

China Environmental Sector

Initiation: set to boom despite economic gloom, but be selective

- Environmental investment in China set to double from CNY4.5tn in 2011-15 (12th FYP) to CNY9.0tn in 2016-20 (13th FYP)
- Water investment should claim c.50% of the investment (CNY4.5tn during the 13th FYP), but IRR more attractive for gas distributors
- Gas distributors to see strong DPS growth amid unit dollar margin risk; prefer water/waste treatment operators with coastal exposure

Negative

Neutral

Positive


Positive
 (initiation)

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Investment case: We initiate coverage of the China Environmental Sector (the consolidation of our China gas, water and solid waste coverage) with a Positive rating on an estimated CNY9tn investment under the 13th FYP (2016-20), doubling from the 12th FYP (2011-15). Accordingly, we forecast China's environmental investment to GDP to rise by 2.0% in 2017 and 2.3% in 2020, from c.1.5% currently. Despite the huge investment, we would cherry-pick stocks that can maintain returns on future projects.

Catalysts: Gas – low-teen volume growth, strong cash flow despite margin risks. We forecast a low-teen national gas demand CAGR during the 13th FYP, boosted by coal-to-gas conversion and increased demand from power generation and vehicles. On the supply side, we expect gas prices to be liberalised, and believe any retail tariff cut would be offset by lower gas costs, especially along the coastal areas of China. We advise investors to focus on the c.180% 2015-18E FCF CAGR for the gas companies under our coverage, which we believe is a good indicator of the companies' ability to raise DPS, despite them registering a slowing 2-16% EPS CAGR over the same period (2012-15: 15-31%).

Water – 50% of 13th FYP environmental investment; focus on PPP with water funds to maintain funding and returns. We expect a CNY4.5tn investment in the 13th FYP (up 67% from the 12th FYP) in the water sector (CNY3.0tn on water-pollution prevention, up 150% from the 12th FYP). We expect municipal waste water treatment project returns to drop from 10-12% (12th FYP) to 7-8% (13th FYP). Thus, big-scale city-water projects (likely PPP projects) financed by water funds, or other less-penetrated industrial waste water treatment projects, would be a more sustainable business model for the water companies to achieve a >12% IRR.

Waste – moving inland means lower returns. Staying in coastal developed regions is key to a higher IRR (12-15% vs 8-10% inland). Waste-to-energy (WTE) penetration in coastal areas is 44%, double inland's 20%.

Valuation: The sector is trading at an 11-12x 2017E PER, with a 13-25% 2015-18E EPS CAGR, representing a 0.6-0.9x PEG. China gas distributors' 0.8-2.5x PBR and 8-24% ROE looks more attractive than water/waste treatment operators' 2.0-3.1x PBR for a similar 19-22% ROE. Our pecking order for the sector: **Beijing Enterprises Water** (Buy [1]), **ENN Energy** (Buy [1]) and **China Gas** (Buy [1]) for mid-caps; **Canvest Environment** (Buy [1]) and **CT Environmental** (Buy [1]) for small-caps.

Risks: Any scaling back in investment or massive tariff cuts due to change in government policy would adversely affect net profit growth significantly.

Key stock calls

	New	Prev.
ENN Energy (2688 HK)		
Rating	Buy	Buy
Target	48.62	50.00
Upside	▲ 28.3%	
China Gas (384 HK)		
Rating	Buy	Buy
Target	14.75	13.84
Upside	▲ 19.1%	
Beijing Enterprises Water Group (371 HK)		
Rating	Buy	Buy
Target	6.90	7.20
Upside	▲ 49.4%	
CT Environmental Group (1363 HK)		
Rating	Buy	Buy
Target	2.75	2.65
Upside	▲ 18%	
Canvest Environment Protection Group (1381 HK)		
Rating	Buy	Buy
Target	5.60	5.60
Upside	▲ 58.2%	

Source: Daiwa forecasts

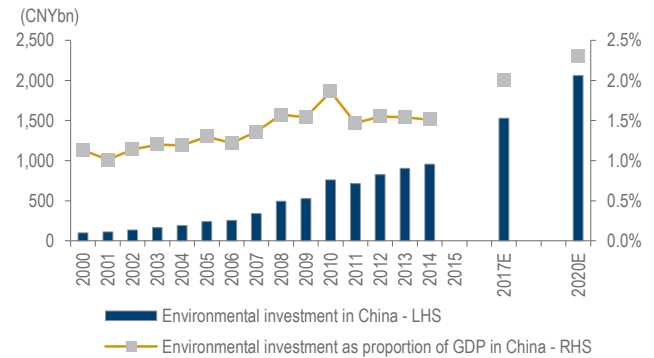
Negative	Neutral	Positive	How do we justify our view?			
★ Positive (initiation)	Growth outlook		Valuation		Earnings revisions	
	✓ ✓ ✓ ✓ ✓		✓ ✓ ✓ ✓ ✓		✓ ✓ ✓ ✓ ✓	

Growth outlook ✓ ✓ ✓ ✓ ✓

Under the 13th FYP, we expect China to double its total environmental protection investment to CNY9tn and raise the ratio to GDP to 2.0% by 2017 and 2.3% by 2020.

For the gas sector, we forecast an 11% 2015-20 CAGR on national natural gas consumption, while regulatory risks on dollar margins could be offset by cost reductions. For waste water treatment, standard upgrades and PPP projects are the major growth drivers, despite the slowing expansion pace in existing MWWT markets. Solid waste treatment companies will mainly expand by diversifying into new areas such as hazardous waste treatment (HWT) and soil restoration, under a downward trend in treatment fees.

China environmental investment

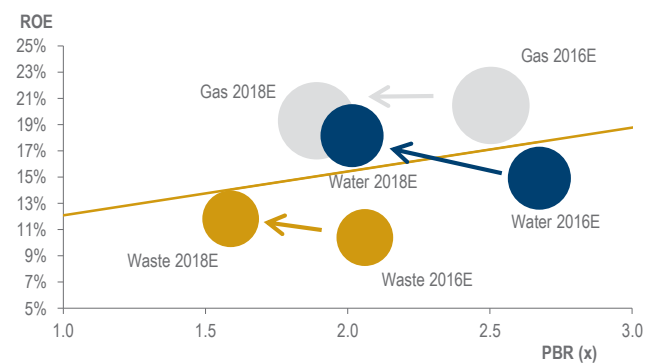


Source: WIND, Daiwa estimates
Note: Per-capita GDP investment on environmental protection should increase from current 1.5% during 12th FYP to 2-2.3% during 13th FYP, representing a doubling investment to CNY9.0tn

Valuation ✓ ✓ ✓ ✓ ✓

The gas companies we cover are trading at a 2.5x 2016E PBR (1SD below the 8-year average), with a 20% ROE. Although we look for 2018 ROE to drop to 19% amid margin risks and slowing connection, we think the sector still deserves a rerating from its current low valuation as gas sales volume growth has likely bottomed out. The water sector is trading at a 2.7x 2016E PBR, which looks fair given the 15% 2016E ROE supported by net gearing over 100%. The solid waste treatment sector is trading at a 2.1x PBR, which is the cheapest among the 3 sub-sectors due to a low 2016E ROE of 10%. We expect its ROE to improve to 14% in 2018 on ample room for them to gear up.

China environmental stocks: ROE versus PBR

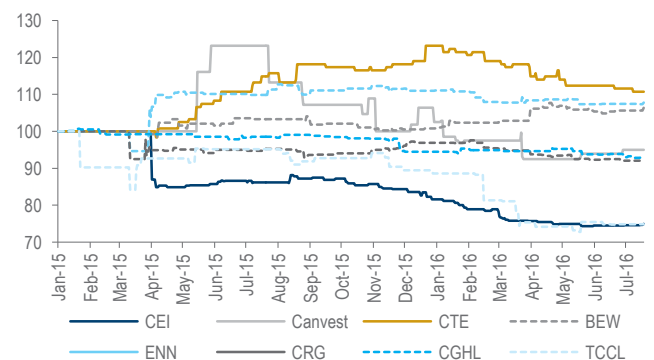


Source: Company, Bloomberg, Daiwa research

Earnings revisions ✓ ✓ ✓ ✓ ✓

The Bloomberg-consensus 2017 EPS forecasts for our preferred water/waste picks, CTE and BEW, have been raised by 6-11% since January 2015, while that for Canvest has remained flat. We believe these companies' unusual positions in the most lucrative segments – coastal WTE plants in developed provinces, IWWT and MWWT (PPP) – could enable them to achieve minimum 15% YoY net profit growth until 2018. For the China gas distributors, since 2015, the Bloomberg consensus 2017E EPS has dropped by 7-8%, due to a volume slowdown on the sharp decline in oil prices in 2015, except ENN (up 8%) and TCCL (down 25%). Currently, we see oil prices stabilising at USD40-50/barrel, which suggests natural gas will become more competitive against refinery oil products.

China environmental stocks: 2017E EPS consensus forecasts



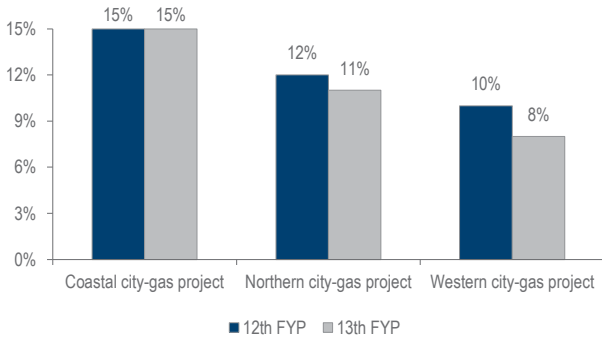
Source: Bloomberg, Daiwa research

Sector stocks: key indicators

Company Name	Stock code	Share Price	Rating		Target price (local curr.)			EPS (local curr.)					
			New	Prev.	New	Prev.	% chg	FY1			FY2		
								New	Prev.	% chg	New	Prev.	% chg
Beijing Enterprises Water Group	371 HK	4.62	Buy	Buy	6.90	7.20	(4.2%)	0.331	0.331	0.0%	0.402	0.402	0.0%
Canvest Environment Protection Group	1381 HK	3.54	Buy	Buy	5.60	5.60	0.0%	0.204	0.216	(5.6%)	0.285	0.286	(0.2%)
China Everbright International	257 HK	8.29	Outperform	Outperform	8.90	9.50	(6.3%)	0.569	0.568	0.0%	0.765	0.765	0.0%
China Gas	384 HK	12.38	Buy	Buy	14.75	13.84	6.6%	0.910	0.893	2.0%	1.037	1.065	(2.6%)
China Resources Gas	1193 HK	23.10	Buy	Buy	27.00	27.00	0.0%	1.532	1.532	0.0%	1.719	1.719	0.0%
CIMC Enric	3899 HK	3.11	Hold	Underperform	3.00	3.00	0.0%	0.225	0.225	0.0%	0.238	0.238	0.0%
CT Environmental Group	1363 HK	2.33	Buy	Buy	2.75	2.65	3.8%	0.107	0.108	(1.2%)	0.133	0.135	(1.0%)
ENN Energy	2688 HK	37.90	Buy	Buy	48.62	50.00	(2.8%)	2.942	2.941	0.0%	3.221	3.237	(0.5%)
Guangdong Investment	270 HK	12.16	Outperform	Outperform	12.80	12.80	0.0%	0.729	0.729	0.0%	0.776	0.776	0.0%
Towngas China	1083 HK	4.80	Hold	Outperform	4.90	5.00	(2.0%)	0.449	0.480	(6.4%)	0.465	0.504	(7.7%)

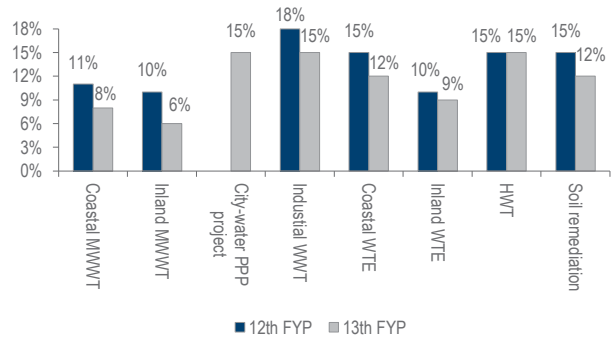
Source: Bloomberg, Daiwa forecasts

China gas distributors: benchmark projects' equity IRR trends



Source: Daiwa estimates

China water and waste: benchmark projects' equity IRR trends



Source: Daiwa estimates

Please also see:

<p>China Solid Waste Sector: Initiation: trash to cash 14 November 2014</p> <p>Dennis Ip, CFA (852) 2848 4068 (dennis.ip@hk.daiwacm.com)</p>	<p>China Water Sector: Initiation: cleaning up in China 4 November 2014</p> <p>Dennis Ip, CFA (852) 2848 4068 (dennis.ip@hk.daiwacm.com)</p>

China Environmental Sector: rating summary and Daiwa's top picks across sub-segments

Company	Rating		Target price (HKD)		Rationale
	New	Prev.	New	Prev.	
China Gas Sector					
China Gas	Buy	Buy	14.75	13.84	Benefit from industrial coal-to-gas conversion and heating demand, high 2015-18E EPS CAGR at 17%
ENN Energy	Buy	Buy	48.62	50.00	16% YoY recurring net profit growth in 2016E; strong margin expansion and organic gas sales volume growth
CR Gas	Buy	Buy	27.00	27.00	Ramping up of new projects, turning positive FCF in 2017E
Towngas China	Hold	Outperform	4.90	5.00	Low growth and high risk of connection fee slowdown, but attractive valuation and potential support from parent buy-back
CIMC Enric	Hold	Underperform	3.00	3.00	Weak energy equipment segment amid slowing capex spending by gas operators; late recovery may come only after 2017E
China Water Sector					
Beijing Enterprise Water	Buy	Buy	6.90	7.20	20% YoY net profit growth in 2016E; water fund helps seize PPP project opportunities
CT Environmental	Buy	Buy	2.75	2.65	More diversified earnings profile with non-IWWT gross profit contribution increasing to 74% in 2018E
Guangdong Investment	Outperform	Outperform	12.80	12.80	Most defensive China-based utility, with 60% regulated businesses, 40% HKD revenue and 90% CNY costs
China Waste Sector					
Canvest Environment Protection	Buy	Buy	5.60	5.60	Clear winner in FB-MG upgrades; solid profitability with over 12% benchmark equity IRRs
China Everbright Int'l	Outperform	Outperform	8.90	9.50	Remains strong in WTE project execution; spin-off of low-return biomass could help restore valuation

Source: Daiwa

China Environmental Sector: assumptions for key stocks

Revenue	Currency	2013	2014	2015	2016E	2017E	2018E	YoY%	2014	2015	2016E	2017E	2018E
China Gas	HKD m	17,956	26,008	31,666	29,139	33,578	40,042		44.8%	21.8%	-8.0%	15.2%	19.3%
ENN Energy	CNY m	22,966	29,087	32,063	31,793	36,193	39,850		26.7%	10.2%	-0.8%	13.8%	10.1%
CR Gas	HKD m	22,288	28,717	31,096	33,403	36,769	40,458		28.8%	8.3%	7.4%	10.1%	10.0%
Towngas China	HKD m	6,716	7,882	7,719	7,148	7,592	8,103		17.4%	-2.1%	-7.4%	6.2%	6.7%
CIMC Enric	CNY m	10,172	11,267	8,241	7,753	8,135	8,523		10.8%	-26.9%	-5.9%	4.9%	4.8%
Beijing Enterprise Water	HKD m	6,406	8,926	13,503	18,365	22,281	24,541		39.3%	51.3%	36.0%	21.3%	10.1%
CT Environmental	CNY m	387	818	1,435	2,187	2,376	2,746		111.5%	75.4%	52.4%	8.6%	15.6%
Guangdong Investment	HKD m	7,990	8,426	9,172	10,769	12,156	12,111		5.5%	8.8%	17.4%	12.9%	-0.4%
Canvest Environment Protection	HKD m	390	794	1,185	1,375	2,222	2,256		103.5%	49.2%	16.1%	61.6%	1.5%
China Everbright Int'l	HKD m	5,320	6,355	8,535	11,872	16,032	14,841		19.5%	34.3%	39.1%	35.0%	-7.4%
Net profit	Currency	2013	2014	2015	2016E	2017E	2018E	YoY%	2014	2015	2016E	2017E	2018E
China Gas	HKD m	1,671	2,569	3,320	3,716	4,701	5,562		53.7%	29.3%	11.9%	26.5%	18.3%
ENN Energy	CNY m	1,937	2,343	2,736	3,186	3,489	3,823		21.0%	16.8%	16.4%	9.5%	9.6%
CR Gas	HKD m	2,161	2,486	2,898	3,333	3,740	4,167		15.1%	16.6%	15.0%	12.2%	11.4%
Towngas China	HKD m	946	1,195	1,203	1,198	1,238	1,299		26.3%	0.6%	-0.4%	3.4%	4.9%
CIMC Enric	CNY m	980	1,029	520	448	481	520		5.1%	-49.5%	-13.9%	7.5%	8.1%
Beijing Enterprise Water	HKD m	1,084	1,794	2,455	2,935	3,619	4,356		65.5%	36.8%	19.5%	23.3%	20.4%
CT Environmental	CNY m	179	318	492	675	842	972		77.7%	54.7%	37.2%	24.6%	15.5%
Guangdong Investment	HKD m	3,249	3,500	4,201	4,563	4,856	4,820		7.7%	20.0%	8.6%	6.4%	-0.7%
Canvest Environment Protection	HKD m	131	191	272	412	580	674		45.9%	42.4%	51.5%	40.8%	16.1%
China Everbright Int'l	HKD m	1,325	1,703	2,085	2,549	3,431	3,811		28.6%	22.4%	22.3%	34.6%	11.1%
Net profit margin		2013	2014	2015	2016E	2017E	2018E	YoY pp	2014	2015	2016E	2017E	2018E
China Gas		9.3%	9.9%	10.5%	12.8%	14.0%	13.9%		0.6	0.6	2.3	1.2	(0.1)
ENN Energy		8.4%	8.1%	8.5%	10.0%	9.6%	9.6%		(0.4)	0.5	1.5	(0.4)	(0.0)
CR Gas		9.7%	8.7%	9.3%	10.0%	10.2%	10.3%		(1.0)	0.7	0.7	0.2	0.1
Towngas China		14.1%	15.2%	15.6%	16.8%	16.3%	16.0%		1.1	0.4	1.2	(0.4)	(0.3)
CIMC Enric		9.6%	9.1%	6.3%	5.8%	5.9%	6.1%		(0.5)	(2.8)	(0.5)	0.1	0.2
Beijing Enterprise Water		16.9%	20.1%	18.2%	16.0%	16.2%	17.7%		3.2	(1.9)	(2.2)	0.3	1.5
CT Environmental		46.3%	38.9%	34.3%	30.9%	35.4%	35.4%		(7.4)	(4.6)	(3.4)	4.5	(0.0)
Guangdong Investment		40.7%	41.5%	45.8%	42.4%	39.9%	39.8%		0.9	4.3	(3.4)	(2.4)	(0.1)
Canvest Environment Protection		33.6%	24.1%	23.0%	30.0%	26.1%	29.9%		(9.5)	(1.1)	7.0	(3.9)	3.8
China Everbright Int'l		24.9%	26.8%	24.4%	21.5%	21.4%	25.7%		1.9	(2.4)	(3.0)	(0.1)	4.3

Source: Companies, Daiwa forecasts

Time to start cleaning up

Expenses on environmental clean-up in China set to double

We expect China to invest CNY9tn in environmental protection under the 13th FYP (2016-20), doubling from CNY4.5tn under the 12th FYP (2011-15), given that the country is in the process of raising its environmental protection expenditure contribution as a percentage of GDP. Accordingly, we forecast China's environmental protection expenditure contribution to GDP to rise to 2% by 2017 and to 2.3% by 2020. In particular, investment in its 3 areas of focus, namely air, water and soil pollution prevention, should bring substantial demand growth opportunities to the gas distribution, wastewater treatment (WWT), and solid waste treatment sectors in China.

China Environmental Sector outlook during 13th FYP

	Gas	Water	Waste
Outlook summary	✓✓	✓✓	✓
	<ul style="list-style-type: none"> Margin to remain stable as margin cuts offset by gas cost reduction Becoming good yield play with positive FCF and increasing payout ratio 	<ul style="list-style-type: none"> High EPS CAGR with limited tariff risk Potential market consolidation favours existing market leaders 	<ul style="list-style-type: none"> Negative-sum competition in existing markets Diversification is key to further earning growth
Key forecasts	<ul style="list-style-type: none"> 219/330bcm annual consumption by 2016E/2020E 20-25% gas cost reduction from upstream supply open-up (2015-18E) 	<ul style="list-style-type: none"> 3-4% WWT capacity CAGR during 13th FYP Eliminate the below-Grade V surface water and below-Grade III treated wastewater Over 60% of treated wastewater achieve Grade I-A or above (or 100% for focus water resources area), and 10% of treated wastewater achieve special discharge standard 	<ul style="list-style-type: none"> WTE/MSWT volume proportion increase from 40% currently to 55% by 2020E 16% urban WTE capacity 2015-20E CAGR to 570ktpd, over c.30% urban WTE capacity 2014-18E CAGR due to un-fulfilled 2015 WTE capacity target
Estimated 13th FYP investment (CNYtn)	Gas: 0.56 Other means of air pollution investment: 1.28 (Total: 1.84)	Water pollution: 3.00 Water infrastructure: 1.50 (Total: 4.50)	WTE: 0.15 HWT: 0.25 Other waste treatment: 0.10 Soil pollution: 1.65 (Total: 2.15)
Operation trends			
Tariff	✘	✓✓	✘
	<ul style="list-style-type: none"> Distribution margin cuts proposed by provincial governments 	<ul style="list-style-type: none"> Discharge standard upgrades Favourable government tax policy 	<ul style="list-style-type: none"> Potential tariff upside from FB-MG upgrades Deteriorating waste treatment fees
Volume / capacity	✓	✓✓	✓
	<ul style="list-style-type: none"> Oil price stabilises Oil/coal-to-gas conversion in industry and transport Gas-fired utilities Weak industrial production 	<ul style="list-style-type: none"> Expansion of PPP projects Raising IWWT and sludge treatment penetration Consolidation of industry Saturating MWWT treatment penetration 	<ul style="list-style-type: none"> Increasing WTE rate vs. landfill More focused on HWT
Cost	✓✓	✘	✘
	<ul style="list-style-type: none"> Market reform set to reduce gas and transmission costs 	<ul style="list-style-type: none"> Higher capex required for discharge standard upgrades 	<ul style="list-style-type: none"> Higher capex required for technological upgrades
Financials	✓✓✓	✓✓	✓✓
	<ul style="list-style-type: none"> Most companies reaching positive FCF by 2017E Stable yield play with increasing payout 	<ul style="list-style-type: none"> New financing methods e.g. green bonds and private water fund 	<ul style="list-style-type: none"> Strong balance sheets (50-60% net gearing) supporting capacity growth New financing methods e.g. green bonds
Valuation (cash-based) (2016E → 2018E)			
PER	✓✓ 13.2 → 10.6	✓✓ 18.7 → 11.8	✓ 20.9 → 14.3
2015-18E EPS CAGR	13%	25%	21%
2016E PEG	1.0	0.7	1.0
PBR	2.5 → 1.9	2.7 → 2.0	2.1 → 1.6
RoE	20% → 19%	15% → 18%	10% → 12%
FCF yield	4.2% → 8.1%	-7.6% → -0.7%	3.0% → -1.8%
Dividend yield	1.9% → 2.9%	2.3% → 3.4%	1.9% → 2.9%
Stock ideas			
Top Buy	ENN Energy (2688 HK) China Gas (384 HK)	Beijing Enterprise Water (371 HK) CT Environmental (1363 HK)	Canvast Environment Protection (1381 HK)

Source: Companies, Daiwa research

CNY9tn investment during the 13th FYP

China's environmental investment as % of GDP is catching up to the world average

Since China entered the reform and openness era starting in 1978, serious pollution problems have accumulated alongside the growth in wealth of the country. While China is currently undergoing an economic restructuring process, the government has also put more effort on environmental protection, aiming to tackle the pollution inherited from the past development. Particularly, the central government has been focusing on prevention of air pollution, water pollution and soil pollution.

Theoretically, a developing country should have a trajectory of an increasing environmental protection investment ratio to GDP during its rapid economic growth period, and then settle at c.3% when economic growth plateaus. For example, the EU is currently spending 2.6% of its total GDP on environmental protection.

During the 12th FYP period, on our estimates, China spent CNY4.5tn on environmental protection, including CNY1tn on air, CNY1.2tn/CNY1.5tn on water pollution prevention and water infrastructure, CNY0.7tn on waste and CNY0.1tn on soil pollution prevention. This accounts for 1.5% of the national GDP, which is well below the 2.5% standard for developed countries. Under the 13th FYP, we expect China to expand its total environmental protection investment and raise the ratio to GDP to 2.0% by 2017 and 2.3% by 2020.

China: environmental protection investment



Source: WIND, Daiwa Research

Major environmental growth drivers for the 13th FYP

Area	Investment themes	Key points	Potential positive impacts
Raising existing standards / targets			
Air	National V vehicle emission standard	25-28%/82% decrease in NOx /PM emission limit	Demand for vehicle gas / NGV station construction
Air	Ultra-low emission for coal-fired power units	50%/30%/50% decrease in dust /SO ₂ /NOx emission limit	Demand for gas-fired power utilities
Air	Size of industrial coal-fired boilers	10t/h or above (currently only 33% of the boilers meet the standard)	Demand for industrial coal-to-gas conversion
Water	Waste water discharge standard	60% for Grade IA or above (currently 19%)	Upside potential for MWWT tariff
Water	Waterbodies	Eliminate Grade V or below surface water, and eliminate Grade III or below treated wastewater to be discharged to river	MWWT river-clean up and waterbody restoration opportunities
Water	Sludge treatment penetration target	90% for county-or-above cities by 2020	Project opportunities for WWT/ WTE operators
Expanding into new issues			
Air	VOCs emission reduction	VOC discharge fee; newly added in 13th FYP pollution prevention targets	Refinery oil upgrades, metering equipment market
Air	PM10 emission reduction	Newly added in 13th FYP pollution prevention targets	Demand for industrial coal-to-gas conversion
Water	River, lake and reservoir clean up	Cleaning 1,880 black and odorous water bodies nationwide	MWWT PPP opportunities
Water	Sponge city	A 3-year CNY400- 600m subsidy pa per city for building integrated city environmental water systems	MWWT PPP opportunities
Soil	Soil restoration	Target 90% safe utilisation rate of polluted farmland by 2020	Demand for soil restoration / pollution detection equipment
Soil	Hazardous waste treatment	50-60% HWT penetration during 13th FYP, up from c.30% currently	HWT project opportunities
Government financial / reform policies			
Air	National carbon allowance market	Target to launch by 2017E, focus on heavy-polluting industries e.g. power, steel, petrochemical	Demand for coal-to-gas conversion / gas-fired utilities
Water	Water resource tax	Tax exemption for recycled and reclaimed water; higher rates for heavy users	IWWT, MWWT and water reclamation penetration
New financing methods			
Overall	Green bond	Debt financing dedicated for environmental friendly projects	Financing for various environmental projects
Water	Water fund	Off-balance-sheet financing of new projects supported by independent second parties	MWWT PPP opportunities for market leaders
Soil	Soil restoration fund	Potentially sparing 10% return from land usage for soil restoration	Financing for soil restoration capacity expansion

Source: Daiwa research

We see 4 major growth drivers for the overall environmental sector in China during the 13th FYP, namely higher standards, wider coverage into new issue areas, government financial policies and new financing methods.

1. Higher discharge standards: new growth under maturing penetration

Standards for pollutant emission by various industries are likely to be tightened under the 13th FYP. For example, we expect a 30% stricter nitrogen oxide (NO) and fine particulate matter (PM2.5) emission requirement for the National VI vehicle emissions standard than for the National V standard, which is even stricter than EU standards. Also, the Water Pollution Prevention Action Plan requires that municipal wastewater discharge along the focus water resource areas achieve a 100% Grade IA discharge standard by 2018, and all newly-constructed municipal wastewater achieve a Grade IA discharge standard starting June 2016.

Not only treatment capacity growth, but also higher discharge standards

The tightening of pollution standards is likely to bring new revenue growth drivers for the maturing market. For the gas sector, the stricter vehicle emissions standards mean more room for gas consumption growth for the NGV market, which we believe should benefit **ENN** and **CGHL**, the two gas distributors which have the largest exposure to vehicle gas sales. As for the water sector, higher discharge standards provide room for upward revisions to waste water treatment tariffs, despite a currently high treatment rate of over 87%. **BEW** is likely to benefit from the higher tariffs, as well as higher technological requirements and should help consolidate the overall WWT market.

2. Wider environmental issue coverage: less competitive markets

Besides tightening existing standards, the 13th FYP for environmental protection will also expand the government supervision coverage into some previously neglected areas.

More target pollutants to be controlled

For example, the Ministry of Environmental Protection's (MEP) air pollution reduction targets will add several new types of air pollutants as focused indicators, such as PM10 and volatile organic compounds (VOCs). We also expect sludge treatment and HWT to be the new focuses for the water and solid waste treatment sectors, respectively.

For the environmental sector as a whole, the government has also begun to focus its efforts on cleaning up polluted areas, in addition to reducing sources of pollution. We estimate that clean-up projects for rivers, lakes and reservoirs is likely to trigger a CNY700bn investment during the 13th FYP, accounting for 23% of the total estimated investment for the CNY3tn water pollution prevention. Moreover, as shown by the aggressive targets in the Soil Pollution Prevention Plan published in May 2016 (90% safety utilisation rate of polluted farmland), we see the soil restoration projects, which we estimate to account for CNY1.65tn, to be the major investment area in the solid-waste treatment sector (CNY2.15tn) during the 13th FYP.

The new policy focuses will help open new markets for the gas, water and solid waste sectors in China. This will be particularly positive for the water and solid waste sectors, as the competition in existing markets eg, MWWT and MSW treatment, is fierce. Companies that have first mover advantage in these new markets are likely to benefit the most. In particular, we are positive on **CTE** amid its technological ability and special expertise in the sludge treatment and HWT market.

3. Stronger government financial policies and enforcement

Besides the hard targets and standards, the central government also aims to implement both punitive and rewarding financial policies in order to support environmental protection.

Financing means, such as subsidies and taxes, to promote environmental awareness

For example, in order to support waste water recycling, recycled water from wastewater and reclaimed water are exempt from the new water resource taxes, whereas users of underground water, special industries, and heavy users need to pay a higher tax rate. Furthermore, the NDRC targets to establish the national carbon allowance trading market by 2017, which will also help reduce air pollution from heavy industries and power plants, as they have greater economic incentive to switch from using coal to cleaner fuels such as natural gas.

Monitoring, inspection and tax policies are the key to achieve full compliance of the environmental law and target for the 13th FYP

We expect the government to also strengthen the enforcement of all the above policies in order to ensure that the environmental targets will be met. In our view, one of the major reasons some environmental protection targets under the 12th FYP were missed, such as sludge treatment penetration and 3rd party IWWT, was the lack of enforcement of environmental law. Currently, the local environmental protection department reports to the municipal government, which could create a conflict of interest if the municipal government prioritises GDP growth over environmental protection. Hence, the central government decided in 2015 to implement a restructuring under which the local environmental protection department would report directly to the Environmental Protection Bureau of the central government, with stronger enforcement such as real-time nation-wide data monitoring and frequent on-site inspections. In Guangdong, we saw stronger enforcement during the 12th FYP period given its monitoring and inspection system is well implemented.

Real-time monitoring of discharge from a WTE plant in Guangdong



Source: Daiwa

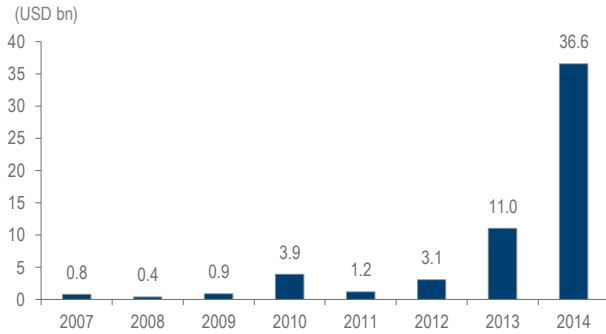
4. New financing methods: accelerating overall growth

The environmental sector has developed new financing methods to seize the public-private-partnership (PPP) project opportunities pushed by the government since 2015. In September 2015, the State Council issued the Ecological Civilization System Reform Plan, encouraging the setting up of the green financial system. Among the various financing methods, we believe the green bonds and green investment funds are the two most promising ideas that will help accelerate investment growth of the environmental sector.

Significant investment needs sustainable financing

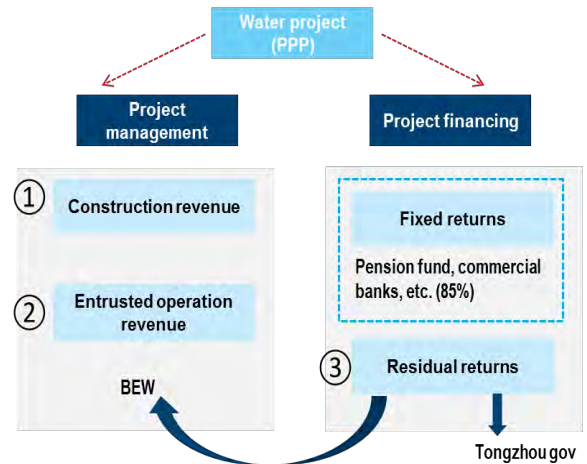
Among our covered companies, **BEW** is cooperating with investment funds to develop a new model for the off-balance-sheet financing of new projects. At the average project return of 8%, we estimate BEW would see about a 20% equity IRR from this fund. We expect the model to help expand BEW's business without constraining its financial capabilities, and believe it could help BEW seize more PPP project opportunities, which involve significant engineering procurement construction (EPC) capex.

Growth in green bond issuance globally



Source: Climate Bonds Initiative

BEW: water investment fund model



Source: Company, Daiwa

China environmental investment during 13th FYP – Daiwa estimates based on the most updated information

Area	(CNYbn)	% to total
Air pollution	1,844	20%
Restructuring energy mix	284	15%
Reducing vehicle emission	1,407	76%
Reducing industrial emission	92	5%
Surface pollution treatment	62	3%
Water pollution	3,005	33%
Wastewater treatment and reclamation	450	15%
Rivers, lakes, reservoirs pollution control and prevention	700	23%
Water supply penetration and upgrade for cities, towns, counties	450	15%
Desalination	50	2%
Sponge city & others	815	27%
Water infrastructure	1,501	17%
Soil pollution	2,150	24%
Soil restoration	1,650	77%
Solid waste treatment	500	23%
Other environmental issues (Energy savings/Energy efficiency)	500	6%
Total	9,000	100%

Source: Daiwa research, Clean Air Alliance of China

Sector views

China Gas for 13th FYP Steady gas sales volume growth, unit-dollar margin intact for better gas source management

Gas: stable double-digit demand growth with limited margin risk

Steady demand growth on multiple drivers: On our estimates, the government targets the contribution of gas in the national primary energy mix and national gas consumption volume to be revised down to 10% and 330bcm respectively (from 12% and 360bcm) when finalising the 13th FYP target, given the gas market slowdown in 2015. That said, the revised target still means an 11% 2015-20E CAGR for national gas consumption volume, which we believe is sufficient to support our forecast 14% 2015-18 EPS CAGR for the gas distributors. We see the major demand growth drivers coming from 3 segments, namely gas-fired power generation, coal-to-gas conversion in the industrial sector, and the natural gas vehicle market. **CGHL** is our preferred stock to capture the new demand, due to its focus on established industrial projects in the Northern provinces.

Supply-side reform favours cost reductions to maintain margins; select players which are more prepared for liberalisation amid tariff cut:

On the supply side, we expect the gas market reform to help maintain the unit dollar margins of the gas distributors at steady levels over the 13th FYP period. Unit gas costs are likely to decrease due to the opening up of upstream gas sources and the price liberalisation reforms, despite a likely slight short-term margin squeeze brought by the city-gate tariff reform. We think **ENN** is the most leveraged play to capture the cost reduction opportunities amid its active participation in LNG imports and the SHPGX.

Nationwide cuts in distribution margins or a cap on distributors' returns are unlikely, given the central government's objectives to increase natural gas penetration and consumption. Although some provinces still face the risk of provincial margin cuts, the overall gross profit impact on gas distributors would not be significant, on our estimates.

China: growth drivers for the gas sector (2016-20E)

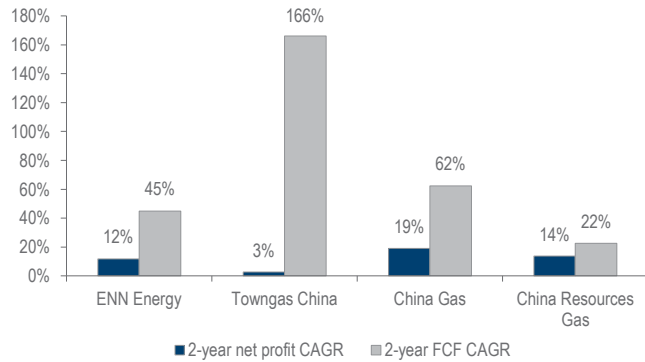
Demand-side				
	Key government policies	Estimated incremental annual gas demand created by 2020E (bcm)	Key success factors	Predicted beneficiaries
Gas-fired power generation	Tariff subsidies; ultra-low emission requirement for coal-fired units;	31.1	Presence in big cities in the North	CGHL, BEH
Coal-to-gas conversion for industrial and heating boilers	Forced close down of small boilers; capex subsidy for conversion	63.8	Well-established industrial projects	CGHL, ENN, TCCL
Natural gas vehicle / vessels	Financial subsidies; 50% vehicle tax cut	24.7	Gas station network in tier-1 and 2 cities / coastal areas	ENN, CGHL, CRG
Supply-side				
	Key government policies	Estimated % gas cost reduction for gas distributors	Key success factors	Predicted beneficiaries
Opening up upstream supply	Opening up LNG terminals and pipelines	20-25%	First-mover advantage in accessing LNG terminal	ENN, CRG, CGHL
Price liberalisation	SHPGX	2-7%	Coastal exposure	ENN, TCCL, CRG
Reforming city-gate tariff	Targeting to unify non-residential and residential tariffs	Mixed	Minimum residential exposure	n.a.

Source: Daiwa estimates

DPS should rise from current low payout on rising FCF; focus on FCF growth instead of net profit growth

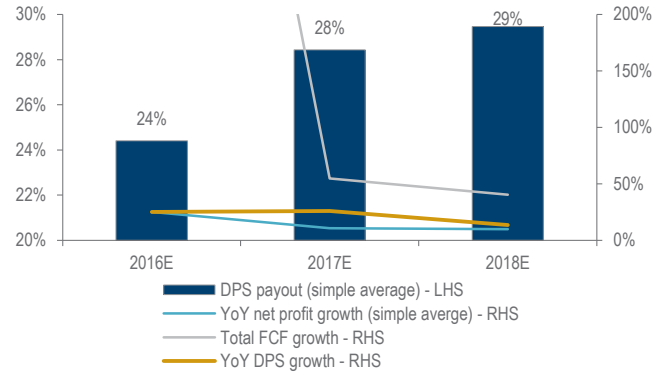
We believe all our covered China gas distributors have completed their major capex phase for pipe-laying, etc, and forecast their FCF to rise at a CAGR of c.180% over 2016-18, along with the rising gas penetration rate from 41-54% currently to over 70% in the very long term.

2016-18E net profit and FCF CAGR



Source: Daiwa forecasts

China gas distributors: DPS payout, YoY net profit and YoY FCF growth



Source: Company, Daiwa forecasts

Note: YoY DPS growth will be faster than net profit growth on a) rising FCF and b) rising payout ratio

China Water for 13th FYP Discharge standard upgrades, city-water projects supported by water-fund, less-penetrated area such as IWWT and sludge, and finally waterbody restoration and river clean-up

Pure MWWT won't ensure a good investment return

Water: focus on PPP and more innovative financing to keep funding and return

We expect CNY4.5tn investment in the water sector (CNY3tn in water pollution prevention) in China during the 13th FYP, which accounts for c.50% of the environmental investment, mainly focusing on capacity upgrade, IWWT, sludge treatment, river clean-up and water conservation projects such as sponge cities and water reclamation projects, apart from the aging water pipeline replacement programme and flood-prevention infrastructure investment. In particular, we see the stricter treatment standards as one of the biggest positive drivers, leading to potential tariff upside for the WWT companies. Also, existing market leaders would benefit from the new financial methods to capture the large project opportunities from the PPP models.

Discharge standard upgrades and capacity expansion remain the main earnings drivers.

We estimate CNY175-180bn in investment demand for MWWT upgrade projects, or investment of above-Grade IA water plants, during the 13th FYP, driven by around 38mtpd of upgrade needs to existing standards, and 50-62mtpd of new capacity targeting new discharge standards (Grade I-A and Super-discharge [equivalent surface water level IV]). As demand growth for new WWT capacity is slowing down (from 21%, 19%, and 6% CAGRs in 10th FYP, 11th FYP, 2010-14, respectively, to 3-4% in 13th FYP on our forecasts), the focus of the 13th FYP is likely to shift to improving water quality in 1-2nd tier cities. We estimate that the acceleration of the Grade I-A upgrades would lead to a 2-4% earnings improvement in 2020, and create more M&A opportunities for market leaders like **BEW** and **CTE**.

Policy drives. Under the PPP model advocated by the central government, social capital will be streamed into the development of environmental infrastructure, which will create more investment opportunities for water operators. Since such projects are large in scale (the investment per project is typically more than CNY500m), and the long payment terms increase the financial burden of the water asset operators, smaller water companies are not in a position to bid on them. We prefer large-scale water operators, like **BEW**, as they are equipped with the financial capability to take on the opportunities of city-water PPP projects.

Cherry-pick players for more resilient returns. While we expect MWWT project returns to drop from 10-12% (12th FYP) to 7-8% (13th FYP), the development of new methods of financing such as green bonds and water funds should help establish a more sustainable business model for water companies over next 5 years. We believe **BEW**, as a pioneer in setting up its water investment fund, is the most scalable company in capturing the PPP project opportunities and should be the biggest winner of market consolidation. We also see strong entry barriers for 3rd party IWWT, in which we believe **CTE** should continue to enjoy over a 15% project IRR.

China: growth drivers for the water sector (2016-20E)

	Key government policies	Our comments	Key success factors	Potential beneficiaries
Discharge standard upgrade		Upside on tariffs	Local government enforcement	Various
City-water PPP project / sponge-city	Further notice about PPP demonstration project implementation (June 2015)	Opportunities for large projects	Strong financial capability	Various
Sludge treatment	Notice about Strengthening Inspection on Sludge Treatment in City Waste Water Treatment Facilities (April 2016)	China: low treatment rate with 70% abandon rate	Recover the value in the sludge; negotiation with government	BEW, CTE
New financing methods	Ecological Civilization System Reform Plan (Sep 2015)	Helps quality WWT companies seize PPP projects	Company scale, SOE background	BEW, CEI
Water resources tax	Resource tax reform (May 2016)	Encourage high-standard WWT and water reclamation		Various
Improve surface water quality	Water pollution prevention plan (April 2015); Water quality improvement list during 13FYP period (June 2016)	Diversification opportunities for WWT companies	Synergy with existing business	CTE, BEW

Source: Daiwa estimates

China Waste for 13th FYP
Staying coastal and/or diversification to other less-penetrated solid waste areas, such as HWT and industrial waste, would be the key to maintain investment returns

WTE, starting to move inland, won't ensure a good investment return

Waste: diversified into various streams

We see there is a solid foundation for long-term growth in the urban WTE market. We expect the proportion of WTE to municipal solid waste (MSW) treatment volume to increase from 40% currently to 55% by 2020, and we forecast steady urban WTE capacity expansion, at a CAGR of 16% over 2015-20, from 276ktpd (12th FYP target) to 570ktpd (our estimate). Given China only has 186ktpd of WTE plants, which is why we think the country missed the 12th FYP target, and needs to catch up during the initial stage of the 13th FYP, we see a 30% capacity CAGR in 2014-18 as likely, which should enable the major WTE operators (like CEI and Canvest) register a decent 20-30% CAGR on WTE operating capacity.

Name of the game: staying coastal to maintain returns. However, as new project opportunities are moving inland, and competition has become fiercer, we note that there has been a downward trend in average waste treatment fees for newly signed WTE projects, from CNY80-100/tonne in the 2000s to CNY60 recently. Some cities even have reported extremely low contracted prices of below CNY30/tonne. The equity IRR for these projects may drop below 10%, which is lower than the typical range of 12-15% for coastal WTE projects. Therefore, we believe staying in coastal developed regions is the key for a higher 12-15% IRR (inland: 8-10%). Thus, we believe **Canvest's** quality portfolio in terms of technological advancement is likely to help maintain its treatment fee premium which ensures its projects are profitable after they commence operations.

Diversifying under fiercer competition: We observed that the competition for quality greenfield projects has become fiercer since the start of 2015, as some companies have tended to expand their capacity at the expense of ROE, by offering extremely low waste-treatment fees. Relying on the experience accumulated in the WTE industry, some WTE operators are expanding into other related fields, seeking a new driver for earnings growth. For example, **CEI** has 15 total HWT projects in Jiangsu and Shandong provinces, and is planning to dispose of all of its HWT projects as part of its greentech business spin-off.

China: growth drivers for the WTE sector (2016-20E)

Growth drivers	Key government policies	Our comments	Key success factors	Potential beneficiaries
Existing MSW market				
MSW capacity expansion	Raising % of incineration as to total waste treatment volume	Intensifying competition and falling tariffs; only avg. 10% equity IRR	Projects in coastal provinces with large scales are better in profitability	/
FB-MG upgrade	/	Relatively niche; 12-15% IRR	Technology edge, flexible strategy in selecting projects	Canvest
Diversifying into new areas				
HWT	National hazardous waste list (June 2016)	Highly fragmented, and low centralization	High technology barrier, and need to have HWT permission	CTE, CEI
Biomass	Local government allowance	Dominated by SOEs, profitability status varies	Good management	CEI
Soil pollution restoration	Soil Pollution Prevention Plan	Undeveloped, but huge long-term market potential	First-mover advantage	CTE, CEI

Source: Daiwa estimates

Top stock ideas

Five stocks on our conviction buy list, ranked by upside

Gas: prefer good geographical exposure to enjoy coal-to-gas conversion demand, or lower gas cost to maintain unit dollar margin

ENN Energy (2688 HK, HKD37.90, Buy [1]). We think management's 16% YoY recurring net profit growth guidance for 2016E is achievable, given the potential we see for ENN's margins to expand due to its cheaper-than-benchmark gas sources from imported LNG and the SHPGX, and its strong organic gas sales volume growth of 15% (total)/10% (retail) in 2016E. In our view, ENN's strong presence in the coastal regions, especially those with developed LNG import facilities, gives the company first-mover advantage in sourcing cheaper natural gas (vs. peers).

China Gas (384 HK, HKD12.38, Buy [1]). We see China Gas as the major beneficiary of the ongoing coal-to-gas conversion initiatives in China, amid its strong industrial exposure in the northern provinces. This northern China exposure also gives China Gas the opportunity to develop a gas-fired utility business, once the gas market reform opens the market to the direct supply of natural gas to power plants and large-scale heating centres.

Water: prefer large SOEs that are ready to transform themselves into city-water operators financed by 3rd party water funds, or players focused on underpenetrated IWWT with higher entry barriers

Beijing Enterprise Water (371 HK, HKD4.62, Buy [1]). We forecast the company's earnings to rise by 20% YoY for 2016, underpinned by water renovation projects and the new water investment fund model. We expect the model to help expand BEW's business without constraining its financial capabilities, and believe it could help BEW seize more PPP project opportunities over the 13th FYP period, which would involve significant EPC capex.

CT Environmental (1363 HK, HKD2.33, Buy [1]). For 2016-18, the company plans to add 1,508tpd of industrial solid waste capacity (an 80% rise from current capacity), and has just commissioned a new vessel and port wastewater treatment in Nansha, and 600tpd of WTE capacity. We forecast the gross profit contribution from CTE's non-IWWT business to rise from 51% for 2015 to 74% in 2018, with CTE successfully diversifying its environmental-protection businesses from the risk of a potential industrial downturn.

Waste: companies staying in coastal areas should be the winners

Canvest Environment Protection (1381 HK, HKD3.54, Buy [1]). In our view, Canvest's focus on FB-MG upgrade projects in the coastal provinces will give it solid project returns. We note that the projects secured by Canvest have a waste treatment fee of CNY80-110/tonne, which ensures the profitability of the projects after they enter the operating stage. The company maintains benchmark equity IRR of 12-15% in selecting projects, higher than its listed competitors (CEI: >10%), by keeping its new projects in the economically developed coastal regions.

Valuation

We believe the China Gas Sector is a good yield play, as we view its valuation as attractive, trading at an average 2.5x 2016E PBR and 20% average 2016E ROE, as well as the positive cash flow we expect all of our covered pure gas distributors to see starting in 2017. We also forecast the average dividend yields for the gas distributors to increase from 1.9% in 2016 to 2.9% in 2018, due to higher FCF as well as higher payout ratios.

As for the water/waste treatment operators, despite a rich-looking valuation at 2.0-3.7x PBR for a 14-21% ROE, we expect strong EPS growth for the well-positioned companies given regulatory support and the overall investment boom.

Gas: attractive PBR, sustainable DPS growth on rising FCF

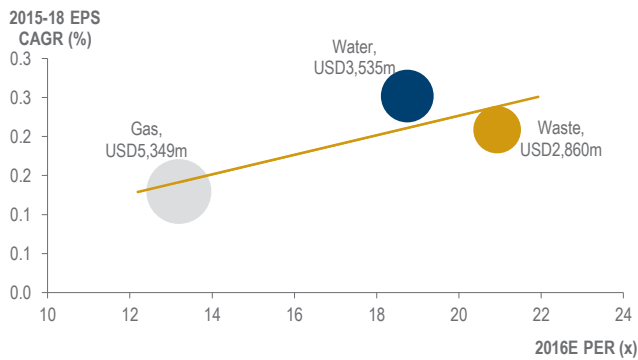
Waste: rich PBR, but EPS growth to accelerate with more significant investment

Valuation table

	Market cap (USDm)	PER (x)		PBR (x)		ROE (%)		EPS CAGR (%)	FCF yield (%)		Dividend yield (%)		
		2016E	2017E	2016E	2017E	2016E	2017E	2015-18E	2016E	2017E	2016E	2017E	
Gas													
ENN Energy	2688 HK	5,259	11.0	10.1	2.2	1.9	22%	20%	12%	4.6%	6.3%	2.0%	3.5%
China Resources Gas	1193 HK	6,621	15.1	13.4	2.6	2.3	18%	18%	13%	4.8%	3.6%	1.6%	1.9%
China Gas	384 HK	7,847	13.6	11.9	2.9	2.5	24%	24%	16%	4.1%	3.3%	2.0%	2.4%
Towngas China	1083 HK	1,670	10.7	10.3	0.9	0.8	9%	8%	2%	1.3%	7.6%	2.2%	2.3%
Simple average		5,349	12.6	11.4	2.2	1.9	18%	17.7%	11%	3.7%	5.2%	1.9%	2.5%
Weighted average		13.2	11.8	2.5	2.2	2.0%	20%	13%	4.2%	4.5%	1.9%	2.5%	
Water													
Beijing Enterprises Water	371 HK	5,172	14.0	11.5	2.3	2.0	17%	19%	20%	-8.7%	-6.4%	2.7%	3.3%
CT Environmental Group	1363 HK	1,897	18.6	15.0	3.7	3.1	21%	22%	24%	-4.6%	5.2%	1.4%	1.8%
Simple average		3,535	16.3	13.2	3.0	2.6	19%	21%	22%	-6.6%	-0.6%	2.0%	2.5%
Weighted average		15.2	12.4	2.7	2.3	18%	20%	21%	-7.6%	-3.3%	2.3%	2.9%	
Waste													
Canvest Environment Protection Group	1381 HK	931	17.4	12.4	2.5	2.2	16%	19%	35%	-11.4%	-7.3%	0.9%	1.6%
China Everbright International	257 HK	4,789	14.6	10.8	2.0	1.7	14%	17%	22%	5.8%	-11.5%	2.1%	2.8%
Simple average		2,860	16.0	11.6	2.3	1.9	15%	18%	28%	-2.8%	-9.4%	1.5%	2.2%
Weighted average		15.0	11.1	2.1	1.8	14%	17%	24%	3.0%	-10.8%	1.9%	2.6%	
Cash-based													
Water													
Beijing Enterprises Water	371 HK	5,172	18.2	14.2			13%	15%	24%				
CT Environmental Group	1363 HK	1,897	20.1	15.0			20%	22%	28%				
Simple average		3,535	19.2	14.6			16%	19%	26%				
Weighted average		18.7	14.4				15%	17%	25%				
Waste													
Canvest Environment Protection Group	1381 HK	931	20.6	15.9			13%	15%	35%				
China Everbright International	257 HK	4,789	21.0	16.0			10%	11%	18%				
Simple average		2,860	20.8	16.0			12%	13%	26%				
Weighted average		20.9	16.0				10%	12%	21%				

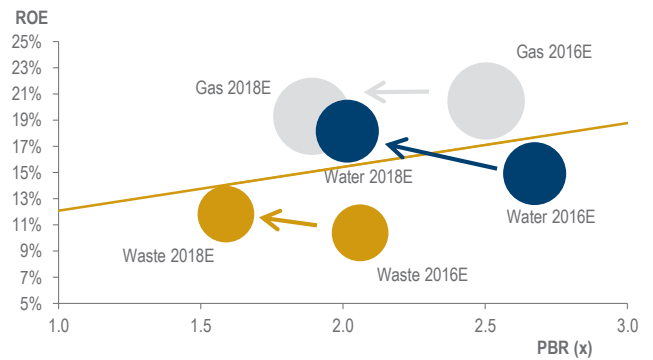
Source: Bloomberg, Daiwa forecast

2016E PER vs. 2015-18E EPS CAGR (sector weighted average)



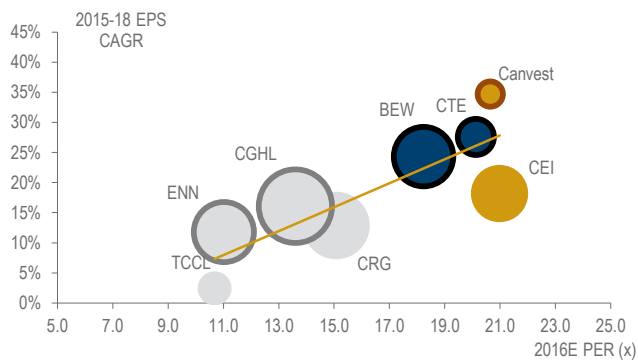
Source: Bloomberg, Daiwa forecast
Note: Cash EPS and PER

2016E PBR vs. 2016E ROE (sector weighted average)



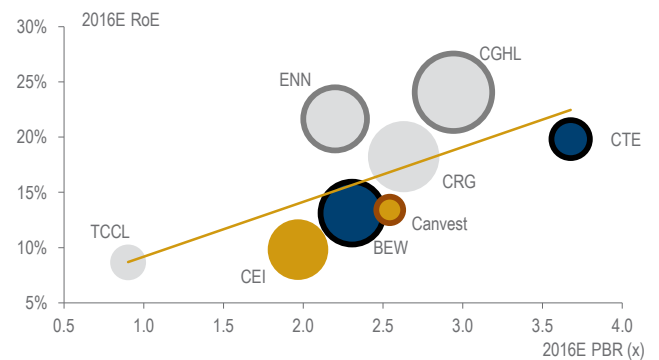
Source: Bloomberg, Daiwa forecast
Note: Cash RoE

2016E PER vs. 2015-18E EPS CAGR (companies)



Source: Bloomberg, Daiwa forecasts
Note (1) Cash EPS and PER
(2) bubble size = market cap
(3) Bolded = preferred pick of the sector

PBR vs. ROE (companies)



Source: Bloomberg, Daiwa forecasts
Note (1) Cash RoE
(2) bubble size = market cap
(3) Bolded = preferred pick of the sector

Risks: cherry-pick operators that can maintain returns with fewer risks

We suggest investors cherry-pick companies with higher returns and less risk

Given gas, water and waste treatment are essential public services, they are exposed to regulatory risk, mainly diminishing tariffs and returns. But with a more commercialized mind-set, such as securing lower resources costs such as spot LNG, introducing an innovative financing model such as the water fund, and geographically focusing on wealthy coastal provinces, etc., the outperformers in our China Environmental sector coverage could maintain at least 10-12% project IRR for 2016-20, on our forecasts.

On our risk analysis, we believe MWWT faces the most risk mainly on project returns and finance, followed by inland WTE whose tariffs, and also returns, are deteriorating rapidly. China gas distributors, on the other hand, face tariff risks but this could likely be offset by lower gas costs along the coastal provinces. Therefore, we think it is vital for companies to: 1) stay coastal, or 2) focus on less-penetrated environmental segments (IWWT, HWT, etc).

For a specific risks discussion on the gas, water and waste sectors, please refer to the segment sections in this report.

China environmental (gas, water and waste): risk factors

	Policy		Regulatory		Finance		Risk score
	Sales volume /residential connection	Discharge/emission standard	Tariff	Return	Cash flow	Accounts receivable	
Air - gas	xxx 11% 2015-20E CAGR / flat connection fee assumption Highly correlated with substitute oil products prices and the macro-economy / related to property market Depends on the execution of the coal-to-gas conversion policy China Gas (384 HK) / ENN Energy have lower risk	x 15-25% PM2.5 reduction from the 2012-level by 2017 in focused regions Clean coal technology might reduce the reliance of gas consumption growth to achieve the emission cut target	xxx Zhejiang and Jiangxi have asked for a distribution tariff cut More provinces, with historical high T&D tariffs and weak industrial economic growth, could follow China Gas (384 HK) has less risk	xx 12-15% equity IRR Highly correlated to actual gas sales demand and connection fees Higher risks for the new industrial parks ENN (2688 HK) has less risk	x All major gas distributors have completed the significant capex phase, and turned themselves into positive FCF companies able to distribute more dividends	x Healthy accounts receivable period, with only 15-30 days, given 1-2 months payment period for C&I, pre-pay card for residential, and immediate payment from NGV refuelling	8
Water - MWWT	x Cities' MWWT penetration: from 87% in 2014 to almost 100% in 2020E Capacity target will be fully achieved based on the China's experience	xx 10% special discharge standard, c.60% Grade I-A or above, eliminate below-Grade II WWTP discharge by end-2020, from only a c.30% Grade I-A or above in 2015 Might be delayed in case of weak regulatory monitoring	x Based on the BOT contract, and especially as water tariffs are only c.0.5% of a household's disposable income, there is a minimal risk of a tariff cut for currently operating plants	xx Due to low entry barrier, and abundance of cheap capital without good investment opportunities in China, equity IRRs have dropped from 10-12% in the early 12th FYP period to 9-10% currently. We expect a further drop in equity IRRs during the 13th FYP Individual MWWT projects, especially in inland provinces, are likely to see diminishing returns. Only city-water projects, in the form of PPP financed by the water-fund, are likely to see their equity IRR recover to at least a mid-teen percentage under the 13th FYP	xxx Declining return of capital intensive MWWT towards negative FCF until the end of the 13th FYP period, if they cannot transform themselves into city-water operators financed by water-funds raised externally	xxx Usually takes 4-6 months to receive payment from local governments given the time required for water-supply companies to pass the payment to the governments for audit City-water PPP projects should see more immediate receipt of customers' payments	11
Water - IWWT (third-party)	x Third-party IWWT penetration is set to increase from c.20-25% in 2015 Third-party IWWT capacity is the next growth driver after the MWWT market is fully penetrated	x Minimum discharge standard: Grade I-B or above Market is less penetrated hence more new capacity with better discharge standard to be commissioned	x Based on cost-based mutual negotiations Commercial terms with minimal influence from governments	x Due to high entry barrier and low penetration, equity IRR could remain at a minimum 15% (under 12th FYP) The only uncontrollable risk is an economic slowdown, when the equity IRR could drop to c.10% without at least 70% utilization	xx Compared with MWWT, the project investment is less intensive for IWWT	xxx Usually takes 1-2 months to receive payment Depends on the economic situation; some customers might be illiquid and ask for extended payment periods, but the risk is minimal given that we estimate that the IWWT is usually only 5% of the COGS, which is not material	8
Soil - WTE (coastal)	Xx We forecast a 16% 2015-20E CAGR (or c.30% 2015-18E CAGR in case the 12th FYP target was missed), but inland provinces could see more growth given their lower 20% penetration rate compared with 45% for coastal provinces Project delay for 6-24 months could happen either during preparation phase (site selection and environmental impact assessment) and construction phase (testing), especially in big cities	x Emission standards could be further strengthened to approach Euro 2000 standards, after the new emission standards become effective in 2016	x Due to the limited land or suspension of further approvals for new landfills, we see WTE as the only solution for some economically developed provinces, such as Guangdong, where WTE treatment fees could be maintained at least CNY110/t over the next 3 years In addition, it is easier for regional-dominated players to obtain new WTE projects given local governments have more confidence in the track record of the existing operators	x Return of coastal province usually can be maintained at 12-15% equity IRR, and project delay only affect the return slightly Land cost becomes higher but equity IRR, including land cost, should still be able to be maintained at 12% given a better technology for highly-efficient big-scale projects Cutting of the on-grid WTE electricity tariff is unlikely, given a minimal proportion of total power generation in China	x Compared with MWWT, most of the WTE operators do not have imminent equity financing needs given their gearing is below 80% (MWWT: 150%)	x Usually can receive payment from both grid companies and local governments within 2 months	5
Soil - WTE (inland)	x We forecast a 16% 2015-20E CAGR (or c.30% 2015-18E CAGR in case the 12th FYP target was missed), but inland provinces could see more growth given their lower 20% penetration rate compared with 45% for coastal provinces Site selection of WTE in inland provinces is easier than coastal big-cities, and thus usually projects can be completed on time	x Emission standards could be further strengthened to approach Euro 2000 standards, after the new emission standards become effective in 2016	xxx Project bidding process has focused more on pricing given weaker financials for the inland provinces, and more competition from landfills, so WTE treatment fees have kept declining from CNY50-60/tonne in 2014 to CNY20-30/tonne in 2015-16	xx Since 2014, returns have dropped below a 10% equity IRR with WTE treatment fee falling below CNY20/tonne in 2016, but we believe it should be above 8% in case that a WTE project only has electricity sales revenue	x Compared with MWWT, most of the WTE operators do not have imminent equity financing needs given their gearing is below 80% (MWWT: 150%)	xx Governments from less financially sound inland provinces might delay payment, but electricity revenue should be collected in 2 months	9

Source: Daiwa

Note: the number of "x" denotes what we see as the greater the policy, regulatory and finance risks

Air pollution: gas sector in the sweet spot

Coal-to-gas, coal-to-oil are the keys to cleaning up the air – contributing a 6% reduction in coal consumption, 4% reduction in PM2.5

We are positive on the prospects for the China gas sector, amid the determination of the government to clean up the air across the country, especially in the northern industrial areas. As the government focuses its effort on reducing air pollution by reducing coal consumption, there will be huge opportunities for the development of natural gas, as a clean and efficient substitute for coal. We believe the major future demand growth drivers in the China gas sector include: 1) the development of gas-fired power generation, 2) the coal-to-gas initiatives for industrial boilers, and 3) the increasing popularity of natural gas vehicles (NGVs).

In total we expect these demand growth drivers to create c.120bcm additional annual gas demand in China, which will account for 86% of the 140bcm national gas consumption volume growth. This will contribute to a 6% reduction in total coal consumption and 4% reduction in PM2.5 in China, on our estimates.

We also see positive supply catalysts such as the opening up of LNG imports, as well as the likely coming price liberalisation in the China upstream gas sector. We believe these will improve gas supply availability and lead to more competitive pricing of gas to competing fuels, and thus reinforce the demand growth of natural gas over other forms of energy.

China: growth drivers for the gas sector (2016-20E)

Demand-side				
	Key government policies	Estimated incremental annual gas demand created by 2020E (bcm)	Key success factors	Predicted beneficiaries
Gas-fired power generation	Tariff subsidies; ultra-low emission requirement for coal-fired units;	31.1	Presence in big cities in the North	CGHL, BEH
Coal-to-gas conversion for industrial and heating boilers	Forced close down of small boilers; capex subsidy for conversion	63.8	Well-established industrial projects	CGHL, ENN, TCCL
Natural gas vehicle / vessels	Financial subsidies; 50% vehicle tax cut	24.7	Gas station network in tier-1 and 2 cities / coastal areas	ENN, CGHL, CRG
Supply-side				
	Key government policies	Estimated % gas cost reduction for gas distributors	Key success factors	Predicted beneficiaries
Opening up upstream supply	Opening up LNG terminals and pipelines	20-25%	First-mover advantage in accessing LNG terminal	ENN, CRG, CGHL
Price liberalisation	SHPGX	2-7%	Coastal exposure	ENN, TCCL, CRG
Reforming city-gate tariff	Targeting to unify non-residential and residential tariffs	Mixed	Minimum residential exposure	n.a.

Source: Daiwa estimates

Air pollution: still a long way to go

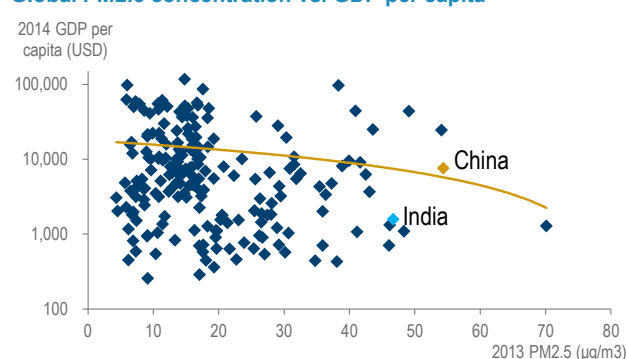
China has long been plagued by serious air pollution problems, and some of its big cities such as Beijing and Shanghai often appear in news headlines for their severe smog problems. According to the World Development Indicator, China ranked second globally in terms of PM2.5 concentration in 2013, signifying that its average air quality is far lower than other developing countries such as India, not to mention developed countries.

Global PM2.5 concentration ranking

Ranking	Country	Average PM2.5 concentration 2013 (µg/m ³)
1	Mauritania	70.1
2	China	54.4
3	Saudi Arabia	54.1
4	Kuwait	49.1
5	Bangladesh	48.4
6	India	46.7
7	Pakistan	46.2
8	Nepal	46.1
9	Bahrain	43.6
10	Cabo Verde	43.1

Source: World Development Indicator

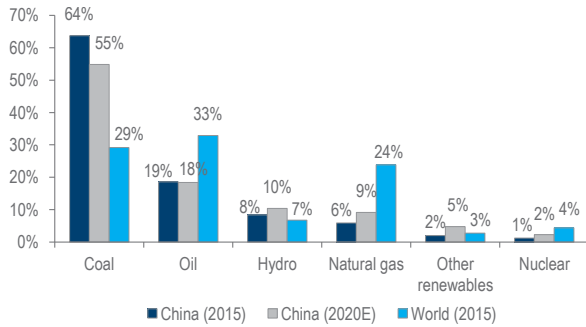
Global PM2.5 concentration vs. GDP per capita



Source: World Development Indicator

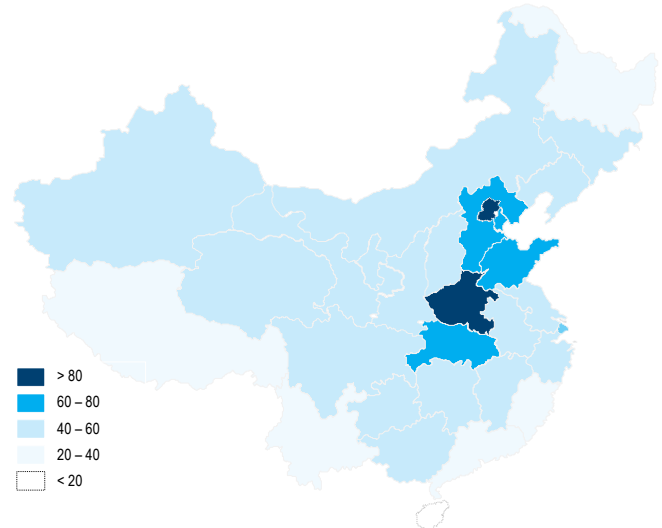
Within China, the areas with the most severe air pollution and smog problems include the Henan, Beijing-Tianjin-Hebei (BTH) areas and Shandong, which are mainly northern provinces with intense industrial activities. Smog is also common in the densely populated areas along the coast such as the Yangtze-River Delta and Pearl River Delta.

China: primary energy mix



Source: BP, Daiwa forecasts

China: PM2.5 concentration by province (2015)



Source: Greenpeace

Coal consumption, industrial activities and vehicle emissions have been polluting the air in China

Besides PM2.5, big cities in China also have high levels of other traditional air pollutants such as SO₂ and NO_x. In the past 1-2 years, the problem of VOCs also emerged, and the reduction in VOC has become the new focus of the government's air pollution prevention plan.

China: pollutant emission volume and breakdown (2014)

Pollutant	Breakdown by source	(mn ton)	(%)
SO ₂	Total	19.7	100%
	Industrial	17.4	88%
	City & households	2.3	12%
	Others	0.0	0%
NO	Total	20.8	100%
	Industrial	14.0	68%
	Vehicle	6.3	30%
	City & households	0.5	2%
Dust	Total	17.4	100%
	Industrial	14.6	84%
	City & households	2.3	13%
	Vehicle	0.6	3%
	Others	0.0	0%

Source: MEP

The reasons for the severe air pollution in China can be attributable to 3 major factors. First, China is still a developing country with c.40% of GDP attributable to secondary industries such as steel and petrochemical. These industries require large amount of energy, which is mostly generated by combustion of hydrocarbon fuels. Second, given the low cost and abundant domestic supply, coal remains the major source of primary energy in China, accounting for 64% of energy consumption in 2015 and 61% of PM_{2.5} emission in the country in 2014. Third, vehicle emission is a major air pollution source in big cities such as Beijing and Shanghai, accounting for 36% and 25% of PM_{2.5} emission in the two cities respectively.

Government targets: stricter and more comprehensive

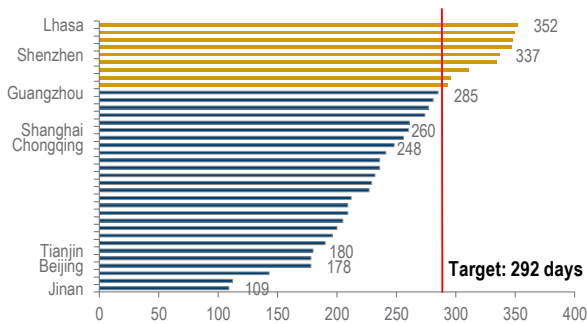
The central government has been putting more and more emphasis on environmental protection, after publishing the Air Pollution Prevention Action Plan (大气污染防治行动计划) in 2013, as well as the Air Pollution Prevention Law (大气污染防治法) in 2015. In the

coming 13th FYP, we expect the government to establish more aggressive and diverse environmental protection targets compared to the 12th FYP. In the 13th FYP Outline released in March 2016, the State Council mentioned the targets of reducing major pollutant (eg, SO₂, NO_x) emissions by 12% from 2016 to 2020, achieving “Good” air quality in all prefecture-level or above cities in 80% of the days (2015 actual: 76.7%), and reducing “Bad” air quality days by 25% in these cities. The 13th FYP will also add new air pollution indicators such as PM_{2.5}, industrial dust and VOCs, in order to more comprehensively control the overall air pollution situation in the country.

Beijing air has been improving due to coal-to-gas boiler conversion, but still has lots room to improve

We see some positive preliminary results from the government’s environmental protection measures. According to Greenpeace, the air quality in cities across the country has shown an improvement, with over 90% of the observed cities recording a fall in PM_{2.5} concentration in 2015, versus 2014. In 1H16, Beijing’s PM_{2.5} concentration decreased by 17.9% YoY, which is ahead of the target set by the central government previously. That said, the level of air pollution in China still has large room to improve before reaching the global average standard. Therefore, we believe the government will not loosen its air pollution control measures.

Number of “Good” air quality days: 2013-15 actual vs. target



Source: People.cn

Note: (1) Using average data for 2013-15, only 9 over 36 big cities (provincial capitals or municipalities) are qualified with the 2020 targets
 (2) “Good” or above air quality = Air Quality Index below 100; “Bad” or below = AQI above 200

China major cities: PM_{2.5} concentration 2015 vs. 2014

(ug/m ³)	2014	2015	YoY%
Beijing	83.1	80.4	-3%
Shanghai	55.6	53.9	-3%
Guangzhou	47.5	38.8	-18%
Shenzhen	32.4	29.9	-8%

Source: Greenpeace

China: air pollution prevention policies

Date	Policy	Chinese	Key points
Jul-11	Third amendment of pollutant standards for thermal power plants	第三次修订火电厂大气污染物排放标准	<ul style="list-style-type: none"> ○ Tighten dust, SO₂, NO₂, etc emission limits for thermal power units
Aug-12	12th FYP for Energy-saving and Emission Reduction	节能减排十二五规划	<ul style="list-style-type: none"> ○ Target to reduce pollution from focused industries such as steel, cement, fertiliser, etc. ○ Start compulsory assessment on heavy-emission corporations ○ Promote desulphurisation and denitration in power generation and other industries
Sep-13	Action Plan for Atmospheric Pollution Prevention	大气污染防治行动计划	<ul style="list-style-type: none"> ○ Raise the standards for emission limit ○ Eliminate excess capacity in various industries ○ Develop emission-reduction technology ○ Restructure energy mix and increase proportion of clean energy ○ Tighten environmental assessment requirement ○ Improve the relevant market, financial and tax mechanisms ○ Strengthen legal enforcement and supervision ○ Establish regional cooperation mechanisms ○ Introduce assessment and warning systems ○ Clarify responsibilities between different players
Mar-14	Action Plan for Strengthening Prevention of Atmospheric Pollution in Energy Industry	能源行业加强大气污染防治工作方案	<ul style="list-style-type: none"> ○ Target primary energy proportion for non-fossil/gas at 11.4%/7% by 2015 ○ Target primary energy proportion for non-fossil/gas at 13%/9% by 2017 ○ Accelerate emission reduction from industrial coal-fired boilers ○ Promote clean energy e.g. gas, nuclear, renewables
Sep-14	2014-20 Action Plan for Energy-saving, Emission Reduction and Upgrade of Coal-fired Power Units	煤电节能减排升级与改造行动计划 2014-2020	<ul style="list-style-type: none"> ○ Target average coal consumption at 310g/kWh by 2020 ○ Target primary energy proportion for coal at below 62% by 2020 ○ Tighten emission limit requirement for new thermal power units
Aug-15	Amendment of the Atmospheric Pollution Prevention Law	大气污染防治法修订	<ul style="list-style-type: none"> ○ Establish an integrated mechanism to facilitate unified planning and standards ○ Raise punishment for high-polluting corporations
Dec-15	Full Implementation of Ultra-low Emission Requirement and Energy-saving for Coal-fired Power Units	全面实施燃煤电厂超低排放和节能改造工作方案	<ul style="list-style-type: none"> ○ CNY0.01/kWh subsidy for ultra-low emission power units

Source: NDRC, MEP, NEA, Daiwa research

Promoting natural gas demand: a prioritised mission

Our 13th FYP estimates on air pollution prevention investment: CNY1.8bn

Since the Air Pollution Prevention Plan was released in 2013, the government has taken multiple measures to tackle the air pollution problem in the country, and the promotion of gas consumption as a replacement to coal is one of the focused areas. According to the Clean Air Alliance of China (CAAC), the Air Pollution Prevention Action Plan published by the State Council in 2013 would trigger CNY1.8tn of capex investment during 2013-17, and 30% of them are related to increase in gas consumption volume. We expect the same pace of investment to continue in the entire 13th FYP. Based on government support, as well as the fact that the proportion of natural gas in China's primary energy mix is still very low (2015: 6% vs. 24% world average), we believe there is significant consumption volume growth potential for the China gas sector.

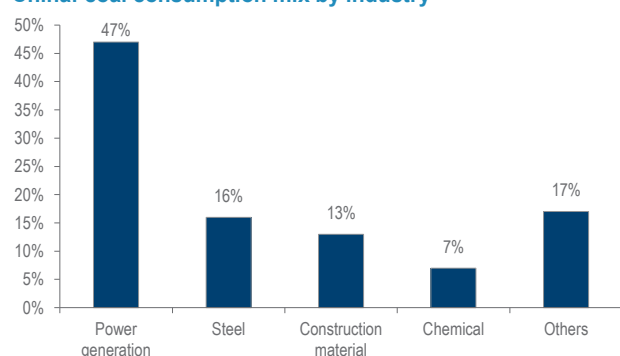
Expected investment caused by Air Pollution Prevention Plan (2013-17E)

Measure	Expected capex investment during 2013-17E (CNYbn)	% to sub-total	% to total
Improving energy mix	284.4	100.0%	15.4%
Closing down coal-fired boilers	32.4	11.4%	1.8%
New gas-fired boilers / power units	252.0	88.6%	13.7%
Reducing vehicle emission	1,406.8	100.0%	76.3%
Natural gas vehicle (NGV) - Vehicle	295.1	21.0%	16.0%
Natural gas vehicle (NGV) - Station	9.4	0.7%	0.5%
Electric vehicle (EV) - Vehicle	325.8	23.2%	17.7%
Electric vehicle (EV) - Station	14.2	1.0%	0.8%
National VI emission standard	281.6	20.0%	15.3%
New refinery oil standard	480.7	34.2%	26.1%
Reducing industrial emission	91.5	100.0%	5.0%
Thermal power - Desulphurisation	6.1	6.6%	0.3%
Thermal power - DeNOx	23.7	25.9%	1.3%
Thermal power - Dust-removal	7.7	8.4%	0.4%
Steel	6.1	6.6%	0.3%
Cement	3.9	4.3%	0.2%
Petrochemical	13.0	14.2%	0.7%
Comprehensive VOC treatment	29.4	32.1%	1.6%
Other PM treatment	1.7	1.8%	0.1%
Surface pollution treatment	61.6	100.0%	3.3%
Construction site dust treatment	60.4	98.1%	3.3%
Road dust treatment	1.2	1.9%	0.1%
Total	1,844.3		100.0%
Gas-related	556.4		30.2%

Source: Clean Air Alliance of China

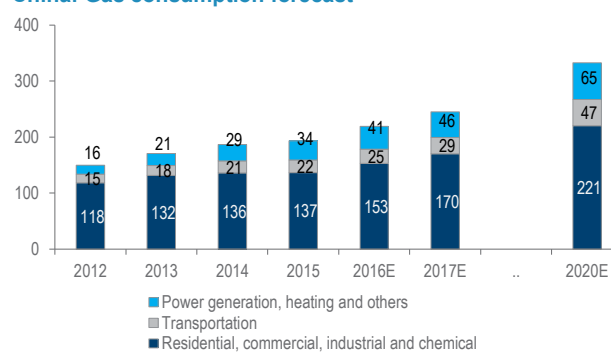
According to the 2014-20 Strategic Energy Plan (能源发展战略行动计划 (2014-2020年)) announced by the State Council in 2014, the government targets to increase national natural gas consumption to 360bcm by 2020. Given 193bcm of total natural gas consumption in 2015, the 360bcm target implies a 13.3% CAGR from 2015 to 2020. Although we expect the target to be tuned down to around 330bcm when the 13th FYP is actually released in 2H16-1Q17, we still see a strong growth for natural gas market in China during the next 5 years. We estimate that by 2020 national natural gas consumption will reach 333bcm, implying an 11.5% CAGR.

China: coal consumption mix by industry



Source: CEIC

China: Gas consumption forecast



Source: CEIC, Daiwa forecast

Power generation, vehicle emission and coal-fired industrial boilers are key growth driver for natural gas consumption

The major consumption volume growth drivers for natural gas will likely be the power generation (47% of total national coal consumption) and the industrial production (c.40% of coal consumption) segments. The developing NGV market would also contribute 25bcm of annual gas demand growth during 2015-20, on our estimate. Moreover, we expect supply-side reforms in the upstream gas sector to be the main catalysts to promote more gas consumption.

1) Gas-fired power generation

Given 50% of coal consumption in China is for power generation, and over 65% of power generation is from coal-fired power, there is huge potential for the shift from coal to gas in the power sector. We expect gas-fired power generation to be a big driver boosting China's natural gas demand, creating over 30bcm of additional annual gas demand during 2015-20.

Currently gas-fired power capacity only accounts for 6.7% of thermal power capacity in China (or 4.4% of total power capacity). However, we see coal-fired power capacity expansion slowing after 2018, as the NDRC introduced restrictive measures on new coal-fired power projects in early 2016. On the other hand, we believe gas-fired power units will continue a stable expansion pace (10GW per year, on our forecast) and gain a larger proportion in China's thermal power capacity mix. We expect gas-fired power capacity to reach 116GW by 2020, representing 9.7% of thermal power, or 5.7% of total power capacity.

China: gas-fired power forecasts

	2010	2011	2012	2013	2014	2015	2016E	2017E	...	2020E
Total installed gas-fired power capacity	26	34	38	43	57	66	76	86		116
- % of total thermal power capacity	4%	4%	5%	5%	6%	7%	7%	8%		10%
Annual utilization hours	2,938	3,210	2,938	2,653	2,753	2,753	2,853	2,853		3,000
Gas consumption rate for power generation (cm/kWh)	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19		0.19
Gas-fired power and heating demand	20	17	16	21	29	34	41	46		65
Growth rate		-14%	-8%	36%	38%	16%	19%	13%		13%
Demand proportion	18%	13%	10%	12%	16%	18%	19%	19%		20%

Source: CEC, Daiwa estimates and forecasts

We also see an increase in utilisation hours for gas-fired power units, given some peaking gas-fired power plants will gain more importance in supporting base-load generation by replacing the less environmental-friendly coal-fired power units. We also expect wider adoption of gas-fired units in power-heating co-generation in the next 5 years. Thus, we expect the average utilisation hour of gas-fired power in China to gradually increase during 2015-20, from c.2,700 hours to over c.3,000 hours by 2020. With larger capacity and higher utilisation hours, we believe gas-fired power generation in China is likely to reach around 300TWh by 2020 (4.8% of total national power generation), representing a 12.5% 2015-20E CAGR from 166TWh in 2015 (3.0% of total).

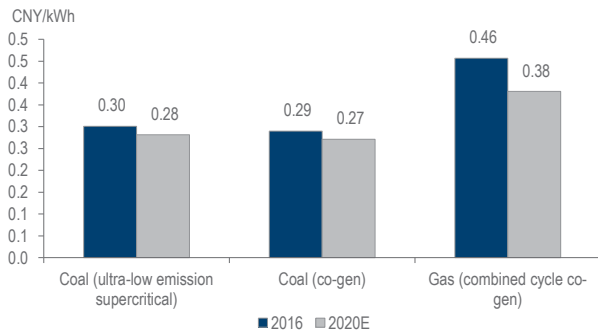
Improving economics of gas-fired power vs. coal-fired power

During the 13th FYP, we expect the IRR difference between coal-fired power and gas-fired power to narrow, supporting the development of gas-fired power generation.

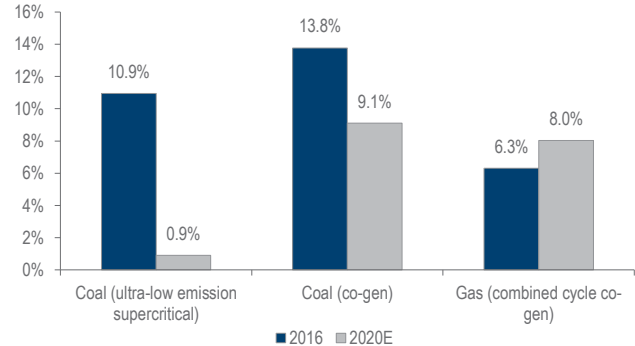
Tariff: subsidy to gas-fired units to remain intact. In terms of tariffs, the power market reform will likely drive down coal-fired power tariffs, as coal-fired IPPs have to compete with low prices for more direct supply contracts in order to maintain viable utilisation hours. Gas-fired power, on the other hand, will likely continue receiving a tariff premium to coal-fired power, as we believe the government will keep supporting the switch from coal to gas in power generation. However, equity IRR of above 9% is unlikely for non-1st tier northern cities given the subsidy are provided locally.

Narrowing cost difference. As for generation costs, although it is unlikely for natural gas to be cheaper than coal, we believe the price discount of coal will gradually decrease, following the natural gas price reform and more low-cost imported LNG. Also, the non-fuel operating costs of coal-fired power will likely continue to increase, given the development

of the national carbon trading market, and the stricter pollutant and carbon emission standards, which will add extra variable costs and capex to coal-fired power producers. Moreover, the impact of the utilisation hour decline of the coal-fired power units will likely offset efficiency improvements brought by technological advancement. Thus, the LCOE difference between coal-fired and gas-fired power should narrow.

Power generation: LCOE by unit type


Source: Daiwa estimates

Power generation: equity IRR by unit type


Source: Daiwa estimates

Possible winners: gas operators in northern provinces

City-gas operators should be the major beneficiaries in the gas-fired power boom, on our forecast, as power generation demand for gas should be a much larger segment than the traditional industrial or residential gas demand segments.

We believe regions with the following 3 characteristics will have the fastest development of gas-fired power in the next 5 years:

- 1) Northern provinces where heating demand during winter is higher.
- 2) Air pollution-prone areas that require immediate replacement of coal-fired power with other clean energy.
- 3) Big cities which are densely populated so that centralised heating is the better way to provide heating to the masses.

Currently the Beijing-Tianjin-Hebei (BTH) area has already developed significant scale of gas-fired power for co-generation. We expect Shandong, as well as the north-eastern provinces, namely Heilongjiang, Liaoning and Jilin, to gradually develop gas-fired power, once a greater natural gas supply is available following the commencement of the major gas import pipelines from Russia and northern China by 2018.

Gas-fired power and heat co-gen winner: China Gas (384 HK)

China Gas potentially the biggest beneficiary. We see limited growth potential for Beijing Enterprise Holdings (BTH) on its gas sales to power generation plants, given the development of gas-fired power in the BTH area is approaching maturity. On the contrary, we believe China Gas (CGHL) has the biggest growth potential in this area, as suggested by its strong presence in northern China.

On the other hand, we think the traditional independent power producers (IPPs) will be less affected by the development of gas-fired power, since coal-fired power still accounts for a major part of their business. In 2015, gas-fired power capacity only accounted for less than 5% of the total power generation of the 5 major IPP listcos. Also, since coal-fired power and gas-fired power are mutually substitutable, we believe that any positive impacts from the growth in the gas-fired power business would be offset by the negative impacts brought by the consequent drop in utilisation hours in the IPPs' coal-fired power units.

2) Coal to gas conversion for industrial and heating: dynamic growth

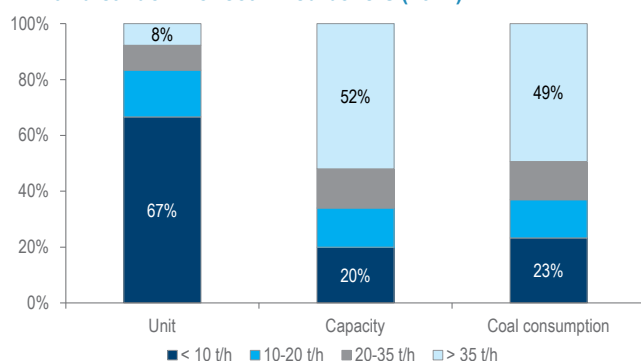
We expect incremental gas demand from coal-to-gas initiatives (ie, replacing small coal-fired industrial or heating boilers with gas-fired boilers) to reach over 60bcm by 2020.

Industrial coal-to-gas conversion winner: China Gas (384 HK)

Besides power generation, coal is widely used in industrial production directly at factory sites, as well as by local small-scale heat-generating plants that provide heating to local households and/or factories. In 2015, the consumption of coal for industrial production accounted for at least 40% of total coal consumption in China. Therefore, the central government has also put a lot of emphasis in its strategic coal consumption reduction plan and air pollution prevention plan on replacing industrial coal-fired boilers.

In the “Air Pollution Prevention Action Plan (大气污染防治行动计划)” published in September 2013, the State Council stressed strongly about the need to consolidate small coal-fired boilers nationwide, and ordered that all coal-fired boilers smaller than 10tonnes/hour should be closed down by 2017. It also urged the replacement of small distributed coal-fired heating boilers with more efficient boilers that are powered by gas or other forms of clean energy. In April 2014, the NDRC published an “Opinion on Establishing a Long-term Stable Natural Gas Supply Mechanism (关于建立保障天然气稳定供应长效机制的若干意见)”, stating that the accumulated gas demand addition from coal-to-gas initiatives should reach 112bcm by 2020. Furthermore, the 13th FYP outline published in March 2016 highlighted that the State Council targets to replace 189,000t/h of coal-fired boilers in key areas (eg, Hebei and Shandong) over 2016-20, which should increase the country’s annual gas consumption by 45bcm.

We estimate that the overall coal-to-gas initiative could lead to an additional 64bcm of annual gas being consumed in China by 2020. As China is targeting to eliminate all coal-fired boilers with a capacity of less than 10t/h, this would reduce 380,000t/h of coal-fired boiler capacity nationwide, accounting for 20% of total boiler coal consumption in China. If 40% of the eliminated coal-fired boilers are converted into gas-fired boilers, around 64bcm p.a. of gas demand could be created, on our estimates.

China: breakdown of coal-fired boilers (2014)


Source: CAQSIQ, Daiwa estimate

China: gas demand from coal-to-gas: over 64bcm by 2020E

	Unit		
Total capacity of coal-fired boilers in China	mn t/h	a	1.90
Capacity % of boilers smaller than 10t/h	%	b	20%
Total capacity to be eliminated	mn t/h	c = a * b	0.38
% to be converted into gas boilers	%	d	40%
Total coal-to-gas capacity	mn t/h	e = c * d	0.15
Daily gas consumption per t/h	cm	f	1500
Utilisation day per year	Day	g	280
Annual gas consumption per t/h	mcm	h = f * g	0.42
Annual gas consumption from coal-to-gas	bcm	i = e * h	64

 Source: MIIT, CAQSIQ, Daiwa estimates¹
Possible winners: city-gas distributors in industrial cities

We see the city-gas operators that have more of an industrial focus as benefiting the most from coal-to-gas initiatives. Also, we believe that industries that currently consume large amounts of coal and low amounts of gas have the greatest potential to create coal-to-gas demand. In this respect, we find that the heavy industries, including ferrous metals, non-ferrous metals, non-metallic mineral products and paper-making, most closely match these characteristics, as shown by the large gaps between their proportion of gas consumption and proportion of coal consumption (see the following table).

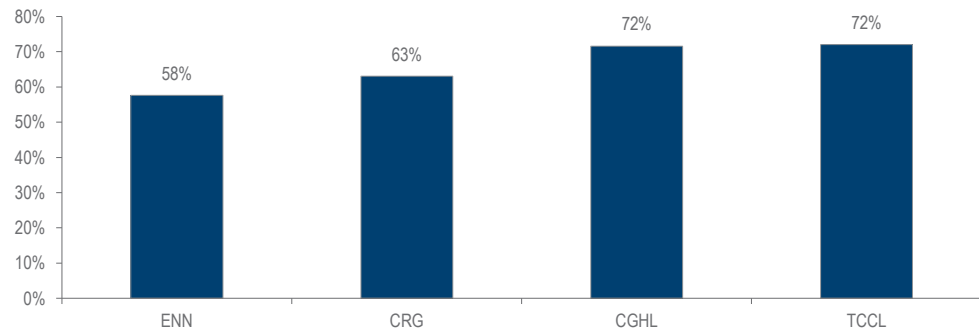
Coal-to-gas: potential industries

Industry	% of China's total gas consumption	% of China's total coal consumption	Top 4 provinces
Ferrous-metal smelting and pressing	2.3%	8.4%	Hebei, Jiangsu, Shandong, Tianjin
Non-ferrous-metal smelting and pressing	2.3%	2.8%	Shandong, Xinjiang, Henan, Gansu
Non-metallic mineral products (cement, glass, ceramics)	5.0%	8.0%	Liaoning, Jiangsu, Shandong, Hebei
Paper-making	0.3%	1.2%	Shandong, Henan, Hainan, Guangxi

Source: WIND

We see **China Gas (CGHL)** as the major company meeting the above criteria, as 57% of its total gas sales volume should be from industrial customers in FY17 (64% in 1H FY16). Also, compared with its pure city-gas distributor peers, CGHL has a higher industrial and commercial (C&I) gas sales proportion (72% in FY17E vs. the peer average of 66% in 2016E).

China gas distributors: commercial and industrial gas sales exposure (2016E)



Source: Daiwa forecasts

Note: 72% of TCCL's gas sales proportion includes natural gas sales for vehicles, which is not the case for peers

3) Natural gas vehicles: high potential in niche markets despite near-term slowdown

To reduce roadside air pollution, the China government also encourages the use of clean energy in transportation to replace diesel. And among the different types of energy used for transportation, we believe that natural gas has certain competitive advantages, such as the ability to support longer travel distances and more powerful engines, when compared to electric vehicles (EVs). We think the competitive advantages of the NGVs in serving niche markets will be intact over the long term, and believe that NGV ownership in China will maintain a stable pace of growth (15% CAGR for 2015-20E).

China: vehicle and vessel gas consumption forecasts

	2010	2011	2012	2013	2014	2015	2016E	2017E	...	2020E
Total number of NG vehicles ('000)	1,110	1,524	2,160	3,365	4,595	5,000	5,883	6,813		10,039
Gas consumed per NG vehicle (mcm/year)	10	9	7	5	5	4	4	4		4
Total NG vehicles gas consumption (bcm)	11	14	15	18	21	22	25	27		40
Total number of LNG vessels ('000)	-	-	-	-	1	1	5	12		40
Gas consumed per LNG vessels (mcm/year)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2		0.2
Total LNG vessels gas consumption (bcm)	-	-	-	-	0	0	1	2		7
Transportation demand (bcm)	11	14	15	18	21	22	25	29		47
Growth rate		30%	12%	14%	22%	3%	15%	15%		17%
Demand proportion	10%	10%	10%	10%	11%	11%	12%	12%		14%

Source: SAE-China, CAAM, Daiwa estimates and forecasts

China: NGV ownership forecasts

	2011	2012	2013	2014	2015	2016E	2017E	...	2020E
Number of CNG vehicle ('000)	1,485	2,085	3,235	4,411	4,788	5,606	6,453		9,416
YoY%	35%	40%	55%	36%	9%	17%	15%		15%
Number of LNG vehicle ('000)	39	75	130	184	212	277	361		623
YoY%	285%	95%	73%	42%	15%	30%	30%		20%
Total NGV ownership ('000)	1,524	2,160	3,365	4,595	5,000	5,883	6,813		10,039
YoY%	37%	42%	56%	37%	9%	18%	16%		14%
Total car ownership ('000)	93,600	109,300	126,700	146,000	148,000	150,000	152,000		156,000
NGV penetration %	1.6%	2.0%	2.7%	3.1%	3.4%	3.9%	4.5%		6.4%

Source: SAE-China, CAAM, Daiwa estimates and forecasts

China: NGV refuelling station forecasts

	2011	2012	2013	2014	2015	2016E	2017E	...	2020E
Number of CNG station	2,114	2,832	3,732	4,447	5,047	5,647	6,247		7,447
YoY%	33%	34%	32%	19%	13%	12%	11%		4%
Number of LNG station	902	1,364	1,844	1,962	2,260	2,560	2,860		3,460
YoY%	43%	51%	35%	6%	15%	13%	12%		5%

Source: NGVChina, Daiwa estimates and forecasts

NGV: number of vehicles to double to 10m units under the 13th FYP

According to the NEA, annual gas demand from NGVs should reach 50bcm by 2020, meaning that 13% of the total growth in the national gas demand should come from NGVs by then. To improve air quality and reduce roadside pollution, the China government has introduced 25 national policies and standards to support the use of NGVs since 1999, in areas including vehicle gas supply, infrastructure, financial subsidies and vehicle gas price reforms. Given the greater emphasis on environmental protection under the 13th FYP (2016-20), we expect the government to continue supporting the NGV market.

Moderate pace of growth

The growth of the overall NGV market depends on 2 things: the economics of owning an NGV and the economics of opening an NGV refuelling station. The former affects the number of NGVs in the market, and will in turn affect a refuelling station's average gas sales and margin. Currently in China, we see attractive economics for both NGV owners and gas station operators, which together have led to the rapid growth of the NGV market in recent years. While we see deteriorating profitability for gas station operators in 2014-15, we remain positive on the development of the NGV market, amid our expectations of natural gas supply-side reforms and the consolidation of the city-gas distribution market after 2018.

NGV data for the top-10 countries with largest NGV ownership (2015)

	Number of NGVs (mn)	Number of fuel stations	Vehicle/station ratio	NGV penetration %	NGV per 1,000 population	Total length of road (km)	Length of road per station (km/station)
China	5.00	7,307	684	3%	3.7	4,106,387	562
- Shandong	0.89	498	1,792	7%	11.0	459,248	922
- Xinjiang	0.83	694	1,190	12%	43.5	79,614	115
- Sichuan	0.44	330	1,340	16%	6.6	145,546	441
- Rest of China	2.84	5,785	491	2%	2.4	3,421,979	592
Iran	4.60	2,495	1,844	37%	58.9	198,866	80
Pakistan	4.26	3,368	1,263	62%	23.0	262,256	78
Argentina	2.86	2,179	1,313	23%	66.5	231,374	106
India	2.07	1,052	1,968	8%	1.6	4,689,842	4,458
Brazil	2.05	2,028	1,010	5%	9.9	1,580,964	780
Italy	1.02	1,191	855	2%	16.7	487,700	409
Colombia	0.58	899	640	12%	12.0	141,374	157
Thailand	0.53	559	951	4%	7.9	180,053	322
Uzbekistan	0.52	239	2,165	45%	16.8	86,496	362
Top-10 countries combined	23.48	21,317	1,101	8%	6.9	11,965,312	561

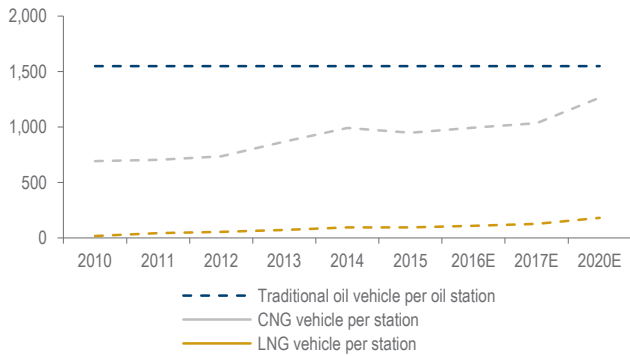
Source: CEIC, World Development Indicator, Society of Automotive Engineers of China, The US Department of Energy, Daiwa estimates

Gas is cheaper than diesel and gasoline

For NGV owners: cheap gas plus abundant refuelling stations. The prices of CNG and LNG have been competitive with diesel over the past 2 years, with close to a 30-40% price discount to diesel and gasoline, currently. Thus, the payback period for different types of public or commercial NGVs can currently be maintained at below 1.5 years.

In terms of station availability, as shown in the comparison between China and the other top-10 countries with the largest NGV ownership, the number of NGVs per refuelling station in China is much lower than that of its peers (684 vs. a weighted average of 1,101). This signifies that China currently has a high number of refuelling stations for each NGV. We see this is an attractive factor for NGV owners, as it means a more abundant and convenient supply of gas.

China: breakdown of the number of NGVs per station



Source: Industry news, Daiwa estimates and forecasts

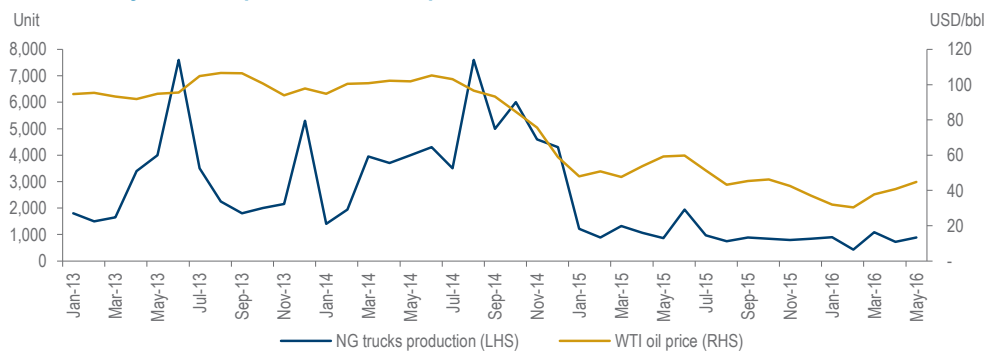
China: payback period for NGVs

		Heavy truck	City-bus	Taxi	Private sedan
NG type		LNG	CNG	CNG	CNG
NG price	CNY/m3	4.0	3.8	3.8	3.8
Diesel / gasoline price	CNY/L	5.5	6.0	6.0	6.0
Heat content ratio (NG m3/Diesel L)		1.0	1.0	1.0	1.0
NG price discount	%	29%	39%	39%	39%
Diesel consumption rate	km/L	2.3	8.3	14.4	14.4
Travel distance	'000 km/year	144	91	110	20
Total diesel consumption	L/year	63	11	8	1
Total fuel cost saved	CNY/year	101	25	18	3
NGV retrofitting cost	'000 CNY/vehicle	100	30	5	5
Payback period	Year	1.0	1.2	0.3	1.6

Source: Daiwa estimates

In 2015, we saw weak growth in China's NGV ownership (9% YoY), amid the weak oil price and gas price overhang before the city-gate gas tariff cut in November 2015. However, as shown from the NG truck production figures (see following chart) for May 2016 (the first month of positive YoY growth since February 2015), there was a slight pick-up in demand for NGVs in China as the oil price rebound. We expect NGV's to regain their economic attractiveness (likely due to supply-side reforms, see the Gas supply-side reform section starting on p.32 helping to boost the growth of NGV ownership in China, although we believe the pace of growth should be moderate – 15% NGV ownership CAGR for 2015-20E versus 35% for 2010-15).

China: monthly NG truck production vs. oil price

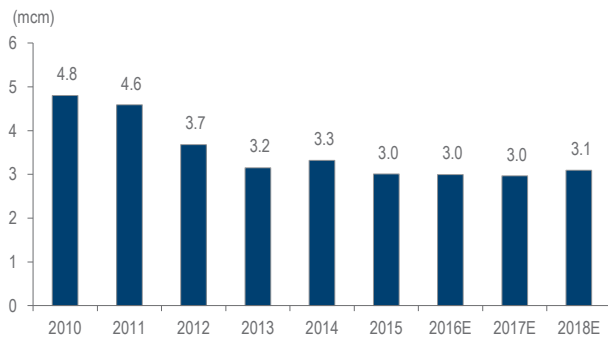


Source: MIIT

New NG truck production is highly correlated to the price of oil (0.62 correlation coefficient)

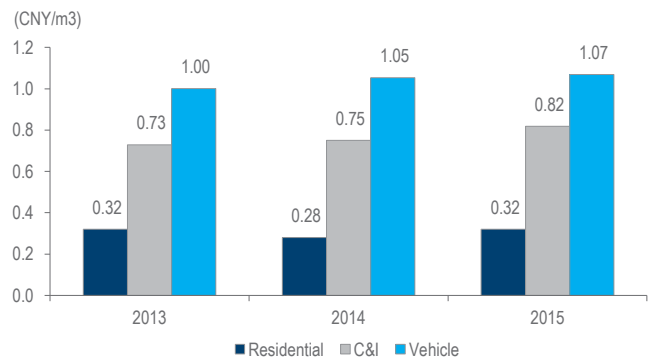
Still a profitable business for the refuelling station operators, waiting for consolidation. On the other side of the coin, the high vehicle/station ratio in China suggests less attractive economics for the gas distributors on a per-station basis. In fact, most of the refuelling station operators, eg, ENN and CRG, recorded declining gas sales volume per refuelling station over the 2014-15 period, amid a slowdown in the NGV number growth, the sharp drop in oil price, and the rapid expansion in the number of refuelling stations in China.

China: average gas volume per station



Source: CEIC, Daiwa estimates and forecasts

China gas distributors: average unit dollar margin



Source: Companies

That said, vehicle gas is still a profitable business for the gas distributors, amid the higher unit dollar margin (more than CNY1/m³ versus CNY0.2-0.7/m³ for residential and C&I gas sales) and the higher gas sales volume growth currently. In the future, we believe the profitability of the vehicle gas station operators will remain attractive, as:

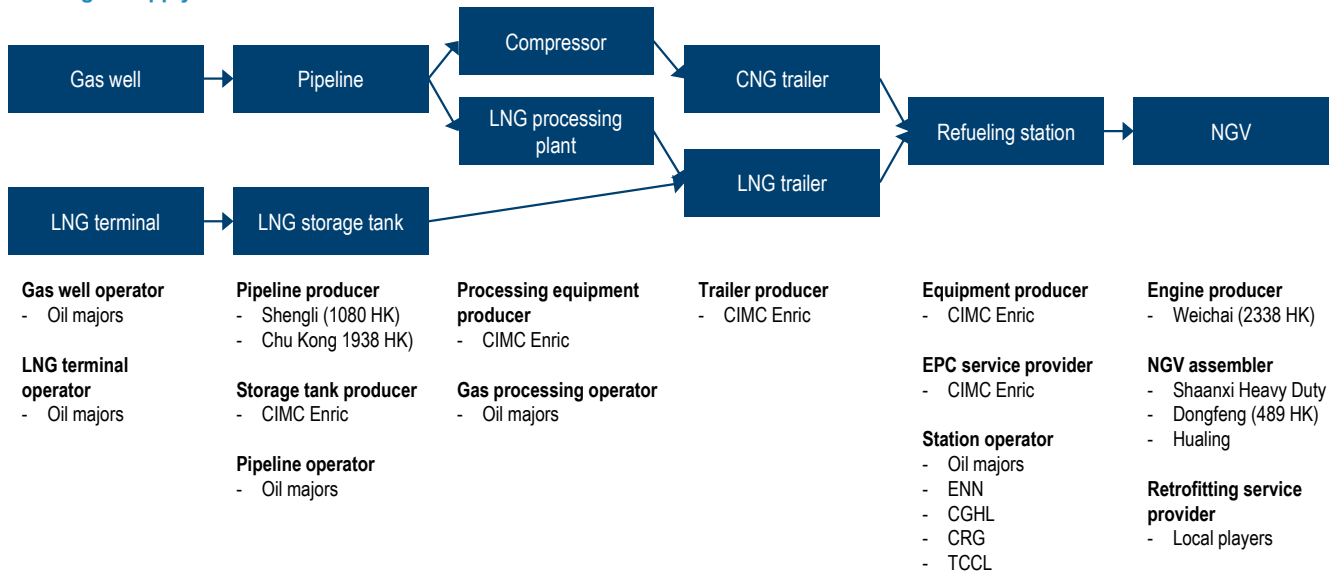
- 1) The difference in the vehicle/station ratio between China and other countries suggests that there is significant potential for China to expand its number of NGVs.
- 2) We see likely consolidation in China's city-gas distribution sector starting around 2018, as we expect fewer new city-gas concessions to be available by then, rendering the small city-gas operators that rely on income from new connections from new projects unviable and pushing them out of business. This would help the rationalisation of the gas station networks and restore the profitability per station.
- 3) The capex of building and maintaining a station should decrease gradually, supported by technological advancement.

However, the saturating number of vehicle gas stations is also likely to create a near-term lack of infrastructure growth momentum for the major NGV equipment suppliers, such as CIMC Enric.

Possible winners along the supply chain

The development of China's NGV market involves multiple industries, including the equipment manufacturers, upstream gas suppliers and downstream distributors, as well as the various service providers. Among these business segments, we favour the big gas station operators, based on the business's high margin, and the possible first-mover advantages they should be able to enjoy once the market matures. Equipment manufacturers, on the other hand, may have weak growth over 2016-17, before seeing a recovery in long term.

China: gas supply chain for the NGV market



Source: Daiwa research

Gas station operators: position in first-/second-tier cities. While the vehicle/station ratio is low on a national basis, the situation does not apply to the 3 major NGV provinces in China, namely Shandong, Xinjiang and Sichuan. In fact, we see Shandong, the largest province in China in terms of NGV ownership, as still having a lot of room for refuelling station network expansion, as shown by the high vehicle/station ratio (1,792 vs. the national average of 684) and high road length per station ratio (922km/station vs. the national average of 562km/station). We expect to see NGV infrastructure growth in Shandong, which is also the headquarter province for Weichai Power (2338 HK, not rated), one of the major NG vehicles engine manufacturers in China.

Near-term winners in the NGV market: ENN, CRG, TCCL

CIMC Enric, China's major equipment supplier, might not see an earnings recovery until 2017, given the current low utilisation rate of existing refuelling stations

Therefore, we believe the NGV operators with larger exposure to the key provinces will have higher profitability per station. Those with larger exposure to the first-/second-tier cities currently would also have first-mover advantages allowing them to enjoy upside in the future, once those cities start to develop NGVs on a more meaningful scale. In this respect, we prefer ENN, CGHL and CR Gas. Among these 3 major players, **ENN** has greater cost advantages, in our view, as it has a greater presence in the coastal cities, where it has access to more cheap LNG from the import terminals and the SHPGX than the other 2.

Equipment manufacturers: weakening earnings growth in 2016-1H17. We are less positive on the equipment manufacturers, such as the storage equipment producers and the refuelling-station equipment producers, as we expect a slowdown in the growth of number of refuelling stations in China over the next 2 years, due to the decreasing profitability per station. As the market leader in these segments, **CIMC Enric** may only see a meaningful recovery in its energy equipment business after the end of 1H17, once the capex plans of the gas distributors resume, after they have improved the utilisation of their NGV refuelling stations.

Connections to slow: gradual process offset by gas volume growth

For the gas distribution companies that we cover, connection fees account for 36-58% of their 2016E gross profit. While the likely decline in residential connections would hurt the earnings and FCFs of the city-gas distributors, we believe the impact will be moderate, as most distributors should have achieved a positive FCF by that time, and their stable gas sales volume growth should partly offset the decline in earnings.

The number of residential connections for the city-gas distributors is likely to decline in the medium term, starting in 2018, on our forecasts, due to a higher city-gas penetration rate and fewer available new projects. A near-term slowdown for some gas distributors is also possible due to the weak property market in tier-3 and tier-4 cities.

However, our sensitivity analysis shows that every 1% decrease in the gross connection profit of the gas distribution companies from a decline in the number of connections could be offset by 0.7-1.4% of incremental gas sales volume growth. Also, their gross profits could still remain flat even if their gross connection profits were to decline by 5-37% in 2017, due to their stable gas sales volume growth. In terms of FCF, we estimate that only a 18-30% YoY decline in connection gross profit in 2018 would cause a flat YoY FCF growth. And we think such a sharp magnitude of decrease is unlikely.

TCCL's earnings is most sensitive to a slowdown in residential connection, and we estimate that a 10% incremental decrease in the number of new connections would reduce the company's 2016 gross profit by 9.2%.

China gas distributors: gross profit sensitivity to connection income

	ENN	CRG	CGHL	TCCL
Gross profit from connection as a % of total gross profit (2016E)	37%	36%	42%	58%
Gross profit from connection as a % of gross profit from gas sales (2016E)	72%	56%	116%	136%
Extra 2017E gas sales volume growth needed to offset:				
1pp extra decrease in gross connection profit*	0.9%	0.6%	1.2%	1.4%
1ppt extra decrease in number of connections**	0.7%	0.5%	0.8%	1.6%
Min. decrease in connection gross profit to cause negative total gross profit growth in 2017E	19.0%	23.2%	36.7%	5.2%
2016E growth in number of connections (YoY%) – Daiwa's base case	-6%	4%	5%	0%
2016E growth in connection gross profit (YoY%) – Daiwa's base case	-6%	-6%	7%	-5%
Comment	2015 was a beat, might decline in 2016E	Connection number to remain stable in 2016E	Highest connection growth guidance; high proportion of gross profit from LPG sales provides a hedge	Highest connection exposure

Source: Companies, Daiwa forecasts

Note: * Assume no change in dollar margins and gas sales mix

** Assume 50% of direct connection costs are fixed & no change in average connection fee

China gas distributors: FCF sensitivity to connection income

	2016E	2018E
Impact on gross profit in case of incremental 10% decrease in number of new connection		
ENN	5.5%	5.4%
CRG	4.7%	4.4%
CGHL	5.1%	4.0%
TCCL	9.8%	9.2%
Impact on FCF in case of incremental 10% decrease in number of new connection		
ENN	27.2%	14.7%
CRG	20.5%	15.1%
CGHL	20.8%	7.9%
TCCL	68.4%	9.7%
Minimum YoY decrease in number of connection to make FCF YoY flat		
ENN		19%
CRG		30%
CGHL		18%
TCCL		19%

Source: Daiwa forecasts

Note: The large impact on 2016E FCF is due mainly to the low base eg. TCCL to turn from negative FCF in 2015 to positive in 2016E

Gas supply-side reform: margins to remain stable

Gas tariff cut should be offset by cheaper gas sources from upstream/midstream liberalisation

We also see improving supply-side factors that could help boost national gas consumption volume, as well as sustain the profitability of the downstream gas distributors.

The natural gas demand growth slowdown in 2015 was mainly due to untimely price adjustments at the same time as the oil price fell. We expect this price overhang to be fully tackled in the coming gas sector liberalisation reforms, which we think will introduce more competition in the upstream gas market and a more market-oriented pricing mechanism for natural gas.

We think there are limited risks to the profit margins of the downstream gas distributors, despite the possible cuts in retail or distribution tariffs in some provinces, as we believe the reduction in unit gas costs due to the upstream gas market liberalisation will be sufficient to offset the retail price cut.

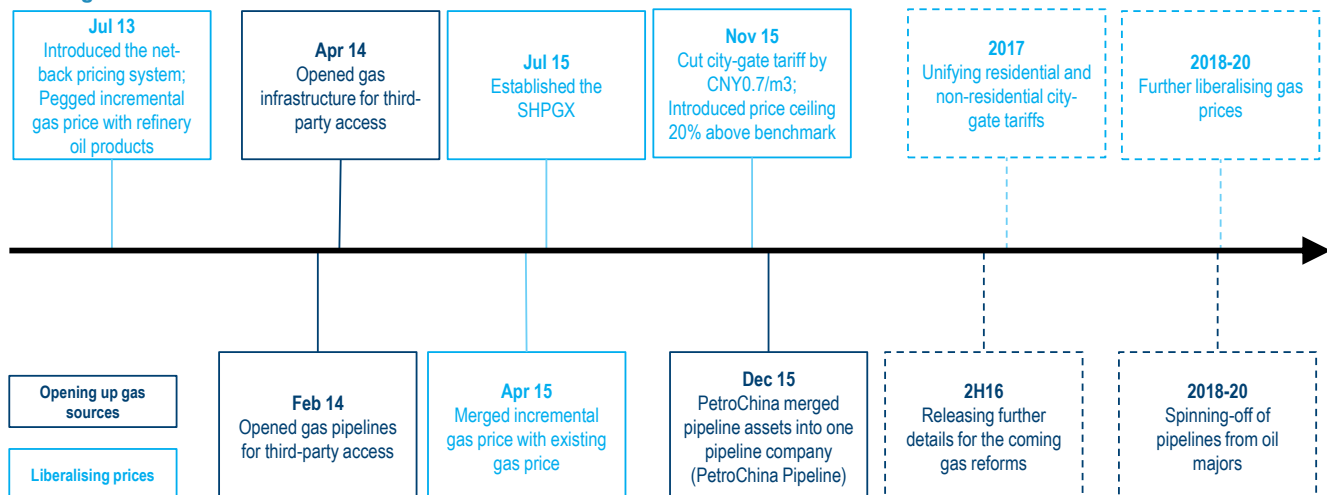
Lastly, we also see the development of the gas pipeline infrastructure as a favourable factor unleashing gas demand in remote provinces.

1) Gas market reform: liberalising prices and opening up cheap gas sources

In our view, market reform would lead to more liberalised prices that will help keep the price of natural gas competitive with other forms of fuel, as well as help reduce the gas costs of the downstream gas distributors. We expect the NDRC and SASAC to start pilot gas reforms in 2H16, and begin to implement full reforms in 2017-18.

The China government is in the process of reforming the natural gas market, based on 2 concepts of “regulating the mid-stream” and “liberalising the two ends of the value chain” (管住中间、放开两头). We believe the 2 concepts will involve the segregation of pipeline assets from the upstream suppliers, and the introduction of competition to upstream gas supply and price liberalisation to the downstream segment.

China: gas market reform timeline since 2013



Source: NDRC, Daiwa research and forecasts

In terms of the NDRC's vision, the price of gas for the upstream and downstream segments will be determined by a competitive market, while the transmission pipeline companies will earn an allowable return based on RoA. To achieve this market structure, 2 major steps are required: 1) introducing effective competition among the upstream gas sources, and then 2) introducing market-oriented gas pricing mechanisms. The first step means the opening-up of upstream gas supply, by opening up the imported LNG market and spinning-off the pipeline assets from the oil majors. After reducing the oligopolistic power of the oil majors, a market-oriented gas pricing mechanism could be created, mainly through the development of the SHPGX and implementation of city-gate tariff reform.

One of the key liberalisation processes: third-party access to transmission and storage facilities

The opening-up of cheaper gas sources

Currently, the upstream oil majors control the supply of piped gas in China, which accounts for over 85% of the national natural gas supply. As one of the country's focused reform measures, the spinning-off of gas pipelines from the oil majors would help reduce their oligopolistic position and thus open up the upstream gas sources to more effective competition. Moreover, the opening up of LNG imports should help diversify natural gas supply sources for the gas distributors, thus helping to drive down the cost of natural gas downstream.

Mixed ownership of the gas transmission pipelines. We believe one of the major focuses in the next round of gas market reform (expected to be released in 2017) will be the spinning-off of the oil majors' transmission pipeline assets. This would help remove the piped gas oligopoly controlled by the oil majors, and facilitate the liberalisation of other forms of gas supply, eg, imported LNG.

In 2014, the NDRC published the "Management Method about Natural Gas Infrastructure Construction and Operation (天然气基础设施建设与运营管理办法)" and the "Regulation on the Fair Opening-Up of Oil and Gas Pipeline Facilities (油气管网设施公平开放监管办法)", which opened up China's natural gas facilities to private investors and operators to participate in. Meanwhile, the oil majors have been restructuring their pipeline assets, preparing for mixed-ownership reforms to their pipeline companies. For example, PetroChina sold a 50% stake of its West Pipeline to 2 private funds in June 2013, and merged its 3 big subsidiary pipeline companies into PetroChina Pipeline in December 2015 – we believe it will be launching an independent IPO in 2017/18.

In the near term (during 2016-17), we expect more active participation by private companies in China's gas transmission business, thus helping the downstream gas distributors diversify their gas sources and reduce their gas costs.

Imported LNG: over 20% cheaper than domestic piped gas. We believe the volume growth potential for imported LNG will be high over 2016-20, as:

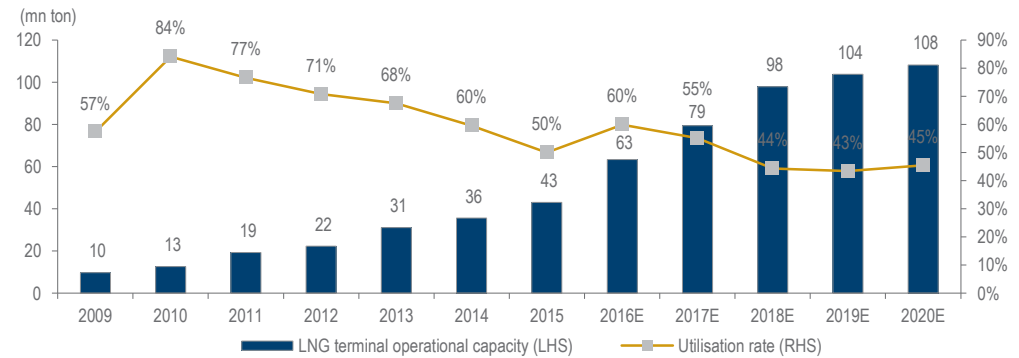
1. Third-party access to existing LNG terminals is likely to expand, due to the rapid capacity expansion of LNG terminals among the 3 oil majors, as well as the current low utilisation rate of existing LNG terminals. We expect the oil majors to become more willing to open up third-party access when the LNG terminal utilisation rate drops below 50%.
2. More non-oil major companies are planning to build their own LNG terminals (likely through JVs or strategic alliances) in order to secure cheaper LNG sources through signing their own new import contracts. We expect a large number of privately owned small LNG terminals to emerge after 2018.

China: operating LNG terminals

Commencement date	Location	Province	Owner	Current capacity (million tonnes)	LNG sources (countries / companies)
2006	Dapeng	Guangdong	CNOOC (35%), BP (30%), Shenzhen Gas (10%), others (25%)	8.4	Australia
2009	Yangshan	Shanghai	Shenergy (55%), CNOOC (45%)	3.0	Malaysia, BP, Australia
2009	Putian	Fujian	CNOOC (60%), Fujian Investment & Development (40%)	5.0	Indonesia
2011	Dalian	Liaoning	CNPC (75%), Dalian Port (20%), Dalian Construction Investment (5%)	3.0	Qatar, Australia, Iran
2012	Ningbo	Zhejiang	CNOOC (51%), Zhejiang Energy (29%), Ningbo Power (20%)	3.0	CNOOC, Shell, BP, etc
2012	Rudong	Jiangsu	CNPC (55%), Pacific Oil & Gas (35%), Jiangsu Guoxin Investment (10%)	6.5	Qatar, Australia
2012	Dongguan	Guangdong	JOVO Group	1.0	Indonesia, Malaysia
2013	Zhuhai	Guangdong	CNOOC (50%), Yudean (25%), Guangzhou Development (25%)	10.5	Qatar, Australia
2013	Nanjing	Tianjin	CNOOC	8.2	
2013	Caofeidian	Hebei	CNPC (51%), Beijing Enterprise Holding (29%), Hebei Gas (20%)	3.5	Qatar, Australia, Iran
2014	Hainan	Hainan	CNOOC	3.0	Qatar, Australia
2014	Shennan	Hainan	CNPC	0.3	
2014	Qingdao	Shandong	Sinopec	3.0	Papua New Guinea
2016	Jieyang	Guangdong	CNOOC	2.0	
2016	Beihai	Guangxi	Sinopec	3.0	
Total operational				63.4	

Source: Companies, Daiwa research

China: LNG terminal capacity and utilisation

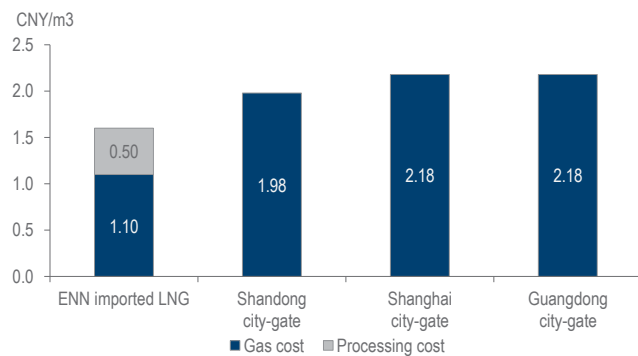


Source: Wind, Daiwa forecasts

The price of imported LNG is currently at a 20-25% discount to the benchmark city-gate price in coastal provinces

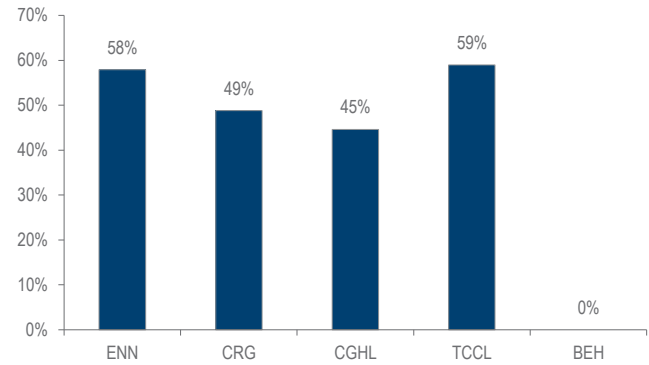
Following the international oil price slump in 2015, the spot price of imported LNG dropped by 34% in 2015, becoming more competitive with the domestic piped gas (which is in line with the oil majors' take-or-pay contracts). Currently, the average price of imported LNG for ENN Energy is around CNY1.1/m³ (CNY1.6/m³ including processing costs), which is 12% cheaper than the national average non-residential city-gate tariff of CNY1.82/m³, or 20-25% cheaper than city-gate tariff in the coastal provinces, at CNY2.0-2.2/m³. We think the price discount of imported LNG to the city-gas tariff will continue, and thus the gradual opening up of LNG imports should continue to benefit downstream gas distributors.

ENN: spot imported LNG price vs. city-gate tariff



Source: Company, NDRC

China gas distributors: coastal exposure (2015)



Source: Companies

ENN Energy: the winner in terms of cheaper gas costs due to industry liberalisation

Of our covered stocks, we believe ENN is going to benefit the most from the opening up of LNG imports, as it has a first-mover advantage in building its own LNG terminal and has the largest exposure to coastal areas. According to ENN, construction of its Zhejiang Zhoushan LNG terminal has started and should begin operating in 2018, with a first-phase annual capacity of 3m tonnes. CRG and CGHL are also looking for opportunities to expand their imported LNG sources.

Shanghai Petroleum and Gas Exchange (SHPGX): a platform for more liberalised pricing

We believe that the SHPGX will enhance the refining margins of the gas distributors in an over-supplied gas market, and provide more room for lower retail gas prices, which would boost overall China gas sales volume growth.

SHPGX: transaction data since inception

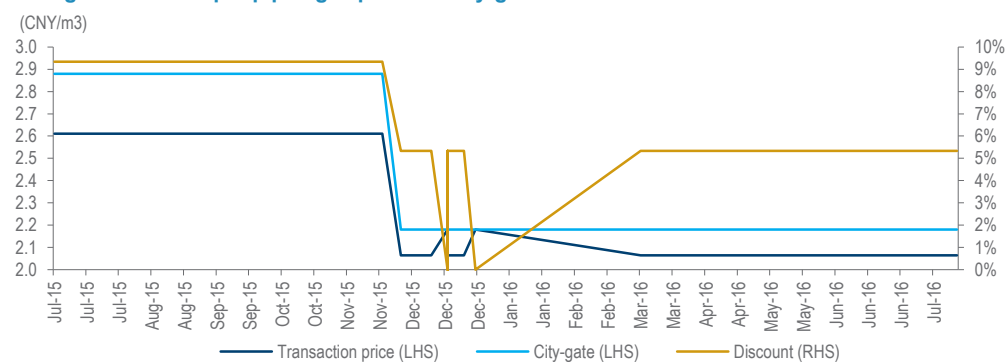
Province	Region	Coastal	Gas transacted (mcm)			Proportion of gas transacted			Average price (CNY/m3)	Average price discount
			Total	2015	2016 YTD	Total	2015	2016 YTD		
Anhui	East	No	865	855	10	3.6%	4.5%	0.2%	2.05	9.9%
Shanghai	East	Yes	3,571	2,106	1,465	14.9%	11.0%	30.0%	2.29	6.8%
Zhejiang	East	Yes	632	632	-	2.6%	3.3%	0.0%	2.17	5.2%
Jiangsu	East	Yes	2,386	1,425	961	9.9%	7.4%	19.7%	2.21	3.8%
Shandong	North	Yes	8,711	8,335	376	36.2%	43.5%	7.7%	2.46	6.4%
Beijing	North	Yes	3,283	1,635	1,648	13.7%	8.5%	33.7%	2.17	0.0%
Hebei	North	Yes	330	330	-	1.4%	1.7%	0.0%	1.98	0.0%
Shanxi	North	Yes	170	170	-	0.7%	0.9%	0.0%	2.16	0.0%
Guangdong	South	Yes	2,491	2,491	-	10.4%	13.0%	0.0%	2.77	-25.2%
Hunan	Central	No	424	364	60	1.8%	1.9%	1.2%	2.04	9.5%
Hubei	Central	No	34	34	-	0.1%	0.2%	0.0%	2.13	22.2%
Henan	Central	No	185	185	-	0.8%	1.0%	0.0%	1.98	19.0%
Liaoning	Northeast	Yes	301	138	163	1.3%	0.7%	3.3%	2.07	5.4%
Jilin	Northeast	No	49	23	26	0.2%	0.1%	0.5%	1.67	13.7%
Jiangxi	Southwest	No	2	-	2	0.0%	0.0%	0.0%	1.65	15.8%
Sichuan	Southwest	No	129	110	19	0.5%	0.6%	0.4%	1.93	1.1%
Chongqing	Southwest	No	346	190	156	1.4%	1.0%	3.2%	1.68	-0.1%
Others	Others	No	126	126	0	0.5%	0.7%	0.0%	2.43	4.1%
Total			24,036	19,149	4,887	100.0%	100.0%	100.0%	2.34	2.1%

Source: SHPGX

Note: Data as at 1 August 2016

The expansion of the SHPGX is likely to bring cheaper gas sources to gas distributors in coastal provinces

As a major price liberalisation measure, the establishment of the SHPGX helps the gas distributors to procure natural gas based on market-based bidding. Since the trial operation of the SHPGX started on 1 July 2015, the exchange has executed 24bcm transactions of piped natural gas and 0.26m tonnes of LNG, representing over 10% of the 2016E total national natural gas supply. The average price discount of piped gas to the city-gate tariff was around 2% during the trial period. We expect the SHPGX to account for c.15% of the natural gas sales in China in 2016, and the volume should increase gradually as more progress is made in natural-gas market reform.

Shanghai: SHPGX spot piped gas price vs. city-gate tariff


Source: SHPGX, Daiwa research

As shown by the transaction data provided by the SHPGX, transaction activity has been less active in 2016 than it was in 2015, which we believe is due mainly to the city-gate tariff cut in late-2015 (which reduced the gas price disequilibrium), and that the data in 2015 were mainly recorded during the winter peak season. We expect the transaction volume of the SHPGX to become active again in 4Q16, during the peak season.

A unified and more dynamic city-gate tariff

All said, the piped gas sold by the oil majors should still account for the majority of the natural gas supply at least in the medium term, before 2018. Thus, the reforms to the city-gate tariff are still important as they will affect the gas costs of the downstream distributors.

We do not expect any further adjustment in the city-gate gas tariff in 2016, as national gas consumption volume growth has already returned to high levels (9.8% YoY in 1H16, vs. 8% YoY in 2015), and the oil price has recovered to around USD45/bbl. Also, we believe the NDRC's focus will shift to reforming the city-gate tariff system, rather than just adjusting it

using the existing mechanism. In the long term, the NDRC is likely to unify the non-residential and residential city-gate tariffs, and introduce a dynamic benchmark tariff that automatically adjusts according to seasonality or actual gas demand.

Merging residential and non-residential tariffs in 2016-17: possible margin squeeze.

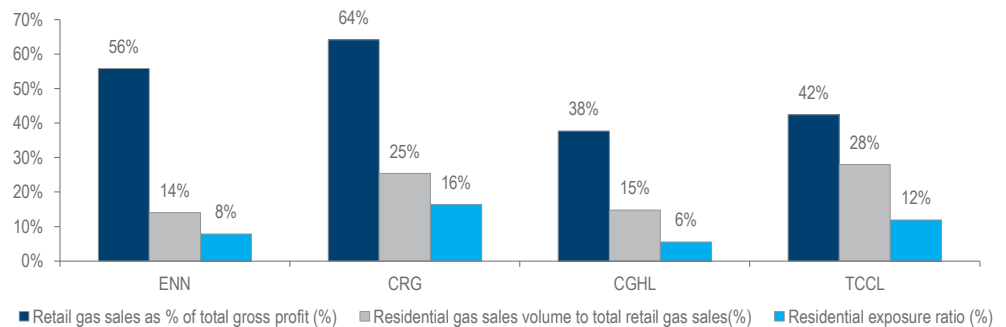
Currently the non-residential city-gate tariffs in different provinces are at least CNY0.2/m³ above the residential tariffs, as the government wants to subsidise household gas consumption with the premiums collected from commercial and industrial users. As stated in various documents, the government plans to remove this “cross-subsidy” and unify the non-residential and residential city-gate tariff in order to promote a more liberalised pricing mechanism. We believe the actual implementation of this policy direction will begin in the near term (2016-17), along with progress in other price liberalisation reforms such as the expansion of the SHPGX.

Near-term risks: margin squeeze due to merging of residential and non-residential city-gate tariffs

More impact on CRG and TCCL vs. peers

Assuming the international oil price can be sustained above USD40/bbl, it is unlikely the NDRC will cut the non-residential city-gate tariff, due to likely opposition from oil majors. Thus, the NDRC is likely to raise the residential city-gate tariff in order to achieve the merger between the two types of tariffs. The residential city-gate tariff hike should lead to a short-term margin squeeze for the gas distributors, as the normal pass-through period is over 3 months, and because the residential retail tariff hike is likely to widely affect people’s daily living expenses. Based on the government’s experience of implementing residential tier pricing, pass-throughs in some cities may take 1-2 months longer than expected, due to lengthy negotiations with local governments and public hearings. Among the pure gas distributors that we cover, CRG and TCCL have the largest residential exposure and thus should be more vulnerable to the margin squeeze.

China gas distributors: 2016E residential gas sales exposure



Source: Companies, Daiwa forecasts

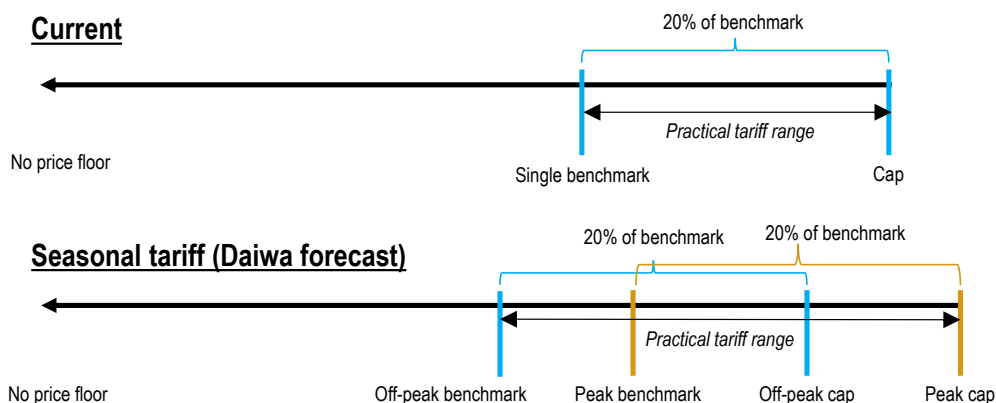
Note: Residential exposure rate = Retail gas sales as a % of total GP * Residential gas sales volume as a % of total retail gas sales

A more dynamic adjustment mechanism: to be more demand-driven. Before the oil-majors’ oligopoly of the upstream gas supply is eliminated, any full liberalisation of the city-gate tariff is not feasible. Therefore, we believe the NDRC will only gradually modify the city-gate tariff system during 2016-18, without major reforms, which may come only after the development of alternative gas sources and once the SHPGX becomes more mature.

Currently, the non-residential city-gate tariff allows room for negotiations between suppliers and buyers, with a 20% moving band above the benchmark and no limit below it. However, given the high bargaining power of the upstream suppliers, the flexibility for the negotiated price is likely to be limited.

To make the gas tariff more mark-to-market while minimising any opposition from the oil majors, the NDRC is likely to introduce a seasonal adjustment mechanism in 2016-17, in which the benchmark city-gate tariffs would increase during the winter peak season, and be adjusted downward when demand is low.

China: city-gate tariff mechanism



Source: NDRC, Daiwa forecasts

On 1 August 2016, Hunan's provincial DRC announced a new seasonal gas tariff mechanism for non-residential users (except refuelling stations) in Changsha, Zhuzhou and Xiangtan. During the off-season (June to August), the retail tariff will be adjusted down by 10% from CNY3.1/m³ to CNY2.79/m³, while during the peak-season (December to February) the tariff will be adjusted up by 8% to CNY3.35/m³. We expect this policy to slightly increase the average dollar margin of gas distributors, given higher gas sales volume during the peak seasons. We believe more provinces will introduce the seasonal tariff mechanism as an intermediate measure to liberalise the gas price in the near-term (2016-17).

2) Limited margin downside despite distribution tariff cuts

Recent distribution tariff cut has had a limited impact on our covered gas distributors

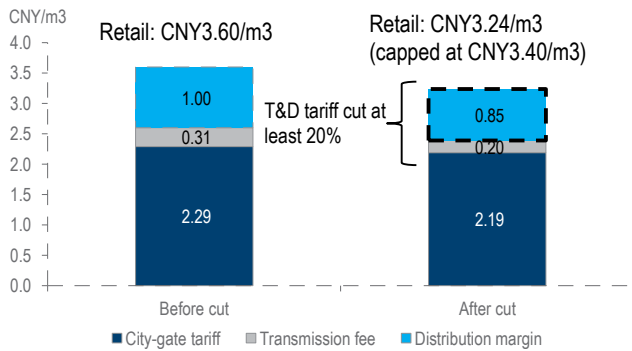
In April 2016, the Zhejiang Provincial Government announced and cut the local city-gate tariff by CNY0.1/m³, the local gas retail tariff by 20%, and capped the non-residential retail gas price at CNY3.4/m³ (we estimate that the overall impact on the gas distributors' distribution margin will be around CNY0.12/m³, or 12%). A month later, the Guangzhou City Government also cut its provincial and city transmission tariffs by CNY0.03/m³ each (all the other Guangdong cities cut their provincial transmission tariffs by CNY0.03/m³ as well, at the same time).

China: provincial or city policies relating to the gas price

Province	Date	City	Regulated part	Details
Directional documents				
Jiangxi	12-May-15	Provincial	Distribution margin	Targets to unify the residential and non-residential dollar margin
Hubei	2-Jun-15	Provincial	Distribution margin	Targets to unify the residential and non-residential dollar margin
Anhui	16-Mar-16	Provincial	Distribution margin	Targets to regularly adjust the distribution margin at least once every 3 years
			Transmission fee	Targets to regulate transmission tariffs
			Distribution margin	Targets to reduce the distribution margin
				Promotes direct gas sales
Specific measures				
Hebei	16-Jun-15	Provincial	IRR	Equity IRR capped at 8%
			RoE	RoE capped at 7%
Jiangxi	15-Jun-15	Provincial	Transmission fee	West-to-east transmission fee cut by CNY0.12/m ³ to CNY0.3/m ³
			Transmission fee	Sichuan-to-east line transmission fee cut by CNY0.087/m ³ to CNY0.333/m ³
			Distribution margin	Residential distribution margin capped at CNY0.8/m ³
Zhejiang	18-Apr-16	Provincial	Distribution margin	Non-residential distribution margin capped at CNY0.6/m ³
			City-gate tariff	Cut by CNY0.1/m ³
			T&D tariff	Cut by at least 20%
			Non-residential retail	Capped at CNY3.4/m ³
Jiangsu	2-Jun-16	Jinhua	Non-residential retail	Capped at CNY3.3/m ³ (previously CNY3.68/m ³)
	5-May-16	Changzhou	Non-residential retail	At least CNY30m discount for C&I users with annual consumption of more than 3mcm
			Non-residential retail	Cancelled winter peak season price hike
Guangdong	7-May-16	Wuxi	Non-residential retail	Lowered cap from 15% above benchmark to 10% above benchmark
	7-May-16	Provincial	Transmission fee	Provincial transmission fee cut by CNY0.03/m ³ to CNY0.26/m ³
		Guangzhou	Transmission fee	(City-transmission fee cut by CNY0.03/m ³ to CNY0.26/m ³)

Source: Provincial DRCs, city governments, companies

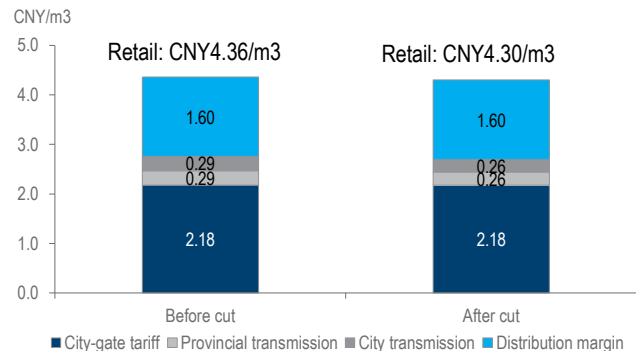
Zhejiang non-residential gas tariff cut



Source: Zhejiang DRC

Note: assumed transmission tariff share at CNY0.11/m³ of the T&D tariff cut

Guangzhou non-residential gas tariff cut



Source: Guangzhou Development

However, despite the tariff cuts we see little risk of the gas-distributor profit margins being affected by regulatory risk, for the following reasons:

- 1) **No incentive for the central government to impose a nationwide return cap.** We see these tariff cuts merely as measures for the provincial governments to boost their local economies. Therefore, we don't think they imply that the central government is planning to introduce a nationwide return cap on the gas distributors. In the case of Zhejiang, the gas tariff cut was 1 of the 20 measures that the provincial government proposed in order to reduce the production costs of different industries.

Moreover, as cutting the gas distribution margin is not the only policy tool that the provincial governments could use to support their local economies, we see a low risk of a massive reduction in their distribution margins (eg, by more than 20%). The relative significant scale of the Zhejiang cut is due to the fact that the province's gas transmission pipeline is owned by the provincial government (rather than the oil majors that are subject to the NDRC's pricing regulations), and thus the Zhejiang case is less applicable to other provinces.

Also, given the ambitious national gas consumption volume target by 2020 (330-360bcm, and 10-12% of the national primary energy mix), a stable gas sales margin is essential to incentivise the city-gas distributors to promote the use of natural gas in different sectors.

- 2) **Impact on the gross profits of the gas distributors should be small,** given the small proportion of gas sales derived from the high-risk provinces for our covered gas distribution companies.

In our stress test, we short-listed 10 provinces that are relatively more likely to boost their local economies by cutting gas tariffs. If all these 10 provinces follow Zhejiang's plan to cut their city-gate tariff, as well as the distribution margin, the 2017 gross profit of the gas distributors would be reduced by 2.8-5.5%, which would not concern us that much.

- 3) **Negative impact of a retail tariff cut could be offset by gas cost reduction.** On average, the SHPGX spot market price is at a 2% discount to the city-gate tariff, while some gas distributors also enjoy a discount of over 10% on the city-gate tariff. As we expect the scale of these open gas markets to expand, the cost of gas cost for the gas distributors would likely decrease gradually, which we would see as a positive.

Also, we expect the pipeline companies to share part of the burden, through a transmission fee cut. As shown in the Guangdong case, the retail gas tariff cut is fully absorbed by the transmission pipeline fee cuts, and the distribution margin remained unchanged.

- 4) **Gas sales volume growth likely to accelerate after retail tariff cuts.** On our estimates, additional gross profit earned on any incremental gas sales volume would offset c.20% of the negative impact on the gross profit brought by any margin squeeze. In our stress test, however, we choose to err on the side of caution and do not factor in the effect of this on the gas sales volume.

China gas distributors: sensitivity analysis of estimated impact of changes in gas sales volume growth on gross profit

	Zhejiang	Guangzhou
Tariff cut: direct impact		
Retail tariff- Before tariff cut	3.60	4.36
Retail tariff- After tariff cut	3.40	4.30
Cut %	5.6%	1.4%
Distribution margin –Before tariff cut	1.00	1.60
Distribution margin –After tariff cut	0.85	1.60
Cut %	15.0%	0.0%
Offsetting factors		
Incremental volume growth (ppt) per ppt retail tariff reduction (assumed)	0.50	0.50
Incremental volume growth (ppt)	2.78	0.69
Net change in gross profit (%)	-12.6%	0.7%

Source: Daiwa estimates

China gas distributors: FCF sensitivity of impact of potential tariff cuts

	2016E	2017E	2018E
ENN Energy			
High risk province follow	-5%	-10%	-8%
Nation-wide cut	-10%	-20%	-15%
Towngas China			
High risk province follow	-16%	-7%	-6%
Nation-wide cut	-20%	-9%	-8%
China Gas			
High risk province follow	-4%	-5%	-4%
Nation-wide cut	-8%	-10%	-9%
China Resources Gas			
High risk province follow	-6%	-21%	-11%
Nation-wide cut	-10%	-38%	-21%

Source: Daiwa estimates and forecasts

Note: Unless specified in the proposed cuts, assume all cuts are effective starting 1 August 2016

China gas distributors: impact of tariff cuts by province

									ENN	CRG	CGHL	TCCL
	Non-residential city-gate tariff	Non-residential retail tariff (provincial capital)	Unit dollar margin for T&D	Unit dollar distribution margin	Max. margin squeeze under assumed cuts	2015 industrial GDP growth	Industrial proportion as a % of GDP	Installed daily capacity for C&I customers %	designed capacity for C&I customers %	Number of projects %	Industrial customers %	Project investment %
Zhejiang	2.29	3.60	1.31	1.00	0.15	5.4%	48%	8%	10%	7%	5%	
Guangdong	2.18	4.36	2.18	1.60	-	6.8%	46%	13%	12%	2%	5%	
Hebei	1.98	3.02	1.04	0.73	0.11	4.7%	51%	12%	3%	8%	4%	
Jiangsu	2.16	3.10	0.94	0.63	0.03	8.4%	47%	11%	7%	6%	2%	
Jiangxi	1.96	2.92	0.96	0.65	0.05	9.4%	52%	0%	5%	0%	5%	
Shanxi	1.91	3.20	1.29	0.98	0.15	-1.1%	49%	0%	4%	0%	0%	
Liaoning	1.98	3.20	1.22	0.91	0.14	-0.2%	50%	1%	7%	4%	21%	
Jilin	1.76	3.15	1.39	1.08	0.16	5.6%	53%	0%	4%	0%	7%	
Heilongjiang	1.76	3.60	1.84	1.53	0.23	1.1%	37%	0%	1%	2%	2%	
Shanghai	2.18	3.57	1.39	1.08	0.16	1.2%	35%	0%	0%	0%	0%	
Shandong	1.98	3.70	1.72	1.41	0.21	7.4%	48%	0%	9%	7%	21%	
Guangxi	2.01	4.18	2.17	1.86	0.28	8.1%	47%	0%	0%	4%	2%	
Sichuan	1.65	3.25	1.60	1.29	0.19	7.8%	49%	0%	7%	0%	13%	
Inner Mongolia	1.34	2.67	1.33	1.02	0.15	8.0%	51%	14%	0%	14%	1%	
Hunan	1.96	3.18	1.22	0.91	0.14	7.4%	46%	12%	5%	1%	2%	
Beijing	2.00	3.16	1.16	0.85	0.13	3.3%	21%	1%	0%	0%	0%	
Tianjin	2.00	2.77	0.77	0.46	0.07	9.2%	49%	0%	0%	0%	0%	
Xinjiang	1.15	2.39	1.24	0.93	0.14	6.9%	43%	0%	0%	0%	0%	
Anhui	2.09	3.30	1.21	0.90	0.14	8.5%	53%	6%	5%	12%	10%	
Henan	2.01	2.90	0.89	0.58	0.09	8.0%	51%	9%	6%	11%	0%	
Hubei	2.31	3.49	1.19	0.88	0.13	8.3%	47%	0%	7%	9%	0%	
Hainan	1.64	2.62	0.98	0.67	0.10	6.5%	25%	0%	0%	0%	0%	
Chongqing	1.64	2.14	0.50	0.19	0.03	11.3%	46%	0%	0%	1%	0%	
Guizhou	1.71	3.30	1.59	1.28	0.19	11.4%	42%	0%	1%	0%	1%	
Yunnan	1.71	3.42	1.71	1.40	0.21	8.6%	41%	0%	3%	0%	1%	
Shaanxi	1.34	2.39	1.05	0.74	0.11	7.3%	54%	0%	0%	5%	0%	
Gansu	1.43	1.99	0.56	0.25	0.04	7.4%	43%	0%	0%	0%	0%	
Ningxia	1.51	2.06	0.55	0.24	0.04	8.5%	49%	0%	0%	0%	0%	
Qinghai	1.27	1.70	0.43	0.12	0.02	8.4%	54%	0%	1%	0%	0%	
Exposure												
- Proposed provinces								44%	36%	23%	20%	
- High-risk provinces								28%	39%	32%	68%	
Max. negative impact on C&I unit dollar margin if:												
- Only the proposed provinces cut distribution margins (based on the announced plan)								3.5%	2.6%	2.5%	1.7%	
- Only the proposed & high-risk provinces cut distribution margins (adopt the Zhejiang plan)								7.7%	8.4%	7.3%	11.9%	
- All provinces cut (adopt the Zhejiang plan)								15.0%	15.0%	15.0%	15.0%	
2017E gross profit % derived from gas sales (assume residential gas sales contribute minimal gross profit)								57%	66%	38%	44%	
Max. estimated negative impact on 2017E gross profit if:												
- Only the proposed provinces cut distribution margins (based on the announced plan)								2.0%	1.7%	1.0%	0.8%	
- Only the proposed & high-risk provinces cut distribution margins (adopt the Zhejiang plan)								4.4%	5.5%	2.8%	5.3%	
- All provinces cut (adopt the Zhejiang plan)								8.6%	9.9%	5.7%	6.7%	
2017E RoE if:												
- No gas tariff cut at all								21.0%	18.4%	24.3%	8.5%	
- Only the proposed provinces cut distribution margins (based on the announced plan)								20.4%	17.9%	24.0%	8.4%	
- Only the proposed & high-risk provinces cut distribution margins (adopt the Zhejiang plan)								19.7%	16.5%	23.4%	8.0%	
- All provinces cut (adopt the Zhejiang plan)								17.7%	13.9%	21.8%	7.5%	

Source: NDRC, companies, Daiwa estimates

- Note: (1) Provinces highlighted in blue = already proposed gas-price related measures to boost local economy
 (2) Cells highlighted in grey = higher-than-average unit dollar margin / lower-than-average industrial GDP growth / larger-than-average industrial GDP proportion
 (3) Text highlighted in red = high-risk provinces that have at least 2 cells highlighted in grey
 (4) Different proxies used depending on data availability for the provincial exposure of each gas distributor
 (5) Assume no change in the gas sales volume
 (6) Unless specified by measures proposed by government, assume all provinces to cut distribution margin by 15%, same as in Zhejiang

3) New transmission pipelines: wider supply availability

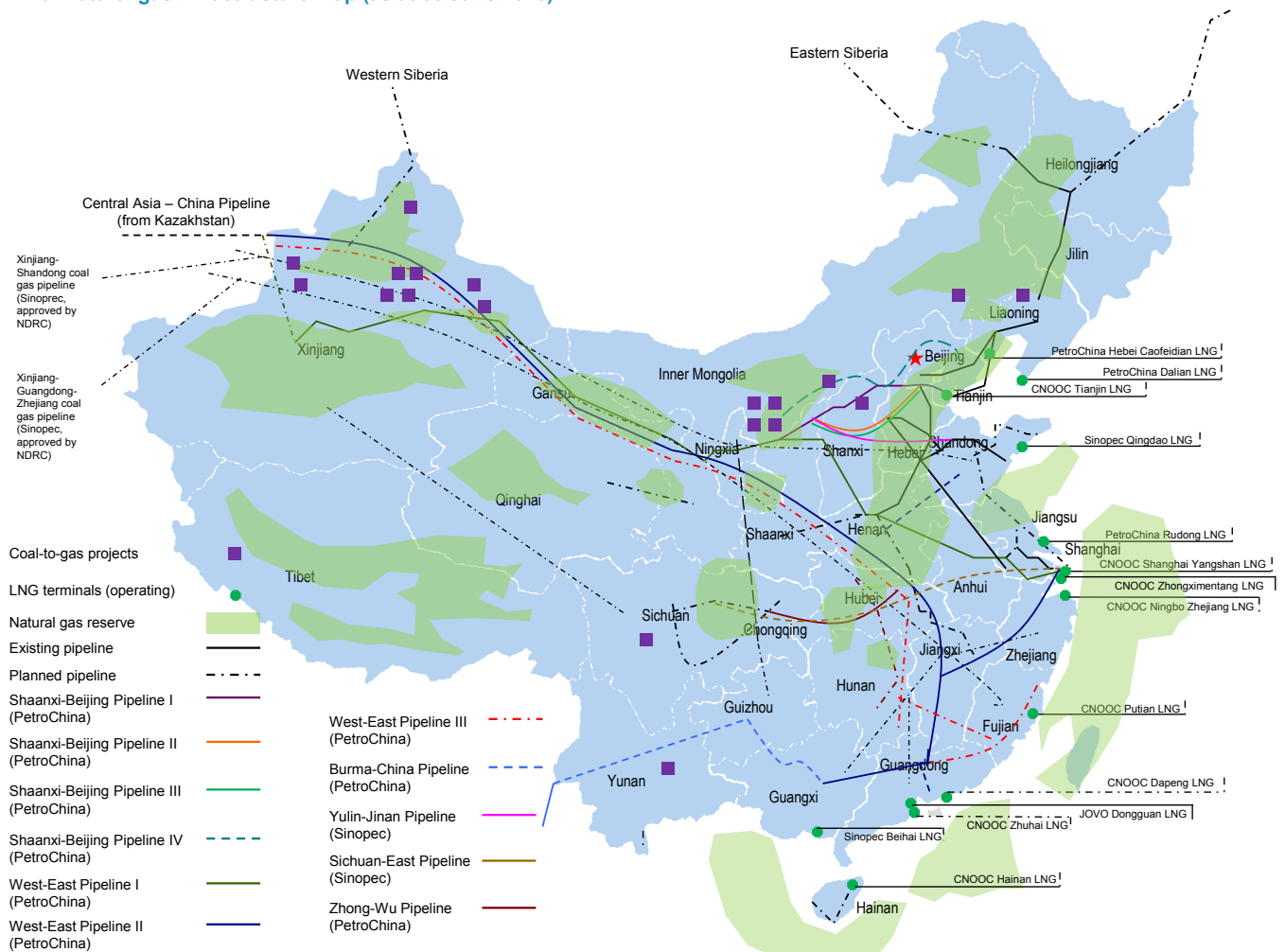
The current oligopoly in the upstream natural gas market in China is partly attributable to the lack of infrastructure, which makes market liberalisation difficult. In our view, full liberalisation without guaranteed supply and stable prices would not be supported by the NDRC, especially given that natural gas-focused markets provide necessary services for the masses and various industries. Moreover, the lack of pipeline and storage infrastructures has created an imbalanced gas supply distribution in China, hindering the development of gas utilisation in remote provinces.

Completion of the Shaan-Jing IV pipeline and the Russia pipeline would release demand in regions currently suffering from tight gas supply

We believe the completion of the Phase IV of Shaanxi-Beijing Pipeline (Shaan-Jing IV, planned by the NDRC by 2017) will accelerate the coal-to-gas conversion in the northern provinces. Also, the commencement of the Russia-China Pipeline in 2018E (on Daiwa's forecast) would help boost gas consumption in the north-eastern provinces, which currently experience gas shortages during the heating (cold) seasons. As the length of China's total transmission pipeline for natural gas is less than 100,000km, which is only c.10% of that of the US, we see high potential consumption upside that would be derived from wider supply availability.

We believe the north-eastern provinces will benefit the most from the improving pipeline infrastructure, and CGHL will be the biggest gas distribution player to enjoy the opportunity, given its strong presence in these provinces.

China: natural gas infrastructure map (as at 30 June 2016)



Source: Companies, NDRC, Daiwa research

Risks to the gas sector

Key risks for the gas sector: dollar margin impact

For the gas distributors, the risks to our bullish sector call would include larger-than-expected cuts in distribution tariffs by local governments, weaker-than-expected industrial production, and a larger-than-expected decrease in the price of oil. Of these 3, we believe the first is the largest risk in terms of probability and impact.

Unit-dollar margin risk on retail tariff cut

Based on our stress test, if a similar transmission and distribution gas tariff cut to the one in Zhejiang were to be implemented by 10 other provinces, this could lead to a 2.8-5.5% 2017 reduction in the gross profit for our covered city-gas distributors. However, if there were larger-than-expected cuts in particular provinces, or if more provinces than expected announce a tariff cut, the negative impact on the earnings of these companies would be greater. For example, if all of China's provinces were to implement the 15% distribution gas tariff cut (or 20% of the combined transmission and distribution cut), the 2017E gross profit of our covered city-gas distribution companies could drop by 5.7-9.9%, or the 2017E FCF could drop by 9-38%, assuming no gas sales volume growth amid the lower gas price.

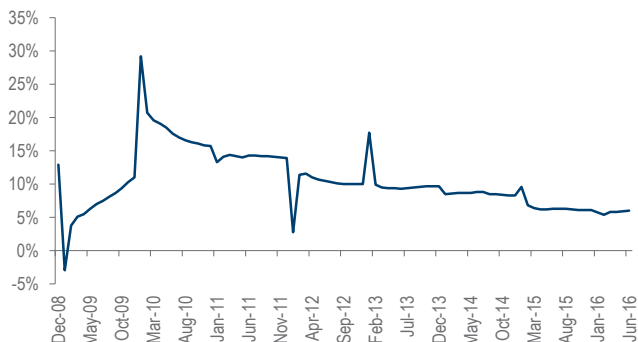
However, while we expect these 10 more risky provinces to cut their distribution tariffs, we still expect some companies to maintain their dollar margins in 2016-18, amid the wider availability of cheap gas sources and higher operating efficiency. For example, ENN could procure LNG from the SHPGX and LNG terminals, which is 2-25% cheaper than the city-gate price.

On the other hand, we do not think a nationwide distribution margin cut initiated by the central government is likely to happen, because the central government is still intent on achieving its national gas consumption growth target (360bcm by 2020, likely to be revised to 330bcm later in 2016 in order to reach a 10-12% penetration rate in the country's primary energy mix).

Weaker-than-expected industrial production

As industrial production accounts for more than 50% of China's total national gas consumption, weaker-than-expected production by China's industries would reduce demand for gas in the country. In 1H16, China's industrial production value growth was only 6% YoY, the slowest since 2009. While we have already assumed a continued slowdown in industrial production growth, risks for industrial gas demand would still exist if the industrial production were weaker than expected, especially for heavy industries such as steel, glass and construction material.

China: industrial production value YoY growth



Source: Wind

China: industrial gas consumption



Source: CEIC

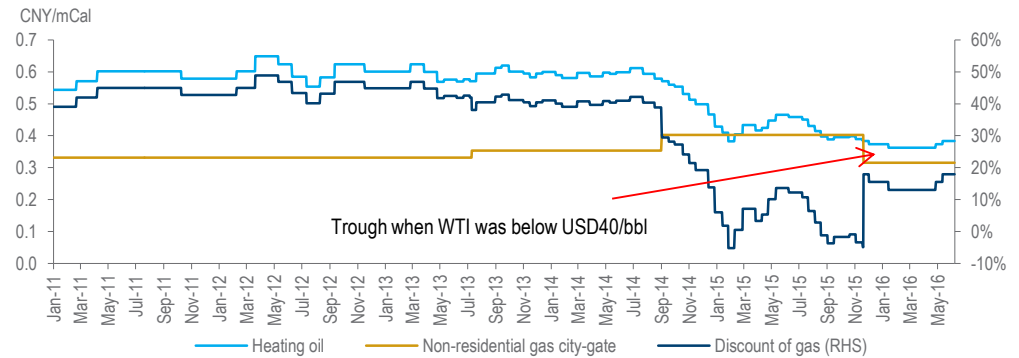
Demand for gas is unaffected when the price of oil drops below USD40/bbl

Larger-than-expected decline in oil prices

Another key risk to our call on the outlook of the China gas sector would be an abrupt fall in oil prices, given our view that the country’s slow gas sales volume growth in 2015 was due to the 10% fall in the price of refinery oil products in China last year (with a 30% drop in the WTI crude oil price for the same period). Should the price of WTI oil fall again, from the current level of USD50/bbl to below USD40/bbl, the price of China’s refinery oil products would likely decline, and the price discount of gas to refinery oil would narrow again.

Given the price floor policy for China’s refinery oil price announced by the NDRC in January 2016, the refinery oil price will not be adjusted down once the reference international oil price falls below USD40/bbl. Therefore, assuming zero exchange rate impact and no upward adjustment in the gas price in the future, the bottom level for the gas price discount to heating oil would be around 13%, which we believe would be sufficient for China to sustain double-digit industrial gas consumption growth.

Gas price discount to industrial heating oil



Source: Bloomberg, NDRC, Daiwa estimates

Water sector: focus on PPP projects and innovative financing

The main themes under the 13th FYP are: **upgraded wastewater discharge standards, city-water (including waterbody restoration and clean-up), and PPP projects with sustainable financing**

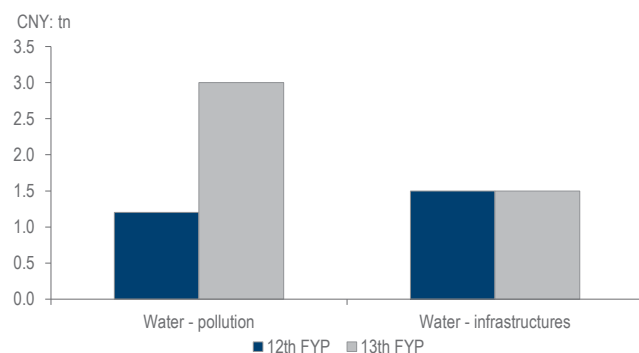
We are positive on the prospects of China's water sector under the 13th FYP, although we see less room to increase city MWWT capacity given the high 87% penetration in 2014 (2010: 72.9%), which was the major 2010-15 earnings growth driver for BEW, our covered China MWWT operator. However, we estimate that investment in China's water sector, particularly measures to counter water pollution, will remain robust and accelerate from CNY1.2tn under the 12th FYP to CNY3.0tn under the 13th FYP, on: 1) upgrades to the MWWT discharge standards, 2) an increase in the sludge treatment penetration rate, 3) an increase in third-party industrial WWT, 4) ongoing waterbody renovation and river clean-ups, and 5) the installation of additional sponge-city (eg, rain-water conservation) programmes.

Accordingly, when it comes to investment themes on the treatment of China's water pollution, we now advise investors to shift their focus from treatment capacity growth, as was the case under the 12th FYP, to **upgrades to standards and the clean-up process (Theme No.1)** under the 13th FYP.

The second theme that we identify under the 13th FYP is **sustainable financing (Theme No.2)**, and this is because we are seeing MWWT operators, like BEW, starting to focus more on PPP projects, supported by green bonds and private water-fund financing sourced from financial institutions, social security funds and insurance companies, all of which require a standard 5-6% return from infrastructure projects in China. Sustainable financing is particularly important as we think that the actual investment in city-water is likely to be 1.5x higher the actual 12th FYP investment amount, supported by the fact that most of the MWWT operators had achieved net debt-to-equity ratios of over 100% as at the end of 2015.

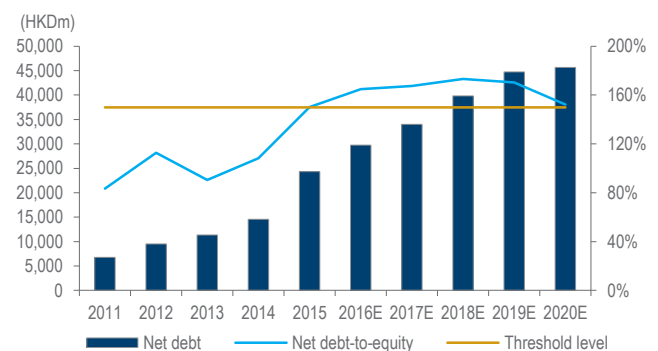
In terms of project return, we have been seeing declining project returns for standalone MWWT projects, from an average of 10-12% (12th FYP) to 7-9% (13th FYP). Therefore, we believe those operators that can transform themselves from a pure-MWWT operator to **city-water PPP project managers (Theme No.3)**, supported by water funds, should be able to achieve returns of over 12%, with controllable net debt-to-equity ratios.

China: water pollution investment plan for the 13th FYP period



Source: Daiwa estimates

BEW: net debt-to-equity since 2011



Source: Company, Daiwa forecasts

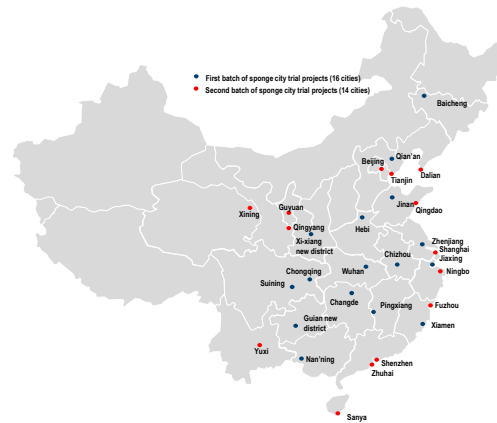
Note: MWWT operators like BEW are seeing rising capex due to their significant investment plans

China water pollution investment plan for 13th FYP

<u>Water: pollution (CNY3tn)</u>	<u>13th FYP investment (CNYbn)</u>	<u>Beneficiary</u>
MWWT - Upgraded	50	BEW
MWWT - new capacity	129	BEW
MWWT - maintenance and others	96	BEW
Reclaimed water and desalination	125	BEW
Water supply	450	BEW
Waterbody renovation	400	BEW
River clean-ups	300	BEW, CTE
Sludge treatment	100	CTE, BEW
Sponge cities	240	BEW
Industrial WWT (third-party light industries)	150	CTE
Industrial WWT (hazardous and high-polluting)	100	CTE
Marine/transportation WWT	50	CTE
Others: technology etc	815	n.a.

Source: Daiwa estimates

Sponge-city water projects



Source: Company, Daiwa estimates

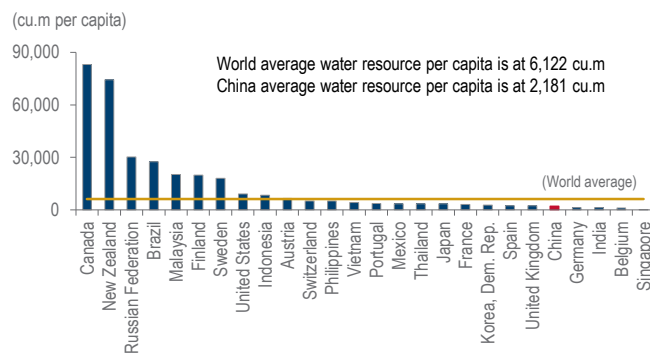
Water pollution and conservation: imminent risks

Risks to survival: insufficient and polluted water

China has long been haunted by serious water scarcity and pollution problems. According to World Bank statistics for 2012, China accounts for only 35% of the world's per-capita water resources, with most of the water flowing along the southern and western parts of China. In the 10 provinces in central China, which account for over 40% of the country's population, the annual per-capita water resource is less than 1,500 cubic metres.

Furthermore, the discharge of industrial, agricultural and municipal wastewater, and the lack of sufficiently high-standard WWT facilities, have resulted in the contamination of China's water resources, such that only 67% of its rivers, 44% of its lakes, and 24% of its underground water are classified as containing water that is clean enough for daily residential use. Meanwhile, 16% of its rivers and 24% of lakes are classified as containing water that is useless and even toxic (which we classify as below-Grade V surface water, and which the government targets to totally eliminate by 2017). Therefore, the per-capita usable water resources in central China could be well below 1,000 cubic metres currently.

World: annual average per capita water resources (2012)



Source: World Bank

China: annual average per capita water resources (2013)



Source: Office of the South-to-North Water Diversion Project Commission of the State Council
Note: China has built a south-to-north water-diversion project to mitigate against the severe water scarcity problem in Central China

China: quality of water resources (2012)

Grade	I	II	III	IV	V	Lower than V
River (% of length)	5.5%	39.7%	21.8%	11.8%	5.5%	15.7%
Lake (% of area)			44.2%		31.5%	24.3%
Reservoir (% of number)	7.2%	50.2%	31.3%	6.7%	2.0%	2.6%
Underground water		3.4%	20.6%		76.0%	-

Grade I: Source water, national nature reserves

Grade II: Centralised drinking water sources

Grade III: Centralised drinking water sources, agricultural and industrial use

Grade IV: General industrial use, recreational water areas without human contact

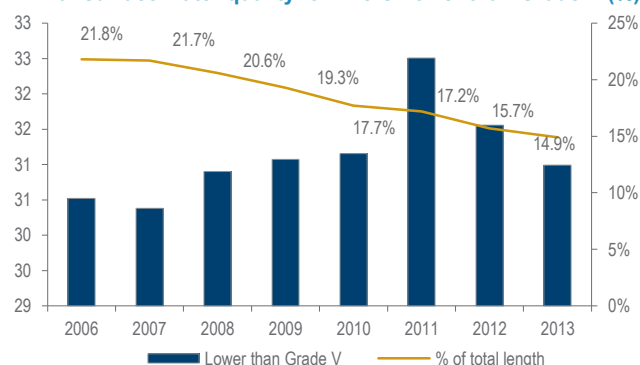
Grade V: General agricultural use, artificial landscape use

Lower than Grade V: Useless and possibly hazardous

By 2017, China targets to eliminate all the below-Grade V surface water. We believe this will be delayed by 3 years and completed in 2020E

Source: Ministry of Water Resources

China: surface water quality for rivers: lower than Grade V (%)



Source: Ministry of Environmental Protection

Owing to China's population and economic growth, some cities like Beijing have been extracting 500mcm of underground water, which has resulted in an 11cm/year drop in the level of its ground since 1999, according to Remote Sensing. This drop has also created structural safety concerns relating to the country's major infrastructure.

How can the MWWT operators compete?

Previously in this report, we discussed how the equity IRR of MWWT projects was 10-12% under the 12th FYP, and likely to fall to 7-9% under the 13th FYP due to fierce competition. In order to compete, we prefer water companies with differentiated business models, such as **BEW**, which is planning to pursue city-water PPP projects financed by a water fund, with a return that could rise to 20%, or **CTE**, which is focused on high-return IWWT segments with higher entry barriers.

Water sector: not a MWWT capacity growth story, which means water companies need to have differentiated business models

13 FYP: Daiwa's expectations for investment in the water sector

Measure	Expected capex investment in 13FYP (CNYbn)	% of total
Water pollution	3,005	100.0%
Wastewater treatment and reclamation	450	15.0%
New WWT capacity	129	4.3%
Existing WWT upgrade	50	1.7%
Sludge treatment	100	3.3%
Water reuse	75	2.5%
Supervision and maintenance	96	3.2%
Rivers, lakes, reservoirs pollution control and prevention	700	23.3%
Water supply penetration and upgrade for cities, towns, counties	450	15.0%
Upgrade of water supply plants	450	15.0%
Desalination	50	1.7%
Sponge city	240	8.0%
Industrial WWT	250	8.3%
Industrial WWT (third-party light industry)	150	5.0%
Industrial WWT (hazardous and high-polluting)	100	3.3%
Marine/transport WWT	50	1.7%
Others	815	27.1%
Water infrastructures	1,501	100.0%
Flood prevention and drainage	1,501	100.0%
Water	4,506	

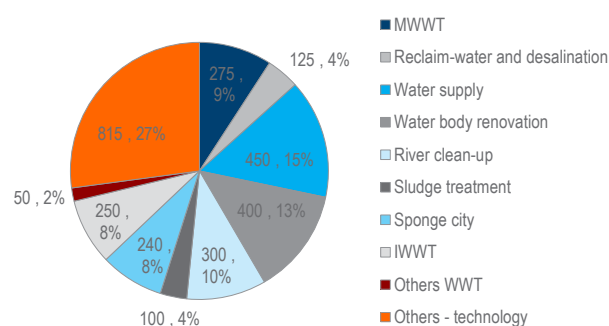
Source: Daiwa estimates

Government target: complete coverage, clean wastewater discharge, restoration, water conservation

Achieving full municipal WWT penetration is only step 1 of the battle against water pollution. In the 13th FYP, we believe the policy will focus more on:

- 1) The upgrading of the discharge standard for existing MWWT plants (eliminating Grade III discharge, lifting to over 60% for above-Grade I-A discharge, and 10% to meet the special standard [equivalent to Grade IV surface water level])
- 2) Waterbody restoration (to eliminate below-Grade V surface water)
- 3) Enhancement of immature WWT segments such as sludge treatment (current: 20% penetration) and third-party IWWT (current: 25-30% penetration), and
- 4) Promoting water conservation projects such as water reclamation and sponge cities, with the introduction of a water resources tax and water usage rights.

China: Daiwa estimates on water-pollution mitigation investment during 13th FYP



Source: Daiwa estimates

China: number and capacity of MWWT plants by discharge standard

	2010	2015E	2018 target	2020E (Daiwa)
Special standard or above	4.0%	5.0%	10.0%	10.0%
Grade I-A	15.4%	18.9%	n.a.	52.3%
Grade I-B	48.0%	47.0%	n.a.	27.7%
Grade II	28.4%	26.1%	n.a.	10.0%
Grade III	0.4%	0.0%	0.0%	0.0%
Others	3.8%	3.0%	n.a.	0.0%
Above Grade I-A	19.4%	23.9%		62.3%
Below Grade I-A	80.6%	76.1%		37.7%

Source: Ministry of Housing and Urban-Rural Development, State Council

Given the significant investment needed, we believe the government will focus on policy regarding financing, such as subsidies for sponge-city pilot projects, green bonds and private water funds.

China: recent news flow regarding upcoming water pollution prevention policies

	Key government policies	Our comments	Key success factors	Potential beneficiaries
Upgrading discharge standard	Target is to achieve a 100% Grade IA-above discharge standard, along with a focus on water resources by 2018 Target is to achieve 10% penetration for the new super-discharge standard (equivalent to Grade IV surface water standard) by 2018	Should result in tariff upside	Local government enforcement	BEW, CEI
Waterbody restoration and river clean-up	Target is to eliminate all below-Grade V waterbodies by 2017	Should result in upside in water renovation projects	Local and provincial government enforcement	BEW, CTE
City-water PPP project / sponge-city	Further notice on PPP demonstration project implementation (June 2015)	Should result in opportunities for large projects	Strong financial capability	Various
Sludge treatment	Notice on "Strengthening Inspection of Sludge Treatment in City Waste Water Treatment Facilities" (April 2016)	China: has a current low treatment rate, with 70% abandon rate of untreated sludge	Recover the value of the sludge; negotiations with government	BEW, CTE
New financing methods	Ecological Civilization System Reform Plan (Sep 2015)	Will help quality WWT companies seize PPP projects	Company scale, SOE background	BEW, CEI
Water resources tax	Resource tax reform (May 2016)	Will encourage high-standard WWT and water reclamation	N.A	BEW, CEI, CTE

Source: Daiwa research

Upgrading standards: the new growth driver

The driver of the earnings growth story for the WWT companies under the 13th FYP is likely to shift from capacity expansion to capacity upgrades, due to a maturing MWWT penetration rate and government policies focusing on raising discharge standards. We believe this is a positive for the big WWT companies, as it creates tariff upside for new or upgraded projects. Companies that have superior technology and expertise relating to the higher discharge standards would be the major beneficiaries.

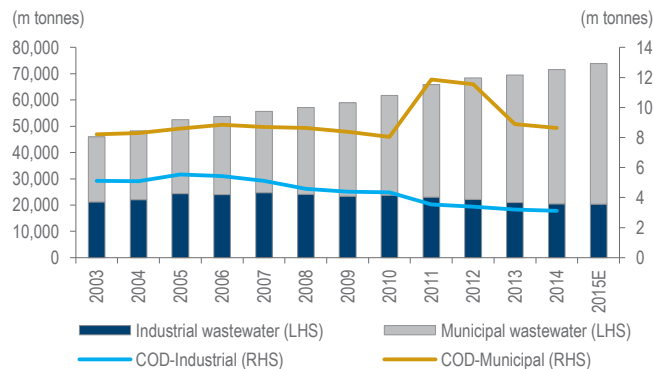
Treatment rate growth set to slow under 13th FYP

MWWT penetration becoming more mature (from 72.9% in 2010 to 87% in 2014)

We see that most of the municipal WWT targets set in the 12th FYP (2010-15) were exceeded, with a significant improvement in the WWT penetration rate, most notably at the county level. According to the Ministry of Environmental Protection, the national daily municipal wastewater treatment capacity increased from 43m tonnes in 2010 to 51m tonnes in 2014, representing a CAGR of 8%, while the penetration rate in the major cities was almost 100% (cities: 87% in 2014).

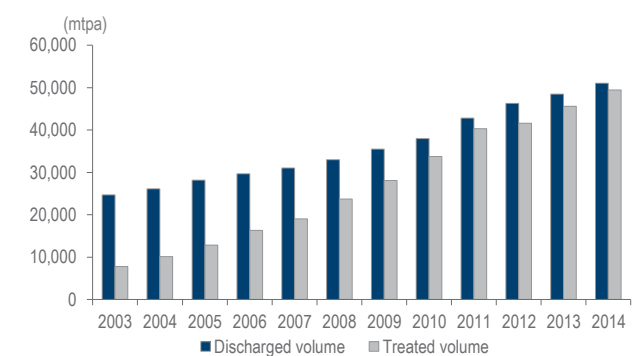
In 2014, China discharged 71.6bn tonnes of wastewater from industrial and municipal sources, containing 23m tonnes of chemical oxygen demand (COD). Municipal wastewater accounted for 71% of the total, and industry wastewater the remainder. Thanks to stricter discharge controls and the shutdown of some high-polluting factories, the annual discharge of industrial wastewater has stabilised in recent years. However, the amount of municipal wastewater discharged has been increasing as a result of improving living standards and urbanisation.

China: wastewater discharge amount



Source: National Bureau of Statistics, Ministry of Environmental Protection, State Council, Daiwa estimates

China: discharged MWW volume and treatment volume

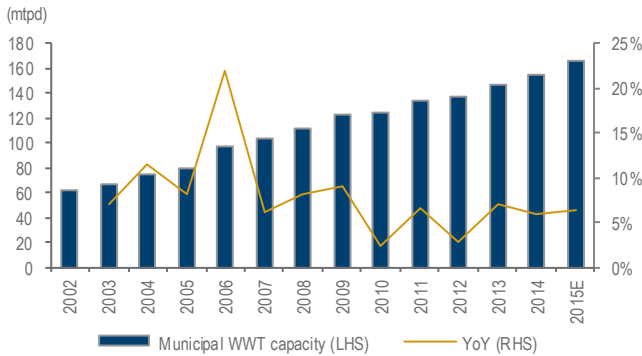


Source: National Bureau of Statistics, Ministry of Environmental Protection, State Council

According to the National Bureau of Statistics, the annual wastewater treatment volume in 2014 was 49.43bn tonnes, representing a CAGR of 10% over 2010-14, faster than the growth in the amount discharged. Also, the city treatment rate has improved from 72.9% in 2010 to 87% in 2014. We see that the unfilled gap between treatment and discharged amount has narrowed, especially over 2012-14, as the government has been promoting investment in the construction and upgrading of WWT infrastructure in recent years, with a particular focus on facilities in cities.

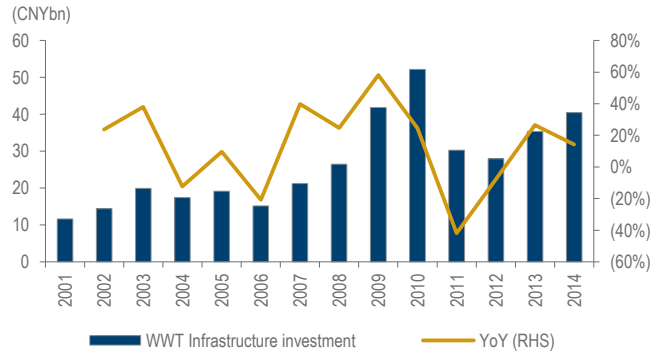
But demand for WWT capacity is slowing. The wastewater treatment capacity CAGR was 21% under the 10th FYP and 19% under the 11th FYP (2010-14), and 5% in 2013-14, and we expect the speed to slow to 3-4% under the 13th FYP period. We believe the focus of the 13th FYP is on improving water quality, including the implementation of higher discharge standards, especially in tier 1-2 cities.

China: municipal WWT capacity



Source: National Bureau of Statistics, Ministry of Environmental Protection, State Council

China: annual investment in municipal WWT infrastructure



Source: National Bureau of Statistics, Ministry of Environmental Protection, State Council

Policy targets shifting to upgrades

The city MWWT almost reached 100% during the 12th FYP period; however, China still has c.15% of its water resources classified as “below Grade V surface water”, which means it is not fit to be consumed by humans. Therefore, we expect the focus for MWWT under the 13th FYP to be on upgrading discharge standards, targeting to fully meet Grade 1A or above (or 10% for special discharge standard, equivalent to Grade IV surface water) in key water resources areas.

China: classification of water quality

Grade	Use	Source of water
Grade I	Can be used for anything	Source of water, national nature reserve
Grade II	Drinking water	Centralised drinking water source
Grade III	Drinking water	Centralised drinking water source, agricultural and industrial use
Grade IV	Other than drinking water	General industrial use, recreational water areas where there is no human contact
Grade V	Other than drinking water	General agricultural use, artificial landscape use
Below Grade V	Can't be used	Can't be used and possibly hazardous

Source: Ministry of Water Resources

Greater proportion of plants meeting high standards

In April 2015, the State Council released its “Water Pollution Prevention Action Plan”, and has used the guidance from the plan for the development of the water sector under the 13th FYP period. As specified in the plan, municipal wastewater discharged in the relevant water resource areas must completely (100%) meet the Grade IA discharge standard by 2018, and from June 2016, all newly constructed municipal wastewater must meet the Grade IA discharge standard.

China: capacity/number of sewage treatment plants by discharge standard

	2015E				2020E	
	Capacity (ktpd)	Proportion	Number of plants	Proportion	Capacity (ktpd)	Proportion
Total MWWT plants	155,000		3,900		200,350	
- those that meet Grade IA or above	29,250	19%	860	22%	104,690	52%
- those that don't meet Grade IA	125,750	81%	3,040	78%	95,660	48%

Source: Ministry of Housing and Urban-Rural Development

Upgrading discharged wastewater:

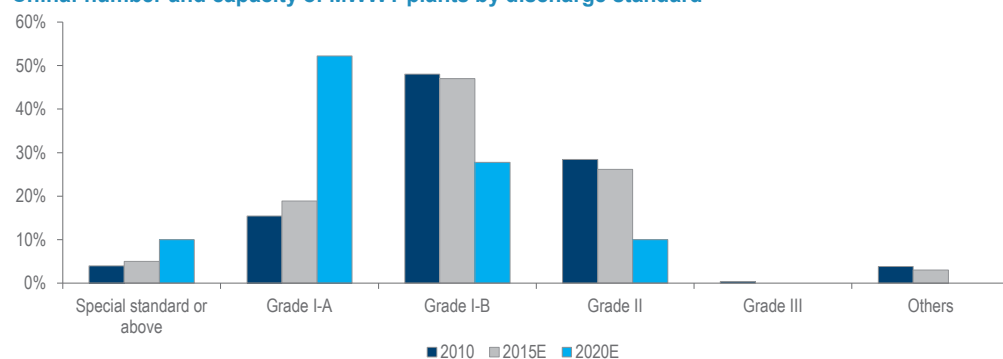
- 1. Eliminate: Below Grade V surface water Grade III treated water**
- 2. Enhance: Grade IA or above treated water**

In November 2015, the Ministry of Environmental Protection released a consulting paper on discharge standards for pollutants from urban wastewater treatment plants. The paper also details the requirements for existing water plants outside of the focus water resource areas, which have to meet the Grade IB discharge standard by 2018 (if the proportion of industrial wastewater treated is less than 80%) or the Grade II standard (if the proportion of industrial wastewater treated is more than 80%). The focus water resource areas include 62 major lakes, water reservations, and 212 seaside water territories in 56 cities, in 11 provinces.

According to the latest (2014) statistics released by the Ministry of Environmental Protection in explaining the consulting paper, around 30% (1,000 plants) of sewage treatment facilities outside the focus water resource areas failed to meet the Grade I-B standard, while 53% (500 plants) of sewage treatment facilities inside the focus water resource areas need to upgrade to the Grade I-A standard.

We estimate that the penetration rate for the MWWT discharge standard for above Grade I-A (including the special discharge standard) will increase from 19% in 2010 and 24% in 2015 to over 60% in 2020, assuming that one-third of the existing below-Grade I-A capacity is upgraded to above the Grade I-A standard.

China: number and capacity of MWWT plants by discharge standard



	2010	2015E	2018 target	2020E
Special standard	4.0%	5.0%	10.0%	10.0%
Grade I-A	15.4%	18.9%	n.a.	52.3%
Grade I-B	48.0%	47.0%	n.a.	27.7%
Grade II	28.4%	26.1%	n.a.	10.0%
Grade III	0.4%	0.0%	0.0%	0.0%
Others	3.8%	2.8%	n.a.	0.0%
Above Grade I-A	19.4%	23.9%		62.3%
Below Grade I-A	80.6%	76.1%		37.7%

Source: Ministry of Housing and Urban-Rural Development, State Council

China: number of sewage treatment plants by discharge standard

Municipal wastewater discharge standard

Grade I-A	The minimum standard for reclaimed water. Allowed to be discharged into rivers/lakes or used as urban landscape water.
Grade I-B	Allowed to be discharged into Grade III surface water (excluding water sources and restricted areas), Grade II Seawater, and enclosed/semi-enclosed lakes and reservoirs
Grade II	Allowed to be discharged into Grade IV and Grade V Surface water, Grade II and Grade III Seawater
Grade III	Allowed to be used outside of protected water source areas and outside major water bodies if local economic conditions cannot support more advanced treatment techniques; but must be upgraded to Grade II in phases

Source: Ministry of Environmental Protection

By 2020: over 60% of treated discharge wastewater should meet Grade I-A

10% as per the special discharge standard

Upward revisions to discharge standards

As one of the focuses in the Water Pollution Prevention and Control Plan, China wants to eliminate any highly polluted water that is classified as being lower than Grade V in the Yangtze River Delta and Pearl River Delta regions by 2020, and reduce below-Grade V surface water in the "Beijing-Tianjin-Hebei" region by 15% by 2020. To do this, the WWT discharge standards need to get more stringent.

The current discharge standards for municipal WWT plants have been in force since July 2003, and in our view, they are too outdated to reach China's target of eliminating the below-Grade V surface water. If we compare the municipal WWT discharge standards with the country's classification for surface water, we find that even the well-treated wastewater that meets the Grade I-A discharge standards is a threat to the environment. This is because the Grade I-A standard for WWT discharge is lower than the lowest classification (Grade V) standard for a natural body of water. Meanwhile, the Grade V standard for natural bodies of water is by definition that the water is useless and possibly hazardous.

China: surface water standards vs. current national WWT pollutant discharge standards

(mg/L)	Surface water classification standards					National municipal WWT discharge standards (Implemented since 2003)			
	Grade I	Grade II	Grade III	Grade IV	Grade V	Grade I-A	Grade I-B	Grade II	Grade III
Chemical Oxygen Demand (COD)	15	15	20	30	40	50	60	100	120
Biochemical Oxygen Demand (BOD ₅)	3	3	4	6	10	10	20	30	60
Suspended Substance (SS)	n.a.	n.a.	n.a.	n.a.	n.a.	10	20	30	50
Fat and Grease	n.a.	n.a.	n.a.	n.a.	n.a.	1	3	5	20
Oil and Petroleum	0.05	0.05	0.05	0.5	1	1	3	5	15
Linear Alkyl benzene Sulfocates (LAS)	0.2	0.2	0.2	0.3	0.3	0.5	1	2	5
Total nitrogen	0.2	0.5	1	1.5	2	15	20	n.a.	n.a.
Ammonia - normal (at or below 12°C)	0.015	0.5	1	1.5	2	5 (8)	8 (15)	25 (30)	n.a.
Total phosphorus - lake (reservoir)	0.02 (0.01)	0.1 (0.025)	0.2 (0.05)	0.3 (0.1)	0.4 (0.2)				
Total phosphorus - commenced operation before (after) 31st Dec 2005						1 (0.5)	1.5 (1)	3 (3)	5 (5)
Chroma	n.a.	n.a.	n.a.	n.a.	n.a.	30	30	40	50
pH	6 - 9	6 - 9	6 - 9	6 - 9	6 - 9	6 - 9	6 - 9	6 - 9	6 - 9
Fecal Coliform (unit/L)	2x10 ²	2x10 ³	10 ⁴	2x10 ⁴	4x10 ⁴	10 ³	10 ⁴	10 ⁴	n.a.
Fecal Coliform (MPL/L)									

Source: Ministry of Environmental Protection, General Administration of Quality Supervision, Inspection and Quarantine

In the consulting paper on the new standard, a new category has been defined as the special discharge standard which applies to wastewater treatment plants in vulnerable environment regions. The special discharge standard includes a strict discharge level, similar to the Grade IV surface water classification standard (with the exception of the total nitrogen content). The Ministry of Environmental Protection has issued guidance that around 10% of the total below-Grade I-A municipal wastewater treatment capacity needs to be upgraded to meet the special discharge standards, equivalent to around 11mtpd capacity.

China: new proposed discharge standards under the 13th FYP (under discussion)

(mg/L)	Surface water classification standard		New discharge standard for municipal WWT				Old discharge standard for municipal WWT		
	Grade IV	Grade V	Special discharge standard	Grade I-A	Grade I-B	Grade II	Grade I-A	Grade I-B	Grade II
Chemical Oxygen Demand (COD)	30	40	30	50	60	80	50	60	100
Biochemical Oxygen Demand (BOD ₅)	6	10	6	10	20	30	10	20	30
Suspended Substance (SS)	n.a.	n.a.	5	10	20	30	10	20	30
Fat and Grease	n.a.	n.a.	1.0	1	3	5	1	3	5
Oil and Petroleum	0.5	1	0.5	1	3	5	1	3	5
Linear Alkylbenzene Sulfonates (LAS)	0.3	0.3	0.3	0.5	1	2	0.5	1	2
Total nitrogen	1.5	2	10/15	15	20	25	15	20	n.a.
Ammonia - normal (at or below 12°C)	1.5	2	1.5 (3)/3 (5)	5 (8)	8 (15)	15 (20)	5 (8)	8 (15)	25 (30)
Total phosphorus - lake (reservoir)	0.3 (0.1)	0.4 (0.2)							
Total phosphorus			0.3	0.5	1	1	0.5	1	3
Chroma	n.a.	n.a.	15	30	30	40	30	30	40
pH	6-9	6-9	6-9	6-9	6-9	6-9	6 - 9	6-9	6-9
Fecal Coliform (unit/L)	2x10 ⁴	4x10 ⁴	10 ³	10 ³	10 ⁴	10 ⁴	10 ³	10 ⁴	10 ⁴

Source: Ministry of Environmental Protection

Compared with the current standards for the discharge of municipal WWT, the basic index for Grade I-A and Grade I-B is basically the same for the new standards (middle column in the chart above), while there have been slight increases for Grade II, and Grade III has been eliminated. The basic index has also been increased to 21 items from 19 previously, adding total nickel and benzopyrene.

More pollutant control items aiming to control unregulated discharged industrial wastewater

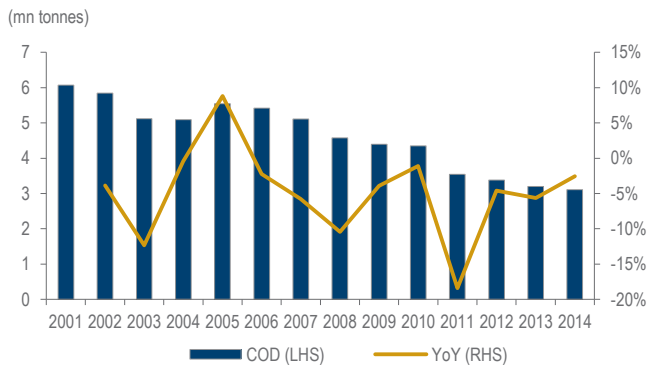
Industrial WWT (centralized) will also be the focus

The new standards also increase the number of selective pollutant control items to 82, from 43, as some municipal water plants receive industrial wastewater that contains various heavy metal and certain organic contaminants. The added items include 20 types of organic matter, 11 types of metal, 7 types of pesticide residue, 1 type of mineral matter, and 1 type of pollutant in the composite toxic index.

Due to their complexity, the industrial WWT discharge standards were issued separately for 11 industries. However, some factories don't have in-house WWT facilities and they often discharge industrial wastewater together with municipal wastewater. The addition of an official performance index with an emphasis on industrial discharge means an increase in the supervision of illegally discharged industrial wastewater, and should push the government to set up a third-party centralised industrial WWT service, especially for small-scale factories with poor environmental facilities.

Specifically, we see the strong likelihood of the more stringent regulations and monitoring standards forcing factories to outsource their WWT services to third-party professional operators instead of handling them in-house. Furthermore, the leading professional operators in the sector have been able to achieve high discharge standards. According to our market research, CTE and BEW's treated wastewater contains 20-30mg/L of COD, higher than the WWT pollutant discharge Grade 1-A standard, and meets the surface water Grade IV (special discharge) standard.

China: industrial COD discharged



Source: Ministry of Environmental Protection

China: market size for industrial WWT



Source: Ministry of Environmental Protection

CNY175-185bn total investment to meet the needs of implementing higher discharge standards

Investment needed to meet higher discharge standard

To ensure that over 60% of China's water plants meet the above-Grade I-A discharge standard by 2020 (10% of total capacity to meet the special discharge standard), we estimate that a total investment of CNY175-185bn is needed. This would be used for the new capacity investment and to ensure that 30% of the existing MWWT capacity meets the discharge upgrade.

China: municipal WWT upgrade investment potential for 13th FYP (2016-20)

			Mostly green-field	Mostly via upgrade
By 2015E	Municipal WWT capacity	(ktpd)	155,000	155,000
	Municipal WWT penetration		87%	87%
(ktpd)	- of which, Grade I-A capacity	(ktpd)	29,250	29,250
	- Lower than Grade I-A capacity	(ktpd)	125,750	125,750
	To be upgrade during 13th FYP	(ktpd)	37,725	37,725
	Further capacity upgrade potential	(ktpd)	88,025	88,025
By 2020E	Target municipal WWT capacity	(ktpd)	200,350	200,350
(ktpd)	Target municipal WWT penetration		100%	100%
	Further capacity addition potential	(ktpd)	45,350	45,350
<u>Unit capex</u>				
	From Grade II to Grade I-A	(CNY/ton)	1,125	1,125
	From Grade I-B to Grade I-A	(CNY/ton)	750	750
	From Grade II to super-discharge standard	(CNY/ton)	3,875	3,875
	From Grade I-B to super-discharge standard	(CNY/ton)	3,500	3,500
	New Grade I-A	(CNY/ton)	2,250	2,250
	New super-discharge standard	(CNY/ton)	5,000	5,000
<u>Total capacity (2015E)</u>				
	Grade II	(ktpd)	40,500	40,500
	Grade I-B	(ktpd)	72,850	72,850
	Grade I-A	(ktpd)	29,250	29,250
	Special discharge (*)	(ktpd)	7,750	7,750
<u>Proportion (2015E)</u>				
	Grade II		26%	26%
	Grade I-B		47%	47%
	Grade I-A		19%	19%
	Special discharge (*)		5%	5%
<u>Proportion (2020E)</u>				
	Grade II		10%	10%
	Grade I-B		28%	28%
	Grade I-A		52%	52%
	Special discharge (*)		10%	10%
<u>Total capacity (2020E)</u>				
	Grade II	(ktpd)	20,035	20,035
	Grade I-B	(ktpd)	55,590	55,590
	Grade I-A	(ktpd)	104,690	104,690
	Special discharge (*)	(ktpd)	20,035	20,035
<u>Total upgraded/new capacity (2015-20E)</u>				
	From Grade II to Grade I-A		20,465	-
	From Grade I-B to Grade I-A		17,260	25,440
	From Grade II to super-discharge standard		-	-
	From Grade I-B to super-discharge standard		-	12,285
	New Grade I-A capacity		50,000	50,000
	New special discharge capacity		12,285	-
<u>Total capex (2015-20E)</u>				
	From Grade II to Grade I-A	(CNYm)	23,023	-
	From Grade I-B to Grade I-A	(CNYm)	12,945	19,080
	From Grade II to super-discharge standard	(CNYm)	-	-
	From Grade I-B to super-discharge standard	(CNYm)	-	42,998
	New Grade I-A capacity		84,859	112,500
	New special discharge capacity	(CNYm)	61,425	-
	Total investment from upgrade	(CNYm)	35,968	62,078
	Total investment on new Grade I-A/special discharge capacity	(CNYm)	146,284	112,500
	TOTAL MWWT INVESTMNET	(CNYm)	182,252	174,578

Source: NDRC, Ministry of Housing and Urban-Rural Development, Daiwa estimates

A higher discharge standard means higher tariffs and a higher unit dollar EBIT

MWWT tariff upside

In China, 6 main processes – oxidation ditch (OD), Anaerobic-Anoxic-Oxic (A²/O), the sequencing batch reactor activated sludge process (SBR), anoxic-oxic (A/O), an activated sludge process and a membrane process – were used by 89.8% of the wastewater treatment plants and accounted for 90.6% of the treatment volume in China in 2014. The penetration rates in China of the prevailing methods in Europe/US, such as OD, A²/O and

A/O, which have an advanced effect on the total phosphorus and total nitrogen discharged in waste treatment, have been rising since mid-2000s, on our estimates.

Cost of different treatment methods

Method	Indicators (% of pollutants cleared)			Financial cost (CNY/m ³)	
	BOD5	Total nitroge	Total phosphorus	Construction cost	Operation cost
Activated sludge process	90-95	30	10	800-1200	0.3-0.6
AB method	90-95	30-40	50-70	1000-1200	0.3-0.6
Membrane process	90	30	10	1200-1400	0.3-0.6
OD	>95	>80	>60	800-1000	0.3-0.6
SBR	>95	80-90	80	800-1000	0.3-0.6
A2/O	90-95	80	80	1200-1500	0.5-0.8
Advanced treatment	>95	90	90	1500-2000	0.6-1.2
MBR (advanced treatment)	>95	>90	>90	2000-3000	1-2

Source: H2O China, Daiwa research

To meet the Grade I-B standard, basic secondary treatment of wastewater is required. For Grade I-A, advanced treatment (a tertiary treatment method) is necessary. To achieve the special discharge standard, additional advanced treatment method is required

Types of sewage treatment facility

Preliminary Treatment / Screening	Includes screening and removal of grit. Solids larger than 6mm in diameter are removed from the sewage.	
Primary Treatment	Includes screening, removal of grit and a sedimentation process. Solid waste and settleable suspended solids are removed from the sewage. Removal efficiency for Total Suspended Solids (TSS) is about 70% and Biochemical Oxygen Demand (BOD) is about 30% with this process.	
Chemically Enhanced Primary Treatment	Chemicals (eg, ferric chloride or alum) are added during the treatment process to enhance the removal of TSS and BOD. The removal efficiency for TSS and BOD with this process is in the region of 80% and 60%, respectively.	
Secondary Treatment	The sewage is purified by means of a biological treatment process after the primary treatment. The organic matter in the settled sewage is decomposed by micro-organisms in the biological treatment process. Treated effluent from this process meets the 30mg/L TSS and 20mg/L BOD standards.	Grade I-A, Grade I-B
Advanced treatment (Tertiary Treatment)	Highest level of treatment to polish the effluent after the secondary treatment process. This process comprises a combination of physical and biological processes with the objective of removing nutrients and any remaining suspended solids in the sewage.	Grade I-A, Special discharge standard

Source: H2O China, Daiwa research

For wastewater treatment plants, if upgrading from Grade I-B to Grade I-A, the estimated unit upgrade capex could be 30-40% of the initial investment for Grade I-A MWWT plant. And if the plant is looking to meet the higher special discharge standards, the unit upgrade capex could end up being the same as the initial investment, to meet with the total N, P and NH₄-H requirements.

MWWT unit dollar EBIT upside should be fully realised by 2020

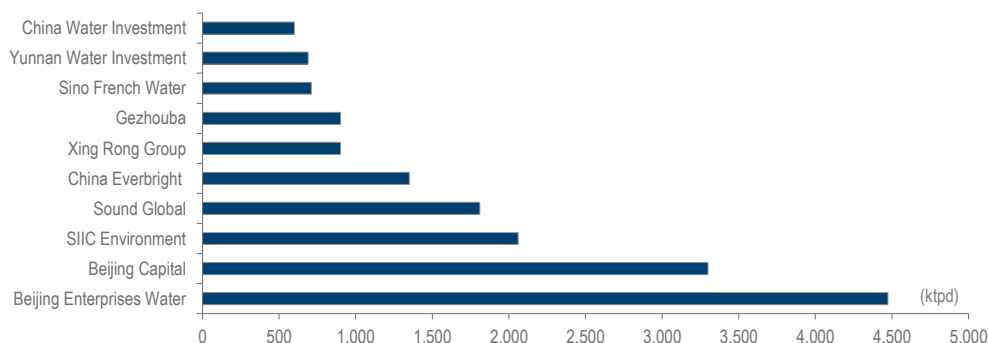
Given the higher operating costs of employing the advanced treatment method, after being upgraded to the Grade I-A discharge standards, we estimate that a municipal WWT plant can generally raise its tariffs by 30-50%, and that the tariff should be at least double (if being upgraded to the special discharge standard), to sustain a reasonable return of 8-10% on investment. We estimate that the EBIT per unit capacity could also increase by 1.5-4x from CNY0.2/tonne of Grade I-B to CNY0.3/tonne for Grade I-A and CNY0.6-0.8/tonne for the national special discharge standard.

Even though the consulting paper targets to complete the upgrades by 2018, we think the actual time taken will be much longer. A major pushback that we see is the financial constraints of local governments. As some of the local governments have already lifted local standards, the water plants will need to reach an agreement with these local governments on new tariffs before investing in upgrades. Bear in mind that some small-scale operators currently lack the technology, financial capital and the expertise to cope with the higher discharge standards. It's not rare to see the water plants failing to agree with the relevant local government on the tariff, according to one supervisor at BEW. And in some cases the water-plant operator has been forced to sell the water asset.

Higher discharge standard should help the market consolidate by leading to the exit of small operators

As the WWT market is highly segmented, the top-10 players had only a 26% share of China's total contracted WWT capacity in 2015, compared with more than 80% in other countries. We believe the raising of discharge standards, coupled with stronger enforcement, could be a share-price catalyst for the market leaders, as it would create more M&A opportunities for them, for example: 1) smaller operators that are lacking operating scale, financial capital or the know-how to cope with the higher discharge standards and decide to sell, and 2) companies with cutting-edge technology, long track records of running operations and cooperating with the local governments, and sizeable portfolios. These would also be ideal targets.

China water companies: Capacity additions (2015)



Source: H2O China, Daiwa

China water companies: ranking in terms of total contracted capacity

Company name	Ticker	Current capacity and pending operation (ktpd)	Market share
Beijing Enterprises Water	371 HK	24,620	4.5%
Beijing Capital	600008 CH	19,000	3.5%
Guangdong GDH Water	Not listed	15,970	2.9%
Shanghai Capital	Not listed	15,250	2.8%
Veolia China	VIE FP	13,520	2.5%
Sino French Water	unlisted	12,370	2.3%
SIIC Environment	SIIC SP	10,560	1.9%
China Water Investment	Not listed	9,680	1.8%
General Water of China	Not listed	7,500	1.4%
Shenzhen Water	Not listed	7,260	1.3%
Beijing Origin Water	300070 CH	6,500	1.2%
Top-11		142,230	26.0%
National total		547,738	100.0%

Source: H2O China, Daiwa

Besides more acquisition opportunities due to discharge standards being upgraded, we estimate that the acceleration in the number of water plants that meet the Grade I-A standard would lead to earnings CAGRS of 2-4% over 2015-20. The additional upgrades to the special discharge standard could lead to 7-10% earnings enhancement, on average, assuming that 30% of water plants need to be converted to Grade I-A and that 20% of water plants need to shift to the super-discharge (surface water Grade IV) standard.

We have a more conservative assumption on the government's upgrade schedule, as we believe the upgrade target in the consulting plan will be reached in 2020, later than 2018 as stated in the plan – we think the move to higher discharge standards will lead to heavier financial burdens for the local governments (transferred to end users by raising tariffs). Before more financing channels (ie, green bonds and private water-funds) are established, we believe the near-term target for the discharge-standard upgrades to be completed is by 2020, and that we will see an acceleration in the pace of water plants meeting the higher discharge standards towards the end of the 13th FYP (ie, 2018-20).

Sludge treatment: becoming a bigger earnings driver

Sludge treatment: c.20-30% penetration in 2015, moving up to 90% penetration in 2020E

While the WWT companies are responsible for the treatment of sludge, the current penetration of sludge non-hazardous treatment is only c.20-30% in China, suggesting huge room for new capacity growth and new project opportunities.

As specified in China's Water Pollution Prevention Plan issued in April 2015, improving sludge treatment rates and standards is one of the main focuses in the plan. The government aims to increase the sludge non-hazardous treatment rate to 90% for city classification, at the county level or above, by 2020, higher than the 2015 target of 30-80%.

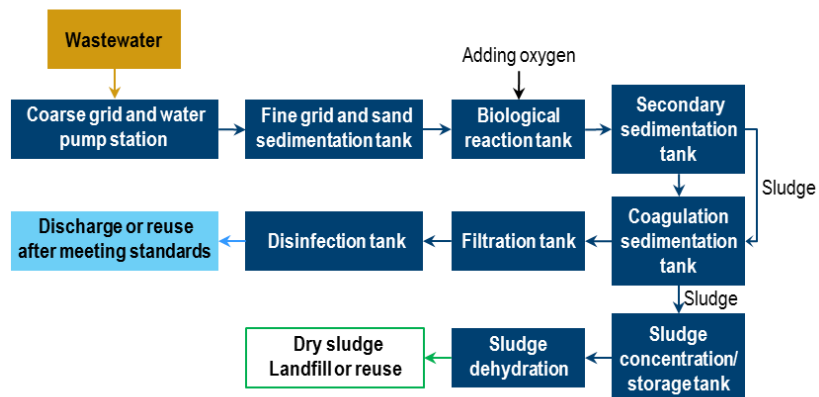
We see sludge treatment as becoming a greater earnings driver for WWT companies as existing MWWT businesses mature, and expect rapid growth in sludge treatment volume during the 13th FYP period.

Current situation: low treatment rate far from 12th FYP target

Sludge is produced as a by-product during the sewage treatment of industrial or municipal wastewater. According to the [Technical guidance for sludge treatment for municipal WWT plants](#) issued by the NDRC and the Ministry of Housing and Urban-Rural Development in 2011, every unit of wastewater produces 0.5-1% of wet sludge (with an 80% moisture rate) after the WWT process.

Wastewater treatment plants are responsible for the treatment of sludge. Originating from wastewater, sludge contains a high concentration of chemical/organic waste and heavy metals, and around 40-60% of the COD in wastewater is contained in the sludge produced, along with 20-30% of N (nitrogen), 90% of P (phosphorus). Therefore, sludge can lead to secondary pollution and directly threaten public health if not properly treated.

General municipal WWT process



Source: Daiwa research

In 2014, the Ministry of Environmental Protection reported in the 2014 Environmental Yearbook that China produced almost 28m tonnes of sludge. Even though the moisture rate (dried or with moisture) may affect the statistics, we believe this reported number is not a precise reflection of the actual situation, mostly as the reported number is the same as the treatment amount. We believe that some of sludge generated in 2014 was untreated and dumped secretly to avoid the cost of treating it. Considering that there were 40.1bn tonnes of municipal wastewater discharged in 2014, and given the 90.2% WWT treatment rate, we estimate that the actual sludge produced (with an 80% moisture rate) in 2014 was around 35m tonnes – and the reported number of 28m tonnes fell short by 20%.

Municipal sludge reported generation volume and Daiwa's estimated generation volume



Source: Ministry of Environmental Protection, Daiwa estimates

Heavy metal and bacterial content of sludge (dry sludge)

Bacterial (unit/kg)	Primary sludge	Activated sludge	Digested sludge
Total Bacterial Count (TBC)	47,170	73,800	3,830
Fecal Coliform	15,800	1,210	120
Parasite Ova	0.233 (78.3% alive)	0.170 (67.8% alive)	0.139 (60% alive)
Heavy Metal (mg/kg)	Max	Average	Min
Cd	999	2.01	0.04
Cu	9,592	219.00	51.00
Pb	1,022	72.30	3.60
Zn	30,098	1,058.00	217.00
Cr	6,365	93.10	20.00
Ni	6,206	48.70	16.40
Hg	18	2.13	0.04
As	269	20.20	0.78

Note: National Development and Reform Commission, Ministry of Housing and Urban Rural Development

Actual sludge volume in China is currently under-reported

According to the Technical guidance, sludge treatment methods have 3 general categories: disposal, incineration and utilisation. The disposal of sludge in landfills could threaten the environment, making the land unusable. Most countries are phasing out landfilling methods for sludge as it is commonly recognised that sewage sludge is a resource more than a liability. The most economical way to deal with treated sludge is to use it as a substitute for fertiliser or soil, and using it for green city projects could generate as much as a CNY400/tonne in net profit (excluding treatment costs, depreciation, etc).

Cost-benefit analysis for production of sludge treatment by-products

(CNY/tonne of 45-50% moisture wet sludge)	Fertiliser	Nutritious soil	Land restoration	Lawn	Urban greening	Forestry
Cost (packaging, transportation, etc)	220	100	160	80	100	160
Saving (replace regular fertiliser or soil)	600	300	200	300	500	500
Net benefit	380	200	40	220	400	340

Source: NDRC, Ministry of Housing and Urban-Rural Development

Sewage sludge production and utilisation rates in selected countries

Country or region	Sludge utilisation rate	Sludge production (mn tons dry solids per year)	Main sludge applications (construction materials)
UK	85%	1.05	Land application, energy recovery
Australia	80%	0.36	Land application
South Africa	80%	1	Land application
India	80%		Land application
Japan	74%	2.2	Energy recovery, construction products (including incinerated ash)
Germany	60%	2.3	Land application, energy recovery
United States	55%	17.8	Land application
European Union	40%	9	Land application
Republic of Korea	6%	1.9	Land application, construction products
Singapore	0%	0.12	-
Hong Kong	0%	0.3	-

Source: ADB

Although the recovery and reuse of energy and resources from sludge treatment is strongly encouraged by the government, no sludge utilisation rate has been specifically stated.

As specified in the Technical guidance, the objective of sludge treatment in China is to realise volume reduction, stabilisation, and the safe disposal of it. In the 12th FYP, the government targeted a municipal sludge non-hazardous treatment rate of 80% for major cities, 70% for other cities and 30% for country areas and towns, from less than 20% as of 2010. As such, the government targeted to spend CNY35bn during the 12th FYP period, nearly tripling the 2010 municipal sludge treatment capacity in China.

Despite the government's aggressive plan, the development of the sludge treatment market had fallen well behind the 2015 target, as at end-2015. Currently, the penetration of sludge non-hazardous treatment is only c.20-30% in the major cities. As reported by the Standing Committee of the Beijing Municipal People's Congress at the 2015 year-end

meeting, the non-hazardous sludge treatment rate in Beijing was only 23%, much lower than the target of 90% set out in the 3-year plan for wastewater treatment and reusable water plant construction issued in 2013. Beijing planned to set up 15 non-hazardous plants for sludge treatment, while only 1 plant was in operation by 2015. Four plants are under construction, and the rest are still at the preparation phase.

Clearer guidelines on sludge treatment could help increase its penetration rate

In our view, the main reasons for the underdevelopment of the sludge treatment are unclear industry guidelines and a lack of financial support. For example, despite the high treatment cost for the stabilisation and treatment of non-hazardous sludge (CNY150-250/tonne for sludge with an 80% moisture rate), there is still a lack of standardised treatment tariffs. Also, as the investment mechanism is not well-established, the government still plays a dominant role in the ownership and financing of China's sludge infrastructure – very few private companies are willing to enter the market.

Looking forward: responsibility clearly assigned

Improvement of sludge treatment rates and standards is one of the main focuses in the Water Pollution Prevention Plan issued in April 2015. The government aims to increase the sludge non-hazardous treatment rate to 90% for city classification, at the county level or above, by 2020, higher than the 2015 target of 30-80%. We estimate that the 2015 target was not met and understand that the government is formulating additional regulations to reduce the amount of untreated disposal.

But the existence of quality standards alone is of little value if they are not adequately enforced. To date, the lack of integrity and effectiveness of a comprehensive regulatory system on sludge treatment has been a significant weakness.

In April 2016, the Ministry of Environmental Protection, together with the Ministry of Housing and Urban-Rural Development issued a Notice on “Strengthening Inspection of Sludge Treatment in City Waste Water Treatment Facilities”. The policy specifies that sludge management is an integral part of wastewater treatment and should be planned and implemented accordingly.

China: recent policies on sludge treatment

Publish date	Department	Document name	Details
Dec-14	MEP, NDRC, MoHURD	Management Method on Waste Water Treatment Charge Utilisation	- Introduce the standard for setting waste water treatment fees, as normal operational cost plus reasonable returns - Gradually adjust the treatment fees that are not up to the announced level
Jan-15	NDRC, MoF, MoHURD	Notice on Setting and Adjusting Waste Water Treatment Fee Standard	- Reiterate the “cost + reasonable return” standard for setting waste water treatment fees - Requires that all cities' waste water treatment fees should be at least CNY0.95/tonne (residential) and CNY1.4/ton (non-residential) by 2016 - Require that all counties' waste water treatment fees should be at least CNY0.85/ton (residential) and CNY1.2/tonne (non-residential) by 2016
Apr-15	State Council	Water Pollution Prevention Action Plan	- Target announced to upgrade all sludge treatment facilities to required operational standards by 2017 - Target announced to achieve 90% sludge treatment penetration in all prefecture-level-or-above cities by 2020
Oct-15	State Council	Several Opinions on Progressing Price Reform	- Required to reasonably raise waste water treatment fees
Apr-16	MEP, MoHURD	Notice on Strengthening Inspection of Sludge Treatment in City Waste Water Treatment Facilities	- Centralise the supervision of sludge treatment and urban waste water treatment - For any sludge treatment that is not up to standard, deduct the volume of COD and NH ₄ (ammonium) reduction, in accordance with the volume of sludge

Source: MEP, NDRC, MoHURD, State Council

In the 13th FYP plan, the China government targets to reduce the per unit GDP production of COD by 3% pa, and a reduction in COD is one of the important indicators for local government assessment. We expect the policy to build up the mechanisms by which local governments will take active source control measures to prevent possible damage to the environment caused by the unregulated disposal of sludge.

City-water PPP model

The PPP project model has been standardised and promoted since 2014

The water companies that we cover, such as BEW, focus mainly on building and operating MWWT plants. However, MWWT only represented 35% of the total CNY1.2tn water investment under the 12th FYP. With the rising penetration rate of MWWT, we believe the government will continue shifting the focus from MWWT to city-water projects, such as replacing old water distribution pipelines, waterbody restoration, river clean-ups, and rainwater conservation projects, using a PPP model that is supported by water funds or green-bond financing. We estimate this city-water model could account for CNY2tn of the total CNY3tn investment earmarked for the water sector during the 13th FYP. Furthermore, we think city water will be the future business direction for China's leading water companies such as BEW and CEWL, which have strong balance sheets and the government relationships needed to embark on such capital-intensive projects.

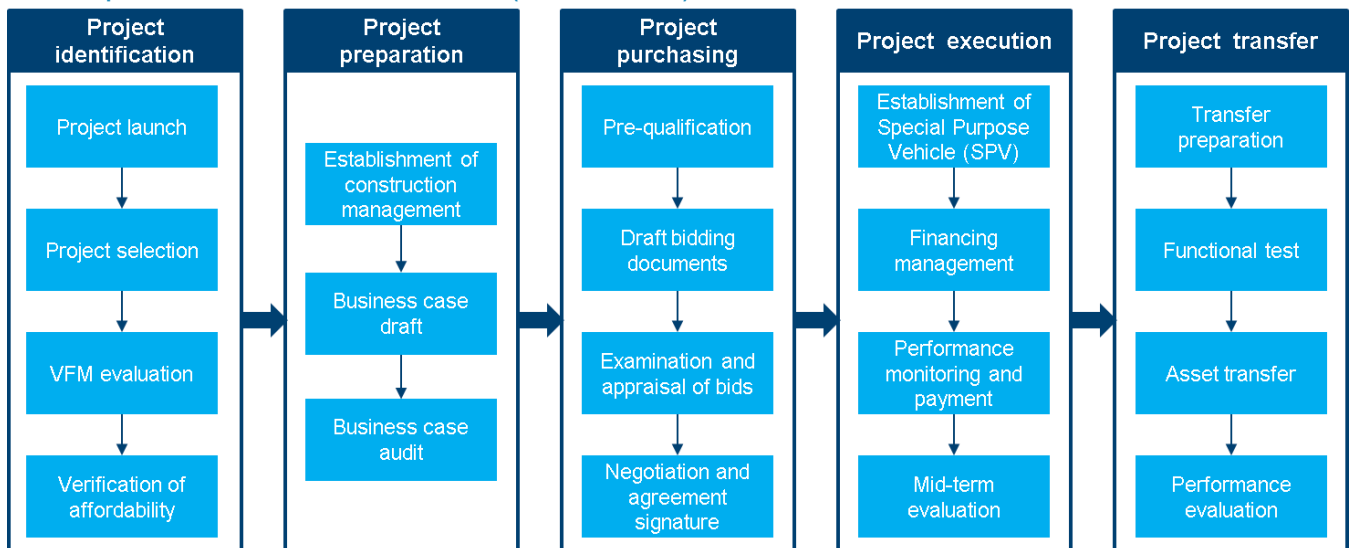
Government support started to bear fruit in 2015

There is no doubt that 2014 was an important year for the development of PPP in China. Many elements are now in place to allow PPPs to flourish: strong central government endorsement, the need for investment, the limited financial resources of local governments, pilot programmes, dedicated institutions and increasing experience.

1. Standardised procedure established

The MOF and the NDRC issued respective guidelines in 2014 concerning PPP agreements. These guidelines are designed to help local governments and private sectors share risk in a sound, efficient manner. According to the NDRC's guidelines, the PPP mechanism should be favoured for infrastructure or public services, both of which fall under the government's responsibility and are suitable for market-based operations. The MoF also provides guidance about the different steps for establishing a PPP.

NDRC: steps to follow to establish a PPP contract (released in 2014)



Source: NDRC

The guidelines also emphasises the need for robust mechanisms entailing cooperation, joint review and price management, political guarantees, and orderly conduct. Specifically, the return on a PPP project is clarified as being "reasonable", considering the interest rates applied to mid-to-long-term commercial bank loans, and the discount rates applied to local government loans. Local governments are also required to limit their annual PPP payments to 10% of their annual fiscal spending, to ensure they can pay and to prevent over-expansion.

PPP: standardised return formula

R = reasonable return

i = annual discount rate

$$\text{Annual operating subsidy} = \frac{\text{Construction cost} \times (1 + R) \times (1 + i)}{\text{Operating period}} + \text{annual operating cost} \times (1 + R) - \text{user payment}$$

Source: NDRC

2. Central PPP policy unit set up to guide implementation

In May 2014, the MOF set up a PPP-leading group, and in December of the same year, the MOF announced the establishment of a PPP centre. The main mission of this centre is policy research, training, gathering statistics and international cooperation. In its next steps, the MOF is willing to build a proper environment for PPPs, increase confidence, better manage related standards and norms, and assist in the implementation of more PPP projects.

3. Detailed approach introduced to ensure specific operating needs are met

We are also delighted to see the development of sector-by-sector standard contracts for PPP implementation, since the PPP model is not a case of one-size-fits-all. Each sector has specific needs and could need a bespoke PPP solution.

For example, in March 2015, the NDRC and MoF cooperated with the Ministry of Water Resources to issue an “Opinion on encouraging private participation in the construction and operation of major hydro projects”, specifying the pricing mechanism, financial support, etc, to encourage private participation in major hydro projects by offering subsidies. It also introduced certain pilot projects to attract private investment. In April 2016, the MoF again, along with the Ministry of Environmental Protection, issued a policy on the implementation opinion about the use of PPP to prevent water pollution.

China government: early policies for the development of the PPP model (2014-Sep 2015)

Policy	Issuing date	Issuing authority	Key points
Notice on the first batch of infrastructure projects that encourage private investment	18-May-14	National Development and Reform Commission	Introduces 80 demonstration projects to encourage private investment in the construction of related infrastructure
Notice on promoting PPP	23-Sep-14	Ministry of Finance	Promotes the implementation of relevant demonstration projects Emphasises the importance of financial management in PPP projects
Notice on PPP operation guidelines (pilot project)	29-Nov-14	Ministry of Finance	Provides detailed rules and guidelines for the operation of PPP projects
Notice on PPP demonstration project implementation	30-Nov-14	Ministry of Finance	Introduces 30 demonstration projects in 15 provinces, including transport, sewage treatment and environmental protection projects
General guidelines on PPP contracts (2014)	2-Dec-14	National Development and Reform Commission	Provides standards and regulations when drafting PPP contracts
Guiding opinion about initiating PPP contracts	2-Dec-14	National Development and Reform Commission	Outlines the overall strategy for developing PPP projects Decides on the scope and common models for PPP projects, and strengthens relevant regulations
Notice on regulating PPP contract management	30-Dec-14	Ministry of Finance	Establishes the core principles for PPP contract management Establishes different terms and rules for PPP projects in different payment models and industries
Notice on government sourcing in PPP projects	31-Dec-14	Ministry of Finance	Regulates the sourcing of PPP projects through various procedures, dispute settlement and inspection mechanisms
Notice on initiating the promotion of PPP contracts in public municipal affairs	13-Feb-15	Ministry of Finance, Ministry of Urban-rural Development	Decides to adopt the PPP model in projects relating to city-water, sewage treatment, solid waste treatment, heating, gas supply, public transport infrastructure, etc.
Notice on promoting developmental finance to support PPP contracts	10-Mar-15	National Development and Reform Commission	Requires the development banks to support PPP finance
Implementation of opinion about encouraging private participation in the construction and operation of major hydro projects	17-Mar-15	National Development and Reform Commission, Ministry of Finance, Ministry of Water Resources	Encourages private participation in major hydro projects by giving out subsidies, implementing a pricing mechanism, financial support, etc Introduces pilot projects to attract private investment
Notice on guidelines to financially stress test for PPP projects	7-Apr-15	Ministry of Finance	Establishes the rules and standards for defining financial responsibilities, budgeting, financial capability assessment and due diligence
Implementation of opinion about PPP contracts for water-pollution prevention	9-Apr-15	Ministry of Finance, Ministry of Environmental Protection	Sets the overall objectives, principles and requirements for PPP contracts in water pollution prevention
Management measures on infrastructure and public utility franchising	25-Apr-15	National Development and Reform Commission, Ministry of Finance, Ministry of Housing and Urban-rural Development, Ministry of Transport, People's Bank of China	Encourages private participation in the construction and operation of infrastructures and public utilities
Guidelines on promoting PPP in public services (Document No.42)	19-May-15	Ministry of Finance, National Development and Reform Commission, People's Bank of China	Adopts international standard definition for PPP contracts Emphasised the importance of the PPP model in public services
Further notice on PPP demonstration project implementation	25-Jun-15	Ministry of Finance	Emphasises that the PPP pilot projects are a major tool for the implementation of the PPP model, and called for the submission of the second batch of PPP pilot projects. Encouraged local government financing vehicle (LGFV) projects to be transferred to PPP projects.
Notice on the second batch of PPP demonstration projects	25-Sep-15	Ministry of Finance	Introduces 206 demonstration projects, involving a total investment of CNY658.9bn

Source: Government documents, Daiwa

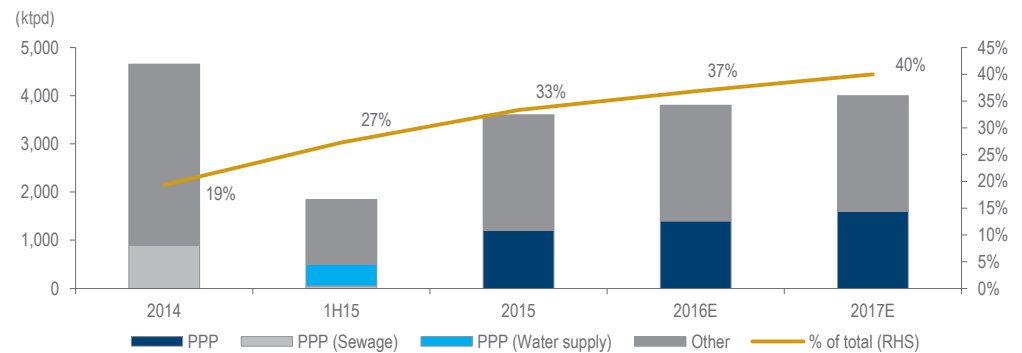
PPP projects should be one of the key growth drivers for BEW's water capacity growth under the 13th FYP

PPP model for the water sector: enlarging the project pool

The wastewater treatment sector made an early start in adopting the PPP operating model. Privately owned companies have been entering the municipal WWT industry since 2000, as a result of the following factors: 1) their flexibility in how to develop their business and the projects they bid on, 2) their operational efficiency and adaptability, made possible by their extensive technical know-how, 3) a reduced burden on the public budget for infrastructure development due to private companies being involved in the service-concession-right, and 4) their stable cash flow, backed by water tariffs and government funding.

In 2015, more than 25% of BEW's total capacity was for PPP projects. These PPP projects are usually for large-scale bundle water projects, instead of individual WWT plants, that would attract investment by scalable WWT companies like BEW, in our view.

BEW: % of projects under the PPP model



Source: Company, Daiwa forecasts

We think the PPP model could enlarge the addressable market for China water operators, by including public projects that may not be included under traditional BOT projects, such as surface-water treatment, water pipelines, and water diversions.

The government used to invest directly in public utilities, leaving them with a heavy debt burden and resulting in low operating efficiency. Into the 13th FYP period, given the country's increasing environmental investment needs and tighter financing channels, the local governments are to lead social investment (instead of just having sole investors) in the thriving water treatment sector.

Sponge cities require significant investment, and are a good source of PPP projects

Sponge cities: a huge opportunity for PPP projects

A “sponge city”, also known as a “low-impact development rainwater system”, refers to a city with a water system that operates like a sponge to absorb, store, infiltrate and purify rainwater and to release it when necessary.

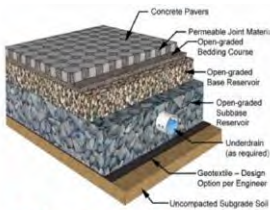
A “sponge city” project is part of an integrated environmental water service, which involves the construction, maintenance and operation of grass channels, rain gardens, sunken green spaces, urban storm water drainage pipes, pump stations and wastewater treatment plants. For 2015-16, China has announced a total 30 trial sponge city projects so far, with a subsidy of CNY1.2-1.8bn for each project. We believe China will add 15 sponge-city projects during the 13th FYP period, requiring subsidies of c.CNY90bn subsidy, if the subsidy scheme continues.

Recent policy developments for sponge cities

Time	Event
Dec-13	At the Central Urbanisation Work Conference, President Xi Jinping mentioned “to construct sponge cities with natural accumulation, natural filtration and natural purification abilities” as part of his speech
Oct-14	The Ministry of Housing and Urban-Rural development (MoHURD) issued “Technical Guidelines for Sponge City Construction”
Jan-15	The Ministry of Finance (MoF) issued the “Notice on carrying out Pilot Sponge City construction with Central Financial Support”
Apr-15	The MoF, MoHURD and Ministry of Water Resources jointly announced the first 16 pilot sponge cities. The central government will provide special financial assistance for these pilot sponge cities for 3 years. The amount of subsidy depends on the size of the city – the directly controlled municipalities receive CNY600m a year, while the provincial capital cities receive CNY500m per year. Other cities receive CNY400m per year. Cities using the PPP model for sponge-city construction receive a special grant equivalent to 10% of the subsidy.
Mar-15	Applications opened for the second batch of sponge cities
April-16	MoF, MoHURD and Ministry of Water Resources jointly announced the second batch of 14 chosen pilot sponge cities.

Source: MoF, MoHURD, MWR, Daiwa

Examples of projects included in the construction of a sponge city



Rainwater Seepage



Rainwater Bioretention



Water Purification Plant



River Restoration and Repair

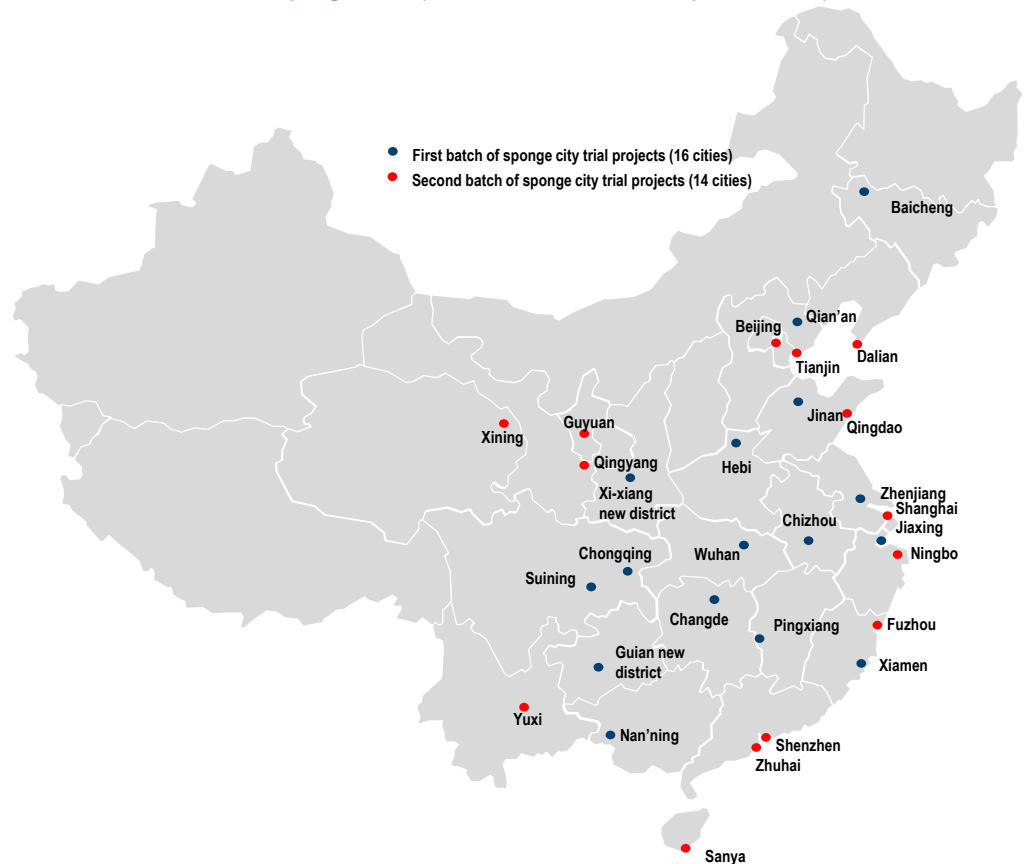


Rainwater Drainage



Rainwater Storage

Source: China Everbright Water

First and second batch of sponge cities (30 cities included in the 2 pilot batches)


Source: Company

Each sponge-city project would receive a subsidy of CNY1.2-1.8bn

Case study: CEWL's sponge-city project in Zhenjiang. On 18 April 2016, CEI announced that its 74.4%-owned subsidiary, China Everbright Water (CEWL), had secured a PPP project to turn Zhenjiang into a sponge city. CEWL will hold a 70% stake in the project company with the remaining 30% to be held by Zhenjiang Waterworks Corporation (ZWC, on behalf of the local government). CEWL estimates that the total investment for the Zhenjiang Sponge City project will be around CNY2.585bn, including a CNY1.2bn subsidy from the China government and a CNY1.385bn investment contribution by the project company. CEWL will contribute CNY323m as equity (a 70% stake), while ZWC will contribute CNY139m, and the rest will be financed by bank debt. CEWL expects an equity IRR of 8-10% on its investment.

The Zhenjiang Sponge City Project is one of 16 sponge-city pilot projects that will receive financial support from China's central government. The project company plans to invest in: 1) operating projects: a) a 75ktpd waste water treatment expansion project (Grade I-B), b) a 200ktpd advanced waste water treatment facility (Grade I-A); and 2) non-operating projects: rainwater pump stations, drainage networks, rainwater storage tanks, and the ecological restoration and repair of certain rivers. We estimate the operating project to account for 30% of the total project company investment.

According to local media reports, the project company is entitled to an annual service fee payment of c.CNY160m from the Zhenjiang Government for its investment payback and operational service. The concession period granted is 23 years (including 3 years for the project to be constructed).

As the government aims to develop more sponge cities across the country during the 13th FYP period, we believe these integrated city water-service projects will account for a huge proportion of PPP project opportunities for the WWT companies in the next 3-5 years.

New financing methods

Source of financing: green bonds

In September 2015, the State Council issued the Ecological Civilization System Reform Plan, encouraging the setting-up of a green financial system, based on 3 aspects: 1) green credit: encourage environmental-protection companies to issue green securities, including bonds; 2) the setting up of a green stock index and related investment products, and encouraging the securitisation of green loans; and 3) the setting up of a green investment fund to channel capital into investment important to addressing environmental challenges, such as climate change.

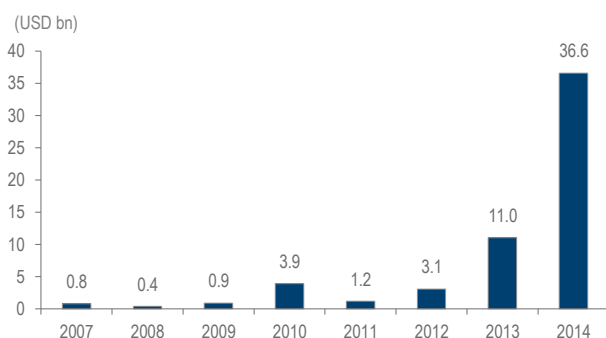
We see this as a strong sign of the government's support in developing new financing methods for environmental-protection companies, such as green bonds. Particularly for the WWT sector, we think there is strong potential for water funds (based on BEW's model), which would give the large water companies a way to raise funds to capture more PPP projects.

Green bonds: cheap funding

A green bond by definition is a bond whose proceeds are used to fund environmentally friendly projects. The Green Bond Principles, issued in January 2014 by a group of banks supported by investor group the Ceres organisation, is a voluntary framework intended to standardise reputable green-bond issuance. Green bonds have the following specifications: 1) use of proceeds: only green projects are eligible: renewable energy, energy efficiency, sustainable waste management, sustainable land use, clean water, etc; 2) the process for project evaluation and selection: the issuer is responsible for outlining the investment decision-making process it follows to determine the eligibility of an individual investment using green bond proceeds; and 3) management of the proceeds: periodic information must be released to monitor the capital flow.

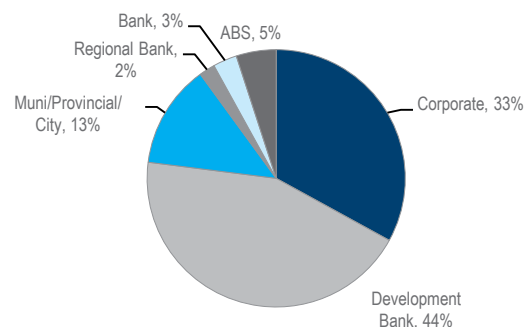
The Green Bonds Initiative released figures showing that 2014 saw USD36.6bn worth of green bonds had been issued worldwide by 73 different issuers, more than 3 times the figure from 2013. Furthermore, at the time, Sean Kidney, the chief executive of the Climate Bonds Initiative, said that he expected the green bonds market to reach USD100bn globally by end-2016.

Growth in green bonds issued globally



Source: Climate Bonds Initiative

2014 global green bonds by issuer type



Source: Climate Bonds Initiative

We expect the specific measure or regulations to be released soon on the use of green bonds in China. We expect the China version of green bonds to come in the form of "targeted easing", meaning that banks will be allowed to pump more money into the energy-saving, environmental or clean-energy sectors.

BEW: new water investment fund model

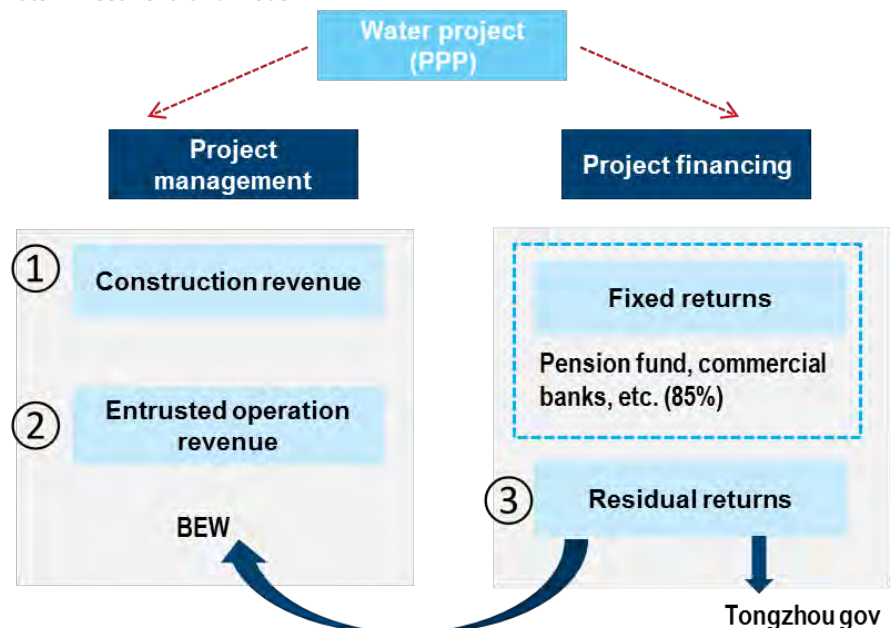
Water fund

- Off-balance sheet leverage
- Higher return as a general partner
- Fund is available to finance capex, minimize account receivable risks

With big public-private-partnership (PPP) projects being pushed by the government since 2015, we think 2017 will be a harvesting year for China's environmental operators. To seize more PPP project opportunities, BEW is cooperating with investment funds to develop a new model for the off-balance-sheet financing of new projects. BEW would be in charge of the construction, and provide operational services if necessary, using its expertise in the water industry, while the project funding would be supported by independent second parties seeking stable returns. At an average project return of 8%, we estimate BEW would see about 20% equity IRR from this fund. We expect the model to help expand BEW's business without constraining its financial capabilities, and believe it could help BEW seize more PPP project opportunities, which involve significant EPC capex.

For the new water investment fund that BEW is planning, BEW and the Tongzhou Government of Beijing, would act as general partners, with respective stakes of 10% and 5%, in the Tongzhou city water (PPP) projects, including a package of water supply, wastewater treatment, waterbody renovation, and river clean-up integrated environmental projects. Four financial institutions – Ping An Insurance Fund, Citic Bank, and 2 of the Big-4 banks in China – would act as limited partners and hold the remaining 85% of the shares. But they would require a fixed 5.5% coupon, while the residual return would go to the general partners (BEW and the Tongzhou government). BEW would also charge 0.2-0.3% of the asset base as a management fee.

BEW: water investment fund model



Source: Company, Daiwa

BEW and Tongzhou Government: equity IRR analysis

(CNYm)	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 19	Year 20	
FCF-Project		10	10	10	10	10	10	10	10	10	10	...	10	10
-interest expense		(2)	(2)	(2)	(2)	(1)	(1)	(1)	(1)	(0)	...	-	-	
-Debt repayment		-	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	...	-	-	
-Coupon expense		(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	...	(2)	(2)	
-Management fee		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	...	0.10	0.10	
FCF- gross profit	(8)	(2.2)	0.5	0.7	0.9	1.2	1.4	1.7	2.0	2.2	2.5	...	7.8	7.8
FCF- Tongzhou gov (non-operating gross profit)	(2.5)	(2.3)	0.1	0.2	0.3	0.4	0.4	0.5	0.6	0.7	0.8	...	2.6	2.6
FCF- BEW (operating gross profit)	(5.0)	0.1	0.4	0.5	0.7	0.8	1.0	1.2	1.3	1.5	1.7	...	5.3	5.3
Equity IRR - Tongzhou gov (non-operating gross profit)	15.0%													
Equity IRR - BEW (operating gross profit)	22.2%													

Source: Daiwa

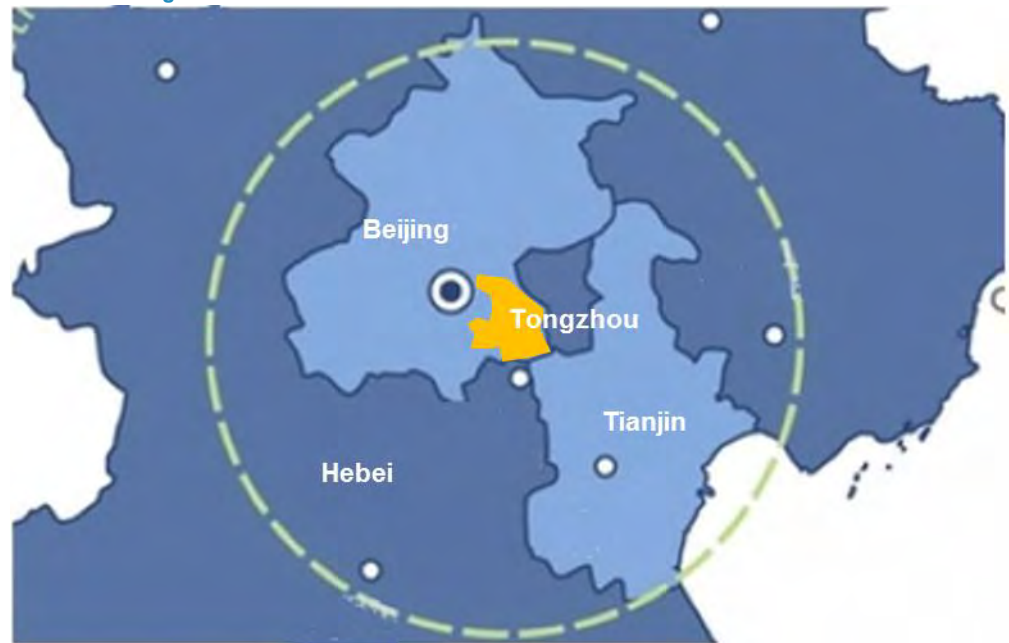
Note: assume the water asset has an 8% project IRR

Tongzhou: the eastern gateway to the nation's capital

Tongzhou is considered to be the eastern gateway to the nation's capital, and is around 20km east of central Beijing. In June 2015, the Beijing Municipal Government announced plans to move the Beijing municipal government departments, comprising tens of thousands of civil servants, to the eastern Tongzhou district, in an effort to reduce pollution and traffic congestion in the city centre.

Given Tongzhou's location (eastern suburbs of Beijing, near Hebei), the development of Tongzhou forms part of the broader "Jing-Jin-Ji" urbanisation plan, involving the integration of Beijing, Tianjin and Hebei, which has extended the functions of Beijing as the capital to nearby areas including Tianjin and Hebei Province.

Location of Tongzhou district



Source: Tongzhou Government

What are the benefits of the water fund model?

The planned water investment fund would be used for PPP projects in the water infrastructure fields, including water supply, wastewater treatment and river clean-up integrated environmental projects in Tongzhou and the Jing-Jin-Ji areas.

1. BEW looking to seize more PPP opportunities

A large proportion of PPP projects in China are typically turnkey construction contracts that involve a lot of EPC capex. With this approach, the government guarantees that it would settle payments for PPP projects within 5-10 years, with interest paid on receivables, plus any entrusted operating expenses incurred. As such projects are large in scale (investment per project is typically more than CNY1bn), and the long payment terms increase the financial burden of the water asset operators, the smaller water companies are not in a position to bid on them. At the same time, larger companies are selective when taking on PPP procurement projects given the constraints these projects impose on their own financial positions.

Under BEW's proposed approach, the financial burden of investing would be transferred to the new proposed fund. Hence, we expect the model to help BEW expand its business without constraining its financial capabilities, and as a result we believe BEW could be better placed to take on more opportunities in PPP projects.

For BEW, the financial burden in investing would be transferred to the fund

In addition to project construction revenue and project operating income from operational services, plus a 0.2-0.3% management fee of the asset base, BEW would also earn an equity investment return from its stake in the fund. Assuming a project return of 8%, we estimate BEW would see about a 20% return from the residual return to be distributed to the general partners.

2. BEW would require less capex

As any future project funding would be taken on by the investment fund, BEW's capex burden should be greatly reduced once the fund is launched. BEW would need to contribute only 10% of the equity, or 5% of the total investment, assuming a debt accounts for 50%, while the debt burden would be completely off its balance sheet. Although a certain amount of profit would be shared among the limited partners, we are positive on the new model, as the shared profit would be small compared with the potentially larger market that BEW could address as a result of this funding assistance.

3. Enhancing its project NPV

As BEW has to account for 10% of the project requirement/investment, it could then leverage third-party limited parties' capital for PPP project financing, achieving a multiplier effect on its returns. The project NPV would be enhanced accordingly.

On our estimates, using such an investment fund model could double BEW's project NPV, as we assuming that project debt would account for 50% and that BEW would hold only a 10% stake in the fund (see the following table for our calculation).

Bew: NPV enhancement with multiplier effect

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 19	Year 20
FCF-Project		10	10	10	10	10	10	10	10	10	10	10
-interest expense		(2)	(2)	(2)	(2)	(1)	(1)	(1)	(1)	(0)	-	-
-Debt repayment		(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	-	-
FCF-BEW	(50)	2.8	3.0	3.3	3.5	3.8	4.0	4.3	4.5	4.8	10.2	10.2
NPV		7.4										
FCF-Project		10	10	10	10	10	10	10	10	10	10	10
-Interest expense		(2)	(2)	(2)	(2)	(1)	(1)	(1)	(1)	(0)	-	-
-Debt repayment		(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	-	-
-Coupon expense	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
-Management fee	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
FCF- gross profit	(7.5)	(2.2)	0.5	0.7	0.9	1.2	1.4	1.7	2.0	2.2	2.5	7.8
FCF- Tongzhou gov (non-operating gross profit)	(2.5)	(2.3)	0.1	0.2	0.3	0.4	0.4	0.5	0.6	0.7	0.8	2.6
FCF- BEW (operating gross profit)	(5.0)	0.1	0.4	0.5	0.7	0.8	1.0	1.2	1.3	1.5	1.7	5.3
NPV		15.7										
Multiplier		2.12										

Source: Daiwa

4. Fund should benefit from BEW's management expertise

While financial institutions, such as banks and pension funds, seek stable returns, they lack the requisite expertise in the water industry to bid for PPP projects, in our view. Under the new model, BEW would act as the fund manager, bid for projects, take care of project construction, and provide operational services if necessary. Meanwhile, financial institutions, as the limited partners, are likely to still see stable returns being distributed.

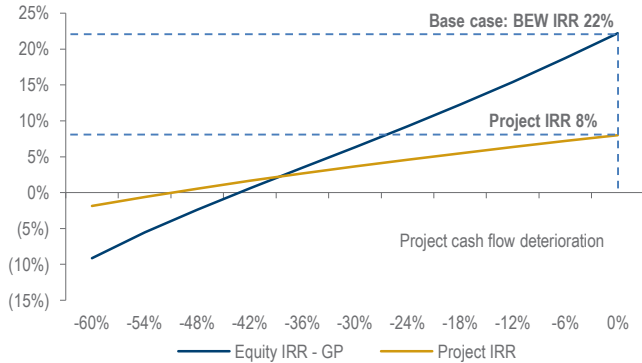
What are the risks?

There is a risk that a project's returns could fall short of expectations

Arguably the major risk for BEW, as a general partner, would be that it would be responsible for distributing the guaranteed fixed coupon in the event that a project's returns fall short of expectations. As BEW is not likely to receive any compensation from the government in such a case, counterparty risk does exist, in our view.

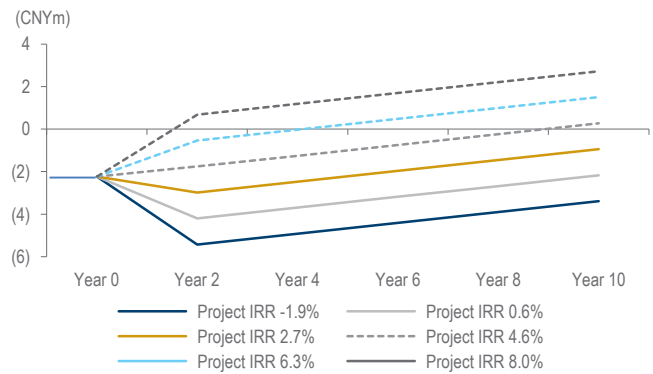
According to our sensitivity analysis, if the annual FCF of a project were to deteriorate by 40%, the equity return would fall below zero and the project return would fall to 2% from 8%. In such a case, BEW would see a negative FCF during the debt payback period (assuming a 10-year debt term).

BEW: sensitivity analysis of equity IRR/project IRR on project cash flow



Source: Daiwa estimates

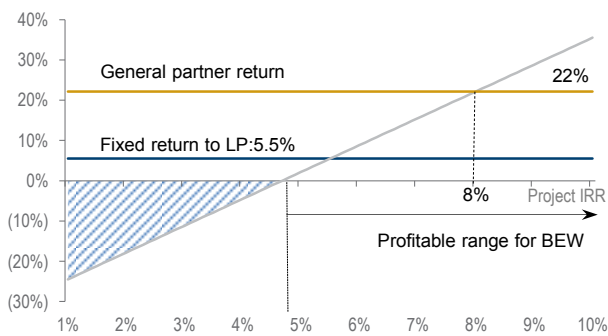
BEW: sensitivity analysis of general partners' cash flow on project IRR



Source: Daiwa estimates

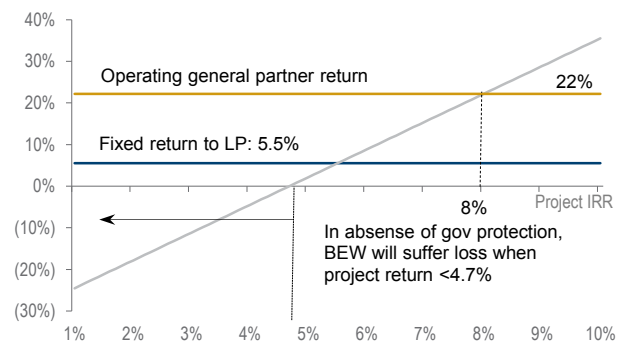
In order to more closely align the interests of counterparties, BEW will invite the Tongzhou Municipal Government to take a stake as a general partner, and it would be the first to take a loss if earnings fell below expectations. However, if the government does not have sufficient capital to deliver the fixed coupon payment to the limited partners, BEW would also be exposed to having to repay (see the following charts and tables).

BEW: annualised return (with government protection)



Source: Daiwa estimates

BEW: annualised return (without government protection)



Source: Daiwa estimates

BEW: annualised returns (without /with government protection)

Project IRR	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
LP return	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%
Operating GP return without gov protection	-24.5%	-17.8%	-11.2%	-4.5%	2.2%	8.8%	15.5%	22.2%	28.8%	35.5%
Operating GP return with gov protection	0%	0%	0%	0%	2.2%	8.8%	15.5%	22.2%	28.8%	35.5%

Source: Daiwa

As the fund manager, BEW's management would be responsible for ensuring the quality of its chosen projects

In the worst case, if the government fails to adhere to its repurchase agreement, BEW would likely suffer a bigger loss than if project returns fell below expectations. Indeed, under such a scenario, its entire capital contribution would be at risk. As the fund manager, BEW would be responsible for ensuring the quality of its chosen projects, including the fixed coupon to be distributed to the limited partners, to achieve the possibility of higher-than-expected returns. In this context, the profitability of a project and the payment ability of the local government are important considerations. Hence, we believe this model would be best suited to financially sound municipal governments, likely those in the tier-1 and tier-2 cities.

BEW has said it would test the model by first setting up the Tongzhou Water Investment Fund, which should start making investments in 2017. To be conservative, we do not factor into our model any possible earnings impact from the start of operations of the Tongzhou fund.

Water resource tax trial

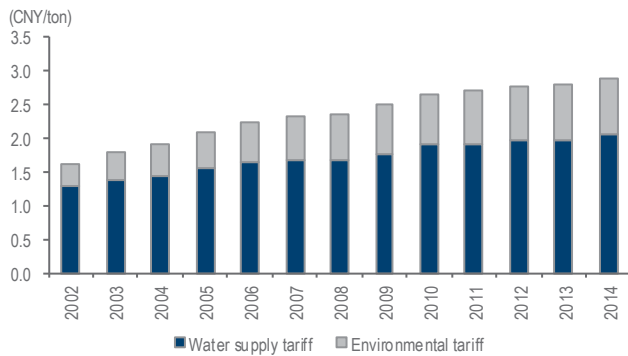
The water resource tax aims to discourage the extraction of underground water and promote the reclaiming and recycling of water for water conservation purposes

On 10 May 2016, the Ministry of Finance, the State Administration of Taxation and the Ministry of Water Resources jointly issued a notice on water resource tax reform. The water resource tax replaces the water resource fee in Hebei Province, effective on 1 June 2016. As part of the trial run, the water resource tariff will be zero, and the water resource tax will be collected by the local tax authorities. For residential, commercial and industrial users, we expect the charge to remain the same as the previous water resource fee. However, we expect it to be higher for industries that are heavy users of water, and users of underground water, where a higher tax rate is usually applied.

The water resource tax charges would be equal to the water resource tax rate at the water collection point multiplied by the actual amount of water used.

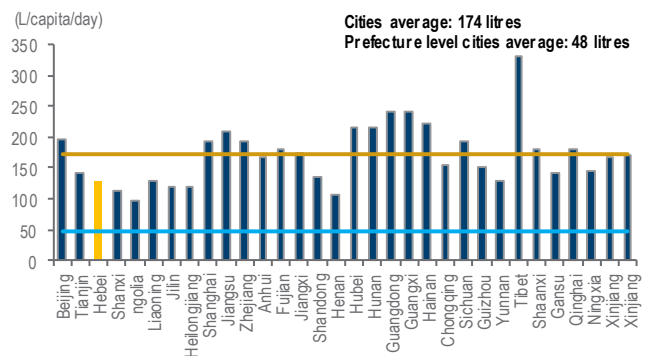
Hebei is short of water resources and the over-exploitation of its underground water has damaged its water-recycling system. Water consumption per capita in Hebei is only 70% of the national average. And this is compounded by the fact that many heavy users of water are concentrated in Hebei, such as steel and cement factories.

China: average unified residential water tariff



Source: H2O China

China: water consumption per capital by province



Source: MOHURD

The new policy also specifies that recycled water from wastewater and reclaimed water is exempt from water resource tax charges. Additionally, the policy requires a higher tax rate for users of underground water, special industries and heavy users. We see the aim of the differentiating tax rate strategy as encouraging the conservative use of water resources. Accordingly, we see a good chance of CTE, as a market leader and with its one-stop solution for industrial WWT and water reclamation, being a key beneficiary of the new policy. Of the municipal WWT operators that we cover, we believe BEW could also benefit from the rising market potential from the reclaimed/recycled water supply market.

On the same day, the State Council, the Ministry of Finance and the State Administration of Taxation released documents on the resource tax reform. The reform requires the resource tax to be levied on most mineral products, based on price instead of quantity, effective 1 July 2016. The water resource tax reform is part of the country's change in policy, and we expect such a tax to be extended to wood, pastures and tidal flats in the future.

More environmental protection tax policies coming

We expect a more comprehensive set of environmental protection tax policies to be released by the end of 2016, in order to offer incentives to different parties such as private companies and local governments to put more effort into protecting the environment.

The central government is now on its way to finalising legislation for the Environmental Protection Tax Law, and the consulting proposal was released in June 2015. The proposal states that the tax-law legislation aims to more clearly delineate the responsibilities of pollution-creators, by identifying the tax payers, taxable pollutants, and the tax collection mechanism.

Key points in the consultation paper on the environmental tax law

Issue addressed	Details
Identity of tax payers	Tax payers will be defined as the entities that directly emit taxable pollutants into the environment
Tax quantity	Tax will be based on polluting emissions volume Adjusted locally, based on differences in environmental capacity, current polluting conditions and biological development targets Will impose a punitive tax of 2-3 times the usual tax on those that emit excess emissions The pollution-discharge fee will be waived for tax payers that abide by the Tax Law
Taxable pollutants	Will mainly include air, water, solid waste and noise pollution There will be a maximum of 3 types of taxable air/water pollutants for each emission source; and a maximum 5 types for heavy metal pollutants
Preferential tax	The pollution tax for agriculture, transportation, municipal waste water or solid waste treatment units that do not exceed the emission standards will be waived Provincial governments will be able to decide to cut 50% of the tax for entities that emit 50% or less
Tax collection mechanism	Will establish an information-sharing system between the environmental protection departments and the tax departments

Source: State Council

Following a consultation period, the drafted legislation bill is being revised internally, and we believe it will be submitted to the National People's Congress in August 2016, and promulgated by end-2016. The more comprehensive tax mechanism would help the central government better control the emissions of pollutants, and may accelerate investment in environmental protection.

Bigger player slowly gaining market share

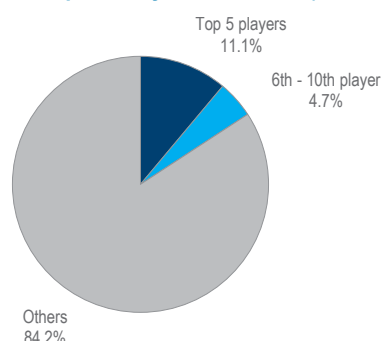
Consolidation of the MWWT market has been speeding up over the past 2 years

China's municipal WWT industry is fragmented, with the top-10 companies together accounting for only 24.8% of the market in terms of total contracted water capacity, according to data from H2O China, as at end-2015. However, the market share of the top-10 companies has risen by 9ppt as at end-2015, from 15.8% as of mid-2013.

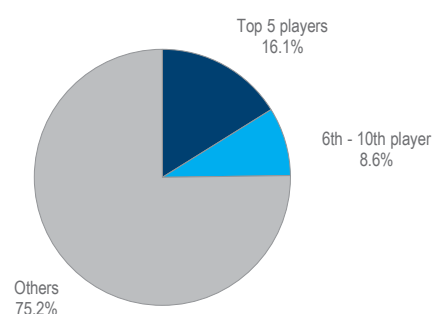
Foreign enterprises are losing their market share to domestic firms. In the past, foreign enterprises expanded rapidly as they had the benefit of advanced technology and management experience, and this has been the case when private foreign companies have been invited to enter the sector through BOT/BOO contracts, especially since the 2000s.

Now we see SOEs dominating the market, relying on mergers between water groups to gain operating efficiency scale. The water market is well positioned to benefit from the consolidation trend, in our view.

China: top-10 water companies by market share (mid-2013)



China: top-10 water companies by market share (2015)



Company name	Ticker	Type	Capacity in and pending operation (mtpd)*	Market share
Veolia China	VIE FP	Foreign	14.41	2.77%
Beijing Capital	600008 CH	SOE	13.99	2.69%
Beijing Enterprises Water	371 HK	SOE	13.36	2.57%
China Water Investment	unlisted	SOE	7.5	1.64%
Sino French Water	unlisted	Foreign JV	7.47	1.43%
SIIC Environment	SIIC SP	SOE	5.88	1.13%
General Water of China	unlisted	SOE	5.16	0.99%
Xing Rong Group	000598 CH	SOE	4.95	0.95%
Tianjin Capital Environmental Protection	600874 CH / 1065 HK	SOE	4.84	0.80%
Sound Group	000826 CH / 967 HK	Private	4.26	0.82%
Top 10			81.82	15.79%

Source: H2O China

*Note: Represents total capacity by mid-2013

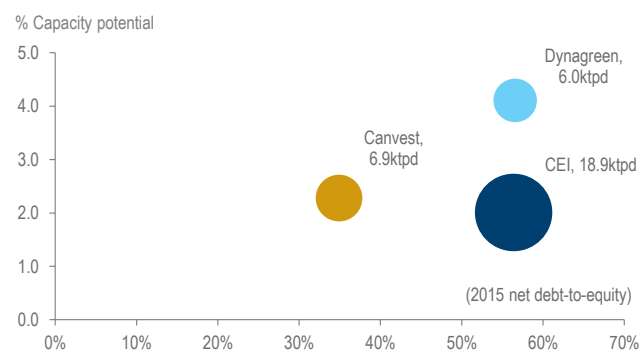
Company name	Ticker	Type	Capacity in and pending operation (ktpd)*	Market share
Beijing Enterprises Water	371 HK	SOE	24.62	4.5%
Beijing Capital	600008 CH	SOE	19.00	3.5%
Guangdong GDH Water	unlisted	SOE	15.97	2.9%
Shanghai Capital	unlisted	SOE	15.25	2.8%
Veolia China	VIE FP	Foreign	13.52	2.5%
Sino French Water	unlisted	Foreign JV	12.37	2.3%
SIIC Environment	SIIC SP	SOE	10.56	1.9%
China Water Investment	unlisted	SOE	9.68	1.8%
General Water of China	unlisted	SOE	7.5	1.4%
Shenzhen Water	unlisted	SOE	7.26	1.3%
Top 10			135.73	24.8%

Source: H2O China

We believe acquisitions or new projects being signed up for would be the key growth strategies for the large/SOE companies aiming to expand their project portfolios and geographic footprints, and given that economies of scale can give way to improved operating efficiency and yields. Additions to the listed operators' project pipelines remain strong currently, especially for the waste treatment operators with SOE backgrounds. As at the end of 2015, we estimate that the total contracted capacity (including capacity in hand and pending operations) for most of the listed operators was on average 200% above their operating capacity for the same period, promising continued operating growth for 2016-20, on our estimates.

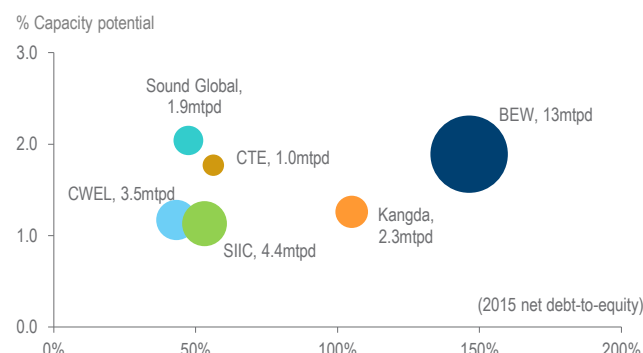
The net debt-to-equity level is also an important factor that could constrain the ability of companies to run pipeline projects. Some of the China environmental companies that we cover have been gearing up or seeking more financing sources to take advantage of M&A opportunities, which means managing their balance sheets is vital to ensuring growth.

China WTE: capacity growth potential vs. gearing ratio



Source: Company, Daiwa estimates

China WWT: capacity growth potential vs. gearing ratio



Source: Company, Daiwa estimates

	WTE			Water					
	257 HK CEI (ktpd)	1381 HK Canvest (ktpd)	1330 HK Dynagreen (ktpd)	371 HK BEW (mtpd)	1363 HK CTE (ktpd)	CEWL SP CWEL (mtpd)	SIIC SP SIIC (mtpd)	967 HK Sound Global (mtpd)	6136 HK Kangda (mtpd)
Operation capacity year-end 2015	18.9	6.9	6.0	13.0	1.0	3.5	4.4	1.9	2.3
Total contracted capacity	37.8	15.7	24.65	24.6	1.7245	4.1	4.997	3.95	2.839
% capacity potential	201%	228%	411%	189%	177%	117%	113%	204%	126%
Net debt-to-equity – year-end 2015	56.4%	34.9%	56.6%	146.4%	56.2%	43.2%	53.1%	47.4%	105%

Source: companies

From the data in the charts and table above, we can see that the water companies on average are more heavily geared than the WTE companies. And the WTE companies have robust project pipelines currently, supported by rising demand for waste incineration, from a low level with a low treatment penetration rate. Given the water sector's high penetration rate currently, the larger water companies could take more advantage of M&A opportunities to grow than their smaller peers.

Industrial WWT as a niche market

Third-party centralised IWWT is the trend outlined in the 13th FYP

China currently has over 82,084 industrial WWT plants, most of which are in the south and east of the country. Guangdong Province leads with a 12% share of the total number of plants, while the most-penetrated 4 provinces together account for 38% of the total.

China: locations of industrial WWT facilities in China (2014)



Source: National Bureau of Statistics

According to the Ministry of Industry and Information Technology, China had 222 National Economic and Technological Development Zones (ETDZ) and 1,568 Provincial ETDZs in 2010. A survey conducted by the China Environment Federation in 2010, which included 18 industrial parks (2 national, 7 provincial and 9 municipal industrial parks), concluded that 100% of the industrial parks discharged untreated or improperly treated wastewater, 78% had air-pollution issues and 17% had solid-waste pollution issues.

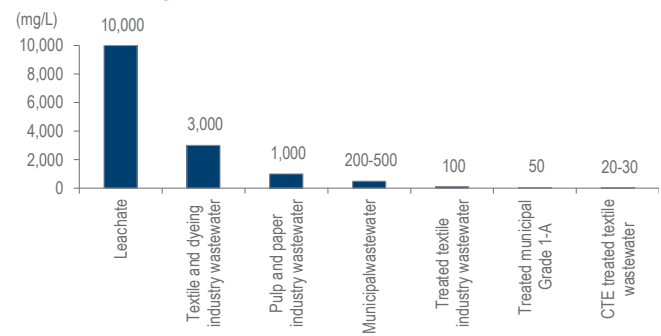
China has been setting up a large number of industrial parks in recent years in an attempt to centralise WWT processing. This centralisation process has been the driver for the industrial WWT operators in China, such as CTE, to expand their businesses, given the current (July 2016) low 20-25% third-party penetration. We believe third-party IWWT operators can benefit their customers by lowering the customers' costs through allowing the customers to transfer their IWWT responsibilities to third-party IWWT operators. Also, it is easier for the government to regulate a centralised facility instead of thousands of individual plants.

Industrial WWT projects vs. municipal WWT projects

	Industrial	Municipal
Usual Discharge Sources	<ul style="list-style-type: none"> - Manufacturers - Petrochemical refineries - Other industrial companies 	<ul style="list-style-type: none"> - Households - Offices - Urban public facilities such as public washrooms
Characteristics	<ul style="list-style-type: none"> - High level of suspended matter and COD - Concentration and components differs from industry to industry 	<ul style="list-style-type: none"> - High level of phosphorus and nitrogen content - Relatively less harmful to the environment
Treatment Process	<ul style="list-style-type: none"> - Requires professional and customised treatment process with complicated techniques and operations - Typically combines chemical, physical and biological treatment 	<ul style="list-style-type: none"> - Standardised treatment process for all wastewater
Treatment Tariff	<ul style="list-style-type: none"> - Little to no government control over pricing, operators can negotiate directly with clients - Thus, usually enjoys higher margins 	<ul style="list-style-type: none"> - Typically pre-determined when entering into a contract with the government - Generally have IRRs of 8-10%
Government Support	<ul style="list-style-type: none"> - Preferential policies and other support measures in establishing industrial parks - Freer market compared with the municipal WWT market 	<ul style="list-style-type: none"> - Government typically offers support through guaranteed minimum volume - Low-cost land usage rights

Source: Company, Daiwa

COD level comparison



Source: China Pollution Source Census, Ministry of Environmental Protection, General Administration of Quality Supervision, Inspection and Quarantine, Companies, Daiwa

Risks to our Positive rating on the water Sector: fierce competition in conventional MWWT segment

Major risk for MWWT segment: over-crowded market

For MWWT operators, declining project IRRs (from 9-12% under the 12th FYP to 7-8% under the 13th FYP), and the capital-intensive nature of the industry are the major risks that we see, given the low entry barriers compared with other segments such as IWWT. To maintain a satisfactory level of returns, we see more companies implementing water funds by raising capital from financial institutions (with a fixed coupon). This would give them the funds needed to bid for PPP city-water projects, including water supply and other related projects such as waterbody restoration and river clean-ups. Therefore, we think only the big SOEs with strong government relationships and track records in the capital market would be able to adopt this asset-light model to leverage their returns to c.20%.

Local government credibility

Many of the WWT projects in China are operated under concession rights agreements (BOT/BT/TOT), for which the water project operators collect construction and/or sewage treatment fees from the local government. If the local government's balance-sheet positions were to deteriorate, it could postpone or default on payments. If the local government were to provide misleading or incomplete information when transferring a plant to the water project operators, the companies could see lower-than-expected project returns.

However, we believe that this risk is manageable within the capacity of our covered water names, including BEW and CTE. As both operate mainly in China's higher-tier cities, we believe the risk of government default is low. In particular, the risks for BEW are even lower due to BEW's SOE background. Also, the local government budget law enacted in 2016 should provide some legal protection for private-sector players involved in public utilities investments, in our view.

Ineffective execution of new environmental standards

We believe much of the market growth for the China water sector under the 13th FYP will come from project opportunities on wastewater discharge upgrades and the implementation of stricter water quality standards, and any ineffective execution of these policies could reduce demand for new water treatment projects. Policy implementation could go wrong if: 1) the pace of regulatory upgrades is slower than expected, probably due to opposition from local industries, and 2) the enforcement of regulations is ineffective, meaning that unregulated sewage discharge activities would continue.

Thus, we prefer water companies that have stronger relationships with local governments, which we see as the key to the effective execution of policies. Local governments could also provide PPP project opportunities, reducing uncertainty over future WWT demand.

Solid waste sector: high WTE capacity growth but diminishing returns, eyeing HWT

12th FYP WTE capacity not completed, growth momentum early into the 13th FYP period

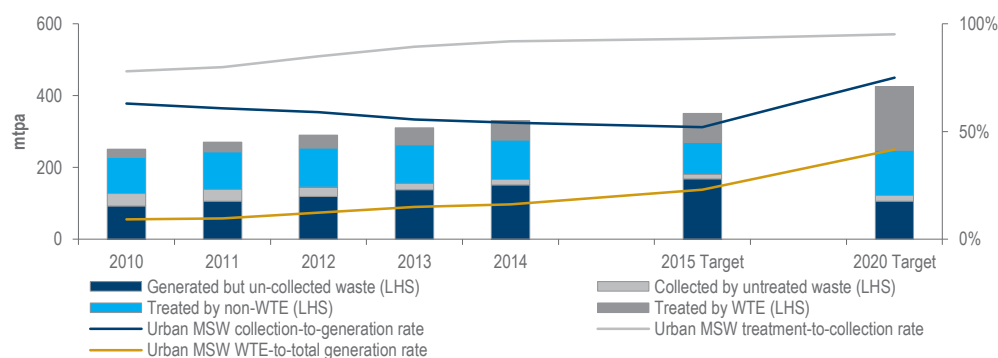
We are positive on the prospects of the China waste sector, and forecast a WTE capacity CAGR of 16% for 2015-20 (or c.30% CAGR over 2015-18 in case the 12th FYP target was missed) on the low 35% penetration rate for the waste treatment market in 2015. The low treatment ratio for collected/generated MSW in the country, which was still at only 54/50%, respectively, in 2014, is also a factor.

China: growth drivers for the WTE sector (2016-20)

Growth drivers	Key government policies	Our comments	Key success factors	Potential beneficiaries
Existing MSW market				
MSW capacity expansion	Increasing % of incineration of total waste treatment volume	Intensifying competition and falling tariffs; only avg. 10% equity IRR	Projects in coastal provinces with large scale will see better profitability	Canvest
FB-MG upgrade	Tightening of the emission standards has created FB-MG upgrade demand	Relatively a niche area; 12-15% IRR	Technological edge, flexible strategy in selecting projects	Canvest
Diversifying into new areas				
HWT	Completed National hazardous waste list (June 2016)	Highly fragmented and low centralisation	High technological barriers and requires permissions to treat HWT	CTE, CEI
Biomass	Local government allowance	Dominated by SOEs, profitability status varies	Good management	CEI
Soil pollution restoration	Soil Pollution Prevention Plan	Undeveloped, but huge long-term market potential	First-mover advantage	CTE, CEI

Source: Daiwa estimates

China MSW sector: waste generation, collection, treatment, and WTE penetration



		2010	2011	2012	2013	2014	2015 Target	2020 Target
Urban MSW generation	(mtpa)	251	270	290	310	330	350	425
Urban MSW collection	(mtpa)	158	164	171	172	179	182	319
Urban MSW treatment	(mtpa)	123	131	145	154	164	169	303
Urban MSW WTE treatment	(mtpa)	23	26	36	46	53	81	177
Urban MSW collection-to-generation rate		63%	61%	59%	56%	54%	52%	75%
Urban MSW treatment-to-collection rate		78%	80%	85%	89%	92%	93%	95%
Urban MSW WTE-to-total treatment rate		19%	20%	25%	30%	33%	48%	58%
Urban MSW WTE-to-total generation rate		9%	10%	12%	15%	16%	23%	42%

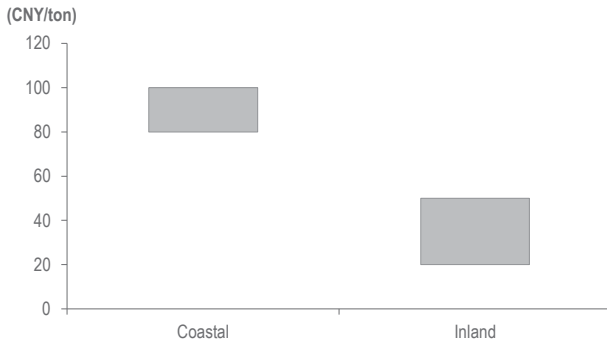
Source: State Council, National Bureau of Statistics, 12th FYP estimates for 2015), Daiwa forecasts (2020E)

Staying in coastal areas more important to ensure better returns

Location, location, location

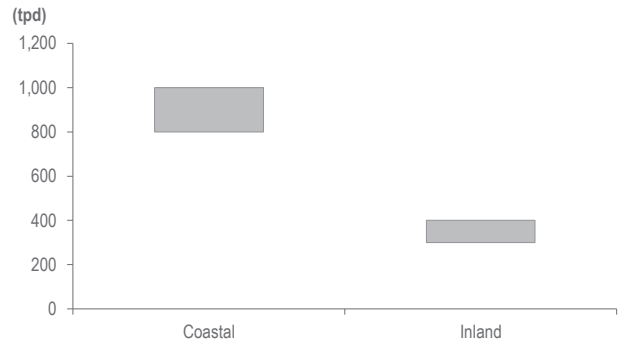
Under the 12th FYP, we saw the country's leading WTE operator CEI expand its operating capacity by a 33% CAGR for 2010-15, attributing to the 7x appreciation of its share price during the period. Under the 13th FYP, the investment strategy for the WTE sector not only focuses on capacity growth, but also on the economically developed coastal provinces. As such, **staying coastal** is now our investment thesis for China's WTE operators, as the inland WTE plants generally charge lower waste treatment fees (CNY20-50/tonne versus CNY80-100/tonne in the coastal areas), on weaker governments and more MSW treatment options, such as landfills. In addition, inland WTE is more costly to run given the lower per-plant capacity than for coastal plants (300-400ktpd versus 800-1,000tpd for plants in coastal areas).

China WTE sector: current coastal and inland treatment fees



Source: Daiwa

China WTE sector: current coastal and inland unit capacity



Source: Daiwa

Economically developed coastal regions

- Higher treatment fees
- Larger capacity

Although WTE plants operating in economically developed coastal areas offer higher returns than those inland WTE, the coastal operators face stronger bidding competition (coastal penetration rate is 44% vs. 20% inland). In addition, it can take 3-5 years to select a site for a coastal WTE plant (site selection and environmental-impact assessment [EIA]), which is likely slower than inland. Thus, we expect the WTE operators to continue to move inland, despite the lower returns.

China WTE: WTE penetration for different provinces

	% of capacity		% of treated volume		Treatment rate
	Landfill	Incineration	Landfill	Incineration	
North	64%	29%	70%	25%	94%
North-eastern	81%	14%	83%	12%	75%
East	47%	51%	47%	51%	99%
South	70%	29%	71%	28%	91%
West	62%	38%	66%	34%	94%
Northwest	100%	0%	100%	0%	85%

Source: National Bureaus of Statistic

Note: Treatment rate is the total MSW treated over total MSW collected. In China, the MSW collection rate is currently around c.55%

China WTE: coastal and inland WTE penetration

	% of capacity		% of treated volume		Treatment rate (*)
	Landfill	Incineration	Landfill	Incineration	
Economically developed coastal areas	51%	46%	53%	44%	95%
Others	78%	21%	79%	20%	89%

Source: National Bureaus of Statistic

Note: Treatment rate is the total MSW treated over total MSW collected. In China, the MSW collection rate is still currently around c.55%

How to compete with other WTE operators

Previously in the report, we said that the equity IRR of WTE projects could drop from 12-15% for coastal areas to 8-10% if they moved inland. Therefore, we prefer **Canvest**, which has the most exposure to the economically developed coastal regions. Also, it has been able to secure additional FB-MG upgrade WTE projects in the coastal areas, and we expect this to continue. **CEI**, on the other hand, has diversified its business to HWT projects, which could strengthen its position as a leading municipal waste treatment operator in China.

Government targets: tighter emissions standards on top of capacity growth

WTE emission standards are also getting stricter

China has been seeking to impose more stringent environmental standards in relation to WTE facilities, given its rapidly developing economy and mounting concerns over the state of the environment. In May 2014, the country released its updated [Standard for pollution control on municipal solid waste incineration \(Chinese-language version\)](#), which is applicable to all newly built WTE plants from 1 July 2014 and to all existing plants from 1 January 2016. With the goal of limiting secondary pollution from emissions discharged by WTE plants, the new rules call for stricter gas emissions standards that are similar to the related EU directive.

Due to a previous lack of universally applied industry standards for FB plants, some FB plants in China escaped from having to install pollution control facilities and, as a result, failed to meet the new standards. Therefore, this tightening of emissions controls could compel operators to upgrade their facilities from FB plants to MG plants.

Pollution control standards: comparison of China's standards and Euro2000

Pollutants (mg/m3)	1-hour average			24-hour average			FB - 1h	MG - 1h
	China's new standard	China's old standard	Euro 2000 standard	China's new standard	China's old standard	Euro 2000 standard		
TSP	30	80	10	20	80	10	80	10
Nox	300	400	200	250	N/A	200-400	400	200
SO2	100	260	50	80	N/A	50	260	50
HCl	60	75	10	50	N/A	10	75	10
Hg	0.05	0.2	0.05	0.05	0.2	0.05	0.2	0.05
Cd+Ti	0.1	0.1 (Cd only)	0.05	0.1	0.1 (Cd only)	0.05	-	0.05
Sb+As+Pb+Cr+Co+Cu+Mn+Ni	1.0	1.6 (Pb only)	0.5	1.0	1.6 (Pb only)	0.5	1.6	0.5
Dioxin (ng TEQ/m3)	0.1	1	0.1	0.1	1	0.1	1	0.1
CO	100	150	50	80	N/A	10	150	50

Source: Ministry of Environmental Protection, European Integrated Pollution Prevention and Control Bureau, Technical guidelines on municipal solid waste fluidized bed incineration

WTE: capacity growth catching up, but moving inland means lower returns

Good capacity growth doesn't mean good returns for new WTE projects launched during the 13th FYP period

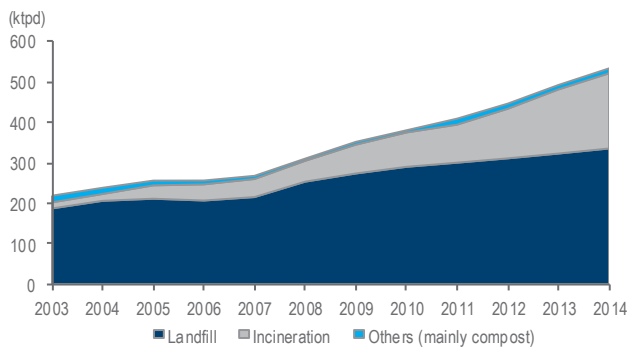
As a result of unfulfilled investment earmarked under the 12th FYP (2014: 186ktpd WTE versus 2015 target: 276ktpd), we expect China's WTE treatment capacity growth to accelerate by a c.30% CAGR over 2015-18, laying solid foundations for long-term capacity growth for the urban WTE market, at a 16% CAGR over 2015-20.

Current situation: landfills still main treatment method, even though WTE share up from 22% in 2010 vs. 35% in 2015

China reported an urban MSW collection rate of 63% in 2010, according to the State Council. Based on our estimates, the MSW collection rate in cities actually dropped to 54% in 2014, as the growth in collection fell behind that of solid waste generation (possibly because the government was focusing on improving the treatment-to-collection rate, and not on properly collecting generated waste). We estimate that the national MSW collection rate, after taking rural MSW generation into account, remains at below 40% currently. We believe that the uncollected waste is being disposed of in open areas or uncontrolled landfills. The current urban MSW collection rate in China is in line with the average level in the East-Asia and Asia-Pacific regions, yet at the low end when it comes to income.

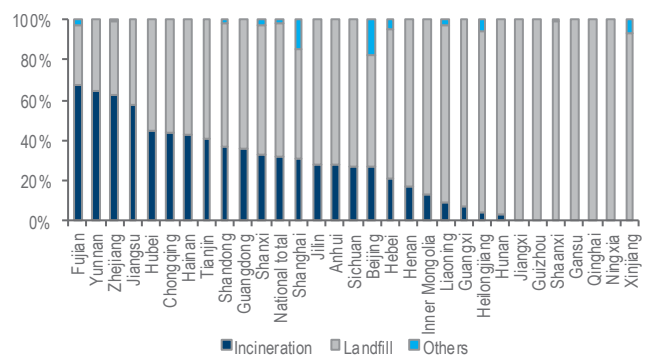
By end-2014, China had an urban non-hazardous MSW treatment capacity of 533ktpd. Of the 3 major waste treatment methods, landfills were still preferred dominant, accounting for 63% and 66% market share in terms of capacity/treatment volume in 2014, down from 75%/78% in 2010. Meanwhile, in Gansu, Guizhou, Jiangxi, Ningxia and Qinghai provinces, landfills are the only available treatment method.

China: urban MSW treatment capacity



Source: State Council, Daiwa estimates

China: urban MSW treatment capacity by province (2014)

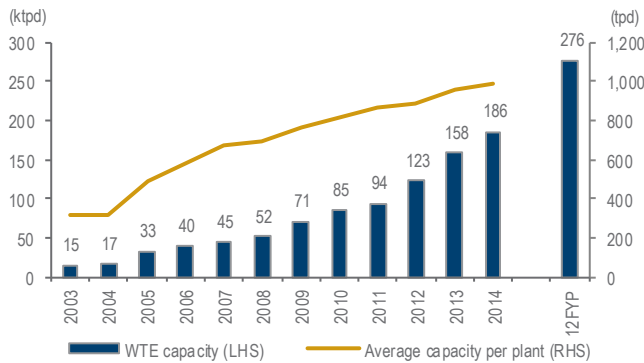


Source: National Bureau of Statistics

Unfulfilled target under 12th FYP: acceleration required for WTE

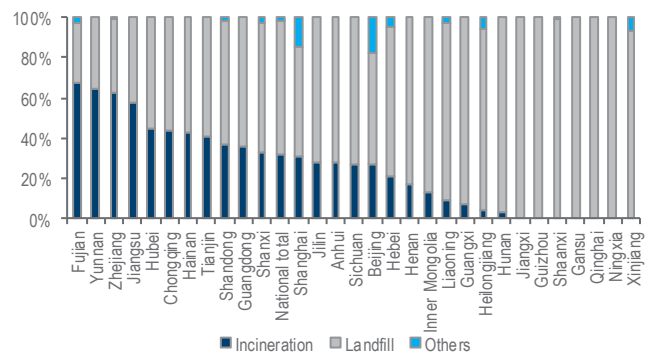
While official 2015 year-end statistics are unavailable, we believe that China has failed to reach several targets set out in the 12th FYP regarding MSW treatment, mainly in terms of capacity. In the 12th FYP, the government targets to reach an urban WTE capacity of 276ktpd by 2015. However, according to the latest statistics from the National Bureau of Statistics, the MSW treatment capacity was only 186ktpd as at end-2014, which means that the MSW capacity will need to have increased by 50% in 2015 to achieve the 276ktpd target. Thus, we estimate that the actual 2015 number is likely to have missed the target by at least 15%.

China: urban WTE capacity



Source: National Bureau of Statistics, State Council, 12th FYP (NDRC estimates for 2015)

China: urban MSW treatment capacity by province (2014)



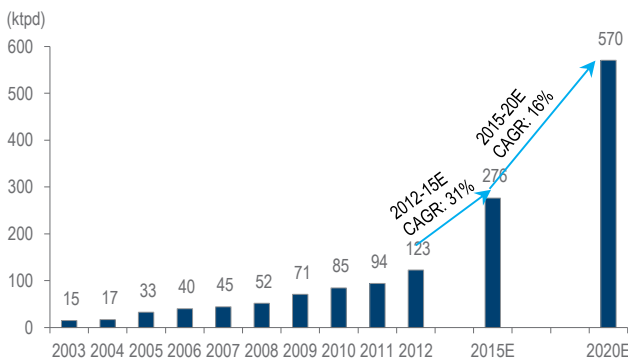
Source: National Bureau of Statistics

Capacity growth to continue under 13th FYP

We see the potential for China to improve its MSW collection and treatment rates under the 13th FYP, which would contribute to the development of the country's MSW treatment market. On our forecasts, China's annual urban MSW hazardous-free treatment volume would rise from 164m tonnes in 2014 to 303m tonnes in 2020 (a 10.8% CAGR over 2014-20E) and 459m tonnes in 2025 (an 9.5% CAGR over 2014-25E), higher than the 5.9% CAGR over 2010-14.

Accordingly, we forecast urban WTE capacity to account for 58% and 61% of total urban MSW treatment capacity by 2020 and 2025, respectively. We forecast steady urban WTE capacity expansion, at CAGRs of 16% and 10% over 2015-20 and 2020-25, to 570ktpd and 908ktpd, respectively. This should translate into 630 WTE plants being installed in cities over the 2015-20 and 2020-25 periods, respectively. We regard this as a solid foundation for long-term growth of the urban WTE market.

WTE: capacity forecasts



Source: State Council, National Bureau of Statistics, 12th FYP (NDRC estimates for 2015), Daiwa forecast (2020E)

China: urban MSW WTE treatment volume forecasts

	2011	2014	2015E	2020E	2025E
Total treatment capacity (ktpd)	409	533	653	1,037	1,397
- WTE treatment capacity (ktpd)	94	186	276	570	908
- % of capacity belonging to WTE	23%	35%	42%	55%	65%
Total treatment volume (m tonnes)	131	164	164	303	459
- WTE treatment volume (m tonnes)	26	53	81	177	282
- % of MSW treated using WTE	20%	33%	48%	58%	61%

Source: World Bank, United Nations, State Council, Ministry of Environmental Protection, National Bureau of Statistics, State Council, Daiwa forecasts
Note: 2015E data is the 12th FYP target, while 2020/25E data are Daiwa forecasts

Soil pollution prevention would limit the growth of landfills and promote WTE

Positive push from the release of the Soil Pollution Prevention Plan

The Soil Pollution Prevention Plan was released by the State Council on 31 May 2015. The plan aims to improve China's overall soil quality, prevent soil pollution at the source, and maintain the entire ecosystem. Previously, China had no special legislation for environmental soil protection, limiting the prevention and control of soil pollution.

The Soil Pollution Prevention Plan sets out detailed targets relating to China's soil pollution for 2020, and provides the legislative foundation. We expect the main focus areas of the plan to be:

- 1. Restoration of polluted soil:** this will involve controlling soil pollution and restoring the quality of soil in highly polluted areas, especially in the southern regions, and the levels of contamination in the major industrial zones,
- 2. Cutting the current pollution source:** this will involve eliminating technology and equipment that causes serious soil pollution, and shutting down polluting enterprises that do not comply with industrial policies, and
- 3. Prevention at the source:** monitoring and supervising industries and enterprises that pose a high risk of soil pollution.

2020 target: a safety utilisation rate for polluted farmland/area of 90%; 2030 target: safety utilisation rate for polluted farmland/area of 95% (current situation: c.84% of sampled land; 80% of farmland).

16% of sampled soil from farmland is contaminated, especially in the southern provinces near the industrial areas

The first national survey on China's soil quality, jointly conducted by the ministries of environmental protection and land and resources in April 2014, revealed the gravity of the situation. Contaminants were discovered in more than 16% of soil samples collected across 6.3m sq km of China's 9.6m sq m total farmland area, and the farmland was found to have been hit particularly badly. The situation was far worse in the southern regions than in the north, and the levels of contamination in the major industrial zones, such as the Yangtze River Delta, the Pearl River Delta and the northeast area of the country, were higher than the national average.

We think the Soil Pollution Prevention Plan will be a positive catalyst for the WTE sector, as the local governments prepare to increase regulatory enforcement in replacing landfills with incineration or WTE. Given the severe soil pollution problem in the southern regions of China, we see a good chance of **Canvest**, as the market leader in Guangdong Province and with its FB-MG upgrading technology, being a key beneficiary.

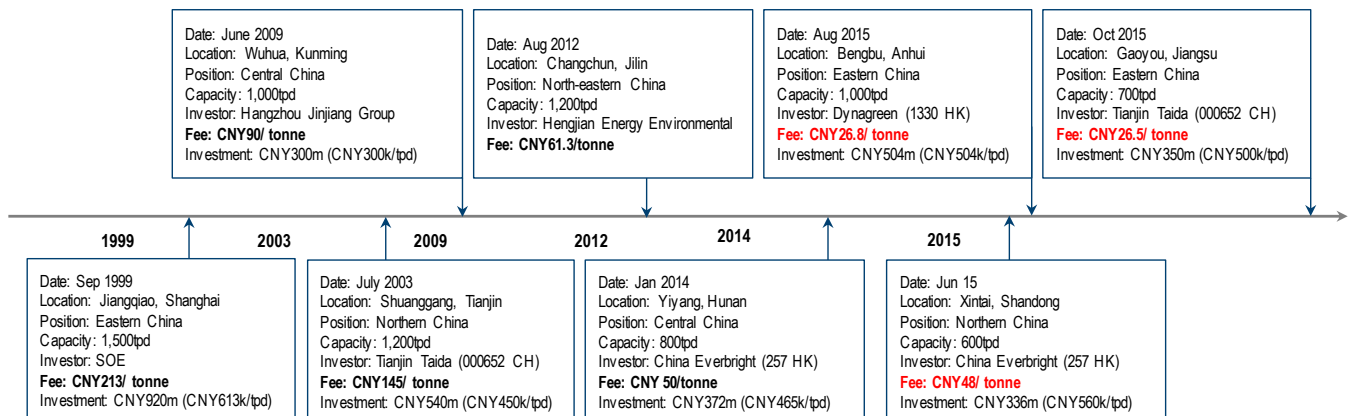
Tariff is declining

However, WTE treatment tariff keeps falling

We have been seeing a downward trend for the average waste treatment fee for newly signed WTE projects, from CNY80-100/tonne in the 2000s to CNY60/tonne recently, and some cities have reported a low contracted price of below CNY25/tonne.

We think this is as a result of fiercer competition for quality greenfield projects, as some companies tend to expand their capacity at the expense of their ROE, by offering very low waste-treatment fees. Constrained by their financial capability, some governments choose operators that charge the lowest waste treatment fee, which hardly covers the cost of ensuring that the treatment of the waste satisfies environmental standards.

China WTE: bidding results for new projects



Source: Daiwa

Equity IRR to drop below 10% on distressing waste treatment fee

IRR to drop to 9.5-10% if the tariff falls below CNY30/tonne

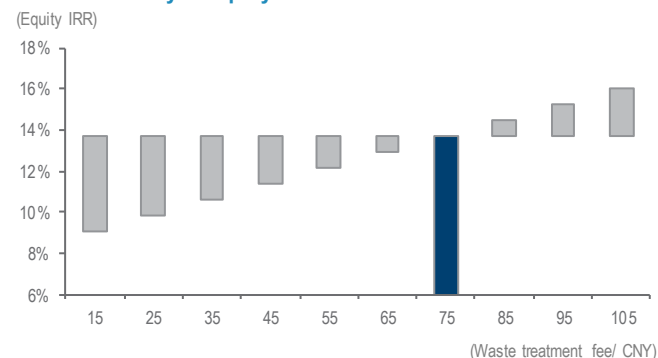
We have conducted a sensitivity analysis to examine the project profitability under such a scenario. According to our sensitivity analysis, a $\pm 3\%$ change in the average tariff (our base case) could affect equity the IRR by $\pm 0.4\text{pp}$.

WTE project assumptions

WTE BOT Project (2 years construction + 30 years operation)		
Construction period	(Years)	2
Operation period	(Years)	30
Unit CAPEX	(CNY/ton)	500,000
Designed capacity	(tpd)	1,500
Guaranteed waste amount	(%)	60%
Moisture rate	(%)	25%
Waste treatment fee	(CNY/ton)	75
On-grid tariff - less than 280 KWh/tonne	(CNY/KWh)	0.65
On-grid tariff - the rest	(CNY/KWh)	0.51
Average Annual power generation	(GWh)	250
Debt to capital	(%)	70%
Finance cost	(%)	6.5%
Payment period	(Years)	15
Operating days per year	(Days)	330
Tax rate	(%)	25%
Equity IRR	(%)	13.7

Source: Daiwa research

WTE: sensitivity of equity IRR to waste treatment fee



Source: Daiwa research

On 11 August 2015, Dynagreen announced that it had won the bidding for a 30-year BOT WTE project in Bengbu City, Anhui Province. The project would have a waste treatment capacity of 1.5ktpd and be constructed in 2 phases. Phase I would have capacity of 1ktpd and the estimated investment will be CNY504m. However, the contracted municipal waste treatment fee for these projects is CNY26.8/tonne, much lower than the national average of CNY60-110/tonne. As a result, management admits that the equity IRR from this project could be 9.76%, lower than the typical range of 12-14% for coastal WTE projects. Based on our WTE IRR project sensitivity analysis, and assuming a contracted waste treatment fee of CNY26.8/tonne, we derive an IRR of 9.5-10% for these projects, which would be a reasonable range, in our view.

A good portfolio can ensure good returns

Canvest: maintaining a quality portfolio to ensure a good return

In our view, Canvest's extensive experience in operating FB and MG plants gives it a competitive edge over other listed WTE operators in terms of executing FB-MG upgrade projects. According to the company's management, it has a wider pool of projects to choose from, as FB-MG upgrade projects usually feature higher IRRs than greenfield projects obtained directly from the governments. We note that the projects secured by Canvest have a waste treatment fee of CNY80-110/tonne, which ensures the profitability of the projects once they start operating. The company maintains benchmark equity IRR of 12-15% when selecting projects, higher than its listed competitors (CEI: >10%).

Canvest: project list

WTE PROJECT	Phase	Type	Province	Location	Commercial operation	Waste treatment fee (CNY/ton)	Capacity (tpd)
Operating projects							
Eco-Tech	I	BOO	Guangdong	Dongguan	Oct-15	110	1,800
Kewei	I	BOO	Guangdong	Dongguan	Nov-12	89	1,800
China Scivest	I	BOT	Guangdong	Dongguan	Aug-14	110	1,800
Zhanjiang	I	BOT	Guangdong	Zhanjiang	April-16	82	1,500
Total							6,900
Acquired operating project							
Xingyi	I	BOT	Guizhou	Xingyi	2H16	85	700
To commence construction in 2016							
Eco-Tech	II	BOO	Guangdong	Dongguan	1H17	110	1,500
Laibin	I	BOT	Guangxi	Laibin	2017	95	1,000
Qingyuan	I	BOT	Guangdong	Qingyuan	2018	50*	1,500
Total							4,000
In preparation							
Laibin	II	BOT	Guangxi	Laibin		95	500
Qingyuan	II	BOT	Guangdong	Qingyuan		50*	1,000
Xingyi	II	BOT	Guizhou	Xingyi		85	350
China Scivest	II	BOT	Guangdong	Dongguan		110	1,200
Beiliu	I	BOT	Guangxi	Yulin		83	700
Beiliu	II	BOT	Guangxi	Yulin		83	350
Total							4,100
Total contracted							15,700

Source: Company, Daiwa

Note: *In the process to raise this to above CNY90/tonne for second year of operation

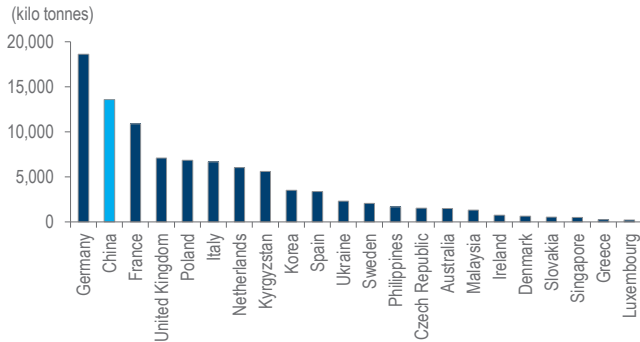
Compared with its competitors focused on greenfield projects, Canvest also sees more opportunities from its advantage in carrying out FB-MG, or processing upgrade projects. With the stricter EIA process and emission standards, management sees significant advantage of FB-MG upgrade projects over greenfield projects for the following reasons:

- 1) The construction time needed for an FB-MG upgrade project is half of that needed to build a greenfield WTE project, as significantly less preparatory work is needed and it is easier to obtain EIA approval
- 2) The old plant has already established mature waste collection and transportation systems, and the payment channel with the government is functioning smoothly. The upgraded plant could reach high operating efficiency upon commission, and
- 3) The upgraded plant is usually required to expand capacity; thus, the operator could benefit from economies of scale.

Hazardous waste treatment

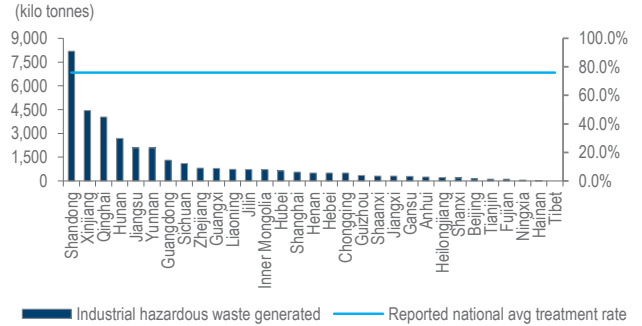
In the 2012 Environmental Yearbook, China was reported to have produced almost 35m tonnes of industrial hazardous waste in 2012, with Shandong being the largest hazardous-waste generator province, accounting for 24% of the national total, probably due to the concentration of the chemical industry in that province. In 2012, 76% of the industrial hazardous waste was either treated or recycled.

World: industrial hazardous waste generation amount (2008)



Source: United Nation, Basel Convention

China: provincial industrial hazardous waste generation (2012)



Source: Ministry of Environmental Protection

HWT: market is in early stages of development, real market size still unclear

Under-reported generation amount

According to our research, the reported production amount of 35m tonnes of industrial hazardous waste is not a precise reflection of the situation, mostly as it includes only key pollution sources. [As defined by the Ministry of Environmental Protection \(click here for the Chinese-language version\)](#), the key national pollution generators are companies that generate industrial hazardous waste of more than 100tpa, while provincial key pollution generators are those that generate more than 10tpa. City-level polluters are those that generate more than 1tpa.

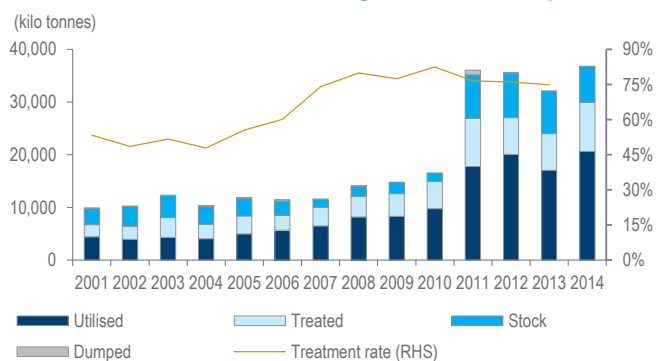
To illustrate, city-level key pollution sources were not included in the reported annual hazardous generation amount until 2011. As a result, the reported amount recorded a 116% YoY increment in 2011.

China: classification of industrial hazardous waste generators

Classification	Industrial hazardous waste generation
National key pollution generator	Generation ≥ 100tpa
Provincial key pollution generator	10tpa ≤ Generation < 100tpa
City-level key pollution generator	1tpa ≤ Generation < 10tpa
Others	Generation < 1tpa

Source: United Nation, Basel Convention

China: industrial hazardous waste generation and disposal



Source: Ministry of Environmental Protection

Note: For 2001-10, the national and provincial key pollution generators are included in the reported data; starting from 2011, national, provincial and city level key pollution generators are included in the reported data

The government carried out a [Census on Pollution Sources \(click here for the Chinese-language version\)](#) (Census) in 2010, in which it reported that the annual industrial waste generation was 45.7m tonnes in 2007, 4.2x the amount reported in the Environmental Yearbook for that year, due mainly to the inclusion of national and provincial key pollution sources in the yearbook, while not taking into account the comprehensive coverage of the Census. To follow, we summarise the differences in the key indicators reported in these 2 sets of statistics:

Comparison of 2007 hazardous waste statistics reported in the Environmental Yearbook and the census on pollution Sources

	EY	Census	Comparison
Centralised treatment			
Centralised treatment capacity (tpd)	19,986	11,300	0.6x
Total number of centralised treatment facilities	322	343	0.6x
Treated amount (kilo tonnes)	1,143	1,568	1.4x
By source: Industrial hazardous waste	1,143	1,174	1.0x
By source: Medical waste	n.a.	394	n.a.
By treatment: Landfill	290	315	1.1x
By treatment: Incineration	782	504	0.6x
By treatment: Others	71	750	10.6x
Non-centralised treatment			
Industrial hazardous waste generated (kilo tonnes)	10,790	45,737	4.2x
Utilised	6,500	16,448	2.5x
Treated	3,460	21,928	6.3x
Stock	1,540	8,124	5.3x
Discharged	1	39	39.4x
Treatment-to-collection rate	74.0%	71.2%	-2.7pp

Source: Ministry of Environmental Protection, National Bureau of Statistics

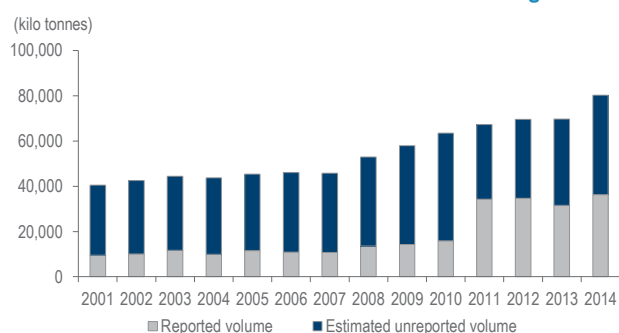
Based on these 2 sets of data and taking note of the difference in the reported annual industrial hazardous waste generation in the Environmental Yearbook for 2011 and 2010, we estimate the breakdown of the 45.7m tonnes of industrial hazardous waste generated in 2007.

Simulated in the above breakdown, and based on the data provided in the Environmental Yearbook, we estimate an actual annual industrial hazardous waste generation of 70m tonnes in 2012, two times the amount reported in the yearbook.

This under-reporting is likely to be the consequence of: 1) a lack of clear regulations and loose enforcement of proper HWT, and 2) the complex chemical or physical characteristics of hazardous waste from different industries, which possibly exposed the environment and its people to dangerous toxins/chemicals.

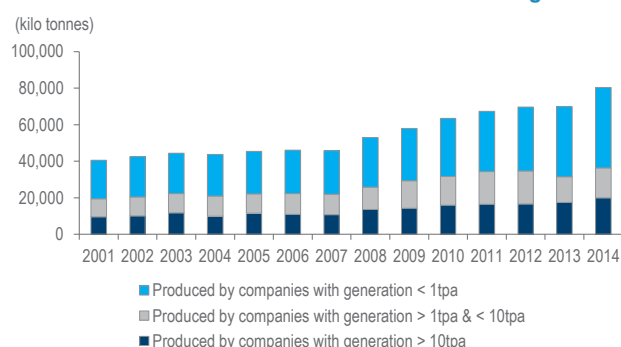
Also, according to our estimates, China has been generating more than 60m tonnes of industrial hazardous waste per year starting in 2010, and reached the government's 2015 forecast (according to the [12th FYP on the prevention of hazardous waste pollution \(click here for the Chinese-language version\)](#)), on our estimates. We are concerned as to whether enough government attention and effort has been made to address the issue, and whether the current as well as planned treatment facilities will be sufficient to treat China's hazardous waste.

China: estimated annual industrial hazardous waste generation



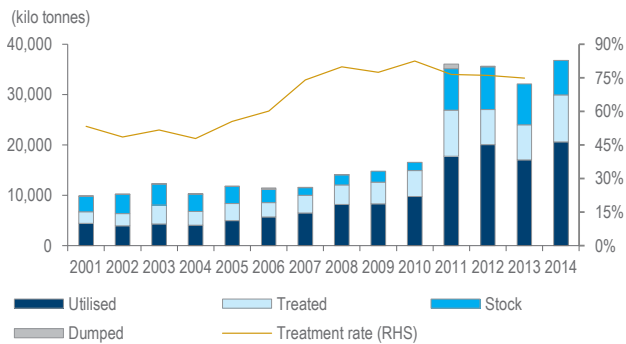
Source: Ministry of Environmental Protection, National Bureau of Statistics, Daiwa estimate
 Note: Reported referred to the volume reported in the Environmental Yearbook, which included companies with generation > 10tpa during 2001-2010, and included companies with generation > 1tpa starting 2011; Estimated unreported volume includes companies with generation < 10tpa during 2001-2010, and include companies with generation < 1tpa starting 2011

China: estimated annual industrial hazardous waste generation



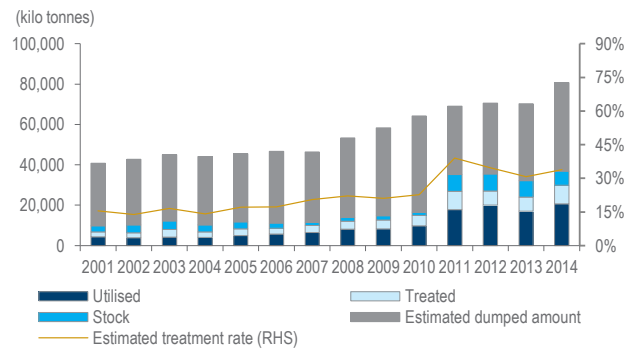
Source: Ministry of Environmental Protection, National Bureau of Statistics, Daiwa estimate
 Note: We estimated the amount generated by companies with annual generation < 10tpa during 2001-2010 (which is the unreported amount), and estimated the amount generated by companies with annual generation < 1tpa starting 2011 (which is the unreported amount). Our estimated 2007 generation match the number reported in the Census.

China: industrial hazardous waste generation and disposal



Source: Ministry of Environmental Protection

China: industrial hazardous waste generation and disposal



Source: Ministry of Environmental Protection, Daiwa estimate

HWT: strong market in Guangdong Jiangsu, and Shandong, focused provinces from CTE and CEI, respectively

Untapped centralised hazardous waste treatment market

Most of the hazardous waste generated is treated in-house by the factories that produce such waste, and as such, there is no publicly available information on the treatment quality of these in-house processes. By 2012, there were 722 centralised HWT facilities throughout China with a total capacity of 60ktpd, among which 236 were designed to treat medical waste.

During 2012, these centralised treatment facilities treated 3.4m tonnes of hazardous waste, including 0.5m tonnes of medical waste, and incurred an annual operating expense of CNY5.4bn.

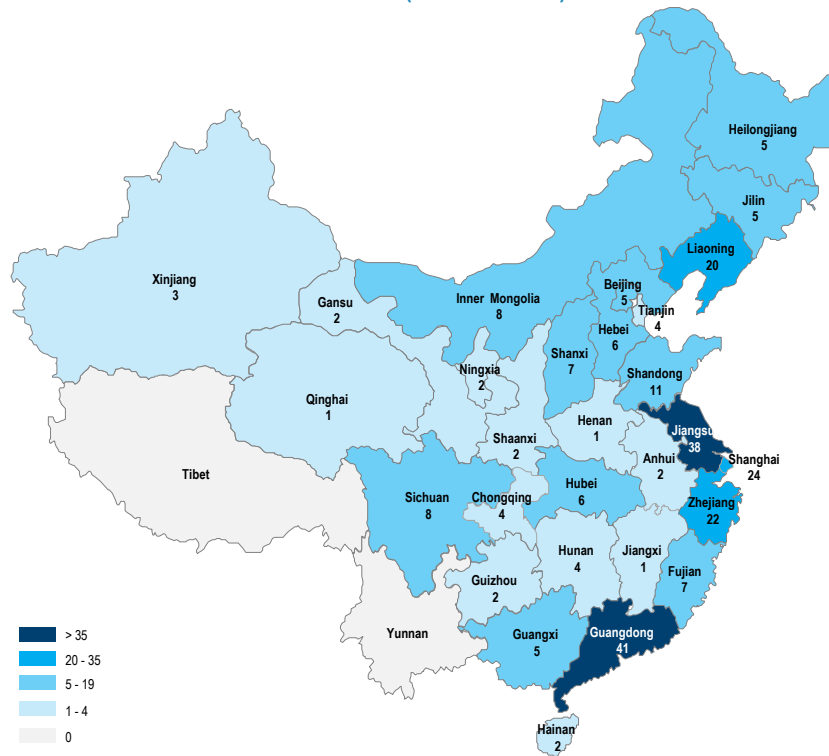
In the long term, we believe third-party centralised treatment will become the trend, as the government has also been gradually shifting its policy from “the one who pollutes should be the one who treats” to “the one who pollutes should be the one who pays for the treatment”, given the advantages of centralised treatment, for example: 1) professional operators are usually equipped with more advanced technology that can treat waste containing greater emissions, 2) centralised treatment facilities can facilitate centralised government monitoring of the treatment quality, 3) centralised treatment can lead to economies of scale, and 4) as the country is gradually moving factories to industrial parks outside of downtown areas, to achieve better control of the industrial hazardous waste generated inside the area, the government is likely to establish centralised treatment facilities in or near the industrial parks.

However, a healthy centralised treatment market relies on clear and supportive government policy which will help establish a value chain, all of which this industry currently lacks.

Currently, Dongjiang Environmental (895 HK, not rated) is an early entrant among the listed companies in the hazardous waste management market. CEI also owns 15 total HWT project pipelines (of which 5 are in operation), including 2 industrial solid waste landfill projects with a total capacity of 40ktpd in operation in Suzhou, 2 hazardous waste landfill projects with a total capacity of 40ktpd in operation in Jiangsu, 1 hazardous waste incineration project in Linayungang, with 3 projects under construction and 7 projects in the preparation stage which are due to commence operations in 2016-20.

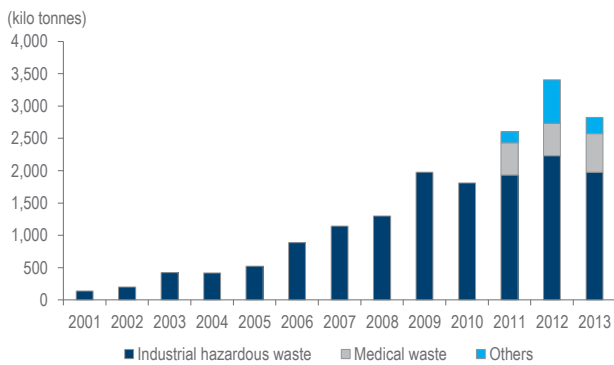
CTE also stands to benefit from the emerging HWT market, with the acquisition of Guangzhou Lvyou, an industrial waste (including dangerous waste) treatment facility in the Nansha district of Guangzhou, in 2015.

China: number of centralised hazardous waste treatment facilities (as at end-2006)



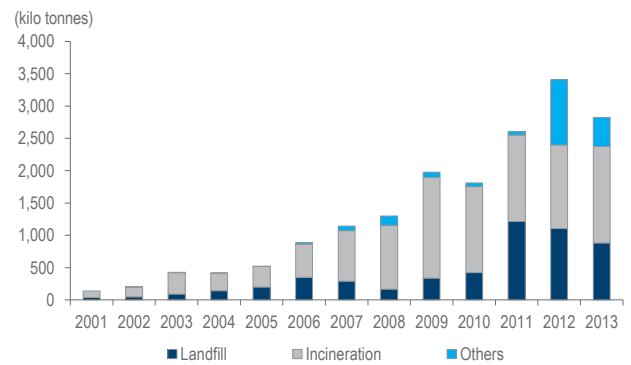
Source: Ministry of Environmental Protection

China: amount of centralised treated hazardous waste



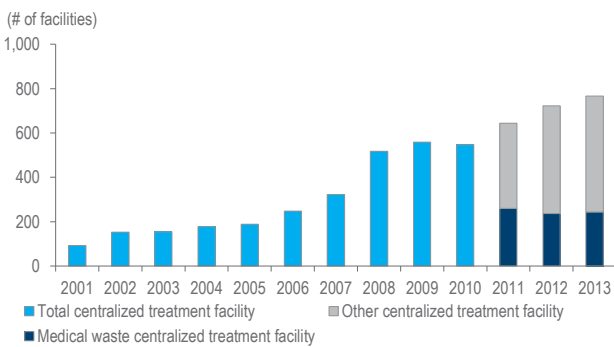
Source: Ministry of Environmental Protection

China: amount of centralised treated hazardous waste



Source: Ministry of Environmental Protection

China: no. of centralised hazardous waste treatment facilities



Source: Ministry of Environmental Protection

Risks to WTE sector: project execution and shift in geographical mix

Major risk of WTE: declining waste treatment fees, especially for inland projects under a poorer government

For waste treatment companies, we see delays in project execution and the dilution of project returns due to a shift in geographical mix as the 2 major risks to our sector call.

Delays in project execution

Project delays could lead to severe near-term earnings fluctuations and could be caused by: 1) delays in government approvals coming through, as gaining EIA approval can take a long time, 2) changes in project location due to an unsatisfactory environmental impact evaluation or opposition by local residents, and 3) overly optimistic estimates for local waste treatment demand.

Returns dilution due to shift in geographical mix

WTE players could face higher-than-expected competition in the coastal provinces, and the smaller players may not be able to compete with the big SOE companies in project bidding. This may cause a shift in the geographical profiles of some companies, driving down their overall average project return.

Currently, WTE projects in poorer inland provinces are seeing lower project returns as: 1) the financial position of inland local governments is not as strong as those of the authorities in coastal regions, and hence lower waste treatment tariffs are a possibility, and 2) the waste heat value may be lower in inland regions due to the lower proportion of organic components in the collected municipal solid waste (MSW) in the inland regions, as a result of slower economic development compared with coastal regions, as well as different cultural norms.

Therefore, in order to mitigate this risk, we believe investors should be selective in choosing the bigger SOE players, or the WTE players that have specific technological advantages (eg, Canvest has expertise in FB-MG upgrade projects).

Appendix 1: gas demand and supply

China: gas demand and supply

	2009	2010	2011	2012	2013	2014	2015	2016E	2017E	2018E	2020E
Domestic conventional gas	79	89	97	110	115	122	122	128	133	138	152
<i>yoy growth</i>		13%	9%	13%	5%	6%	0%	5%	4%	4%	5%
Domestic unconventional gas	4	4	4	5	3	6	13	21	28	34	43
<i>yoy growth</i>		0%	0%	25%	-42%	96%	126%	62%	33%	22%	12%
CBM	4	4	4	5	3	4	7	10	13	16	20
Shale gas	-	-	-	-	-	1	5	7	9	11	15
Coal-to-gas	-	-	-	-	-	1	1	4	6	7	8
Total domestic gas supply	83	93	101	115	118	128	135	149	161	172	194
<i>yoy growth</i>		12%	9%	14%	3%	8%	6%	10%	8%	7%	6%
Imported piped gas	-	4	16	20	28	31	32	39	45	52	74
Imported LNG	6	11	12	15	25	27	29	36	45	57	70
Total imported gas supply	6	15	28	35	53	58	61	75	90	109	144
<i>yoy growth</i>		150%	87%	23%	54%	9%	5%	21%	20%	21%	15%
Total supply	89	108	129	150	172	186	196	224	251	281	338
<i>yoy growth</i>		21%	19%	16%	15%	8%	6%	14%	12%	12%	10%
Total demand	90	108	134	150	171	187	193	219	245	273	333
Residential, commercial, industrial and chemical	67	78	98	118	132	136	137	153	170	187	221
Transportation	9	11	14	15	18	21	22	25	29	34	47
Power generation, heating and others	12	20	17	16	21	29	34	41	46	51	65
Other unfulfilled demand	30	30	20	15	-	-	-	-	-	-	-
Total surplus/(deficit)	(31)	(30)	(25)	(15)	1	(1)	3	4	5	8	5
Demand proportion											
Residential, commercial, industrial and chemical	75%	72%	73%	79%	77%	73%	71%	70%	69%	69%	66%
Transportation	10%	10%	10%	10%	10%	11%	11%	12%	12%	13%	14%
Power generation, heating and others	14%	18%	13%	10%	12%	16%	18%	19%	19%	19%	20%
Other unfulfilled demand	34%	28%	15%	10%	0%	0%	0%	0%	0%	0%	0%
Demand growth rate		21%	24%	12%	14%	10%	3%	14%	12%	11%	10%
Residential, commercial, industrial and chemical		15%	27%	21%	11%	3%	0%	12%	11%	10%	9%
Transportation		17%	30%	12%	14%	22%	3%	15%	15%	18%	17%
Power generation, heating and others		59%	-14%	-8%	36%	38%	16%	19%	13%	12%	27%

Source: NDRC, NEA, CNPC, Daiwa forecasts

Appendix 2: gas distributor operating data

Operation data for major China gas distributors

	2010	2011	2012	2013	2014	2015	2016E	2017E	2018E
Number of city gas projects									
ENN Energy	90	104	117	134	142	152	162	172	182
Towngas China	63	68	78	93	98	102	110	120	130
China Gas	148	160	179	237	273	305	335	365	395
China Resources Gas	48	73	151	176	205	220	235	250	265
New household connection ('000)									
ENN Energy	876	1,030	1,122	1,220	1,323	1,707	1,600	1,750	1,800
Towngas China (consolidated)	454	477	500	524	973	999	952	915	875
China Gas	902	1,105	1,226	1,662	1,921	2,100	2,200	2,200	2,100
China Resources Gas	926	1,005	1,129	1,403	2,329	2,872	2,975	3,005	3,137
Connectable households (m)									
ENN Energy	15.6	17.7	18.5	20.3	21.8	23.8	25.5	27.4	29.3
Towngas China	14.8	15.2	15.7	16.1	16.6	17.1	17.4	17.8	18.2
China Gas	19.7	20.8	21.9	25.2	30.6	33.1	35.5	37.7	39.7
China Resources Gas	24.4	26.3	34.2	44.1	50.4	57.5	65.0	72.8	80.8
Residential penetration rate (%)									
ENN Energy	35%	38%	42%	45%	49%	52%	55%	57%	60%
Towngas China	39%	41%	43%	45%	50%	54%	58%	62%	66%
China Gas	33%	37%	42%	44%	44%	48%	52%	55%	58%
China Resources Gas	36%	40%	41%	42%	41%	41%	42%	43%	47%
Connection fee per household (CNY)									
ENN Energy	2,854	2,796	2,810	2,792	2,853	2,766	2,766	2,766	2,766
Towngas China	3,209	3,607	3,787	3,715	3,567	3,558	3,593	3,593	3,593
China Gas	2,454	2,473	2,550	2,562	2,568	2,530	2,530	2,530	2,530
China Resources Gas	2,640	2,874	2,959	3,250	3,160	2,990	2,990	2,990	2,990
Connection fee GPM									
ENN Energy	53%	62%	62%	62%	63%	63%	60%	56%	57%
Towngas China (segment margin)	40%	44%	46%	44%	45%	42%	42%	41%	41%
China Gas	68%	65%	69%	67%	67%	69%	70%	71%	71%
China Resources Gas	61%	59%	61%	62%	60%	60%	61%	61%	62%
Connection fee as % of revenue (%)									
ENN Energy	27%	23%	20%	17%	15%	17%	17%	16%	16%
Towngas China	23%	24%	23%	22%	21%	22%	23%	22%	20%
China Gas	15%	15%	15%	14%	15%	16%	15%	13%	11%
China Resources Gas	23%	21%	21%	23%	22%	22%	19%	18%	17%
Connection fee as % of gross profit / segment profit (%)									
ENN Energy	54%	55%	47%	44%	46%	50%	41%	39%	39%
Towngas China	66%	66%	64%	60%	61%	61%	58%	56%	53%
China Gas	55%	51%	49%	46%	48%	47%	42%	38%	33%
China Resources Gas	48%	42%	42%	42%	43%	42%	36%	34%	34%

Source: Company, Daiwa forecasts

Operation data for major China gas distributors (continued)

	2010	2011	2012	2013	2014	2015	2016E	2017E	2018E
City-gas distributed sales volume (mcm)									
ENN Energy	3,808	5,011	6,225	8,037	10,120	11,286	12,986	14,732	16,271
Towngas China (consolidated)	987	1,200	1,310	1,570	1,726	1,719	1,822	1,968	2,145
China Gas	4,452	5,563	6,825	8,045	8,975	9,860	11,929	13,467	15,164
China Resources Gas	5,577	7,215	9,268	12,091	13,660	14,913	17,019	18,681	20,340
City-gas distributed sales yoy volume growth (%)									
ENN Energy	45%	32%	24%	29%	26%	12%	15%	13%	10%
Towngas China	30%	22%	9%	20%	10%	0%	6%	8%	9%
China Gas	32%	25%	23%	18%	12%	10%	21%	13%	13%
China Resources Gas	152%	29%	28%	30%	13%	9%	14%	10%	9%
Gas sales proportion to residential (%)									
ENN Energy	15%	15%	14%	13%	12%	13%	14%	15%	16%
Towngas China	27%	26%	25%	25%	24%	27%	28%	29%	29%
China Gas	13%	13%	12%	14%	15%	16%	15%	15%	15%
China Resources Gas	30%	29%	27%	25%	25%	26%	25%	26%	26%
Gas sales proportion to commercial and industrial (%)									
ENN Energy	71%	67%	67%	68%	66%	62%	58%	55%	53%
Towngas China	73%	74%	75%	75%	76%	73%	72%	71%	71%
China Gas	79%	78%	79%	77%	73%	73%	72%	71%	70%
China Resources Gas	61%	58%	60%	63%	63%	63%	63%	63%	63%
Gas sales proportion to vehicles refuelling (%)									
ENN Energy	13%	13%	14%	15%	14%	14%	14%	14%	15%
Towngas China	NA	NA	NA	NA	NA	NA	NA	NA	NA
China Gas	9%	9%	9%	9%	12%	12%	14%	14%	15%
China Resources Gas	8%	12%	12%	12%	12%	11%	12%	12%	11%
City gas ASP (CNY/m3)									
ENN Energy	3.04	3.37	3.42	3.55	3.77	3.62	3.08	3.08	3.08
Towngas China	2.03	2.25	2.47	2.66	2.85	2.83	2.61	2.61	2.60
China Gas	2.32	2.37	2.44	2.60	2.83	2.61	2.32	2.32	2.31
China Resources Gas	2.24	2.46	2.43	2.75	2.91	2.94	2.61	2.60	2.60
City gas average cost (CNY/m3)									
ENN Energy	2.52	2.63	2.62	2.77	2.89	2.73	2.19	2.19	2.19
Towngas China (segment)	1.90	2.09	2.27	2.45	2.64	2.62	2.38	2.37	2.36
China Gas	1.84	1.86	1.96	2.09	2.29	2.09	1.80	1.79	1.79
China Resources Gas	1.79	1.93	1.87	2.04	2.24	2.23	1.81	1.81	1.81
City gas dollar spread (CNY/m3)									
ENN Energy	0.53	0.74	0.80	0.79	0.88	0.89	0.88	0.89	0.89
Towngas China (segment)	0.13	0.16	0.19	0.22	0.22	0.21	0.24	0.24	0.24
China Gas	0.47	0.51	0.49	0.51	0.54	0.51	0.52	0.52	0.52
China Resources Gas	0.45	0.53	0.56	0.71	0.67	0.71	0.80	0.80	0.79
City gas GPM									
ENN Energy	17%	16%	19%	17%	15%	15%	21%	21%	21%
Towngas China (segment)	6%	7%	8%	8%	8%	8%	9%	9%	9%
China Gas	18%	19%	18%	18%	18%	18%	21%	22%	22%
China Resources Gas	20%	21%	23%	26%	22%	24%	25%	25%	25%
SG&A to revenue									
ENN Energy	12%	11%	11%	9%	8%	8%	8%	8%	8%
Towngas China	NA	NA	NA	NA	NA	NA	NA	NA	NA
China Gas	10%	9%	10%	8%	8%	9%	9%	8%	8%
China Resources Gas	16%	18%	19%	21%	18%	18%	18%	18%	17%
Earnings summary									
Net profit growth (YoY)									
ENN Energy	26%	27%	26%	20%	21%	17%	16%	10%	10%
Towngas China	40%	60%	34%	19%	26%	1%	0%	3%	5%
China Gas	-8%	54%	103%	54%	29%	12%	27%	18%	13%
China Resources Gas	71%	49%	40%	31%	15%	14%	17%	12%	11%
Net profit, 2-year CAGR									
ENN Energy		24%	26%	24%	22%	19%	18%	14%	12%
Towngas China		43%	44%	37%	26%	15%	8%	1%	3%
China Gas		11%	42%	69%	59%	31%	22%	19%	19%
China Resources Gas		58%	53%	40%	28%	20%	16%	15%	14%
Dividend payout (%)									
ENN Energy	30%	25%	25%	33%	30%	25%	22%	35%	36%
Towngas China	20%	21%	20%	22%	22%	22%	23%	24%	24%
China Gas	18%	21%	23%	23%	25%	26%	27%	29%	30%
China Resources Gas	15%	15%	16%	22%	23%	24%	25%	26%	27%
DPS (YoY)									
ENN Energy	48%	3%	17%	11%	59%	5%	1%	74%	13%
Towngas China	68%	49%	27%	26%	25%	0%	3%	6%	8%
China Gas	63%	74%	116%	42%	34%	20%	29%	20%	19%
China Resources Gas	54%	20%	33%	38%	14%	20%	23%	17%	16%

Source: Company, Daiwa forecasts

Appendix 3: gas-fired power IRR analysis

Assumptions

Assumptions		Coal (ultra-low emission USC)		Coal (co-gen)		Gas co-gen	
		2016	2020E	2016	2020E	2016	2020E
Capacity	(MW)	1,000	1,000	330	330	300	300
Operation	(Years)	25	25	20	20	20	20
Unit-capex (including VAT)	(CNY/W)	4.0	4.4	4.5	5.0	3.0	3.0
Unit-capex (excluding VAT)	(CNY/W)	3.4	3.8	3.8	4.2	2.6	2.6
Total investments (including VAT)	(CNY mn)	4,000	4,400	1,485	1,634	900	900
Total investments (excluding VAT)	(CNY mn)	3,419	3,761	1,269	1,396	769	769
Construction period	Years	3.0	3.0	3.0	3.0	3.0	3.0
Residual value of asset	(%)	0.05	0.05	0.05	0.05	0.05	0.05
Tariff (including VAT)	(CNY/kWh)	0.36	0.30	0.36	0.30	0.53	0.48
Tariff (excluding VAT)	(CNY/kWh)	0.31	0.26	0.31	0.26	0.45	0.41
Heat-power ratio (heating season)	(%)	n.a.	n.a.	90%	90%	90%	90%
Heat-power ratio (non-heating season)	(%)	n.a.	n.a.	60%	60%	60%	60%
Number of heating month	(Month)	n.a.	n.a.	3.0	3.0	4.0	4.0
Heating price (including VAT)	(CNY/GJ)	n.a.	n.a.	40.0	30.0	40.0	30.0
Heating price (excluding VAT)	(CNY/GJ)	n.a.	n.a.	34.2	25.6	34.2	25.6
Utilization hours	(hours)	4,226	3,900	3,500	3,800	3,500	4,200
In-plant power consumption	(%)	5%	4%	5%	4%	5%	4%
Debt	(%)	70%	70%	70%	70%	70%	70%
Debt repayment years	(years)	12	12	12	12	12	12
Finance cost	(%)	5.0%	4.0%	5.0%	4.0%	5.0%	4.0%
Other variable costs	(CNY/kWh)	0.03	0.03	0.03	0.03	0.02	0.02
Overhead	(CNYm/MW)	0.10	0.11	0.10	0.11	0.10	0.11
Inflation	(%)	2%	2%	2%	2%	2%	2%
Fuel consumption	(g/kWh) / (m3/kWh)	280	260	310	300	0.20	0.20
Fuel price	(CNY/ton) / (CNY/m3)	452	400	452	400	1.96	1.70
Unit fuel cost	(CNY/kWh)	0.13	0.10	0.14	0.12	0.39	0.34
Carbon price	(CNY/ton)	25	25	25	25	25	25
Carbon emission per unit fuel consumed	(ton/ton) / (m3/ton)	1.80	1.50	1.80	1.50	1,395	1,125
Carbon cost	(CNY/kWh)	0.01	0.01	0.01	0.01	0.01	0.01
Water consumption	(kg/kWh)	1.60	1.40	1.60	1.40	0.80	0.70
Water price	(CNY/ton)	4.00	4.00	4.00	4.00	4.00	4.00
Water cost	(CNY/kWh)	0.01	0.01	0.01	0.01	0.00	0.00
Unit variable cost	(CNY/kWh)	0.17	0.15	0.19	0.17	0.42	0.37
Dark spread	(CNY/kWh)	0.19	0.15	0.17	0.13	0.11	0.11
IRR	(%)	10.9%	0.9%	13.8%	9.1%	6.3%	8.0%

Source: Daiwa estimate and forecasts

Gas-fired power IRR: sensitivity analysis

		Tariff (CNY/kWh, inc. VAT)						
		0.44	0.46	0.48	0.50	0.52	0.54	0.56
Gas cost (CNY/m3)	1.50	10.3%	15.1%	19.5%	23.7%	27.6%	31.3%	34.9%
	1.60	4.3%	9.5%	14.3%	18.8%	23.0%	26.9%	30.7%
	1.70	-2.7%	3.4%	8.7%	13.5%	18.0%	22.3%	26.3%
	1.80	-12.5%	-3.9%	2.4%	7.8%	12.7%	17.3%	21.6%
	1.90	n.a.	-14.6%	-5.1%	1.4%	6.9%	11.9%	16.5%
	2.00	n.a.	n.a.	n.a.	-6.4%	0.4%	6.0%	11.1%
	2.10	n.a.	n.a.	n.a.	n.a.	-7.8%	-0.6%	5.1%
	2.20	n.a.	n.a.	n.a.	n.a.	n.a.	-9.3%	-1.7%

Source: Daiwa estimates

Note: n.a. = nominal loss for all operating years

Appendix 4: NGV policies

China: NGV policies

Date	Document	Chinese	Key points
Energy policies			
Oct-07	Energy Saving Law	节约能源法	"The country will develop and encourage the application of clean fuel in transportation"
Aug-12	12th FYP for Energy Saving and Emission Reduction	节能减排“十二五”规划	"Encourage the use of natural gas and coal-bed methane in qualified city buses, taxis and inter-city trucks"
Dec-12	12th FYP for Development of Natural Gas	天然气发展“十二五”规划	"Gradually and orderly replace oil with gas, such as adopting gas in vehicles and ships"
Jun-14	2014-20 Strategic Plan for Energy Development	能源发展战略行动计划（2014-2020年）	"Gradually develop NGVs by focusing on city buses and taxis, accelerate construction of gas stations"
Mar-16	Guidance on 2016 Energy Work Plan	2016年能源工作指导意见	"Improve technology for the application of gas in transportation, strengthen planning of gas station construction, actively develop NGVs"
Automobile policies			
Aug-09	Automobile Industry Development Policy	汽车产业发展政策	"The country will support the study on new types of vehicle fuel such as natural gas, and encourage the auto-makers to develop such vehicles"
Jun-12	Development Plan for Energy Saving and New Energy Vehicle Industry	节能与新能源汽车产业发展规划	"Encourage areas with rich natural gas (including LNG) resources to develop new energy vehicles"
Environmental policies			
Sep-13	Air Pollution Prevention Plan in BTH and Surrounding Areas	京津冀及周边地区落实大气污染防治行动计划实施细则	"Requires 60% of newly added buses in Beijing, Tianjin, Taiyuan, etc. to be NGVs"
Sep-14	2014-20 State Plan to cope with Climate Change	国家应对气候变化规划（2014-2020年）	"Encourage NGVs and natural gas ships as major measures to control emissions from transportation"
Transportation policies			
Feb-11	Guidance on Building Low-carbon Transportation System	建设低碳交通运输体系指导意见	"Encourage transportation companies to adopt NGVs as operating vehicles in qualified areas"
Feb-11	Pilot Plan in Building Low Carbon Transportation System	建设低碳交通运输体系试点工作方案	"Requiring 5% NG passenger vehicles and 10% NG truck ratio in all pilot cities"
Apr-11	12th FYP in Emissions Reduction in Road and Marine Transport	公路水路交通运输节能减排“十二五”规划	"Starting pilot projects to encourage use of NGVs in logistics and public transport"
May-13	Guidance on Accelerating Green Transportation Development	加快推进绿色循环低碳交通运输发展指导意见	"Encourage use of natural gas in transportation and mechanical equipment"
Aug-14	Technological Policy on Road and Marine Transport	公路水路交通运输主要技术政策	"Encourage clean energy in road transport"
May-15	Notice about Improving Oil Subsidies for City Transport and Accelerating Application for New Energy Vehicles	关于完善城市公交车成品油价格补助政策，加快新能源汽车推广应用的通知	"Urge to introduce timely public NGV supporting policies"

Source: NDRC, NEA, State Council, MIIT, MEP, MoT

China: major central government financial subsidies to the NGV industry

Document / Measure (Chinese)	Measures
交通运输节能减排专项资金管理暂行办法	Subsidy of CNY2,000 per tonne of standard oil equivalent for alternative fuel vehicles (reduced to CNY250/tonne in 2015)
关于节约能源 使用新能源车船车船税优惠政策的通知	50% cut in vehicle tax for NGVs
节能减排专项资金	Special fund to subsidise public NGVs in pilot cities
燃油补贴	Subsidising public NGVs (70% of the subsidy for diesel vehicles)

Source: China Road Transport Association, Daiwa

Appendix 5: foreign case studies

Air: smog in southern California

California has reduced air pollution substantially, with strong and focused policies that have created various market opportunities for the gas sector

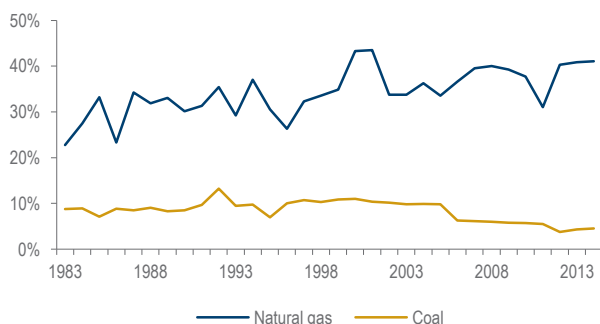
Since the 1940s, southern California, especially Los Angeles, has suffered from the one of the most serious smog problems in the world, following the boom in the city's economy after World War II. The major source of pollutants then came from steel and chemical plants, oil refineries and backyard trash incinerators. Moreover, the number of vehicles on the road increased sharply between 1940s and 1950s, driven by the higher average household income. For example, in LA, autos ownership doubled from 1m to 2m during the 1940-50 period.

Throughout the past few decades, the California government has been carrying out various measures to tackle the air pollution problem, including the setting-up of special departments to deal with different types of air pollution. In 1959, the California Motor Vehicle Control Board established the first automobile emissions standard worldwide. Following the introduction of the US Air Pollution Law in 1960 and the Clean Air Act Amendments in 1970, the NO₂, SO₂ and O₃ emission standards for vehicles and factories were greatly tightened.

With the focus on reducing emissions from vehicles and power plants, the government also advocated the use of natural gas or methanol as the primary fuels for vehicles and power generation. Gas consumption increased greatly, becoming the primary hydrocarbon energy source, especially for power generation. In 2015, power generation accounted for 36% of California's total natural gas consumption. Entering the 2010s, the government strengthened its promotion of EVs and NGVs. In 2015, California's vehicle gas consumption volume reached 466mcm (10-year CAGR of 6%).

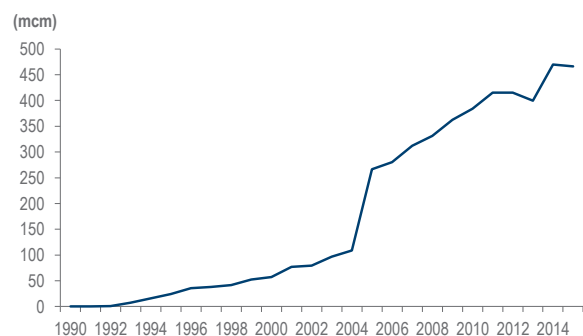
Having made an effort for more than 50 years, the average number of heavy-air-pollution days has decreased by over 80% compared to 50 years ago, despite the 400% population growth and increase in number of vehicles. The average allowed air-polluting emissions per vehicle have also been reduced by over 90%. As China is only starting to implement its air-pollution legislation and regulatory systems, there is still a long way for the country to go to tackle its air pollution problem, and we see a lot of market opportunities along the way.

California: sources of power generation



Source: California Energy Commission

California: NGV gas consumption volume



Source: US Energy Information Administration

The River Thames example suggests heavy investment in infrastructure is the first step to dealing with water pollution

Water: the UK's River Thames

The pollution in the longest river in England, the River Thames, started in the 1800s due to the country's growing population and industrialisation. In the next 100 years, the river remained filled with raw sewage, and industrial waste was discharged directly into the river. So bad was it that the river was declared biologically dead in 1957 by the Natural History Museum as the pollution level was so bad that no wildlife could survive in it. What's worse, bombings during World War II had destroyed nearly all of the old Victorian sewers and treatment facilities.

It wasn't until the 1960s when the UK recovered from World War II that the restoration of the River Thames began with a major clean-up operation and the rebuilding of the sewage treatment facilities. Apart from improving the sewage system and the water clean-up, tighter regulations on pesticides and fertilisers, which were washed into the rivers with every rainfall, were implemented as public awareness on environmental issues increased into the 1970s.

The UK government passed the Water Act in 1989 that privatised the water industry, with Thames Water taking on London's entire water supply and sewage treatment. From then on, the company made significant investments in updating existing treatment facilities and new water infrastructure, including USD400m for the Thames Water Ring Main (London's largest tunnelling then) in 1994. There are currently 845 waste management sites along the river and this, coupled with the closure of harbours and the removal of heavy industry, has made the River Thames one of the world's cleanest urban rivers and home to 119 species of fish.

The understanding and cooperation of residents have been the keys to successful waste management

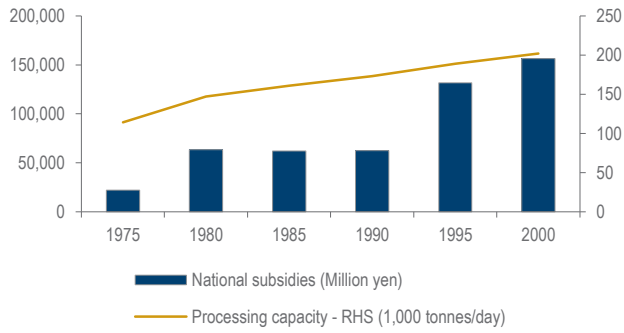
Waste: Japan's experience

Japan is well known globally for its effective waste management and recycling. But at one time, the country faced similar problems to those China is handling today. In the 1960s, when Japan experienced rapid economic growth due to industrialisation, widespread use of home appliances and changes in consumption created a surge in the amount and diversity of urban waste, making it more difficult for the old waste management system to work effectively and thus posing threats to the country's living environment and public health.

To tackle the issue, the Japan government enacted the Waste Management and Public Cleansing Act in 1970, specifying the responsibility of its municipalities to manage municipal waste while appointing waste-generating business operators to manage industrial waste. Secondly, the government pushed for the construction of more waste management facilities across the country, with clearly defined standards and a national subsidy system to incentivise these qualified facilities. Also, in order to increase the country's incinerating efficiency, the government established sophisticated rules for sorting waste in the process of waste collection (combustible waste, non-combustible waste, plastic, etc).

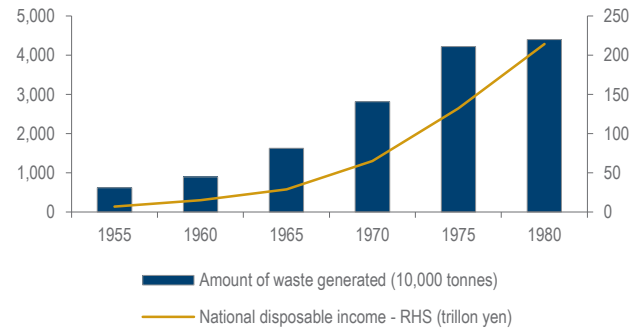
Like other countries, the public protested about the construction of waste incineration facilities. In 1971, the Japan government launched a "War against Waste" campaign, stating that the impending waste crisis was threatening the lives of residents and that the government would have to implement effective waste management measures. This campaign raised awareness that waste is a serious issue, making people recognise the importance of the government and residents working together to ensure that effective waste management happens.

Japan: historical national subsidies for waste management facilities



Source: Ministry of the Environment of Japan

Japan: historical waste generated and national disposable income



Source: Ministry of the Environment of Japan

Appendix 6: Illustration of returns in water investment fund model

Assumptions

WWT IRR (1 year construction + 25 years operation)		
Construction period	(Years)	1
Operation period	(Years)	20
Debt to capital	(%)	50%
Finance cost	(%)	5%
Payment period	(Years)	10
Total investment	(CNY mn)	100
Stake hold by BEW	(%)	10%
Stake hold by gov	(%)	5%
Stake hold by fund	(%)	85%
Coupon rate	(%)	5.5%
Management fee	(%)	0.2%

Source: Daiwa

FCF analysis

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12
Capex	100												
FCFE	(100)	10	10	10	10	10	10	10	10	10	...	10	10
Project IRR	8%												

BS	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12
Debt schedule													
Beginning balance	-	50	45	40	35	30	25	20	15	10	...		
- Borrowing	50	-	-	-	-	-	-	-	-	-	...		
- Repayment	-	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	...		
Ending balance	50	45	40	35	30	25	20	15	10	5	...		
Interest expense	(1)	(2)	(2)	(2)	(2)	(1)	(1)	(1)	(1)	(0)	...		

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	
FCF-Project		10	10	10	10	10	10	10	10	10	...	10	10	
-interest expense		(2)	(2)	(2)	(2)	(1)	(1)	(1)	(1)	(0)	...	-	-	
-Debt repayment		(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	...	-	-	
-Coupon expense		(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	...	(2)	(2)	
-Management fee		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	...	0.1	0.1	
FCF-GP	(7.5)	(2.2)	0.5	0.7	0.9	1.2	1.4	1.7	2.0	2.2	2.5	...	13	13
FCF- Tongzhou gov (non-operating GP)	(2.5)	(2.3)	0.1	0.2	0.3	0.4	0.4	0.5	0.6	0.7	0.8	...	2.6	2.6
FCF- BEW (operating GP)	(5.0)	0.1	0.4	0.5	0.7	0.8	1.0	1.2	1.3	1.5	1.7	...	5.3	5.3

Equity IRR - Tongzhou gov (non-operating GP)	15.0%
Equity IRR - BEW (operating GP)	22.2%

Source: Daiwa

For a BOT construction demo model, please refer to our China water sector initiation report, [cleaning up in China](#), published on 4 November 2014.

For a typical WTE IRR model and hazardous waste data, please refer to our China solid waste sector initiation report, [trash to cash](#), published on 14 November 2014.

Appendix 7: WWT and WTE operator operating data

China WWT and WTE: operating data for major companies

	Unit	2010	2011	2012	2013	2014	2015	2016E	2017E	2018E
Operating Capacity										
Beijing Enterprises Water	mtpd of MWWT	2.86	5.08	7.29	9.49	11.45	13.02	16.02	19.02	22.77
CT Environmental	ktpd of IWWT	215	215	265	315	515	745	830	930	1,045
China Everbright International	ktpd of WTE	4.55	8.15	8.15	9.65	14.55	19.15	22.35	30.35	38.90
Canvest Environment	ktpd of WTE	n.a.	3.00	3.00	3.00	3.60	5.40	9.10	11.30	12.80
Capacity pipeline ratio (total capacity over operating capacity)										
Beijing Enterprises Water	MWWT	206%	172%	144%	176%	176%	189%	182%	177%	167%
CT Environmental	IWWT	n.a.	n.a.	n.a.	n.a.	n.a.	145%	144%	129%	114%
CT Environmental	Sludge treatment	n.a.	n.a.	n.a.	n.a.	n.a.	160%	138%	100%	100%
China Everbright International	WTE	n.a.	n.a.	n.a.	n.a.	222%	197%	192%	171%	134%
China Everbright International	Investment	n.a.	n.a.	n.a.	n.a.	n.a.	708%	853%	135%	130%
Canvest Environment	WTE	n.a.	n.a.	n.a.	n.a.	n.a.	250%	173%	168%	148%
BOT construction as % of revenue										
Beijing Enterprises Water		86%	51%	53%	59%	51%	62%	65%	61%	55%
CT Environmental		36%	19%	0%	3%	9%	8%	0%	0%	0%
China Everbright International		58%	61%	47%	59%	57%	58%	63%	65%	50%
Canvest Environment		n.a.	n.a.	n.a.	n.a.	31%	49%	41%	51%	40%
BOT construction as % of GP										
Beijing Enterprises Water		8%	7%	7%	4%	15%	30%	23%	19%	16%
CT Environmental		14%	6%	0%	1%	3%	3%	0%	0%	0%
China Everbright International		29%	29%	19%	26%	24%	25%	31%	32%	21%
Canvest Environment		n.a.	n.a.	n.a.	n.a.	12%	22%	16%	22%	15%
SG&A over non-construction revenue										
Beijing Enterprises Water		5%	14%	21%	16%	17%	21%	15%	14%	14%
CT Environmental		9%	9%	6%	9%	8%	8%	8%	8%	8%
China Everbright International		15%	17%	16%	18%	20%	21%	22%	22%	15%
Canvest Environment		11%	9%	10%	12%	19%	15%	18%	15%	10%


Source: Company, Daiwa forecasts



ENN Energy (2688 HK)

 Target price: **HKD48.62** (from HKD50.00)

 Share price (3 Aug): **HKD37.90** | Up/downside: **+28.2%**

 5 4 3 2 **1**

Buy
 (unchanged)

1H16 likely on track; ready for sector liberalisation

- Stable unit dollar margin despite the tariff cut in Zhejiang, leading to...
- Solid ROIC, helped by low-cost spot LNG
- Reiterating Buy (1) rating; TP cut to HKD48.62

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What's new: ENN's share price has fallen by 15% since Zhejiang announced a 20% T&D tariff cut (April 2016), but we calculate that this will have only a 2% impact on ENN's gross profit. Our recent business update from ENN confirmed that its unit dollar margin is intact as it has succeeded in procuring cheaper gas via the SHPGX. In the medium term, we expect ENN's ROIC to be stable, driven by its cheaper LNG supply contracts starting 2018. For 1H16, we expect ENN to have achieved 15% YoY net profit growth, from CNY1.38bn to CNY1.6bn, on 9% YoY retail gas sales volume growth, 10% YoY residential connection growth, and CNY100m in dividends from an available-for-sale equity investment, Sinopec Marketing.

What's the impact: Unit dollar margin maintained despite Zhejiang cut.

We confirm that ENN maintained its unit dollar margin in 1H16 vs. 2H15. While we don't believe the Zhejiang tariff cut will be replicated nationwide, we do see a chance of 10 other provinces adopting a similar cut, which combined could reduce ENN's 2017 gross profit by 4.4%, on our estimates. For 1H16, only Guangdong announced a CNY0.03/m³ transmission tariff cut, with an unchanged distribution unit dollar margin, while Jiangsu and Jiangxi capped their unit distribution margins, leading to a slight cut in the margin.

Various measures to maintain ROIC. ENN has been looking for more low-cost spot LNG sources to cut costs and in January 2016, it entered the retail power business to boost profit. According to ENN, it plans to import 1.5mtpa (or c.2bcm p.a.) of natural gas starting in 2018, at USD5/mmbtu (ie, CNY1.2/m³, or CNY1.5/m³ including the LNG processing cost), lower than the current national average city-gate tariff (CNY1.82/m³, coastal: CNY1.98-2.18/m³). Thus, we believe ENN could at least maintain its unit dollar margin, should China cut the distribution tariff nationwide. Of all the China gas distributors we cover, ENN should be the most likely to defend its unit dollar margin given its c.60% exposure to the coastal areas (in terms of connectable households), which have multiple gas sources, making it easier to secure cheaper gas and thus lower costs. This, coupled with it offering more asset-light value-added services (ie, power/heating) to its C&I customers through its power-retail JVs in Zhaoqing and Kunming, allow us to believe ENN will maintain a minimal 14% ROIC over 2016-20E.

What we recommend: We reiterate our Buy (1) rating on ENN, but cut our DCF-derived 12-month TP to HKD48.62 from HKD50.00, on a 1pp cut in our gas sales volume growth forecast for 2017, leading to our c.1% EPS cut for 2017-18E. Key risk: the retail-gas tariff cut by more provinces.

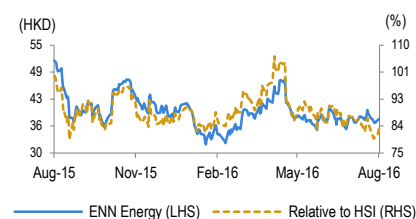
How we differ: Our 2016-18E EPS are 7-10% higher than consensus, as we believe the market has yet to incorporate ENN's latest guidance.

Forecast revisions (%)

Year to 31 Dec	16E	17E	18E
Revenue change	-	(0.6)	(1.3)
Net profit change	-	(0.5)	(1.0)
Core EPS (FD) change	-	(0.5)	(1.0)

Source: Daiwa forecasts

Share price performance



12-month range	31.95-51.20
Market cap (USDbn)	5.28
3m avg daily turnover (USDm)	8.34
Shares outstanding (m)	1,083
Major shareholder	ENN Group (30.5%)

Financial summary (CNY)

Year to 31 Dec	16E	17E	18E
Revenue (m)	31,793	36,193	39,850
Operating profit (m)	5,645	5,943	6,302
Net profit (m)	3,186	3,489	3,823
Core EPS (fully-diluted)	2,942	3,221	3,530
EPS change (%)	16.4	9.5	9.6
Daiwa vs Cons. EPS (%)	9.5	6.7	7.6
PER (x)	11.0	10.1	9.2
Dividend yield (%)	2.0	3.5	3.9
DPS	0.647	1.127	1.271
PBR (x)	2.2	1.9	1.7
EV/EBITDA (x)	6.3	5.9	5.3
ROE (%)	21.7	20.4	19.7

Source: FactSet, Daiwa forecasts

5 4 3 2 **1**

How do we justify our view?



Buy
(unchanged)

Growth outlook



Valuation



Earnings revisions

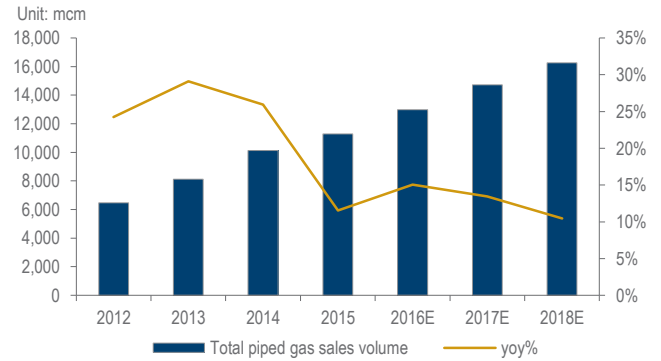


Growth outlook



We forecast ENN's total gas sales volume growth to rise from 12% YoY for 2015 to 15% YoY for 2016 (after the city-gate tariff cut in Nov 2015). Connection fees should continue to contribute to gross profit growth, despite the large number of old lower-margin buildings due to be connected in 2016 (2015: c.0.5m old-building connections; CNY100-150/household lower in terms of gross profit). Our market research suggests growth of its new residential connections will be at least flat YoY for 2016. ENN also plans to add 20 CNG stations and 30 LNG stations in 2016E, and increase the utilisation rate of its stations (CNG: 60-65%; LNG: 40-45% in 2016E).

ENN: total gas sales volume



Source: Company, Daiwa forecasts

Valuation



Trading at a 2016E PER of 11x currently, ENN is at the lower end of the 11-15x PER range for its city-gas distributor peers, and 1.3SD below its past-8-year-average 12-month-forward PER of 15.2x. We believe ENN's valuation is undemanding, given the superior geographical locations of its city-gas projects, where c.60% of the connected population is located in the coastal areas. As the coastal areas are exposed to multiple gas sources, enabling ENN to pick the low-cost gas options, it should be able to maintain its gas dollar margin. Accordingly, we expect its total gas sales volume growth to pick up in 2016 (15% YoY on our forecasts), vs. 2015.

ENN: 1-year-forward PER bands



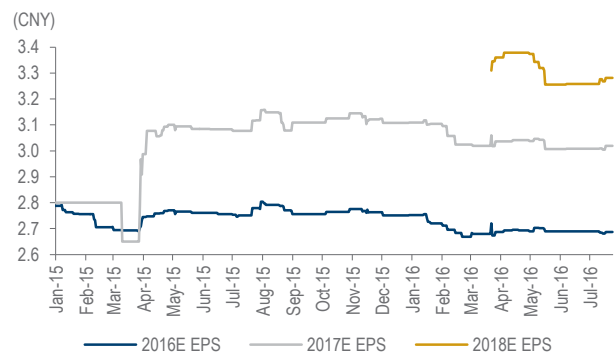
Source: Company, Daiwa forecasts

Earnings revisions



The Bloomberg consensus has cut its 2016-17E EPS for ENN by 2-4% YTD, probably because the street has factored in a lower unit dollar margin on the provincial governments' decision to cut or cap the distribution tariffs for gas distributors during April-June, like the 20% T&D tariff cut in Zhejiang in April. Based on our talks with management, ENN has maintained a stable unit dollar margin YTD, leading us to believe that the market's concerns about a margin squeeze are likely overdone. If we were to assume that the 10 other provinces will follow Zhejiang and cut their T&D tariffs, which would be excessive, we estimate a 4.4/6.6% reduction in the company's 2017E gross/net profit.

ENN: Bloomberg consensus EPS forecast revisions



Source: Bloomberg

Financial summary

Key assumptions

Year to 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Natural gas sales volume (m3)	5,011	6,225	8,037	10,120	11,286	12,986	14,732	16,271
Gas ASP, incl tax (CNY/m3)	3.37	3.42	3.55	3.77	3.62	3.08	3.08	3.08
Gas purchase cost, incl tax (CNY/m3)	2.63	2.62	2.77	2.89	2.73	2.19	2.19	2.19
Residential gas connection ('000 households)	1,030	1,122	1,220	1,323	1,707	1,600	1,750	1,800
Gross profit contribution - connection fee	55	47	44	46	50	41	39	39

Profit and loss (CNYm)

Year to 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Gas connection	3,415	3,633	3,843	4,403	5,508	5,422	5,972	6,263
Sales of gas	7,980	10,516	14,102	17,485	18,680	17,494	19,302	21,066
Other Revenue	3,673	3,878	5,021	7,199	7,875	8,878	10,919	12,522
Total Revenue	15,068	18,027	22,966	29,087	32,063	31,793	36,193	39,850
Other income	167	171	238	271	391	491	491	491
COGS	(11,166)	(13,183)	(17,502)	(23,018)	(25,197)	(23,937)	(27,721)	(30,720)
SG&A	(1,663)	(1,971)	(2,133)	(2,417)	(2,683)	(2,702)	(3,020)	(3,319)
Other op. expenses	14	13	(685)	625	(700)	0	0	0
Operating profit	2,420	3,057	2,884	4,548	3,874	5,645	5,943	6,302
Net-interest inc./(exp.)	(460)	(621)	(567)	(430)	(542)	(504)	(469)	(466)
Assoc/forex/extraord./others	367	416	443	629	695	596	643	693
Pre-tax profit	2,327	2,852	2,760	4,747	4,027	5,737	6,117	6,529
Tax	(660)	(859)	(960)	(1,127)	(1,306)	(1,803)	(1,861)	(1,922)
Min. int./pref. div./others	(414)	(511)	(548)	(652)	(685)	(748)	(767)	(784)
Net profit (reported)	1,253	1,482	1,252	2,968	2,036	3,186	3,489	3,823
Net profit (adjusted)	1,285	1,616	1,937	2,343	2,736	3,186	3,489	3,823
EPS (reported)(CNY)	1.193	1.388	1.156	2.741	1.880	2.942	3.221	3.530
EPS (adjusted)(CNY)	1.223	1.514	1.789	2.164	2.526	2.942	3.221	3.530
EPS (adjusted fully-diluted)(CNY)	1.210	1.504	1.788	2.014	2.526	2.942	3.221	3.530
DPS (CNY)	0.295	0.345	0.382	0.610	0.640	0.647	1.127	1.271
EBIT	2,420	3,057	2,884	4,548	3,874	5,645	5,943	6,302
EBITDA	2,808	3,552	3,451	5,201	4,734	6,450	6,806	7,219

Cash flow (CNYm)

Year to 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Profit before tax	2,327	2,852	2,760	4,747	4,027	5,737	6,117	6,529
Depreciation and amortisation	519	618	708	817	939	805	863	916
Tax paid	(660)	(859)	(960)	(1,127)	(1,306)	(1,803)	(1,861)	(1,922)
Change in working capital	525	941	966	1,272	(301)	(38)	102	686
Other operational CF items	(154)	316	552	(626)	663	(596)	(643)	(693)
Cash flow from operations	2,557	3,868	4,026	5,083	4,022	4,105	4,578	5,517
Capex	(2,739)	(2,878)	(3,034)	(2,578)	(2,540)	(2,390)	(2,220)	(2,050)
Net (acquisitions)/disposals	(179)	(3)	(118)	(658)	(4,000)	(658)	(658)	(658)
Other investing CF items	(2,731)	2,014	58	504	346	287	309	333
Cash flow from investing	(5,649)	(867)	(3,094)	(2,732)	(6,194)	(2,761)	(2,569)	(2,375)
Change in debt	4,370	(600)	(2,559)	171	(299)	0	0	0
Net share issues/(repurchases)	13	0	0	3	0	0	0	0
Dividends paid	(527)	(315)	(414)	(709)	(693)	(701)	(1,221)	(1,376)
Other financing CF items	(260)	715	2,750	1,872	0	0	0	(3,556)
Cash flow from financing	3,596	(200)	(223)	1,337	(992)	(701)	(1,221)	(4,932)
Forex effect/others	0	0	0	0	0	0	0	0
Change in cash	504	2,801	709	3,688	(3,164)	643	788	(1,790)
Free cash flow	(182)	990	992	2,505	1,482	1,590	2,222	3,342

Source: FactSet, Daiwa forecasts

Financial summary continued ...

Balance sheet (CNYm)

As at 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Cash & short-term investment	6,024	6,472	7,082	10,574	7,454	8,097	8,885	7,095
Inventory	272	311	419	510	404	379	414	426
Accounts receivable	1,837	2,062	2,829	2,883	3,051	2,768	3,151	3,469
Other current assets	811	842	767	1,035	948	902	926	945
Total current assets	8,944	9,687	11,097	15,002	11,857	12,146	13,376	11,935
Fixed assets	13,073	15,099	17,531	19,441	21,121	22,784	24,220	25,433
Goodwill & intangibles	1,247	1,434	1,500	1,993	2,206	1,859	1,780	1,701
Other non-current assets	3,624	4,673	5,777	6,599	11,835	12,431	13,075	13,768
Total assets	26,888	30,893	35,905	43,035	47,019	49,221	52,451	52,837
Short-term debt	3,213	3,945	921	1,530	6,654	6,654	6,654	3,098
Accounts payable	4,172	4,894	6,166	7,262	7,133	6,883	7,095	7,866
Other current liabilities	2,135	2,775	3,782	4,748	5,621	4,727	4,614	4,638
Total current liabilities	9,520	11,614	10,869	13,540	19,408	18,264	18,363	15,602
Long-term debt	7,459	7,297	11,522	12,970	9,026	9,026	9,026	9,026
Other non-current liabilities	1,069	1,312	1,622	1,984	2,490	2,602	2,699	2,614
Total liabilities	18,048	20,223	24,013	28,494	30,924	29,892	30,088	27,243
Share capital	110	113	113	113	113	113	113	113
Reserves/R.E./others	6,936	8,540	9,430	11,985	13,355	15,840	18,107	20,554
Shareholders' equity	7,046	8,653	9,543	12,098	13,468	15,953	18,220	20,667
Minority interests	1,794	2,017	2,349	2,443	2,627	3,375	4,142	4,927
Total equity & liabilities	26,888	30,893	35,905	43,035	47,019	49,221	52,451	52,837
EV	39,083	38,786	38,976	37,119	41,087	40,595	39,931	38,257
Net debt/(cash)	4,648	4,770	5,361	3,926	8,226	7,583	6,795	5,029
BVPS (CNY)	6.708	8.104	8.813	11.171	12.436	14.731	16.825	19.084

Key ratios (%)

Year to 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Sales (YoY)	34.4	19.6	27.4	26.7	10.2	(0.8)	13.8	10.1
EBITDA (YoY)	28.6	26.5	(2.8)	50.7	(9.0)	36.3	5.5	6.1
Operating profit (YoY)	31.5	26.3	(5.7)	57.7	(14.8)	45.7	5.3	6.1
Net profit (YoY)	26.8	25.8	19.9	21.0	16.8	16.4	9.5	9.6
Core EPS (fully-diluted) (YoY)	26.8	24.3	18.9	12.7	25.4	16.4	9.5	9.6
Gross-profit margin	25.9	26.9	23.8	20.9	21.4	24.7	23.4	22.9
EBITDA margin	18.6	19.7	15.0	17.9	14.8	20.3	18.8	18.1
Operating-profit margin	16.1	17.0	12.6	15.6	12.1	17.8	16.4	15.8
Net profit margin	8.5	9.0	8.4	8.1	8.5	10.0	9.6	9.6
ROAE	19.7	20.6	21.3	21.7	21.4	21.7	20.4	19.7
ROAA	5.5	5.6	5.8	5.9	6.1	6.6	6.9	7.3
ROCE	14.5	14.8	12.5	17.0	12.7	16.9	16.3	16.6
ROIC	14.2	14.8	11.5	19.4	12.2	15.1	14.7	14.9
Net debt to equity	66.0	55.1	56.2	32.5	61.1	47.5	37.3	24.3
Effective tax rate	28.4	30.1	34.8	23.7	32.4	31.4	30.4	29.4
Accounts receivable (days)	38.7	39.5	38.9	35.8	33.8	33.4	29.8	30.3
Current ratio (x)	0.9	0.8	1.0	1.1	0.6	0.7	0.7	0.8
Net interest cover (x)	5.3	4.9	5.1	10.6	7.1	11.2	12.7	13.5
Net dividend payout	24.7	24.8	33.1	22.2	34.0	22.0	35.0	36.0
Free cash flow yield	n.a.	2.8	2.8	7.1	4.2	4.5	6.3	9.5

Source: FactSet, Daiwa forecasts

Company profile

ENN Energy is one of the leading city-gas distributors in China, owning 152 projects (as of December 2015) with a geographical focus on Guangdong, Shandong, Jiangsu and Hunan provinces.

Valuation

ENN: DCF valuation

12 mths to 31 Dec, All figures in CNYmillions	Forecast								
	2016	2017	2018	2019	2020	2021	2022	Terminal	
Valuation Date	3-Aug-16	31-Dec-16	31-Dec-17	31-Dec-18	31-Dec-19	31-Dec-20	31-Dec-21	31-Dec-22	31-Dec-22
Next Balance Date	31-Dec-16								
First Year Cash Flow Adjustment	0.41								
Free Cash Flow									
EBITDA	6,450	6,806	7,219	7,625	8,011	8,362	8,666		
Less: Other Non Cash	-	-	-	-	-	-	-		
Less: Cash Tax Payable on EBIT	(1,774)	(1,808)	(1,855)	(1,893)	(1,920)	(1,932)	(1,927)		
Plus: Decrease in Working Capital	(38)	102	686	498	389	304	224		
Less: Capital Expenditure	(3,048)	(2,878)	(2,708)	(2,538)	(2,371)	(2,222)	(2,066)		
Free Cash Flow	1,590	2,222	3,342	3,692	4,108	4,511	4,896	4,994	
Free Cash Flow for Valuation Purposes	1,590	2,222	3,342	3,692	4,108	4,511	4,896	4,994	
WACC	9.7%	9.7%	9.7%	9.7%	9.7%	9.7%	9.7%	9.7%	
NPV of Free Cash Flow	1,531	1,950	2,675	2,694	2,732	2,735	2,707	35,951	

Source: Daiwa forecasts

ENN: DCF calculation

Target gearing (debt/capital) (%)	35%
Market risk premium (%)	10.0%
Risk-free rate (%)	3.5%
Cost of debt (%)	3.1%
Cost of equity (%)	13.6%
WACC (%)	9.7%
Terminal Value	
Terminal Growth Rate	2.00%
Terminal WACC	9.68%
Estimated Terminal Free Cash Flow	4,994
NPV of Terminal Value (as at 30 Jun 2020)	65,025
NPV of Terminal Value (as at 03 Aug 2016)	35,951
DCF Valuation	
NPV of Forecasts (CNYm)	17,024
NPV of Terminal Value (CNYm)	35,951
Enterprise Value (CNYm)	52,975
Less: Net Debt (2016E)	-7,583
Equity Value (CNYm)	45,392
No. Shares (m)	1,083
Per Share Equity Value	HKD48.62

Source: Daiwa forecasts

ENN: DCF sensitivity analysis

Discount Rate	NPV of FCF (CNYm)	Enterprise Value (CNYm)	Equity Value (CNYm)	Equity Value Per Share (HKD)
7.2%	18,564	80,359	72,777	77.95
7.7%	18,240	72,938	65,355	70.00
8.2%	17,924	66,725	59,143	63.35
8.7%	17,616	61,449	53,866	57.70
9.2%	17,316	56,914	49,331	52.84
9.7%	17,024	52,975	45,392	48.62
10.2%	16,740	49,523	41,940	44.92
10.7%	16,462	46,472	38,890	41.66
11.2%	16,192	43,759	36,176	38.75
11.7%	15,928	41,330	33,747	36.15
12.2%	15,671	39,143	31,560	33.81

Source: Daiwa estimates and forecasts

China Gas (384 HK)

 Target price: **HKD14.75** (from HKD13.84)

 Share price (3 Aug): **HKD12.38** | Up/downside: **+19.1%**

 5 4 3 2 **1**

Buy
 (unchanged)

Fastest volume growth on back of coal-to-gas demand

- 15% retail gas sales volume growth for FY17E looks achievable
- Low sensitivity to margin/connection risks due to its diversified profile
- Raising target price to HKD14.75; reiterating Buy (1) call

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What's new: We expect China Gas's (CGHL) gas sales to recover in FY17E, thanks to strong coal-to-gas demand in its focus areas and robust commercial gas sales (FY17E: 18% YoY). Thus, we reiterate our Buy (1) rating on the stock, despite cutting our FY17-19E net profit forecasts to factor in what we see as rising gas-sales margin and connection risks.

What's the impact: FY17E guidance looks achievable. CGHL met its 10% gas sales volume growth for FY16, and has guided for resilient retail gas sales volume growth of 15% YoY for FY17E. We believe this target is achievable, given that its natural gas sales volume recovered to low-teens YoY growth for 5M16, and that we see high potential of CGHL being able to capture new customers on the back of coal-to-gas conversion, which we estimate would create an extra 64bcm of national gas demand p.a., as at the end of the 13th FYP period. Also, CGHL is the only gas distributor of those we cover to guide for growth in its residential connections (2.2m for FY17E, up from 2.1m for FY16). We think this target is feasible given its new acquisitions in June 2016 and the forthcoming asset injections by parent Beijing Enterprise Holdings (BEH, 392 HK, HKD44.75, Outperform [2]). Therefore, we forecast an EPS CAGR of 14% (FY16-19E), which is the highest among the gas names that we cover.

Gas sales margin and connection risks: emerging but manageable.

From our stress test, we estimate that CGHL's FY17E gross/net profit would decline by only 2.8/3.9% if the 10 other (risky) provinces were to also cut their gas distribution tariffs, which we believe is manageable. Also, the impact of a potential decrease in new residential connections would be limited, in our view, as this would likely be offset by CGHL's strong gas and LPG sales volume growth. Based on our estimates for FY18-19, a 10% incremental decrease in new connections would result in a negative impact of only 3.6-4.3% on CGHL's gross profit.

What we recommend: We reiterate our Buy (1) rating and raise our DCF-derived 12-month TP to HKD14.75 (from HKD13.84), after raising our FY17 EPS forecast (to factor in the delayed equity dilution due to our forecast of a further delay in BEH injection) and rolling over our valuation. We cut our FY18-19E EPS by 0.1-2.6%, on the back of the emerging risks that we see from distribution margin cuts and a slowdown in residential connections. We raise our revenue forecasts by 3-6% on the back of an increase in its wholesale gas sales. Other major risks: a slowdown in China's industrial production.

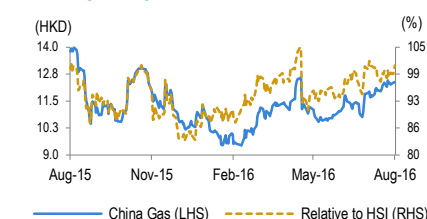
How we differ: Our FY17-19E EPS forecasts are 3-4% above consensus, as we believe the consensus has not incorporated CGHL's FY16 results.

Forecast revisions (%)

Year to 31 Mar	17E	18E	19E
Revenue change	3.3	4.1	5.7
Net profit change	(0.1)	(4.6)	(2.1)
Core EPS (FD) change	2.0	(2.6)	(0.1)

Source: Daiwa forecasts

Share price performance



12-month range	9.44-13.98
Market cap (USDbn)	8.04
3m avg daily turnover (USDm)	5.75
Shares outstanding (m)	5,039
Major shareholder	Beijing Enterprises Holdings (24.7%)

Financial summary (HKD)

Year to 31 Mar	17E	18E	19E
Revenue (m)	33,578	40,042	45,437
Operating profit (m)	6,156	7,198	8,111
Net profit (m)	4,701	5,562	6,280
Core EPS (fully-diluted)	0.910	1.037	1.171
EPS change (%)	21.6	13.9	12.9
Daiwa vs Cons. EPS (%)	3.1	3.8	3.6
PER (x)	13.6	11.9	10.6
Dividend yield (%)	2.0	2.4	2.9
DPS	0.250	0.301	0.357
PBR (x)	2.9	2.5	2.1
EV/EBITDA (x)	10.3	8.6	7.4
ROE (%)	24.1	24.0	23.0

Source: FactSet, Daiwa forecasts

5 4 3 2 **1**

How do we justify our view?

Buy
(unchanged)

Growth outlook

✓ ✓ ✓ ✓ ✓

Valuation

✓ ✓ ✓ ✓ ✓

Earnings revisions

✓ ✓ ✓ ✓ ✓

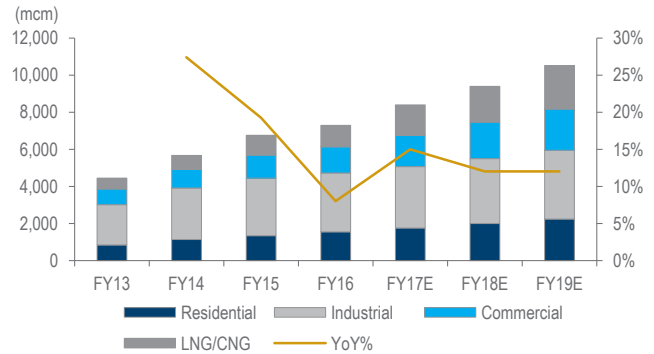
Growth outlook

✓ ✓ ✓ ✓ ✓

We forecast 15% YoY retail natural gas sales volume growth for CGHL for FY17E, in line with management's guidance. We continue to see great potential for CGHL to capture new customers on the back of nationwide coal-to-gas initiatives, amid its large exposure to northern China (40% of FY16 industrial customers were in the north).

We forecast a recurring net profit CAGR of 19% for FY16-19E (or 16% recurring EPS CAGR), driven mainly by its natural gas sales volume growth and LPG sales volume growth. We expect its LPG segment to be a good natural hedge against a potential gas sales margin squeeze, accounting for over 21-24% of the company's total gross profit for FY17-18E.

CGHL: retail natural gas sales volume



Source: Company, Daiwa forecasts

Valuation

✓ ✓ ✓ ✓ ✓

Although the shares have been derated since mid-2015 on the back of the oil price slump, we have been seeing a recovery in CGHL's valuation, on the rebound in the oil price. Meanwhile, the city-gate tariff cut in November 2015 is likely to continue to boost CGHL's gas sales volume growth in FY17E.

The stock is now trading at 13.1x 12-month rolling forward PER (13.6x FY17E PER), which is 0.4SD below its past-7-year mean. We think this is undemanding, given our EPS CAGR of 16% for FY16-19E, which is the highest among the gas distributors that we cover.

CGHL: 12-month forward PER



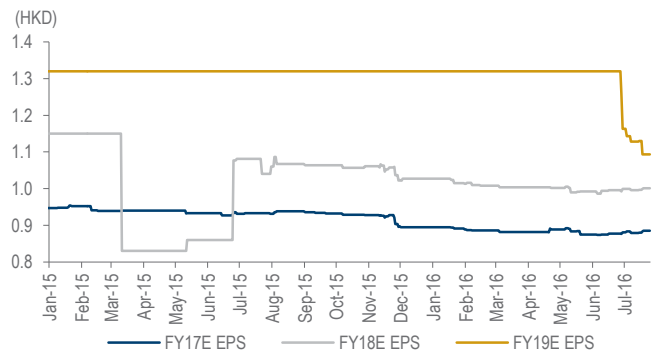
Source: Bloomberg, Daiwa forecasts

Earnings revisions

✓ ✓ ✓ ✓ ✓

The Bloomberg consensus has cut its FY17-18E EPS forecasts for CGHL by 1.1-2.5% since the start of 2016, mainly due to concerns in the market about the impact of a potential cut in its distribution margin. But we believe such a cut would have only a limited impact on CGHL (2.8/3.9% reduction in its 2017E gross/net profit, on our estimates, assuming all the 10 provinces cut their T&D tariff).

CGHL: Bloomberg consensus EPS forecast revisions



Source: Bloomberg

Financial summary

Key assumptions

Year to 31 Mar	2012	2013	2014	2015	2016	2017E	2018E	2019E
Natural gas sales volume (mn m3)	5,563	6,825	8,045	8,975	9,860	11,929	13,467	15,164
Gas ASP, incl tax (CNY/m3)	2.37	2.44	2.60	2.83	2.61	2.32	2.32	2.31
Gas purchase cost, incl tax (CNY/m3)	1.86	1.96	2.09	2.29	2.09	1.80	1.79	1.79
Residential gas connection ('000 households)	1,105	1,226	1,662	1,921	2,100	2,200	2,200	2,100
Gross profit contribution - connection fee (%)	51	49	46	48	47	42	38	33

Profit and loss (HKDm)

Year to 31 Mar	2012	2013	2014	2015	2016	2017E	2018E	2019E
Sales of piped gas	7,663	7,352	10,169	12,929	12,996	14,206	17,428	21,204
Gas connection income	2,804	2,709	3,658	4,659	4,794	5,047	5,121	4,990
Other Revenue	8,467	7,895	12,182	14,078	11,349	14,325	17,494	19,243
Total Revenue	18,934	17,956	26,008	31,666	29,139	33,578	40,042	45,437
Other income	516	588	485	727	(292)	752	945	1,120
COGS	(15,328)	(14,180)	(20,722)	(25,210)	(22,105)	(25,235)	(30,406)	(34,698)
SG&A	(1,672)	(1,788)	(2,071)	(2,586)	(2,649)	(2,938)	(3,384)	(3,749)
Other op. expenses	0	0	0	0	0	0	0	0
Operating profit	2,450	2,576	3,699	4,597	4,092	6,156	7,198	8,111
Net-interest inc./(exp.)	(916)	(691)	(615)	(554)	(758)	(758)	(670)	(661)
Assoc/forex/extraord./others	86	552	636	767	383	1,045	1,221	1,376
Pre-tax profit	1,620	2,437	3,721	4,810	3,718	6,443	7,749	8,826
Tax	(479)	(400)	(741)	(940)	(984)	(1,269)	(1,569)	(1,849)
Min. int./pref. div./others	(188)	(272)	(404)	(499)	(460)	(522)	(618)	(698)
Net profit (reported)	954	1,764	2,576	3,371	2,273	4,651	5,562	6,280
Net profit (adjusted)	821	1,671	2,569	3,320	3,716	4,701	5,562	6,280
EPS (reported)(HKD)	0.218	0.394	0.536	0.673	0.458	0.923	1.088	1.228
EPS (adjusted)(HKD)	0.187	0.373	0.534	0.663	0.749	0.933	1.088	1.228
EPS (adjusted fully-diluted)(HKD)	0.177	0.349	0.515	0.645	0.749	0.910	1.037	1.171
DPS (HKD)	0.037	0.079	0.121	0.162	0.195	0.250	0.301	0.357
EBIT	2,450	2,576	3,699	4,597	4,092	6,156	7,198	8,111
EBITDA	3,053	3,151	4,411	5,480	5,006	7,070	8,188	9,157

Cash flow (HKDm)

Year to 31 Mar	2012	2013	2014	2015	2016	2017E	2018E	2019E
Profit before tax	1,620	2,437	3,721	4,810	3,718	6,443	7,749	8,826
Depreciation and amortisation	603	575	711	883	914	914	990	1,046
Tax paid	(479)	(400)	(741)	(940)	(984)	(1,269)	(1,569)	(1,849)
Change in working capital	(1,459)	269	287	262	1,845	(810)	472	364
Other operational CF items	1,226	16	(594)	(363)	370	(286)	(551)	(715)
Cash flow from operations	1,512	2,896	3,383	4,653	5,862	4,991	7,091	7,672
Capex	(2,116)	(2,511)	(3,182)	(4,003)	(3,288)	(3,000)	(2,500)	(2,400)
Net (acquisitions)/disposals	1,347	(187)	(1,215)	(33)	(358)	0	0	0
Other investing CF items	(355)	122	(744)	(1,135)	(355)	0	0	0
Cash flow from investing	(1,124)	(2,576)	(5,141)	(5,170)	(4,001)	(3,000)	(2,500)	(2,400)
Change in debt	640	(33)	4,730	768	1,693	0	0	0
Net share issues/(repurchases)	0	193	0	(233)	(947)	0	0	0
Dividends paid	(96)	(278)	(411)	(606)	(942)	(966)	(1,293)	(1,613)
Other financing CF items	(1,258)	(858)	(93)	(638)	(1,131)	(758)	(670)	(661)
Cash flow from financing	(715)	(976)	4,226	(708)	(1,327)	(1,724)	(1,963)	(2,274)
Forex effect/others	0	0	0	0	0	0	0	0
Change in cash	(327)	(655)	2,468	(1,226)	533	267	2,629	2,998
Free cash flow	(604)	386	201	650	2,574	2,057	4,703	5,422

Source: FactSet, Daiwa forecasts

Financial summary continued ...

Balance sheet (HKDm)

As at 31 Mar	2012	2013	2014	2015	2016	2017E	2018E	2019E
Cash & short-term investment	5,180	4,499	6,705	5,292	5,772	6,039	8,668	11,666
Inventory	1,514	952	1,207	1,199	1,213	1,395	1,576	1,750
Accounts receivable	2,720	3,347	4,737	5,328	5,094	6,005	7,161	8,126
Other current assets	355	555	1,284	1,149	1,567	1,567	1,567	1,567
Total current assets	9,769	9,354	13,932	12,968	13,647	15,006	18,972	23,109
Fixed assets	11,432	13,896	17,835	21,116	22,850	25,017	26,606	28,037
Goodwill & intangibles	1,599	1,752	4,322	5,570	5,540	5,459	5,380	5,303
Other non-current assets	6,820	7,493	9,176	10,971	11,497	11,941	12,461	13,047
Total assets	29,620	32,495	45,265	50,624	53,533	57,423	63,419	69,495
Short-term debt	3,549	3,640	2,783	2,581	10,324	10,324	10,324	10,324
Accounts payable	3,813	4,148	6,079	6,924	8,549	8,832	10,642	12,144
Other current liabilities	5,382	5,229	3,422	2,132	929	929	305	305
Total current liabilities	12,744	13,017	12,284	11,637	19,803	20,086	21,271	22,773
Long-term debt	5,789	6,356	14,192	16,817	12,010	12,010	12,010	12,010
Other non-current liabilities	377	379	631	735	756	483	726	238
Total liabilities	18,910	19,752	27,108	29,189	32,569	32,578	34,007	35,021
Share capital	44	46	50	50	49	49	49	49
Reserves/R.E./others	9,698	11,439	15,734	18,346	17,803	21,162	25,111	29,476
Shareholders' equity	9,742	11,485	15,783	18,396	17,853	21,211	25,160	29,525
Minority interests	968	1,258	2,374	3,039	3,112	3,634	4,252	4,950
Total equity & liabilities	29,620	32,495	45,265	50,624	53,533	57,423	63,419	69,495
EV	62,285	63,298	68,226	70,974	73,156	72,967	70,437	67,550
Net debt/(cash)	4,158	5,496	10,271	14,106	16,562	16,295	13,666	10,668
BVPS (HKD)	2.223	2.563	3.284	3.672	3.596	4.209	4.920	5.774

Key ratios (%)

Year to 31 Mar	2012	2013	2014	2015	2016	2017E	2018E	2019E
Sales (YoY)	19.4	(5.2)	44.8	21.8	(8.0)	15.2	19.3	13.5
EBITDA (YoY)	29.1	3.2	40.0	24.2	(8.7)	41.2	15.8	11.8
Operating profit (YoY)	42.8	5.1	43.6	24.3	(11.0)	50.4	16.9	12.7
Net profit (YoY)	54.2	103.4	53.7	29.3	11.9	26.5	18.3	12.9
Core EPS (fully-diluted) (YoY)	42.4	97.2	47.5	25.3	16.1	21.6	13.9	12.9
Gross-profit margin	19.0	21.0	20.3	20.4	24.1	24.8	24.1	23.6
EBITDA margin	16.1	17.5	17.0	17.3	17.2	21.1	20.4	20.2
Operating-profit margin	12.9	14.3	14.2	14.5	14.0	18.3	18.0	17.9
Net profit margin	4.3	9.3	9.9	10.5	12.8	14.0	13.9	13.8
ROAE	8.9	15.7	18.8	19.4	20.5	24.1	24.0	23.0
ROAA	2.7	5.4	6.6	6.9	7.1	8.5	9.2	9.4
ROCE	11.6	12.0	12.8	12.1	9.7	13.6	14.6	14.9
ROIC	11.4	13.0	12.7	11.6	8.2	12.6	13.6	14.5
Net debt to equity	42.7	47.9	65.1	76.7	92.8	76.8	54.3	36.1
Effective tax rate	29.5	16.4	19.9	19.5	26.5	19.7	20.2	20.9
Accounts receivable (days)	49.2	61.7	56.7	58.0	65.3	60.3	60.0	61.4
Current ratio (x)	0.8	0.7	1.1	1.1	0.7	0.7	0.9	1.0
Net interest cover (x)	2.7	3.7	6.0	8.3	5.4	8.1	10.7	12.3
Net dividend payout	17.0	20.1	22.5	24.0	42.5	27.1	27.6	29.1
Free cash flow yield	n.a.	0.6	0.3	1.0	4.1	3.3	7.5	8.7

Source: FactSet, Daiwa forecasts

Company profile

China Gas is one of the leading city-gas distributors in China, owning 305 projects (as of March 2016) with geographical focus on northern provinces. It also owns LPG wholesales and distribution business.

Valuation

CGHL: DCF valuation

12 mths to 31 Mar, All figures in HK\$millions	Forecast									
	FY2017	FY2018	FY2019	FY2020	FY2021	FY2022	FY2023	FY2024	Terminal	
Valuation Date	3-Aug-16	1-Dec-16	30-Sep-17	30-Sep-18	30-Sep-19	30-Sep-20	30-Sep-21	30-Sep-22	30-Sep-23	30-Sep-23
Next Balance Date	31-Mar-17									
First Year Cash Flow Adjustment	0.66									
Free Cash Flow										
EBITDA	7,070	8,188	9,157	9,934	10,554	11,115	11,668	12,167		
Less: Other Non Cash	-	-	-	-	-	-	-	-		
Less: Cash Tax Payable on EBIT	(1,203)	(1,457)	(1,699)	(1,913)	(2,103)	(2,288)	(2,481)	(2,668)		
Plus: Decrease in Working Capital	(810)	472	364	366	403	310	334	359		
Less: Capital Expenditure	(3,000)	(2,500)	(2,400)	(2,400)	(2,300)	(2,100)	(2,100)	(1,200)		
Free Cash Flow	2,057	4,703	5,422	5,987	6,554	7,037	7,422	8,659	8,832	
Free Cash Flow for Valuation Purposes	2,057	4,703	5,422	5,987	6,554	7,037	7,422	8,659	8,832	
WACC	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%
NPV of Free Cash Flow	1,996	4,228	4,447	4,479	4,472	4,380	4,214	4,485	60,019	

Source: Daiwa forecasts

CGHL: DCF calculation

Target gearing (debt/capital) (%)	35%
Market risk premium (%)	10.0%
Beta	1.00
Risk-free rate (%)	3.5%
Cost of debt (%)	3.2%
Cost of equity (%)	13.5%
WACC (%)	9.6%
Terminal Value	
Terminal Growth Rate	2.00%
Terminal WACC	9.62%
Estimated Terminal Free Cash Flow	8,832
NPV of Terminal Value (as at 30 Sep 2023)	115,879
NPV of Terminal Value (as at 03 Aug 2016)	60,019
DCF Valuation	
NPV of Forecasts (HKDm)	32,700
NPV of Terminal Value (HKDm)	60,019
Enterprise Value (HKDm)	92,718
Less: Net Debt (2016E)	-16,570
Equity Value (HKDm)	76,148
No. Shares (m)	5,164
Per Share Equity Value	HK\$14.75

Source: Daiwa forecasts

CGHL: DCF sensitivity analysis


Discount Rate	NPV of FCF	Enterprise Value	Equity Value	Equity Value Per Share (HKD)
7.1%	35,849	141,211	124,640	24.14
7.6%	35,183	128,025	111,454	21.58
8.1%	34,535	117,010	100,440	19.45
8.6%	33,906	107,675	91,105	17.64
9.1%	33,294	99,665	83,094	16.09
9.6%	32,700	92,718	76,148	14.75
10.1%	32,121	86,639	70,068	13.57
10.6%	31,558	81,275	64,704	12.53
11.1%	31,011	76,509	59,938	11.61
11.6%	30,478	72,247	55,676	10.78
12.1%	29,959	68,414	51,843	10.04

Source: Daiwa estimates and forecasts

China Resources Gas (1193 HK)

 Target price: **HKD27.00** (from HKD27.00)

 Share price (3 Aug): **HKD23.10** | Up/downside: **+16.8%**

 5 4 3 2 **1**

Buy
 (unchanged)

1H16 likely on track; strong FCF despite M&A spending

- Likely +15% YoY net profit growth in 1H16 on high gas volume growth
- Previously acquired projects now entering harvesting stage
- Reaffirming Buy (1) rating and TP of HKD27, 4% FCF yield in 2017E

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What's new: CRG has confirmed a strong gas sales recovery with mid-teens growth in 5M16 due to the city-gate tariff cut in November 2015 and a colder-than-usual winter. After the end of winter in March, CRG's gas sales volume growth remained at the low-teens levels in April and May. However, CRG is confident to achieve 15% YoY net profit growth in 2016 on the Qingdao JV contribution from 4Q16. We expect CRG to achieve +15% YoY net-profit growth of HKD1.8bn in 1H16.

What's the impact: Gas sales volume growth picked up in 1H16, steady residential connection income growth. CRG's 5M16 gas sales volume growth recovered to 15% YoY, from 9% YoY in 2015. As the company completed another half of the CNY0.7/m³ city-gate tariff cut in November 2015, its unit dollar margin was squeezed but was offset by more projects implementing residential tier-pricing; hence we expect its 1H16 unit dollar margin to at least remain at the 2015 level of CNY0.71/m³. CRG has recorded robust residential connection growth due to its stronger-than-peers exposure to large cities, and expects to connect to 1.1m residential households in 1H16 (1H15: 1.025m), in line with our HK/China property analyst Jonas Kan's view on the improving China property market (see [China Property Sector: 1H16 review](#), 13 July 2016).

Recently acquired projects turning profitable. Management expects 20% of its 220 city-gas projects to make annual losses of c.HKD200m in 2016 (2015: 25% of its projects reported a total loss of c.HKD250m). We expect these projects to break even by 2018, with increased penetration of new gas sources (such as W-E Pipeline III) to under-developed provinces. As per management, CRG is negotiating a higher stake of 60% (from 49%) on Dalian, which could delay the JV completion from 2H16 to 2017. Thus, we cut CRG's 2016E capex from HKD6.2bn to HKD5bn.

What we recommend: We reiterate our Buy (1) rating and maintain our DCF-based 12-month TP at HKD27. The stock is currently trading at a 15.1x 2016E PER, or 0.2SD below its past-7-year average rolling 1-year-forward PER of 15.8x. We like CRG in view of its good 2017E 4% FCF yield (China gas peers: 3-8%; other China utilities: mostly negative), and hence more room to raise the DPS payout ratio from 23% in 2015, despite an aim to spend HKD1.0-1.5bn on acquiring new city-gas projects. Key risk: a severe retail gas tariff cut which could lower CRG's 2017 gross profit by c.6% if 10 more provinces implement the Zhejiang's tariff cut due to slow industrial GDP and high T&D tariff, according to our stress test analysis.

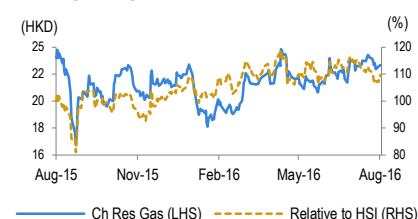
How we differ: Unlike the street, we focus on gas distributors' FCF amid a potential margin squeeze if more provinces follow Zhejiang's gas tariff cut.

Forecast revisions (%)

Year to 31 Dec	16E	17E	18E
Revenue change	-	-	-
Net profit change	-	-	-
Core EPS (FD) change	-	-	-

Source: Daiwa forecasts

Share price performance



12-month range	16.80-24.35
Market cap (USDbn)	6.62
3m avg daily turnover (USDm)	5.27
Shares outstanding (m)	2,224
Major shareholder	China Resources Group (64.0%)

Financial summary (HKD)

Year to 31 Dec	16E	17E	18E
Revenue (m)	33,403	36,769	40,458
Operating profit (m)	5,613	6,055	6,587
Net profit (m)	3,333	3,740	4,167
Core EPS (fully-diluted)	1.532	1.719	1.916
EPS change (%)	15.0	12.2	11.4
Daiwa vs Cons. EPS (%)	(0.7)	0.4	(0.3)
PER (x)	15.1	13.4	12.1
Dividend yield (%)	1.6	1.9	2.2
DPS	0.368	0.430	0.498
PBR (x)	2.6	2.3	2.0
EV/EBITDA (x)	8.4	7.8	6.9
ROE (%)	18.2	17.9	17.4

Source: FactSet, Daiwa forecasts

5 4 3 2 **1**

How do we justify our view?

Buy
(unchanged)

Growth outlook



Valuation



Earnings revisions



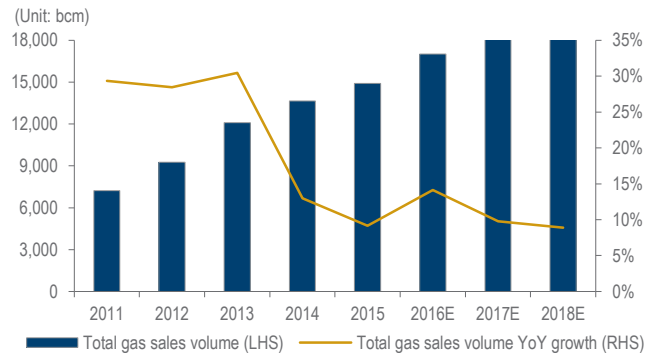
Growth outlook



Our total natural gas sales volume growth forecasts for CRG remain unchanged at 14% YoY for 2016 and 10% YoY for 2017. We believe the ongoing pass-through of the city-gate tariff cut in November 2015 will continue to support the recovery of the company's C&I gas demand. Moreover, an improvement in the gas sales and operations at new projects, such as the Tianjin and Qingdao projects, would contribute to CRG's total gas sales volume growth.

CRG also plans to import more spot LNG (6% of the total in 5M16) to lower its gas purchase cost and expand the unit dollar margin over CNY0.71/m³ in 2016.

CRG: total gas sales volume



Source: Company, Daiwa forecasts

Valuation



Based on our revised recurring EPS forecast, CRG is trading at a 15.1x 2016E PER, or 0.2SD below its past-7-year average 12-month-forward PER of 15.8x. We consider this multiple to be undemanding, based on our expectation of improvements in CRG's 2016 gas sales, unit gas sales margin, resilient residential connections, and profitability for recently acquired projects.

CRG: 1-year-forward PER



Source: Bloomberg, Company, Daiwa forecasts

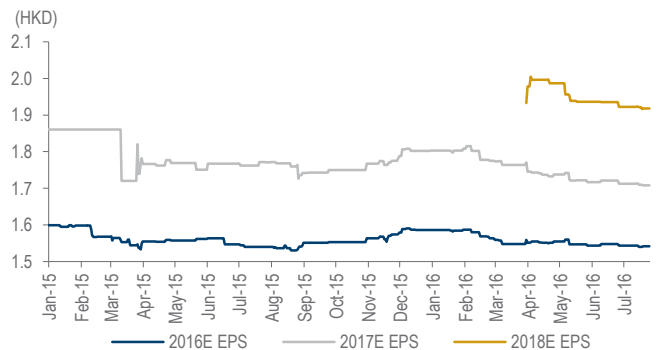
Earnings revisions



The Bloomberg-consensus 2016-17 EPS forecasts for CRG have dropped by 3-5% YTD, likely as the street has factored in a lower unit dollar margin given the Zhejiang's decision to cut the T&D tariff by 20% in April and Guangdong's distribution margin cut to CNY0.03/cm.

Regarding another investor concern of whether CRG will pay an up-front fee to retire part of its USD/HKD-loan given significant 95% exposure, management has stated that the company would replace part of its HKD bank loan with CNY loans gradually, to ensure no one-off significant increase in its finance cost and to maintain it at around HKD500-550m over the next two years (2015: HKD546m).

CRG: consensus EPS forecast revisions



Source: Bloomberg

Financial summary

Key assumptions

Year to 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Natural gas sales volume (mn m3)	7,215	9,268	12,091	13,660	14,913	17,019	18,681	20,340
Gas ASP, incl tax (HKD/m3)	3.00	2.99	3.47	3.67	3.63	3.02	3.02	3.02
Gas purchase cost, incl tax (HKD/m3)	2.35	2.30	2.57	2.82	2.75	2.10	2.10	2.10
Residential gas connection ('000 households)	1,005	1,129	1,403	2,329	2,872	2,975	3,005	3,137
Gross profit contribution - connection fee (%)	42	42	42	43	42	36	34	34

Profit and loss (HKDm)

Year to 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Sales of gas	11,254	10,725	17,164	22,481	24,227	27,106	30,276	33,541
Gas connection	2,954	2,896	5,124	6,236	6,869	6,297	6,493	6,917
Other Revenue	0	0	0	0	0	(0)	0	0
Total Revenue	14,208	13,622	22,288	28,717	31,096	33,403	36,769	40,458
Other income	459	280	518	877	892	901	893	835
COGS	(10,043)	(9,369)	(14,666)	(19,997)	(21,246)	(22,675)	(25,150)	(27,784)
SG&A	(2,520)	(2,626)	(4,604)	(5,083)	(5,631)	(6,016)	(6,457)	(6,922)
Other op.expenses	0	0	0	(74)	(158)	0	0	0
Operating profit	2,103	1,907	3,536	4,440	4,952	5,613	6,055	6,587
Net-interest inc./(exp.)	(88)	(315)	(524)	(537)	(541)	(526)	(511)	(496)
Assoc/forex/extraord./others	119	977	798	861	961	1,063	1,179	1,308
Pre-tax profit	2,135	2,569	3,811	4,764	5,372	6,150	6,723	7,399
Tax	(563)	(540)	(987)	(1,408)	(1,508)	(1,709)	(1,795)	(1,939)
Min. int./pref. div./others	(396)	(384)	(663)	(869)	(965)	(1,108)	(1,189)	(1,293)
Net profit (reported)	1,176	1,646	2,161	2,486	2,898	3,333	3,740	4,167
Net profit (adjusted)	1,176	1,646	2,161	2,486	2,898	3,333	3,740	4,167
EPS (reported)(HKD)	0.612	0.816	0.996	1.144	1.333	1.532	1.719	1.916
EPS (adjusted)(HKD)	0.612	0.816	0.996	1.144	1.333	1.532	1.719	1.916
EPS (adjusted fully-diluted)(HKD)	0.612	0.816	0.996	1.144	1.333	1.532	1.719	1.916
DPS (HKD)	0.091	0.119	0.160	0.250	0.300	0.368	0.430	0.498
EBIT	2,103	1,907	3,536	4,440	4,952	5,613	6,055	6,587
EBITDA	2,665	2,407	4,096	5,381	6,003	6,924	7,591	8,322

Cash flow (HKDm)

Year to 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Profit before tax	2,135	2,569	3,811	4,764	5,372	6,150	6,723	7,399
Depreciation and amortisation	562	500	560	947	1,112	1,311	1,536	1,734
Tax paid	(563)	(540)	(987)	(1,408)	(1,508)	(1,709)	(1,795)	(1,939)
Change in working capital	(1,040)	1,868	4,613	2,443	365	2,939	1,536	1,644
Other operational CF items	918	(2,097)	(2,326)	(1,282)	350	(1,063)	(1,179)	(1,308)
Cash flow from operations	2,012	2,300	5,671	5,464	5,690	7,628	6,820	7,531
Capex	(1,954)	(2,589)	(3,764)	(3,287)	(2,257)	(4,487)	(4,342)	(4,197)
Net (acquisitions)/disposals	(1,097)	(1,600)	659	(652)	(1,816)	(1,000)	(1,000)	0
Other investing CF items	232	(567)	(4,259)	(57)	0	0	0	0
Cash flow from investing	(2,819)	(4,756)	(7,365)	(3,996)	(4,073)	(5,487)	(5,342)	(4,197)
Change in debt	736	5,205	686	760	(30)	0	0	0
Net share issues/(repurchases)	0	2,699	0	0	0	0	0	0
Dividends paid	(187)	(425)	(744)	(1,088)	(543)	(652)	(800)	(934)
Other financing CF items	(303)	346	(329)	(292)	0	0	0	0
Cash flow from financing	245	7,824	(386)	(620)	(573)	(652)	(800)	(934)
Forex effect/others	0	0	0	0	0	0	0	0
Change in cash	(562)	5,367	(2,079)	847	1,043	1,489	679	2,400
Free cash flow	58	(289)	1,907	2,176	3,433	2,476	1,844	3,715

Source: FactSet, Daiwa forecasts

Financial summary continued ...

Balance sheet (HKDm)

As at 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Cash & short-term investment	5,189	10,608	9,803	9,773	10,802	12,290	12,969	15,369
Inventory	301	535	792	640	571	591	597	623
Accounts receivable	2,482	3,174	6,666	6,992	7,369	6,259	6,991	7,745
Other current assets	268	395	958	3,053	1,609	1,362	1,522	1,686
Total current assets	8,240	14,712	18,219	20,458	20,351	20,503	22,079	25,423
Fixed assets	7,510	13,010	18,528	21,492	22,717	28,588	32,367	34,805
Goodwill & intangibles	453	691	1,168	2,079	1,975	1,529	1,557	1,582
Other non-current assets	8,641	9,270	12,567	13,722	14,854	15,083	16,222	17,487
Total assets	24,844	37,683	50,482	57,752	59,896	65,703	72,225	79,297
Short-term debt	1,461	175	859	3,297	4,220	4,220	4,220	4,220
Accounts payable	3,389	5,092	11,470	12,840	12,441	13,801	15,308	16,911
Other current liabilities	2,819	5,499	5,627	7,642	8,763	9,080	10,007	10,992
Total current liabilities	7,669	10,766	17,956	23,779	25,423	27,101	29,534	32,123
Long-term debt	4,883	11,518	13,016	11,633	10,679	10,679	10,679	10,679
Other non-current liabilities	488	713	895	1,213	1,306	1,794	1,889	1,995
Total liabilities	13,040	22,997	31,866	36,624	37,409	39,575	42,103	44,798
Share capital	199	222	222	222	222	222	222	222
Reserves/R.E./others	9,119	11,476	13,961	15,841	16,787	19,320	22,125	25,210
Shareholders' equity	9,319	11,699	14,183	16,063	17,009	19,543	22,348	25,432
Minority interests	2,485	2,987	4,433	5,065	5,478	6,585	7,774	9,067
Total equity & liabilities	24,844	37,683	50,482	57,752	59,896	65,703	72,225	79,297
EV	53,418	53,689	57,922	59,605	58,997	58,478	58,835	57,559
Net debt/(cash)	1,155	1,085	4,071	5,156	4,098	2,609	1,930	(470)
BVPS (HKD)	4.677	5.260	6.377	7.223	7.648	8.787	10.048	11.435

Key ratios (%)

Year to 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Sales (YoY)	52.3	(4.1)	63.6	28.8	8.3	7.4	10.1	10.0
EBITDA (YoY)	43.0	(9.7)	70.2	31.4	11.6	15.3	9.6	9.6
Operating profit (YoY)	46.7	(9.3)	85.4	25.6	11.5	13.4	7.9	8.8
Net profit (YoY)	49.4	40.0	31.3	15.1	16.6	15.0	12.2	11.4
Core EPS (fully-diluted) (YoY)	12.3	33.4	22.0	14.9	16.4	15.0	12.2	11.4
Gross-profit margin	29.3	31.2	34.2	30.4	31.7	32.1	31.6	31.3
EBITDA margin	18.8	17.7	18.4	18.7	19.3	20.7	20.6	20.6
Operating-profit margin	14.8	14.0	15.9	15.5	15.9	16.8	16.5	16.3
Net profit margin	8.3	12.1	9.7	8.7	9.3	10.0	10.2	10.3
ROAE	15.5	15.7	16.7	16.4	17.5	18.2	17.9	17.4
ROAA	5.2	5.3	4.9	4.6	4.9	5.3	5.4	5.5
ROCE	13.2	8.6	12.0	13.0	13.5	14.3	14.1	14.0
ROIC	15.6	10.5	13.6	12.8	13.5	14.7	14.6	14.7
Net debt to equity	12.4	9.3	28.7	32.1	24.1	13.4	8.6	n.a.
Effective tax rate	26.4	21.0	25.9	29.6	28.1	27.8	26.7	26.2
Accounts receivable (days)	54.6	75.8	80.6	86.8	84.3	74.5	65.8	66.5
Current ratio (x)	1.1	1.4	1.0	0.9	0.8	0.8	0.7	0.8
Net interest cover (x)	24.0	6.1	6.8	8.3	9.2	10.7	11.9	13.3
Net dividend payout	14.8	14.6	16.1	21.8	22.5	24.0	25.0	26.0
Free cash flow yield	0.1	n.a.	3.7	4.2	6.7	4.8	3.6	7.2

Source: FactSet, Daiwa forecasts

Company profile

China Resources Gas is one of the leading city-gas distributors in China, owning 220 projects (as of December 2015) with a geographical focus on economically developed and densely populated cities, serving industrial, commercial and residential customers, as well as operating vehicle gas refueling stations.

Valuation

CRG: DCF valuation

12 mths to 31 Dec, All figures in HKD millions		Forecast							
		2016E	2017E	2018E	2019E	2020E	2021E	2022E	Terminal
Valuation Date	3-Aug-16	17-Oct-16	31-Dec-17	31-Dec-18	31-Dec-19	31-Dec-20	31-Dec-21	31-Dec-22	31-Dec-22
Next Balance Date	31-Dec-16								
First Year Cash Flow Adjustment	0.41								
Free Cash Flow									
EBITDA		6,924	7,591	8,322	8,925	9,888	11,122	6,550	
Less: Other Non Cash		(45)	(9)	14	72	73	37	1,158	
Less: Cash Tax Payable on EBIT		(1,856)	(1,932)	(2,068)	(2,177)	(2,375)	(2,636)	(1,486)	
Plus: Decrease in Working Capital		2,939	1,536	1,644	1,562	1,727	1,793	1,843	
Less: Capital Expenditure		(5,487)	(5,342)	(4,197)	(4,052)	(3,907)	(3,762)	(3,623)	
Free Cash Flow		2,476	1,844	3,715	4,330	5,405	6,553	4,442	4,531
Free Cash Flow for Valuation Purposes		2,476	1,844	3,715	4,330	5,405	6,553	4,442	4,531
WACC	8.6%	8.6%	8.6%	8.6%	8.6%	8.6%	8.6%	8.6%	8.6%
NPV of Free Cash Flow		2,434	1,641	3,044	3,268	3,755	4,191	2,616	40,388

Source: Daiwa forecasts

CRG: DCF calculation

Target gearing (debt/capital) (%)	35.0%
Market risk premium (%)	10.0%
Risk-free rate (%)	3.5%
Beta	0.84
Cost of debt (%)	3.2%
Cost of equity (%)	11.9%
WACC (%)	8.6%
Terminal Value	
Terminal Growth Rate	2.00%
Terminal WACC	8.61%
Estimated Terminal Free Cash Flow	4,531
NPV of Terminal Value (as at 31 Dec 2022)	68,585
NPV of Terminal Value (as at 03 Aug 2016)	40,388
DCF Valuation	
NPV of Forecasts (HKDm)	20,949
NPV of Terminal Value (HKDm)	40,388
Enterprise Value (HKDm)	61,337
Less: Net Debt (2016E)	-2,609
Equity Value (HKDm)	58,728
No. Shares (m)	2,175
Per Share Equity Value	HK\$27.0

Source: Daiwa forecasts

CRG: DCF sensitivity analysis

Discount Rate	NPV of FCF	Enterprise Value	Equity Value	Equity Value Per Share (HKD)
6.1%	22,852	98,292	95,684	44.0
6.6%	22,451	87,706	85,097	39.1
7.1%	22,060	79,186	76,577	35.2
7.6%	21,680	72,180	69,571	32.0
8.1%	21,309	66,317	63,708	29.3
8.6%	20,949	61,337	58,728	27.0
9.1%	20,597	57,054	54,445	25.0
9.6%	20,255	53,331	50,722	23.3
10.1%	19,921	50,064	47,455	21.8
10.6%	19,596	47,175	44,566	20.5
11.1%	19,279	44,600	41,991	19.3

Source: Daiwa estimates and forecasts

Towngas China (1083 HK)

 Target price: **HKD4.90** (from HKD5.00)

 Share price (3 Aug): **HKD4.80** | Up/downside: **+2.0%**

 5 4 **3** 2 1


Hold
 (from Outperform)

Diminished near-term growth

- Weak 5% YoY 5M16 gas sales growth amid flat industrial gas sales
- Sensitive to residential connection slowdown in the medium term
- Downgrade to Hold (3); expect support on continued parent buybacks

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What's new: Our recent update with management suggested TCCL might miss its 10% YoY gas sales volume growth target in 2016, given it only posted 5% YoY gas sales volume growth in 5M16 due to flat YoY industrial gas sales. We maintain our view that TCCL is vulnerable to a slowdown in both gas sales and new connections, but the share price could be supported by continued buybacks by parent HKCG (3 HK, not rated).

What's the impact: A recovery only likely after 2018. TCCL saw weak industrial gas sales in 5M16 as its greenfield projects still needed time to ramp up, and gas supply in the northeast regions (its exposure: 31%) was still tight. We believe TCCL's future gas sales volume growth will depend on the organic growth of new industrial park projects and industrial demand from coal-to-gas users, which is only likely to see a significant pick-up after the commencement of the Russia pipeline in 2018E. We thus trim our 2016-18 EPS forecasts by 6-8% after lowering our near-term gas sales volume CAGR forecast (from 13% for 2015-18E to 8%), while remaining positive on organic gas sales growth beyond 2018E given the higher supply availability (9% CAGR for 2018-20E).

Large impact from connection slowdown. TCCL guides for a flat new connection number (0.39m) in 2016, and we see the risk of a decline in 2016-18, given TCCL's slowdown in project acquisitions, and the slowing property market. Based on our estimates, 58% of TCCL's 2016 gross profit would come from connection income (vs. 40% peer average), which would see it being more affected by a potential decline in new connections (9.8%/9.2% gross profit impact on a 10% incremental new-connection decline in 2016/18E).

Share price supported by parent buybacks. Since our last report on TCCL ([Would now be a good time to privatise?](#)), HKCG has repurchased over 1% of TCCL's outstanding shares, increasing its stake from 62.5% to 63.7%. We expect the buyback price range of HKD4.1-4.4 to serve as support for TCCL's share price, despite the stagnant growth outlook.

What we recommend: We downgrade TCCL from Outperform (2) to Hold (3) and cut our 12-month TP from HKD5.0 to HKD4.9, as we now see a slower recovery in industrial gas sales for its greenfield projects, which should affect gas sales until a cheaper Russian gas supply emerges in 2018; hence the terminal value of our DCF is broadly unchanged. Despite the near-term overhang, the share price should be supported by a low valuation (10.7x 2016E PER, vs. 13.2x peer average) and continued buybacks by HKCG. Key risks: higher/lower-than-expected industrial gas sales volume growth.

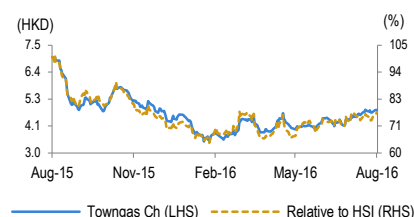
How we differ: Our 2016-18 EPS forecasts are 4-7% below consensus, as we have taken account of the weak gas sales growth in 5M16.

Forecast revisions (%)

Year to 31 Dec	16E	17E	18E
Revenue change	(4.9)	(9.0)	(13.5)
Net profit change	(6.4)	(7.7)	(8.0)
Core EPS (FD) change	(6.4)	(7.7)	(8.0)

Source: Daiwa forecasts

Share price performance



12-month range	3.48-7.01
Market cap (USDbn)	1.64
3m avg daily turnover (USDm)	1.75
Shares outstanding (m)	2,665
Major shareholder	The Hong Kong and China Gas (63.7%)

Financial summary (HKD)

Year to 31 Dec	16E	17E	18E
Revenue (m)	7,148	7,592	8,103
Operating profit (m)	1,002	1,252	1,317
Net profit (m)	1,198	1,238	1,299
Core EPS (fully-diluted)	0.449	0.465	0.487
EPS change (%)	(0.9)	3.4	4.9
Daiwa vs Cons. EPS (%)	(5.6)	(6.7)	(4.4)
PER (x)	10.7	10.3	9.8
Dividend yield (%)	2.2	2.3	2.5
DPS	0.104	0.110	0.119
PBR (x)	0.9	0.8	0.8
EV/EBITDA (x)	9.9	8.1	7.3
ROE (%)	8.7	8.4	8.3

Source: FactSet, Daiwa forecasts

5 4 **3** 2 1

How do we justify our view?

Hold
(from Outperform)

Growth outlook

✓ ✓ ✓ ✓ ✓

Valuation

✓ ✓ ✓ ✓ ✓

Earnings revisions

✓ ✓ ✓ ✓ ✓

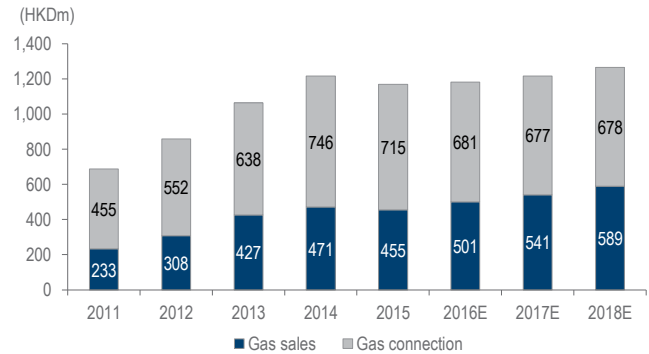
Growth outlook

✓ ✓ ✓ ✓ ✓

We look for 6% YoY gas sales volume growth in 2016, leading to a 10% YoY increase in TCCL's gas sales segment profit, versus a 3% decline in 2015. However, its gas connection profit should continue to shrink amid CNY depreciation and an expected increase in connection costs due to the growing proportion of old buildings in the connection mix.

In the medium term, we forecast a 3% 2015-18 EPS CAGR for TCCL. We estimate its earnings are sensitive to the number of new connections, whereby a 10% incremental decrease would lead to 9.2% reduction in total 2018 segment profit.

TCCL: total segment profit



Source: Company, Daiwa forecasts

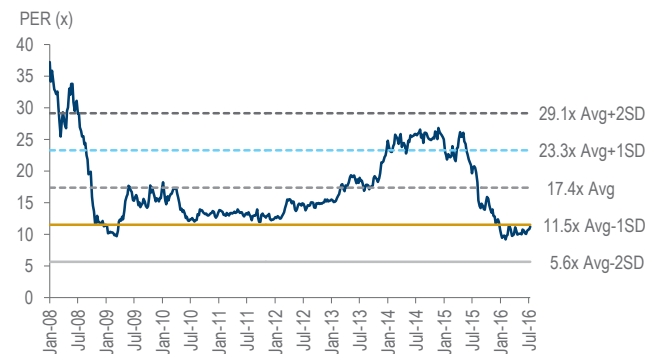
Valuation

✓ ✓ ✓ ✓ ✓

TCCL is now trading at a 10.7x 2016E PER, which is 1SD below its past-8-year average. The stock has also been trading at a 20%+ discount to its peer average in terms of 12M trailing PER since September 2015, given the weak 2% 2015-18E EPS CAGR, versus the 13% peer average.

That said, we believe the stock's valuation will find support at an 8x 12M trailing PER on buybacks by HKCG, as well as a stable dividend yield (2016E dividend yield: 2.2%) amid a gradually increasing payout (23-24% in 2016-18E, up from 22% in 2015, recurring basis) and FCF.

TCCL: 12M trailing PER



Source: Bloomberg, Daiwa forecasts

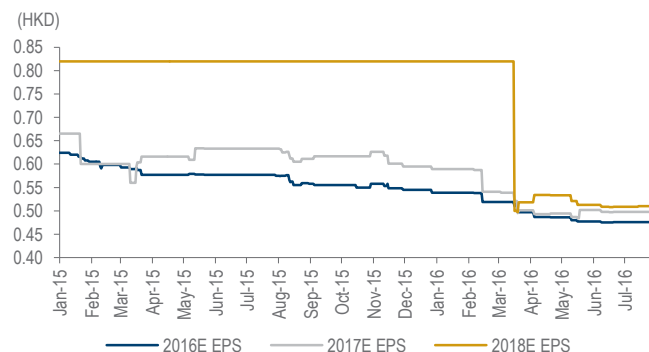
Earnings revisions

✓ ✓ ✓ ✓ ✓

The Bloomberg-consensus 2016-17 EPS forecasts for TCCL have been revised down by 24-25% since 2015 on slow growth in the gas sales volume and weak industrial gas demand at its industrial park projects.

Our 2016-18 EPS forecasts are 4-7% below consensus, as we have incorporated the weak 5% YoY gas sales volume growth in 5M16, and are more conservative on the profitability of its new greenfield industrial park projects.

TCCL: EPS Bloomberg consensus



Source: Bloomberg

Financial summary

Key assumptions

Year to 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Total gas sales volume (mn m3)	4,670	5,320	5,945	6,511	6,562	6,700	6,979	7,347
Subsidiary gas sales volume (mn m3)	1,200	1,310	1,570	1,726	1,719	1,822	1,968	2,145
Gas ASP, incl tax (HKD/m3)	2.74	3.03	3.35	3.60	3.50	3.03	3.02	3.01
Gas purchase cost, incl tax (HKD/m3)	2.55	2.80	3.08	3.32	3.23	2.76	2.75	2.74
Segment profit contribution - connection fee (%)	66	64	60	61	61	58	56	53

Profit and loss (HKDm)

Year to 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Sales of gas	3,288	3,972	5,265	6,205	6,011	5,521	5,952	6,461
Gas connection	1,034	1,211	1,451	1,677	1,708	1,627	1,641	1,642
Other Revenue	0	0	0	0	0	0	0	0
Total Revenue	4,321	5,183	6,716	7,882	7,719	7,148	7,592	8,103
Other income	195	160	246	14	(162)	(47)	168	185
COGS	(3,634)	(4,324)	(5,650)	(6,664)	(6,549)	(5,966)	(6,374)	(6,836)
SG&A	0	0	0	0	0	0	0	0
Other op.expenses	(101)	(116)	(140)	(151)	(152)	(133)	(134)	(135)
Operating profit	782	904	1,171	1,080	856	1,002	1,252	1,317
Net-interest inc./(exp.)	(142)	(148)	(164)	(174)	(181)	(181)	(131)	(119)
Assoc/forex/extraord./others	394	480	601	625	593	628	654	688
Pre-tax profit	1,034	1,236	1,609	1,531	1,269	1,449	1,775	1,887
Tax	(257)	(299)	(383)	(350)	(344)	(333)	(391)	(434)
Min. int./pref. div./others	(68)	(95)	(120)	(127)	(117)	(118)	(147)	(154)
Net profit (reported)	709	841	1,106	1,054	808	998	1,238	1,299
Net profit (adjusted)	592	796	946	1,195	1,203	1,198	1,238	1,299
EPS (reported)(HKD)	0.289	0.342	0.424	0.402	0.305	0.374	0.465	0.487
EPS (adjusted)(HKD)	0.241	0.323	0.363	0.456	0.454	0.449	0.465	0.487
EPS (adjusted fully-diluted)(HKD)	0.241	0.323	0.362	0.454	0.454	0.449	0.465	0.487
DPS (HKD)	0.050	0.064	0.080	0.100	0.100	0.104	0.110	0.119
EBIT	782	904	1,171	1,080	856	1,002	1,252	1,317
EBITDA	1,019	1,179	1,502	1,482	1,305	1,491	1,779	1,881

Cash flow (HKDm)

Year to 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Profit before tax	1,034	1,236	1,609	1,531	1,269	1,449	1,775	1,887
Depreciation and amortisation	237	276	331	402	449	489	527	563
Tax paid	(257)	(299)	(383)	(350)	(344)	(333)	(391)	(434)
Change in working capital	48	524	436	(201)	312	(402)	159	183
Other operational CF items	(433)	(661)	(942)	(124)	(270)	(628)	(654)	(688)
Cash flow from operations	628	1,075	1,051	1,258	1,417	576	1,417	1,511
Capex	(894)	(1,610)	(1,685)	(2,005)	(1,955)	(1,200)	(1,200)	(1,100)
Net (acquisitions)/disposals	(170)	(136)	(317)	(318)	(5)	0	0	0
Other investing CF items	33	96	(981)	(272)	190	0	0	0
Cash flow from investing	(1,031)	(1,651)	(2,983)	(2,595)	(1,770)	(1,200)	(1,200)	(1,100)
Change in debt	1,044	670	788	681	1,261	(600)	(600)	(204)
Net share issues/(repurchases)	40	0	940	10	41	0	0	0
Dividends paid	(97)	(147)	(191)	(121)	(187)	(267)	(277)	(294)
Other financing CF items	37	567	70	73	46	0	0	0
Cash flow from financing	1,025	1,089	1,607	643	1,161	(867)	(877)	(498)
Forex effect/others	0	0	0	0	0	0	0	0
Change in cash	622	513	(326)	(694)	808	(1,491)	(660)	(87)
Free cash flow	(266)	(536)	(634)	(746)	(539)	169	970	1,195

Source: FactSet, Daiwa forecasts

Financial summary continued ...

Balance sheet (HKDm)

As at 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Cash & short-term investment	2,071	2,699	2,605	1,797	2,376	886	225	138
Inventory	388	395	588	566	558	560	565	565
Accounts receivable	852	1,057	1,580	1,788	1,507	1,526	1,620	1,729
Other current assets	187	196	274	225	217	127	48	213
Total current assets	3,498	4,346	5,047	4,376	4,658	3,099	2,458	2,646
Fixed assets	6,128	7,652	9,355	11,026	12,055	12,786	13,480	14,037
Goodwill & intangibles	4,031	4,462	5,972	6,499	6,293	6,303	6,283	6,262
Other non-current assets	4,526	4,795	5,254	5,449	5,866	6,473	7,106	7,773
Total assets	18,183	21,255	25,629	27,350	28,871	28,661	29,327	30,718
Short-term debt	1,513	1,946	2,419	2,483	3,183	3,183	3,183	3,183
Accounts payable	2,263	2,998	4,152	4,136	4,160	3,779	4,038	4,330
Other current liabilities	516	629	812	770	806	806	806	806
Total current liabilities	4,291	5,574	7,383	7,389	8,149	7,768	8,026	8,318
Long-term debt	2,902	3,145	3,488	4,075	4,591	3,991	3,391	3,187
Other non-current liabilities	691	1,249	1,280	1,441	1,431	1,363	1,280	1,447
Total liabilities	7,884	9,968	12,150	12,906	14,171	13,123	12,698	12,953
Share capital	246	246	261	263	267	267	267	267
Reserves/R.E./others	9,369	10,236	12,270	12,991	13,212	13,932	14,876	15,858
Shareholders' equity	9,615	10,482	12,531	13,254	13,478	14,198	15,142	16,125
Minority interests	684	805	947	1,191	1,222	1,340	1,487	1,641
Total equity & liabilities	18,183	21,255	25,629	27,350	28,871	28,661	29,327	30,718
EV	12,094	11,918	12,443	13,971	14,400	14,781	14,334	13,683
Net debt/(cash)	2,344	2,393	3,302	4,761	5,398	6,289	6,349	6,233
BVPS (HKD)	3.908	4.261	4.796	5.035	5.058	5.328	5.682	6.051

Key ratios (%)

Year to 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Sales (YoY)	44.9	20.0	29.6	17.4	(2.1)	(7.4)	6.2	6.7
EBITDA (YoY)	52.9	15.8	27.3	(1.3)	(11.9)	14.2	19.3	5.7
Operating profit (YoY)	66.8	15.6	29.6	(7.8)	(20.7)	17.0	25.0	5.2
Net profit (YoY)	59.6	34.5	18.9	26.3	0.6	(0.4)	3.4	4.9
Core EPS (fully-diluted) (YoY)	42.0	34.0	12.2	25.5	(0.2)	(0.9)	3.4	4.9
Gross-profit margin	15.9	16.6	15.9	15.4	15.2	16.5	16.0	15.6
EBITDA margin	23.6	22.8	22.4	18.8	16.9	20.9	23.4	23.2
Operating-profit margin	18.1	17.4	17.4	13.7	11.1	14.0	16.5	16.3
Net profit margin	13.7	15.4	14.1	15.2	15.6	16.8	16.3	16.0
ROAE	6.5	7.9	8.2	9.3	9.0	8.7	8.4	8.3
ROAA	3.6	4.0	4.0	4.5	4.3	4.2	4.3	4.3
ROCE	5.8	5.8	6.5	5.3	3.9	4.4	5.5	5.6
ROIC	5.0	5.2	5.9	4.6	3.2	3.7	4.4	4.3
Net debt to equity	24.4	22.8	26.4	35.9	40.1	44.3	41.9	38.7
Effective tax rate	24.9	24.2	23.8	22.9	27.1	23.0	22.0	23.0
Accounts receivable (days)	58.4	67.2	71.7	78.0	77.9	77.4	75.6	75.4
Current ratio (x)	0.8	0.8	0.7	0.6	0.6	0.4	0.3	0.3
Net interest cover (x)	5.5	6.1	7.2	6.2	4.7	5.6	9.6	11.1
Net dividend payout	17.3	18.6	18.8	24.9	33.0	27.8	23.8	24.4
Free cash flow yield	n.a.	n.a.	n.a.	n.a.	n.a.	1.3	7.6	9.3

Source: FactSet, Daiwa forecasts

Company profile

Towngas China is one of the leading city-gas distributors in China, owning 100 projects (as of December 2015) with a geographical focus on Sichuan, Shandong and Liaoning provinces. In 2015, the company sold 1.9bcm of natural gas (at the subsidiary level).

Valuation

TCCL: DCF valuation

12 mths to 31 Dec, All figures in HKD millions	Forecast								Terminal
	2016E	2017E	2018E	2019E	2020E	2021E	2022E		
Valuation Date	3-Aug-16	31-Dec-16	31-Dec-17	31-Dec-18	31-Dec-19	31-Dec-20	31-Dec-21	31-Dec-22	31-Dec-22
Next Balance Date	31-Dec-16								
First Year Cash Flow Adjustment	0.41								
Free Cash Flow									
EBITDA		1,491	1,779	1,881	1,991	1,841	1,946	2,035	
Less: Other Non Cash		510	507	534	577	509	542	569	
Less: Cash Tax Payable on EBIT		(230)	(276)	(303)	(333)	(307)	(328)	(344)	
Plus: Decrease in Working Capital		(402)	159	183	195	274	238	140	
Less: Capital Expenditure		(1,200)	(1,200)	(1,100)	(664)	(664)	(664)	(664)	
Free Cash Flow		169	970	1,195	1,767	1,653	1,735	1,735	1,769
Free Cash Flow for Valuation Purposes		169	970	1,195	1,767	1,653	1,735	1,735	1,769
WACC	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%
NPV of Free Cash Flow		162	853	958	1,293	1,103	1,057	964	12,964

Source: Daiwa forecasts

TCCL: DCF calculation

Target gearing (debt/capital) (%)	30%
Market risk premium (%)	10.00%
Risk-free rate (%)	3.50%
Cost of debt (%)	2.60%
Cost of equity (%)	12.86%
WACC (%)	9.59%
Terminal Value	
Terminal Growth Rate	2.00%
Terminal WACC	9.59%
Estimated Terminal Free Cash Flow	1,769
NPV of Terminal Value (as at 31 Dec 2022)	23,321
NPV of Terminal Value (as at 03 Aug 2016)	12,964
DCF Valuation	
NPV of Forecasts (HKDm)	6,391
NPV of Terminal Value (HKDm)	12,964
Enterprise Value (HKDm)	19,355
Less: Net Debt (2016E)	-6,289
Equity Value (HKDm)	13,066
No. Shares (m)	2,665
Per Share Equity Value	HK\$4.90

Source: Daiwa forecasts

TCCL: DCF sensitivity analysis

Discount Rate	NPV of FCF	Enterprise Value	Equity Value	Equity Value Per Share (HKD)
7.1%	6,993	29,409	23,120	8.68
7.6%	6,866	26,675	20,386	7.65
8.1%	6,742	24,391	18,102	6.79
8.6%	6,621	22,455	16,166	6.07
9.1%	6,504	20,793	14,503	5.44
9.6%	6,389	19,350	13,061	4.90
10.1%	6,278	18,087	11,798	4.43
10.6%	6,169	16,972	10,683	4.01
11.1%	6,063	15,980	9,691	3.64
11.6%	5,959	15,093	8,804	3.30
12.1%	5,858	14,294	8,005	3.00

Source: Daiwa estimates and forecasts

CIMC Enric (3899 HK)

 Target price: **HKD3.00** (from HKD3.00)

 Share price (3 Aug): **HKD3.11** | Up/downside: **-3.5%**

 5 4 **3** 2 1


Hold
 (from Underperform)

Negative news seems priced in; fair valuation now

- Valuation reached fair levels after 11% correction since profit warning
- Near-term outlook still gloomy; eyeing an earnings recovery in 2017E
- Upgrading to Hold (3) on valuation grounds; maintaining TP of HKD3.0

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What's new: Since CIMC Enric (Enric) issued a profit warning and made a CNY1.21bn provision for the termination of the acquisition of SinoPacific Offshore & Engineering (SOE) on 14 July, its share price has dropped by 11%. In our view, the market has priced this negative news, as well as the weak 2016E energy equipment sales forecast (Daiwa forecast: 15% YoY drop in energy equipment sales revenue for 2016), into Enric's share price.

What's the impact: Provision for SOE acquisition termination looks priced in. Given the CNY450m liquidation value of SOE estimated by the company, Enric made a provision of around CNY1.21bn for the termination of the CNY1.66bn acquisition of SOE, in which Enric made a CNY179m prepayment, CNY482m of offered loans and a CNY1bn bank loan guarantee. As the share price has dropped by 11% since then, Enric's 2016E PBR has fallen to 0.8x, which we believe would be a fair PBR level in case Enric needs to write off the entire provision. Although a near-term overhang is still likely, Enric's net cash on its balance sheet of CNY1.6bn (HKD0.96/share) as of end-December 2015 should provide some support to the share price.

Eyeing a recovery in gas-equipment sales starting 2017E. We maintain our view that Enric's gas equipment sales will only recover in 2017E at the earliest, as LNG-vehicle refuelling operators, such as ENN Energy (2688 HK, HKD37.9, Buy [1]) and Kunlun Energy (135 HK, not rated), are still focusing on enhancing utilisation rather than reactivating plans to expand refuelling stations. Thus, we maintain our forecast of a 15% YoY decline in Enric's energy-equipment sales revenue in 2016. Chemical equipment should see flat sales revenue growth in 2016E due to the weak global trade outlook, while liquid food equipment could pick up to 1% YoY growth in 2016E (vs. -13% YoY in 2015) amid the stabilizing EUR against the HKD.

What we recommend: We believe the 11% share-price correction since the announcement of the profit warning and the CNY1.2bn provision already reflects the negative impact of the news on Enric. As a result, we upgrade our rating on the stock to Hold (3) from Underperform (4), with an unchanged 12-month target price of HKD3.00, based on a 0.78x 2016E PBR, which seems reasonable as we expect a 2017E ROE of 7.1%. Key upside risk to our call: a reversal of the c.CNY1.21bn provision should SOE's liquidation value be higher than CNY450m; key downside risk: weaker-than-expected or later-than-expected recovery in energy-equipment sales volumes.

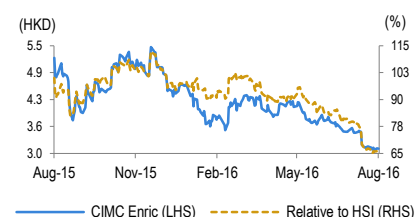
How we differ: Our revised 2016-18E EPS are 25-28% below consensus, which we attribute to the recovery in energy equipment sales lagging the recovery in NGV utilisation, with the global trade outlook still challenging.

Forecast revisions (%)

Year to 31 Dec	16E	17E	18E
Revenue change	-	-	-
Net profit change	-	-	-
Core EPS (FD) change	-	-	-

Source: Daiwa forecasts

Share price performance



12-month range	3.08-5.47
Market cap (USDbn)	0.78
3m avg daily turnover (USDm)	1.12
Shares outstanding (m)	1,967
Major shareholder	CIMC Group (70.4%)

Financial summary (CNY)

Year to 31 Dec	16E	17E	18E
Revenue (m)	7,753	8,135	8,523
Operating profit (m)	629	685	742
Net profit (m)	448	481	520
Core EPS (fully-diluted)	0.225	0.238	0.257
EPS change (%)	(15.3)	5.8	8.1
Daiwa vs Cons. EPS (%)	(26.5)	(28.1)	(25.0)
PER (x)	11.8	11.2	10.3
Dividend yield (%)	3.3	3.6	3.9
DPS	0.087	0.094	0.105
PBR (x)	0.8	0.8	0.7
EV/EBITDA (x)	3.9	3.0	2.5
ROE (%)	6.9	7.1	7.4

Source: FactSet, Daiwa forecasts

5 4 **3** 2 1

How do we justify our view?

Hold
(from Underperform)

Growth outlook



Valuation



Earnings revisions

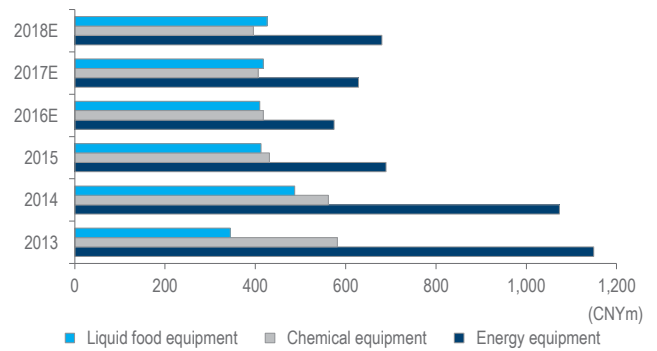


Growth outlook



We forecast Enric to past a gross profit CAGR of -1% in 2015-18, on a recovery in vehicular gas refuelling equipment sales from 2017 achieving a +1% gross profit CAGR on energy equipment during the period (vs. a steep decline over 2013-15). We forecast a -3% segment gross profit 2015-18 CAGR for the chemical equipment segment as the business could still face a downturn on a prolonged slowdown in global trade. As for liquid food equipment, we see a segment gross profit CAGR of 1% in 2015-18 amid a stabilising EUR.

Enric: gross-profit forecasts by business segment



Source: Company, Daiwa forecasts

Valuation



Enric is trading currently at a 0.8x 2016E PBR, which we believe is a fair level if we assume Enric writes off its CNY1.2bn provision for the SOE acquisition termination. Enric's current 0.8x 12-month-forward PBR is also near the trough levels in 2008 and 2011, and 1.5SD below its past-8-year average. Thus, we see limited downside at the current share-price level, but also see few positive catalysts supporting a rerating to above a 1.0x forward PBR.

Enric: 1-year-forward PBR



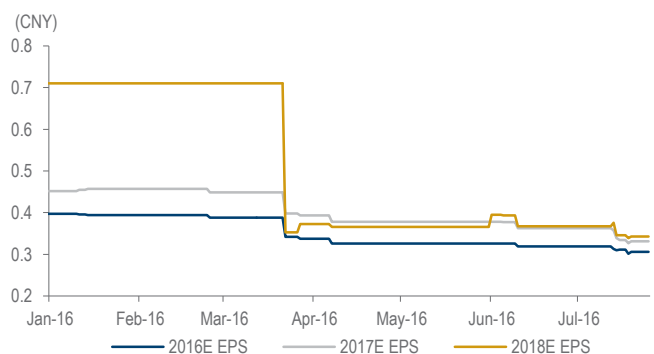
Source: Bloomberg, Daiwa forecasts

Earnings revisions



The Bloomberg-consensus 2016-17E EPS for Enric have declined by 50-51% YTD, which we attribute to concerns about its weak outlook for energy equipment and chemical equipment sales, as well as the profit warning for 1H16 and termination of the SOE acquisition announced in July 2016.

Enric: Bloomberg-consensus EPS-forecast revisions



Source: Bloomberg

Financial summary

Key assumptions

Year to 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
CNG equipment revenue (CNYm)	1,614	1,491	1,606	1,399	700	686	679	679
LNG equipment revenue (CNYm)	1,518	1,550	2,503	2,425	1,096	434	577	710
Energy consultancy revenue (CNYm)	0	457	475	660	820	994	1,176	1,355
CNG equipment GP margin (%)	27.9	31.3	30.0	26.2	22.3	22.1	21.9	21.7
LNG equipment GP margin (%)	19.6	19.5	19.9	20.0	19.6	19.5	19.4	19.3

Profit and loss (CNYm)

Year to 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Energy	3,381	4,268	5,372	5,422	3,397	2,887	3,205	3,525
Chemical	2,875	2,846	3,093	3,383	2,710	2,710	2,710	2,710
Other Revenue	573	968	1,707	2,462	2,135	2,156	2,221	2,288
Total Revenue	6,829	8,083	10,172	11,267	8,241	7,753	8,135	8,523
Other income	130	192	223	247	206	210	223	235
COGS	(5,550)	(6,505)	(8,096)	(9,144)	(6,709)	(6,351)	(6,683)	(7,021)
SG&A	(670)	(824)	(1,067)	(1,146)	(1,020)	(983)	(991)	(995)
Other op. expenses	0	0	0	0	0	0	0	0
Operating profit	739	946	1,231	1,223	718	629	685	742
Net-interest inc./ (exp.)	(12)	(19)	(35)	(33)	(37)	(38)	(44)	(44)
Assoc/forex/extraord./others	0	0	0	0	0	0	0	0
Pre-tax profit	726	927	1,195	1,189	681	591	640	697
Tax	(147)	(162)	(208)	(148)	(145)	(129)	(144)	(161)
Min. int./pref. div./others	(8)	(6)	(8)	(12)	(17)	(14)	(15)	(16)
Net profit (reported)	572	760	980	1,029	520	448	481	520
Net profit (adjusted)	572	760	980	1,029	520	448	481	520
EPS (reported)(CNY)	0.305	0.405	0.509	0.532	0.269	0.228	0.241	0.260
EPS (adjusted)(CNY)	0.305	0.405	0.509	0.532	0.269	0.228	0.241	0.260
EPS (adjusted fully-diluted)(CNY)	0.305	0.401	0.498	0.522	0.265	0.225	0.238	0.257
DPS (CNY)	0.060	0.070	0.120	0.195	0.100	0.087	0.094	0.105
EBIT	739	946	1,231	1,223	718	629	685	742
EBITDA	854	1,082	1,421	1,423	928	858	973	1,036

Cash flow (CNYm)

Year to 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Profit before tax	726	927	1,195	1,189	681	591	640	697
Depreciation and amortisation	115	136	190	200	210	229	288	295
Tax paid	(147)	(162)	(208)	(148)	(145)	(129)	(144)	(161)
Change in working capital	(481)	(185)	(202)	(148)	(635)	461	(100)	(101)
Other operational CF items	140	141	161	(4)	554	18	21	24
Cash flow from operations	353	857	1,137	1,089	665	1,170	706	754
Capex	(447)	(556)	(342)	(389)	(217)	(150)	(150)	(150)
Net (acquisitions)/disposals	0	(261)	0	0	(240)	(600)	0	0
Other investing CF items	(57)	90	29	67	0	0	0	0
Cash flow from investing	(504)	(726)	(313)	(322)	(457)	(750)	(150)	(150)
Change in debt	373	(113)	(286)	(84)	972	0	0	0
Net share issues/(repurchases)	0	0	0	337	0	220	0	0
Dividends paid	0	(112)	(133)	(236)	(384)	(196)	(173)	(191)
Other financing CF items	(11)	14	181	(198)	0	0	0	0
Cash flow from financing	362	(211)	(237)	(180)	588	24	(173)	(191)
Forex effect/others	0	0	0	0	0	0	0	0
Change in cash	211	(81)	586	586	796	445	383	413
Free cash flow	(94)	301	794	700	448	1,020	556	604

Source: FactSet, Daiwa forecasts

Financial summary continued ...

Balance sheet (CNYm)

As at 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Cash & short-term investment	1,082	1,010	1,676	1,795	2,697	3,142	3,525	3,938
Inventory	2,078	1,974	2,495	1,969	1,912	1,837	1,933	2,031
Accounts receivable	1,356	1,842	2,437	3,139	2,566	2,684	2,816	2,950
Other current assets	456	498	881	722	1,641	973	1,021	1,070
Total current assets	4,971	5,324	7,489	7,625	8,817	8,636	9,295	9,988
Fixed assets	1,295	1,763	2,115	2,235	2,339	3,506	3,617	3,719
Goodwill & intangibles	76	263	253	226	461	215	52	42
Other non-current assets	435	377	523	542	696	420	411	401
Total assets	6,777	7,727	10,380	10,628	12,312	12,777	13,375	14,151
Short-term debt	321	263	134	60	125	125	125	125
Accounts payable	1,312	1,351	1,857	1,860	1,813	1,739	1,830	1,922
Other current liabilities	1,250	1,501	2,605	2,136	2,480	2,516	2,602	2,689
Total current liabilities	2,883	3,115	4,596	4,056	4,418	4,380	4,556	4,736
Long-term debt	195	137	36	25	933	933	933	933
Other non-current liabilities	269	397	425	418	495	710	826	1,098
Total liabilities	3,346	3,649	5,057	4,499	5,847	6,023	6,315	6,767
Share capital	17	17	17	18	18	18	18	18
Reserves/R.E./others	3,393	4,035	5,272	6,065	6,294	6,569	6,859	7,167
Shareholders' equity	3,411	4,052	5,289	6,083	6,312	6,586	6,876	7,185
Minority interests	20	26	34	46	153	168	183	199
Total equity & liabilities	6,777	7,727	10,380	10,627	12,312	12,777	13,375	14,151
EV	4,686	4,648	3,757	3,564	3,742	3,316	2,948	2,551
Net debt/(cash)	(566)	(610)	(1,505)	(1,709)	(1,639)	(2,084)	(2,467)	(2,880)
BVPS (CNY)	1.821	2.162	2.749	3.146	3.264	3.349	3.440	3.594

Key ratios (%)

Year to 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Sales (YoY)	70.8	18.4	25.8	10.8	(26.9)	(5.9)	4.9	4.8
EBITDA (YoY)	76.1	26.7	31.3	0.2	(34.8)	(7.6)	13.4	6.5
Operating profit (YoY)	95.6	28.0	30.1	(0.6)	(41.3)	(12.4)	8.8	8.3
Net profit (YoY)	106.4	33.0	28.9	5.1	(49.5)	(13.9)	7.5	8.1
Core EPS (fully-diluted) (YoY)	106.4	31.4	24.1	4.9	(49.2)	(15.3)	5.8	8.1
Gross-profit margin	18.7	19.5	20.4	18.8	18.6	18.1	17.9	17.6
EBITDA margin	12.5	13.4	14.0	12.6	11.3	11.1	12.0	12.2
Operating-profit margin	10.8	11.7	12.1	10.9	8.7	8.1	8.4	8.7
Net profit margin	8.4	9.4	9.6	9.1	6.3	5.8	5.9	6.1
ROAE	18.4	20.4	21.0	18.1	8.4	6.9	7.1	7.4
ROAA	9.8	10.5	10.8	9.8	4.5	3.6	3.7	3.8
ROCE	21.5	22.5	24.7	20.9	10.5	8.2	8.6	9.0
ROIC	24.2	24.7	27.9	26.0	12.2	10.4	11.5	12.5
Net debt to equity	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Effective tax rate	20.3	17.4	17.4	12.5	21.3	21.9	22.5	23.1
Accounts receivable (days)	59.7	72.2	76.8	90.3	126.3	123.6	123.4	123.5
Current ratio (x)	1.7	1.7	1.6	1.9	2.0	2.0	2.0	2.1
Net interest cover (x)	59.3	50.1	35.0	36.5	19.5	16.6	15.5	16.8
Net dividend payout	19.7	17.3	23.6	36.6	37.2	38.2	39.2	40.2
Free cash flow yield	n.a.	5.7	15.2	13.4	8.6	19.5	10.6	11.6

Source: FactSet, Daiwa forecasts

Company profile

CIMC Enric has a c.50% share of the CNG/LNG equipment market in China. In our view, it is well positioned for the volume growth of the natural gas vehicles (NGV) market and city-gas peak shaving infrastructure in China, but recent low utilisation of refuelling stations could cloud the near-term sales outlook. The company also has chemical container tank and liquid food equipment businesses serving the overseas market.

Beijing Enterprises Water Group (371 HK)

 Target price: **HKD6.90** (from HKD7.20)

 Share price (3 Aug): **HKD4.62** | Up/downside: **+49.3%**

 5 4 3 2 1
Buy
 (unchanged)

Transforming into a city-water operator

- MWWT plants getting lower returns on fierce competition
- City-water financed by a water fund could help maintain IRR
- Reiterate Buy (1), TP revised to HKD6.90; eye on water fund set-up

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What's new: BEW's shares have corrected by about 15% from its high in April 2016, likely due to gearing concerns regarding the delayed set-up of the private water fund with the Tongzhou Government (originally aimed for 1H16). During our recent update with BEW, we heard that the target for setting up the fund has been delayed to end-2016. We also believe that the announcement of the CNY3tn investment breakdown under the water pollution prevention plan (in the 13th FYP), likely in 2H16, would be another positive catalyst.

What's the impact: Tongzhou's water investment fund should be set up by end-2016. BEW is cooperating with financial institutions to set up the first water fund (CNY10bn) as an off-balance sheet financing for Tongzhou's city-water project. BEW would be in charge of the construction, and provide entrusted operational services, using its expertise in the water industry, while the project funding would be supported by independent parties seeking stable returns. At a project return of 8%, we estimate that BEW would see about a 20% return, given the leftover return would be distributed completely to the general partners (BEW), as limited partners (major financial institutions) seek only a stable 5.5% return. In our view, the city-water PPP project financed by the water investment fund would be the answer to BEW maintaining its project IRR, as we estimate its MWWT/water supply BOT project returns will decline from 9% in 2015 to 8% for the early years under the 13th FYP, on fierce competition as the non-water corporates are also bidding for water projects amid the current L-shaped economy, where positive-cash generating NPV projects are limited.

1H16 preview: we forecast core profit growth of 25% YoY. We estimate that BEW's 1H16 recurring net profit rose by 25% YoY to HKD1.35bn. As at May 2016, BEW had acquired new capacity of 2.04mtpd (including 1.21mtpd signed and 0.83mtpd obtained) and under-constructed comprehensive renovations worth CNY6.1bn (we expect c.200% YoY revenue in 2016), and these should be some of its major earnings growth contributors (see [updated report](#)). BEW's MWWT plants are mainly located in the financially rich coastal developed cities (84.1% exposure), and its account receivables days should be stable at 120-140 days, in our view.

What we recommend: We reiterate our Buy (1) call and cut our DCF-based 12-month TP to HKD6.90, from HKD7.20, implying a 17x 2017E PER. We assume a WACC of 8.0% (previous: 7.8%) on a rising asset beta due to gearing concerns, as we forecast BEW's net debt-to-equity ratio to rise to 161% by end-2016 and 165% by end-2017. Key risk: equity dilution.

How we differ: We are 2-3% below consensus on 2016-18E EPS on our different assumptions as to the timing of BEW's water capacity ramp-up.

Forecast revisions (%)

Year to 31 Dec	16E	17E	18E
Revenue change	-	-	-
Net profit change	-	-	-
Core EPS (FD) change	-	-	-

Source: Daiwa forecasts

Share price performance



12-month range	3.55-6.59
Market cap (USDbn)	5.36
3m avg daily turnover (USDm)	9.32
Shares outstanding (m)	9,005
Major shareholder	Beijing Enterprises Holdings (47.3%)

Financial summary (HKD)

Year to 31 Dec	16E	17E	18E
Revenue (m)	18,365	22,281	24,541
Operating profit (m)	5,135	6,315	7,547
Net profit (m)	2,935	3,619	4,356
Core EPS (fully-diluted)	0.331	0.402	0.484
EPS change (%)	17.5	21.4	20.4
Daiwa vs Cons. EPS (%)	(1.8)	(2.5)	(1.7)
PER (x)	14.0	11.5	9.6
Dividend yield (%)	2.7	3.3	3.9
DPS	0.124	0.151	0.182
PBR (x)	2.3	2.0	1.8
EV/EBITDA (x)	13.1	11.1	10.0
ROE (%)	17.1	18.9	20.1

Source: FactSet, Daiwa forecasts

5 4 3 2 **1**

How do we justify our view?

Buy
(unchanged)

Growth outlook

✓ ✓ ✓ ✓ ✓

Valuation

✓ ✓ ✓ ✓ ✓

Earnings revisions

✓ ✓ ✓ ✓ ✓

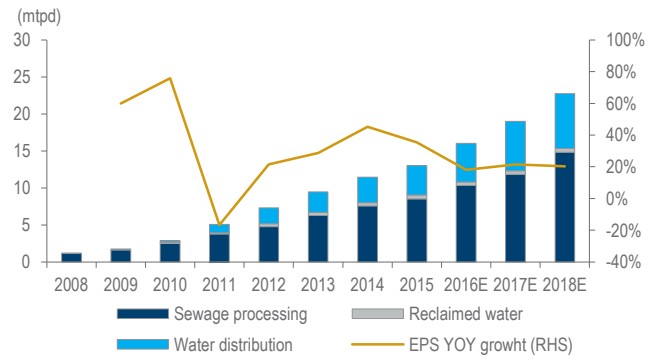
Growth outlook

✓ ✓ ✓ ✓ ✓

BEW expanded its total water treatment capacity from 1.53mtpd in 2008 to 24.62mtpd in 2015, representing a 49% capacity CAGR over the period. In 2015, BEW had 388 water projects, comprising 285 MWWT projects, 8 reclaimed water projects, 94 water-supply projects and 1 seawater desalination project.

We forecast operating capacity additions of 4.5mtpd a year for BEW's combined MWWT and water-supply capacity over 2016-18, on maintaining the 4.5mtpd momentum in 2015. And we forecast a 21% net profit CAGR for 2015-18.

BEW: total operating water capacity and EPS growth



Source: Company, Daiwa estimates

Valuation

✓ ✓ ✓ ✓ ✓

Since 2013, BEW has traded at a 1-year rolling forward PER at the upper end of the 10-28x trading range of the China Water Sector. Backed by its high business growth profile, leading position in the municipal water-services industry and longer listing history vs. peers, BEW's correction, from a 20x forward PER at the end of November 2015 to 13x as of 3 August 2016, is unjustified, in our view.

We believe the establishment of the water fund with Tongzhou would allay investors' concerns about BEW's stretched balance sheet, leading it to recover from its current 11.5x 2017E PER, 1.7SD below its past-6.5-year average of 19x.

BEW: one-year forward PER



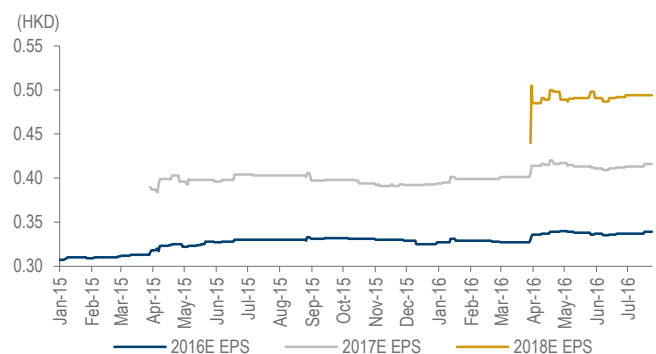
Source: Company, Daiwa estimates

Earnings revisions

✓ ✓ ✓ ✓ ✓

The Bloomberg consensus 2016 and 2017 EPS forecasts for BEW have each been revised up by 2%, since BEW's 2015 results announcement at end-March 2016, on: 1) the company's solid 2015 results, which beat the consensus forecast by 6%, and 2) new water project acquisition momentum, with 2015 new capacity additions of 4.5mtpd, exceeding the 3mtpd annual target. Our 2016-18E EPS are slightly below consensus by 2-3%.

BEW: consensus EPS forecasts



Source: Bloomberg

Financial summary

Key assumptions

Year to 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Year-end operating WWTP and water reclaim capacity (mtpd)	3.96	5.16	6.70	8.00	9.02	10.82	12.32	15.32
WWTP plant utilization rate (%)	76.8	79.8	89.6	89.6	90.6	91.6	92.6	93.6
WWTP services tariff (HKD/ton)	1.15	1.16	1.22	1.27	1.31	1.37	1.43	1.49
Year-end operating water supply capacity (mtpd)	1.13	2.13	2.79	3.46	4.00	5.20	6.70	7.45
Water supply plant utilization rate (%)	38.6	42.8	41.0	46.7	44.3	50.3	56.3	62.3

Profit and loss (HKDm)

Year to 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Sewage and reclaimed water treatment services	995	1,425	2,141	3,250	3,515	3,997	4,976	6,216
Construction services	1,365	1,974	3,764	4,583	8,331	11,857	13,558	13,558
Other Revenue	295	328	501	1,093	1,657	2,510	3,747	4,768
Total Revenue	2,654	3,727	6,406	8,926	13,503	18,365	22,281	24,541
Other income	144	194	200	608	455	794	792	910
COGS	(1,746)	(2,290)	(3,901)	(5,430)	(8,536)	(12,037)	(14,370)	(15,275)
SG&A	(301)	(440)	(775)	(1,066)	(1,226)	(1,649)	(1,978)	(2,179)
Other op.expenses	16	(127)	(188)	(11)	(248)	(337)	(409)	(451)
Operating profit	768	1,064	1,743	3,028	3,948	5,135	6,315	7,547
Net-interest inc./(exp.)	73	(27)	(354)	(639)	(831)	(1,067)	(1,284)	(1,486)
Assoc/forex/extraord./others	21	55	108	278	429	221	259	305
Pre-tax profit	861	1,092	1,497	2,667	3,546	4,289	5,290	6,367
Tax	(170)	(225)	(352)	(594)	(778)	(944)	(1,164)	(1,401)
Min. int./pref. div./others	(90)	(117)	(61)	(279)	(312)	(411)	(507)	(610)
Net profit (reported)	601	750	1,084	1,794	2,455	2,935	3,619	4,356
Net profit (adjusted)	601	750	1,084	1,794	2,455	2,935	3,619	4,356
EPS (reported)(HKD)	0.089	0.109	0.140	0.208	0.282	0.331	0.402	0.484
EPS (adjusted)(HKD)	0.089	0.109	0.140	0.208	0.282	0.331	0.402	0.484
EPS (adjusted fully-diluted)(HKD)	0.089	0.109	0.140	0.208	0.282	0.331	0.402	0.484
DPS (HKD)	0.031	0.042	0.055	0.079	0.095	0.124	0.151	0.182
EBIT	768	1,064	1,743	3,028	3,948	5,135	6,315	7,547
EBITDA	815	1,134	1,865	3,237	4,154	5,396	6,741	8,126

Cash flow (HKDm)

Year to 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Profit before tax	861	1,092	1,497	2,667	3,546	4,289	5,290	6,367
Depreciation and amortisation	47	70	122	209	207	260	426	579
Tax paid	(170)	(225)	(352)	(594)	(778)	(944)	(1,164)	(1,401)
Change in working capital	(100)	1,121	808	(339)	1,057	(1,048)	(615)	(631)
Other operational CF items	(2,836)	(2,486)	(3,011)	(1,679)	(6,658)	(6,083)	(6,488)	(6,455)
Cash flow from operations	(2,198)	(427)	(936)	264	(2,627)	(3,525)	(2,552)	(1,542)
Capex	(204)	(109)	(70)	(691)	(594)	(92)	(111)	(123)
Net (acquisitions)/disposals	(1,877)	(407)	(4,395)	(1,239)	(1,092)	(2,700)	(2,700)	(2,700)
Other investing CF items	584	(44)	1,607	195	(2,070)	0	0	0
Cash flow from investing	(1,496)	(560)	(2,857)	(1,734)	(3,755)	(2,792)	(2,811)	(2,823)
Change in debt	95	3,450	380	3,445	7,344	1,616	6,304	5,583
Net share issues/(repurchases)	3,385	0	2,297	0	0	1,827	0	0
Dividends paid	(66)	(2)	0	(10)	(18)	0	0	0
Other financing CF items	162	(479)	(763)	(744)	(398)	0	0	0
Cash flow from financing	3,576	2,969	1,914	2,691	6,928	3,443	6,304	5,583
Forex effect/others	0	0	0	0	0	0	0	0
Change in cash	(118)	1,981	(1,879)	1,220	546	(2,874)	940	1,219
Free cash flow	(2,402)	(536)	(1,005)	(427)	(3,221)	(3,617)	(2,664)	(1,664)

Source: FactSet, Daiwa forecasts

Financial summary continued ...

Balance sheet (HKDm)

As at 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Cash & short-term investment	2,016	3,725	5,423	6,395	6,643	2,829	2,550	2,284
Inventory	13	30	55	58	99	95	121	136
Accounts receivable	4,018	2,800	3,172	4,236	5,984	6,554	8,637	9,822
Other current assets	5,608	7,124	6,562	4,389	5,427	6,779	8,538	9,776
Total current assets	11,654	13,679	15,212	15,078	18,153	16,256	19,847	22,018
Fixed assets	233	528	379	1,243	1,380	2,826	4,159	5,386
Goodwill & intangibles	1,650	1,779	2,539	2,553	3,005	3,002	2,997	2,994
Other non-current assets	11,212	15,304	26,057	32,767	41,954	51,015	56,681	62,357
Total assets	24,750	31,290	44,187	51,641	64,492	73,099	83,685	92,755
Short-term debt	1,070	2,810	2,148	3,945	6,015	6,015	6,015	6,015
Accounts payable	2,049	1,919	2,755	3,564	5,786	5,634	7,232	8,118
Other current liabilities	3,552	4,529	6,748	3,910	5,971	6,993	8,649	9,568
Total current liabilities	6,671	9,258	11,651	11,419	17,773	18,642	21,896	23,702
Long-term debt	7,691	10,465	15,303	19,546	24,318	25,934	29,946	35,529
Other non-current liabilities	678	836	1,308	1,587	2,111	5,962	6,516	4,868
Total liabilities	15,039	20,558	28,262	32,552	44,201	50,538	58,358	64,099
Share capital	691	691	844	871	872	900	900	900
Reserves/R.E./others	7,391	7,776	12,454	14,914	15,312	17,143	19,402	22,120
Shareholders' equity	8,082	8,467	13,298	15,784	16,184	18,044	20,302	23,021
Minority interests	1,629	2,264	2,627	3,304	4,107	4,518	5,025	5,635
Total equity & liabilities	24,750	31,290	44,187	51,641	64,492	73,099	83,685	92,755
EV	47,965	50,998	53,232	58,893	64,933	70,554	75,093	81,247
Net debt/(cash)	6,745	9,550	12,028	17,095	23,690	29,120	33,411	39,260
BVPS (HKD)	1.170	1.225	1.576	1.813	1.855	2.004	2.255	2.557

Key ratios (%)

Year to 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Sales (YoY)	(58.2)	40.4	71.9	39.3	51.3	36.0	21.3	10.1
EBITDA (YoY)	(13.8)	39.1	64.5	73.5	28.4	29.9	24.9	20.6
Operating profit (YoY)	(15.3)	38.6	63.8	73.7	30.4	30.1	23.0	19.5
Net profit (YoY)	17.2	24.9	44.5	65.5	36.8	19.5	23.3	20.4
Core EPS (fully-diluted) (YoY)	(16.8)	21.5	28.7	48.5	35.7	17.5	21.4	20.4
Gross-profit margin	34.2	38.6	39.1	39.2	36.8	34.5	35.5	37.8
EBITDA margin	30.7	30.4	29.1	36.3	30.8	29.4	30.3	33.1
Operating-profit margin	28.9	28.5	27.2	33.9	29.2	28.0	28.3	30.8
Net profit margin	22.6	20.1	16.9	20.1	18.2	16.0	16.2	17.7
ROAE	10.0	9.1	10.0	12.3	15.4	17.1	18.9	20.1
ROAA	2.9	2.7	2.9	3.7	4.2	4.3	4.6	4.9
ROCE	4.8	5.0	6.1	8.0	8.5	9.8	10.9	11.5
ROIC	4.5	4.6	5.5	7.3	7.7	8.4	8.9	9.3
Net debt to equity	83.5	112.8	90.4	108.3	146.4	161.4	164.6	170.5
Effective tax rate	19.7	20.6	23.5	22.3	21.9	22.0	22.0	22.0
Accounts receivable (days)	612.1	333.8	170.1	151.5	138.1	124.6	124.4	137.3
Current ratio (x)	1.7	1.5	1.3	1.3	1.0	0.9	0.9	0.9
Net interest cover (x)	n.a.	39.8	4.9	4.7	4.8	4.8	4.9	5.1
Net dividend payout	34.5	38.9	39.3	37.8	33.7	37.6	37.6	37.6
Free cash flow yield	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Source: FactSet, Daiwa forecasts

Company profile

As the environmental water utilities flagship company under parent group Beijing Enterprises Holdings, Beijing Enterprises Water Group provides a full range of water services comprising water supply, sewage treatment, reclaimed water and seawater desalination. The company had treatment capacity of 13.02mtpd in operation and 11.61mtpd not yet launched at the end of 2015. It is the No. 1 water supply and sewage treatment company in China in terms of total capacity.

Valuation

BEW: DCF valuation

12 mths to 31 Dec, All figures in HKDm	Forecast									
	2016E	2017E	2018E	2019E	2020E	2021E	2022E	Terminal		
Valuation Date	3-Aug-16	17-Oct-16	30-Dec-17	30-Dec-18	30-Dec-19	30-Dec-20	30-Dec-21	30-Dec-22	30-Dec-22	30-Dec-22
Next Balance Date	31-Dec-16									
First Year Cash Flow Adjustment	0.41									
Free Cash Flow										
EBITDA (IFRIC 12)		5,718	6,884	8,247	9,743	10,560	11,517	12,143		
BOT construction revenue		(6,188)	(6,188)	(6,188)	(6,188)	0	0	0		
BOT construction cost		4,703	4,703	4,703	4,703	0	0	0		
Reinstatement of operation income		157	254	286	295	239	198	227		
EBITDA (non-IFRIC 12)		4,390	5,653	7,048	8,553	10,799	11,715	12,370		
Less: Other Non Cash		221	259	305	357	383	409	435		
Less: Cash Tax Payable on EBIT		(617)	(837)	(1,074)	(1,393)	(1,849)	(2,130)	(2,302)		
Plus: Decrease in Working Capital		(1,048)	(615)	(631)	(513)	(652)	(482)	62		
Less: Minority interest		(411)	(507)	(610)	(731)	(783)	(876)	(942)		
Less: Capital Expenditure		(6,842)	(6,861)	(6,873)	(6,886)	(121)	(127)	(131)		
Free Cash Flow		(4,307)	(2,909)	(1,835)	(613)	7,778	8,509	9,493		9,588
Free Cash Flow for Valuation Purposes		(4,307)	(2,909)	(1,835)	(613)	7,778	8,509	9,493		9,588
WACC	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%		8.0%
NPV of Free Cash Flow		(4,240)	(2,611)	(1,526)	(472)	5,544	5,617	5,804		84,013.8

Source: Daiwa forecasts

BEW: DCF calculation

Target gearing (debt/capital) (%)	60%
Market risk premium (%)	12.00%
Risk-free rate (%)	3.50%
Cost of debt (%)	4.50%
Cost of equity (%)	14.77%
WACC (%)	7.98%
Terminal Value	
Terminal Growth Rate	1.00%
Terminal WACC	7.98%
Estimated Terminal Free Cash Flow	9,588
NPV of Terminal Value (as at 30 Jun 2020)	137,418
NPV of Terminal Value (as at 03 Aug 2016)	84,014
DCF Valuation	
NPV of Forecasts (HKDm)	8,116
NPV of Terminal Value (HKDm)	84,014
Enterprise Value (HKDm)	92,130
Less: Net Debt (2016E)	-29,120
Equity Value (HKDm)	63,010
No. Shares (m)	9,043
Per Share Equity Value	6.90

Source: Daiwa forecasts

BEW: free cash flow valuation

Discount Rate	NPV of FCF	Enterprise Value	Equity Value	Equity Value Per Share (HKD)
5.5%	10,184	162,324	132,604	14.66
6.0%	9,743	142,512	112,793	12.47
6.5%	9,316	126,379	96,659	10.69
7.0%	8,903	113,000	83,280	9.21
7.5%	8,503	101,736	72,016	7.96
8.0%	8,116	92,130	63,010	6.90
8.5%	7,742	83,850	54,130	5.99
9.0%	7,379	76,644	46,924	5.19
9.5%	7,027	70,322	40,602	4.49
10.0%	6,687	64,736	35,016	3.87
10.5%	6,357	59,768	30,048	3.32

Source: Daiwa forecasts

CT Environmental Group (1363 HK)

 Target price: **HKD2.75** (from HKD2.65)

 Share price (3 Aug): **HKD2.33** | Up/downside: **+18.0%**

 5 4 3 2 **1**
Buy
 (unchanged)

Focused on less-penetrated industrial clean-up

- Industrial waste treatment is less penetrated with more defensive return
- Steady c.24% EPS CAGR over 2015-18E, driven by organic growth
- TP lifted to HKD2.75; reiterate Buy (1) despite rich-looking valuation

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What's new: We see CTE's project IRR remaining resilient at 15-20% for 2016-17E given its focus on less-penetrated environmental segments – industrial waste water treatment (IWWT), sludge, industrial solid waste, hazardous waste treatment (HWT) and marine-transport WWT, etc. However, we believe CTE will now focus on organic growth after 2 rounds of acquisitions of Lvyou companies to broaden its business scope.

What's the impact: More greenfield growth backed by strong balance sheet; expect modest 30% YoY net profit growth for 1H16. After the acquisitions of Qingyuan Lvyou and Guangzhou Lvyou in 2014-15, the biggest sludge treatment and HWT operators in Guangdong, CTE is now poised to grow more organically through its existing IWWT, sludge, solid-waste and HWT platform. As such, it recently commissioned a Nansha marine-transport WWT plant (see [Moving into the marine-transport WWT business](#), 1 June 2016). In total it has earmarked 2016 capex of CNY1.5bn for 3 major projects – Nansha (total investment: CNY320m), Longmen (CNY630m) and Guangxi Yulin (CNY500m) – backed by a USD260m-equivalent CNY-denominated credit facility from the Asia Development Bank at a low cost of c.3%. Thus, we see CTE with a healthy 67% net debt-to-equity at end-2016E. In 2016, CTE expects to grow capacity by 11% YoY (IWWT), 390% YoY (sludge), 16% YoY (solid waste), 79% YoY (HWT).

Also, we expect CNY320m in construction revenue from the Longmen WTE plant. Based on the [recent HWT orders](#) with Guangzhou Automobile Group (2238 HK, HKD9.99, Sell [5]) and Baoshan Iron & Steel, we expect Guangzhou Lvyou, the major earnings contributor of HWT for CTE, to achieve over 10% YoY revenue growth for 2016. Hence, we estimate that CTE's net profit rose by 30% YoY for 1H16, after reviewing the progress on its key greenfield projects construction and operating progress.

What we recommend: We reiterate our Buy (1) rating on CTE and fine-tune up our DCF-based 12-month TP to HKD2.75 (from HKD2.65), implying a 2016E PER of 22x. Although our TP implies a richer 0.85x PEG (on a 2015-18E EPS CAGR vs. China peers' 0.4-0.6x), most of CTE's 2016E gross profit comes from cash-based operating earnings from its BOO exposure. We trim our 2016-18E net profit by 1% on the slight delays in its new IWWT plants starting operations, and our WACC from 8.3% to 8.2% on its more diversified earnings streams. The main risk: greater-than-expected competition from the SOE players.

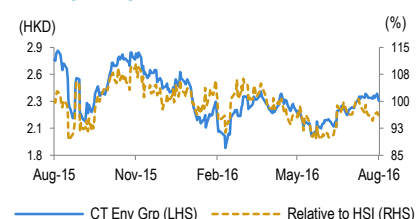
How we differ: We are 1-6% below consensus on 2016-18E EPS, as despite our positive call on the stock, we still factor in IWWT delays and are more conservative in our utilization assumptions for CTE's new projects.

Forecast revisions (%)

Year to 31 Dec	16E	17E	18E
Revenue change	(1.1)	(1.0)	(0.9)
Net profit change	(1.2)	(1.0)	(0.9)
Core EPS (FD) change	(1.2)	(1.0)	(0.9)

Source: Daiwa forecasts

Share price performance



12-month range	1.87-2.82
Market cap (USDbn)	1.89
3m avg daily turnover (USDm)	1.70
Shares outstanding (m)	6,317
Major shareholder	Mr. Tsui Cham To (55.0%)

Financial summary (CNY)

Year to 31 Dec	16E	17E	18E
Revenue (m)	2,187	2,376	2,746
Operating profit (m)	861	1,051	1,209
Net profit (m)	675	842	972
Core EPS (fully-diluted)	0.107	0.133	0.154
EPS change (%)	32.5	24.6	15.5
Daiwa vs Cons. EPS (%)	(6.2)	(0.6)	(2.6)
PER (x)	18.6	14.9	12.9
Dividend yield (%)	1.4	1.8	1.9
DPS	0.027	0.035	0.038
PBR (x)	3.7	3.1	2.6
EV/EBITDA (x)	13.7	10.5	8.9
ROE (%)	21.4	22.4	21.7

Source: FactSet, Daiwa forecasts

5 4 3 2 **1**

How do we justify our view?

Buy
(unchanged)

Growth outlook



Valuation



Earnings revisions

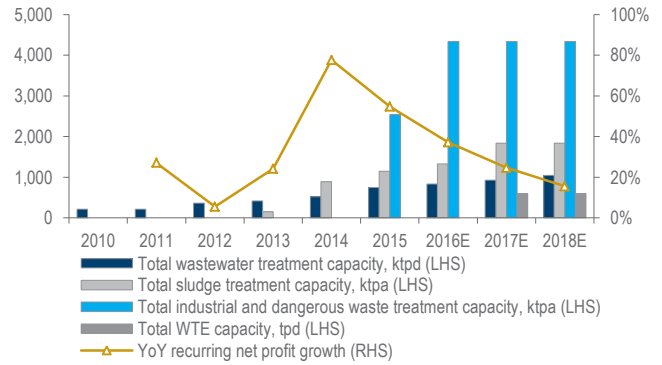


Growth outlook



We now forecast a net profit CAGR of 25% for CTE over the 2015-18E period (previous: 26%). We forecast WWT capacity and sludge treatment CAGRs of 12% and 60%, respectively, over 2015-18E. For 2016-18, the company plans to add 1,508tpd of industrial solid waste capacity (80% rise from current capacity), and has just commissioned a marine transport wastewater treatment facility in Nansha, and 600tpd of WTE capacity from the Longmen plant. We forecast the gross profit contribution from CTE's non-IWWT businesses to rise from 51% for 2015 to 74% for 2018E, with CTE diversifying its environmental-protection businesses from the risks of a potential industrial downturn.

CTE: IWWT, sludge treatment, industrial, hazardous waste treatment, and WTE capacity and company's net profit growth



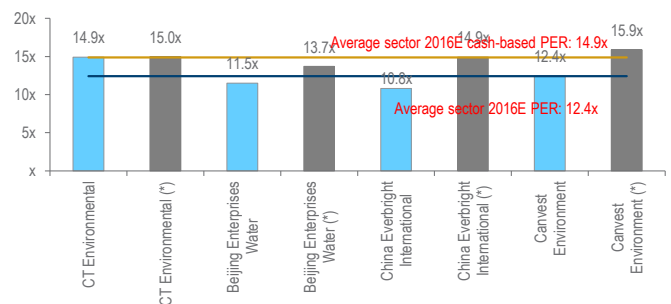
Source: Company, Daiwa forecasts

Valuation



The stock is trading currently at a 2017E PER of 14.9x, vs. an average PER of 12.4x for the China environmental sector companies that we cover. We believe CTE deserves to trade at a higher PER valuation vs. its MWWT peers because most of its earnings are cash-based given its significant BOO exposure. We forecast an EPS CAGR for CTE (mainly organic growth) of 24% over 2015-18E, equivalent to a PEG of 0.8x over 2015-18E, based on 2016E PER.

CTE and China peers: PER comparison (2016E)



Source: Daiwa forecasts

Note: * denotes that we have stripped out non-cash earnings from its BOT construction revenue from our 2016E PER calculation; share prices are as at 3 August 2016

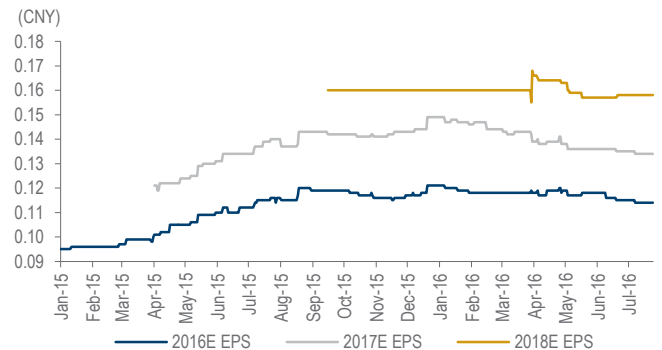
Earnings revisions



Since the start of 2016, the Bloomberg consensus has been cutting its 2016-17 EPS forecasts for CTE by 6-10% on IWWT project delays and lower-than-expected utilisation ramp-up of its non-IWWT facilities.

We only include announced projects in our model, and thus any new acquired projects beyond here could lead to additional earnings upside for CTE.

CTE: Bloomberg-consensus EPS forecast revisions (2016-17E)



Source: Bloomberg

Financial summary

Key assumptions

Year to 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Year-end WWT capacity (ktpd)	215	265	315	515	745	830	930	1,045
WWT plant utilization rate (%)	95	81	87	88	61	66	71	75
WWT services tariff (CNY/tonne)	3.1	2.8	2.7	2.6	3.0	3.2	3.4	3.6
Sludge capacity (tonne/day)	n.a.	n.a.	400	2,442	3,142	3,642	5,031	5,031
Sludge treatment utilization rate (%)	n.a.	n.a.	35	81	93	100	100	100
Total sludge treatment fee and resales ASP (CNY/tonne)	n.a.	n.a.	230	635	660	660	660	660

Profit and loss (CNYm)

Year to 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Wastewater treatment	320	230	262	466	577	602	752	960
Sludge, industrial waste and hazardous waste treatment	0	0	16	243	657	1,089	1,376	1,477
Other Revenue	63	82	109	109	200	496	248	309
Total Revenue	383	312	387	818	1,435	2,187	2,376	2,746
Other income	3	0	16	20	69	82	103	133
COGS	(162)	(107)	(143)	(357)	(719)	(1,203)	(1,212)	(1,428)
SG&A	(33)	(18)	(33)	(66)	(139)	(206)	(216)	(242)
Other op.expenses	(1)	(3)	(1)	(1)	94	0	0	0
Operating profit	190	185	226	413	739	861	1,051	1,209
Net-interest inc./(exp.)	(22)	(30)	(26)	(43)	(70)	(114)	(110)	(110)
Assoc/forex/extraord./others	0	19	18	3	1	0	0	0
Pre-tax profit	169	174	219	374	671	747	941	1,099
Tax	(31)	(29)	(39)	(35)	(69)	(70)	(97)	(125)
Min. int./pref. div./others	(1)	(0)	(0)	(3)	(2)	(2)	(2)	(2)
Net profit (reported)	137	144	179	336	599	675	842	972
Net profit (adjusted)	137	144	179	318	492	675	842	972
EPS (reported)(CNY)	0.034	0.035	0.040	0.060	0.098	0.107	0.133	0.154
EPS (adjusted)(CNY)	0.034	0.035	0.040	0.057	0.081	0.107	0.133	0.154
EPS (adjusted fully-diluted)(CNY)	0.034	0.035	0.040	0.057	0.081	0.107	0.133	0.154
DPS (CNY)	0.000	0.000	0.009	0.015	0.021	0.027	0.035	0.038
EBIT	190	185	226	395	633	861	1,051	1,209
EBITDA	220	201	261	470	718	1,083	1,364	1,529

Cash flow (CNYm)

Year to 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Profit before tax	169	174	219	374	671	747	941	1,099
Depreciation and amortisation	11	14	18	67	145	223	313	321
Tax paid	(22)	(30)	(26)	(43)	(70)	(114)	(110)	(110)
Change in working capital	219	(120)	19	(168)	(221)	30	(107)	(70)
Other operational CF items	(277)	189	(133)	240	(0)	44	13	(14)
Cash flow from operations	99	226	96	470	524	929	1,050	1,225
Capex	(90)	(50)	(174)	(249)	(1,084)	(1,500)	(400)	(200)
Net (acquisitions)/disposals	0	0	(33)	(650)	(876)	0	0	0
Other investing CF items	83	(268)	43	128	171	0	0	0
Cash flow from investing	(7)	(317)	(163)	(771)	(1,788)	(1,500)	(400)	(200)
Change in debt	533	266	44	531	968	523	0	0
Net share issues/(repurchases)	0	0	376	279	1,129	0	0	0
Dividends paid	0	0	0	(33)	(67)	(135)	(168)	(194)
Other financing CF items	(598)	(208)	(55)	(670)	(500)	0	0	0
Cash flow from financing	(64)	58	365	107	1,531	388	(168)	(194)
Forex effect/others	0	0	0	0	0	0	0	0
Change in cash	28	(34)	298	(194)	266	(183)	481	830
Free cash flow	9	176	(78)	221	(560)	(571)	650	1,025

Source: FactSet, Daiwa forecasts

Financial summary continued ...

Balance sheet (CNYm)

As at 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Cash & short-term investment	42	8	350	117	388	251	732	1,563
Inventory	1	1	1	7	30	25	31	34
Accounts receivable	120	214	221	496	794	819	1,038	1,172
Other current assets	17	17	17	17	34	34	34	34
Total current assets	180	240	589	637	1,246	1,129	1,836	2,803
Fixed assets	181	215	402	1,249	2,151	3,500	3,655	3,599
Goodwill & intangibles	7	7	39	234	1,151	1,087	1,028	971
Other non-current assets	349	463	456	732	957	1,059	1,034	1,081
Total assets	717	926	1,487	2,852	5,505	6,775	7,552	8,455
Short-term debt	55	67	41	298	642	642	642	642
Accounts payable	109	82	108	222	322	371	489	556
Other current liabilities	8	10	14	20	23	23	23	23
Total current liabilities	172	159	163	540	986	1,036	1,154	1,221
Long-term debt	338	420	394	743	1,367	1,890	1,890	1,890
Other non-current liabilities	26	29	43	75	254	410	394	450
Total liabilities	535	608	600	1,357	2,608	3,337	3,438	3,561
Share capital	0	0	110	114	125	125	125	125
Reserves/R.E./others	174	316	775	1,357	2,757	3,297	3,971	4,748
Shareholders' equity	174	317	885	1,471	2,883	3,423	4,096	4,874
Minority interests	8	1	2	23	14	16	18	20
Total equity & liabilities	717	926	1,487	2,852	5,505	6,775	7,552	8,455
EV	12,933	12,925	12,514	13,521	14,203	14,866	14,386	13,558
Net debt/(cash)	351	478	84	925	1,621	2,282	1,800	970
BVPS (CNY)	0.043	0.078	0.157	0.233	0.456	0.542	0.648	0.772

Key ratios (%)

Year to 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Sales (YoY)	21.4	(18.4)	23.9	111.5	75.4	52.4	8.6	15.6
EBITDA (YoY)	44.8	(8.5)	30.0	80.0	52.6	50.9	26.0	12.1
Operating profit (YoY)	27.4	(2.9)	22.3	74.6	60.2	36.0	22.1	15.0
Net profit (YoY)	27.0	5.5	24.2	77.7	54.7	37.2	24.6	15.5
Core EPS (fully-diluted) (YoY)	27.0	5.5	13.4	41.0	42.7	32.5	24.6	15.5
Gross-profit margin	57.7	65.8	63.1	56.4	49.9	45.0	49.0	48.0
EBITDA margin	57.4	64.4	67.6	57.5	50.0	49.5	57.4	55.7
Operating-profit margin	49.8	59.2	58.5	48.3	44.1	39.4	44.2	44.0
Net profit margin	35.7	46.2	46.3	38.9	34.3	30.9	35.4	35.4
ROAE	71.1	58.8	29.8	27.0	22.6	21.4	22.4	21.7
ROAA	20.6	17.6	14.8	14.7	11.8	11.0	11.7	12.1
ROCE	35.8	26.8	21.3	20.5	17.0	15.8	16.7	17.2
ROIC	30.8	23.1	21.0	22.1	19.1	15.2	16.2	18.2
Net debt to equity	201.6	150.9	9.5	62.8	56.2	66.7	44.0	19.9
Effective tax rate	18.6	16.9	17.9	9.2	10.3	9.3	10.3	11.3
Accounts receivable (days)	215.5	195.3	205.1	159.9	164.1	134.7	142.7	146.9
Current ratio (x)	1.0	1.5	3.6	1.2	1.3	1.1	1.6	2.3
Net interest cover (x)	8.7	6.1	8.8	9.2	9.0	7.6	9.5	11.0
Net dividend payout	0.0	0.0	23.2	25.0	21.6	25.5	26.2	24.7
Free cash flow yield	0.1	1.4	n.a.	1.8	n.a.	n.a.	5.2	8.2

Source: FactSet, Daiwa forecasts

Company profile

CT Environmental (CTE) mainly engages in industrial wastewater treatment (IWWT) services, sludge treatment services and industrial & hazardous solid waste treatment service. As of end-2015, its consolidated treatment capacity totaled 745ktpd of WWT (mainly IWWT) and 3,142tpd of sludge treatment. Unlike with its peer, Beijing Enterprises Water, mainly pursues a build-operate-transfer (BOT) model, CTE mainly pursues a build-operate-own (BOO) model.

Valuation

CTE: DCF valuation

12 mths to 31 Dec, All figures in CNYm	Forecast							Terminal	
	2016E	2017E	2018E	2019E	2020E	2021E	2022E		
Valuation Date	3-Aug-16	31-Dec-16	31-Dec-17	31-Dec-18	31-Dec-19	31-Dec-20	31-Dec-21	31-Dec-22	31-Dec-22
Next Balance Date	31-Dec-16								
First Year Cash Flow Adjustment	0.41								
Free Cash Flow									
EBITDA (IFRIC 12)	1,083	1,364	1,529	1,678	1,743	1,790	1,824		
BOT construction revenue	(422)	0	0	0	0	0	0		
BOT construction cost	351	0	0	0	0	0	0		
Reinstatement of operation income	(47)	(49)	(51)	(53)	(55)	(57)	(58)		
EBITDA (non-IFRIC 12)	964	1,315	1,478	1,625	1,688	1,734	1,766		
Less: Other Non Cash	0	0	0	0	0	0	0		
Less: Cash Tax Payable on EBIT	(74)	(109)	(137)	(168)	(193)	(218)	(241)		
Plus: Decrease in Working Capital	30	(107)	(70)	(58)	(33)	(6)	5		
Less: Minority interest	(2)	(2)	(2)	(2)	(1)	(1)	0		
Less: Capital Expenditure	(1,500)	(400)	(200)	(200)	(200)	(200)	(200)		
Free Cash Flow	(582)	697	1,069	1,196	1,260	1,310	1,330		1,336
Free Cash Flow for Valuation Purposes	(582)	697	1,069	1,196	1,260	1,310	1,330		1,336
WACC	8.2%	8.2%	8.2%	8.2%	8.2%	8.2%	8.2%		8.2%
NPV of Free Cash Flow	(563)	624	884	914	890	855	802		13,000

Source: Daiwa forecasts

CTE: DCF calculation

Target gearing (debt/capital) (%)	40%
Market risk premium (%)	10.00%
Risk-free rate (%)	3.50%
Cost of debt (%)	4.50%
Cost of equity (%)	11.42%
WACC (%)	8.20%
Terminal Value	
Terminal Growth Rate	2.00%
Terminal WACC	8.19%
Estimated Terminal Free Cash Flow	1,336
NPV of Terminal Value (as at 31 Dec 2022)	21,549
NPV of Terminal Value (as at 3 Aug 2016)	13,000
DCF Valuation	
NPV of Forecasts (CNYm)	4,406
NPV of Terminal Value (CNYm)	13,000
Enterprise Value (CNYm)	17,406
Less: Net Debt (2016E)	-2,282
Equity Value (CNYm)	15,124
No. Shares (m)	6,317
Per Share Equity Value (HKD)	2.75

Source: Daiwa forecasts

CTE: DCF sensitivity analysis

(in CNYm)					Equity Value
Discount Rate	NPV of FCF	Enterprise Value	Equity Value	Per Share (HKD)	
5.7%	4,891	30,200	27,918	5.08	
6.2%	4,788	26,419	24,137	4.39	
6.7%	4,689	23,445	21,163	3.85	
7.2%	4,592	21,043	18,761	3.42	
7.7%	4,498	19,064	16,783	3.06	
8.2%	4,406	17,406	15,124	2.75	
8.7%	4,317	15,995	13,714	2.50	
9.2%	4,230	14,782	12,500	2.28	
9.7%	4,145	13,727	11,445	2.08	
10.2%	4,062	12,801	10,520	1.92	
10.7%	3,982	11,983	9,701	1.77	

Source: Daiwa estimates and forecasts

Guangdong Investment (270 HK)

 Target price: **HKD12.80** (from HKD12.80)

 Share price (3 Aug): **HKD12.16** | Up/downside: **+5.2%**

 5 4 3 **2** 1


Outperform
 (unchanged)

Likely the most defensive China-based utility

- Strong earnings growth for 2016-17E
- Defensive nature and DPS growth potential still attractive
- Reiterating our Outperform (2) rating and TP of HKD12.80

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What's new: We forecast GDI's 2016 recurring net profit to rise strongly by 9% YoY, on the back of the new projects injected by its parent group, Guangdong Holdings Limited (GDH), in December 2015. We like GDI's stable growth in HKD revenue for 2016-17E, and remain confident that it can achieve an 8% 2015-18E DPS CAGR.

What's the impact: Strong earnings growth at least for 2016-17E. We see solid net earnings growth for GDI at least before the Hong Kong water supply price is reset in 2018. We forecast 9% YoY growth in its recurring net profit for 2016, mainly supported by the Xingliu road project and the water supply and treatment projects injected by GDH in December 2015, and 4% YoY growth in revenue from the Dongshen project, amid the 6% YoY increase in revenue from Hong Kong. In our view, the risk of a large decline in Hong Kong's water supply prices after 2018 is low, given the HKSAR Government's incentive to keep a stable water supply.

Defensive: regulated businesses and CNY-neutral earnings. Over 60% of GDI's revenue and PBT comes from its regulated businesses, which gives it a visible revenue stream for the next 2-10 years. Also, over 40% of its 2016-17E total revenue would be in HKD, while 95% of costs are in CNY, making GDI one of the least-sensitive China utility stocks to CNY depreciation risks. We estimate that a 10% incremental fall in the CNY:HKD rate would lead to only a 4% drop in our TP for GDI, vs. 11-13% for the other China water companies under our coverage.

8% 2015-18E DPS CAGR supported by M&A and rise in payout ratio. While a further asset injection by GDH is likely only after end-2016, we see a good chance of GDI closing a few M&A deals in 2016, supported by its HKD9bn cash balance as at end-2015. GDI should still be able to raise its dividend payout ratio in case of a lack of M&A opportunities, similar to what CKI (1038 HK, HKD70.05, Outperform [2]) did during 2006-10.

What we recommend: We maintain our Outperform (2) rating and SOTP-derived 12-month TP of HKD12.80, implying a 17.5x 2016E PER. The stock is trading currently at a 16.7x 2016E PER, which may look rich. But, we believe the premium is justified given its potential for stable HKD earnings over 2016-17E, its CNY-neutral characteristics, and 7-9% 2015-18E DPS growth. Key risks: a huge cut in the 2018-20E Hong Kong water supply contracted price, and an earlier-than-expected US Fed rate hike.

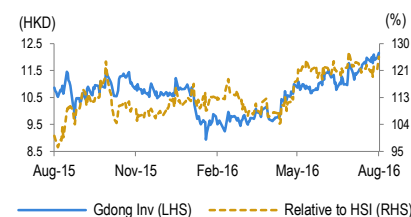
How we differ: We assume Hong Kong's reset water supply contract prices to remain flat from 2018-20 (vs. the consensus forecast for a 1-2% rise).

Forecast revisions (%)

Year to 31 Dec	16E	17E	18E
Revenue change	-	-	-
Net profit change	-	-	-
Core EPS (FD) change	-	-	-

Source: Daiwa forecasts

Share price performance



12-month range	8.93-12.16
Market cap (USDbn)	9.81
3m avg daily turnover (USDm)	8.24
Shares outstanding (m)	6,265
Major shareholder	Guangdong Holdings Limited (54.6%)

Financial summary (HKD)

Year to 31 Dec	16E	17E	18E
Revenue (m)	10,769	12,156	12,111
Operating profit (m)	5,616	6,060	5,983
Net profit (m)	4,563	4,856	4,820
Core EPS (fully-diluted)	0.729	0.776	0.771
EPS change (%)	8.7	6.5	(0.7)
Daiwa vs Cons. EPS (%)	2.0	(0.6)	(6.5)
PER (x)	16.7	15.7	15.8
Dividend yield (%)	3.1	3.3	3.5
DPS	0.371	0.404	0.432
PBR (x)	2.3	2.1	2.0
EV/EBITDA (x)	11.1	10.0	9.8
ROE (%)	14.0	13.9	13.0

Source: FactSet, Daiwa forecasts

5 4 3 **2** 1

How do we justify our view?

Outperform
(unchanged)

Growth outlook



Valuation



Earnings revisions



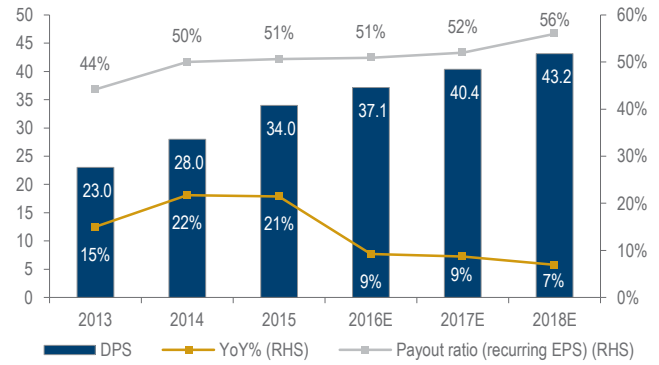
Growth outlook



We expect GDI's recurring net profit to post stable growth in 2015-17E registering an 8% CAGR. After 2018, despite the risk of a decline in revenue from the Hong Kong water supply business, the growth in the property segment and potential M&A could help maintain sustainable net profit growth of 3-5% YoY, on our forecasts.

As we expect the company to achieve a higher payout ratio in the future, we forecast its stable earnings and cash flow to support DPS growth of 7-9% YoY for 2016-18E.

GDI: DPS and dividend payout growth



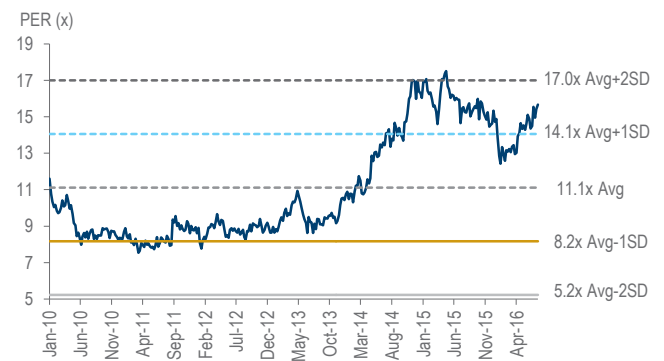
Source: Company, Daiwa forecasts

Valuation



GDI is trading currently at a 16.7x 2016E PER, which is 1.9SD above its past 6-year average 12-month forward PER. However, we think the stock's current premium valuation is justified given the defensive nature of the business, and the market's preference for stable regulated businesses, especially HKD assets. The current price is also supported by a 3.1% 2016E dividend yield, based on our forecasts.

GDI: 12M forward PER



Source: Bloomberg, Daiwa forecasts

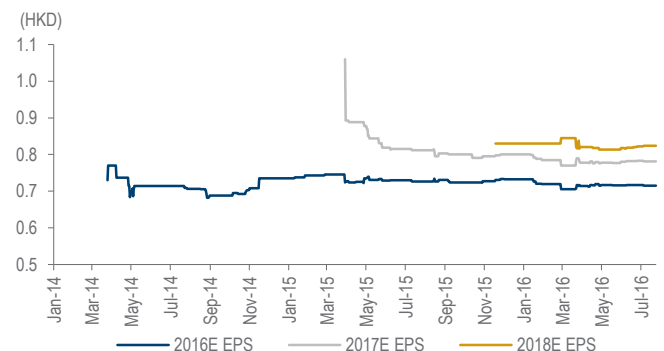
Earnings revisions



The consensus 2016-18 EPS forecasts for GDI have remained steady since 2014, given the stable business environment and high revenue visibility of the company.

Our 2016E EPS for GDI is 2% above consensus, likely as we have factored in the above-consensus 1Q16 results of the company. On the other hand, our 2018E EPS forecast is 6.5% below consensus, as we conservatively assume a flat contracted price for the Hong Kong water supply over the 2018-20 period.

GDI: Bloomberg-consensus EPS forecasts



Source: Bloomberg

Financial summary

Key assumptions

Year to 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Revenue from Dongshen Water	4,493	4,775	4,934	5,164	5,489	5,718	6,029	5,758
Revenue from Teemall	996	1,056	1,115	1,180	1,186	1,135	1,137	1,139
Revenue from power generation	525	520	498	479	471	1,265	1,509	1,452

Profit and loss (HKDm)

Year to 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Revenue from Dongshen Water	4,493	4,775	4,934	5,164	5,489	5,718	6,029	5,758
Revenue from Teemall	996	1,056	1,115	1,180	1,186	1,135	1,137	1,139
Other Revenue	1,672	1,905	1,940	2,082	2,497	3,916	4,989	5,214
Total Revenue	7,161	7,736	7,990	8,426	9,172	10,769	12,156	12,111
Other income	47	64	72	81	156	0	0	0
COGS	(2,534)	(2,649)	(2,666)	(2,778)	(3,028)	(3,358)	(4,026)	(4,065)
SG&A	(991)	(1,231)	(1,260)	(1,375)	(1,562)	(1,834)	(2,070)	(2,063)
Other op. expenses	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Operating profit	4,308	4,662	5,463	5,358	4,400	5,616	6,060	5,983
Net-interest inc./(exp.)	(77)	108	268	431	521	483	494	620
Assoc/forex/extraord./others	191	152	313	312	325	151	116	92
Pre-tax profit	4,422	4,922	6,045	6,101	5,246	6,250	6,670	6,696
Tax	(937)	(954)	(1,099)	(1,138)	(957)	(1,140)	(1,217)	(1,221)
Min. int./pref. div./others	(478)	(554)	(520)	(566)	(384)	(509)	(597)	(654)
Net profit (reported)	3,007	3,414	4,426	4,397	3,905	4,601	4,856	4,820
Net profit (adjusted)	2,230	2,619	3,249	3,500	4,201	4,563	4,856	4,820
EPS (reported)(HKD)	0.482	0.548	0.710	0.705	0.624	0.736	0.776	0.771
EPS (adjusted)(HKD)	0.358	0.420	0.521	0.561	0.672	0.730	0.776	0.771
EPS (adjusted fully-diluted)(HKD)	0.357	0.419	0.519	0.560	0.671	0.729	0.776	0.771
DPS (HKD)	0.180	0.200	0.230	0.280	0.340	0.371	0.404	0.432
EBIT	4,308	4,662	5,463	5,358	4,400	5,616	6,060	5,983
EBITDA	5,328	5,721	6,530	6,429	5,525	7,006	7,528	7,525

Cash flow (HKDm)

Year to 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Profit before tax	4,422	4,922	6,045	6,101	5,246	6,250	6,670	6,696
Depreciation and amortisation	1,020	1,059	1,067	1,071	1,124	1,390	1,468	1,541
Tax paid	(572)	(928)	(729)	(832)	(877)	(1,140)	(1,217)	(1,221)
Change in working capital	299	45	(153)	(73)	(280)	(261)	701	51
Other operational CF items	(374)	(548)	(1,514)	(1,082)	215	(135)	(3)	(51)
Cash flow from operations	4,794	4,550	4,716	5,185	5,429	6,105	7,620	7,016
Capex	(370)	(375)	(258)	(814)	(2,071)	(2,504)	(2,445)	(1,986)
Net (acquisitions)/disposals	(633)	(397)	1,077	(199)	(3,115)	0	0	0
Other investing CF items	(1,605)	100	(2,208)	(3,437)	643	165	165	191
Cash flow from investing	(2,608)	(672)	(1,388)	(4,450)	(4,543)	(2,338)	(2,280)	(1,795)
Change in debt	609	1,449	0	2,092	6,086	0	0	0
Net share issues/(repurchases)	4	2	11	2	92	0	0	0
Dividends paid	(1,151)	(1,170)	(1,340)	(1,498)	(2,050)	(2,324)	(2,525)	(2,699)
Other financing CF items	(802)	(2,751)	(293)	(890)	(3,174)	(174)	(1,163)	(1,140)
Cash flow from financing	(1,341)	(2,471)	(1,623)	(294)	955	(2,498)	(3,688)	(3,839)
Forex effect/others	0	0	0	0	0	0	0	0
Change in cash	957	1,407	1,793	432	1,399	1,268	1,652	1,381
Free cash flow	5,058	4,572	4,549	4,655	6,480	3,601	5,174	5,029

Source: FactSet, Daiwa forecasts

Financial summary continued ...

Balance sheet (HKDm)

As at 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Cash & short-term investment	3,543	4,472	6,532	7,002	9,295	10,564	12,215	13,597
Inventory	61	57	79	94	143	132	158	159
Accounts receivable	2,942	3,123	521	642	737	810	914	910
Other current assets	64	432	5,041	8,270	6,317	6,317	6,317	6,317
Total current assets	6,610	8,084	12,174	16,008	16,492	17,822	19,604	20,984
Fixed assets	10,401	12,560	13,617	15,763	19,410	21,404	21,799	21,706
Goodwill & intangibles	15,301	14,487	13,681	13,339	15,817	15,081	15,664	16,202
Other non-current assets	2,519	2,231	1,840	2,505	2,391	2,391	2,391	2,391
Total assets	34,832	37,362	41,312	47,615	54,110	56,697	59,457	61,282
Short-term debt	2,484	238	975	1,889	556	556	556	556
Accounts payable	2,545	2,639	2,631	3,164	4,385	4,186	5,018	5,067
Other current liabilities	983	682	771	1,080	837	837	837	837
Total current liabilities	6,012	3,559	4,376	6,134	5,778	5,579	6,411	6,460
Long-term debt	1,346	2,547	1,581	1,975	7,016	7,016	6,016	5,016
Other non-current liabilities	2,972	2,871	3,174	3,842	4,048	4,048	4,048	4,048
Total liabilities	10,331	8,978	9,131	11,951	16,843	16,644	16,475	15,525
Share capital	3,116	3,117	3,120	5,595	5,712	5,712	5,712	5,712
Reserves/R.E./others	18,535	20,921	24,194	24,672	25,760	28,038	30,369	32,490
Shareholders' equity	21,651	24,038	27,313	30,267	31,472	33,750	36,081	38,202
Minority interests	2,849	4,346	4,868	5,397	5,795	6,304	6,901	7,556
Total equity & liabilities	34,832	37,362	41,312	47,615	54,110	56,697	59,457	61,282
EV	77,163	76,635	75,367	76,779	78,358	77,598	75,543	73,816
Net debt/(cash)	288	(1,687)	(3,977)	(3,137)	(1,723)	(2,991)	(5,643)	(8,025)
BVPS (HKD)	3.474	3.856	4.378	4.850	5.031	5.396	5.768	6.107

Key ratios (%)

Year to 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Sales (YoY)	12.7	8.0	3.3	5.5	8.8	17.4	12.9	(0.4)
EBITDA (YoY)	14.6	7.4	14.1	(1.5)	(14.1)	26.8	7.4	(0.0)
Operating profit (YoY)	17.6	8.2	17.2	(1.9)	(17.9)	27.6	7.9	(1.3)
Net profit (YoY)	9.4	17.4	24.0	7.7	20.0	8.6	6.4	(0.7)
Core EPS (fully-diluted) (YoY)	9.3	17.4	24.0	7.7	19.9	8.7	6.5	(0.7)
Gross-profit margin	64.6	65.8	66.6	67.0	67.0	68.8	66.9	66.4
EBITDA margin	74.4	74.0	81.7	76.3	60.2	65.1	61.9	62.1
Operating-profit margin	60.2	60.3	68.4	63.6	48.0	52.1	49.9	49.4
Net profit margin	31.1	33.9	40.7	41.5	45.8	42.4	39.9	39.8
ROAE	10.9	11.5	12.7	12.2	13.6	14.0	13.9	13.0
ROAA	6.7	7.3	8.3	7.9	8.3	8.2	8.4	8.0
ROCE	15.9	15.7	16.6	14.4	10.4	12.1	12.5	11.9
ROIC	14.5	14.6	16.3	14.4	10.6	12.6	13.3	13.0
Net debt to equity	1.3	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Effective tax rate	21.2	19.4	18.2	18.7	18.2	18.2	18.2	18.2
Accounts receivable (days)	90.2	143.1	83.2	25.2	27.4	26.2	25.9	27.5
Current ratio (x)	1.1	2.3	2.8	2.6	2.9	3.2	3.1	3.2
Net interest cover (x)	55.9	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Net dividend payout	37.3	36.5	32.4	39.7	54.4	50.5	52.0	56.0
Free cash flow yield	6.6	6.0	6.0	6.1	8.5	4.7	6.8	6.6

Source: FactSet, Daiwa forecasts

Company profile

Guangdong Investment (GDI) engages in diversified businesses including water resources, property investment and development, department store operations, hotel operations and management and investments in other infrastructure projects. As of 31 December 2015, the total water supply capacity of GDI (subsidiary and associate) was 8.8mtpd.

Valuation

GDI: SOTP valuation

Segments	Enterprise value	Per share (HKD)	%	Method	
Water	53,475	8.55	69%	DCF	7.4% WACC
Property	10,999	1.76	14%	2016E NAV	30% Discount
Department stores	2,308	0.37	3%	2016E PER	10.8x PER
Hotel	1,591	0.25	2%	2016E NAV	30% Discount
Power	4,368	0.70	6%	DCF	8.6% WACC
Road	4,323	0.69	6%	DCF	7.9% WACC
Enterprise value	77,063	12.32			
Net debt	(2,991)	(0.48)			
Equity value	80,054	12.80			

Source: Daiwa forecasts

GDI: DCF valuation of water business

12 mths to 31 Dec, All figures in HK\$millions		Forecast							
		2016E	2017E	2018E	2019E	2020E	2021E	2022E	Terminal
Valuation Date	3-Aug-16	17-Oct-16	31-Dec-17	31-Dec-18	31-Dec-19	31-Dec-20	31-Dec-21	31-Dec-22	31-Dec-22
Next Balance Date	31-Dec-16								
First Year Cash Flow Adjustment	0.41								
Free Cash Flow									
EBITDA		4,672	4,944	4,750	4,737	4,724	4,793	4,779	
Less: Other Non Cash		(131)	(141)	(133)	(132)	(131)	(133)	(133)	
Less: Cash Tax Payable on EBIT		(682)	(731)	(695)	(691)	(688)	(697)	(694)	
Plus: Decrease in Working Capital		(120)	302	(137)	(27)	21	26	20	
Less: Capital Expenditure		(150)	(153)	(158)	(162)	(167)	(172)	(177)	
Free Cash Flow		3,589	4,220	3,628	3,724	3,758	3,815	3,795	3,795
Free Cash Flow for Valuation Purposes		3,589	4,220	3,628	3,724	3,758	3,815	3,795	3,795
WACC	7.4%	7.4%	7.4%	7.4%	7.4%	7.4%	7.4%	7.4%	7.4%
NPV of Free Cash Flow		3,536	3,816	3,054	2,919	2,742	2,592	2,400	32,416

Source: Daiwa forecasts

GDI water business: DCF calculation

Target gearing (debt/capital) (%)	40.0
Market risk premium (%)	10.0
Risk-free rate (%)	3.2
Cost of debt (%)	3.0
Cost of equity (%)	10.7
WACC (%)	7.4
Terminal Value	
Terminal Growth Rate	0.00%
Terminal WACC	7.40%
Estimated Terminal Free Cash Flow	3,795
NPV of Terminal Value (as at 31 Dec 2022)	51,253
NPV of Terminal Value (as at 03 Aug 2016)	32,416
DCF Valuation	
NPV of Forecasts (HKDm)	21,059
NPV of Terminal Value (HKDm)	32,416
Enterprise Value (HKDm)	53,475
Less: Net Debt (2016E)	0
Equity Value (HKDm)	53,475
No. Shares (m)	6,254
Per Share Equity Value	HK\$8.55

Source: Daiwa forecasts

GDI water business: DCF sensitivity analysis

Discount Rate	NPV of FCF	Enterprise Value	Equity Value	Equity Value Per Share (HKD)
4.90%	22,671	79,593	79,593	12.73
5.40%	22,332	72,436	72,436	11.58
5.90%	22,001	66,491	66,491	10.63
6.40%	21,679	61,474	61,474	9.83
6.90%	21,365	57,185	57,185	9.14
7.40%	21,059	53,475	53,475	8.55
7.90%	20,760	50,234	50,234	8.03
8.40%	20,469	47,380	47,380	7.58
8.90%	20,185	44,846	44,846	7.17
9.40%	19,908	42,581	42,581	6.81
9.90%	19,637	40,546	40,546	6.48

Source: Daiwa estimates and forecasts

Canvest Environment Protection Group (1381 HK)

 Target price: **HKD5.60** (from HKD5.60)

 Share price (3 Aug): **HKD3.54** | Up/downside: **+58.1%**

 5 4 3 2 1
Buy
 (unchanged)

High-quality WTE profile should support growth

- EPS CAGR of 35% for 2015-18E, driven by new capacity
- High-quality projects should lead to profitability once operational
- Reiterate Buy (1); maintain HKD5.60 TP, equal to a PEG of 0.65x

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What's new: Since early May 2015, Canvest's total waste-to-energy (WTE) capacity has risen by 87%, from 8.4ktpd to 15.7ktpd. We expect its operating capacity to increase by 137% (from 5.4ktpd to 12.8ktpd) over 2015-18, which should pave the way for the company to achieve a 35% EPS CAGR over the same period.

What's the impact: Is Canvest undervalued? The stock is trading at a 17.4x 2016E PER, higher than China Everbright International (CEI, 257 HK, HKD8.29, Hold [3]) and Beijing Enterprises Water (BEW, 371 HK, HKD4.62, Buy [1]). Before mid-2015, CEI had been trading at a premium to the other Hong Kong-listed WTE operators, but since mid-2015, the stock has been derated from a 25-30x 2016E PER to 17.5x currently. We believe CEI's derating has led to investors wondering whether the other WTE operators (including Canvest) still deserve to trade at PERs of 20-25x. We see Canvest's current 2016E 0.4x PEG as undemanding, compared with CEI's 0.5x, and forecast an EPS CAGR for Canvest of 35% for 2015-18, driven by new capacity additions. As such, we think the stock deserves to trade at a 20-25x PER, the same as when CEI was rerated over 2013-14 (at that time, CEI saw strong EPS/capacity growth). Our DCF-based valuation yields a 12-month TP of HKD5.60, equivalent to a 2017E PER of 19.6x and a PEG of 0.65x.

High-quality profile, strong 1H16 results. Waste-treatment fees for China's new WTE projects have been falling since 2014. Some WTE projects now command treatment fees of just CNY20-30/tonne, much lower than the average range of CNY60-80/tonne before 2015. However, Canvest has maintained an equity IRR of 12% when selecting projects, higher than its listed peers (eg, CEI: >10%). The company has a bigger-than-peers pool of projects to choose from, as FB-MG upgrade projects usually feature higher IRRs than greenfield projects obtained from governments (Canvest's WTE projects have waste treatment fees of CNY80-110/tonne, strengthening the profitability of projects once operational). Given the commissioning of the 1.8ktpd Eco-Tech upgrade in October 2015 and the 1.5ktpd Zhangjiang in April 2016, we expect c.50% YoY recurring net profit growth in 1H16, up from HKD97m in 1H15, according to the positive profit alert issued on 3rd August 2016.

What we recommend: We cut our 2016 EPS by 6% to reflect our lower utilisation assumptions for the Zhanjiang project. Our DCF-based valuation yields a 12-month TP of HKD5.60, with a WACC of 7.1% (unchanged). Main risk: an unexpected slowdown in securing new WTE projects.

How we differ: Our 2017-18E EPS are 7% above the Bloomberg consensus as we have factored in all of Canvest's announced projects.

Forecast revisions (%)

Year to 31 Dec	16E	17E	18E
Revenue change	(3.0)	-	-
Net profit change	(5.6)	(0.2)	(0.2)
Core EPS (FD) change	(5.6)	(0.2)	(0.2)

Source: Daiwa forecasts

Share price performance



12-month range	2.86-3.82
Market cap (USDbn)	0.92
3m avg daily turnover (USDm)	1.81
Shares outstanding (m)	2,034
Major shareholder	Best Approach (63.4%)

Financial summary (HKD)

Year to 31 Dec	16E	17E	18E
Revenue (m)	1,375	2,222	2,256
Operating profit (m)	535	770	921
Net profit (m)	412	580	674
Core EPS (fully-diluted)	0.204	0.285	0.331
EPS change (%)	49.9	39.9	16.1
Daiwa vs Cons. EPS (%)	(0.1)	7.2	7.2
PER (x)	17.4	12.4	10.7
Dividend yield (%)	0.9	1.6	1.9
DPS	0.031	0.057	0.066
PBR (x)	2.5	2.2	1.9
EV/EBITDA (x)	12.8	9.6	8.1
ROE (%)	15.9	18.8	18.7

Source: FactSet, Daiwa forecasts

5 4 3 2 **1**

How do we justify our view?

Buy
(unchanged)

Growth outlook

✓ ✓ ✓ ✓ ✓

Valuation

✓ ✓ ✓ ✓ ✓

Earnings revisions

✓ ✓ ✓ ✓ ✓

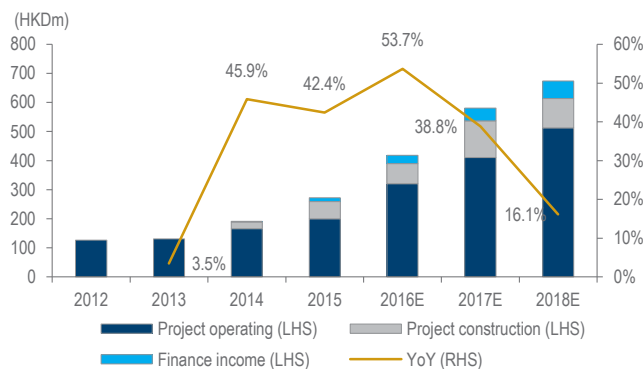
Growth outlook

✓ ✓ ✓ ✓ ✓

We forecast a net profit CAGR of 35% for 2015-18. Our forecast takes into account the June update for its Scivest Phase II, Xingyi project, Beiliu project and subsequent earnings dilution from a new share issuance to one of its pre-IPO investors. Upon securing the 1.05ktpd Beiliu project in March 2016, Canvest has exceeded its 2016 target of 15ktpd, achieving total WTE capacity of 15.7ktpd. As a result, its operating capacity should increase from 5.4ktpd currently to 9.1ktpd by end-2016/1H17, to 11.3ktpd by end-2017/1H18 and 12.8ktpd by end-2018.

Management confirmed its plans for a 30% expansion in contracted capacity (to 19-20ktpd) in 2017, which is not yet reflected in our forecasts.

Canvest: net profit forecasts by business segment



Source: Company, Daiwa forecasts

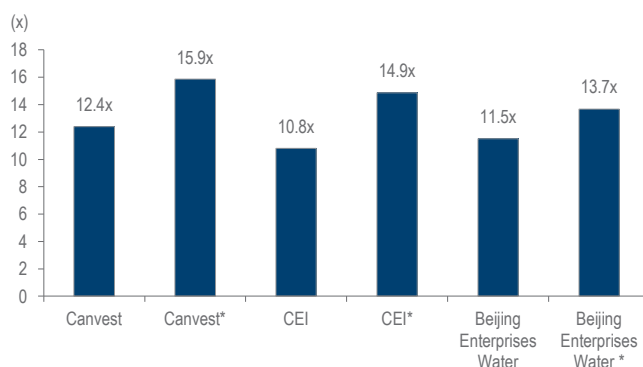
Valuation

✓ ✓ ✓ ✓ ✓

The stock is trading at a 12.4x 2017E PER, higher than CEI and BEW, on our forecasts. Our DCF-based valuation yields a 12-month TP of HKD5.60, equivalent to a 2017E PER of 19.6x.

We believe Canvest deserves to trade at a higher valuation than its peers considering its superior upgraded WTE business model, and because its earnings are more cash-based – 72% of its operating WTE capacity operates under the build-own-operate (BOO) model, or build-operate-transfer (BOT), with no guaranteed waste amount. This compares with 62% for CEI.

Canvest vs. China peers: PER comparison (2017E)



Source: Bloomberg and Daiwa forecasts

Note: For Canvest*, CEI* and Beijing Enterprises Water*, we have removed non-cash earnings from its BOT projects; share prices are as at 3 August 2016

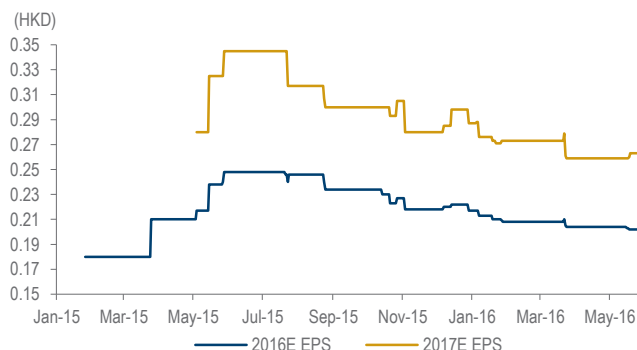
Earnings revisions

✓ ✓ ✓ ✓ ✓

The Bloomberg-consensus 2016-17 EPS forecasts for Canvest have been revised down by 9-10% YTD, mainly to reflect the lagged earnings impact from delays in the commissioning of its 1.5ktpd Zhangjiang Phase 1 project, from Jan-2016 to April-2016. We expect Canvest to pursue projects that are already operating to boost earnings, making the Bloomberg-consensus EPS forecasts subject to upward revisions, in our view.

Our 2016-18E EPS forecasts are 0-7% above the Bloomberg consensus figures, as we factor in all of Canvest's recently announced projects.

Canvest: Bloomberg-consensus EPS forecasts



Source: Bloomberg, Daiwa forecasts

Financial summary

Key assumptions

Year to 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Year-end operating WTE capacity (ktpd)	3.00	3.00	3.00	3.60	5.40	9.10	11.30	12.80
Waste processing capacity utilization rate (%)	56	97	90	91	101	88	84	86
Per unit on-grid generation of wet waste (KWh/ton)	345	369	403	378	360	376	409	421
Average waste treatment fee (CNY/ton)	89	89	101	110	109	105	102	104
Annual on-grid electricity sold (GWh)	154	408	409	525	555	916	1,324	1,677

Profit and loss (HKDm)

Year to 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Project operating	154	387	390	542	581	751	1,024	1,271
Construction revenue	0	0	0	248	583	584	1,134	894
Other Revenue	0	0	0	4	20	40	65	91
Total Revenue	154	387	390	794	1,185	1,375	2,222	2,256
Other income	1	13	13	52	53	68	96	122
COGS	(59)	(180)	(188)	(452)	(745)	(787)	(1,354)	(1,253)
SG&A	(17)	(35)	(42)	(97)	(112)	(121)	(196)	(203)
Other op.expenses	0	0	0	0	0	0	0	0
Operating profit	79	185	174	297	381	535	770	921
Net-interest inc./ (exp.)	(25)	(32)	(26)	(62)	(51)	(72)	(110)	(156)
Assoc/forex/extraord./others	0	0	0	0	0	0	0	0
Pre-tax profit	54	153	148	236	330	463	659	766
Tax	(11)	(26)	(17)	(27)	(41)	(51)	(79)	(92)
Min. int./pref. div./others	(4)	0	0	(17)	(17)	0	0	0
Net profit (reported)	39	127	131	191	272	412	580	674
Net profit (adjusted)	39	127	131	191	272	412	580	674
EPS (reported)(HKD)	0.026	0.084	0.087	0.127	0.136	0.204	0.285	0.331
EPS (adjusted)(HKD)	0.026	0.084	0.087	0.127	0.136	0.204	0.285	0.331
EPS (adjusted fully-diluted)(HKD)	0.026	0.084	0.087	0.127	0.136	0.204	0.285	0.331
DPS (HKD)	0.000	0.000	0.000	0.000	0.000	0.031	0.057	0.066
EBIT	79	185	174	297	381	535	770	921
EBITDA	107	225	216	402	500	690	997	1,182

Cash flow (HKDm)

Year to 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Profit before tax	54	153	148	236	330	463	659	766
Depreciation and amortisation	28	40	42	105	119	155	227	261
Tax paid	0	(10)	(29)	(20)	(14)	(51)	(79)	(92)
Change in working capital	(33)	(19)	29	36	75	(29)	129	243
Other operational CF items	28	40	30	(154)	(541)	(552)	(1,088)	(829)
Cash flow from operations	76	204	221	202	(31)	(14)	(152)	348
Capex	(122)	(34)	(33)	(207)	(367)	(806)	(372)	(113)
Net (acquisitions)/disposals	26	(16)	0	(113)	(356)	0	0	0
Other investing CF items	0	0	(176)	53	72	6	4	3
Cash flow from investing	(96)	(50)	(209)	(267)	(651)	(800)	(368)	(109)
Change in debt	60	(23)	(103)	(105)	339	662	678	14
Net share issues/(repurchases)	0	0	0	1,088	(10)	112	0	0
Dividends paid	0	0	0	0	0	(25)	(83)	(124)
Other financing CF items	(22)	(143)	95	362	(504)	(78)	(114)	(159)
Cash flow from financing	38	(166)	(8)	1,345	(176)	670	481	(268)
Forex effect/others	1	0	1	(0)	(21)	0	0	0
Change in cash	19	(12)	5	1,278	(879)	(144)	(40)	(29)
Free cash flow	(46)	170	187	(6)	(399)	(820)	(524)	236

Source: FactSet, Daiwa forecasts

Financial summary continued ...

Balance sheet (HKDm)

As at 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Cash & short-term investment	56	45	183	1,461	606	462	422	393
Inventory	2	3	2	1	0	4	7	7
Accounts receivable	72	92	158	103	159	196	329	346
Other current assets	0	0	46	1	38	84	136	170
Total current assets	130	139	389	1,566	803	746	895	915
Fixed assets	526	490	472	530	965	1,694	1,931	1,889
Goodwill & intangibles	175	175	181	1,271	1,915	2,132	2,616	2,860
Other non-current assets	182	184	198	400	785	1,027	1,495	1,792
Total assets	1,014	989	1,241	3,767	4,468	5,599	6,936	7,456
Short-term debt	96	148	88	253	321	520	690	694
Accounts payable	387	243	64	213	498	468	631	587
Other current liabilities	4	2	3	2	3	3	3	3
Total current liabilities	486	393	154	468	823	992	1,324	1,283
Long-term debt	399	324	294	776	1,099	1,561	2,070	2,081
Other non-current liabilities	26	43	31	106	212	212	212	212
Total liabilities	912	760	479	1,349	2,134	2,765	3,606	3,576
Share capital	0	0	0	20	20	20	20	20
Reserves/R.E./others	102	229	676	2,295	2,314	2,813	3,310	3,860
Shareholders' equity	102	229	676	2,315	2,334	2,833	3,330	3,880
Minority interests	0	0	86	103	0	0	0	0
Total equity & liabilities	1,014	989	1,241	3,767	4,468	5,599	6,936	7,456
EV	7,640	7,628	7,485	6,872	8,015	8,821	9,539	9,583
Net debt/(cash)	439	427	198	(433)	814	1,620	2,338	2,382
BVPS (HKD)	0.068	0.153	0.451	1.157	1.167	1.393	1.637	1.907

Key ratios (%)

Year to 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Sales (YoY)	n.a.	150.6	0.8	103.5	49.2	16.1	61.6	1.5
EBITDA (YoY)	n.a.	110.3	(3.8)	86.1	24.2	38.0	44.5	18.6
Operating profit (YoY)	n.a.	134.5	(5.6)	70.7	28.1	40.4	43.8	19.7
Net profit (YoY)	n.a.	226.6	3.5	45.9	42.4	51.5	40.8	16.1
Core EPS (fully-diluted) (YoY)	n.a.	226.6	3.5	45.8	6.9	49.9	39.9	16.1
Gross-profit margin	61.5	53.4	51.9	43.1	37.1	42.8	39.1	44.4
EBITDA margin	69.2	58.1	55.4	50.7	42.2	50.2	44.9	52.4
Operating-profit margin	50.9	47.7	44.6	37.5	32.2	38.9	34.6	40.8
Net profit margin	25.1	32.7	33.6	24.1	23.0	30.0	26.1	29.9
ROAE	75.7	76.4	28.9	12.8	11.7	15.9	18.8	18.7
ROAA	7.6	12.6	11.7	7.6	6.6	8.2	9.3	9.4
ROCE	26.3	28.4	18.9	13.0	10.6	12.4	14.0	14.5
ROIC	11.5	25.5	19.0	17.9	13.0	12.5	13.4	13.6
Net debt to equity	428.4	186.6	29.3	n.a.	34.9	57.2	70.2	61.4
Effective tax rate	20.8	17.3	11.7	11.6	12.4	11.0	12.0	12.0
Accounts receivable (days)	84.5	77.1	117.1	60.2	40.4	47.1	43.1	54.6
Current ratio (x)	0.3	0.4	2.5	3.4	1.0	0.8	0.7	0.7
Net interest cover (x)	3.1	5.8	6.7	4.8	7.4	7.4	7.0	5.9
Net dividend payout	0.0	0.0	0.0	0.0	0.0	15.0	20.0	20.0
Free cash flow yield	n.a.	2.4	2.6	n.a.	n.a.	n.a.	n.a.	3.3

Source: FactSet, Daiwa forecasts

Company profile

Canvest is a leading WTE provider focused on the development, management and operation of WTE plants. As of end-2015, Canvest had a total MSW processing capacity of 6.9ktpd and was ranked the second-largest WTE provider in Guangdong Province, occupying 13.0% of the market

Valuation

Canvest: DCF valuation

12 mths to 31 Dec, All figures in HKDm	Forecast										Terminal
	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2027E	2028E		
Valuation Date	3-Aug-16	17-Oct-16	31-Dec-17	31-Dec-18	31-Dec-19	31-Dec-20	31-Dec-21	31-Dec-22	31-Dec-27	31-Dec-28	31-Dec-28
Next Balance Date	31-Dec-16										
First Year Cash Flow Adjustment	0.41										
Free Cash Flow											
EBITDA (IFRIC)		690	997	1,182	1,267	1,359	1,388	1,448	1,431	1,395	
Less: Construction Revenue		(584)	(1,134)	(894)	(251)	(590)	(232)	0	0	0	
Plus: Construction Cost		487	944	745	209	492	194	0	0	0	
Plus: Re-statement of Operational Income		(20)	(31)	(35)	(9)	(6)	3	11	14	13	
Non-IFRIC EBITDA		572	777	998	1,217	1,255	1,352	1,460	1,445	1,408	
Less: Adjusted Cash Tax Payable on EBIT		(40)	(56)	(74)	(96)	(119)	(150)	(189)	(285)	(281)	
Plus: Decrease in Working Capital		(71)	26	(61)	(131)	70	(74)	(47)	0	(1)	
Less: Capital Expenditure (incl. BOT construction)		(1,292.7)	(1,316.7)	(857.6)	(300.0)	(603.9)	(293.8)	(91.9)	(94.4)	(92.3)	
Free Cash Flow		(831.5)	(569.9)	5.8	689.1	602.6	834.2	1,131.6	1,065.2	1,033.9	1,054.6
Free Cash Flow for Valuation Purposes		(831.5)	(569.9)	5.8	689.1	602.6	834.2	1,131.6	1,065.2	1,033.9	1,054.6
WACC	7.2%	7.2%	7.2%	7.2%	7.2%	7.2%	7.2%	7.2%	7.2%	7.2%	7.2%
NPV of Free Cash Flow		(819.7)	(516.9)	5.0	544.2	444.0	573.5	725.9	483.3	437.7	8,639.6

Source: Daiwa forecasts

Canvest: DCF calculation

Target gearing (debt/capital) (%)	60
Market risk premium (%)	8.9
Risk-free rate (%)	4.5
Cost of debt (%)	5.5
Cost of equity (%)	11.32
WACC (%)	7.17
Terminal Value	
Terminal Growth Rate	2.00%
Terminal WACC	7.17%
Estimated Terminal Free Cash Flow	1,055
NPV of Terminal Value (as at 31 Dec 2027)	20,410
NPV of Terminal Value (as at 3 Aug 2016)	8,640
DCF Valuation	
NPV of Forecasts (HKDm)	4,298
NPV of Terminal Value (HKDm)	8,640
Enterprise Value (HKDm)	12,938
Less: Net Debt (2016E)	-1,620
Equity Value (HKDm)	11,318
No. Shares (m)	2,021
Per Share Equity Value	5.60

Source: Daiwa forecasts

Canvest: DCF sensitivity analysis

Discount Rate	NPV of FCF	Enterprise Value	Equity Value	Equity Value Per Share (HKD)
4.7%	5,426.91	27,866.01	26,246.06	12.99
5.2%	5,179.44	22,990.17	21,370.22	10.58
5.7%	4,943.45	19,445.87	17,825.92	8.82
6.2%	4,718.33	16,753.97	15,134.03	7.49
6.7%	4,503.50	14,640.64	13,020.69	6.44
7.2%	4,298.42	12,938.02	11,318.07	5.60
7.7%	4,102.58	11,537.47	9,917.52	4.91
8.2%	3,915.51	10,365.59	8,745.65	4.33
8.7%	3,736.75	9,370.99	7,751.04	3.84
9.2%	3,565.87	8,516.61	6,896.66	3.41
9.7%	3,402.49	7,775.04	6,155.10	3.05

Source: Daiwa estimates and forecasts

China Everbright International (257 HK)

 Target price: **HKD8.90** (from HKD9.50)

 Share price (3 Aug): **HKD8.29** | Up/downside: **+7.3%**

 5 4 3 **2** 1

Outperform
 (unchanged)

Refocusing on its waste-to-energy identity

- Good progress on new waste-to-energy (WTE) projects YTD
- Successful spin-off of greentech business could restore valuation
- Reiterating our Outperform (2) rating with a revised TP of HKD8.90

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What's new: CEI's shares are down 17% YTD, vs. a 6% rise for peer Canvest (1381 HK, HKD3.54, Buy [1]), likely due to market concerns about its biomass exposure and extended project construction. The stock is trading at a 14.6x 2016E PER, which is 1.3SD below its past-5-year average and its trough level since 2013. We expect positive catalysts, such as the planned spin-off of its greentech business (mainly biomass) and the large-scale commissioning of new WTE projects for 2H16-1H17, to prompt a rerating of CEI to at least a 19x forward PER (its past-5.5-year average).

What's the impact: Robust pipeline for WTE business, in-line 1H16 results. Since end-2015, CEI has seen 7 new projects commence construction (total of 11 under construction currently), signalling a 58% rise in operating capacity, from 19ktpd at end-2015 to 30ktpd by end-2017E. Projects to be completed include the 2,000tpd Nanjing WTE Project Phase II and 1,000tpd Jiangyin WTE Project Phase II – large-scale expansions that should see a 15%-plus equity IRR. Hence, we consider concerns in the market over CEI's prolonged WTE construction as overdone. YTD, it has maintained a robust new WTE project pipeline of 7 projects (total investment: CNY4.5bn) with capacity of 54.4ktpd. According to the latest new project construction schedule, we expect c.20% YoY recurring net profit growth to c.HKD1.1bn in 1H16 vs. HKD907m in 1H15.

Greentech spin-off could be a catalyst. CEI aims to shift its focus back to being a pure WTE business through a planned spin-off of its greentech segment (mainly biomass, hazardous waste treatment and wind/solar). We believe one reason for the stock's derating (from 30x forward PER to about 13x over the past 12 months) has been the concern about CEI's investment in biomass projects. By divesting these biomass-WTE integrated projects (targeted for 2H16), CEI should be able to restore its investment identity as a leading WTE operator in China, which in turn could minimise its "conglomerate discount" and support a potential rerating of its PER.

What we recommend: We reiterate our Outperform (2) rating on CEI and cut our DCF-based 12-month TP from HKD9.50 to HKD8.90, implying a 14.6x 2016E PER. We increase our WACC from 8.9% to 9.0% due to the increasing market risk premium. The main risks: delays in project execution and more exposure to low-IRR inland WTE projects.

How we differ: Our 2016E EPS is 3% below consensus while our 2017E EPS is 4% above consensus due to differences in our assumptions on the timing of CEI's WTE project construction and/or commencement. Also, we are more conservative on the profit contribution from biomass projects which are soon to start mass-scale production.

Forecast revisions (%)

Year to 31 Dec	16E	17E	18E
Revenue change	0.3	0.4	0.1
Net profit change	-	-	-
Core EPS (FD) change	-	-	-

Source: Daiwa forecasts

Share price performance



12-month range	7.14-12.88
Market cap (USDbn)	4.79
3m avg daily turnover (USDm)	7.39
Shares outstanding (m)	4,484
Major shareholder	China Everbright Holdings (41.3%)

Financial summary (HKD)

Year to 31 Dec	16E	17E	18E
Revenue (m)	11,872	16,032	14,841
Operating profit (m)	4,260	5,489	6,260
Net profit (m)	2,549	3,431	3,811
Core EPS (fully-diluted)	0.569	0.765	0.850
EPS change (%)	22.3	34.6	11.1
Daiwa vs Cons. EPS (%)	(3.3)	4.0	0.0
PER (x)	14.6	10.8	9.8
Dividend yield (%)	2.1	2.8	3.1
DPS	0.171	0.230	0.257
PBR (x)	2.0	1.7	1.5
EV/EBITDA (x)	10.7	9.4	8.7
ROE (%)	14.1	17.0	16.7

Source: FactSet, Daiwa forecasts

5 4 3 **2** 1

How do we justify our view?

Outperform
(unchanged)

Growth outlook



Valuation



Earnings revisions



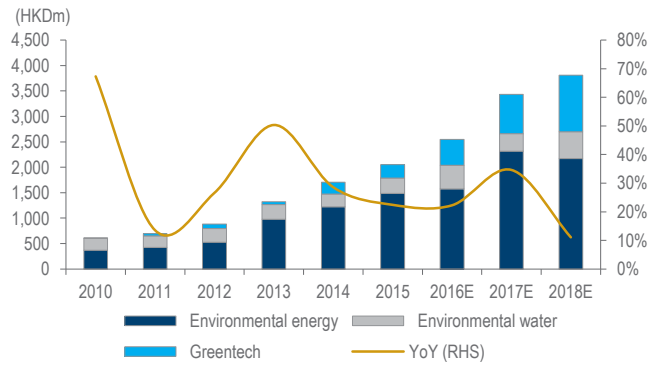
Growth outlook



We believe CEI has a proven ability to secure and execute new projects, as evidenced by its 33% WTE capacity CAGR for 2010-15. Based on currently secured projects, we expect that by end-2017 CEI would operate 39 WTE projects with waste-processing capacity of 30.35ktpd (including food and sludge), which would be equivalent to a CAGR of 27% for its WTE operating capacity for 2015-18E.

The WTE business is the main driver of our forecast for CEI to deliver a net profit CAGR of 22% for 2015-18.

CEI: adjusted recurring net profit from operating business



Source: Company, Daiwa forecasts

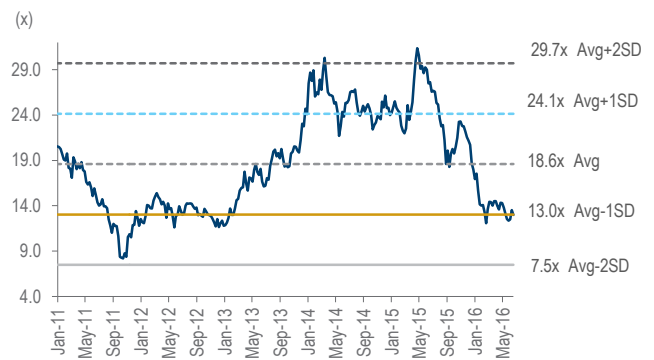
Valuation



CEI's share price has retreated by over 34% since early November 2015, and has been trading in a range of 12-14x 1-year forward rolling PER since then, representing its past-3-year trough valuation, or c.1.0SD below its past-5-year average.

We expect the spin-off of its greentech business to be a rerating catalyst for CEI. On 8 June 2016, CEI submitted the A1 form to the Hong Kong Exchange for the separate listing of its greentech business. As a result, we expect the market's focus on CEI to shift back to WTE, which should help restore the stock's PER valuation to close to 19x.

CEI: rolling one-year forward PER bands



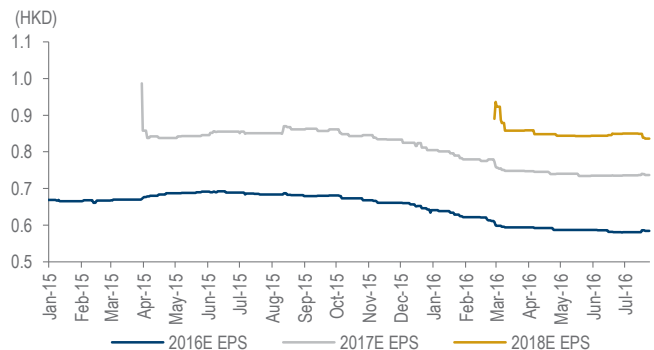
Source: Company, Daiwa forecasts

Earnings revisions



The Bloomberg-consensus EPS forecasts for 2016-18 have been relatively flat since CEI's 2015 results announcement at the end of February 2016.

CEI: Bloomberg-consensus EPS forecasts



Source: Bloomberg

Financial summary

Key assumptions

Year to 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Year-end WTE waste treatment capacity (ktpd)	8.15	8.15	9.65	14.55	19.15	22.35	30.35	38.90
Average household waste treatment fee (CNY/ton)	76	78	80	82	82	82	82	82
On-grid electricity generated - WTE (GWh)	553	825	1,069	1,390	1,914	2,283	2,923	3,930
Waste water treated (mn tonnes)	501	510	527	586	899	1,212	1,287	1,331
Average WWT tariff (CNY/ton)	1.30	1.34	1.41	1.48	1.57	1.51	1.52	1.53

Profit and loss (HKDm)

Year to 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Environmental energy	2,161	1,742	3,626	4,202	5,400	6,587	9,820	7,607
Environmental water	805	1,267	1,291	1,051	1,815	2,735	1,933	2,434
Other Revenue	521	401	403	1,103	1,319	2,550	4,280	4,801
Total Revenue	3,487	3,410	5,320	6,355	8,535	11,872	16,032	14,841
Other income	58	97	144	251	436	316	370	481
COGS	(2,048)	(1,726)	(2,944)	(3,387)	(4,626)	(6,978)	(9,662)	(7,918)
SG&A	(204)	(226)	(302)	(424)	(585)	(757)	(1,038)	(908)
Other op. expenses	(32)	(72)	(91)	(115)	(184)	(193)	(213)	(235)
Operating profit	1,260	1,483	2,127	2,680	3,576	4,260	5,489	6,260
Net-interest inc./(exp.)	(247)	(313)	(316)	(381)	(452)	(474)	(482)	(668)
Assoc/forex/extraord./others	0	0	0	(1)	(6)	0	0	0
Pre-tax profit	1,014	1,171	1,812	2,299	3,119	3,786	5,007	5,592
Tax	(290)	(267)	(447)	(534)	(783)	(909)	(1,202)	(1,342)
Min. int./pref. div./others	(28)	(23)	(40)	(62)	(251)	(328)	(374)	(439)
Net profit (reported)	696	881	1,325	1,703	2,085	2,549	3,431	3,811
Net profit (adjusted)	696	881	1,325	1,703	2,085	2,549	3,431	3,811
EPS (reported)(HKD)	0.190	0.233	0.326	0.380	0.465	0.569	0.765	0.850
EPS (adjusted)(HKD)	0.190	0.233	0.326	0.380	0.465	0.569	0.765	0.850
EPS (adjusted fully-diluted)(HKD)	0.188	0.231	0.326	0.380	0.465	0.569	0.765	0.850
DPS (HKD)	0.045	0.064	0.090	0.110	0.185	0.171	0.230	0.257
EBIT	1,260	1,483	2,127	2,680	3,576	4,260	5,489	6,260
EBITDA	1,292	1,555	2,218	2,796	3,760	4,453	5,702	6,496

Cash flow (HKDm)

Year to 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Profit before tax	1,014	1,171	1,812	2,299	3,119	3,786	5,007	5,592
Depreciation and amortisation	58	81	90	114	183	193	213	235
Tax paid	(86)	(143)	(156)	(173)	(217)	(454)	(601)	(671)
Change in working capital	(832)	(1,766)	(2,424)	(2,676)	(4,839)	(1,194)	(8,520)	(6,143)
Other operational CF items	375	367	315	314	217	474	482	668
Cash flow from operations	528	(290)	(364)	(123)	(1,538)	2,804	(3,419)	(318)
Capex	(946)	(732)	(302)	(1,086)	(1,082)	(645)	(849)	(713)
Net (acquisitions)/disposals	0	649	(254)	(27)	(2,344)	0	0	0
Other investing CF items	72	(980)	(394)	675	751	0	0	0
Cash flow from investing	(874)	(1,063)	(950)	(439)	(2,676)	(645)	(849)	(713)
Change in debt	1,186	829	807	1,187	6,793	(3,940)	6,155	3,003
Net share issues/(repurchases)	8	1,179	3,662	86	138	0	0	0
Dividends paid	(130)	(246)	(263)	(448)	(560)	(844)	(872)	(1,080)
Other financing CF items	(422)	(304)	(312)	(542)	(166)	(474)	(482)	(668)
Cash flow from financing	642	1,458	3,894	283	6,204	(5,258)	4,802	1,255
Forex effect/others	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Change in cash	296	105	2,579	(279)	1,989	(3,099)	534	224
Free cash flow	(419)	(1,021)	(666)	(1,209)	(2,620)	2,159	(4,268)	(1,031)

Source: FactSet, Daiwa forecasts

Financial summary continued ...

Balance sheet (HKDm)

As at 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Cash & short-term investment	1,900	2,797	5,815	5,150	6,673	3,575	4,109	4,333
Inventory	43	65	76	117	202	201	288	304
Accounts receivable	1,570	1,851	2,319	3,185	4,607	5,312	7,259	8,006
Other current assets	0	26	35	35	5	5	5	5
Total current assets	3,513	4,739	8,244	8,487	11,488	9,092	11,660	12,648
Fixed assets	846	1,423	1,374	1,511	2,350	2,450	2,609	2,765
Goodwill & intangibles	1,116	634	1,117	3,406	4,419	4,771	5,248	5,569
Other non-current assets	8,405	9,787	12,736	17,796	22,366	22,940	30,674	36,287
Total assets	13,880	16,583	23,471	31,200	40,623	39,253	50,191	57,269
Short-term debt	1,064	1,635	1,780	2,611	3,410	2,560	3,887	4,534
Accounts payable	1,423	1,191	1,734	2,302	2,794	2,877	4,126	4,359
Other current liabilities	52	58	58	68	119	119	119	119
Total current liabilities	2,539	2,884	3,572	4,981	6,323	5,557	8,132	9,013
Long-term debt	4,029	4,369	5,141	6,525	12,411	9,320	14,149	16,505
Other non-current liabilities	650	659	979	1,850	2,468	2,922	3,523	4,194
Total liabilities	7,218	7,913	9,692	13,357	21,203	17,799	25,804	29,712
Share capital	368	404	448	7,405	7,405	7,405	7,405	7,405
Reserves/R.E./others	5,822	7,946	12,926	8,858	9,791	11,496	14,055	16,786
Shareholders' equity	6,190	8,350	13,374	16,263	17,196	18,901	21,461	24,192
Minority interests	472	321	405	1,580	2,224	2,553	2,927	3,365
Total equity & liabilities	13,880	16,583	23,471	31,200	40,623	39,253	50,191	57,269
EV	40,835	40,698	38,427	42,454	48,093	47,580	53,575	56,793
Net debt/(cash)	3,193	3,208	1,107	3,986	9,147	8,306	13,927	16,706
BVPS (HKD)	1.684	2.068	2.983	3.627	3.835	4.216	4.786	5.395

Key ratios (%)

Year to 31 Dec	2011	2012	2013	2014	2015	2016E	2017E	2018E
Sales (YoY)	19.0	(2.2)	56.0	19.5	34.3	39.1	35.0	(7.4)
EBITDA (YoY)	21.9	20.3	42.7	26.1	34.5	18.4	28.1	13.9
Operating profit (YoY)	23.7	17.7	43.4	26.0	33.4	19.1	28.9	14.1
Net profit (YoY)	13.5	26.6	50.3	28.6	22.4	22.3	34.6	11.1
Core EPS (fully-diluted) (YoY)	13.5	22.9	40.8	16.6	22.4	22.3	34.6	11.1
Gross-profit margin	41.3	49.4	44.7	46.7	45.8	41.2	39.7	46.6
EBITDA margin	37.1	45.6	41.7	44.0	44.1	37.5	35.6	43.8
Operating-profit margin	36.1	43.5	40.0	42.2	41.9	35.9	34.2	42.2
Net profit margin	20.0	25.8	24.9	26.8	24.4	21.5	21.4	25.7
ROAE	12.1	12.1	12.2	11.5	12.5	14.1	17.0	16.7
ROAA	5.6	5.8	6.6	6.2	5.8	6.4	7.7	7.1
ROCE	29.1	26.6	30.8	29.1	28.8	29.3	30.9	28.7
ROIC	10.0	10.5	12.0	11.2	10.6	11.1	12.3	11.5
Net debt to equity	51.6	38.4	8.3	24.5	53.2	43.9	64.9	69.1
Effective tax rate	28.6	22.8	24.7	23.2	25.1	24.0	24.0	24.0
Accounts receivable (days)	135.8	183.1	143.0	158.0	166.6	152.5	143.1	187.7
Current ratio (x)	1.4	1.6	2.3	1.7	1.8	1.6	1.4	1.4
Net interest cover (x)	5.1	4.7	6.7	7.0	7.9	9.0	11.4	9.4
Net dividend payout	23.6	27.3	27.6	29.0	39.8	30.0	30.1	30.2
Free cash flow yield	n.a.	n.a.	n.a.	n.a.	n.a.	5.8	n.a.	n.a.

Source: FactSet, Daiwa forecasts

Company profile

CEI is a leading WTE investor and operator in China, with about a 6% market share in terms of operating WTE capacity at the end of 2014. At the end of 2015, CEI had 21 WTE plants in operation with a total designed household-waste-processing capacity of 18.6ktpd and a total designed power-generation capacity of 1,987GWh. It also had 8 WTE projects (waste-processing capacity: 9.3ktpd) under construction, and 40 WTE (19.4ktpd) at the preparation or concession stages as of end 2015.

Valuation

CEI: DCF valuation

12 mths to 31 Dec, All figures in HKDm	Forecast									
	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2034E	Terminal	
Valuation Date	3-Aug-16	17-Oct-16	30-Dec-17	30-Dec-18	30-Dec-19	30-Dec-20	30-Dec-21	30-Dec-22	30-Dec-34	30-Dec-34
Next Balance Date	31-Dec-16									
First Year Cash Flow Adjustment	0.41									
Free Cash Flow										
EBIT (IFRIC 12)	4,260	5,489	6,260	6,622	6,868	7,314	7,925		6,622	
BOT construction revenue	(7,485)	(10,360)	(7,398)	(5,937)	(3,811)	(2,925)	(5,454)		0	
BOT construction cost	5,988	8,288	5,918	4,750	3,049	2,340	4,363		0	
Reinstatement of operation income	548	605	984	1,284	1,521	1,849	1,992		4,577	
EBIT (non-IFRIC 12)	3,311	4,021	5,765	6,718	7,626	8,579	8,827		11,199	
Plus: Depreciation/amortization	193	213	235	259	288	320	355		829	
Less: Adjusted income tax	(549)	(704)	(987)	(1,126)	(1,297)	(1,458)	(1,495)		(1,566)	
Plus: Adjusted net change in working capital	(620)	(786)	(530)	(125)	(24)	(50)	(315)		152	
Less: Minority interest	(328)	(374)	(439)	(489)	(467)	(497)	(528)		(412)	
Less: Capital Expenditure	(6,633)	(9,137)	(6,631)	(5,541)	(3,942)	(3,320)	(5,404)		(1,035)	
Free Cash Flow	(4,626)	(6,767)	(2,587)	(303)	2,185	3,574	1,439		9,168	9,260
Free Cash Flow for Valuation Purposes	(4,545)	(5,992)	(2,102)	(226)	1,493	2,241	828		9,168	9,260
WACC	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%
NPV of Free Cash Flow	(4,545)	(5,992)	(2,102)	(226)	1,493	2,241	828		1,871	23,581

Source: Daiwa forecasts

CEI: DCF calculation

Target gearing (debt/capital) (%)	50%
Market risk premium (%)	10.00%
Risk-free rate (%)	3.50%
Cost of debt (%)	4.50%
Cost of equity (%)	14.65%
WACC (%)	9.01%
Terminal Value	
Terminal Growth Rate	1.00%
Terminal WACC	9.01%
Estimated Terminal Free Cash Flow	9,260
NPV of Terminal Value (as at 30 Jun 2034)	115,568
NPV of Terminal Value (as at 3 Aug 2016)	23,581
DCF Valuation	
NPV of Forecasts (HKDm)	24,620
NPV of Terminal Value (HKDm)	23,581
Enterprise Value (HKDm)	48,201
Less: Net Debt (2016E)	-8,306
Equity Value (HKDm)	39,895
No. Shares (m)	4,484
Per Share Equity Value	8.90

Source: Daiwa forecasts

CEI: sensitivity analysis

Discount Rate	NPV of FCF	Enterprise Value	Equity Value	Equity Value Per Share (HKD)
6.5%	35,795	88,344	80,038	17.85
7.0%	33,254	77,451	69,146	15.42
7.5%	30,878	68,324	60,019	13.39
8.0%	28,654	60,581	52,276	11.66
8.5%	26,571	53,943	45,638	10.18
9.0%	24,620	48,201	39,895	8.90
9.5%	22,791	43,193	34,887	7.78
10.0%	21,076	38,795	30,490	6.80
10.5%	19,467	34,910	26,604	5.93
11.0%	17,957	31,458	23,152	5.16
11.5%	16,539	28,376	20,070	4.48

Source: Daiwa forecasts







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Disclosure of investment ratings

Rating	Percentage of total
Buy*	65.8%
Hold**	21.8%
Sell***	12.4%

Source: Daiwa

Notes: data is for single-branded Daiwa research in Asia (ex Japan) and correct as of 30 June 2016.

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