

WATER

Every drop counts

June 27, 2008

India: Water stressed? A progressive decline

India's exploitable renewable fresh water resources are estimated at ~1,100-1,200 bcm. While the total water resource availability remains constant, water demand has grown steeply due to steady growth in population, increasing urbanization, changing lifestyles, and economic growth. Consequently, the per capita availability of water in India has declined to ~1,150 m³/year, which makes India a water stressed country.

A tale of regulatory failure

Water is a state subject, which implies that according to the Constitution of India it comes under the purview of the state government. The 74th Amendment of the Constitution delegated 18 functions, including water supply, to urban local bodies (ULB), and accorded constitutional status to these institutions as the third tier of the government. However, without commensurate increase in their revenue-raising powers, ULBs face inordinate fiscal stress, which has rendered most of them incapable of meeting the challenges of a rapidly urbanising society.

Changing regulations: Ray of hope

While the water situation in India is grim, reforms on the regulation front have begun to take shape and success of these can throw up potentially huge investment opportunities. We believe the investment opportunities in the water industry can be classified as those driven by water demand management, water supply management, water infrastructure upgradation, and water utilities management. Through our interaction with industry sources, we believe the water supply management opportunity could have a potential of ~INR 60 bn over the next ten years, while the potential of water infrastructure upgradation is likely to be ~INR 900 bn over the next five years, driven by irrigation infrastructure upgradation.

Water opportunity in India: Play it for the long term

While the number of companies serving the water industry in India abounds, it is difficult to identify public companies that have a substantial chunk of revenues coming from the water market. The potential for the water industry in India is immense; however, the current exposure to water industry in the listed space is limited. We continue to like companies with some presence in the water segment, as they can scale up their exposure to the water industry when the opportunity arises over the medium to long term. We prefer plays on urban water demand and water treatment and recycling space compared to irrigation, given the increasing investment in urban renewal and improvement in environment consciousness of corporate India. However, given the sheer size of the irrigation sector compared to urban water treatment and recycling, it is likely to result in higher growth for companies addressing the irrigation space.

In the urban water treatment and recycling space we prefer Thermax (TMX) and Larsen and Toubro (LNT). However, while TMX and LNT are leading listed players in the water industry, water segment forms a minuscule part of their revenues currently. In the irrigation space, we prefer Patel Engineering; irrigation projects form ~20% of its revenues. The water industry in India is in a nascent stage. Investor confidence is likely to increase as progress on the regulatory front gathers momentum. We believe the industry is set to realize its potential over the medium to long term as pressure to control the rapidly deteriorating dynamics of water is already showing on the regulator.

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An Overview

"We have been in this settlement (Kothrud, western Pune) for more than 12 years, since we worked as labourers on the construction of the apartment blocks that you see all around here... now we face an acute shortage of water. We have public standposts in the settlement, but water is available for only two to three hours a day. In such a short period of time, it is not possible for all of us to fill water. There is always a long queue and frequent fights. Women come to blows because some try to fill many handaas (small water containers) or jump the queue. Those who do not get their turn before the water is turned off have to walk 20 to 30 minutes to fetch water. Some pay up to INR 5 for one handaa of water. Some collect the water that keeps percolating in a small ditch by the side of the path near the water taps. As you can see, the water is turbid. We cannot drink it, but we can use it for washing. For a few weeks before municipal elections, one of the candidates who lives on the other side of this hill used to supply water to us via long hosepipes from taps in his house. After the elections, the hosepipes disappeared and our water supply stopped. Now, if we go to him to ask for water he drives us away as if we are beggars. It is so humiliating!"

*from interviews with women in Laxminagar, Pune, India.
Source: UN-HABITAT, 2004, as quoted in Millennium Project*

Ancient cities taking root close to fresh water bodies was not a coincidence; water nurtures civilisations. While this base fact has remained unchanged since ancient times, it has been progressively obscured by developments of the modern age. Increase in population and urbanisation have been two significant developments which have intensified the pressure on world water resources. The world's population, which was 2.5 bn in 1950, has increased 150% to over 6 bn in 2000. About half the world's population lives in urban centres today, compared to less than 15% in 1900.

With a weak and inefficient institutional framework, India has been unable to rise to the challenge of managing water resources in the face of the above two factors. Over the past three decades, the per capita water availability in the country has declined two-fifths. The urban water supply system is in need of an overhaul, water treatment capacities have grown at an abysmally low pace, and the area under irrigation needs to grow to feed an ever increasing population. We believe, insufficient regulatory action and not enough emphasis on water management is responsible for the current situation. However, we are beginning to see the first signs of that changing. The Jawaharlal Nehru National Urban Renewal Mission (JNNURM), an initiative dealing with the infrastructure needs of a rapidly urbanising India, has ~38% projects that have been sanctioned till date for improving water supply infrastructure in India. The states of Andhra Pradesh and Karnataka are leading the expansion of irrigation capacities. Hence, while the water situation in India is grim, opportunities have begun to bud.

The water industry in the country can be divided into demand management, water supply augmentation & treatment, water infrastructure, and water utilities. Different verticals have varying dynamics. While the number of companies serving the water industry in India abounds, it is difficult to identify public companies that have a substantial chunk of revenues coming from the water market. In this report, we will look at Thermax (TMX), Larsen and Toubro (LNT), Patel Engineering (PEL), Hindustan Dorr-Oliver (HDO) and Ion Exchange (ION), which have a presence in the water sector in India, however small. We believe, the water story in the country is a long drawn one and only at a later stage in the cycle can water come to contribute a substantial portion of revenues for companies covered. Nevertheless, as the cliché goes, 'catch them young'.

"How is it that water, which is so useful that life is impossible without it, has such a low price, while diamonds, which are quite unnecessary, have such a high price?" — Adam Smith

Water demand-supply dynamics: The progressive decline

According to various sources, India's exploitable renewable fresh water resources are estimated at ~1,100-1,200 bcm. Surface water accounts for a majority of fresh water resources in the country. However, there is an overlap between surface and ground water resources, as shown in the table below:

India: Water resources

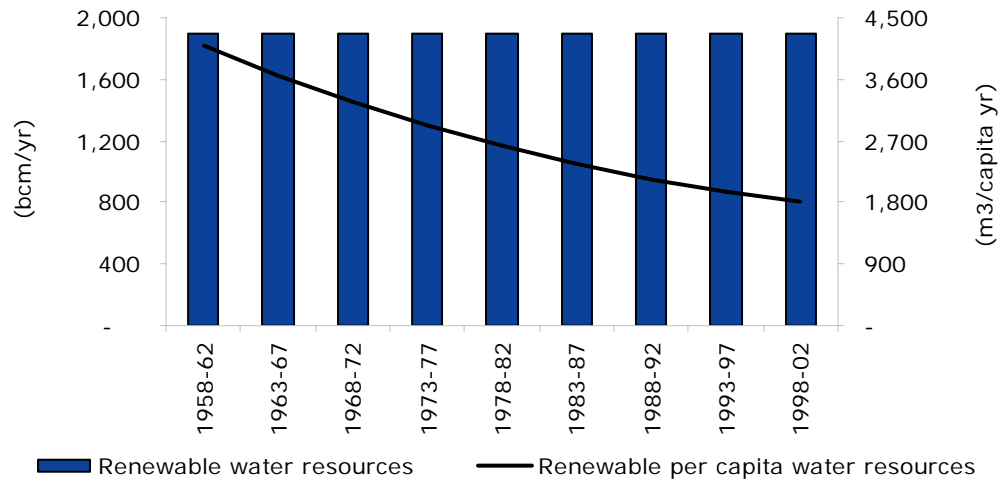
	1958-62	1963-67	1968-72	1973-77	1978-82	1983-87	1988-92	1993-97	1998-02	2003-07
Water resources: Total renewable (bcm/yr)	1,261	1,261	1,261	1,261	1,261	1,261	1,261	1,261	1,261	1,261
Water resources: Total renewable per capita (m ³ /capita yr)	2,724	2,432	2,171	1,947	1,755	1,583	1,432	1,305	1,201	1,149
Surface water: Produced internally (bcm/yr)	1,222	1,222	1,222	1,222	1,222	1,222	1,222	1,222	1,222	1,222
Groundwater: Produced internally (bcm/yr)	419	419	419	419	419	419	419	419	419	419
Overlap between surface water and ground water (bcm/yr)	380	380	380	380	380	380	380	380	380	380

Source: FAO Aquastat

Note: m³/capita yr - cubic meter per capita per year

While the total water resource availability remains constant, the per capita availability of water has declined steadily due to population growth. A per capita availability of less than 1,700 m³/year is termed a water stressed condition, while if it falls below 1,000 m³/year, it is termed as water scarcity condition. Per capita water availability in India stands at ~1,150 m³/year. While on an average we may be nearing the water scarce condition, on an individual river basin-wise situation, ~45% of Indian river basins are facing water stressed conditions.

Trend in renewable per capita water resources



Source: FAO Aquastat

The demand on water resources is generally classified according to end users. While agriculture constitutes the largest share of water demand, it is pertinent to note that the share of agricultural water demand is declining in contrast to an increase in the share of domestic and industrial water demand. We believe, this is a consequence of high industrial growth, coupled with lower growth in agriculture in the past decade.

Breakup of use based water demand

(%)	1973-77	1983-87	1988-92	1998-02
Agricultural water withdrawal	93.0	95.0	92.0	86.0
Domestic water withdrawal	3.0	3.0	5.0	8.0
Industrial water withdrawal	4.0	2.0	3.0	5.0

Source: FAO Aquastat

Steady growth in population over 1973-02 and changing lifestyles have also contributed to the steep growth in domestic water demand. It grew at a CAGR of 14.7% over 1973-02 compared to 6.7% and 4.3% in industrial and agricultural water demand, respectively, over the same period.

The future: Will it get worse before it gets better?

According to Ministry of Water Resources and National Commission on Integrated Water Resources Development (NCIWRD) estimates, demand for water is likely to increase at a CAGR of ~1.5% and ~1.3%, respectively, from 2010 to 2050. We are more comfortable with estimate of the former as it does not assume substantial increase in irrigation efficiency unlike the latter.

Water requirement for various sectors

Sector	Water demand in bcm					
	Standing sub-committee of MoWR			NCIWRD		
	2,010	2,025	2,050	2,010	2,025	2,050
Irrigation	688	910	1,072	557	611	807
Drinking water	56	73	102	43	62	111
Industry	12	23	63	37	67	81
Energy	5	15	130	19	33	70
Others	52	72	80	54	70	111
Total	813	1,093	1,447	710	843	1,180

Source: Ministry Of Water Resources, Edelweiss research

The peculiarity in the case of water is that supply driven by the hydrological cycle remains constant, while demand follows a linear path, driven by population growth, industrial growth, and change in lifestyle. Apart from the per capita availability of water, we look at the water dependency ratio to ascertain the stress on water resources in India (table below).

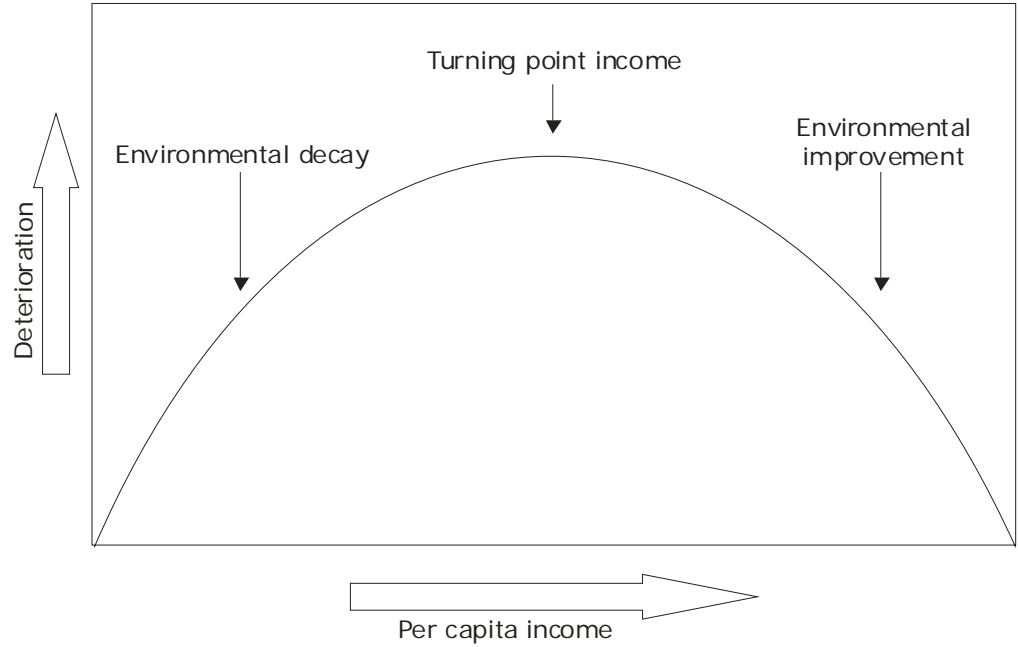
India: Water demand and supply over the years

	1973-77	1983-87	1988-92	1998-02	2010E	2025E	2050E
Water supply	1,261	1,261	1,261	1,261	1,261	1,261	1,261
Water demand	380	497	500	646	813	1,093	1,447
Water dependency ratio (%)	0.3	0.4	0.4	0.5	0.6	0.9	1.2

Source: FAO Aquastat

Driven by the increase in agricultural, domestic, and industrial demand of 64% in 2010E, the water dependency ratio is likely to be at dangerous levels. The declining water demand-supply dynamics can be explained by the Environmental Kuznets curve. According to it, in the initial part of economic development, the environment deteriorates as pollution increases. However, after a threshold, when basic needs are met, environment gets priority, which facilitates investments in the same (see chart below).

Environmental Kuznets curve



Source: AEI, Environmental Policy Outlook, Edelweiss research

While India may still be on the upward leg of the Kuznets curve, we believe, we are close to a threshold point from where investments in the water sector are likely to increase. We use the water dependency ratio as a guide to predict the threshold. The increasing water dependency ratio, according to us, implies that we are getting closer to the threshold point.

Water demand: The obscure details

In this section, we look at water demand based on end user industries.

Urban/domestic water demand

While we do not intend to paint a bleak scenario of urban water supply, it will not be an exaggeration if we say that India has progressively moved to a water stressed situation, driven by ineffective institutional set up and rapid urbanisation.

Water is a state subject, which implies that according to the Constitution of India it comes under the purview of the state government¹. The 74th Amendment of the Constitution delegated 18 functions, including water supply to urban local bodies (ULB), and accorded constitutional status to these institutions as the third tier of the government. However, without commensurate increase in their revenue-raising powers, ULBs face inordinate fiscal stress, which has rendered most of them incapable of meeting the challenges of a rapidly urbanising society.

Compounding the predicament in the institutional set up is the pace of urbanisation in the country. According to the 2001 census, India's urban population was 27.8% in 2001, up from 10.8% in 1901. The number of metropolitan cities rose from one in 1901 to 35 in 2001. Currently, ~30% of India's population lives in urban areas and by 2030 this is likely to increase to ~40%. Given the sheer size of the country's human capital, India is already the second-largest urban system in the world.

We believe, most problems encountered in the urban water supply sector in India have their genesis in the above two factors. We classify the two problems as macro issues afflicting the sector, while there are a host of micro issues resulting from the above. Of the various micro issues faced in the urban water supply sector, we believe the gravest ones are those of poor financial management indicated by high operating ratios, unmetered connections, water availability and quality. We detail these problems in the section below²:

Operating ratio: The average operating ratio (operating expenses/operating revenue) for Indian water utilities is at ~1.63x, implying higher expenses than revenues. While this reflects low productivity, more importantly, it reflects the subsidised character of urban water supply in India. Additionally, high operating ratio reflects lower number of metered connections. However, about one-third of urban water utilities (including Chennai 0.44x, Mumbai 0.49x, Bangalore 0.8x) have an operating ratio of less than 1x. The worst performers on this metric are Indore at 5.33x and Kolkata at 4.73x. Interestingly, Kolkata does not charge tariff for urban water supply, leading to a high operating ratio.

Unmetered connections: On an average, only ~25% of water connections are metered in urban India. A few water utilities like those in Bhopal and Mathura do not have water metering at all. This results in high unaccounted for water (UFW) and high operating ratio.

Water availability: According to a study by the Asian Development Bank on Indian utilities, average water supply in urban areas is ~4.3 hours/day. However, variance across different cities is substantial. Chandigarh has the longest available supply of ~12 hours/day, while Rajkot has a duration of ~0.33 hours/day, followed by Indore at ~0.75 hours/day. Health risks increase when water supply is less than 24 hours, due to contamination of water distribution pipes as a vacuum is created due to absence of water in pipes. Studies point to higher wastage in the absence of 24-hour water supply as water taps are left open even after storing water, thus increasing wastage. Lack of 24-hour supply also impacts the lower strata of the population as they have limited storage facilities. It is pertinent to note here that costs

¹ Besides State subjects, the Constitution of India defines Central and Concurrent subjects.

² The data in this section is taken from Benchmarking & data book of water utilities in India, 2007-Asian Development Bank and Ministry of Urban Development.

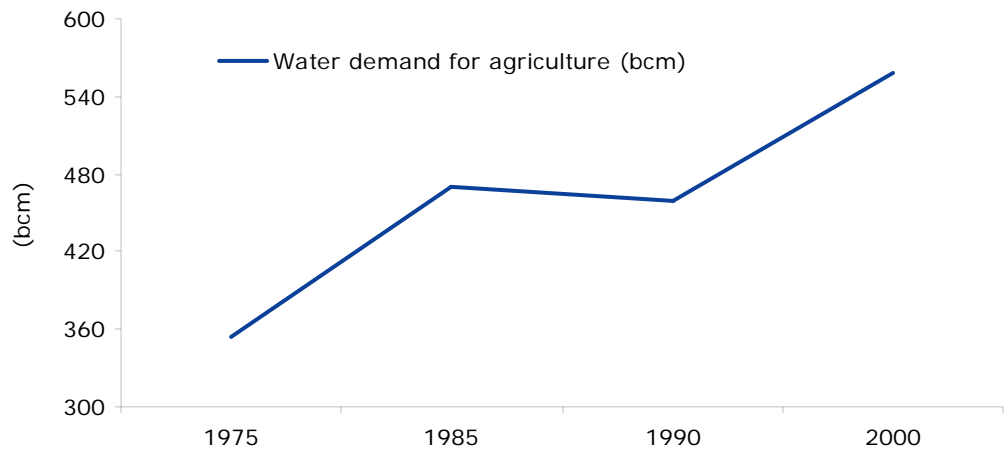
to consumers and utilities are lesser with 24-hour supply. Delivering ~123 litres/capita/day (average daily consumption per capita for urban areas) for one hour requires larger pipes than delivering the same amount of water over 24 hours.

The urban water supply situation is grim and we expect regulatory changes to drive reforms in the sector.

Agricultural water demand

India has total land of ~3.3 mn km². The total cultivable area is ~1.85 mn km², ~56% of the total area. The total land under cultivation has grown at 18% per year between 1950 and 1970, while it grew 2% per year from 1970 to 1990. The total cultivated area was estimated at 1.4 mn sq km in 1995. Agricultural demand for water is driven by the increase in area under irrigation. The area under irrigation in India has increased at a CAGR of ~5.05% over 1962-00.

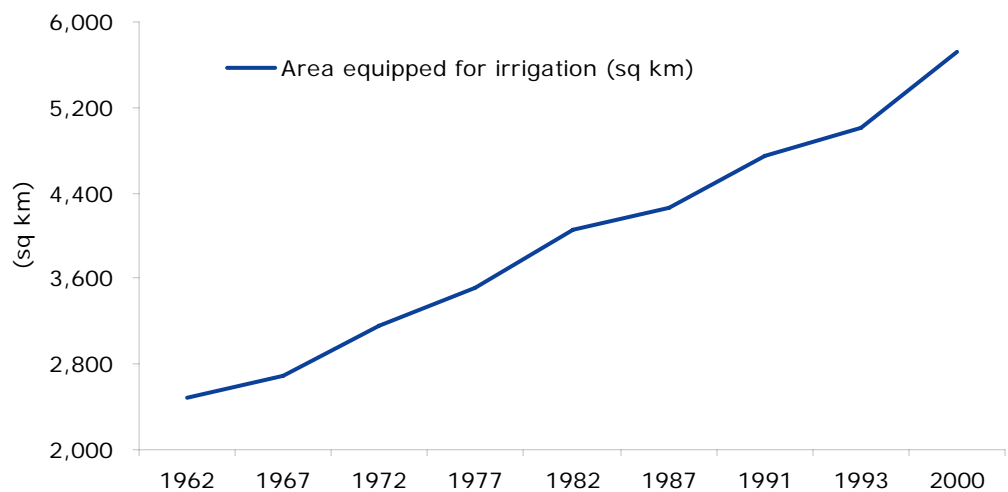
Water demand for agriculture



Source: Ministry Of Water Resources, Edelweiss research

Given the above backdrop, the annual agricultural water demand has grown at a CAGR of ~5.3% over 1975-00; in 2000, it stood at ~558.4 m³/p.a.

Growth in area under irrigation in India



Source: Ministry Of Water Resources, Edelweiss research

According to NCIWRD, India's population is expected to be ~1,346- 1,586 mn by 2050. Based on this, the country's total food requirement is estimated between 382 mn tonne and 449 mn tonne. Wastage, feed requirement, and seed requirement is estimated at 12.5% of food grain production.

Thus, food grain production must double to ~420 mn tonne from the current ~210 mn tonne to meet the projected requirement. Thus, on an average, food grain production needs to be enhanced by ~5 mn tonne per year. Accordingly, targeted growth of 25 mn tonne in food grain production is to be achieved in the Eleventh Plan.

Currently, the average yield rate of food grains in the country is at ~2.5 tonne per ha in areas under irrigation and ~1 tonne per ha in rain-fed areas. Therefore, with the introduction of irrigated agriculture, it can be presumed that there will be a net increase in food grain production by ~1.5 tonne per ha. As per the 16.5 mn ha target set for the Eleventh Plan for creation of irrigation potential, it is likely that food grain production will be enhanced by about 25 mn tonne when the created potential will be put into actual utilization.

Consequently, with population increase driving demand for food grains, we believe the demand for water for agricultural needs is likely to be on an uptrend.

However, like the urban water sector, the irrigation sector also has its set of challenges. The focus of the irrigation sector in developing countries like India has been on the supply side till now. The future merits a change in orientation towards proactive demand management under the auspices of the integrated water resources management (IWRM). However, this calls for a paradigm shift, which is easier said than done. Measures such as enacting new water laws, forming basin organisations out of erstwhile regional water departments, and proclaiming water as an economic good are simply not enough. Instead, the situation calls for radical initiatives such as enforcing the recently-drafted water laws, comprehensive water resource management at the basin level, and using price mechanisms to give priority to high-value users. Currently, the so-called IWRM initiatives in India have been unable to change the situation at the ground level. The new age irrigation framework demands promotion of the micro-irrigation technology like drip irrigation (to save water, decrease fertiliser consumption, and increase productivity), subsidies to farmers (bolstered by spreading awareness), and promoting sustainable irrigation methods.

Industrial water demand

Approximately 80% of the water used by industry is for heating and cooling, which is discharged after use as waste water or effluent. The balance is used directly in a variety of manufacturing processes. Practically all industrial uses end up polluting the water used, and only a small fraction of the water used is actually consumed. Industry, therefore, uses a huge amount of water and contaminates it heavily and ends up with the problem of having to dispose it of.

The highest consumers of water include thermal power plants, pulp and paper, textiles and iron and steel industries.

Industry wise water usage and discharge

Industrial sector	Annual wastewater water discharge (mcm)	Annual consumption (mcm)
Thermal power plants	27,001	35,157
Engineering	1,551	2,020
Pulp and paper	696	906
Textiles	637	830
Steel	397	517
Sugar	150	195
Fertiliser	56	74
Others	241	314
Total	30,729	40,012

Source: CSE India, Edelweiss research

As water has become scarce, agricultural, industrial, and domestic demand is competing more for a limited supply. The agriculture sector continues to dominate water use owing to its importance in the Indian economy, while industrial demands are increasing as the sector continues to grow.

Data on industrial water usage varies significantly amongst various sources. According to MoWR, industrial water use in India stands at about 40 bcm in 1999. Whereas according to the Central Pollution Control Board (CPCB), in 2000, Indian industry consumed about 10 bcm of water as process water and 30 bcm as cooling water. According to the World Bank, the water demand for industrial use and energy production will grow at 4.2% per year, rising from 67 bcm in 1995 to 228 bcm in 2025E.

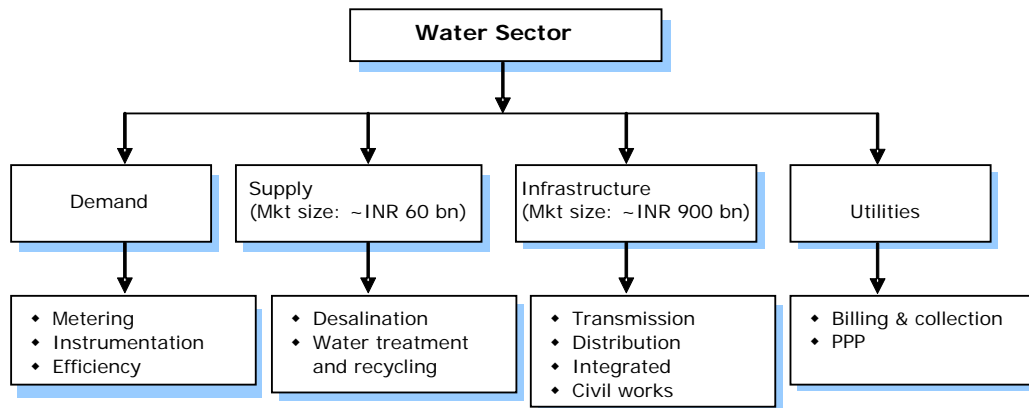
There have been cases in the past where industries had to be shut down due to shortage of water. Some cases are illustrated below:

- In a study undertaken by the Confederation of Indian Industry and the World Bank in 2003, to find out what constituted good investment climate in various parts of India, it was found that water availability is one of the major infrastructural bottlenecks companies in Tamil Nadu face. The study covered 1,099 manufacturing companies in four sectors—textiles, garments, consumer electronics, and pharmaceuticals— in 10 states and listed water as one of the major bottlenecks for future industrial growth in the country.
- In 2002, companies like Harihar Polyfibres (Karnataka) and the Indian Rayon plant (Nagda) shut shop for a few day due to non-availability of water.

Investment opportunities in water

Given the above facts, we believe, opportunities exist in various verticals of the water sector. We have identified the following verticals:

Investment opportunities in water



Source: Edelweiss research

Most of the activity in the water sector is happening in verticals of water infrastructure and water supply augmentation. The concept of private water utilities is still at nascent experimental stages in India. Demand management is likely to be taken up in the later stage of the water investment cycle as higher efficiencies can be obtained from upgradation in water infrastructure, while water supply augmentation can vastly increase the quantum of water supply. We look at the opportunities in the context of the issues dodging various end user sectors in the water industry.

Water opportunity matrix

	Water demand management	Water supply management	Water infrastructure	Water utilities
Domestic water demand	✓	✓	✓	✓
Irrigation water demand			✓	
Industrial water demand		✓		

Source: Edelweiss research

Opportunities in urban/ domestic water demand

The Jawaharlal Nehru National Urban Renewal Mission (JNNURM) launched in December 2005 is an attempt towards addressing the institutional shortcomings afflicting urban planning and infrastructure. We believe, JNNURM is likely to catalyze reforms and hence, further investments in the urban water supply sector over the long term. In the following paragraphs we look at the opportunities that are likely to be thrown up if JNNURM is successful in implementing a few economically self sustainable projects in the urban water supply sector.

Jawaharlal Nehru National Urban Renewal Mission (JNNURM)

It is estimated that ULBs will require total investments of ~INR 1,205 bn over 2005-12 to upgrade urban infrastructure.

Urban sector planned investment under JNNURM

Category	No. of cities	Investment required (over 7 years beginning 2005-06)	Annual fund requirement
Cities with over 4 mn population	7	571.4	81.6
Cities with 1-4 mn population	28	571.4	81.6
Selected cities with less than 1 mn population	28	62.5	8.9
Total	63	1,205.4	172.2

Source: Ministry of Urban Development, Government of India

Of the total investment requirement, ~INR 500 bn is likely to be provided as grant by the Union government over a seven year period. However, for accessing Union government grant, ULBs are obliged to initiate a set of mandatory reforms listed under JNNURM. The total investment is proposed to be shared among the Union government, state governments, and ULBs in the ratio of 35:15:50 for Category A cities, 50:20:30 for Category B cities, and 80:10:10 for Category C cities.

Number of cities covered under JNNURM

Category	No. of cities
A Cities/ UAs with 4 mn plus population as per 2001 census	7
B Cities/ UAs with 1-4 mn population as per 2001 census	28
C Selected cities/ UAs (State capitals and other cities/ UA of religious/ historic and tourist importance)	28

Source: Ministry of Urban Development, Government of India

As of May 2008, projects worth ~INR 285 bn were sanctioned under JNNURM. Water supply projects at ~INR 108 bn form a substantial chunk of the projects approved.

Breakup of projects sanctioned under JNNURM till date

Sector	No. of DPRs	Total approved cost (INR bn)
Development of heritage areas	1	0.4
Damage / Storm water drains	35	31.8
Mass rapid transport system	16	29.5
Other urban transport	12	5.9
Preservation of water bodies	1	0.0
Roads / Flyovers / ROB	61	23.3
Sewerage	57	69.4
Solid waste management	28	15.1
Urban renewal	7	1.6
Water supply	96	107.7
Total	314	285.0

Source: Ministry of Urban Development, Edelweiss research

We believe, JNNURM has the potential to address the issues impacting the urban infrastructure sector. To access Union government grants, ULBs need to implement mandatory reforms from the first year of the project, while at least two optional reforms need to be undertaken each year from 2005-12.

Opportunities abound in the urban water supply sector as India takes first tentative steps towards capacity build up. A few leading contractors addressing water supply projects have emerged over the years. While there are a few leading players in the water supply EPC business, as of now, water supply EPC business forms only a small percentage of their total

sales. Hence, investors are likely to end up buying a basket of business opposed to solely water supply EPC business.

Leading players in the water EPC business are likely to benefit from the impending capacity expansion in water supply and water treatment projects. However, we believe the pre qualifications criteria in the above projects is not stiff and hence, a larger universe of EPC players can participate in the water supply capacity expansion plans in the country. The water supply contractors industry can be split into three categories:

- **Large players:** Hindustan Dorr Oliver, Ion Exchange, Thermax, Degremont.
- **Medium sized players:** Aquatech, Fontus Water.
- **Smaller unorganized players:** Over 500.

Additionally, in the past few years, many large international players like Veolia Water, etc., have entered the market.

Completed water supply projects from 2002 till date

Promoter	Project Name	Contractor	Cost (INR bn)	Completion date
Hyd Metro. Water Supply & Sewerage Board	Krishna WSS (Hyd) - Phase I	Larsen & Toubro Nagarjuna Construction Co.	10.00	Apr-04
Mahindra Water Utilities	WSS (Tirupur)	Hindustan Construction Co. Bechtel Enterprises Inc. Mahindra Realty & Infra Devp. United Utilities International	9.70	Apr-05
Chennai Metropolitan Water Supply & Sewerage Board	WSS (Veeranam)	NA	7.20	May-04
Bangalore Water Supply & Sewerage Board	WSS (Bangalore)	NA	3.50	Dec-07
Gujarat Water Supply & Sewerage Board	WSS (Maliya-Morvi)	Essar Projects	1.73	May-02
Gujarat Water Supply & Sewerage Board	WSS (Maliya-Morvi)	Engineering Projects India Essar Projects	0.98	Jun-02
Gujarat Water Resources Devp. Corpn.	WSS (Mahesana)	Larsen & Toubro	0.92	Jan-06
Government of West Bengal	Arsenic Drinking WSS (Malda)	Gannon Dunkerley & Co.	0.64	Mar-03
Government of Gujarat	WSS (Bhavnagar)	Engineering Projects India	0.62	Apr-03
Government of West Bengal	WSS (North 24 Parganas)	Petron Civil Engineering	0.58	Jan-06
Government of Gujarat	WSS (Labhor-Fatepur)	Jyoti	0.44	Mar-07
Government of Gujarat	WSS (Khed-hathmati)	Larsen & Toubro	0.32	Mar-07
Gujarat Water Supply & Sewerage Board	WSS (Vav & Tharad)	NA	0.25	Jan-05
Maharashtra Jeevan Pradhikaran	Panvel-III (A) WSS	NA	0.24	Sep-07
Maharashtra Jeevan Pradhikaran	Khed WSS	NA	0.23	Jun-07
Ahmedabad Municipal Corpn.	WSS (Ahmedabad)	NA	0.21	Jan-07
Maharashtra Jeevan Pradhikaran	WSS (Kallam)	NA	0.20	Sep-07
Maharashtra Jeevan Pradhikaran	WSS (Umberpada-Nandade)	NA	0.18	Dec-05
Maharashtra Jeevan Pradhikaran	Akhoni WSS	Jai Hind Projects	0.18	Dec-07
Maharashtra Jeevan Pradhikaran	WSS (Sillod)	S R Chechani Ganga Constructions	0.12	Dec-07
Maharashtra Jeevan Pradhikaran	WSS (Kannad)	Empire Associates	0.10	Dec-07
Maharashtra Jeevan Pradhikaran	Junnar WSS	R B Krushnani	0.06	May-08
Government of Jharkhand	WSS (Daltonganj) - Augmentation	Electrosteel Infra Services Petron Civil Engineering	0.06	Dec-05
Maharashtra Jeevan Pradhikaran	Khapa WSS	IVRCL Infra & Proj	0.04	Sep-07
Maharashtra Jeevan Pradhikaran	Jambat WSS	Indian Hume Pipe Co. SR Constructions Arihant Construction	0.03	Jan-07
Maharashtra Jeevan Pradhikaran	Gavli Shivra WSS	A C Kothari	0.02	Feb-08

Source: Project today, Edelweiss research

Note: WSS - Water supply scheme

Opportunities in irrigation water demand

Irrigation capacity expansion involves investments in the field of water transmission and distribution and water storage. The water transmission and distribution market is by and large dominated by EPC players. Due to low entry barriers the industry has the characteristic of being extremely fragmented and local in nature. Further, weak fundamentals and poor record in implementing projects of government department addressing irrigation across the state and central levels have been a barrier to entry of larger organized players. However, large organized players are present in the water storage market. Some key players addressing opportunities in this segment are:

Completed irrigation projects from 2002 till date

Promoter	Project name	Contractor	Cost (INR bn)
Government of Chhattisgarh	Hasdeo Bango Irrigation	NA	7.00
Government of Rajasthan	Siddhmukh & Nohar Irrigation	NA	3.09
Government of Uttar Pradesh	Hindon Krishna Doab Irrigation	NA	0.39
Government of Karnataka	Arkavathi Irrigation	NA	1.10
Government of Karnataka	Manchanabele Irrigation	NA	0.75
Karnataka Neeravari Nigam	Harinala Irrigation	NA	0.41
Government of Karnataka	Maskinala Irrigation	NA	0.47
Government of Andhra Pradesh	Sathnala Irrigation	NA	0.37
Government of Jammu &	Koil Lift Irrigation Scheme	NA	0.11
Government of Karnataka	Hirehalla Irrigation	NA	1.57
Sardar Sarovar Narmada Nigam	Sardar Sarovar (Narmada) Irrigation	EPC Contractor Sumitomo Corpn.	180.00
		Technical Collaborator Bhagheeratha Engineering	
		Civil Contractor Hindustan Construction Co.	
Andhra Pradesh Power Gen.Corp.	Srisaillam LBC Lift Irrigation Hydel Power	Bharat Heavy Electricals	NA
Government of Tamil Nadu	Poigaiar Irrigation	NA	0.08
Government of Tamil Nadu	Sothupparai Irrigation	NA	0.35
Government of Tamil Nadu	Kirudumal Minor Irrigation	NA	0.03
Government of Tamil Nadu	Rajathope Minor Irrigation	NA	0.02
Gujarat Water Resources Devp. Corp.	Khorsam Lift Irrigation	INRCL/ Nagarjuna	NA

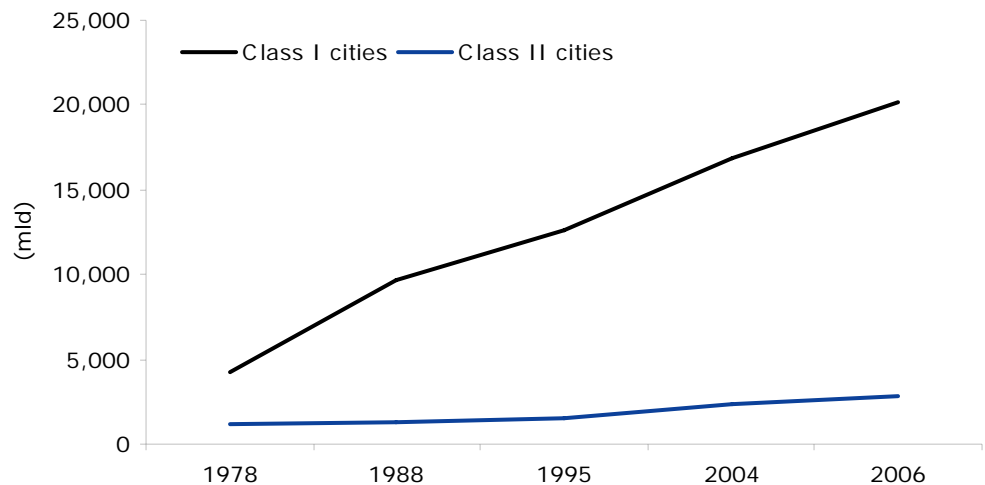
Source: Project today, Edelweiss research

Opportunities in industrial water demand

Water treatment and recycling

According to the Central Pollution Control Board (CPCB), the total waste water discharged by all major industrial sources is 83,048 mn litres per day (mld). As per CPCB, only ~21% of the total waste water generated is treated. While the waste water generated per capita has increased over the years, the water treatment capacity has not kept pace. Consequently, the amount of untreated water has been on the rise over the years, which presents an immense opportunity for the water treatment market. Also, the industrial waste water treatment market is expected to grow further on account of growing investments in the high water polluting sectors such as chemicals and petrochemicals, metal processing, power and food processing.

Trend in untreated water over the years



Source: CPCB, Edelweiss research

Apart from the above, water is also treated to make it useable for equipment such as boilers, cooling water systems, and heat exchangers. The purpose of the treatment is to minimize the adverse effect of impurities in the feed water. Over a period of time, the quality of water available for the industry has deteriorated which has led to an increasing demand for treatment facilities. A United Nations report in its World Water Forum at Kyoto (Japan) in March 2003 ranked India third from the bottom (out of 170 countries surveyed) in terms of water quality for its inability and lack of commitment to improve the situation.

Non-availability or irregular supply is expected to drive industries to look at recycling of water for sustainability. Water recycling requires only incremental investment to enable the treated waste water to be re-used/recycled by the industry rather than discharge it. Researchers believe that if every source of waste water is carefully monitored in an industry, it will be possible to segregate easy to treat waste streams from the difficult to treat streams, thereby recycling easily treatable wastes instead of combining all waste together for a final "end of the pipe" treatment. The overall cost of treatment could come down substantially and also the amount available for re-use/re-cycle would increase substantially if this approach is made standard practice.

We believe, opportunities exist in the water treatment and recycling space; as also in the product and EPC segments. The high end product segment is dominated by multinational companies or their joint ventures like GE, Veolia, among others. In addition, there are companies which provide end-to-end solutions in water treatment. Most of them are leading EPC players in the country. Some of them are detailed in the table below:

Completed water treatment projects from 2002 till date

Promoter	Project Name	Contractor	Cost (INR bn)	Completion Date
Delhi Jal Board	Water TP (Sonia Vihar)	NA	7.50	Sep-06
Delhi State Industrial & Infra Devp. Corpn.	Common Effluent TP (Delhi)	NA	2.54	Dec-02
Ramky Enviro Engineers	Hazardous Waste TP (Haldia)	NA	1.50	Sep-07
Ramky Enviro Engineers	Industrial Waste TP (Chal)	NA	0.45	Dec-02
Chennai Metropolitan Water Supply & Sewerage Board	Sewage TP (Kodungaiyur)	NA	0.44	Sep-07
Bangalore Water Supply & Sewerage Board	Tertiary TP (Vrishabhavati Valley)	NA	0.44	Jun-02
Chennai Metropolitan Water Supply & Sewerage Board	Sewage TP (Nesapakkam)	NA	0.36	Sep-07
Bangalore Water Supply & Sewerage Board	Tertiary TP (Yelahanka)	NA	0.34	May-03
Chennai Metropolitan Water Supply & Sewerage Board	Sewage TP (Koyambedu)	NA	0.29	Sep-07
Neyveli Lignite Corpn.	Water TP (Neyveli Township)	Engineering Projects India	0.16	Feb-05
Hyderabad Urban Devp. Authority	Tertiary Treatment Project (Ranga Reddy)	NA	0.14	Nov-07
Jeedimetla Effluent Treatment	Treatment Storage, Disposal Facility (Dundigal)	Ramky Enviro Engineers	0.10	Dec-04
Kolkata Municipal Corpn.	Water TP (Doighat)	NA	0.10	NA
Government of Karnataka	Sewage TP (Bhatkal Town)	Petron Civil Engineering	0.09	Dec-05
Punjab Small Industries & Export Corpn.	Common Effluent TP(Ludhiana)	NA	0.09	NA
Maharashtra Industrial Devp. Corpn.	Common Effluent TP (Patalganga)	NA	0.07	Feb-04
Hyderabad Urban Devp. Authority	Tertiary Treatment Project (Madhapur)	NA	0.07	Jan-08

Source: Project today, Edelweiss research

Note: TP - treatment plant

While most companies catering to this space are privately held, a few prominent publicly listed companies are Thermax, Ion Exchange, and Larsen and Toubro, among others. Though water treatment forms a small fraction of their revenues currently, it does have the potential to grow at a fast pace given the impending urban renewal spend in the country.

Desalination

Desalination refers to the wide range of processes designed to remove salts from water of different qualities. Desalted water can be used for a wide range of purposes, including providing potable fresh water for domestic and municipal purposes, treated water for industrial processes, and emergency water for refugees or military operations. Basically, there are two major technologies for desalination viz., the thermal process (based on natural hydrologic cycle) and the membrane process (based on natural biological process). The earliest plants were based mostly on the thermal evaporation technology; however, since 1970 more plants were installed using membrane technology. Both the technologies have their pros and cons. Membrane technology can desalinate both sea water and brackish water, it can remove organic contaminants and requires lower capital costs and energy than thermal systems. However, thermal systems can produce water with much lower salt content than membrane systems (typically less than 25 parts per million (ppm)) compared to less than 500 ppm in membrane systems.

Desalination in India

Water from desalination has not been a major source of supply in India till now. A recent announcement of a 150 MLD desalination plant in the Kutch region has been the biggest plant in the country and there has been no plant even close to this size in the country. The various desalination projects in the country are given in the table below:

Desalination projects in India

Project Name	Ownership	State	Converted capacity in MLD	Cost (INR mn)	Capital cost per litre	Project status
Desalination Plant (Jamnagar)	Reliance Group	Gujarat	9	500	550	Completed
Desalination Plant (Kachchh)	State Government	Gujarat	150	750	50	Planning
Water Desalination Plant (Metapur)	Tata Group	Gujarat	0	-	NA	Under execution
Desalination Plant (Chavara)	State Government	Kerala	10	-	NA	Deferred
Sea Water Desalination Plant (Kochi)	State Government	Kerala	0	-	NA	Planning
Desalination Plant (Kavaratti)	State Government	Lakshadweep	0	5	NA	Completed
Sea Water Desalination Plant (Pondicherry)	Chemfab Alkalies Group	Puducherry	4	30	75	Planning
Water Desalination (Matasukh) Project	State Government	Rajasthan	20	300	150	Under execution
Water Desalination Plant (Chennai)	Central Government	Tamil Nadu	10	80	80	Planning
Water Desalination Plant (Alathur)	Private (Indian)	Tamil Nadu	0	-	NA	Planning
Water Desalination Plant (Chennai)	Central Government	Tamil Nadu	0	-	NA	Planning
Sea Water Desalination Plant (Nemmel)	State Government	Tamil Nadu	100	-	NA	Planning
Water Desalination Plant (Tuticorin)	Sterlite Group	Tamil Nadu	10	-	NA	Planning
Sea Water Desalination Plant (Minjur)	State Government	Tamil Nadu	100	430	43	Under execution
Sea Water Desalination Plant (Manali)	Central Government	Tamil Nadu	26	193	73	Under execution

Source: Project today, Edelweiss research

It may be noted that all the projects, except for Rajasthan, have been in the coastal region, wherein the cost of sourcing water, discarding the brine, and thereby the overall operating cost tends to be low compared to a hinterland region. Also, regions where desalination has been planned or executed are amongst the high water stress regions of India. Further, all the capacities are being installed by central/state governments; only a few small plants have been installed by private entities for captive use.

Although the cost of desalination has dipped in recent years, it is still an expensive water supply option. The proponents of desalination believe that the cost will reduce in the years to come. However, with rising energy costs unless there is new technology in place, the same appears to be unlikely in the near future. The future cost of desalinated water will be more sensitive to changes in energy prices than other sources of water. Also, with the current technology, low cost desalted water can be generated in coastal areas with a dedicated power plant. Environment issues associated with desalination cannot be ignored. Desalination in India looks to be a distant proposition in the absence of any regulatory push or government incentive (in the form of subsidies, whether capital or otherwise).

We prefer...

We prefer plays on urban water demand and water treatment and recycling space compared to irrigation, given the increasing investment in urban renewal and improvement in environment consciousness of corporate India. Further, we believe EPC players in the irrigation space have low entry barriers with high working capital requirement. However, given the sheer size of the irrigation sector as compared to urban water demand and water treatment and recycling, it is likely to result in higher growth for companies addressing the irrigation space.

In the urban water demand and treatment and recycling space, we prefer TMX and LNT over others. However, while they are leading listed players in the water industry, water segment forms only a minor part of their revenues currently. For TMX it forms ~7% of revenues while for LNT it forms lower than 5% of total revenues.

We believe the water sector story in India is a long drawn one and while the potential for the same is immense given the factors explained above, the current exposure to water industry in the listed space is rather limited. However, we continue to like companies with some presence in the water segment, as these are the ones which can scale up their exposure to the water industry when the opportunity arises over the medium to long term.

Appendix

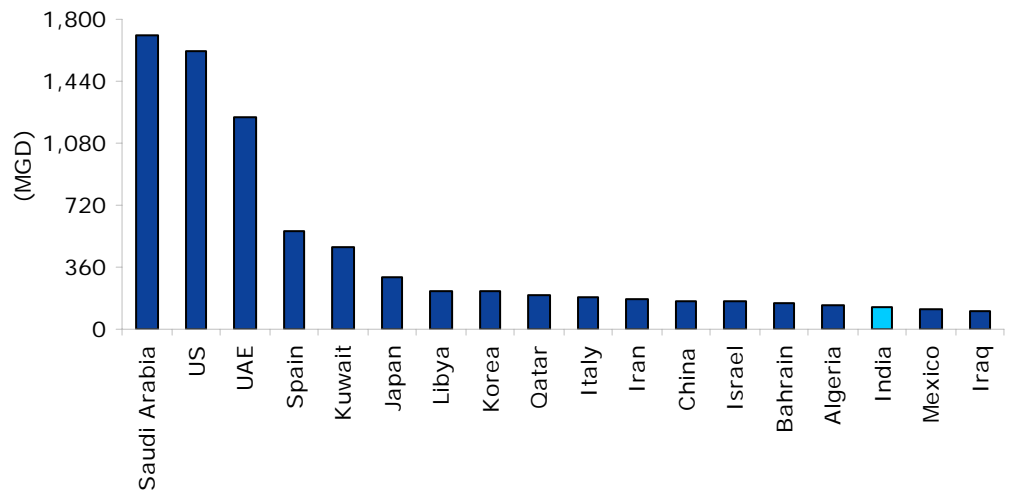
Need for desalination

Desalination is one of the technologies available for countries facing water scarcity. Changes in climatic conditions leading to droughts, growth in population, industrialization and urbanization have increased the need for clean water substantially. This is precisely the reason why desalination projects have been undertaken on a large scale in water scarce areas like the Middle-East, US, Israel, Spain, and Australia.

Desalination capacities around the world

Globally, the total desalination capacity in 2004 was estimated to be ~36 mn m³/d (9,500 MGD) of water from all sources. The country-wise capacity details are given below:

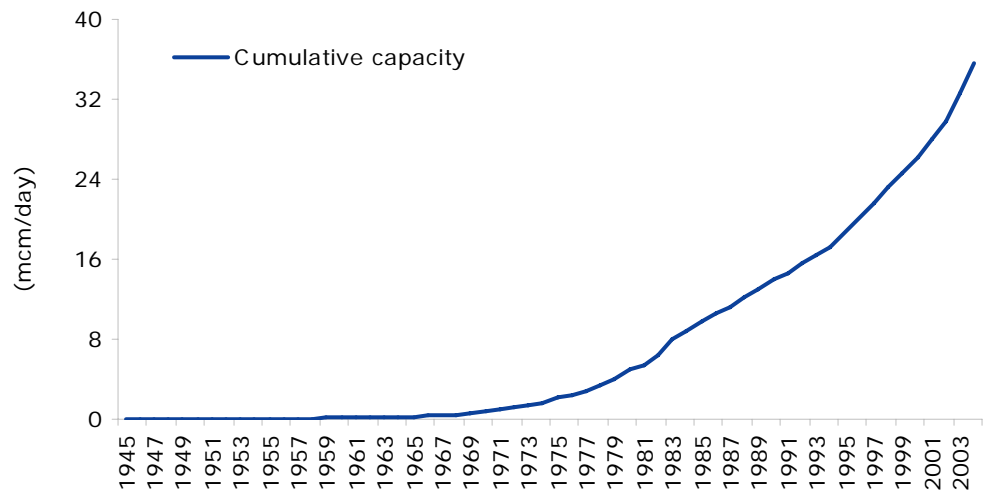
Country-wise desalination capacity



Source: Pacific Institute Report, Edelweiss research

The water scarce Middle-East region accounts for ~50% of the world desalination capacity.

Growth in global desalination capacity



Source: Pacific Institute Report, Edelweiss research

As is evident from the chart above, since 1980 water supply through desalination has seen massive growth of ~10% from ~2 mn cu.m to ~36 mn cu.m in 2004. However, the data in the chart does not exclude desalination plants that were never completed or which no longer operate. Figures on actual production of desalinated water are not available. Hence, considering the actual production, growth is likely to be lower than depicted in the chart above. Also, no large desalination plant of capacity higher than 100,000 cu.m/day was added until 2000. The 100 biggest plants in operation now or being executed have all begun after 2000.

Desalination experiences around the world

Although some form of desalination is used in ~130 countries, large projects have been undertaken in the US, Middle East, Spain, Israel, and Australia. In the Middle East, water shortage has been a major problem and hence, desalination has to be taken up irrespective of the cost. For majority of the users water is heavily subsidized. However, the region is not immune to the demerits of desalination (i.e., environment issues, rising sea water salinity leading to death of marine life, increasing requirement of capital and energy). In Israel also the background for desalination has been acute water shortage, in addition to frequent droughts. Ashkelon, the world's largest desalination plant (capacity 320,000 cu.m/day) is in Israel. Pollution of rivers and the marine environment is becoming an issue in Israel, but effluent desalination plants are a long way down the list of concerns. Also, there is a concern that the flows of pollution disposed by desalination plants in to the Mediterranean will increase desalination costs in the coming future.

The US has had a very different experience with respect to desalination. The country has witnessed significant ups and downs with desalination related studies and plants. The US government alone had spent nearly USD 2 bn on the basic research and development framework for many of the technologies now used for desalting sea water and brackish waters. The country's plans for large-scale desalination are facing opposition on environmental and cost grounds. The country has had some mishaps like at the Tampa bay desalination plant, which has resulted in the US scouting for more environmentally benign ways of ensuring water security.

Spain contributes significantly to the world desalination capacity; also, Spanish companies contribute significantly in creating desalination capacities around the world. The country has put up desalination capacities under the pretext of agriculture, while reports suggest that farmers continue to illegally extract groundwater leading to under-utilization of capacity.

Australia has been an isolated example wherein desalination has not invited any trouble. The country was going slow on desalination, giving high priority to water conservation and efficiency programmes. However, the state is now witnessing huge water shortage which resulted in it approving a few projects. Some of the projects have a dedicated wind-power project to fulfill its power requirements.

Concerns on desalination

World Wild Life's (WWF–Organisation engaged in wildlife and nature conservation) survey of world desalination trends shows that while desalination capacity is mounting, so are related problems and awareness of possible environmental impacts.

High energy requirement; cost of desalting

The capital and operating costs for desalination have decreased over the years on account of technological improvements, economies of scale associated with large plants, and improved project management and experience. Improvements in Reverse Osmosis (RO) technology have resulted in cost reduction. Membrane technologies have improved, leading to higher membrane life. Generally, the cost of desalting increases along with the salt content in the water. Hence, it is less costly to desalt brackish water compared to sea water. Also, the cost of desalting is lower for a larger plant (> 100 MLD) than a small one (< 25 MLD). The cost of

desalination also depends on the location of the plant. It is more competitive to have plants closer to the ocean to minimize transportation of feed water cost and disposal of brine.

Although costs have reduced, current capital cost on account of rising steel prices and operating cost on account of its significant energy requirement still remains too high. According to researchers, energy cost constitutes as much as ~45% and 59% of the total cost for RO and thermal desalination plants, respectively. According to Siemens, ~3 kWh and ~5 kWh of energy is required to desalt a liter of sea water using RO and thermal processes, respectively. Electricity cost can be reduced to some extent if a dedicated power plant is developed along with the desalination plant. Experts believe that unless radical new technologies or breakthroughs in both materials and energy costs are achieved it may be difficult to reduce costs substantially.

Estimated cost of desalination and water recycling

Sources for non-traditional supply estimated cost

Desalination	INR 30-50/ m3
Reuse of waste water	INR 15-45/ m3

Type and source of water	Range in energy consumption, Kwh/m3
Desalination	4.5 - 5.5
Biological waste water treatment + RO	2.5 - 3.5

Source: Siemens

Disposal of waste

The waste disposed from desalination plants which has very high salt content is known as brine. The common practice with sea water desalination plants is to discharge the concentrated brine back in to the sea, which results in the contamination of sea water. The discharged waste has the potential to raise the temperature of the coastal water near the outlet. This has adverse effect on marine life and water quality. Researchers believe that increasing sea water salinity will in turn lead to increase in desalination costs in the future.

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HINDUSTAN DORR OLIVER**INR 90****Engineered for success****NOT RATED**

June 27, 2008

Company description

Hindustan Dorr Oliver (HDO) is an EPC company primarily focussed on providing engineered solutions, technologies, and EPC installations in liquid-solid separation applications. HDO has, over decades, positioned itself as a dynamic component engineering company, with superior technologies to emerge among leading process equipment and plant engineering companies in India. With engineering skills across the entire spectrum of services, HDO is engaged in research and development of new products, processes and technologies to design, construct, install, erect, and commission systems on complete EPC basis.

Investment theme

HDO is a pioneer in water/waste water and industrial effluent treatment systems and offers integrated solutions for customer satisfaction. It has over five decades of experience in India/abroad in terms of executing turnkey projects in this segment. Backed by its core strength in solid-liquid separation technologies, HDO offers a wide range of unit operations and processes for treatment of a variety of effluents. HDO has executed water treatment projects for industrial process and drinking water. Further, it undertakes waste water treatment for domestic sewage and industrial effluents.

IVRCL Infrastructure and Projects (IVRC) acquired HDO as a wholly owned subsidiary in June 2005. IVRC's acquisition has placed HDO on a strong growth trajectory, enabling it to leverage its engineering capabilities along with IVRC's growth. HDO's revenues have grown at a CAGR of 58% over FY05-07 with margins expanding from 1.3% in FY05 to 7.4% in FY07.

Financials

Year to March	FY05	FY06	FY07	FY08
Revenues (INR mn)	838	1,414	2,085	3,060
Growth (%)		68.7	47.5	46.7
EBITDA (INR mn)	15	63	186	346
Net profit (INR mn)	11	65	154	229
Growth (%)		308.9	197.3	86.1
Diluted shares outstanding (mn)	21	30	36	36
EPS (fully diluted) (INR)	1	2	4	6
EPS growth (%)		271.0	105.4	58.2
Diluted P/E (x)	170.5	46.0	22.4	14.1
EV/EBITDA (x)	125.5	34.8	15.1	NA
ROAE (%)	1.9	6.9	12.0	NA

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Reuters : HDOR.BO
Bloomberg : HDOR IN

Market Data

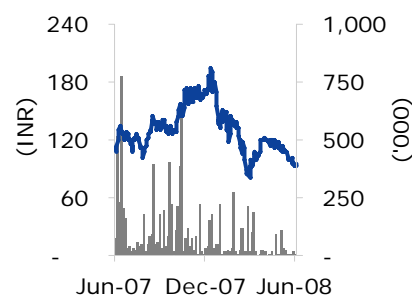
52-week range (INR) : 199 / 75
Share in issue (mn) : 36.0
M cap (INR bn/USD mn) : 3.2 / 75.9
Avg. Daily Vol. BSE ('000) : 58.6

Share Holding Pattern (%)

Promoters : 52.8
MFs, FIs & Banks : 11.1
FIIs : 2.6
Others : 33.5

Relative Performance (%)

	Sensex	Stock	Stock over Sensex
1 month	(11.4)	(16.8)	(5.4)
3 months	(10.4)	4.9	(15.3)
12 months	(0.1)	(15.4)	(15.3)



HDO's proprietary products

Water treatment	Wastewater treatment
Flash Mixer	Bar Screens
Flocculator	Detritors
Conventional Clarifiers	API Separators
Lamella Clarifiers	TPI Separators
Hi-Rate Clarifiers	Dissolved Air Flootation
Solid Contact Clarifiers	Clarifiers
Clariflocculators	Aerators
Sand Filters	Filters

Source: Company

The company has inked a number of project-specific technology tie-ups across all business verticals with overseas players. In the water and environmental management segment, HDO has the following JVs:

- **ABS, Singapore:** For lending technology support in WTP/STP/ETP projects and associating as equipment supplier.
- **KEPPEL SEGHERS, Belgium:** For various waste water technologies.
- **SFC, Austria:** For SBR technology.
- **GE INFRA, US:** For comprehensive water reuse technologies.

Key risks

Tightening of interest rate is likely to slowdown corporate capex which will decelerate HDO's order book. Further, increase in the prices of key raw materials like steel plates and structures, castings and other components can adversely affect HDO's profitability.

Financial Statements

Income statement		(INR mn)			
Year to March	FY05	FY06	FY07	FY08	
Income from operations	838	1,414	2,085	3,060	
Materials costs	629	1,151	1,639	2,407	
Employee cost	105	104	119	171	
Other manufacturing expenses	89	97	140	135	
Total operating expenses	823	1,351	1,899	2,713	
EBITDA	15	63	186	346	
Depreciation and amortisation	5	7	16	25	
EBIT	11	55	170	322	
Interest expense	17	6	8	38	
Other income	27	25	51	60	
Profit before tax	20	74	214	343	
Provision for tax	9	15	69	114	
Core Profit	11	59	145	229	
Prior period adjustments	-	(6)	(9)	-	
Profit after tax	11	65	154	229	
Profit after minority interest	11	65	154	229	
Equity shares outstanding (mn)	21	29	36	36	
Diluted shares (mn)	21	30	36	36	
EPS (INR) fully diluted	0.5	2.0	4.0	6.4	
CEPS (INR)	0.7	2.4	4.4	7.0	
DPS	0.2	0.4	0.5	1.6	
Dividend payout (%)	45.7	17.9	11.7	25.0	

Common size metrics- as % of net revenues

Year to March	FY05	FY06	FY07	FY08
Operating expenses	98.2	95.6	91.1	88.7
Material cost	75.0	81.4	78.6	78.7
Employee cost	12.5	7.3	5.7	5.6
Other manufacturing expenses	10.7	6.9	6.7	4.4
Depreciation and amortisation	0.6	0.5	0.8	0.8
Interest expenditure	2.0	0.4	0.4	1.3
EBITDA margins	1.8	4.4	8.9	11.3
Net profit margins	1.3	4.2	6.9	7.5

Growth metrics (%)

Year to March	FY05	FY06	FY07	FY08
Revenues	12.0	68.7	47.5	46.7
EBITDA	(72.6)	308.9	197.3	86.1
Net profit	(71.8)	426.2	146.5	58.2
EPS	(71.8)	271.0	105.4	58.2

Balance sheet		(INR mn)		
As on 31st March		FY05	FY06	FY07
Equity capital		42	58	72
Share application money		0	6	0
Reserves & surplus		534	1,058	1,225
Shareholders funds		577	1,122	1,297
Secured loans		77	342	0
Unsecured loans		57	0	0
Borrowings		134	342	0
Deferred tax (net)		(5)	(9)	(6)
Sources of funds		705	1,455	1,291
Gross block		466	499	538
Depreciation		207	185	200
Net block		260	314	338
Capital work in progress		0	4	15
Investments		20	17	17
Inventories		90	86	122
Sundry debtors		613	309	1,025
Cash and bank balances		97	760	410
Loans and advances		279	579	950
Total current assets		1,080	1,734	2,508
Sundry creditors and others		648	591	1,551
Provisions		6	24	36
Total current liabilities & provisions		654	614	1,588
Net current assets		425	1,120	921
Uses of funds		705	1,455	1,291
Book value per share (INR)		19	37	36

Free cash flow		FY05	FY06	FY07
Year to March		FY05	FY06	FY07
Net profit		11	65	154
Add: Depreciation		5	7	16
Add: Deferred tax		(0)	3	(3)
Add: Others		-	-	-
Gross cash flow		16	75	167
Less: Changes in working capital		36	32	150
Operating cash flow		(20)	44	17
Less: Capex		2	37	50
Free cash flow		(23)	6	(33)

Cash flow metrics		FY05	FY06	FY07
Year to March		FY05	FY06	FY07
Operating cash flow		(20)	44	17
Financing cash flow		(9)	481	21
Investing cash flow		2	34	50
Net cash flow		(32)	491	(12)
Capex		2	37	50
Dividend paid		5	11	18

Profitability & liquidity ratios

Year to March	FY05	FY06	FY07
ROAE (%)	1.9	6.9	12.0
ROACE (%)	1.5	5.2	12.6
Inventory (days)	49	28	23
Debtors (days)	226	119	117
Payable (days)	317	197	238
Cash conversion cycle	(42)	(50)	(98)
Current ratio	1.7	2.8	1.6
Debt/EBITDA	8.7	5.5	0.0
Interest cover (x)	0.6	9.2	22.7
Debt/Equity (x)	0.2	0.3	-
Adjusted debt/Equity	0.2	0.3	-

Operating ratios

Year to March	FY05	FY06	FY07
Fixed assets turnover (x)	3.2	4.9	6.4
Total asset turnover(x)	1.2	1.3	1.5
Equity turnover(x)	1.5	1.7	1.7

Du pont analysis

Year to March	FY05	FY06	FY07
NP margin %	1.3	4.2	6.9
Total assets turnover	1.2	1.3	1.5
Leverage multiplier	1.3	1.3	1.1
ROAE %	1.9	6.9	12.0

Valuation parameters

Year to March	FY05	FY06	FY07
Diluted EPS (INR)	0.5	2.0	4.0
Y-o-Y growth (%)	(71.8)	271.0	105.4
CEPS (INR)	0.7	2.4	4.4
Diluted P/E (x)	170.5	46.0	22.4
Price/BV(x)	4.7	2.4	2.5
EV/Sales (x)	2.3	1.5	1.3
EV/EBITDA (x)	125.5	34.8	15.1

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ION EXCHANGE (INDIA)

INR 142

**Leading the pack****NOT RATED**

June 27, 2008

Company description

Ion Exchange (India) (ION), a leader in the Indian water treatment industry, offers total water management solutions for industry, homes, and communities. It is one of the very few companies in the world with a range of technologies, products, and services that cover the entire spectrum of water and waste-water treatment. A subsidiary of British Permutit till 1985, it became a wholly Indian company when Permutit divested its holdings. ION has three decades of experience in the manufacture of resins and in the design and supply of treatment plants for water, process liquid, and waste water. It has also entered the domestic household segment with its well-known *Zero-B* brand of drinking water purifiers and water conditioners. Further, it also entered the public health sector, urban and rural, for infrastructural and community level drinking water treatment.

Investment theme

Its product range includes water, process liquid, and waste water treatment as well as recycling plants, using various physico-chemical processes for setting, clarification, filtration, disinfection; membrane technology; resins, polymers and polyelectrolytes for water and non-water processes; and boiler, cooling water, and fireside treatment chemicals. It has supplied to more than 2,000 plants in India and abroad, of which, over 400 installations are at thermal and nuclear power plants, fertilizer factories, refineries, and petrochemical and other industries. The company has executed World Bank-funded projects worth over USD 25 mn in India and many projects in Thailand, Indonesia, Malaysia, and Africa. The company has licensing agreements with some of the best known specialist water treatment companies in the US and Western Europe. It has a R&D centre recognised by the Department of Science and Technology, India. The company provides comprehensive consultancy services, including water management surveys and detailed project reports, apart from a range of technical services.

Key risks

The company's profitability is sensitive to prices of raw materials like steel and styrene, the increase in which can adversely affect the company. Further, the company has increased exports which has exposed it to forex fluctuation risk.

Financials

Year to March	FY05	FY06	FY07	FY08
Revenues (INR mn)	2,363	2,942	4,059	5,308
Growth (%)	19.9	24.5	38.0	30.8
EBITDA (INR mn)	162	171	192	212
Net profit (INR mn)	48	51	60	93
Growth (%)	157.9	(0.1)	18.4	48.7
Diluted shares outstanding (mn)	11	11	12	12
EPS (fully diluted) (INR)	4.5	4.4	5.0	7.8
EPS growth (%)	154.6	(2.5)	12.7	56.2
Diluted P/E (x)	31.3	32.1	28.4	18.2
EV/EBITDA (x)	14.1	12.8	10.9	NA
ROAE (%)	5.0	4.8	5.4	NA

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Bloomberg : ION IN

Market Data

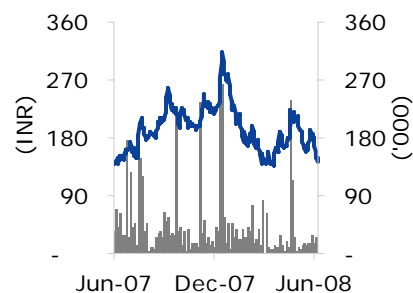
52-week range (INR) : 314 / 127
Share in issue (mn) : 12.7
M cap (INR bn/USD mn) : 1.8 / 42.1
Avg. Daily Vol. BSE ('000) : 30.2

Share Holding Pattern (%)

Promoters : 43.9
MFs, FIs & Banks : 6.7
FIIs : 1.6
Others : 47.8

Relative Performance (%)

	Sensex	Stock	Stock over Sensex
1 month	(11.4)	(22.8)	(11.4)
3 months	(10.4)	4.5	14.9
12 months	(0.1)	5.9	6.0



Financial Statements

Income statement		(INR mn)			
Year to March	FY05	FY06	FY07	FY08	
Income from operations	2,363	2,942	4,059	5,308	
Materials costs	1,485	1,981	2,908	3,948	
Employee cost	220	263	328	417	
Other manufacturing expenses	496	527	631	731	
Total operating expenses	2,201	2,771	3,867	5,096	
EBITDA	162	171	192	212	
Depreciation and amortisation	50	42	44	48	
EBIT	112	129	149	164	
Interest expense	88	84	74	73	
Other income	27	26	29	59	
Profit before tax	51	70	103	149	
Provision for tax	(0)	20	43	60	
Core Profit	51	51	60	89	
Prior period adjustments	3	-	-	-	
Profit after tax	48	51	60	89	
Less: Minority Interest	-	-	-	5	
Add: Associate income	-	-	-	10	
Profit after minority interest	48	51	60	93	
Equity shares outstanding (mn)	11	11	12	12	
Diluted shares (mn)	11	11	12	12	
Diluted EPS	4.5	4.4	5.0	7.8	
CEPS (INR)	14	12	12	12	
DPS	1.0	1.0	1.5	NA	
Dividend payout (%)	26.4	26.0	35.4	NA	

Common size metrics- as % of net revenues

Year to March	FY05	FY06	FY07	FY08
Operating expenses	93.1	94.2	95.3	96.0
Material cost	62.9	67.3	71.6	74.4
Employee cost	9.3	8.9	8.1	7.9
Other manufacturing expenses	21.0	17.9	15.5	13.8
Depreciation and amortisation	2.1	1.4	1.1	0.9
Interest expenditure	3.7	2.9	1.8	1.4
EBITDA margins	6.9	5.8	4.7	4.0
Net profit margins	2.1	1.7	1.5	1.7

Growth metrics (%)

Year to March	FY05	FY06	FY07	FY08
Revenues	19.9	24.5	38.0	30.8
EBITDA	(5.7)	5.6	12.5	10.2
Net profit	158	(0)	18	49
EPS	154.6	(2.5)	12.7	56.2

Balance sheet		(INR mn)		
As on 31st March		FY05	FY06	FY07
Equity capital		111	114	120
Reserves & surplus		918	959	1,021
Shareholders funds		1,029	1,074	1,141
Secured loans		489	438	373
Unsecured loans		279	309	195
Borrowings		767	747	568
Deferred tax (net)		0	0	24
Sources of funds		1,797	1,822	1,733
Gross block		925	911	961
Depreciation		522	496	538
Net block		403	415	423
Capital work in progress		19	10	71
Investments		31	42	64
Inventories		325	290	303
Sundry debtors		1,103	1,327	1,833
Cash and bank balances		39	132	103
Loans and advances		531	544	668
Other current assets		4	2	2
Total current assets		2,001	2,294	2,910
Sundry creditors and others		639	916	1,696
Provisions		23	25	39
Total current liabilities & provisions		662	941	1,735
Net current assets		1,339	1,353	1,175
Misc expenditure		5	2	0
Uses of funds		1,797	1,822	1,733
Book value per share (INR)		92	94	95

Free cash flow		FY05	FY06	FY07
Year to March				
Net profit		48	51	60
Add: Depreciation		50	42	44
Add: Deferred tax		4	(0)	(24)
Gross cash flow		102	92	80
Less: Changes in working capital		116	(79)	(150)
Operating cash flow		(14)	172	230
Less: Capex		(30)	(23)	111
Free cash flow		16	195	118

Cash flow metrics		FY05	FY06	FY07
Year to March				
Operating cash flow		(14)	172	230
Financing cash flow		(20)	(6)	8
Investing cash flow		(29)	(13)	134
Net cash flow		(4)	178	103
Capex		(30)	(23)	111
Dividend paid		11	12	18

Profitability & liquidity ratios

Year to March	FY05	FY06	FY07
ROAE (%)	5.0	4.8	5.4
ROACE (%)	6.5	7.3	8.6
Inventory (days)	72	57	37
Debtors (days)	160	151	142
Payable (days)	148	143	164
Cash conversion cycle	85	64	15
Current ratio	3.0	2.4	1.7
Debt/EBITDA	4.7	4.4	3.0
Interest cover (x)	1.3	1.5	2.0
Debt/Equity (x)	0.7	0.7	0.5

Operating ratios

Year to March	FY05	FY06	FY07
Fixed assets turnover (x)	5.6	7.2	9.7
Total asset turnover(x)	1.3	1.6	2.3
Equity turnover(x)	2.3	2.8	3.7

Du pont analysis

Year to March	FY05	FY06	FY07
NP margin (%)	2.14	1.72	1.47
Total assets turnover	1.34	1.63	2.28
Leverage multiplier	1.74	1.73	1.61
ROAE (%)	5.01	4.82	5.41

Valuation parameters

Year to March	FY05	FY06	FY07
Diluted EPS (INR)	4.5	4.4	5.0
Y-o-Y growth (%)	154.6	(2.5)	12.7
CEPS (INR)	13.5	11.8	12.3
Diluted P/E (x)	31.3	32.1	28.4
Price/BV(x)	1.5	1.5	1.5
EV/Sales (x)	1.0	0.7	0.5
EV/EBITDA (x)	14.1	12.8	10.9
Dividend yield (%)	0.7	0.7	1.1

LARSEN AND TOUBRO**INR 2,267****Leading light****BUY**

June 27, 2008

Company description

Larsen & Toubro (LT), headquartered in Mumbai, is one of the largest conglomerate business groups in India with core focus on engineering and construction. In existence since the past seven decades, it has additional interests in manufacturing, services, equipment leasing/financing, and information technology. LT operates in core infrastructure sectors like power, oil & gas, ship building, and processes. The company is also increasing its global footprint operating in geographies like Middle East, Asia etc., which contribute ~ 17% of total revenues.

Investment theme

Although water business currently forms a small part of LT's turnkey offering portfolio, the company sees potential in areas of water management, effluent treatment, and recycling and water de-salination. LT's water and utilities SBU offers turnkey project services involving civil, mechanical, electrical, and instrumentation works with single point responsibility, including engineering, design, procurement, commissioning, operation, and maintenance works. LT takes the total water management of an industrial or municipal unit into account and provides integrated solutions involving both water and waste water treatment with desalination and recycling needs and aims to provide end-to-end solutions.

LT has established itself as a leading player in the water sector over the past two decades. The company is focused on conventional water and waste water treatment technologies and systems like municipal water supply, effluent treatment, sewage treatment, and pre-treatment of water for industries. The SBU has been executing some of the major and critical water transmission/distribution and water treatment projects in India and abroad for various metros, urban, municipal, and rural customers. Some of the key projects executed by SBU are given below:

- Intake well with bridge for rural water supply project, Rajsamand district of Rajasthan.
- Clariflocculator for rural water supply project, Rajsamand district of Rajasthan.

Financials

Year to March	FY07	FY08	FY09E	FY10E
Revenues (INR mn)	205,153	291,985	389,275	498,046
Rev. growth (%)	23.9	42.3	33.3	27.9
EBITDA (INR mn)	25,732	34,471	46,703	67,011
Net profit after minority interest (IN)	13,332	22,401	23,254	33,678
Share outstanding (mn)	283	292	292	292
Diluted EPS (INR)	62.4	77.9	114.5	147.4
EPS growth (%)	35.8	24.8	47.0	28.7
Diluted P/E (x)	36.3	29.1	19.8	15.4
EV/EBITDA (x)	26.1	21.0	16.7	12.0
ROAE (%)	30.0	26.5	28.5	28.7

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 Bloomberg : LT IN

Market Data

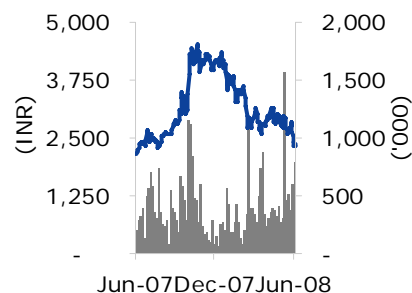
52-week range (INR) : 4,670 / 2,134
 Share in issue (mn) : 292.3
 M cap (INR bn/USD mn) : 690 / 15,516
 Avg. Daily Vol. BSE/NSE ('000) : 1,295.2

Share Holding Pattern (%)

Promoters : 0.0
 MFs, FIs & Banks : 37.7
 FIIs : 16.6
 Others : 45.7

Relative Performance (%)

	Sensex	Stock	Stock over Sensex
1 month	(11.4)	(14.2)	(2.8)
3 months	(10.4)	(22.6)	(12.2)
12 months	(0.1)	9.9	10.0



LT's water process technology business unit, based at Vadodara is expanding its technical expertise and process capability to address the demand of high-end water technologies and markets. The thrust is on providing knowledge-based water solutions, such as:

- Desalination of water (sea water, brackish water, normal water) utilizing technologies like membrane processes (reverse osmosis, ultra-filtration), thermal processes (MSF, MED and VC), and advanced technologies like nano filtration, eletrodialysis, etc.
- Water recycling and reuse.
- Ultra pure water for selected industries.
- Advanced technologies for physical, chemical and biological treatment.
- Zero discharge technologies.

Key risks

Human resource retention: One of the prime concerns for LT has been retaining manpower, especially with technical expertise (engineers). Also, given that construction is at the lower end of the value chain, it has become increasingly difficult to attract younger talent. The company-wide attrition rate is at 10%, well below industry average. However, certain pockets are experiencing higher attrition viz., middle management, junior management, and engineers. As LT scales up the technology chain, providing high-end engineering solutions, hiring talented and qualified human resource will remain a challenge.

Economy slowdown: Being a play across India growth spectrum, any slowdown in the broad economy will impact LT's operations. Also, given that a large part of the infrastructure capex is government-driven, any political instability could impact the roll-out plans and, in turn, LT's growth plans.

Raw material costs and execution risks: Any sudden surge in prices of base raw material comprising steel, aluminum, cement etc., could detrimentally affect the company's margin/operations, despite most contracts having a built-in price escalation clause. Also, given the scale of projects being executed by LT, any execution delay could cost company dearly.

Outlook and valuations

Given LT's diversified exposure to core India infrastructure creation (backed by strong order backlog,) venture into promising new businesses, and improving subsidiary traction, we expect consolidated revenues and earnings to grow at a CAGR of 31% and 38%, respectively, over FY08-10E. Factoring in FY08 actual numbers, our SOTP now stands at INR 4,147/share (FY09E-end), indicating a 44% upside from current levels. On our consolidated EPS estimates of INR 115 and INR 147 for FY09E and FY10E, the stock is trading at P/E of 20x and 15x, respectively. Based on LT's proven execution capability (backed by strong order backlog providing earnings visibility), potential surprises in new businesses, improving subsidiary profile, and medium-term value unlocking trigger, we maintain our **'BUY'** recommendation on the stock.

Financial Statements

Income statement					(INR mn)
Year to March	FY06	FY07	FY08	FY09E	FY10E
Income from operations	165,604	205,153	291,985	389,275	498,046
Direct costs	125,231	146,718	219,794	290,893	366,198
Employee costs	10,444	15,741	20,494	25,217	31,844
Other expenses	14,109	16,962	17,227	26,462	32,993
Total operating expenses	149,784	179,421	257,514	342,572	431,036
EBITDA	15,819	25,732	34,471	46,703	67,011
Depreciation and amortisation	2,416	3,413	5,097	5,978	8,465
EBIT	13,403	22,319	29,373	40,724	58,546
Interest expenses	1,303	538	2,031	2,317	5,374
Other income	4,582	3,548	6,501	8,040	9,225
Profit before tax	16,683	25,329	33,843	46,448	62,397
Provision for tax	4,313	7,327	11,608	13,650	18,461
Core profit	12,369	18,002	22,235	32,798	43,936
Extraordinary items	698	4,610	343	-	-
Profit after tax	13,067	22,612	22,578	32,798	43,936
Less: Minority interests	450	1,162	683	709	2,497
Add: Share in profits of associates	715	951	1,358	1,589	1,910
PAT after minority interest	13,332	22,401	23,254	33,678	43,349
Adjusted net profit	12,635	17,791	22,911	33,678	43,349
Diluted equity shares (mn)	275	285	294	294	294
EPS (INR) fully diluted	46.0	62.4	77.9	114.5	147.4
CEPS (INR)	54	75	96	136	177
Dividend per share	11.0	13.0	17.0	18.0	20.0
Dividend payout (%)	25.9	19.2	23.5	17.8	15.4

Common size metrics- as % of net revenues

Year to March	FY06	FY07	FY08	FY09E	FY10E
Direct cost	75.6	71.5	75.3	74.7	73.5
Employee expenses	6.3	7.7	7.0	6.5	6.4
S G &A expenses	8.5	8.3	5.9	6.8	6.6
Operating expenses	90.4	87.5	88.2	88.0	86.5
Depreciation and amortization	1.5	1.7	1.7	1.5	1.7
Interest expenditure	0.8	0.3	0.7	0.6	1.1
EBITDA margins	9.6	12.5	11.8	12.0	13.5
EBIT margins	8.1	10.9	10.1	10.5	11.8
Net profit margins	7.5	8.8	7.6	8.4	8.8

Growth metrics (%)

Year to March	FY06	FY07	FY08	FY09E	FY10E
Revenues	13.8	23.9	42.3	33.3	27.9
EBITDA	37.6	62.7	34.0	35.5	43.5
PBT	58.8	51.8	33.6	37.2	34.3
Net profit	62.3	45.5	23.5	47.5	34.0
EPS	72.0	35.8	24.8	47.0	28.7

Balance sheet		(INR mn)				
As on 31st March	FY06	FY07	FY08E	FY09E	FY10E	
Equity capital	275	567	585	585	585	
Reserves & surplus	49,414	68,649	103,495	131,947	169,640	
Shareholders funds	49,689	69,216	104,080	132,532	170,224	
Minority interest	1,066	6,457	11,670	16,972	19,512	
Secured loans	19,114	31,090	101,705	138,811	158,558	
Unsecured loans	15,873	33,232	26,565	28,161	33,200	
Borrowings	34,987	64,322	128,271	166,972	191,758	
Sources of funds	85,742	139,995	244,020	316,476	381,494	
Gross block	43,271	61,146	81,985	106,274	173,764	
Depreciation	15,952	21,299	23,861	29,835	37,621	
Net block	27,319	39,847	58,124	76,439	136,144	
Capital work in progress	2,416	14,692	29,674	57,960	14,363	
Total fixed assets	29,735	54,539	87,799	134,400	150,506	
Investments	16,757	24,793	48,905	44,742	46,949	
Inventories	24,774	36,764	41,980	59,356	68,800	
Sundry debtors	52,823	61,381	119,656	156,924	193,454	
Cash and equivalents	8,204	17,180	31,507	20,032	19,891	
Loans and advances	30,636	52,260	58,330	75,735	103,446	
Total current assets	116,436	167,585	251,473	312,046	385,591	
Sundry creditors and others	65,243	92,648	118,706	144,895	167,041	
Provisions	10,915	13,370	24,318	28,673	33,358	
Total CL & provisions	76,158	106,019	143,023	173,568	200,399	
Net current assets	40,279	61,566	108,449	138,479	185,191	
Net deferred tax	(1,268)	(1,074)	(1,232)	(1,232)	(1,232)	
Others	240	170	98	89	80	
Uses of funds	85,742	139,995	244,020	316,476	381,494	
Adjusted BV per share (INR)	180	244	356	453	582	

Free cash flow

Year to March	FY06	FY07	FY08E	FY09E	FY10E
Net profit	13,332	22,401	23,254	33,678	43,349
Depreciation	2,416	3,413	5,097	5,978	8,465
Deferred tax	(89)	(70)	200	0	0
Others	167	71	898	941	1,193
Gross cash flow	15,826	25,815	29,448	40,597	53,007
Less: Changes in WC	1,215	12,311	32,557	41,503	46,855
Operating cash flow	14,611	13,503	(3,109)	(906)	6,152
Less: Capex	32,367	55,078	60,750	77,502	48,820
Free cash flow	(17,756)	(41,575)	(63,858)	(78,408)	(42,667)

Cash flow metrics

Year to March	FY06	FY07	FY08E	FY09E	FY10E
Operating cash flow	14,611	13,503	(3,109)	(906)	6,152
Financing cash flow	3,029	26,684	74,041	32,545	17,945
Investing cash flow	(42,323)	(63,115)	(84,862)	(73,339)	(51,027)
Net cash flow	(24,683)	(22,928)	(13,929)	(41,700)	(26,929)
Capex	(32,367)	(55,078)	(60,750)	(77,502)	(48,820)
Dividends paid	(3,023)	(3,683)	(4,970)	(5,262)	(5,847)
Share issuance / (buyback)	6,027	1,657	15,907	0	0

Profitability & liquidity ratios

Year to March	FY06	FY07	FY08E	FY09E	FY10E
ROAE (%) (on adjusted profits)	30.7	30.0	26.5	28.5	28.7
ROACE (%)	20.5	24.2	18.9	17.4	19.3
Inventory days	72	77	65	64	64
Debtors days	105	102	113	130	128
Payable days	171	196	175	165	155
Cash conversion cycle	5.7	(18.3)	3.0	27.9	36.8
Current ratio	1.5	1.6	1.8	1.8	1.9
Debt/EBITDA	2.2	2.5	3.7	3.6	2.9
Interest coverage	10.3	41.5	14.5	17.6	10.9
Fixed assets t/o (x)	6.9	6.1	6.0	5.8	4.7
Debt/equity	0.7	0.9	1.2	1.3	1.1
Adjusted debt/Equity	0.7	0.9	1.2	1.3	1.1

Operating ratios

Year to March	FY06	FY07	FY08E	FY09E	FY10E
Total asset turnover	2.1	1.8	1.5	1.4	1.4
Fixed asset turnover	6.9	6.1	6.0	5.8	4.7
Equity turnover	4.0	3.5	3.4	3.3	3.3

Du pont analysis

Year to March	FY06	FY07	FY08E	FY09E	FY10E
NP margin (%)	7.6	8.7	7.8	8.7	8.7
Total assets turnover	2.1	1.8	1.5	1.4	1.4
Leverage multiplier	1.9	1.9	2.2	2.4	2.3
ROAE (%)	30.7	30.0	26.5	28.5	28.7

Valuation parameters

Year to March	FY06	FY07	FY08E	FY09E	FY10E
Diluted EPS (INR)	46.0	62.4	77.9	114.5	147.4
Y-o-Y growth (%)	72.0	35.8	24.8	47.0	28.7
CEPS	54.4	74.6	96.5	135.6	177.2
Diluted P/E (x)	49.3	36.3	29.1	19.8	15.4
Price/BV (x)	12.6	9.3	6.4	5.0	3.9
EV/Sales (x)	3.8	3.3	2.5	2.0	1.6
EV/EBITDA (X)	40.1	26.1	21.0	16.7	12.0
Dividend yield (%)	0.5	0.6	0.7	0.8	0.9
FCFPS (INR)	(64.6)	(146.8)	(218.4)	(268.2)	(145.9)
Y-o-Y growth (%)	26.6	(127.2)	(48.8)	(22.8)	45.6
FCFPE (x)	(35.1)	(15.4)	(10.4)	(8.5)	(15.5)

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PATEL ENGINEERING**INR 364****Concrete measures****BUY**

June 27, 2008

Company description

Patel Engineering (PEL) is a leading civil engineering and construction company engaged primarily in the construction of hydel power, irrigation, water supply, and transportation projects. Its core competency lies in the construction of hydel power plants; it has participated in the construction of hydel power projects generating more than 7,000 MW of power, out of a total of approximately 32,000 MW generated in India since independence.

PEL is one of the few Indian construction companies with a presence in the US. It has two US incorporated subsidiaries—ASI Constructors and Westcon Microtunnelling. These two companies have given PEL an added advantage in terms of access to use of sophisticated technology like RCC and microtunnelling, besides giving it a business presence in the technologically advanced US and European markets. It is now focusing on the use of this technology in Indian markets since it is cost effective and gives it a competitive advantage.

The company has land bank of 1,001 acres which it proposes to exploit in a phased manner, with the first phase spanning across 12% of the land bank. PEL is also making inroads in the asset ownership space with entry in the road and power (both thermal and hydel) space.

Investment theme

PEL is a significant player in the highly profitable hydel power and upstream irrigation contracting space with close to six decades of experience. Currently, these segments account for ~ 80% of its INR 58 bn order book. It has long standing experience and expertise, having garnered 22% of cumulative hydel power contracting share in India since independence and technology edge through adoption of innovative technologies such as roller compacted concrete and double lake tap. The company has guided that in the future it will be focusing more on the hydel power segment.

In the hydel power segment, civil construction is usually split into two or three contracts and involves structures such as power house, dam, tunnels (diversion, head race and tail race), desilting chambers, intake structures, hydro mechanical works (sluice gates, spillways etc..) and electro mechanical works. PEL provides all the services including civil works of various project components, installation of plant and comprehensive project management (including quality control, environmental management, safety services etc.).

Financials (Consolidated)

Year to March	FY07	FY08	FY09E	FY10E
Revenue	12,956	18,596	21,238	27,776
Rev. growth (%)	27.7	43.5	14.2	30.8
EBITDA (INR mn)	1,547	2,740	2,842	4,460
Adj. net profit	1,130	1,519	1,108	1,618
Shares outstanding (mn)	60	60	60	60
Diluted EPS	18.9	25.5	18.6	27.1
EPS growth (%)	28.0	34.6	(27.1)	46.1
Diluted P/E (x)	19.2	14.3	19.6	13.4
EV/ EBITDA	15.4	10.5	12.0	9.1
ROAE (%)	25.0	20.7	13.9	17.7

* assuming full tax rate for FY09E and FY10E

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Market Data

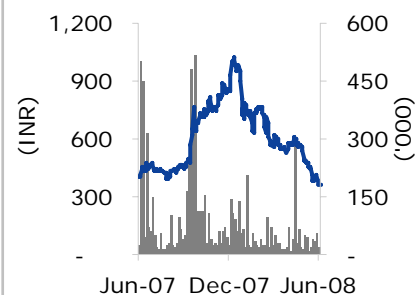
52-week range (INR)	: 1,070 / 342
Share in issue (mn)	: 59.7
M cap (INR bn/USD mn)	: 21.8 /508.5
Avg. Daily Vol. BSE/NSE ('000)	: 168.9

Share Holding Pattern (%)

Promoters	: 52.3
MFs, FIs & Banks	: 11.0
FIIIs	: 10.6
Others	: 26.1

Relative Performance (%)

	Sensex	Stock	Stock over Sensex
1 month	(11.4)	(26.3)	(14.9)
3 months	(10.4)	(36.9)	(26.5)
12 months	(0.1)	(10.4)	(10.3)



In the irrigation segment, PEL has focused on undertaking works in the upstream irrigation segment, a strategy driven by its intention to replicate its expertise in hydel power projects in this sector. The activities that it undertakes are usually impounding the reservoir, construction of pump station, water conducting system and canals. It has also entered into EPC and/or LSTK execution of lift-irrigation projects.

Some of the technological milestones achieved by PEL:

- First construction company in Asia to execute double lake tap works.
- Constructed largest under ground cavern (surge chamber) in Asia.
- Pioneer in the use of roller compacted concrete (RCC) technology for construction of dams in India.
- One of the few Indian companies with in-house expertise and technology to execute RCC dams.
- Among the first few companies to have secured lift irrigation contracts.

Further, PEL is also making inroads in the asset ownership space. It has entered into an MoU with Arunachal Pradesh government for setting up a 100-MW Gongri Hydel-Electric Power in West Kameng district of Arunachal Pradesh. The project is likely to be implemented on BOOT basis for a lease period of 40 years from the commercial operation date.

Key risks

■ One time tax outgo if Section 80 (IA) benefits are withdrawn

PEL continues to claim benefits under Section 80 (IA) even though they were withdrawn in Budget 2008. According to the company, PEL fulfils all the required conditions under the clause of being an infrastructure developer. The company had earlier won the right to claim Sec 80 (IA) benefits in a court ruling in February 2007 (prior to Budget 2008). The matter is currently pending with the Mumbai High Court and a final decision is awaited. The liability arising out of the same was estimated at INR 650 mn at the end of FY07. The cash impact for the company will be around INR 250 mn.

■ Threat of equity dilution

PEL's recent venture in the owned infrastructure and real estate spaces will demand upfront investments with returns being back ended. Though the company currently does not face a cash crunch, we believe increasing funding requirement in the future is likely to lead to a rise in leverage levels. This may entail additional fund raising through equity dilution.

■ Slowdown in real estate cycle

A slowdown in the real estate cycle may lead to slowdown in project ramp ups, affecting PEL's revenue growth and hence, cash flows. This could be more pronounced in case of PEL since majority of the projects in Phase I are being developed on lease basis, which are subject to upfront capital investment, as opposed to the sale basis wherein the funding is largely met through customer advances.

Outlook and valuations

Given the pessimism in the real estate sector, we attempted a bear case valuation scenario for the company. With a full tax rate, PEL's EPS works out to INR 19 in FY08. Factoring a 15% increase in contracting PBT, the EPS for FY09E will be INR 22 which at a P/E multiple of 15 contributes INR 330/share from the contracting business alone. Even after taking no value from real estate development projects and applying a discount of 50% to the land bank value of INR 20 bn, the stock looks compelling at current valuations. We accept that the outlook for the real estate sector is challenging, but we believe these concerns have been adequately factored in. At CMP of INR 366, the stock is trading at P/E of 19.6x for FY09E and 13.4x for FY10E considering full tax rate. We maintain our **'BUY'** recommendation.

Financial Statements (Consolidated)

Income statement		(INR mn)				
Year to March	FY06	FY07	FY08	FY09E	FY10E	
Income from operations	10,148	12,956	18,596	21,238	27,776	
Direct costs	7,929	10,218	13,798	16,660	21,098	
Employee costs	353	406	504	597	787	
Other expenses	621	785	1,554	1,139	1,430	
Total operating expenses	8,903	11,409	15,856	18,396	23,316	
EBITDA	1,245	1,547	2,740	2,842	4,460	
Depreciation and amortisation	311	349	627	490	793	
EBIT	934	1,198	2,113	2,352	3,668	
Interest expense	314	319	295	719	1,194	
Other income	189	435	37	263	288	
Profit before tax	808	1,315	1,855	1,896	2,761	
Provision for tax	66	144	227	644	938	
Core profit *	742	1,171	1,628	1,252	1,823	
Profit after tax	742	1,171	1,628	1,252	1,823	
Minority interest	9	41	109	145	205	
Profit after minority interest	733	1,130	1,519	1,108	1,618	
Equity shares outstanding (mn)	50	60	60	60	60	
EPS (INR) basic *	14.8	18.9	25.5	18.6	27.1	
Diluted shares (mn)	49.6	59.7	59.7	59.7	59.7	
EPS (INR) fully diluted	14.8	18.9	25.5	18.6	27.1	
Dividend per share (INR)	1.4	1.3	1.5	1.5	1.6	
Dividend payout (%)	9.1	6.6	5.5	7.1	5.2	

* assuming full tax rate for FY09E and FY10E

Common size metrics- as % of net revenues

Year to March	FY06	FY07	FY08E	FY09E	FY10E
Operating expenses	87.7	88.1	85.3	86.6	83.9
EBITDA margins	12.3	11.9	14.7	13.4	16.1
Depreciation and amortization	3.1	2.7	3.4	2.3	2.9
Interest expenditure	3.1	2.5	1.6	3.4	4.3
Other income	1.9	3.4	0.2	1.2	1.0
Tax	0.6	1.1	1.2	3.0	3.4
EBIT margins	9.2	9.2	11.4	11.1	13.2
Net profit margins	7.3	9.0	8.8	5.9	6.6

Growth metrics (%)

Year to March	FY06	FY07	FY08E	FY09E	FY10E
Revenues	28.1	27.7	43.5	14.2	30.8
EBITDA	58.8	24.3	77.1	3.7	56.9
Net profit	76.1	57.8	39.1	(23.1)	45.6
EPS	70.5	28.0	34.6	(27.1)	46.1

Balance sheet		(INR mn)				
As on 31st March	FY06	FY07	FY08E	FY09E	FY10E	
Equity capital	50	60	60	60	60	
Reserves & surplus	1,957	7,014	7,929	8,932	10,436	
Shareholders funds	2,007	7,074	7,989	8,991	10,496	
Secured loans	5,069	4,379	7,155	12,110	15,927	
Unsecured loans	484	532	1,085	1,626	4,053	
Borrowings	5,553	4,911	8,241	13,736	19,980	
Net deferred tax	153	118	155	154	159	
Minority interest	254	74	180	323	525	
Sources of funds	7,968	12,177	16,564	23,204	31,160	
Gross block	3,574	3,568	5,404	7,384	12,639	
Depreciation	1,190	1,145	1,784	2,266	3,050	
Net block	2,384	2,423	3,620	5,118	9,589	
Capital work in progress	46	112	1,053	4,478	5,956	
Total fixed assets	2,430	2,535	4,673	9,597	15,545	
Investments	283	1,714	15	14	14	
Inventories	3,031	4,241	7,157	8,810	11,625	
Sundry debtors	1,714	3,031	2,849	3,562	4,470	
Cash and equivalents	722	1,047	1,091	1,233	1,253	
Loans and advances	2,569	2,962	5,125	5,638	6,167	
Total current assets	8,035	11,282	16,223	19,243	23,516	
Sundry creditors and others	2,788	3,375	4,675	6,345	8,400	
Provisions	25	6	6	7	8	
Total CL & provisions	2,813	3,380	4,681	6,352	8,408	
Net current assets	5,222	7,901	11,542	12,891	15,108	
Others	32	27	334	702	493	
Uses of funds	7,968	12,177	16,564	23,204	31,160	
Book value per share (INR)	8	24	26	28	34	

Free cash flow

Year to March	FY06	FY07	FY08E	FY09E	FY10E
Net profit	733	1,130	1,519	1,108	1,618
Add: Depreciation	311	349	627	490	793
Add: Deferred tax	32	0	0	0	7
Add: Others	(60)	(1,474)	1,397	(327)	303
Gross cash flow	1,016	4	3,543	1,270	2,720
Less: Changes in W. C.	2,164	2,354	3,596	1,208	2,197
Operating cash flow	(1,148)	(2,349)	(53)	62	523
Less: Capex	411	60	2,777	5,405	6,733
Free cash flow	(1,559)	(2,409)	(2,830)	(5,343)	(6,209)

Cash flow metrics

Year to March	FY06	FY07	FY08E	FY09E	FY10E
Operating cash flow	(1,148)	(2,349)	(53)	62	523
Financing cash flow	1,530	2,809	3,436	5,638	6,446
Investing cash flow	(411)	(60)	(2,777)	(5,405)	(6,733)
Net cash flow	(29)	399	606	296	236
Capex	(411)	(60)	(2,777)	(5,405)	(6,733)
Dividends paid	(57)	(66)	(75)	(74)	(79)
Share issuance / (buyback)	(60)	3,451	106	143	202

Profitability and liquidity ratios

Year to March	FY06	FY07	FY08E	FY09E	FY10E
ROAE (%)	44.4	25.0	20.7	13.9	17.7
ROACE (%)	14.2	13.2	15.6	11.8	13.5
Current ratio	2.9	3.3	3.5	3.0	2.8
Debtors (days)	55	67	58	55	53
Inventory days	152	184	207	253	253
Average working capital turnover (x)	2.4	2.0	1.9	1.7	2.0
Average capital turnover ratio (x)	1.5	1.3	1.3	1.1	1.0
Net debt/equity	2.3	0.3	0.9	1.4	1.8
Debt/Equity	2.8	0.7	1.0	1.5	1.9
Payable days	119	110	106	121	128
Cash conversion cycle	89	141	158	188	178
Debt/EBITDA	4.5	3.2	3.0	4.8	4.5
Adjusted debt/Equity	2.8	0.7	1.0	1.5	1.9

Operating ratios

Year to March	FY06	FY07	FY08E	FY09E	FY10E
Total asset turnover	1.5	1.3	1.3	1.1	1.0
Fixed assets t/o (x)	3.1	3.6	4.4	3.4	2.8
Equity turnover	6.1	2.9	2.5	2.5	2.9

Dupont analysis

Year to March	FY06	FY07	FY08E	FY09E	FY10E
NP margin (%)	7.2	8.7	8.2	5.2	5.8
Total assets turnover	1.5	1.3	1.3	1.1	1.0
Leverage multiplier	4.2	2.2	2.0	2.5	3.0
ROAE (%)	44.4	25.0	20.7	13.9	17.7

Valuation parameters

Year to March	FY06	FY07	FY08E	FY09E	FY10E
Diluted EPS *	14.8	18.9	25.5	18.6	27.1
Y-o-Y growth (%)	70.5	28.0	34.6	(27.1)	46.1
CEPS (INR)	4.3	5.0	7.2	5.4	8.1
Diluted P/E (x)	24.6	19.2	14.3	19.6	13.4
Price/BV(x)	45.7	15.4	14.2	13.1	10.9
EV/Sales (x)	2.6	1.8	1.6	1.6	1.5
EV/EBITDA (x)	21.1	15.4	10.5	12.0	9.1
Dividend yield (%)	0.4	0.4	0.4	0.4	0.4

* assuming full tax rate for FY09E and FY10E

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THERMAX**INR 375****Reclaiming water resources****REDUCE**

June 27, 2008

Company description

Thermax (TMX) provides solutions in the energy and environment space. The energy business contributes around 65% of revenues, whereas the environment business contributes around 35%. Further, 60% of revenues are from products and 40% from services. TMX's market share for chillers is 90%, 35-38% for boilers and heaters, 8% for water and waste water, 35% for chemicals, and around 60% for air treatment divisions.

Investment theme

TMX has been a key player in the industrial water and waste water management business with over 20 years of experience. The synergies between TMX's other related businesses which includes captive power plants, chillers and chemicals has enabled the company offer integrated services in the water treatment division. TMX has a wide product range which includes variety of clarifiers and filters, deionizers, membrane-based reverse osmosis technology, waste water recycling and resource recovery.

TMX has recently started focusing on the growing municipal water treatment segment for which it has formed a separate group in the company. It is currently executing a ~INR 340 mn project for the Chandigarh Municipal Corporation wherein the experience has been good, following which TMX has got itself pre-qualified with a couple of more corporations. The company is prequalified for most of the water projects under JNNURM. It has strong product knowledge but has less focus on the EPC part of the project; hence, it is likely to go in for consortia approach for bigger projects.

The water and waste water business has remained at ~7% of sales over the past three years, while the chemical business has contributed ~6-8% in the same time frame. TMX has had high growth in FY05-08, and hence, constant contribution of ~7% from water and waste water segment implies high growth in the water business also. Revenues from water and waste water segment grew at ~50% in FY07.

Key risks

Increase in key policy rates, by way of monetary policy actions is likely to result in slowdown in corporate capex which shall lead to slowdown in TMX's order accretion. Further we believe increase in government subsidies and grants has a potential to slowdown other government funded projects which can impact TMX's revenues.

Financials

Year to March	FY07	FY08	FY09E	FY10E
Revenues (INR mn)	23,266	34,815	42,377	52,451
<i>Growth (%)</i>	<i>43.1</i>	<i>49.6</i>	<i>21.7</i>	<i>23.8</i>
EBITDA (INR mn)	2,889	4,267	4,977	6,133
Net profit (INR mn)	1,937	2,907	3,460	4,280
<i>Growth (%)</i>	<i>96</i>	<i>45</i>	<i>20</i>	<i>24</i>
Diluted shares outstanding (mn)	119	119	119	119
EPS (fully diluted) (INR)	17	24	29	36
<i>EPS growth (%)</i>	<i>95.7</i>	<i>44.9</i>	<i>19.9</i>	<i>23.7</i>
Diluted P/E (x)	22.4	15.5	12.9	10.4
EV/EBITDA (x)	13.2	8.3	6.6	4.9
ROAE (%)	38.0	42.4	40.2	39.8

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Market Data

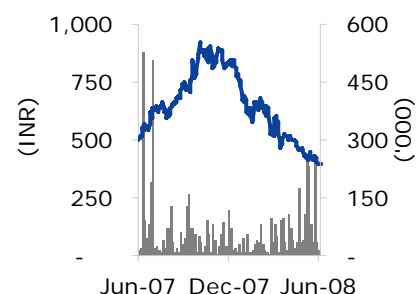
52-week range (INR) : 968 / 380
 Share in issue (mn) : 119.2
 M cap (INR bn/USD mn) : 46.8 / 1.046.2
 Avg. Daily Vol. BSE/NSE ('000) : 118.2

Share Holding Pattern (%)

Promoters : 62.0
 MFs, FIs & Banks : 14.4
 FIIs : 6.5
 Others : 17.1

Relative Performance (%)

	Sensex	Stock	Stock over Sensex
1 month	(11.4)	(8.7)	2.7
3 months	(10.4)	(27.7)	(17.3)
12 months	(0.1)	(21.7)	(21.6)



Outlook and valuations

Given the slowdown in the energy business segment and increase in spending in urban infrastructure upgradation projects, contribution from the water and waste water segments is likely to increase for TMX over the medium to long term. We believe TMX is a good bet for investors keen to play the water and waste water story in India over the long term. While we believe TMX's long term story remains strong driven by investments in corporate capex, captive power and power generation in the Indian economy, the recent spell of monetary policy tightening is likely to deter any meaningful growth in the order book and the concerns on the order flows are likely to persist. On our EPS estimates of ~INR 29 and ~INR 36, the stock is trading at a P/E of ~13x and ~10x for FY09E and FY10E, respectively. We continue to maintain our **'REDUCE'** recommendation.

Financial Statements

Income statement		(INR mn)				
Year to March	FY06	FY07	FY08	FY09E	FY10E	
Income from operations	16,261	23,266	34,815	42,377	52,451	
Materials costs	9,858	14,579	22,202	26,788	33,112	
Employee cost	1,599	2,139	2,672	4,181	5,271	
Other manufacturing expenses	3,044	3,660	5,675	6,431	7,935	
Total operating expenses	14,501	20,378	30,549	37,400	46,318	
EBITDA	1,760	2,889	4,267	4,977	6,133	
Depreciation and amortisation	160	195	232	360	430	
EBIT	1,600	2,694	4,035	4,617	5,703	
Interest expense	16	15	17	31	37	
Other income	137	360	439	758	963	
Profit before tax	1,721	3,038	4,457	5,344	6,629	
Provision for tax	703	1,046	1,571	1,885	2,349	
Core Profit	1,018	1,992	2,886	3,460	4,280	
Extraordinary income/(loss)	-	(55)	21	-	-	
Profit after tax	1,018	1,937	2,907	3,460	4,280	
Profit after minority interest	1,018	1,937	2,907	3,460	4,280	
Equity shares outstanding (mn)	119	119	119	119	119	
Diluted shares (mn)	119	119	119	119	119	
EPS (INR) fully diluted	8.5	16.7	24.2	29.0	35.9	
CEPS (INR)	10	18	26	32	40	
DPS	3.4	6.0	9.0	12.0	13.0	
Dividend payout (%)	52.1	46.3	43.2	48.4	42.3	

Common size metrics- as % of net revenues

Year to March	FY06	FY07	FY08	FY09E	FY10E
Operating expenses	89.2	87.6	87.7	88.3	88.3
Material cost	60.6	62.7	63.8	63.2	63.1
Employee cost	9.8	9.2	7.7	9.9	10.0
Other manufacturing expenses	18.7	15.7	16.3	15.2	15.1
Depreciation and amortisation	1.0	0.8	0.7	0.8	0.8
Interest expenditure	0.1	0.1	0.0	0.1	0.1
EBITDA margins	10.8	12.4	12.3	11.7	11.7
Net profit margins	6.3	8.6	8.3	8.2	8.2

Growth metrics (%)

Year to March	FY06	FY07	FY08	FY09E	FY10E
Revenues	28.1	43.1	49.6	21.7	23.8
EBITDA	68.0	64.1	47.7	16.7	23.2
Net profit	51.5	95.7	44.9	19.9	23.7
EPS	(70.2)	95.7	44.9	19.9	23.7

Balance sheet		(INR mn)				
As on 31st March	FY06	FY07	FY08	FY09E	FY10E	
Equity capital	238	238	238	238	238	
Reserves & surplus	4,356	5,661	7,482	9,269	11,737	
Shareholders funds	4,594	5,900	7,721	9,507	11,975	
Secured loans	70	22	22	22	22	
Borrowings	70	22	22	22	22	
Deferred tax (net)	92	68	68	68	68	
Sources of funds	4,756	5,989	7,811	9,597	12,065	
Gross block	2,528	2,921	3,858	4,573	5,488	
Depreciation	1,139	1,250	1,539	1,899	2,329	
Net block	1,389	1,671	2,319	2,674	3,159	
Capital work in progress	50	118	0	0	0	
Investments	3,970	5,741	5,438	5,438	5,438	
Inventories	1,283	2,108	3,185	3,873	4,787	
Sundry debtors	2,412	4,000	5,959	7,158	8,844	
Cash and bank balances	547	972	3,807	6,201	9,296	
Loans and advances	901	2,016	3,002	3,617	4,480	
Other current assets	764	1,139	2,402	3,001	3,815	
Total current assets	5,907	10,235	18,354	23,850	31,221	
Sundry creditors and others	5,949	11,204	17,430	21,310	26,453	
Provisions	612	574	870	1,054	1,300	
Total current liabilities & provisions	6,562	11,778	18,300	22,365	27,753	
Net current assets	(655)	(1,543)	54	1,486	3,469	
Misc expenditure	3	1	0	0	0	
Uses of funds	4,756	5,989	7,811	9,597	12,065	
Book value per share (INR)	39	49	65	80	101	

Free cash flow

Year to March	FY06	FY07	FY08E	FY09E	FY10E
Net profit	1,018	1,937	2,907	3,460	4,280
Add: Depreciation	160	195	232	360	430
Add: Deferred tax	24	(24)	-	-	-
Add: Others	(71)	182	1	-	-
Gross cash flow	1,131	2,290	3,140	3,820	4,710
Less: Changes in working capital	(1,090)	(1,313)	(1,238)	(963)	(1,112)
Operating cash flow	2,221	3,603	4,378	4,783	5,822
Less: Capex	164	461	819	715	915
Free cash flow	2,056	3,142	3,559	4,068	4,907

Cash flow metrics

Year to March	FY06	FY07	FY08	FY09E	FY10E
Operating cash flow	2,221	3,603	4,378	4,783	5,822
Financing cash flow	(1,004)	(945)	(1,255)	(1,673)	(1,812)
Investing cash flow	(950)	(2,233)	(516)	(715)	(915)
Net cash flow	267	425	2,608	2,395	3,094
Capex	(164)	(461)	(819)	(715)	(915)
Dividend paid	(530)	(897)	(1,255)	(1,673)	(1,812)
Share issuance/(Buyback)	(477)	-	-	-	-

Profitability & Liquidity ratios

Year to March	FY06	FY07	FY08	FY09E	FY10E
ROAE (%)	23.5	38.0	42.4	40.2	39.8
ROACE (%)	139.2	520.7	307.9	141.4	105.7
Inventory (days)	43	42	44	48	48
Debtors (days)	56	50	52	56	56
Payable (days)	198	215	235	264	263
Cash conversion cycle	(98)	(122)	(140)	(159)	(160)
Current ratio	0.9	0.9	1.0	1.1	1.1
Interest cover (x)	99.4	174.9	244.5	150.7	153.3

Operating ratios

Year to March	FY06	FY07	FY08E	FY09E	FY10E
Fixed assets turnover (x)	12.4	15.2	17.5	17.0	18.0
Total asset turnover(x)	3.4	4.3	5.0	4.9	4.8
Equity turnover(x)	3.7	4.4	5.1	4.9	4.9

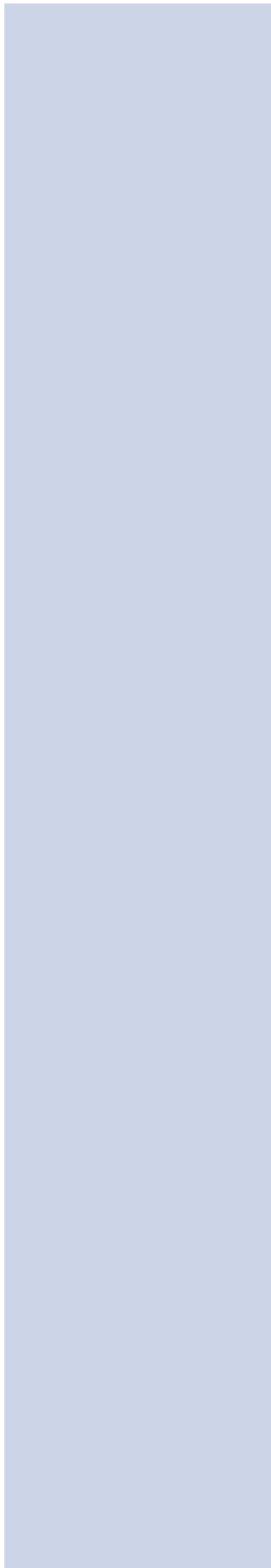
Du pont analysis

Year to March	FY06	FY07	FY08	FY09E	FY10E
NP margin (%)	6.3	8.6	8.3	8.2	8.2
Total assets turnover	3.4	4.3	5.0	4.9	4.8
Leverage multiplier	1.1	1.0	1.0	1.0	1.0
ROAE (%)	23.5	38.0	42.4	40.2	39.8

Valuation parameters

Year to March	FY06	FY07	FY08	FY09E	FY10E
Diluted EPS (INR)	8.5	16.7	24.2	29.0	35.9
Y-o-Y growth (%)	(70.2)	95.7	44.9	19.9	23.7
CEPS (INR)	10.1	18.2	26.2	32.1	39.5
Diluted P/E (x)	43.9	22.4	15.5	12.9	10.4
Price/BV(x)	9.7	7.6	5.8	4.7	3.7
EV/Sales (x)	2.5	1.6	1.0	0.8	0.6
EV/EBITDA (x)	22.9	13.2	8.3	6.6	4.9

NOTES

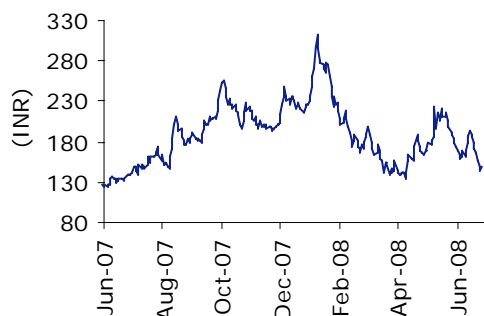


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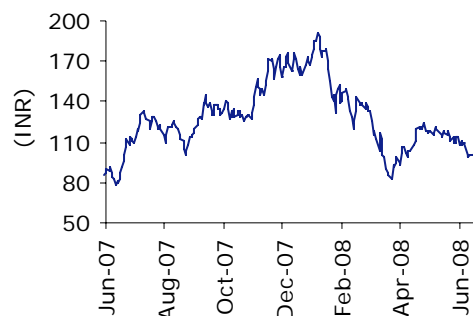
Coverage group(s) of stocks by primary analyst(s): Engineering and Capital Goods:

ABB, Apar Industries, BHEL, Crompton Greaves, Emco, Jyoti Structures, Kalpataru Power Transmission, KEC International, KEI Industries, L & T, Siemens, Thermax, Transformers & Rectifiers, Voltamp, and Voltas,

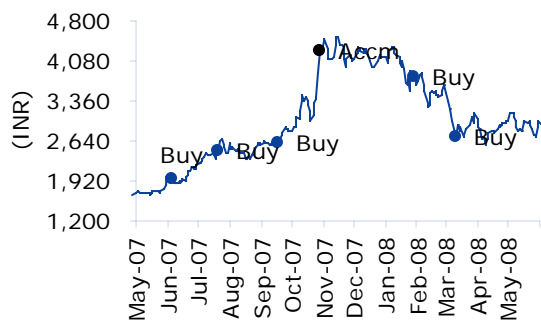
Hindustan Dorr Oliver



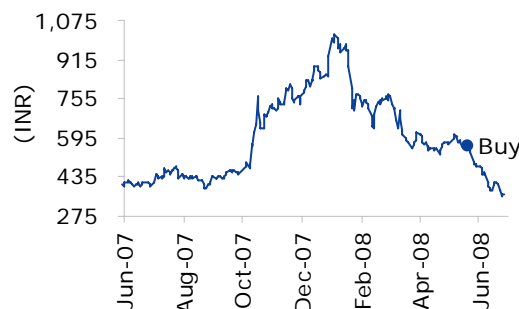
Ion Exchange



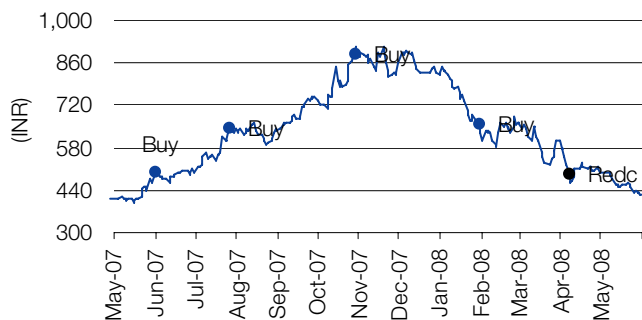
Larsen & Toubro



Patel Engineering



Thermax



Date	Company	Title	Price (INR)	Recos
19-Jun-08	KEI Industries	Margin squeeze	49	Buy
11-Jun-08	Suzlon Energy	Repowered; Event Update	270	Buy
02-Jun-08	NTPC	Burning bright; Result Update	161	Accum
20-May-08	Suzlon Energy	Risk-reward unfavourable; 318 Result Update	318	Reduce

Distribution of Ratings / Market Cap

Edelweiss Research Coverage Universe

	Buy	Accumulate	Reduce	Sell	Total
Rating Distribution*	104	60	15	2	193

* 11 stocks under review / 1 rating withheld

	> 50bn	Between 10bn and 50 bn	< 10bn
Market Cap (INR)	85	73	35

Rating Interpretation

Rating	Expected to
Buy	appreciate more than 20% over a 12-month period
Accumulate	appreciate up to 20% over a 12-month period
Reduce	depreciate up to 10% over a 12-month period
Sell	depreciate more than 10% over a 12-month period

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