29% over FY14-FY17F, which is better than its peers (except for Chinese companies with in-line growth).

Rising O&M revenues could drive further re-rating

As we highlighted earlier in this report, both from a near-term perspective as well as over the long-term, O&M revenues are set to grow faster than rest of the business for VATW. With O&M being a higher-profit business and one that provides greater visibility and stability in revenue/profits, we believe the stock could re-rate as the O&M revenue share grows further.

Fig. 60: Regional valuation comparison

Stock prices in local currency

			Price	Mkt Cap	P/E (x)			EV/EBITDA (x)			P/BV (x)			ROE (%)			CAGR (FY14-17F)	
Company	Tickers	Rating	(local)	(bn USD)	FY15F	FY16F	FY17F	FY15F	FY16F	FY17F	FY15F	FY16F	FY17F	FY15F	FY16F	FY17F	EBITDA	EPS
Europe & US water & environment																		
Suez Environment	SEV FP	Not Rated	16	10.0	20.7	18.3	16.2	7.0	6.6	6.2	1.7	1.7	1.6	8.0	8.3	7.8	5%	13%
Veolia Environment	VIE FP	Not Rated	17	10.4	22.5	17.8	15.4	8.0	7.5	7.0	1.1	1.1	1.1	4.9	6.2	6.3	10%	34%
American Water Works	AWK US	Not Rated	57	10.1	21.7	20.2	19.4	10.4	9.9	9.1	2.0	1.9	2.2	9.1	9.4	9.3	7%	6%
Acciona SA	ANA SM	Not Rated	64	4.1	28.3	21.4	18.7	9.1	8.8	8.7	1.1	1.0	0.9	3.7	5.3	6.0	3%	22%
ACS	ACS SM	Not Rated	32	11.4	13.5	12.1	10.4	6.5	6.2	5.8	2.5	2.3	2.0	19.3	19.0	16.1	5%	11%
Abengoa	ABG SM	Not Rated	3	2.7	11.5	11.5	13.7	7.4	6.8	6.8	1.7	1.5	NA	13.0	13.7	11.1	7%	14%
Average					**19.7**	**16.9**	**15.6**	**8.1**	**7.6**	**7.3**	**1.7**	**1.6**	**1.6**	**9.7**	**10.3**	**9.4**	**6%**	**17%**
China/SG water & environment																		
Sound Global	967 HK	Buy	7.8	1.5	15.3	12.0		8.2	6.0		2.1	1.5		14.9	14.4		33%	22%
Beijing Enterprises Water	371 HK	Buy	5.2	5.8	26.9	18.7		24.2	18.0		2.9	2.6		12.0	15.5		32%	43%
CT Environmental	1363 HK	Buy	7.8	1.4	31.4	21.2		23.8	14.6		6.3	5.0		23.8	26.1		59%	35%
China Everbright Int'l	257 HK	Buy	11.5	6.7	26.1	20.9		18.1	15.5		3.5	3.1		14.0	15.5		25%	30%
Kangda Environmental	6136 HK	Buy	3.3	0.9	17.8	12.6		12.7	11.1		1.8	1.6		14.0	13.5		29%	NA
Guangdong Investment	270 HK	Reduce	10.8	8.7	20.8	19.6		12.7	12.2		2.2	2.1		11.5	10.9		3%	6%
Hyflux Ltd	HYF SP	Not Rated	1.0	1.0	122.5	20.4		19.1	11.8		0.9	0.8		0.6	5.3		NA	NA
Average ex-Hyflux					**23.0**	**17.5**		**16.6**	**12.9**		**3.1**	**2.6**		**15.0**	**16.0**		**30%**	**27%**
India E&C																		
Hindustan Construction	HCC IN	Not Rated	29	0.3	NA	44.3	11.6	21.2	19.6	16.8	1.5	1.4	1.2	2.4	5.4	10.4	15%	NA
Nagarjuna Construction	NJCC IN	Not Rated	72	0.7	42.5	21.2	13.2	12.5	10.7	8.7	1.3	1.2	1.1	2.7	5.3	8.2	-2%	75%
Simplex Infra	SINF IN	Not Rated	367	0.3	26.3	15.3	8.8	7.7	6.8	5.9	1.2	1.2	1.0	4.9	7.8	12.1	12%	51%
J Kumar Infra	JKIL IN	Not Rated	479	0.3	15.0	11.5	9.2	7.3	6.0	5.0	2.0	1.8	1.4	14.9	16.0	16.8	24%	20%
Supreme Infra	SPII IN	Not Rated	265	0.1	6.5	4.8	4.6	11.8	10.3	9.3	0.8	0.7	0.7	12.2	14.0	13.8	7%	0%
Ahluwalia Contractors	AHLU IN	Not Rated	243	0.2	24.1	18.1	13.5	14.4	11.1	8.5	4.9	3.9	3.0	23.1	23.2	24.4	71%	NA
KNR Construction	KNRC IN	Not Rated	376	0.2	16.9	13.7	10.8	10.9	9.1	7.6	1.8	1.6	1.4	11.4	12.6	14.1	16%	26%
Thermax	TMX IN	Reduce	1,102	2.1	44.7	33.5	24.4	27.0	21.3	15.9	5.8	5.1	4.4	14.0	17.1	19.7	23%	22%
Engineers India Ltd (consol)	ENGR IN	Not Rated	224	1.2	20.9	15.6	15.1	22.6	12.7	12.4	2.8	2.6	2.5	14.7	18.2	16.6	-1%	-1%
NBCC	NBCC IN	Buy	820	1.6	30.3	21.3	14.4	25.6	17.9	11.7	7.2	5.8	4.5	26.1	30.3	35.1	46%	38%
VA Tech Wabag		Buy	1,596	1.6	31.9	23.5	18.3	17.6	13.6	10.8	3.8	3.0	2.6	13.8	14.3	15.3	28%	29%
Average					**25.9**	**20.2**	**13.1**	**16.2**	**12.7**	**10.2**	**3.0**	**2.6**	**2.2**	**12.7**	**14.9**	**16.9**	**22%**	**29%**

Source: Bloomberg consensus for Not Rated stocks, Nomura estimates. Note: Prices as on 23 January 2015

VA Tech Wabag: TP of INR1,958 based on 22.5x FY17F P/E

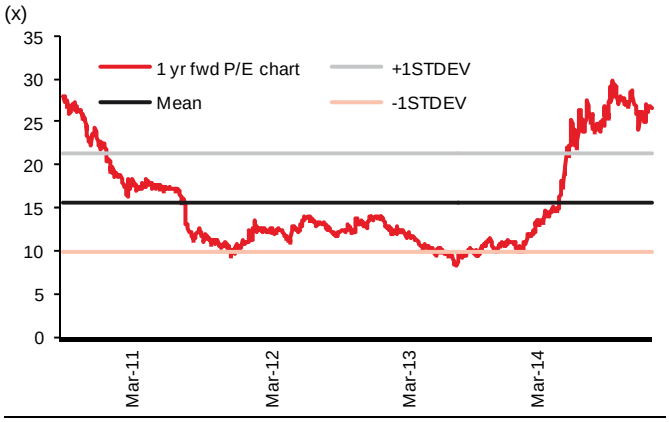
Compared to its peer group, VATW generates better ROE, has a superior growth profile (both in the near-term as well as in the longer term) and has a cleaner balance sheet. As we expect a revival of the growth outlook and margin recovery to aid PAT growth of 29% over FY14-17F, we believe VATW should trade at the upper end of its fair value range of 15-25x one-year forward earnings. Accordingly, we value VATW at 22.5x FY17F P/E (EPS: INR87) to arrive at our one-year forward target price of INR1,958/share, implying a 23% upside potential from current levels.

Our fair value range of 15-25x is derived based on the trading mean range of ENGR and NBCC, which we think are the closest similar businesses in India for VATW. Compared to India E&C companies' current trading one-year forward average P/E of 20.2x, we assume an 11% premium for VATW, while from the regional peer group, we assume a 33% premium to European peers and a 29% premium to China peers.

In our view, most regional peers have high leverage and also have asset-heavy business models due to their BOT nature, while VATW is largely asset-light and generates better ROEs despite a debt-free balance sheet. The company, thus, deserves to trade at a premium vs. peer groups, in our view.

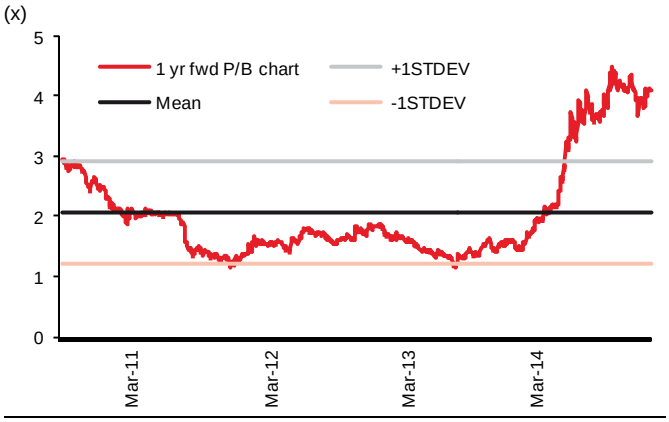
Historical valuation charts (based on consensus estimates)

Fig. 61: VA Tech Wabag: 1-year forward P/E chart



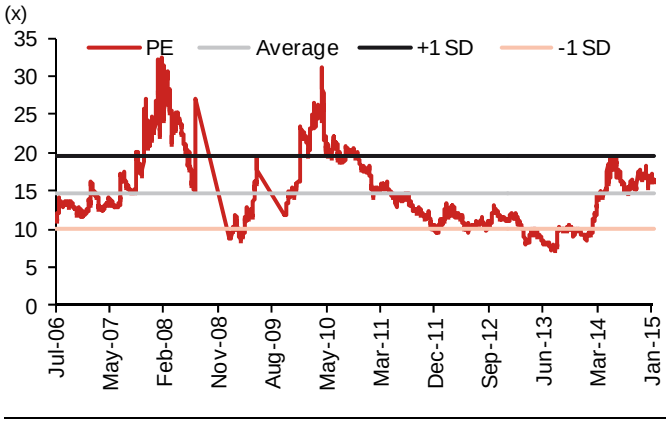
Source: Bloomberg consensus, Nomura estimates

Fig. 62: VA Tech Wabag: 1-year forward P/BV chart



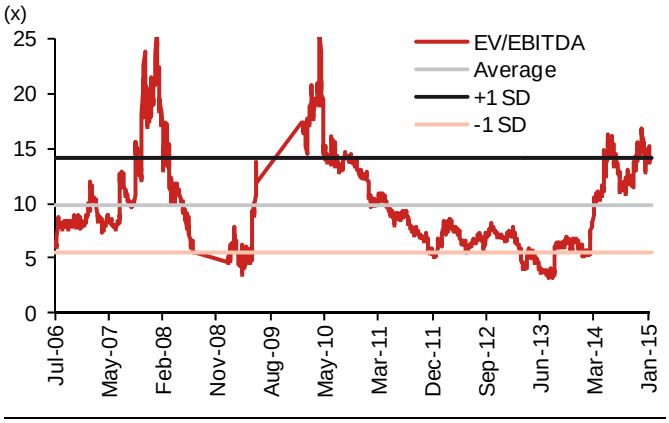
Source: Bloomberg consensus, Nomura estimates

Fig. 63: Engineers India: 1-year forward P/E chart



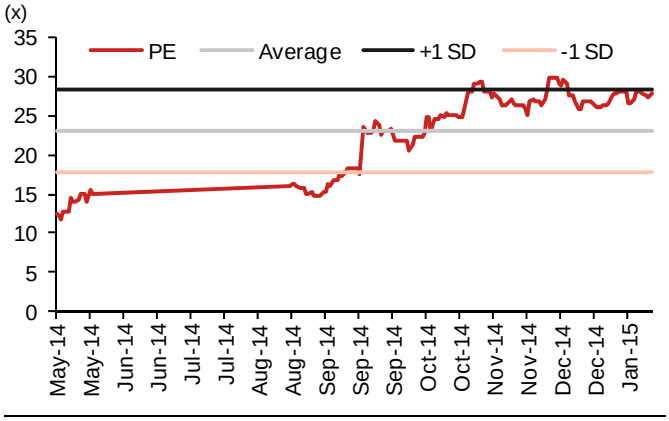
Source: Bloomberg consensus

Fig. 64: Engineers India: 1-year forward EV/EBITDA chart



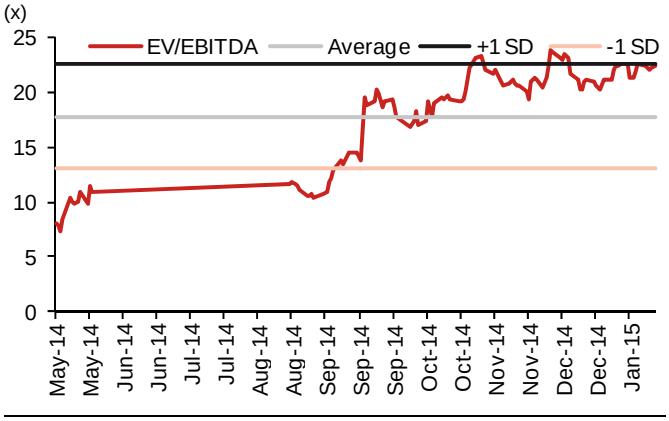
Source: Bloomberg consensus

Fig. 65: NBCC: 1-year forward P/E chart



Source: Bloomberg consensus

Fig. 66: NBCC: 1-year forward EV/EBITDA chart



Source: Bloomberg consensus

VATW: Key investment risks

- A diverse geographical spread could pose strain on management bandwidth and lead to unforeseen risks.
- Rising working capital could pose risks to cash flows.
- Execution delays could delay earnings growth.
- The frail financial health of municipalities in India could delay the materialisation of opportunities.
- Larger players such as L&T could pursue sector opportunities more aggressively, thus skewing competitive intensity further.

Annexure

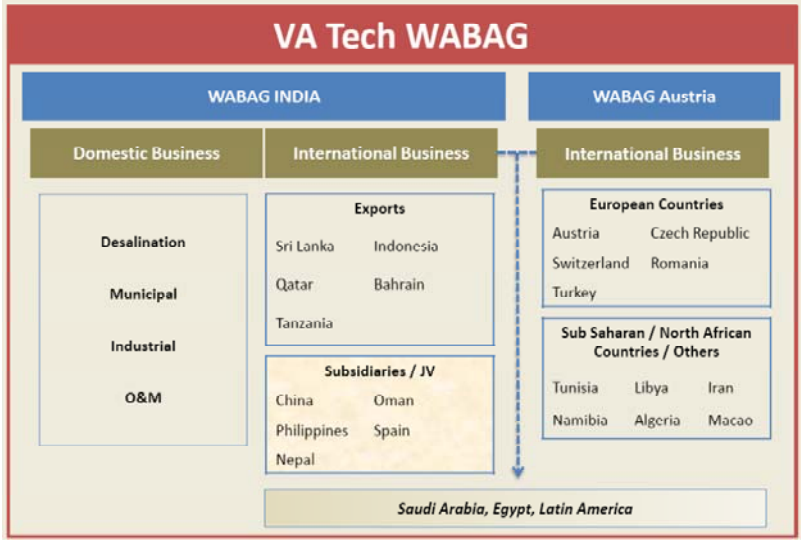
Company background

VATW is a multinational player in the water treatment industry with market presence in India, the Middle East, North Africa, Central and Eastern Europe, China and South East Asia through its two key entities Wabag India and Wabag Austria. VATW offers complete life cycle solutions including conceptualization, design, engineering, procurement, supply, installation, construction and O&M services for sewage treatment, processed and drinking water treatment, effluent treatment, sludge treatment, desalination and water reuse for both municipal and industrial segments.

VATW is now one of the world's leading companies in the water treatment field. VATW's key competencies, which are based on over 90 years of plant building experience, lie in the design, completion and operation of drinking water and wastewater plants for both municipal and industrial sectors.

Fig. 67: Organisation structure of VATW

Two key entities: India and Austria that jointly target global markets apart from respective home markets



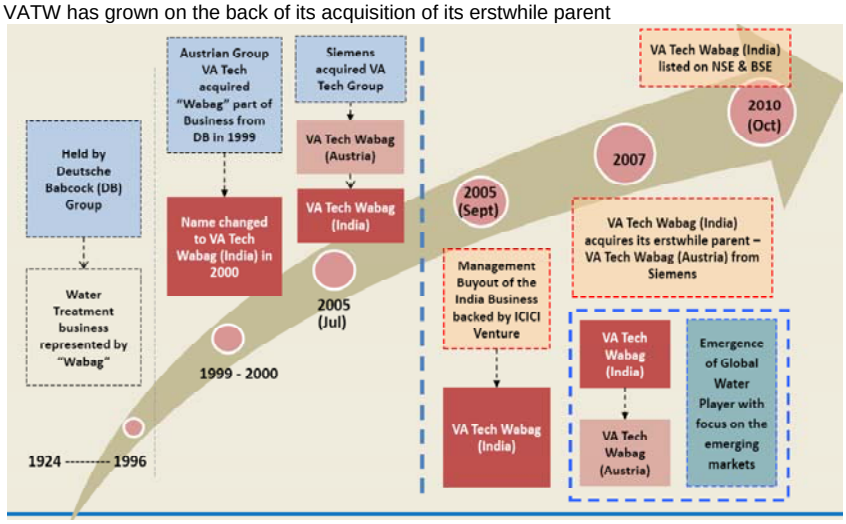
Source: Company

History of VA Tech Wabag

VATW was formed following the merger of the water technology segment of the VA Technologie Group with that of Deutsche Babcock in 1999. However, the WABAG brand dates back to 1924, while one of the taproots of the company extends to year 1868. The company has seen several changes in control and management over the past few decades, which is summarised in the chart below:

Fig. 68: History of VATW

VATW has grown on the back of its acquisition of its erstwhile parent



Source: Company

Management background

Fig. 69: Key management personnel

Personnel	Designation	Description
Mr. Rajiv Mittal	Promoter, Managing Director	- 30 years of work experience in the Water Industry - Previously worked with Wabag Water Engineering, UK as Deputy Director - International sales
Mr. Shiv Narayan Saraf	Promoter, Head of Operations	- 42 years of experience in the water industry; worked previously with Ion Exchange India Limited - Responsible for construction management of all projects of all SBUs
Mr. Amit Sengupta	Promoter, Head of Corporate Strategy & Marketing	- over 30 years of experience in marketing and sales of water and wastewater technology - previously worked with Kirloskar AAF in the water SBU - Responsible for devising & implementing corporate strategies for growth, technology acquisitions & licensing & synergizing strengths within Wabag Group
Mr. S. Varadarajan	Promoter, CFO	- 28 years of work experience; worked previously with PL Agro Technologies - In charge for finance, commercial, legal, secretarial, information technology, income tax and general administration functions
Mr. Erik P. Gothlin	CEO - Wabag Austria	- 22 years of Work Experience in the Industry - Previously held various management positions in Westermo Teleindustri, Sweden, ABB, and Chromalox Group as Managing Director – International for United Kingdom, France and China

Source: Company data

Appendix A-1

Analyst Certification

We, Amar Kedia and Vineet Verma, hereby certify (1) that the views expressed in this Research report accurately reflect our personal views about any or all of the subject securities or issuers referred to in this Research report, (2) no part of our compensation was, is or will be directly or indirectly related to the specific recommendations or views expressed in this Research report and (3) no part of our compensation is tied to any specific investment banking transactions performed by Nomura Securities International, Inc., Nomura International plc or any other Nomura Group company.

Issuer Specific Regulatory Disclosures

The term "Nomura Group" used herein refers to Nomura Holdings, Inc. or any of its affiliates or subsidiaries, and may refer to one or more Nomura Group companies.

Materially mentioned issuers

Issuer	Ticker	Price	Price date	Stock rating	Sector rating	Disclosures
National Buildings Construction Corporation	NBCC IN	INR 820	23-Jan-2015	Buy	N/A	
VA Tech Wabag	VATW IN	INR 1596	23-Jan-2015	Buy	N/A	

VA Tech Wabag (VATW IN) **INR 1596 (23-Jan-2015)** Buy (Sector rating: N/A)

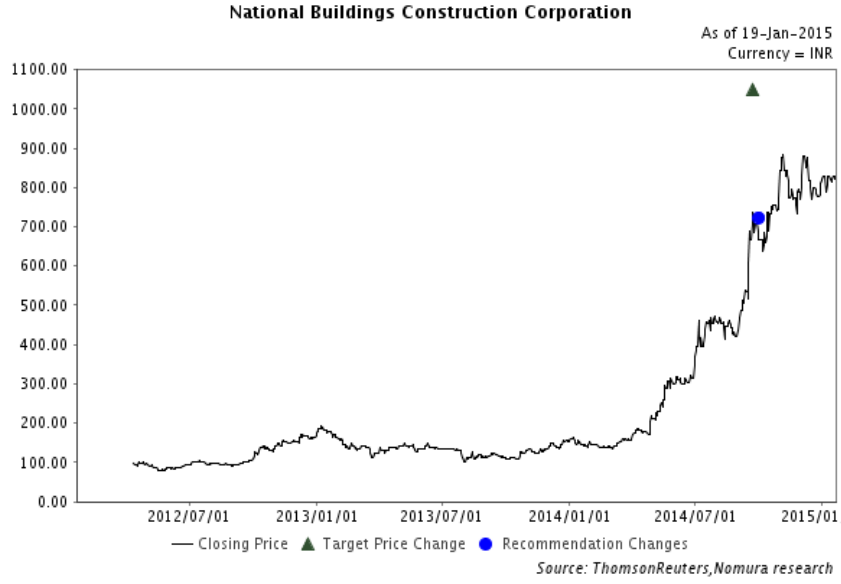
Chart Not Available

Valuation Methodology We value VATW at 22.5x FY17F EPS (INR87) to arrive at our TP of INR1,958/share. Our assigned multiple is based on an 11% premium to Indian E&C names given the superior financial metrics and balance sheet for VATW. The benchmark index for this stock is MSCI India.

Risks that may impede the achievement of the target price •A diverse geographical spread could pose strain on management bandwidth and lead to unforeseen risks. •Rising working capital could pose risks to cash flows. •Execution delays could delay earnings growth. •Frail financial health of municipalities in India could delay opportunity materialisation. •Larger players such as L&T could pursue the sector opportunities more aggressively, thus skewing the competitive intensity further.

National Buildings Construction Corporation (NBCC IN) **INR 820 (23-Jan-2015)** Buy (Sector rating: N/A)

Rating and target price chart (three year history)



Date	Rating	Target price	Closing price
23-Sep-14	Buy		738.15
23-Sep-14		1,049.00	738.15

For explanation of ratings refer to the stock rating keys located after chart(s)

Valuation Methodology We value the stock on 15x Sep-16F EV/EBITDA to arrive at our TP of INR1,049 per share. The benchmark index for this stock is MSCI India.

Risks that may impede the achievement of the target price 1) Overhang of further dilution by the government in the stock as NBCC is currently 90% owned by the government of India. 2) Execution delays could delay earnings growth.

Important Disclosures

Online availability of research and conflict-of-interest disclosures

Nomura research is available on www.nomuranow.com/research, Bloomberg, Capital IQ, Factset, MarkitHub, Reuters and ThomsonOne. Important disclosures may be read at http://go.nomuranow.com/research/globalresearchportal/pages/disclosures/disclosures.aspx or requested from Nomura Securities International, Inc., on 1-877-865-5752. If you have any difficulties with the website, please email grpsupport@nomura.com for help.

The analysts responsible for preparing this report have received compensation based upon various factors including the firm's total revenues, a portion of which is generated by Investment Banking activities. Unless otherwise noted, the non-US analysts listed at the front of this report are not registered/qualified as research analysts under FINRA/NYSE rules, may not be associated persons of NSI, and may not be subject to FINRA Rule 2711 and NYSE Rule 472 restrictions on communications with covered companies, public appearances, and trading securities held by a research analyst account.

Nomura Global Financial Products Inc. ("NGFP") Nomura Derivative Products Inc. ("NDPI") and Nomura International plc. ("NIplc") are registered with the Commodities Futures Trading Commission and the National Futures Association (NFA) as swap dealers. NGFP, NDPI, and NIplc are generally engaged in the trading of swaps and other derivative products, any of which may be the subject of this report.

Any authors named in this report are research analysts unless otherwise indicated. *Industry Specialists* identified in some Nomura International plc research reports are employees within the Firm who are responsible for the sales and trading effort in the sector for which they have coverage. Industry Specialists do not contribute in any manner to the content of research reports in which their names appear.

Distribution of ratings (Global)

The distribution of all ratings published by Nomura Global Equity Research is as follows:
49% have been assigned a Buy rating which, for purposes of mandatory disclosures, are classified as a Buy rating; 43% of companies with this rating are investment banking clients of the Nomura Group*.
43% have been assigned a Neutral rating which, for purposes of mandatory disclosures, is classified as a Hold rating; 54% of companies with this rating are investment banking clients of the Nomura Group*.
8% have been assigned a Reduce rating which, for purposes of mandatory disclosures, are classified as a Sell rating; 26% of companies with this rating are investment banking clients of the Nomura Group*.
As at 31 December 2014. **The Nomura Group as defined in the Disclaimer section at the end of this report.*

Explanation of Nomura's equity research rating system in Europe, Middle East and Africa, US and Latin America, and Japan and Asia ex-Japan from 21 October 2013

The rating system is a relative system, indicating expected performance against a specific benchmark identified for each individual stock, subject to limited management discretion. An analyst's target price is an assessment of the current intrinsic fair value of the stock based on an appropriate valuation methodology determined by the analyst. Valuation methodologies include, but are not limited to, discounted cash flow analysis, expected return on equity and multiple analysis. Analysts may also indicate expected absolute upside/downside relative to the stated target price, defined as (target price - current price)/current price.

STOCKS

A rating of **'Buy'**, indicates that the analyst expects the stock to outperform the Benchmark over the next 12 months. A rating of **'Neutral'**, indicates that the analyst expects the stock to perform in line with the Benchmark over the next 12 months. A rating of **'Reduce'**, indicates that the analyst expects the stock to underperform the Benchmark over the next 12 months. A rating of **'Suspended'**, indicates that the rating, target price and estimates have been suspended temporarily to comply with applicable regulations and/or firm policies. Securities and/or companies that are labelled as **'Not rated'** or shown as **'No rating'** are not in regular research coverage. Investors should not expect continuing or additional information from Nomura relating to such securities and/or companies. Benchmarks are as follows: **United States/Europe/Asia ex-Japan**: please see valuation methodologies for explanations of relevant benchmarks for stocks, which can be accessed at: http://go.nomuranow.com/research/globalresearchportal/pages/disclosures/disclosures.aspx; **Global Emerging Markets (ex-Asia)**: MSCI Emerging Markets ex-Asia, unless otherwise stated in the valuation methodology; **Japan:** Russell/Nomura Large Cap.

SECTORS

A **'Bullish'** stance, indicates that the analyst expects the sector to outperform the Benchmark during the next 12 months. A **'Neutral'** stance, indicates that the analyst expects the sector to perform in line with the Benchmark during the next 12 months. A **'Bearish'** stance, indicates that the analyst expects the sector to underperform the Benchmark during the next 12 months. Sectors that are labelled as **'Not rated'** or shown as **'N/A'** are not assigned ratings. Benchmarks are as follows: **United States:** S&P 500; **Europe:** Dow Jones STOXX 600; **Global Emerging Markets (ex-Asia):** MSCI Emerging Markets ex-Asia. **Japan/Asia ex-Japan:** Sector ratings are not assigned.

Explanation of Nomura's equity research rating system in Japan and Asia ex-Japan prior to 21 October 2013

STOCKS

Stock recommendations are based on absolute valuation upside (downside), which is defined as (Target Price - Current Price) / Current Price, subject to limited management discretion. In most cases, the Target Price will equal the analyst's 12-month intrinsic valuation of the stock, based on an appropriate valuation methodology such as discounted cash flow, multiple analysis, etc. A **'Buy'** recommendation indicates that potential upside is 15% or more. A **'Neutral'** recommendation indicates that potential upside is less than 15% or downside is less than 5%. A **'Reduce'** recommendation indicates that potential downside is 5% or more. A rating of **'Suspended'** indicates that the rating and target price have been suspended temporarily to comply with applicable regulations and/or firm policies in certain circumstances including when Nomura is acting in an advisory capacity in a merger or strategic transaction involving the subject company. Securities and/or companies that are labelled as **'Not rated'** or shown as **'No rating'** are not in regular research coverage of the Nomura entity identified in the top banner. Investors should not expect continuing or additional information from Nomura relating to such securities and/or companies.

SECTORS
A **'Bullish'** rating means most stocks in the sector have (or the weighted average recommendation of the stocks under coverage is) a positive absolute recommendation. A **'Neutral'** rating means most stocks in the sector have (or the weighted average recommendation of the stocks under coverage is) a neutral absolute recommendation. A **'Bearish'** rating means most stocks in the sector have (or the weighted average recommendation of the stocks under coverage is) a negative absolute recommendation.

Target Price
A Target Price, if discussed, reflects in part the analyst's estimates for the company's earnings. The achievement of any target price may be impeded by general market and macroeconomic trends, and by other risks related to the company or the market, and may not occur if the company's earnings differ from estimates.

Disclaimers
This document contains material that has been prepared by the Nomura entity identified on page 1 and/or with the sole or joint contributions of one or more Nomura entities whose employees and their respective affiliations are also specified on page 1 or identified elsewhere in the document. The term "Nomura Group" used herein refers to Nomura Holdings, Inc. or any of its affiliates or subsidiaries and may refer to one or more Nomura Group companies including: Nomura Securities Co., Ltd. ('NSC') Tokyo, Japan; Nomura International plc ('NIplc'), UK; Nomura Securities International, Inc. ('NSI'), New York, US; Nomura International (Hong Kong) Ltd. ('NIHK'), Hong Kong; Nomura Financial Investment (Korea) Co., Ltd. ('NFIK'), Korea (Information on Nomura analysts registered with the Korea Financial Investment Association ('KOFIA') can be found on the KOFIA Intranet at http://dis.kofia.or.kr); Nomura Singapore Ltd. ('NSL'), Singapore (Registration number 197201440E, regulated by the Monetary Authority of Singapore); Nomura Australia Ltd. ('NAL'), Australia (ABN 48 003 032 513), regulated by the Australian Securities and Investment Commission ('ASIC') and holder of an Australian financial services licence number 246412; P.T. Nomura Indonesia ('PTNI'), Indonesia; Nomura Securities Malaysia Sdn. Bhd. ('NSM'), Malaysia; NIHK, Taipei Branch ('NITB'), Taiwan; Nomura Financial Advisory and Securities (India) Private Limited ('NFASL'), Mumbai, India (Registered Address: Ceejay House, Level 11, Plot F, Shivsagar Estate, Dr. Annie Besant Road, Worli, Mumbai- 400 018, India; Tel: +91 22 4037 4037, Fax: +91 22 4037 4111; CIN No : U74140MH2007PTC169116, SEBI Registration No: BSE INB011299030, NSE INB231299034, INF231299034, INE 231299034, MCX: INE261299034) and NIplc, Madrid Branch ('NIplc, Madrid'). 'CNS Thailand' next to an analyst's name on the front page of a research report indicates that the analyst is employed by Capital Nomura Securities Public Company Limited ('CNS') to provide research assistance services to NSL under a Research Assistance Agreement. 'NSFSPL' next to an employee's name on the front page of a research report indicates that the individual is employed by Nomura Structured Finance Services Private Limited to provide assistance to certain Nomura entities under inter-company agreements.
THIS MATERIAL IS: (I) FOR YOUR PRIVATE INFORMATION, AND WE ARE NOT SOLICITING ANY ACTION BASED UPON IT; (II) NOT TO BE CONSTRUED AS AN OFFER TO SELL OR A SOLICITATION OF AN OFFER TO BUY ANY SECURITY IN ANY JURISDICTION WHERE SUCH OFFER OR SOLICITATION WOULD BE ILLEGAL; AND (III) BASED UPON INFORMATION FROM SOURCES THAT WE CONSIDER RELIABLE, BUT HAS NOT BEEN INDEPENDENTLY VERIFIED BY NOMURA GROUP.
Nomura Group does not warrant or represent that the document is accurate, complete, reliable, fit for any particular purpose or merchantable and does not accept liability for any act (or decision not to act) resulting from use of this document and related data. To the maximum extent permissible all warranties and other assurances by Nomura group are hereby excluded and Nomura Group shall have no liability for the use, misuse, or distribution of this information.
Opinions or estimates expressed are current opinions as of the original publication date appearing on this material and the information, including the opinions and estimates contained herein, are subject to change without notice. Nomura Group is under no duty to update this document. Any comments or statements made herein are those of the author(s) and may differ from views held by other parties within Nomura Group. Clients should consider whether any advice or recommendation in this report is suitable for their particular circumstances and, if appropriate, seek professional advice, including tax advice. Nomura Group does not provide tax advice.
Nomura Group, and/or its officers, directors and employees, may, to the extent permitted by applicable law and/or regulation, deal as principal, agent, or otherwise, or have long or short positions in, or buy or sell, the securities, commodities or instruments, or options or other derivative instruments based thereon, of issuers or securities mentioned herein. Nomura Group companies may also act as market maker or liquidity provider (within the meaning of applicable regulations in the UK) in the financial instruments of the issuer. Where the activity of market maker is carried out in accordance with the definition given to it by specific laws and regulations of the US or other jurisdictions, this will be separately disclosed within the specific issuer disclosures.
This document may contain information obtained from third parties, including ratings from credit ratings agencies such as Standard & Poor's. Reproduction and distribution of third-party content in any form is prohibited except with the prior written permission of the related third-party. Third-party content providers do not guarantee the accuracy, completeness, timeliness or availability of any information, including ratings, and are not responsible for any errors or omissions (negligent or otherwise), regardless of the cause, or for the results obtained from the use of such content. Third-party content providers give no express or implied warranties, including, but not limited to, any warranties of merchantability or fitness for a particular purpose or use. Third-party content providers shall not be liable for any direct, indirect, incidental, exemplary, compensatory, punitive, special or consequential damages, costs, expenses, legal fees, or losses (including lost income or profits and opportunity costs) in connection with any use of their content, including ratings. Credit ratings are statements of opinions and are not statements of fact or recommendations to purchase hold or sell securities. They do not address the suitability of securities or the suitability of securities for investment purposes, and should not be relied on as investment advice.
Any MSCI sourced information in this document is the exclusive property of MSCI Inc. ('MSCI'). Without prior written permission of MSCI, this information and any other MSCI intellectual property may not be reproduced, re-disseminated or used to create any financial products, including any indices. This information is provided on an "as is" basis. The user assumes the entire risk of any use made of this information. MSCI, its affiliates and any third party involved in, or related to, computing or compiling the information hereby expressly disclaim all warranties of originality, accuracy, completeness, merchantability or fitness for a particular purpose with respect to any of this information. Without limiting any of the foregoing, in no event shall MSCI, any of its affiliates or any third party involved in, or related to, computing or compiling the information have any liability for any damages of any kind. MSCI and the MSCI indexes are services marks of MSCI and its affiliates.
Russell/Nomura Japan Equity Indexes are protected by certain intellectual property rights of Nomura Securities Co., Ltd. and Russell Investments. Nomura Securities Co., Ltd. and Russell Investments do not guarantee the accuracy, completeness, reliability, or usefulness thereof and do not account for business activities and services that any index user and its affiliates undertake with the use of the Indexes.
Investors should consider this document as only a single factor in making their investment decision and, as such, the report should not be viewed as identifying or suggesting all risks, direct or indirect, that may be associated with any investment decision. Nomura Group produces a number of different types of research product including, among others, fundamental analysis and quantitative analysis; recommendations contained in one type of research product may differ from recommendations contained in other types of research product, whether as a result of differing time horizons, methodologies or otherwise. Nomura Group publishes research product in a number of different ways including the posting of product on Nomura Group portals and/or distribution directly to clients. Different groups of clients may receive different products and services from the research department depending on their individual requirements.

Figures presented herein may refer to past performance or simulations based on past performance which are not reliable indicators of future performance. Where the information contains an indication of future performance, such forecasts may not be a reliable indicator of future performance. Moreover, simulations are based on models and simplifying assumptions which may oversimplify and not reflect the future distribution of returns.
Certain securities are subject to fluctuations in exchange rates that could have an adverse effect on the value or price of, or income derived from, the investment.
The securities described herein may not have been registered under the US Securities Act of 1933 (the '1933 Act'), and, in such case, may not be offered or sold in the US or to US persons unless they have been registered under the 1933 Act, or except in compliance with an exemption from the registration requirements of the 1933 Act. Unless governing law permits otherwise, any transaction should be executed via a Nomura entity in your home jurisdiction.
This document has been approved for distribution in the UK and European Economic Area as investment research by NIplc. NIplc is authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority. NIplc is a member of the London Stock Exchange. This document does not constitute a personal recommendation within the meaning of applicable regulations in the UK, or take into account the particular investment objectives, financial situations, or needs of individual investors. This document is intended only for investors who are 'eligible counterparties' or 'professional clients' for the purposes of applicable regulations in the UK, and may not, therefore, be redistributed to persons who are 'retail clients' for such purposes. This document has been approved by NIHK, which is regulated by the Hong Kong Securities and Futures Commission, for distribution in Hong Kong by NIHK. This document has been approved for distribution in Australia by NAL, which is authorized and regulated in Australia by the ASIC. This document has also been approved for distribution in Malaysia by NSM. In Singapore, this document has been distributed by NSL. NSL accepts legal responsibility for the content of this document, where it concerns securities, futures and foreign exchange, issued by their foreign affiliates in respect of recipients who are not accredited, expert or institutional investors as defined by the Securities and Futures Act (Chapter 289). Recipients of this document in Singapore should contact NSL in respect of matters arising from, or in connection with, this document. Unless prohibited by the provisions of Regulation S of the 1933 Act, this material is distributed in the US, by NSI, a US-registered broker-dealer, which accepts responsibility for its contents in accordance with the provisions of Rule 15a-6, under the US Securities Exchange Act of 1934. The entity that prepared this document permits its separately operated affiliates within the Nomura Group to make copies of such documents available to their clients.
This document has not been approved for distribution to persons other than 'Authorised Persons', 'Exempt Persons' or 'Institutions' (as defined by the Capital Markets Authority) in the Kingdom of Saudi Arabia ('Saudi Arabia') or 'professional clients' (as defined by the Dubai Financial Services Authority) in the United Arab Emirates ('UAE') or a 'Market Counterparty' or 'Business Customers' (as defined by the Qatar Financial Centre Regulatory Authority) in the State of Qatar ('Qatar') by Nomura Saudi Arabia, NIplc or any other member of Nomura Group, as the case may be. Neither this document nor any copy thereof may be taken or transmitted or distributed, directly or indirectly, by any person other than those authorised to do so into Saudi Arabia or in the UAE or in Qatar or to any person other than 'Authorised Persons', 'Exempt Persons' or 'Institutions' located in Saudi Arabia or 'professional clients' in the UAE or a 'Market Counterparty' or 'Business Customers' in Qatar . By accepting to receive this document, you represent that you are not located in Saudi Arabia or that you are an 'Authorised Person', an 'Exempt Person' or an 'Institution' in Saudi Arabia or that you are a 'professional client' in the UAE or a 'Market Counterparty' or 'Business Customers' in Qatar and agree to comply with these restrictions. Any failure to comply with these restrictions may constitute a violation of the laws of the UAE or Saudi Arabia or Qatar.
NO PART OF THIS MATERIAL MAY BE (I) COPIED, PHOTOCOPIED, OR DUPLICATED IN ANY FORM, BY ANY MEANS; OR (II) REDISTRIBUTED WITHOUT THE PRIOR WRITTEN CONSENT OF A MEMBER OF NOMURA GROUP. If this document has been distributed by electronic transmission, such as e-mail, then such transmission cannot be guaranteed to be secure or error-free as information could be intercepted, corrupted, lost, destroyed, arrive late or incomplete, or contain viruses. The sender therefore does not accept liability for any errors or omissions in the contents of this document, which may arise as a result of electronic transmission. If verification is required, please request a hard-copy version.

Nomura Group manages conflicts with respect to the production of research through its compliance policies and procedures (including, but not limited to, Conflicts of Interest, Chinese Wall and Confidentiality policies) as well as through the maintenance of Chinese walls and employee training.
Additional information is available upon request and disclosure information is available at the Nomura Disclosure web page: http://go.nomuranow.com/research/globalresearchportal/pages/disclosures/disclosures.aspx