Report on Ludhiana Corporation's Water Supply and Sewerage business

September 2014

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Acronyms used

CAGR	Compounded annual growth rate
Cr/Crs	Crores (10 million)
DPR	Detailed Project report
EBIDTA	Earnings before depreciation, interest and tax adjustments
EBIT	Earnings before interest
GoP	Government of Punjab
JnNURM	Jawaharlal Nehru national urban renewal mission
KL	Kilo-litre (thousand litres) or cubic meter
Lpcd	Litre per capita day
MCL	Ludhiana Municipal Corporation
Mn	Million
NLTA	Non-loan technical assistance
Opex/ capex	Operational expenditure/ capital expenditure
PPP	Public private partnership
PPP	Public private partnership
PWSSB	Punjab Water Supply and Sewerage Board
Rs	Rupees
SS	Sewerage System
ST/ LT	Short term/ Long term
VAT	Value added tax
WS	Water Supply

Study background

The present study is a part of non-lending technical assistance ("NLTA") support on Transformative change in Urban Services Delivery in Ludhiana and Ludhiana cities to the Government of Punjab ("GoP"). Some of the components of the study includes institutional, operational and water governance model for water (including waste water) sector in the two cities of Ludhiana and Ludhiana cities in Punjab such that there is sustainability in the sector operations.

The institutional model is needed to ensure that operations are carried out in an efficient and optimal fashion at the municipal corporation level and could draw from experience of other states in the country.

Along with this, the study involves two separate but inter related components viz.

a) analysis of the financial viability of the water sector (including sewerage services) in the municipal corporations, along with the implications it has on the city finances comprising of the general fund
b) develop a financial model that can forecast the WS business and study the impact of inter-play amongst the key cost drivers

Thus, the study covers

- Documentation of the current financial position of water and sewage services in the cities, clarifying the costs and the various sources of revenues – across water sector and the municipal corporation operations
- Analyzing he billing data base that is used by the corporations (this would enhance the validation of data sourced from the accounting department)
- Identifying the underlying factors that influence the cost drivers – for eg. The power consumption in tube well operations vis-à-vis the cost of operating a surface based waster system etc.
- Importantly consider the capex propped under different options – continuing to operate with the tube wells in the coming years or switch to surface water provision with attendant costs like water treatment, bulk water transmission etc.
- Understand the tariff structure as is worked out in the city and its implications on the revenues
- Provide a clear view of the value chain of operations in the WS sector as well as ULB operations.
  Usually (as the past practice in the sector) shows, value chain is focused exclusive on O&M, interest servicing on loans taken. It ignores (or assumes) the depreciation charge as part of tariff chain – as the future capex is supposed to be funded outside the sector by the stakeholders.
  Secondly, the deficit arising out of operation and its financing cost is also not included in the decision analysis. This is implicitly assumed to be financed as 'no-cost' deferral of liabilities to be paid (employees or suppliers) and hence ignored
- Provide evidence based benchmarking, wherever it adds value to enhance understating the policy issue and the means of implementing such policies
- Allow PPP consultants to study the impact of financing options for future capex investments and the attendant policy issues to be addressed

The Financial model should as far as possible encode the above key interactions and also provide for flexibility in changing assumptions, options (continuing ground water vis-à-vis providing 24 x7 through surface water – either to core city area or for the entire city). It should also provide for running scenarios where in changes to the key parameters can be studied.

City background

Ludhiana municipal corporation ("MCL"), as per the statute carries out the business of operation and maintenance of water supply and sewerage systems ("WS&SS") in the city limits of MCL. The MCL raises resources mainly through as property tax (recently introduced which replaced the earlier House tax, even though some of the old arrears under this head is still being collected), license fees, user fees for WS & SS services, octroi on electricity, development fees etc. it receives a substantial portion of its income from the State government in term so allocation from the State VAT fund (which compensates the MCL for abolition of octroi).

It spends majorly on Operation and Maintenance (such as employee expenses, repairs and maintenance, power and other administrative expenses) expenses required to manage the resources as detailed above.

It further is a participant in a recent urban transport venture within the city (which on a PPP mode) and makes capital contributions to such service. As MCL receives grants/ capital support from schemes like JnNURM etc., where a portion of the capital is received from Central and State Government with the balance being contributed by it.

Accounting system

Based on the current practice, the accounting for water sector and general fund has been segregated in the corporation. All O&M expenses, interest and loan repayment, capital expenditure and special grants received for WS sector business is accounted separately under natural heads. In the general budget, WS sector income and expenses are grouped under the 'O&M' cell head.

However, as per the accounting systems generally followed in municipal accounting, the income and expenses are not fully based on 'accrual concept'. Hence, income includes arrears collection, whereas expenses are accounted on the basis of actual payment and not when the 'right to pay' occurs. There is also no balance sheet (both for the WS and the general fund) to account for the assets and liabilities fully.

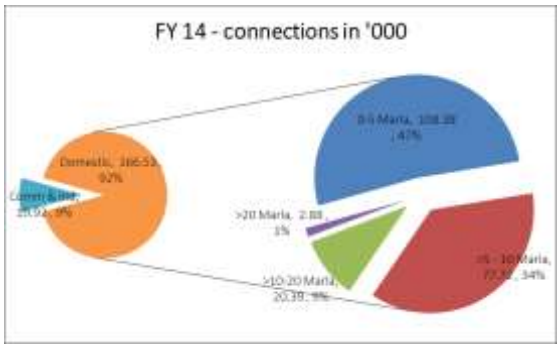
The corporation produces periodically an 'unpaid liabilities' statement for the purpose of understanding its funds position. An attempt had been made few years back to take the help of chartered accountants firm to prepare the financial statements for the MCL (including WS separately). This experiment didn't carry far enough as the statements suffered from non-application of proper accounting standards as well as non-provision of data from the city.

Description of the existing business

MCL extracts water from the ground resources and supplies water intermittently (10-12 hours) in the city limits. As per our understanding the total quantum of eater extracted is 530 MLD and of this, the sale quantum of water to paying consumers 35% or 190 MLD. With a population of ~1.8 mn, this works out to a production of 257 lpcd and the sale is ~90 lpcd. However, without proper metering at various levels, these numbers are more based on 'delphi' approach.

It is of concern to MCL that the water table is depleting and is evaluating other options of getting surface water. Planning and construction of network and assets is undertaken by PWSSB and the O&M is maintained by MCL.

Based on the internal database the city has ~209,373 connections covering a population of ~1.8 million as of 2014. Currently, there is no systematic reconciliation on the number of connections and the property data base to ensure that the universe of connections is fully accounted for.



Of the total consumers those in 0-5 Marla (a marla is ~ 30 sq. yards or ~25 sq. mtrs) in domestic category are exempted from paying WS and SS charges. This means ~ 47% of connections don't pay any user charges (though the tariff schedule does include tariff rates for such slab).

Size of Household in Marla	Domestic	Comm & Industrial	% of G total	% of G total
0-5	1,08,383	4,317	52%	22%
5-10	77,722	-	37%	0%
10-20	20,389	-	10%	0%
>20	2,879	15,607	1%	78%
G Total	2,09,373	19,924	91%	9%

SS covers ~73% of the connections. This has been roughly worked out from the billing database using the tariff categorisation as a measure. This works out to ~ 166,400 million connections.

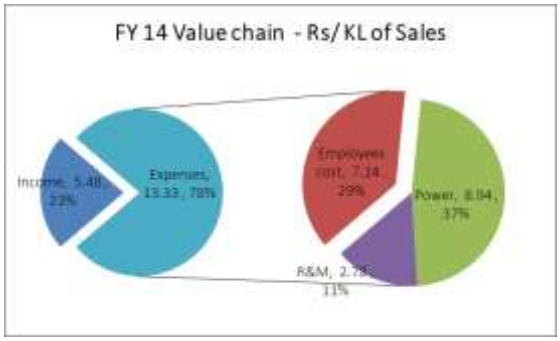
Financial position of the WS&SS services

As major numbers of connections are exempted from user charge, the financial position of the sector is in a very bad shape is deteriorating as the costs increase.

						Rs Lakhs	
	FY 09	FY 10	FY 11	FY 12	FY 13	FY 14	CAGR
Income			2,310.41	2,451.44	2,433.25	3,708.16	17%
Per KL of production	-	-	1.19	1.27	1.26	1.92	
Per KL of sale	-	-	3.41	3.62	3.59	5.48	
Cost coverage	0%	0%	28%	25%	21%	29%	
Employees cost	2791.94	3101.04	4157.16	4770.73	5338.29	4831.62	12%
Power	2441.98	2726.87	2975.64	3628.91	4850.06	6051.79	20%
R&M	1018.43	751.87	1103.83	1488.53	1354.47	1882.37	13%
Others							
Total	6252.35	6579.78	8236.63	9888.17	11542.82	12765.78	15%
Per KL of production	3.23	3.40	4.26	5.11	5.97	6.60	
Per KL of sale	9.23	9.72	12.17	14.60	17.05	18.85	
capex	1836.78	2223.81	5947.41	6954.14	2997.57	2352.40	

The income as shown here is based on the 'tally' data, MIS data from MCL and the billing database from the IT. It is not clear from these (as the database and the tally differ) as to what is the true accrual amount (excluding interest, arrears etc.). The income also includes disposal charges collected

from the commercial consumers. It is difficult to explain the sudden jump in FY 14 as compared to previous years and could very well include arrears collections as well.



On an average, ~45% of the expenses is accounted by the establishment section. This expenses is steadily growing at the CAGR of 12% in the past 5 years. Power is the second largest head and this accounts for ~41% of the costs stack up and is growing at a rate higher than the establishment expenses. In Punjab, the cross-subsidisation is yet to be corrected and this category may undergo some correction, once implemented by the electricity regulatory commission. R&M expenses seems to fluctuate at 11% to 16% in the cost chain. This could be due to the fact that this expenses is more based on cash availability and hence could be break-down maintenance rather than preventive maintenance.

Cost recovery is a measure of how much income (on accrual basis would include only that which is for the current period viz. the current demand) covers the O&M expenses which comprises of the establishment, power, R&M and other administrative expenses.

The cost recovery has steadily worsened till FY 13 and is now only at 29% in FY 14 (this could be due to the sudden jump in the income accounted in FY 14 – 50% as compared to the previous year. If this increase is ignored, then the cost recovery falls to 18% only). The costs on an average have increased by a CAGR of 15%. The income has grown by 17% (as FY 14 shows a very high increase). The main reason for income not increasing, except for natural accretion in connections, is that there has been no tariff increase for the last 6 years.

It can be seen very clearly from the above that that as the Rs/KL of production (usually this is done on the sale quantity, but as the sale is not metered and input has more certainty in measurement, the benchmarking is done on production) has almost doubled in the last 6 years from Rs 3.23 to Rs 6.6, the tariff realisation @ an average of Rs 1.3 (ignoring FY 14) has almost stayed constant. Further, the average monthly bill per paying connection (excluding the exempted category) shows a recovery of Rs 123 only but is lower than the first block of paying consumers which starts at Rs 140 per month for WS or SS. Even increasing the average by at least say Rs 17 per connection per month can translate into an additional revenue of Rs 45 million per year.

In comparison, this is much lower than what is seen elsewhere for e.g. in Gulbarga in Karnataka (comparatively a city with lower population and economic prospects than Ludhiana) the average realisation per connection on flat rate is Rs 175 per month for water supply only. Hence there is a potential to increase the revenue.

The O&M gap is met by a withdrawal from consolidated fund and the WS account shows a break-even (without charging for depreciation, interest, return on capital etc.).

Capital expenditure during this period is driven more by fund availability. The main areas of investment is majorly in tube wells, WS & SS distribution network.

Financial position of the MCL (excluding WS)

Based on the data sourced from the accounts department, the financial position of the corporation is as follows:

				Rs Million
MCL - Funds flow	Mar-11	Mar-12	Mar-13	Mar-14
Income				
Htax/Prop Tax	537	689	736	623
Share of VAT/Octroi	2,199	2,558	2,790	3,052
Octroi on Elec	308	329	351	354
Addln Excise duty	407	28	149	304
Grants	570	108	421	245
Others	318	431	306	882
Total Income	4,338	4,142	4,753	5,460
Expenditure				
Employees cost	1,579	1,835	2,266	2,660
Electricity	238	273	278	407
R&M	545	609	345	666
A&G	20	18	5	154
Others	-	-	-	-
Total O&M	2,382	2,734	2,894	3,887
EBIDTA - General fund	1,956	1,408	1,859	1,574
Amount trfd to WS&SS	(1,229)	(1,513)	(1,197)	(1,312)
Net EBIDTA	727	(106)	662	262
Extordnry Inflows - sale of land	321	202	216	202
Loans and Assistance	389	1,052	119	1,276
Funds available	1,438	1,148	997	1,740
Capex - General	1,685	1,302	658	803
Capex - WS	595	695	300	235
Net Fund available	(842)	(849)	39	702

Usually, the financial position of the corporation is not shown in this fashion but more as a funds flow (income and expenditure account) statement. Thus, the receipts includes all items of income, loan receipts, grants receipts, arrears collections etc. Similarly, expenses clump together the operational & capital expenses along with debt servicing, advances & deposits.

However an attempt has been made above to understand the net position of the MCL after accounting exceptional items, loan receipts, debt servicing and the contribution it makes towards capital expenditure. As far as possible, income is restricted to demand for the period (excluding arrears collection) and expenditure segregated between operations, debt servicing and capital expenditure.

Overall income is growing at a CAGR rate of 8% whereas the expenditure is growing at 18% in the same period. Thus, the operational surplus (termed as EBIDTA in the table above) which was around 45% in FY 11 has dropped to 28% in FY 14.

Property tax (previously house tax) accounts only 11% of the total income for the corporation – this has been growing @ 5% CAGR in the past 4 years. Others (levies such as licensee fees, tehbazari fees, development charges, regularisation of building fees etc.) account for another 16% in the stack. The rest of the income chain consists of transfers from the State in terms of share of VAT (~ 56% - this head is growing at a health rate of ~12% in the past 4 years), octroi on electricity (~5%) and additional excise duty.

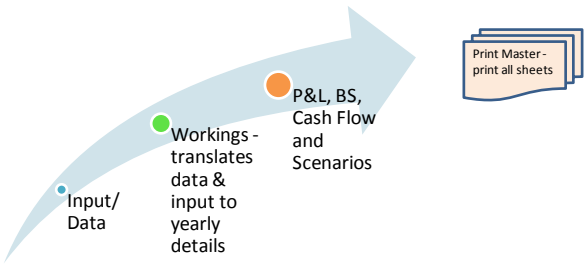
In expenditure stack, establishment costs accounts for ~70% on an average (this head is growing at a CAGR of 19% - more than the major source of income for the corporation viz. share of VAT), power (majorly contributed by street lighting) accounts for ~10% (growing at a CAGR 20%) and the rest comprises of administration and general expenses. In the last two years (FY 13 and FY 14), the share of VAT transfer is little less than that of the establishment expenses and any delay in such transfers puts the corporation in a tight spot in paying the salaries in time.

It can be seen that in the last few years, the operating surplus of the MCL (excluding WS sector) is adequate to meet the losses made in the WS&SS sector prior to debt servicing and capital expenditure contribution (accounting for almost 80%. Thus, the net fund is eroded in the last few years, as there is deficit after financing the capital expenditure.

The capital expenditure also shows very low spending capability and this puts into a question as to whether the MCL is in a position to fund its contribution for the proposed capital expenditure.

Development of financial forecast model

A financial model has been developed for the WS&SS sector in MCL are which lists out the key drivers, the assumptions behind them and the end result of how the sector would stand on an "business as usual" basis. This is the base scenario and alternates are provided as to how this can be changed with changing the critical factors such as tariff etc. are worked out.



The model works on a switch wherein the 3 options – continuance of intermittent water supply (on a flat tariff basis) under 'No conversion to 24x7' option for which the selection button is number '0'. If the core city alone is to be changed over to 24x7, then the option to be selected would be number '1' and finally if the entire city is to be converted to 24x7, then the selection has to be set to number '2'.

The 'data' worksheet contains the analysis of data sourced from the consumer billing data, data from the accounts department, data from PUDA survey etc. In the 'input' worksheet, the main assumptions for key variables that would impact the business are set out.

This covers areas like population, connections in WS, coverage of SS, tariff assumptions (flat and volumetric), tariff hikes, water accounting, capex etc.

Worksheet 'workings' does the calculation yearwise translating the assumptions (for e.g. population known for certain years like 2011, 2017, 2032 are then translated into yearwise population using the CAGR of the end points to draw out the population).

P&L, BS and CF stands for the profit and loss account, Balance sheet and the cash flow statements for the WS and SS business.

Worksheet 'MCL' sets out the income and expenditure of the MCL yearwise and also projects these for the subsequent years using the past as a guidance (CAGR of the past 6 years).

Scenarios under each option (as explained above, 'no conversion to 24x7', 'core city 24x7' and the 'full city 24x7') is set out in separate sheets 'NoCscenatios', 'CCscenarios' and 'FCscnearios' respectively.

Worksheet 'Print' sets out the custom view for each worksheet and selecting the same, highlights the print area of that worksheet and then issuing print command will prepare the hard copies of the workbook.

Details of working of model is in Appendix A.

Financial Analysis – No conversion to 24x7 and billing continues as flat tariff basis

This is the 'business as usual' option. This would be the 'worst' case option and brings out the impact of continuing the existing policies. This would help the policy makers to understand the gap that exists in cost recovery chain and the impact of full cost of the sector (adding depreciation, debt servicing, deficit financing) on the general fund of MCL.

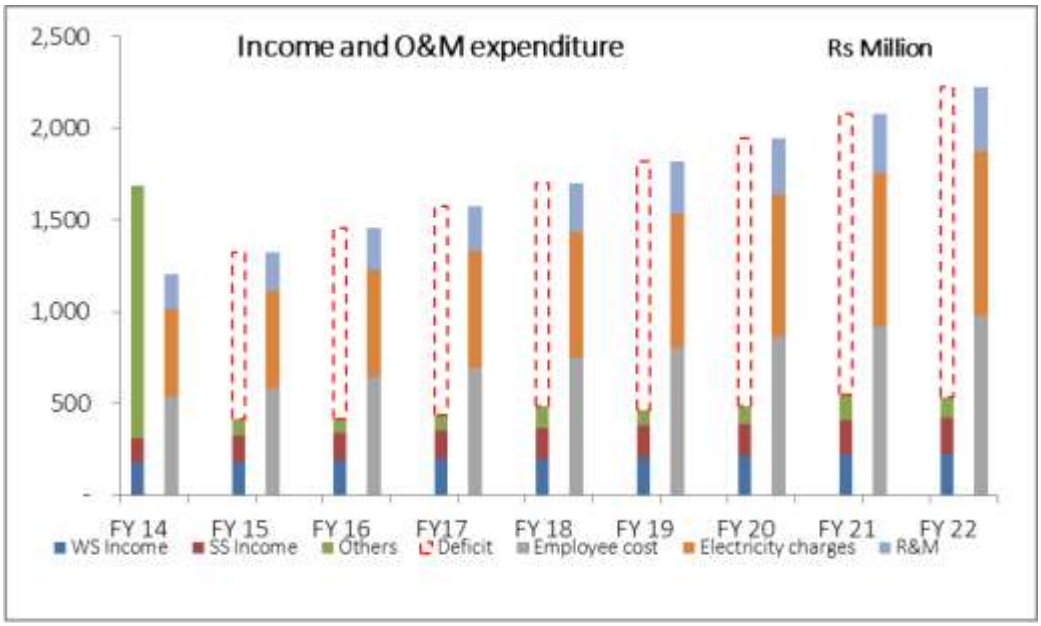
The summary of assumption in this option are:

a. No tariff increase for the projection period. Collection efficiency is assumed at 78% steadily increasing to 95% by the projection period. Past arrears is assumed at a low value (even though the database shows a large amount, it is assumed that many may be disputed or non-reconciled balances)
b. O&M costs increases at historical CAGR but is tapered down in the future years
c. No introduction of WS and SS charges for the 0-5 marla exempted category
d. Capex projected to the extent of ~Rs 1,167 million

Capex Summary	Rs Million
JnNURM II & Others	1,167
Total	1,167

e. Depreciation is charged on non-grant portion of asset capitalised at an average rate of 6% for new assets (assumes an average life of 15 years and residual value of 10%). For the existing assets, this is based on the data provided by MCL
f. LT interest on loans based on the term sheets with MCL. HUDCO loans are priced at 10.25%. New loans are priced at 12% rate of interest with a 10
g. Any shortfall in operation is assumed to be borrowed at 12% rather than from the consolidated fund

The P&L under the base scenario is set out below. This is the base case i.e. no conversion to 24x7



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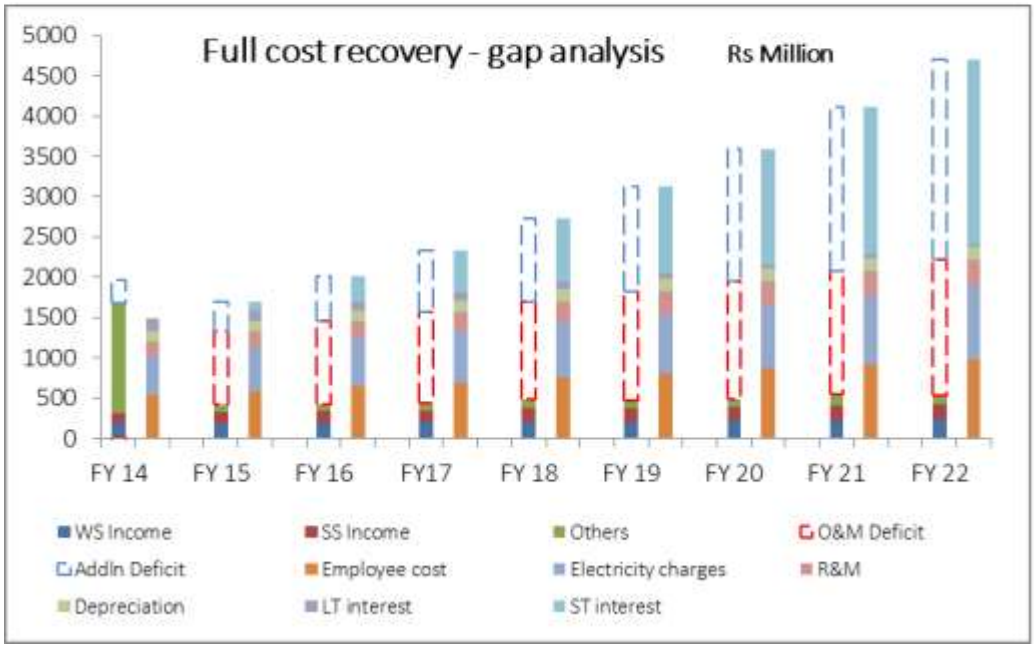


summary for WS, the financial numbers are:

Ludhiana WS									Rs Crores
	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20	FY 21	FY 22
Revenue	37.08	41.32	41.64	43.43	48.17	46.55	48.20	54.62	53.01
O&M	120.26	132.28	145.51	157.15	169.72	181.60	194.32	207.92	222.47
Operating Surplus/(defiit)	(83.18)	(90.96)	(103.87)	(113.72)	(121.55)	(135.06)	(146.12)	(153.30)	(169.46)
Deprn, Interest	27.87	26.16	24.58	23.93	24.71	23.13	21.55	19.97	18.39
Int on deficit financing	-	10.36	30.76	52.58	77.97	107.72	142.60	182.80	229.30
Net Deficit	(111.05)	(127.47)	(159.21)	(190.23)	(224.23)	(265.91)	(310.27)	(356.08)	(417.16)
Cost Recovery (O&M level)	31%	31%	29%	28%	28%	26%	25%	26%	24%

Analysis of operational chain:

- The income from WS & SS growth is due to the accretion in the overall connections. Growth in SS coverage is more as JICA project is expected to be commissioned during this period
- O&M expenses growth has been tempered (as stated in the assumptions) but is still much higher than the growth in income. No tariff hike has been assumed during this period

- Thus, the operational deficit (or cost recovery) worsens during this period from a 28% in FY 14 (prior to accounting for the transfer from general fund) to 24% in FY 22

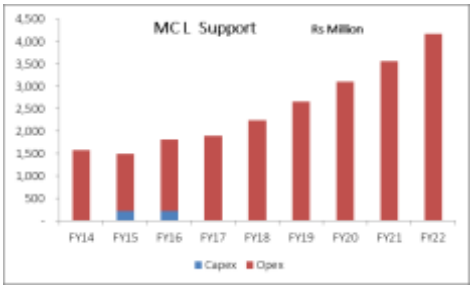
In the subsequent years, this annual deficit balloons up and in FY 22 it is almost double of FY 14 level. Thus, in the period between FY15 to FY 22, the total deficit for the business is Rs 10,340 million at operational level and Rs 20,500 million at full cost level. This total cost gap can be explained as follows:

a. Additional depreciation on account of capex incurred – Rs 1,190 million in the projection period
b. LT interest (JICA and HUDCO loans) add to ~ Rs 6,30 million (based on the term sheet data provided by MCL)
c. ST interest (deficit financing) amounts to ~ Rs 8,340 million

The following table shows the P&L, cost chain (as shown below) and the deterioration therein.

									Rs Million
Profit & Loss Account	Mar-14	Mar-15	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21	Mar-22
Option Chosen:									
Water Production	1,93,450	1,93,450	1,93,450	1,93,450	1,93,450	1,93,450	1,93,450	1,93,450	1,93,450
Losses	65%	65%	65%	62%	62%	60%	60%	55%	55%
Sale	67,708	67,708	67,708	73,511	73,511	77,380	77,380	87,053	87,053
Revenue									
Revenue from WS	175.21	181.68	188.39	195.34	200.60	205.99	211.53	217.22	223.06
Revenue from SS	132.67	142.18	147.43	152.87	167.45	171.95	176.57	192.65	197.83
Rev. Grants/Trf from Gen fur	1,311.92	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Conn charges/Otherincome	62.94	88.39	79.55	85.09	112.67	86.52	92.85	135.29	108.23
Total Revenue	1,682.74	413.24	416.37	434.30	481.71	465.46	481.95	546.16	530.12
Expenditure									
Employees cost	531.29	584.42	642.86	694.29	749.84	802.33	858.49	918.58	982.88
Electricity	483.63	531.99	585.19	632.00	682.56	730.34	781.46	836.17	894.70
Repairs & Maintenance,Othe	187.65	206.41	227.05	245.22	264.83	283.37	303.21	324.43	347.14
Total O&M Cost	1,202.56	1,322.82	1,455.10	1,571.51	1,697.23	1,816.04	1,943.16	2,079.18	2,224.73
EBIDTA	480.17	(909.58)	(1,038.74)	(1,137.21)	(1,215.52)	(1,350.58)	(1,461.21)	(1,533.03)	(1,694.60)
Depreciation	127.40	127.40	127.40	136.70	160.25	160.25	160.25	160.25	160.25
EBIT	352.77	(1,036.98)	(1,166.13)	(1,273.91)	(1,375.77)	(1,510.83)	(1,621.46)	(1,693.28)	(1,854.85)
Interest	151.30	134.17	118.39	102.60	86.82	71.03	55.25	39.46	23.68
ST Loan Interest		103.55	307.59	525.81	779.73	1,077.21	1,425.98	1,828.02	2,293.03
Net Profit/(Loss)	201.47	(1,274.70)	(1,592.11)	(1,902.32)	(2,242.32)	(2,659.07)	(3,102.69)	(3,560.76)	(4,171.56)
Analysis									
Rs/KL - Sales Based	Mar-14	Mar-15	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21	Mar-22
WS & SS Billing income	4.55	4.78	4.96	4.74	5.01	4.88	5.02	4.71	4.83
Grant	19.38	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total Income	24.85	6.10	6.15	5.91	6.55	6.02	6.23	6.27	6.09
O&M Expenditure	17.76	19.54	21.49	21.38	23.09	23.47	25.11	23.88	25.56
Total Cost	21.88	24.93	29.66	31.79	37.06	40.38	46.33	47.18	54.01
Rs/KL - Production Based	Mar-14	Mar-15	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21	Mar-22
WS & SS Billing income	1.59	1.67	1.74	1.80	1.90	1.95	2.01	2.12	2.18
Grant	6.78	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total Income	8.70	2.14	2.15	2.25	2.49	2.41	2.49	2.82	2.74
O&M Expenditure	6.22	6.84	7.52	8.12	8.77	9.39	10.04	10.75	11.50
Total Cost	7.66	8.73	10.38	12.08	14.08	16.15	18.53	21.23	24.30
Average Monthly Bill - paying consumers - Rs/Month									
WS - Alone	120.75	120.75	120.75	120.75	120.75	120.75	120.75	120.75	120.75
SS - Alone	126.14	126.14	126.14	126.14	126.14	126.14	126.14	126.14	126.14
WS + SS	123.02	123.06	123.06	123.06	123.15	123.15	123.15	123.23	123.23
Margins - with grant/transfer from General Fund									
EBIDTA	**29%**	**(220%)**	**(249%)**	**(262%)**	**(252%)**	**(290%)**	**(303%)**	**(281%)**	**(320%)**
Cost Recovery - O&M	140%	31%	29%	28%	28%	26%	25%	26%	24%
Cost Recovery - Full cost	114%	24%	21%	19%	18%	15%	13%	13%	11%

The position in FY 14 is showing a positive EBIDTA and cost recovery almost full because there is a transfer of Rs 1311 million from the consolidated fund to the WS&SS business. This has not been factored in the subsequent period (only nominal value which generally accrues from some local development fund or some politician development fund etc.) and hence the cost recovery shows a declining trend, as the costs increase without a suitable increase in income. However, the entire deficit of WS is shown as a funding line in MCL funds flow and the net effect is reflected in the MCL funds position.



Depreciation is based on the assets added and the interest is on loans (from JICA). The ST interest is nothing but assumed financing of the cash deficit and shows an increasing financing required as the losses mount up.

The impact of this on the corporation's account is:

									Rs Million
Balanc Sheet	Mar-14	Mar-15	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21	Mar-22
Capital	-	532	1,115	1,115	1,115	1,115	1,115	1,115	1,115
Add: Reserves and Surplus	201	(1,073)	(2,665)	(4,568)	(6,810)	(9,469)	(12,572)	(16,133)	(20,304)
Total Equity	201	(541)	(1,550)	(3,452)	(5,695)	(8,354)	(11,456)	(15,017)	(19,189)
Long Term Loan	1,386	1,232	1,078	924	770	616	462	308	154
Current Liabilities	470	110	121	131	141	151	162	173	185
ST Borrowing	-	1,726	3,401	5,363	7,633	10,321	13,446	17,021	21,196
Total Liabilities	2,057	2,527	3,050	2,966	2,849	2,735	2,613	2,486	2,346
Gross Assets	2,123	2,123	2,123	2,278	3,394	3,394	3,394	3,394	3,394
Less: Acc. Depreciation	(127)	(255)	(382)	(519)	(679)	(839)	(1,000)	(1,160)	(1,320)
Net Fixed Assets	1,996	1,869	1,741	1,759	2,715	2,554	2,394	2,234	2,073
CWIP	-	532	1,115	960	(155)	(155)	(155)	(155)	(155)
Investments									
Current Assets									
Cash & Bank balance	1	1	1	1	1	1	1	1	1
Receivables	60	125	192	244	288	334	372	405	426
Others	1	1	1	1	1	1	1	1	1
Total Assets	2,057	2,527	3,050	2,966	2,849	2,735	2,613	2,486	2,346

As mentioned earlier, the current liability (which is the de facto financier of the operational deficit) is restricted to normal working cycle of a commercial organisation and the deficit financing (along with the cost of such borrowing) is shown separately as ST borrowing. It is a moot point whether the corporation would be in a position to raise this type of finance or simple cut back on operations to manage within the available resources.

Further, the major assumption in this forecast is that the corporation is able to keep up the collections at the current levels and is not recognising as current assets, as the probability of them being realised would be low, given the past trends.

Corporation fund flow:

								Rs Million
MCL - Funds flow	Mar-15	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21	Mar-22
Income								
Htax/Prop Tax	654	687	728	772	818	867	919	974
Share of VAT/Octroi	3,418	3,828	4,058	4,301	4,560	4,833	5,123	5,431
Octroi on Elec	425	467	514	555	599	641	686	734
Addln Excise duty	319	335	352	370	388	408	428	449
Grants								
Others	567	614	722	666	701	731	734	722
Total Income	5,383	5,932	6,374	6,664	7,066	7,480	7,891	8,310
Expenditure								
Employees cost	3,165	3,482	3,830	4,136	4,467	4,780	5,115	5,473
Electricity	488	537	591	638	689	737	789	844
R&M	713	763	816	873	934	1,000	1,070	1,145
A&G	177	194	214	231	249	267	286	306
Others	-	-	-	-	-	-	-	-
Total O&M	4,543	4,976	5,451	5,878	6,340	6,784	7,259	7,767
EBIDTA - General fund	840	956	923	785	726	696	632	544
Amount trfd to WS &SS	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Net EBIDTA	839	955	922	784	725	695	631	543
Extordnry Inflows - sale of land	165	193	227	211	213	212	214	222
Loans and Assistance								
Funds available	1,004	1,148	1,150	995	937	907	845	765
Capex - General								
Capex - WS	222	222	-	-	-	-	-	-
Net Fund available	**781.48**	**926.33**	**1,149.83**	**995.30**	**937.45**	**907.43**	**844.67**	**764.89**
Total Amount to be mobilisied by AMC								
Surplus/(Deficit) - as above	781.48	926.33	1,149.83	995.30	937.45	907.43	844.67	764.89
WS Surplus/(deficit)- Incldg ST fu	-1,274.70	-1,592.11	-1,902.32	-2,242.32	-2,659.07	-3,102.69	-3,560.76	-4,171.56
Grand Total	-493.22	-665.79	-752.49	-1,247.02	-1,721.62	-2,195.26	-2,716.09	-3,406.68

In summary, the key financial position:

Ludhiana Municipal Corporation									Rs Crores
	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20	FY 21	FY 22	Total
Revenue	538.28	593.18	637.40	666.38	706.59	748.02	789.06	831.04	
Expenses	454.29	497.58	545.05	587.84	634.00	678.38	725.86	776.67	
Operating Surplus/(Deficit)	83.99	95.59	92.35	78.54	72.59	69.64	63.20	54.36	610.26
Other net flows	(5.74)	(2.86)	22.74	21.09	21.26	21.20	21.37	22.23	
Net Surplus/(Deficit)	78.25	92.73	115.08	99.63	93.85	90.84	84.57	76.59	731.54
Trf reqd to WS - cover O&M defic	(90.96)	(103.87)	(113.72)	(121.55)	(135.06)	(146.12)	(153.30)	(169.46)	(1,034.05)

The funds position of MCL has been projected using the past CAGR and an attempt has been made to study the impact of the WS & SS sector has on the finances of the city funds. Similar to WS tariff, property tax for 0-5 marla is also exempt and not accounted in the projections. The city funds also account for the capital contribution to be made for the WS sector (whether it is in JICA project or JnNURM project or 24x7 project).

In the forecast period

- Property tax is expected to go up atleast by 6% (as currently the compliance is not full and there is a possibility of better coverage in the coming years)
- Share of VAT is also not pegged at high growth, as in the past but tempered down (this could be an underestimate if the economy booms in the coming years but can be other way round too). Thus, the total income of MCL is up by ~7% during the forecast period
- Expenses, like WS business is also tempered ad is expected to grow by 9%.

Thus, the operational surplus which is ~15% in FY 14 is expected to slide down to ~6% in FY 22. This presents an alarming picture, as operational surplus of MCL is down and the deficit in WS is up, resulting in a large deficit for corporation.

WS Support by MCL	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22
Opex + Capex - as % Income	21%	21%	18%	18%	19%	20%	19%	20%
Full cost + capex - as % income	28%	31%	30%	34%	38%	41%	45%	50%

Further, MCL is expected to contribute its share of capital investments in WS (bridging the gap between the grant and total project cost). Given this, it could be seen that the income for the corporation should be atleast be doubled to handle the capex as well meet the O&M for the WS and SS sector.

From the table, it can be seen that during the projected period, ~20%, on an average per annum, of MCL's income would needs to support the opex+capex for WS. If full cost of the WS sector is to be absorbed by MCL, then the proportion leaves MCL in deficit in all years.

As per the forecast, MCL is able to generate operating surplus funds, Rs ~765 million on an average between FY 15 to FY 22, totalling to Rs 6,100 million. It is expected to contribute ~Rs 450 million to the capex of WS apart from funding an operational deficit of ~Rs 10,340 million.

This again points to the need for the MCL to introduce property tax across all categories (including the 0-5 marla properties) as well as 'user charges'.

To summarise, in this 'No conversion' option:

a. The total uncovered O&M costs in WS is Rs 10,340 million
b. The additional deficit on account of depreciation and interest is Rs 10,160 million
c. The operating surplus in MCL totals to Rs 6,100 only. The share of MCL in capex works out to Rs 445million
d. The surplus available in the general fund (after expenses) is not enough to meet the operations cost of WS along with the contribution (its share) to capex.

Alternate Scenarios in this option of 'No conversion to 24x7'

Alternate assumptions are tested out in the scenarios and their implications on the total costs are presented below: the key parameters are the changes in EBIDTA line (as to how much of cost recovery improves due to change in the variable and hence reduction of loss in EBIDTA) and the overall financial impact on MCL.

Scenario 1								
Reintroduction of first slab with some value - WS								
	Mar-15	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21	Mar-22
0-5 Marla	-	-	80	-	-	-	-	-
Impact Current Position **No 24x7**								
Base case EBIDTA	(909.58)	(1,038.74)	(1,137.21)	(1,215.52)	(1,350.58)	(1,461.21)	(1,533.03)	(1,694.60)
Revised EBIDTA	(909.58)	(1,038.74)	(1,021.20)	(1,096.40)	(1,228.25)	(1,335.59)	(1,404.03)	(1,562.14)
Base case MCL overall support	(493.22)	(665.79)	(752.49)	(1,247.02)	(1,721.62)	(2,195.26)	(2,716.09)	(3,406.68)
Revised MCL overall support	(493.22)	(665.79)	(630.19)	(1,107.81)	(1,563.08)	(2,014.73)	(2,510.38)	(3,172.09)

Scenario 2								
Reintroduction of first slab with some value - SS								
	Mar-15	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21	Mar-22
0-5 Marla	-	-	80	-	-	-	-	-
Impact Current Position **No 24x7**								
Base case EBIDTA	(909.58)	(1,038.74)	(1,137.21)	(1,215.52)	(1,350.58)	(1,461.21)	(1,533.03)	(1,694.60)
Revised EBIDTA	(909.58)	(1,038.74)	(1,050.10)	(1,120.10)	(1,252.59)	(1,360.59)	(1,423.25)	(1,581.87)
Base case MCL overall support	(493.22)	(665.79)	(752.49)	(1,247.02)	(1,721.62)	(2,195.26)	(2,716.09)	(3,406.68)
Revised MCL overall support	(493.22)	(665.79)	(660.65)	(1,136.18)	(1,595.39)	(2,051.51)	(2,545.44)	(3,212.02)

Scenario 3

Increase in SS tariff post JICA								
	Mar-15	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21	Mar-22
0-5 Marla	0%	0%	0%	0%	0%	0%	0%	0%
>5 - 10 Marla	0%	0%	0%	10%	6%	6%	6%	6%
Base case MCL overall support	0%	0%	0%	10%	6%	6%	6%	6%
Revised MCL overall support	0%	0%	0%	10%	6%	6%	6%	6%
Comm & Ind	0%	0%	0%	10%	6%	6%	6%	6%
Impact Current Position **No 24x7**								
Base case EBIDTA	(909.58)	(1,038.74)	(1,137.21)	(1,215.52)	(1,350.58)	(1,461.21)	(1,533.03)	(1,694.60)
Revised EBIDTA	(909.58)	(1,038.74)	(1,137.21)	(1,198.78)	(1,322.03)	(1,419.54)	(1,473.28)	(1,617.70)
Base case MCL overall support	(493.22)	(665.79)	(752.49)	(1,247.02)	(1,721.62)	(2,195.26)	(2,716.09)	(3,406.68)
Revised MCL overall support	(493.22)	(665.79)	(752.49)	(1,229.33)	(1,689.47)	(2,145.54)	(2,641.35)	(3,304.70)

Introduction of basic rate for the first slab improves income on an average ~Rs 95 million per annum for the MCL. The scenario assumes that this increase is implemented only from 2017 (as it would be too early to introduce it in this or next financial year). Similarly if the same is introduced for the SS, the income goes up by the same amount. The total value during the projection period is Rs 745 million for WS and Rs 600 million for SS. On the overall shortfall, the situation improves by Rs 1,000 million (after considering the ST interest element). Even, if the sizes of the gains are small, it is better to introduce the concept and ensure the equality of the user charges across categories.

Scenario 3 looks at the increase in SS tariff (without the first slab), post JICA (as the connections improve), the impact on the revenue is Rs 220 million in the projection period (between 2018-2022). The overall gain in this is very small (~Rs 270 million) as the base is too small and the increase is moderate given that the tariffs have stagnated in the past. Clearly an unworkable situation of having low tariff increases, especially as O&M costs are galloping[1].

Combination of Scenario 1 & 2

Impact Current Position **No 24x7**	Mar-15	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21	Mar-22
Base case EBIDTA	(909.58)	(1,038.74)	(1,137.21)	(1,215.52)	(1,350.58)	(1,461.21)	(1,533.03)	(1,694.60)
Revised EBIDTA	(909.58)	(1,038.74)	(934.09)	(1,000.98)	(1,130.27)	(1,234.97)	(1,294.25)	(1,449.41)
Base case MCL overall support	(493.22)	(665.79)	(752.49)	(1,247.02)	(1,721.62)	(2,195.26)	(2,716.09)	(3,406.68)
Revised MCL overall support	(493.22)	(665.79)	(538.35)	(996.98)	(1,436.85)	(1,870.97)	(2,339.72)	(2,977.43)

Combination of Scenario 1,2 & 3

Impact Current Position **No 24x7**	Mar-15	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21	Mar-22
Base case EBIDTA	(909.58)	(1,038.74)	(1,137.21)	(1,215.52)	(1,350.58)	(1,461.21)	(1,533.03)	(1,694.60)
Revised EBIDTA	(909.58)	(1,038.74)	(934.09)	(984.23)	(1,101.72)	(1,193.31)	(1,234.51)	(1,372.50)
Base case MCL overall support	(493.22)	(665.79)	(752.49)	(1,247.02)	(1,721.62)	(2,195.26)	(2,716.09)	(3,406.68)
Revised MCL overall support	(493.22)	(665.79)	(538.35)	(979.29)	(1,404.70)	(1,821.25)	(2,264.98)	(2,875.45)

[1] In many states, when electricity reforms were introduced/ implemented, the initial tariff hikes increased the bar by a good quantum to correct some of the past imbalances. Similarly, for this sector, re-introduction of first slab and annual tariff increases seem to be inevitable.

Obviously a combination of scenario 1, 2 and 3 show a very high income generation potential and reduces the loss substantially and hence the funding for the sector. This additional resource mobilised at ~Rs 2,100 million.

Scenario 4

Increase in WS & SS tariff								
	Mar-15	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21	Mar-22
0-5 Marla	0%	0%	0%	0%	0%	0%	0%	0%
>5 - 10 Marla	0%	0%	0%	10%	6%	6%	6%	6%
Base case MCL overall support	0%	0%	0%	10%	6%	6%	6%	6%
RevisedMCL overall support	0%	0%	0%	10%	6%	6%	6%	6%
Comm & Ind	0%	0%	0%	10%	6%	6%	6%	6%
Impact Current Position **No 24x7**								
Base case EBIDTA	(909.58)	(1,038.74)	(1,137.21)	(1,215.52)	(1,350.58)	(1,461.21)	(1,533.03)	(1,694.60)
Revised EBIDTA	(909.58)	(1,038.74)	(1,137.21)	(1,189.18)	(1,305.68)	(1,395.67)	(1,441.06)	(1,576.22)
Base case MCL overall support	(493.22)	(665.79)	(752.49)	(1,247.02)	(1,721.62)	(2,195.26)	(2,716.09)	(3,406.68)
Revised MCL overall support	(493.22)	(665.79)	(752.49)	(1,219.20)	(1,671.05)	(2,117.05)	(2,600.66)	(3,249.26)

Scenario 5 126%

Increase in WS & SS tariff required to cover O&M in Mar-22								
	Mar-15	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21	Mar-22
0-5 Marla	0%	26%	26%	26%	26%	26%	26%	26%
>5 - 10 Marla	0%	26%	26%	26%	26%	26%	26%	26%
>10-20 Marla	0%	26%	26%	26%	26%	26%	26%	26%
>20 Marla	0%	26%	26%	26%	26%	26%	26%	26%
Comm & Ind	0%	26%	26%	26%	26%	26%	26%	26%
Impact Current Position **No 24x7**								
Base case EBIDTA	(909.58)	(1,038.74)	(1,137.21)	(1,215.52)	(1,350.58)	(1,461.21)	(1,533.03)	(1,694.60)
Revised EBIDTA	(909.58)	(951.61)	(933.09)	(848.32)	(777.62)	(619.51)	(307.17)	0.00
Base case MCL overall support	(493.22)	(665.79)	(752.49)	(1,247.02)	(1,721.62)	(2,195.26)	(2,716.09)	(3,406.68)
Revised MCL overall support	(493.22)	(578.66)	(548.37)	(879.82)	(1,148.66)	(1,353.57)	(1,490.23)	(1,712.07)

Scenario 6

Increase in WS and SS tariff - equal- to cover total costs in Mar- 22								
Impact Current Position **No 24x7**	Mar-15	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21	Mar-22
0-5 Marla	0%	36%	36%	36%	36%	36%	36%	36%
>5 - 10 Marla	0%	36%	36%	36%	36%	36%	36%	36%
>10-20 Marla	0%	36%	36%	36%	36%	36%	36%	36%
>20 Marla	0%	36%	36%	36%	36%	36%	36%	36%
Comm & Ind	0%	36%	36%	36%	36%	36%	36%	36%
Impact Current Position **No 24x7**								
Base case EBIDTA	(909.58)	(1,038.74)	(1,137.21)	(1,215.52)	(1,350.58)	(1,461.21)	(1,533.03)	(1,694.60)
Revised EBIDTA	(909.58)	(917.92)	(841.59)	(658.26)	(436.49)	(45.23)	647.81	1,501.97
Base case MCL overall support	(493.22)	(665.79)	(752.49)	(1,247.02)	(1,721.62)	(2,195.26)	(2,716.09)	(3,406.68)
Revised MCL overall support	(493.22)	(538.80)	(427.71)	(609.53)	(634.41)	(451.38)	43.92	764.90

In scenario 5, the monthly average bill per connection moves from current position of Rs 120 to Rs 195 by FY 17 and increases to Rs 620 by FY 22, which covers the entire O&M. In this scenario the overall MCL support also falls by similar amount of Rs 5,000 million, which can be used to leverage capex in other sectors to the extent of say Rs 15,000 million (assuming that contribution of Rs 5,000 million is say 30% contribution).

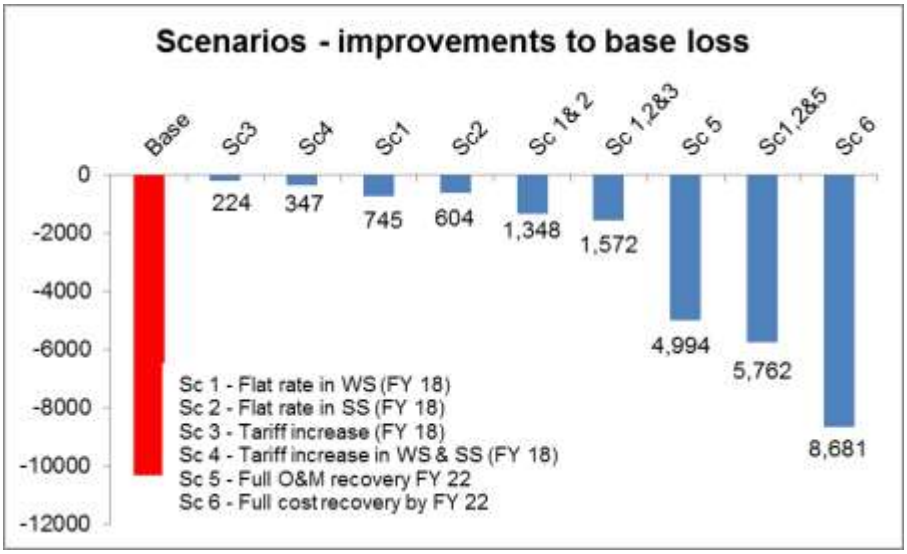
Scenario 6 looks at the tariff increase required to cover the entire costs (depreciation and interest) by FY 22, which seems highly improbable.

Combination of 1,2 & 5

Impact Current Position **No 24x7**	Mar-15	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21	Mar-22
0-5 Marla	0%	19%	19%	19%	19%	19%	19%	19%
>5 - 10 Marla	0%	19%	19%	19%	19%	19%	19%	19%
>10-20 Marla	0%	19%	19%	19%	19%	19%	19%	19%
>20 Marla	0%	19%	19%	19%	19%	19%	19%	19%
Comm & Ind	0%	19%	19%	19%	19%	19%	19%	19%
Base case EBIDTA	(909.58)	(1,038.74)	(1,137.21)	(1,215.52)	(1,350.58)	(1,461.21)	(1,533.03)	(1,694.60)
Revised EBIDTA	(909.58)	(975.02)	(750.88)	(660.08)	(600.28)	(470.91)	(211.34)	(0.00)
Base case MCL overall support	(493.22)	(665.79)	(752.49)	(1,247.02)	(1,721.62)	(2,195.26)	(2,716.09)	(3,406.68)
Revised MCL overall support	(493.22)	(598.82)	(338.28)	(607.98)	(803.70)	(916.91)	(935.07)	(1,013.74)

In the above scenario, the tariff hike required is reduced further, as the first slab is reintroduced. The additional resource generated reduces the overall support by ~Rs 700 million.

Summary of all alternate scenarios and their reduction of deficit:



To conclude,

- Business as usual – is not clearly tenable as the cost recovery is way too low. Further, the surplus in MCL is also not expected to be adequate to cover the rising deficits in WS business
- Re-introduction of first slab improves the resources of the sector but more as a principle rather than generating resources
- This coupled with regular increases of tariff hike improves the cost recovery
- Due to large tariff imbalances of the past, tariff & realisation needs to move to atleast Rs 620 per month per connection by FY 22 (as compared to Rs 123 today) to recover the O&M.
- This would improve the finances of MCL also, as the support to be given to the sector can be diverted to the important areas of Health and other social infrastructure sectors.

Financial Analysis – Core city conversion to 24x7 (volumetric tariff basis) and the rest of city on flat rate basis

As per the current thinking in MCL, the city is planning to augment its depleting ground water table by tapping surface water and also improve its service to 24x7. Such change is also expected to change the method of charging for the water from flat rate to a more equitable volumetric basis.

It is assumed that even if the project is started now, the construction would be completed in say next 2 years and the first set of conversion in connections would be felt in FY 17 and balance in FY 18.

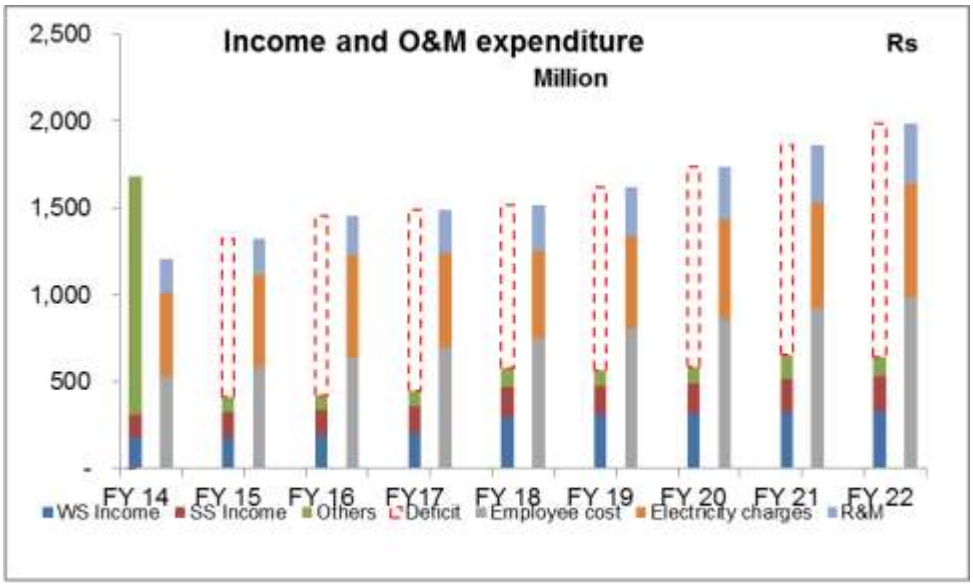
Summary of assumption in this scenario

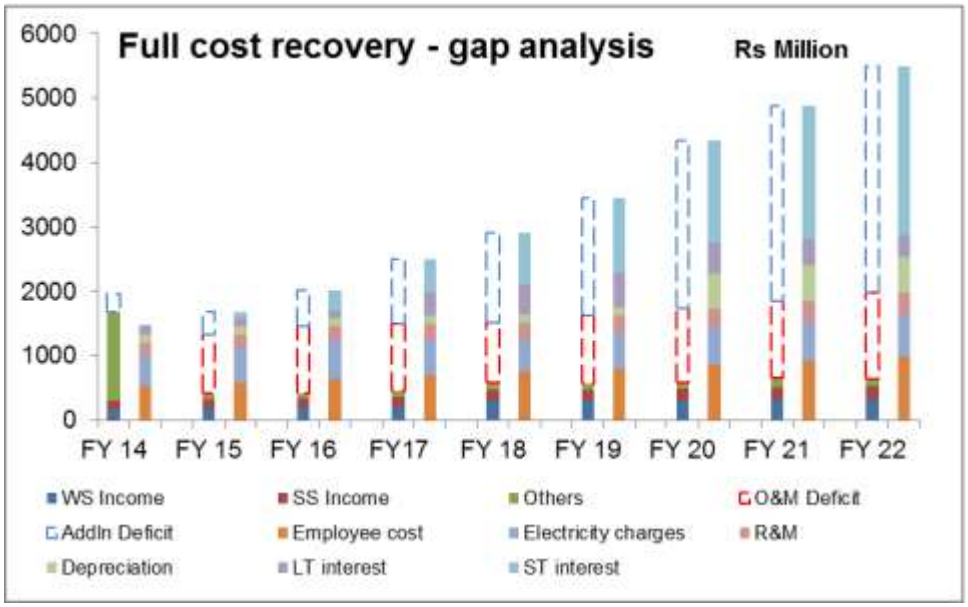
a. Tariff for volumetric basis starts at the existing rates of Rs 2.9/KL on consumption quantity (this is an assumption and can be changed). The tariff structure bills for all consumers (brings in automatically the first slab as well). Average consumption for each slab based on the survey conducted by PUDA.
b. No tariff increase for the projection period. Collection efficiency is assumed at 78%. Steadily increasing to 95% by the projection period. Past arrears is assumed at a low value (even though the database shows a large amount, it is assumed that many may be disputed or non-reconciled balances)
c. O&M costs increases at historical CAGR but is tapered down in the future years
d. No introduction of WS and SS charges for the 0-5 marla exempted category (in case of residuary flat rate consumers)
e. Capex projected to the extent of Rs 13,720 million –for conversion of core city area into 24x7.

Capex Summary	Rs Million
Core city conversion to 24x7	13,720
Total	13,720

f. 24x7 capex is assumed to be funded as 50% grant, 30% by a loan (say @12% interest, repayable in 12 (with first two years as moratorium – construction period)
g. Depreciation is charged on non-grant portion of asset capitalised at an average rate of 6% for new assets (assumes an average life of 15 years and residual value of 10%). For the existing assets, this is based on the data provided by MCL
h. LT interest on loans based on the term sheets with MCL
i. Any shortfall in operation is assumed to be borrowed at 12% rather than from the consolidated fund

The profit and loss account and the gap in the account are as follows:





In summary,

Ludhiana WS									Rs Crores
	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20	FY 21	FY 22
Revenue	37.08	41.32	41.64	44.64	57.85	56.48	58.40	65.10	63.77
O&M	120.26	132.28	145.51	148.77	151.62	162.24	173.60	185.75	198.75
Operating Surplus/(defiit)	(83.18)	(90.96)	(103.87)	(104.14)	(93.78)	(105.75)	(115.19)	(120.65)	(134.98)
Deprn, Interest	27.87	26.16	24.58	48.63	59.40	67.70	102.34	95.82	89.30
Int on deficit financing	-	10.36	30.76	53.60	80.86	115.53	158.65	207.27	262.38
Net Deficit	(111.05)	(127.47)	(159.21)	(206.36)	(234.03)	(288.98)	(376.18)	(423.74)	(486.66)
Cost Recovery (O&M level)	31%	31%	29%	30%	38%	35%	34%	35%	32%

The revenue from WS improves by Rs 522 million in the last 5 years (as compared to earlier option of 'No conversion'), as the volumetric tariff is introduced across all categories and all categories are charged on the basis of consumption[2] – the average per monthly bill per connection works out to Rs 127 (for WS alone) as compared to the existing Rs 123.

[2] Consumption per each category is based on a study conducted by PUDA over a period. Further, the tariff regime need not be classified based on the size of property but can be moved to a volumetric slab as a rationale basis. Further in any tariff regime, there could be cross-subsidisation between poor and less consuming slab and the highest one. This can be further sliced using capability to pay.

The O&M expenses (as compared to previous scenario) improve by Rs 1,120 million in the projection period mainly due to reduction in power charges. Thus there is an overall additional resource to the extent of ~Rs 1,645 million in the projection period. This is shown by the reduced losses in the EBIDTA line, which now stands at ~Rs 8,700 million.

Additional deficit on account of depreciation and interest works out to Rs ~12,500 million (depreciation contributing to Rs 1,120 million, LT interest - ~Rs 2,195 and ST interest – ~ Rs 9,190 million).

The depreciation line increases as the additional capex (on account of 24x7) is capitalised and charged to P&L. This of course, doesn't change the cash requirement from the sector but shows its impact on the overall cost to be recovered.

A portion of the 24x7 (30%) is funded by loan and this increases the interest cost by ~Rs 2,200 million during the projection period and the repayment principal of ~Rs 1,650 million. As the income is not adequate, this increases the cash support from MCL by this amount apart from the original capital contribution of ~Rs 2,750 million (20% of project cost). Thus the additional cost to MCL on account of going 24x7 in the core city area works out to ~Rs 6,600 (2200+1650+2750) million during the projection period.

This also increases the short term borrowing (deficit financing) by ~ Rs 900 million.

									Rs Million
Profit & Loss Account	Mar-14	Mar-15	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21	Mar-22
Option Chosen:									
Water Production	1,93,450	1,93,450	1,93,450	1,93,450	1,93,450	1,93,450	1,93,450	1,93,450	1,93,450
Losses	65%	65%	65%	51%	39%	38%	38%	36%	36%
Sale	67,708	67,708	67,708	95,362	1,17,213	1,19,001	1,19,001	1,23,471	1,23,471
Revenue									
Revenue from WS	175.21	181.68	188.39	207.41	297.37	305.37	313.58	322.01	330.67
Revenue from SS	132.67	142.18	147.43	152.87	167.45	171.95	176.57	192.65	197.83
Rev. Grants/Trf from Gen fur	1,311.92	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Conn charges/Otherincome	62.94	88.39	79.55	85.09	112.67	86.52	92.85	135.29	108.23
Total Revenue	1,682.74	413.24	416.37	446.36	578.49	564.84	584.01	650.95	637.74
Expenditure									
Employees cost	531.29	584.42	642.86	695.22	751.83	804.46	860.77	921.03	985.50
Electricity	483.63	531.99	585.19	547.29	499.58	534.55	571.97	612.01	654.85
Repairs & Maintenance,Othe	187.65	206.41	227.05	245.22	264.83	283.37	303.21	324.43	347.14
Total O&M Cost	1,202.56	1,322.82	1,455.10	1,487.72	1,516.25	1,622.39	1,735.95	1,857.47	1,987.49
EBIDTA	480.17	(909.58)	(1,038.74)	(1,041.36)	(937.76)	(1,057.54)	(1,151.95)	(1,206.52)	(1,349.75)
Depreciation	127.40	127.40	127.40	136.70	136.70	136.70	548.30	548.30	548.30
EBIT	352.77	(1,036.98)	(1,166.13)	(1,178.05)	(1,074.45)	(1,194.24)	(1,700.24)	(1,754.81)	(1,898.05)
Interest	151.30	134.17	118.39	349.56	457.26	540.26	475.08	409.90	344.73
ST Loan Interest		103.55	307.59	536.02	808.62	1,155.31	1,586.45	2,072.72	2,623.84
Net Profit/ (Loss)	201.47	(1,274.70)	(1,592.11)	(2,063.64)	(2,340.33)	(2,889.80)	(3,761.78)	(4,237.43)	(4,866.61)
Analysis									
Rs/KL - Sales Based	Mar-14	Mar-15	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21	Mar-22
WS & SS Billing income	4.55	4.78	4.96	3.78	3.97	4.01	4.12	4.17	4.28
Grant	19.38	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total Income	24.85	6.10	6.15	4.68	4.94	4.75	4.91	5.27	5.17
O&M Expenditure	17.76	19.54	21.49	15.60	12.94	13.63	14.59	15.04	16.10
Total Cost	21.88	24.93	29.66	26.32	24.90	29.03	36.52	39.59	44.58
Rs/KL - Production Based	Mar-14	Mar-15	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21	Mar-22
WS & SS Billing income	1.59	1.67	1.74	1.86	2.40	2.47	2.53	2.66	2.73
Grant	6.78	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total Income	8.70	2.14	2.15	2.31	2.99	2.92	3.02	3.36	3.30
O&M Expenditure	6.22	6.84	7.52	7.69	7.84	8.39	8.97	9.60	10.27
Total Cost	7.66	8.73	10.38	12.97	15.09	17.86	22.46	25.27	28.45
Average Monthly Bill - paying consumers - Rs/Month									
WS - Alone	120.75	120.75	120.75	107.13	128.46	128.46	128.46	128.46	128.46
SS - Alone	126.14	126.14	126.14	126.14	126.14	126.14	126.14	126.14	126.14
WS + SS	123.02	123.06	123.06	114.45	127.62	127.62	127.62	127.58	127.58
Margins - with grant/transfer from General Fund									
EBIDTA	**29%**	**(220%)**	**(249%)**	**(233%)**	**(162%)**	**(187%)**	**(197%)**	**(185%)**	**(212%)**
Cost Recovery - O&M	140%	31%	29%	30%	38%	35%	34%	35%	32%
Cost Recovery - Full cost	114%	24%	21%	18%	20%	16%	13%	13%	12%

Clearly, as the O&M costs are contained and the revenues are improved, the cost recovery improves close to 8% points between the options (no conversion) to the partial conversion in the core city area.

								Rs Million
Balanc Sheet	Mar-15	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21	Mar-22
Capital	-	-	4,802	9,604	9,604	9,604	9,604	9,604
Add: Reserves and Surplus	(1,073)	(2,665)	(4,729)	(7,069)	(9,959)	(13,721)	(17,958)	(22,825)
Total Equity	(1,073)	(2,665)	73	2,535	(355)	(4,117)	(8,354)	(13,221)
Long Term Loan	1,232	1,078	2,982	4,886	4,320	3,755	3,189	2,624
Current Liabilities	110	121	124	126	135	145	155	166
ST Borrowing	1,726	3,401	5,533	7,944	11,311	15,130	19,416	24,315
Total Liabilities	1,995	1,935	8,712	15,491	15,412	14,912	14,405	13,883
Gross Assets	2,123	2,123	2,278	2,278	2,278	15,998	15,998	15,998
Less: Acc. Depreciation	(255)	(382)	(519)	(656)	(792)	(1,341)	(1,889)	(2,437)
Net Fixed Assets	1,869	1,741	1,759	1,623	1,486	14,658	14,109	13,561
CWIP	-	-	6,705	13,565	13,565	(155)	(155)	(155)
Investments								
Current Assets								
Cash & Bank balance	1	1	1	1	1	1	1	1
Receivables	125	192	246	302	359	408	449	476
Others	1	1	1	1	1	1	1	1
Total Assets	1,995	1,935	8,712	15,491	15,412	14,912	14,405	13,883

Corporation fund flow:

								Rs Million
MCL - Funds flow	Mar-15	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21	Mar-22
Income								
Htax/Prop Tax	654	687	728	772	818	867	919	974
Share of VAT/Octroi	3,418	3,828	4,058	4,301	4,560	4,833	5,123	5,431
Octroi on Elec	425	467	514	555	599	641	686	734
Addln Excise duty	319	335	352	370	388	408	428	449
Grants								
Others	567	614	722	666	701	731	734	722
Total Income	5,383	5,932	6,374	6,664	7,066	7,480	7,891	8,310
Expenditure								
Employees cost	3,165	3,482	3,830	4,136	4,467	4,780	5,115	5,473
Electricity	488	537	591	638	689	737	789	844
R&M	713	763	816	873	934	1,000	1,070	1,145
A&G	177	194	214	231	249	267	286	306
Others	-	-	-	-	-	-	-	-
Total O&M	4,543	4,976	5,451	5,878	6,340	6,784	7,259	7,767
EBIDTA - General fund	840	956	923	785	726	696	632	544
Amount trfd to WS &SS	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Net EBIDTA	839	955	922	784	725	695	631	543
Extordnry Inflows - sale of land	165	193	227	211	213	212	214	222
Loans and Assistance								
Funds available	1,004	1,148	1,150	995	937	907	845	765
Capex - General								
Capex - WS	-	-	1,372	1,372	-	-	-	-
Net Fund available	**1,003.58**	**1,148.43**	**-222.17**	**-376.70**	**937.45**	**907.43**	**844.67**	**764.89**
Total Amount to be mobilisied by AMC								
Surplus/(Deficit) - as above	1,003.58	1,148.43	-222.17	-376.70	937.45	907.43	844.67	764.89
WS Surplus/(deficit)- Incldg ST fu	-1,274.70	-1,592.11	-2,063.64	-2,340.33	-2,889.80	-3,761.78	-4,237.43	-4,866.61
Grand Total	-271.12	-443.69	-2,285.80	-2,717.03	-1,952.35	-2,854.35	-3,392.76	-4,101.73

In summary,

Ludhiana Municipal Corporation									Rs Crores
	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20	FY 21	FY 22	Total
Revenue	538.28	593.18	637.40	666.38	706.59	748.02	789.06	831.04	
Expenses	454.29	497.58	545.05	587.84	634.00	678.38	725.86	776.67	
Operating Surplus/(Deficit)	83.99	95.59	92.35	78.54	72.59	69.64	63.20	54.36	610.26
Other net flows	16.47	19.35	(114.46)	(116.11)	21.26	21.20	21.37	22.23	
Net Surplus/(Deficit)	100.46	114.94	(22.12)	(37.57)	93.85	90.84	84.57	76.59	501.56
Trf reqd to WS - cover O&M defic	(90.96)	(103.87)	(104.14)	(93.78)	(105.75)	(115.19)	(120.65)	(134.98)	(869.32)

The absolute amount of support from MCL, as compared to the previous option, increases by ~ Rs 4,820 million as the MCL has to contribute:

- 20% of capex amounting to Rs 2,740 million

- Additional debt servicing to the extent of Rs 2,100 million (net of additional income and savings in expense)

WS Support by MCL	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20	FY 21	FY 22
Opex + Capex - as % Income	17%	18%	38%	35%	15%	15%	15%	16%
Full cost + capex - as % income	24%	27%	54%	56%	41%	50%	54%	59%

As compared to the previous option (of no conversion), this option is not a major improvement, as the additional capex and debt servicing on capital investment of Rs 4,820 million impacts the MCL finances. Additional income on conversion to volumetric basis is not adequate as ~46% of the connections still play a low flat rate.

Alternate Scenarios in this option of converting core city 24x7

Scenario 1

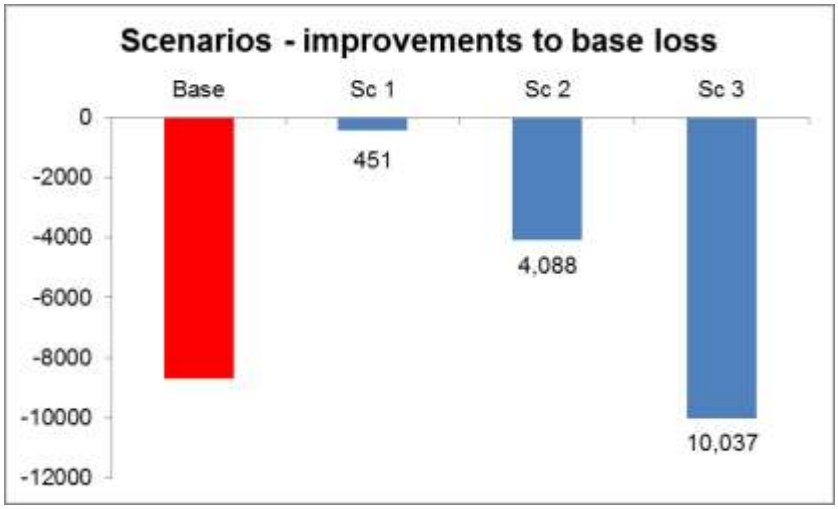
Increase in WS &SS tariff								
	Mar-15	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21	Mar-22
0-5 Marla	0%	0%	0%	0%	0%	0%	0%	0%
>5 - 10 Marla	0%	0%	0%	10%	6%	6%	6%	6%
>10-20 Marla	0%	0%	0%	10%	6%	6%	6%	6%
>20 Marla	0%	0%	0%	10%	6%	6%	6%	6%
Comm & Ind	0%	0%	0%	10%	6%	6%	6%	6%
Impact Current Position **Core city 24x7**								
Base case EBIDTA	(909.58)	(1,038.74)	(1,041.36)	(937.76)	(1,057.54)	(1,151.95)	(1,206.52)	(1,349.75)
Revised EBIDTA	(909.58)	(1,038.74)	(1,041.36)	(903.31)	(998.83)	(1,066.24)	(1,087.33)	(1,196.34)
Base case MCL overall support	(271.12)	(443.69)	(2,285.80)	(2,717.03)	(1,952.35)	(2,854.35)	(3,392.76)	(4,101.73)
Revised MCL overall support	(271.12)	(443.69)	(2,285.80)	(2,680.65)	(1,886.22)	(2,752.06)	(3,242.95)	(3,897.47)

Scenario 2

Increase in WS & SS tariff required to cover O&M in Mar-22								
	Mar-15	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21	Mar-22
0-5 Marla	0%	21%	21%	21%	21%	21%	21%	21%
>5 - 10 Marla	0%	21%	21%	21%	21%	21%	21%	21%
>10-20 Marla	0%	21%	21%	21%	21%	21%	21%	21%
>20 Marla	0%	21%	21%	21%	21%	21%	21%	21%
Comm & Ind	0%	21%	21%	21%	21%	21%	21%	21%
Impact Current Position **Core city 24x7**								
Base case EBIDTA	(909.58)	(1,038.74)	(1,041.36)	(937.76)	(1,057.54)	(1,151.95)	(1,206.52)	(1,349.75)
Revised EBIDTA	(909.58)	(969.24)	(876.80)	(625.01)	(571.14)	(447.65)	(205.74)	0.00
Base case MCL overall support	(271.12)	(443.69)	(2,285.80)	(2,717.03)	(1,952.35)	(2,854.35)	(3,392.76)	(4,101.73)
Revised MCL overall support	(271.12)	(374.19)	(2,121.25)	(2,404.28)	(1,465.94)	(2,150.05)	(2,391.98)	(2,751.97)

Scenario 3

Increase in WS and SS tariff - equal- to cover total costs in Mar- 22								
Impact Current Position **Core city**	Mar-15	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21	Mar-22
0-5 Marla	0%	36%	36%	36%	36%	36%	36%	36%
>5 - 10 Marla	0%	36%	36%	36%	36%	36%	36%	36%
>10-20 Marla	0%	36%	36%	36%	36%	36%	36%	36%
>20 Marla	0%	36%	36%	36%	36%	36%	36%	36%
Comm & Ind	0%	36%	36%	36%	36%	36%	36%	36%
Impact Current Position **Core city 24x7**								
Base case EBIDTA	(909.58)	(1,038.74)	(1,041.36)	(937.76)	(1,057.54)	(1,151.95)	(1,206.52)	(1,349.75)
Revised EBIDTA	(909.58)	(917.15)	(733.24)	(311.88)	(9.31)	491.67	1,335.67	2,397.32
Base case MCL overall support	(271.12)	(443.69)	(2,285.80)	(2,717.03)	(1,952.35)	(2,854.35)	(3,392.76)	(4,101.73)
RevisedMCL overall support	(271.12)	(315.89)	(1,947.76)	(2,005.53)	(713.53)	(842.51)	(191.65)	764.90



Scenario 1 looks at increase in tariffs but the impact is hardly felt as they are too little to alter the case seriously. Scenario 2 calculates the tariff hike required to achieve O&M break even by FY 22 and Scenario 3 at full cost recovery in FY 22.

Scenario 2, clearly shows that additional resource mobilisation from consumers is the only way to improve the finances of the MCL and it can contribute to the total support expected from MCL in the projection period - Rs 4,800 million towards debt servicing and contribution from MCL. If this tariff path can be set out with certain regulatory certainty, then the project can be offered through the PPP mode.

To conclude,

- As all categories of consumers are covered in billing, this is a better option (once 24x7 service is introduced, consumers may be more than willing to paying for the service)
- 24x7 results in higher costs (depreciation, debt servicing, MCL contribution) but O&M costs are little lower, as compared to earlier option, as the electricity charges are lower
- Though the model assumes a lower billing rate for volumetric basis, pilots in Karnataka has effectively demonstrated that that the monthly billing can go up (even after cross-subsiding the poor within the consumer category).

Financial Analysis – Full city conversion to 24x7 (volumetric tariff basis)

The previous option may not be adequate as all consumers in the city area may clamour for similar service (which is the experience elsewhere, where this type of 24x7 services have been introduced). Hence, in this option the entire city is proposed to be covered in 24x7. Initial technical study has outlined the costs involved in such conversion and has been adopted in the study.

It is assumed that even if the project is started now, the construction would be completed in say next 4 years and the first set of conversion in connections would be felt from FY 17 in a phased manner (20%, 30%, 30% and finally 20%) ending by FY 20. Hence the impact on the projection horizon is not much as compared to the core city conversion.

Summary of assumption in this scenario

a. Tariff for volumetric basis starts at the existing rates of Rs 2.9/KL on consumption quantity. The tariff structure starts for all consumers (brings in automatically the first slab as well). Consumption based on the survey conducted by PUDA.
b. No tariff increase for the projection period. Collection efficiency is assumed at 90%. Steadily increasing to 98% by the projection period. Past arrears is assumed at a low value (even though the database shows a large amount, it is assumed that many may be disputed or non-reconciled balances)
c. O&M costs increases at historical CAGR but is tapered down in the future years
d. Capex projected to the extent of Rs 21,000 million for conversion of full city area into 24x7.

Capex Summary	Rs Million
Full city conversion to 24x7	21,000
Total	21,000

e. 24x7 capex is assumed to be funded as 50% grant, 30% by a loan (say @12% interest, repayable in 12 (with first two years as moratorium – construction period)
f. Depreciation is charged on non-grant portion of asset capitalised at an average rate of 6% for new assets (assumes an average life of 15 years and residual value of 10%). For the existing assets, this is based on the data provided by MCL
g. LT interest on loans based on the term sheets with MCL
h. Any shortfall in operation is assumed to be borrowed at 12% rather than from the consolidated fund

The profit and loss account and he gap in the account are as follows:

The revenue from WS improves (as compared to 'No scenario') by Rs 650 million in the last 5 years – the average per monthly bill per connection works out to Rs 120 (for WS alone).

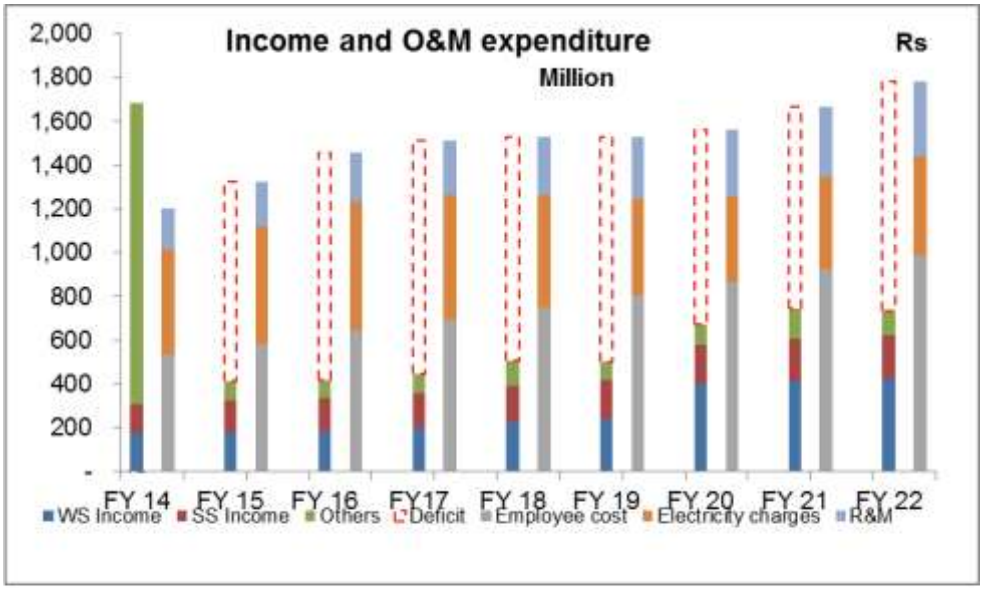
The O&M expenses (as compared to previous scenario) improve by Rs 1,750 million in the projection period mainly due to reduction in power charges. Thus there is an overall additional resource to the extent of ~Rs 2,400 million (650+1750) in the projection period. This is shown by the reduced losses in the EBIDTA line, which now stands at ~Rs 7,900 million.

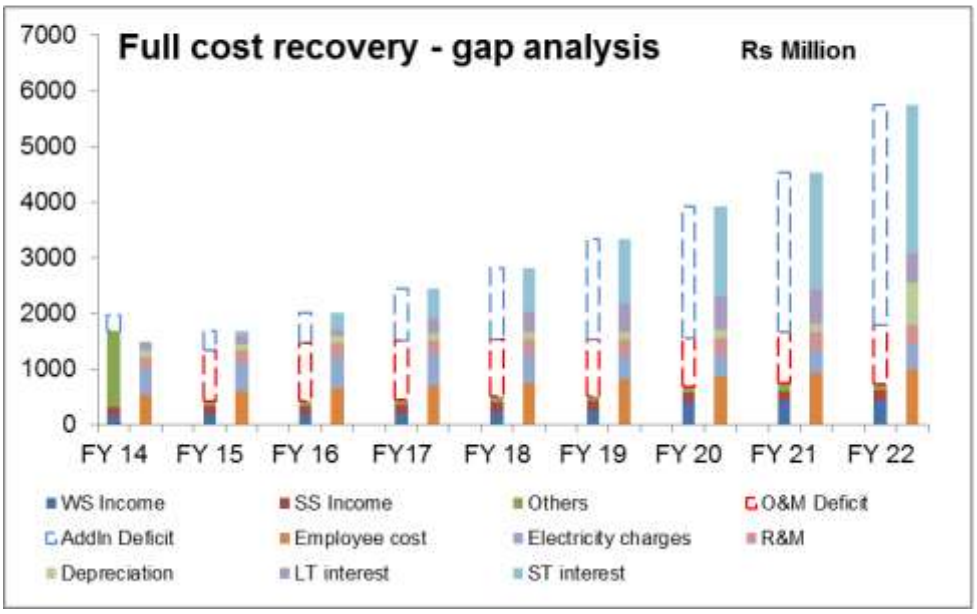
Additional deficit on account of depreciation, interest works out to Rs ~14,100 million (depreciation contributing to Rs 1,705 million, LT interest - ~Rs 3,120 and ST interest – ~ Rs 9,270 million).

The depreciation line increases as the additional capex (on account of 24x7) is capitalised and charged to P&L. This of course, doesn't change the cash requirement from the sector but shows its impact on the overall cost to be recovered.

A portion of the 24x7 (30%) is funded by loan and this increases the interest cost by ~Rs 2,500 million during the projection period and the repayment principal of ~Rs 2,520 million. As the income is not adequate, this increases the cash support from MCL by this amount apart from the original contribution of ~Rs 4,200 million. Thus the additional cost to MCL on account of going 24x7 in the core city area works out to ~Rs 9,220 (4,200+2500+2520) million during the projection period.

This also increases the short term borrowing (deficit financing) by ~ Rs 930 million only.





In summary,

Ludhiana WS									Rs Crores
	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20	FY 21	FY 22
Revenue	37.08	41.32	41.64	44.33	50.47	50.33	67.17	74.10	73.02
O&M	120.26	132.28	145.51	150.92	152.90	152.80	155.79	166.70	178.37
Operating Surplus/(defiit)	(83.18)	(90.96)	(103.87)	(106.59)	(102.43)	(102.47)	(88.62)	(92.60)	(105.35)
Deprn, Interest	27.87	26.16	24.58	39.05	48.81	66.13	75.89	74.32	128.18
Int on deficit financing	-	10.36	30.76	53.13	79.69	115.13	160.02	210.47	267.53
Net Deficit	(111.05)	(127.47)	(159.21)	(198.78)	(230.93)	(283.73)	(324.54)	(377.39)	(501.06)
Cost Recovery (O&M level)	31%	31%	29%	29%	33%	33%	43%	44%	41%

The cost recovery under this scenario improves as the volumetric rates kicks across the entire spectrum of connection but since the time period of full conversions in the projection period is short it is not translated into full effect. This the cost recovery moves from 24% to 41%. The full cost changes as the short term borrowing is more as well as the depreciation.

									Rs Million
Profit & Loss Account	Mar-14	Mar-15	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21	Mar-22
Option Chosen:									
Water Production	1,93,450	1,93,450	1,93,450	1,93,450	1,93,450	1,93,450	1,93,450	1,93,450	1,93,450
Losses	65%	65%	65%	54%	41%	28%	20%	20%	20%
Sale	67,708	67,708	67,708	89,761	1,14,136	1,39,284	1,54,760	1,54,760	1,54,760
Revenue									
Revenue from WS	175.21	181.68	188.39	204.31	223.63	243.83	401.26	412.05	423.13
Revenue from SS	132.67	142.18	147.43	152.87	167.45	171.95	176.57	192.65	197.83
Rev. Grants/Trf from Gen fur	1,311.92	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Conn charges/Otherincome	62.94	88.39	79.55	85.09	112.67	86.52	92.85	135.29	108.23
Total Revenue	1,682.74	413.24	416.37	443.27	504.74	503.30	671.69	740.99	730.20
Expenditure									
Employees cost	531.29	584.42	642.86	694.98	751.69	805.50	862.74	923.13	987.75
Electricity	483.63	531.99	585.19	569.00	512.47	439.14	391.98	419.42	448.78
Repairs & Maintenance,Othe	187.65	206.41	227.05	245.22	264.83	283.37	303.21	324.43	347.14
Total O&M Cost	1,202.56	1,322.82	1,455.10	1,509.20	1,528.99	1,528.01	1,557.93	1,666.98	1,783.67
EBIDTA	480.17	(909.58)	(1,038.74)	(1,065.93)	(1,024.25)	(1,024.71)	(886.24)	(925.99)	(1,053.47)
Depreciation	127.40	127.40	127.40	136.70	136.70	136.70	136.70	136.70	766.70
EBIT	352.77	(1,036.98)	(1,166.13)	(1,202.62)	(1,160.95)	(1,161.41)	(1,022.94)	(1,062.69)	(1,820.17)
Interest	151.30	134.17	118.39	253.80	351.42	524.63	622.25	606.46	515.08
ST Loan Interest		103.55	307.59	531.33	796.89	1,151.27	1,600.23	2,104.74	2,675.32
Net Profit/(Loss)	201.47	(1,274.70)	(1,592.11)	(1,987.76)	(2,309.25)	(2,837.32)	(3,245.42)	(3,773.89)	(5,010.57)
Analysis									
Rs/KL - Sales Based	Mar-14	Mar-15	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21	Mar-22
WS & SS Billing income	4.55	4.78	4.96	3.98	3.43	2.99	3.73	3.91	4.01
Grant	19.38	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total Income	24.85	6.10	6.15	4.94	4.42	3.61	4.34	4.79	4.72
O&M Expenditure	17.76	19.54	21.49	16.81	13.40	10.97	10.07	10.77	11.53
Total Cost	21.88	24.93	29.66	27.08	24.65	23.98	25.31	29.17	37.09
Rs/KL - Production Based	Mar-14	Mar-15	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21	Mar-22
WS & SS Billing income	1.59	1.67	1.74	1.85	2.02	2.15	2.99	3.13	3.21
Grant	6.78	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total Income	8.70	2.14	2.15	2.29	2.61	2.60	3.47	3.83	3.77
O&M Expenditure	6.22	6.84	7.52	7.80	7.90	7.90	8.05	8.62	9.22
Total Cost	7.66	8.73	10.38	12.57	14.55	17.27	20.25	23.34	29.68
Average Monthly Bill - paying consumers - Rs/Month									
WS - Alone	120.75	120.75	120.75	107.10	92.96	83.24	120.79	120.79	120.79
SS - Alone	126.14	126.14	126.14	126.14	126.14	126.14	126.14	126.14	126.14
WS + SS	123.02	123.06	123.06	114.50	104.76	96.87	122.38	122.45	122.45
Margins - with grant/transfer from General Fund									
EBIDTA	**29%**	**(220%)**	**(249%)**	**(240%)**	**(203%)**	**(204%)**	**(132%)**	**(125%)**	**(144%)**
Cost Recovery - O&M	140%	31%	29%	29%	33%	33%	43%	44%	41%
Cost Recovery - Full cost	114%	24%	21%	18%	18%	15%	17%	16%	13%

Clearly, as the O&M costs are contained and the revenues are improved, the cost recovery improves close to 17% points between the options (no conversion) to the full conversion in the city area. This is mainly attributable to volumetric tariff for <u>all</u> categories of consumers.

								Rs Million
Balanc Sheet	Mar-15	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21	Mar-22
Capital	-	-	2,940	7,350	11,760	14,700	14,700	14,700
Add: Reserves and Surplus	(1,073)	(2,665)	(4,653)	(6,962)	(9,800)	(13,045)	(16,819)	(21,830)
Total Equity	(1,073)	(2,665)	(1,713)	388	1,960	1,655	(2,119)	(7,130)
Long Term Loan	1,232	1,078	2,184	3,920	5,026	5,502	4,718	3,934
Current Liabilities	110	121	126	127	127	130	139	149
ST Borrowing	1,726	3,401	5,455	7,827	11,361	15,309	19,770	24,819
Total Liabilities	1,995	1,935	6,051	12,262	18,475	22,596	22,508	21,772
Gross Assets	2,123	2,123	2,278	2,278	2,278	2,278	2,278	23,278
Less: Acc. Depreciation	(255)	(382)	(519)	(656)	(792)	(929)	(1,066)	(1,832)
Net Fixed Assets	1,869	1,741	1,759	1,623	1,486	1,349	1,213	21,446
CWIP	-	-	4,045	10,345	16,645	20,845	20,845	(155)
Investments								
Current Assets								
Cash & Bank balance	1	1	1	1	1	1	1	1
Receivables	125	192	246	292	342	400	448	480
Others	1	1	1	1	1	1	1	1
Total Assets	1,995	1,935	6,051	12,262	18,475	22,596	22,508	21,772

Corporation fund flow:

								Rs Million
MCL - Funds flow	Mar-15	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21	Mar-22
Income								
Htax/Prop Tax	654	687	728	772	818	867	919	974
Share of VAT/Octroi	3,418	3,828	4,058	4,301	4,560	4,833	5,123	5,431
Octroi on Elec	425	467	514	555	599	641	686	734
Addln Excise duty	319	335	352	370	388	408	428	449
Grants								
Others	567	614	722	666	701	731	734	722
Total Income	5,383	5,932	6,374	6,664	7,066	7,480	7,891	8,310
Expenditure								
Employees cost	3,165	3,482	3,830	4,136	4,467	4,780	5,115	5,473
Electricity	488	537	591	638	689	737	789	844
R&M	713	763	816	873	934	1,000	1,070	1,145
A&G	177	194	214	231	249	267	286	306
Others	-	-	-	-	-	-	-	-
Total O&M	4,543	4,976	5,451	5,878	6,340	6,784	7,259	7,767
EBIDTA - General fund	840	956	923	785	726	696	632	544
Amount trfd to WS &SS	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Net EBIDTA	839	955	922	784	725	695	631	543
Extordnry Inflows - sale of land	165	193	227	211	213	212	214	222
Loans and Assistance								
Funds available	1,004	1,148	1,150	995	937	907	845	765
Capex - General								
Capex - WS	-	-	840	1,260	1,260	840	-	-
Net Fund available	**1,003.58**	**1,148.43**	**309.83**	**-264.70**	**-322.55**	**67.43**	**844.67**	**764.89**
Total Amount to be mobilised by AMC								
Surplus/(Deficit) - as above	1,003.58	1,148.43	309.83	-264.70	-322.55	67.43	844.67	764.89
WS Surplus/(deficit)- Incldg ST fu	-1,274.70	-1,592.11	-1,987.76	-2,309.25	-2,837.32	-3,245.42	-3,773.89	-5,010.57
Grand Total	-271.12	-443.69	-1,677.93	-2,573.95	-3,159.86	-3,177.99	-2,929.22	-4,245.68

In summary,

Ludhiana Municipal Corporation									Rs Crores
	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20	FY 21	FY 22	Total
Revenue	538.28	593.18	637.40	666.38	706.59	748.02	789.06	831.04	
Expenses	454.29	497.58	545.05	587.84	634.00	678.38	725.86	776.67	
Operating Surplus/(Deficit)	83.99	95.59	92.35	78.54	72.59	69.64	63.20	54.36	610.26
Other net flows	16.47	19.35	(61.26)	(104.91)	(104.74)	(62.80)	21.37	22.23	
Net Surplus/(Deficit)	100.46	114.94	31.08	(26.37)	(32.15)	6.84	84.57	76.59	355.96
Trf reqd to WS - cover O&M defic	(90.96)	(103.87)	(106.59)	(102.43)	(102.47)	(88.62)	(92.60)	(105.35)	(792.89)

The absolute amount of support from MCL, as compared to the previous option, increases as the MCL has to contribute to capex and additional debt servicing. However, at the opex level support, clearly there is improvement as volumetric shift brings in additional income which reduces the overall burden.

WS Support by MCL	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20	FY 21	FY 22
Opex + Capex - as % Income	17%	18%	30%	34%	32%	23%	12%	13%
Full cost + capex - as % income	24%	27%	44%	54%	58%	55%	48%	60%

Alternate Scenarios in this option of converting full city to 24x7

Scenario 1 looks at increase in tariffs but the impact is hardly felt as they are too little to alter the case seriously. Scenario 2 calculates the tariff hike required to achieve O&M break even by FY 22 and Scenario 3 at full cost recovery in FY 22.

Scenario 2, clearly shows that additional resource mobilisation from consumers is the only way to improve the finances of the MCL and it can contribute to the total support expected from MCL in the projection period - Rs 1,950 million towards debt servicing and contribution from MCL. If this tariff path can be set out with certain regulatory certainty, then the project can be offered through the PPP mode.

Scenario 1

Increase in WS & SS tariff								
	Mar-15	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21	Mar-22
0-5 Marla	0%	0%	0%	0%	0%	0%	0%	0%
>5 - 10 Marla	0%	0%	0%	10%	6%	6%	6%	6%
>10-20 Marla	0%	0%	0%	10%	6%	6%	6%	6%
>20 Marla	0%	0%	0%	10%	6%	6%	6%	6%
Comm & Ind	0%	0%	0%	10%	6%	6%	6%	6%
Impact Current Position **Full city 24x7**								
Base case EBIDTA	(909.58)	(1,038.74)	(1,065.93)	(1,024.25)	(1,024.71)	(886.24)	(925.99)	(1,053.47)
Revised EBIDTA	(909.58)	(1,038.74)	(1,065.93)	(990.38)	(959.26)	(783.20)	(783.42)	(869.95)
Base case MCL overall support	(271.12)	(443.69)	(1,677.93)	(2,573.95)	(3,159.86)	(3,177.99)	(2,929.22)	(4,245.68)
Revised MCL overall support	(271.12)	(443.69)	(1,677.93)	(2,538.18)	(3,086.69)	(3,056.65)	(2,751.71)	(4,003.27)

Scenario 2

Increase in WS & SS tariff required to cover O&M in Mar-22								
	Mar-15	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21	Mar-22
0-5 Marla	0%	17%	17%	17%	17%	17%	17%	17%
>5 - 10 Marla	0%	17%	17%	17%	17%	17%	17%	17%
>10-20 Marla	0%	17%	17%	17%	17%	17%	17%	17%
>20 Marla	0%	17%	17%	17%	17%	17%	17%	17%
Comm & Ind	0%	17%	17%	17%	17%	17%	17%	17%
Impact Current Position **Full city 24x7**								
Base case EBIDTA	(909.58)	(1,038.74)	(1,065.93)	(1,024.25)	(1,024.71)	(886.24)	(925.99)	(1,053.47)
Revised EBIDTA	(909.58)	(980.94)	(932.41)	(785.61)	(655.78)	(332.64)	(139.51)	0.00
Base case MCL overall support	(271.12)	(443.69)	(1,677.93)	(2,573.95)	(3,159.86)	(3,177.99)	(2,929.22)	(4,245.68)
Revised MCL overall support	(271.12)	(385.89)	(1,544.41)	(2,335.31)	(2,790.93)	(2,624.39)	(2,142.74)	(3,192.21)

Scenario 3

Increase in WS and SS tariff - equal- to cover total costs in Mar- 22								
Impact Current Position **Full city 2**	Mar-15	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21	Mar-22
0-5 Marla	0%	36%	36%	36%	36%	36%	36%	36%
>5 - 10 Marla	0%	36%	36%	36%	36%	36%	36%	36%
>10-20 Marla	0%	36%	36%	36%	36%	36%	36%	36%
>20 Marla	0%	36%	36%	36%	36%	36%	36%	36%
Comm & Ind	0%	36%	36%	36%	36%	36%	36%	36%
Impact Current Position **Full city 24x7**								
Base case EBIDTA	(909.58)	(1,038.74)	(1,065.93)	(1,024.25)	(1,024.71)	(886.24)	(925.99)	(1,053.47)
Revised EBIDTA	(909.58)	(916.86)	(759.61)	(425.22)	(5.80)	781.96	1,685.44	2,826.78
Base case MCL overall support	(271.12)	(443.69)	(1,677.93)	(2,573.95)	(3,159.86)	(3,177.99)	(2,929.22)	(4,245.68)
RevisedMCL overall support	(271.12)	(315.59)	(1,341.75)	(1,890.99)	(1,955.42)	(1,147.51)	339.93	764.90

Separately, two further scenarios were covered under this option. These concern the assumption of pegging MCL growth of share in VAT and Otcroi and others to historical averages throughout the

projected period (instead of tapering down) and introduction of an average volumetric tariff realisation of Rs 11/ KL. This is clearly shown in the table below[3].

Comparative tariff across select cities is presented below including the successful pilot that has been running in Karnataka for the past few years.

Karnataka – KWASIP	Actual realisation	Rs/KL	Research
The GoK fixed tariff is higher than these, with minimum fixed at Rs 56	0-8 KL	Rs 48 minimum	
	8-15 KL	8	
	15-25 L	10	
	'> 25 KL	12	
	Average Realisation Rs/ KL	10.87	As on FY 12
Jabalpur	Rs 1680/ Connection/ year	Rs 1680	CBUD Rapid Baseline Assessment Report, MOUD
Coimbatore	0-15 KL	Rs 100 Minimum	Attached
	15-20 KL	Rs 6/kl	
	20-150 KL	Rs 8/kl	
	>150 KL	Rs 10/kl	
Nagpur	1-20 Kl	Rs 5.5/kl	CBUD Rapid Baseline Assessment Report, MOUD
	21-30 KL	Rs 8.8/kl	
	31-80 KL	Rs 12.1/kl	
	Above 80	Rs 16.5/kl	
Raipur	General category/ per month	Rs 200	CBUD Rapid Baseline Assessment Report, MOUD
	BPL per month	Rs 60	
Vishakapatnam	General category/ per month	Rs 120	CBUD Rapid Baseline Assessment Report, MOUD
	BPL per month	Rs 69	
	Metered	Rs 10/kl	

[3] The average realisation ensures that the cross-subsidisation between categories would be fine-tuned in such a manner that the weaker section of consumers are not overburdened. This tariff is existing tariff in the 24x7 pilot zones in Karnataka where the weaker consumer pays only Rs 48 per month (assumed to be consuming not more than 8 KL per month).

Scenario 4 - High growth in Share of VAT

		FY 15	FY 16	FY 17	FY 18	FY 19	FY 20	FY 21	FY 22
Share of VAT growth		13%	13%	13%	13%	13%	13%	13%	13%
Other income heads		8%	8%	8%	8%	8%	8%	8%	8%
Impact Current Position	**Full city 24x7**								
Base case EBIDTA		(909.58)	(1,038.74)	(1,065.93)	(1,024.25)	(1,024.71)	(886.24)	(925.99)	(1,053.47)
Revised EBIDTA		(909.58)	(1,038.74)	(1,065.93)	(1,024.25)	(1,024.71)	(886.24)	(925.99)	(1,053.47)
Base case MCL overall support		(271.12)	(443.69)	(1,677.93)	(2,573.95)	(3,159.86)	(3,177.99)	(2,929.22)	(4,245.68)
Revised MCL overall support		(210.58)	(325.83)	(1,257.93)	(1,799.91)	(1,968.97)	(1,498.18)	(679.74)	(1,360.68)

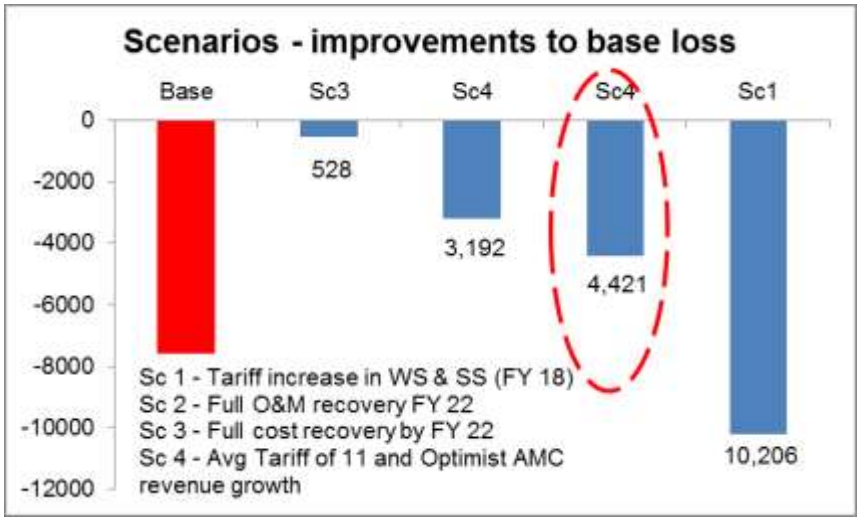
Scenario 5 - Scenario 4 & New average Volumteric Tariff

Average Tariff and MCL Scenario		FY 15	FY 16	FY 17	FY 18	FY 19	FY 20	FY 21	FY 22
Average Volumetric Tariff - Rs/KL		11							
Impact Current Position	**Full city 24x7**								
Base case EBIDTA		(909.58)	(1,038.74)	(1,065.93)	(1,024.25)	(1,024.71)	(886.24)	(925.99)	(1,053.47)
Revised EBIDTA		(909.58)	(1,038.74)	(934.90)	(687.88)	(472.05)	217.44	207.37	110.36
Base case MCL overall support		(271.12)	(443.69)	(1,677.93)	(2,573.95)	(3,159.86)	(3,177.99)	(2,929.22)	(4,245.68)
Revised MCL overall support		(210.58)	(325.83)	(1,119.79)	(1,429.52)	(1,328.01)	(200.47)	802.37	333.55

This scenarios clearly show that the city can increase its revenues by close to Rs 4,400 million and thereby possibly structure a PPP deal (provided that there are adequate safeguards built in sharing of VAT etc. can be structured) to improve the sector. In this scenario,

WS Support by MCL	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22
Capex	-	-	840	1,260	1,260	840	-	-
Full cost support	1,275	1,592	1,850	1,939	2,196	1,948	2,292	3,316
Opex support	910	1,039	935	688	472	(217)	(207)	(110)
Opex + Capex - as % Income	17%	17%	26%	26%	21%	7%	-2%	-1%
Full cost + capex - as % income	23%	26%	40%	43%	42%	30%	23%	30%

The full cost support is not exceeding the share of VAT received by corporation. Of course, requires further structuring and working out details of such participation.



In this scenario 5 (revised volumetric tariff), the summary of P&L of WS sector and MCL is as follows:

Ludhiana WS								Rs Crores
	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20	FY 21	FY 22
Revenue	37.08	41.32	41.64	57.43	84.11	105.60	177.54	187.44	189.40
O&M	120.26	132.28	145.51	150.92	152.90	152.80	155.79	166.70	178.37
Operating Surplus/(defiit)	(83.18)	(90.96)	(103.87)	(93.49)	(68.79)	(47.20)	21.74	20.74	11.04
Deprn, Interest	27.87	26.16	24.58	39.05	48.81	66.13	75.89	74.32	128.18
Int on deficit financing	-	10.36	30.76	52.42	76.29	106.30	140.62	175.60	214.49
Net Deficit	(111.05)	(127.47)	(159.21)	(184.96)	(193.89)	(219.64)	(194.77)	(229.18)	(331.63)
Cost Recovery (O&M level)	31%	31%	29%	38%	55%	69%	114%	112%	106%

Ludhiana Municipal Corporation									Rs Crores
	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20	FY 21	FY 22	Total
Revenue	543.87	604.33	678.55	742.83	824.54	914.67	1,012.43	1,117.73	
Expenses	454.29	497.58	545.05	587.84	634.00	678.38	725.86	776.67	
Operating Surplus/(Deficit)	89.57	106.74	133.50	154.99	190.55	236.29	286.57	341.06	1,539.27
Other net flows	16.94	19.99	(60.41)	(103.95)	(103.61)	(61.47)	22.95	24.03	
Net Surplus/(Deficit)	106.51	126.73	73.08	51.03	86.93	174.82	309.52	365.09	1,293.72
Trf reqd to WS - cover O&M defic	(90.96)	(103.87)	(93.49)	(68.79)	(47.20)	21.74	20.74	11.04	(350.80)

It can be seen that the cost recovery in the last 3 years turns positive and contributes to depreciation and debt servicing as well. As can be seen from MCL's position, net surplus is adequate to finance the O&M of the WS sector. Thus, there is a chance to structure the 24x7 investment with additional support from GoP.

To conclude,

- Though 24x7 results in higher costs (depreciation, debt servicing, MCL contribution), it provides an opportunity to move all consumers to volumetric basis which can substantially improve the resources
- O&M costs would also taper down as the main electricity charges would be little lower than the 'No conversion' scenario
- Though the model assumes a lower billing rate for volumetric basis, pilots in Karnataka has effectively demonstrated that that the monthly billing can go up (even after cross-subsiding the poor within the consumer category).
- Clearly, introducing volumetric tariff fine-tuned to consumption and rationalising tariff helps the corporation to finance such projects.

Report Conclusion

- Continuing 'business as usual' is no more feasible as cost recovery keeps falling with increasing O&M costs and continuing 'no tariff increase' regime
- Re-introduction of first slab improves the resources of the sector is an imperative and using the 24x7 approach would make it easier to convince all stakeholders (public, corporation and political). This can also lead to re-introduction of property tax for these slabs as service level improvements can drive all changes.
- This coupled with regular increases of tariff hike improves the cost recovery but not drastically
- Introducing 24x7 and volumetric tariff (which can be calibrated to provide for cross-subsidy to poor sections) does improve the revenue mobilisation for MCL. This would help the MCL to reallocate the additional resources to other pressing areas such as health, education etc.
- As 24x7 provides for a radical approach and high customer satisfaction (as demonstrated in Karnataka), even the volumetric tariff can be calibrated close to cost of production.
- The capital contribution from MCL required for this project would challenge the financial capability of MCL but can be innovated using raising municipal bonds and by leveraging the VAT transfers or can be through PPP mode, if regulatory certainty can be provided for tariff adjustments.
- Conventional approach to 24x7, may lead to a spiralling debt trap for MCL and it mayn't be in a position to finance even a portion of the deficit.

Appendix A

Working of the model

Population – data points are 2011, 2017 and 2032 population (primarily taken from DHV report). The compounding rate of growth between these points is used to calculate the intermittent year's population.

Floating population – again as per DHV report which is used for calculating the total population and the lpcd requirements (converted to connections).

Connections – based on the billing database for 2014, it is found that the number of connections amount to 181,132. Using the derived population, as stated above and the number of connections, the average population per connection is arrived at and this is used for calculating for subsequent period.

As stated earlier, the conversion to 24x7 is used as a switch to select the following options"
'0'- No conversion to 24x7
'1' – Core city converted to 24x7 (and switch over to volumetric basis of tariff) and the rest of the connections continuing to be intermittent water supply (flat tariff basis) – it is expected that in the first year 50% of connections will be given and the balance in second year. The project (assuming it starts in the coming financial year) will be operational from 2017. As per DHV report ~40% of demand is in core city and this has been used for connections and water accounting
'2'- Full city conversion to 24x7 (switch over to volumetric basis of tariff) - it is expected that in the phasing of connections will be 20%,30%,30% and 20% in 4 years. The project (assuming it starts in the coming financial year) will be operational from 2017

Distribution of connections (WS & SS) – this is based on the pattern of existing billing database and is not expected to drastically change over a period of time (as the plot sizes may not significantly change)

SS coverage – this is primarily an input field to show the number of connections that would be serviced. As per JICA DPR, it is expected that 90% coverage would be achieved by 2025. The DPR doesn't specify the phasing of expenditure nor the year-wise connections that would be provided.

Consumption across categories – this is based on reading of the PUDA survey carried out earlier, wherein meters were fixed in select houses and meter reading taken after a gap of 15 to 18 months. This is used as a benchmark the volumetric accounting and the billing is accordingly done.

Tariff flat rate basis – this is the average realisation from the billing database, though this looks less than the actual tariff rates that are extant. This needs further investigation by the MCL. However, the net income as shown for FY 14 matches the billing database. However, as mentioned earlier, the current demand as per billing database and the accounts seems to be ~15% different.

The input sheet allows tariff for the first slab (which is currently exempted from user charges) to be introduced at any period and calculates the impact on the income from such. This is one of the scenarios introduced later.

Volumetric tariff – Rs/KL – this is assumed to start at close to the existing rates (can be changed also) and provides for all slabs including the first slab to be within the tariff table. It is assumed that there would be lot more willingness to pay (as we have seen the experiment for long time in Karnataka).

Tariff hikes table – provides for the tariff hikes expected in each year and is set to 'Zero' in the base case. Alternate scenarios explore variations to this case.

Water accounting – production, loss and sales quantities are based on the earlier discussions, data provided by MCL and as per the DHV's feasibility report. The loss in the base case is close to 60%, whereas it is assumed to be 20%% after introduction of 24x7.

O&M expenses – this is based on the existing trend and as far as possible converted to the production so that as the volume goes up there are adequate changes to the cost. The inflation for O&M expenses is based on the past CAGR where it is more than the inflation. O&M expenses, in case of 24x7, have been discussed with the technical expert in the Bank team and are based on these assumptions.

Capital expenditure – each head (JnNURM, JICA etc) has been sourced from the MCL and is based on such data. JICA DPR also set out the O&M expenses in case of SS business and this has been included in the workings.

The phasing of capital expenditure, the share of Grant and contribution from MCL have been included as variable cells in the model and can be changed to suit the individual needs.