



Ticker	Sector	LTP (09/04/2019)	Fair Value	12m Target Price
UPPER	Hydropower	Rs.233	Rs.296.61	Rs. 305

Upper Tamakoshi Hydropower Co. Ltd. is a subsidiary of Nepal Electricity Authority (NEA), developing one of the largest "National Pride" hydro-electric project with an installed capacity of 456 MW.

Stock's Profile

LTP (09/04/2019)	Rs.233
No. of trades	60
High – Low Price	Rs.342 – 219
Average closing price	Rs.242.10
Trading Liquidity	100%
Median daily volume	45,338
O/s Shares	105,900,001
Market Capitalization	Rs.24.674 billion

Statistical Measure (Daily)

Metrics	UPPER	NEPSE
Mean Return	0.12%	0.01%
Standard Deviation	3.28%	0.76%
Beta (with NEPSE)	2.15	
Adjusted Beta	1.77	
Correlation (with NEPSE)	0.50	

Note: Trading period relates from 13/1/19 – 9/4/19.

Comment:

- The stock is comparatively volatile than NEPSE.
- Beta is significantly higher, implying that the stock will be greatly affected by the systematic risks, particularly lower yields during stressed period.
- The stock is positively correlated with NEPSE but at moderate level, implying lower diversification benefits.

Valuation

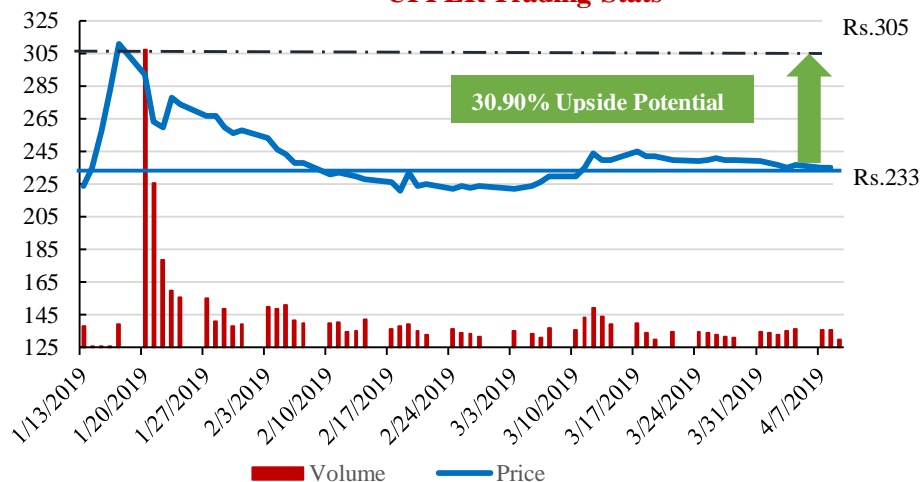
Approach	Weight	Value
As per DCF	65%	228.25
As per RIM	35%	68.36
Fair Value		Rs. 296.61
Upside potential		30.90%

Note: Team Computation

Market Profile (As on 9/04/2019)

Sector	Hydropower
Listed Scripts	25
Market Cap	79,785,354,058.00

UPPER Trading Stats



Investment Recommendation

We issue a **BUY** recommendation with a 12 month target price of Rs.305 per share, a potential capital yield of 30.90% from its current closing price of Rs.233. Our target price is based on the Monte Carlo Simulation Method, where we simulated the randomly generated price of the next 229th day (assuming 229 trading days a year) for 50,000 times, giving us the average price level of Rs.305.

We have derived Rs.296.61 as the value per share of the company using DCF and RIM approach at a mixture of 65/35.

We believe the stock has higher upside potential (limited downside) from the current price level, inferring to long the stock with a long term holding objectives of five years north. However the stock is more volatile and riskier.

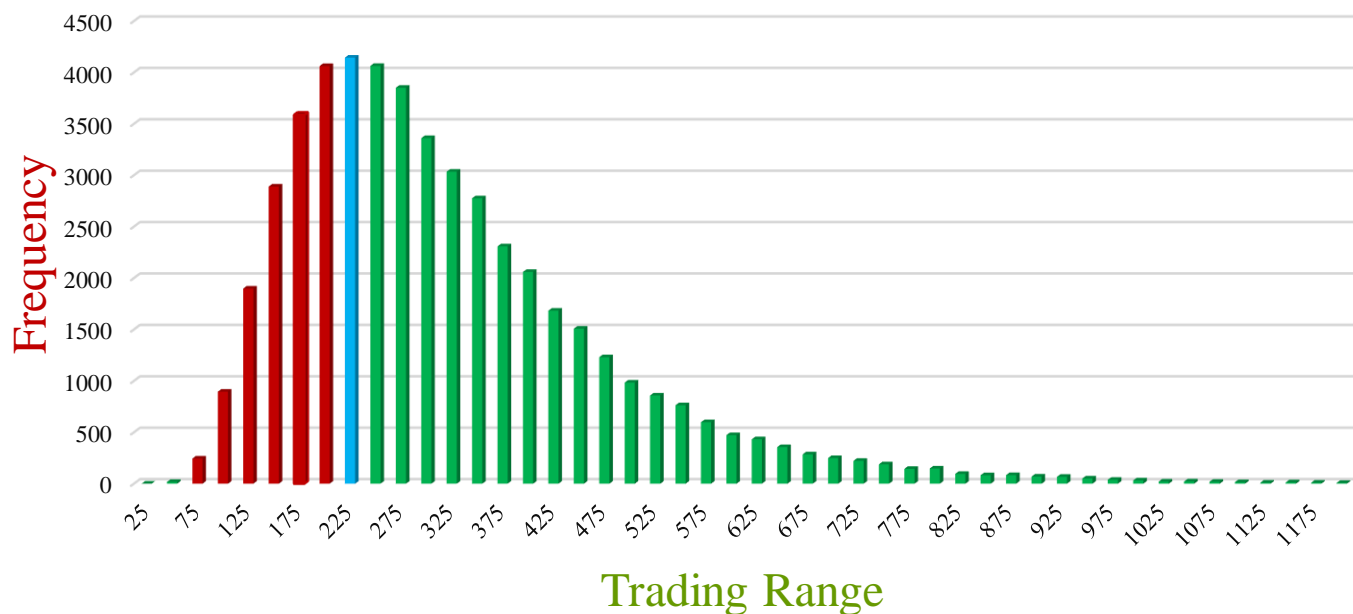
Key Highlights

- National Pride Project and the largest Hydro-project at present**
- Project scheduled to be completed by Mangshir 2076** As per the monthly progress report of Magh 2075, 98.3% of the project works has been completed. The RCOD of the project has been extended for the fourth time and is now scheduled to be finished by Mangshir 2076. The project has been in construction phase for 10 years now.
- Highest market cap in the industry** As on 9th April, the company is largest by market capitalization in the Hydropower industry, which alone occupy 30.93% of Rs.79.79 billion market size.
- Project commissioned at low cost** Upon multiple time project cost being revised due to delay and cost overrun, it is now projected Rs.66.18 billion which is Rs.14.51 crore per MW. The cost is still relatively lower than the current industry average of approx. 17 crores per MW.
- Modest return potential of 14% avg. ROE and weaker outlook from capital budgeting prospective, requiring Real option justification.**



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12 Month Target Price – Monte Carlo Simulation

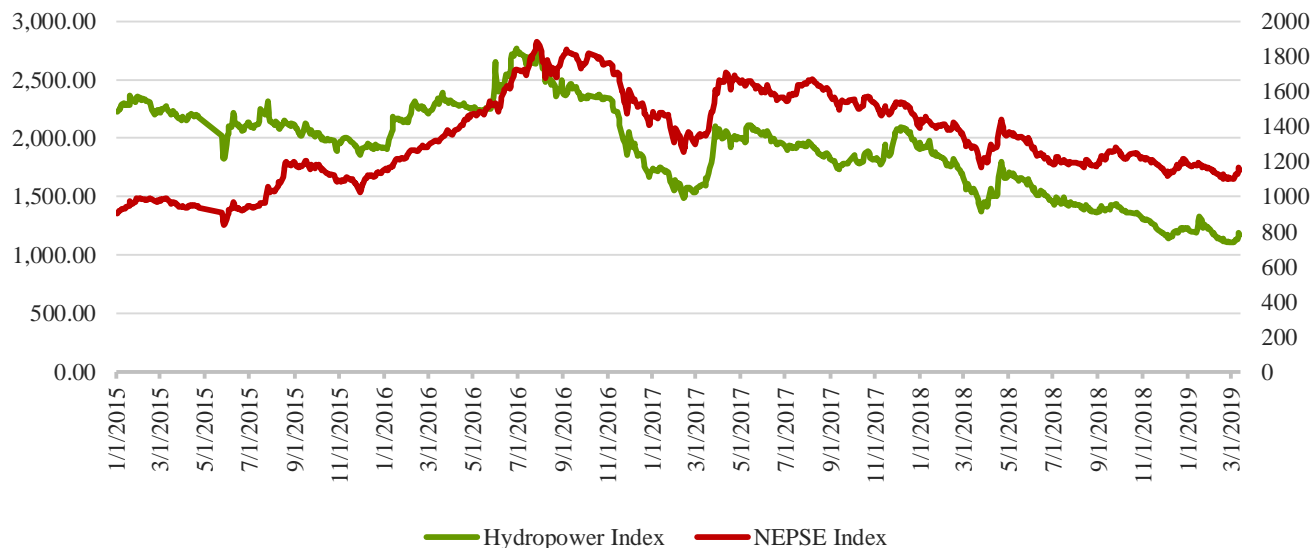


■ Sell ■ Hold ■ Buy

Comment:

- 64.52% of the simulation support Buy Recommendation
- 8.29% of the simulation support Hold Recommendation
- 27.19% of the simulation support Sell Recommendation

NEPSE VS. HYDROPOWER



Note: NEPSE vs Hydropower Index Level of last 5 years



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PROJECT PROFILE

Project Type	Peaking Run-off-River
Project Model	BOOT
Project Site	Lamabagar, Dolakha
Status	>98.3% completed
COD (Estimated)	Mangshir 2076
Number of Units	6
Annual Energy Gen.	2,281,255,000 kWh
Wet Season (8mth)	1,988,970,000 kWh
Dry Season (4mth)	292,285,000 kWh
Project Costs (w/o IDC)	Rs. 49,295,543,109
Per MW Cost (w/o IDC)	Rs. 108,104,261
Gen. License Issue date	20/08/2067
Validity of Gen. License	19/08/2102
PPA date	14/09/2067
PPA valid for	26 years (estimated)
Construction period	10 years (approx.)
Payback Period	12.83 years
Discounted PBP	-
IRR	7.61%

Other Feature of the Project

Headworks Location	Lamabagar, Lamabagar VDC
Powerhouse Location	Gongar Gaon, Lamabagar VDC
Gross Head	822 m
Design Discharge	66.0 m ³ /sec
Catchment Area	1,745 km ²
Min. Mean Monthly Flow	14.1 m ³ /sec.
Mean Annual Flow	67.2 m ³ /sec.
Design flood Q1,000	885.0 m ³ /sec
Diversion Dam	22 m x 60.0 m (H x L)
Live Storage	1.2 Million m ³
Settling Basins	2 Nos. L=225 m
Headrace Tunnel	8.4 km (Cross Sectional Area = 32.14 m ²)
Penstock (Vertical Shaft and Horizontal Tunnel)	1,134.0 m
Power House (Underground)	142.0m x 13.0m x 25.0 m (L x B x H)
Tailrace Tunnel	2.9 km (Cross Sectional Area = 35.0 m ²)
Access Road from Charikot of Dolakha	68.0 km
Transmission line	220 kVA Double Circuit, 47.0 km (Gongar to Khimti Substation)

Company Profile

Upper Tamakoshi Hydropower Ltd. was registered as an autonomous company by Nepal Electricity Authority (NEA) on 25/11/2063 with the prime objectives of developing a hydropower projects in the country. Registered office of the company is situated at Gyaneswor, Kathmandu while the project site is at Lamabagar VDC, Dolakha District.

The company went public by floating 26,475,000 units IPO (25% of Issued Capital) to the Public (both Local - 10% and General - 15%) in 2075. ICRA Nepal assigned IPO grade 4 to the proposed IPO shares which indicate below average fundamentals.

The company has one hydro project at present, fully financed through domestic investments i.e. without any foreign debt.

Upper Tamakoshi Hydro-Electric Project (HEP)

The company had obtained the license to generate 456 MW electricity from the Electricity Department, Ministry of Energy, Gov. of Nepal, on 20/08/2067. National Planning Commission has grouped the project under “National Pride Project” and upon its completion it will be the largest HEP to date in the country.

The project is the daily peaking run-off-river type and has the capacity to generate electricity for 4 hours on daily basis even in the most dry-season. It utilizes the water of Tamakoshi Rivers. As per Magh 2075 Progress Report, 98.3% of the project has been completed.

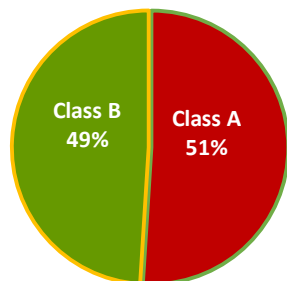
The project has a large catchment area of approx. 1,745 sq. km that is expected to support the design discharge of 66 cumecs while the gross head available for the project is 822 meters. The electricity generated from the project shall be evacuated from switchyard of the project to proposed Khimti substation through a 47 km long 220 kV double circuit ‘Gongor – Khimti’ transmission line.

The Project cost (without Interest During Construction) was revised to Rs.49.29 billion on 30/12/2074 from Rs.35.29 billion due to the reasons like Earthquake, Strikes on Terai region, price escalations, Dollar appreciation, change in Tunnel design etc. Including the I.D.C. the project costs are estimated to mount Rs.66.18 billion (interest capitalization of Rs.18 billions). As on Magh end 2075, Rs.43.77 billion expenditure has been recorded.



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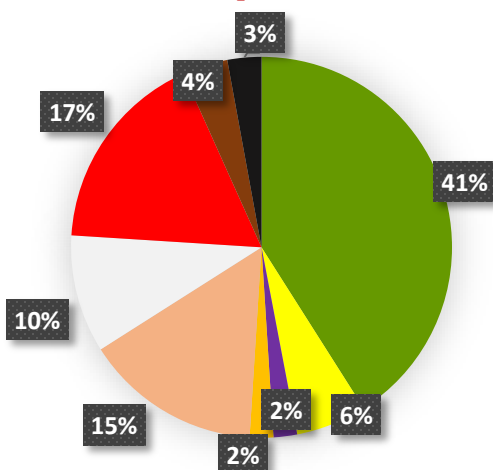
SHAREHOLDING PERCENTAGE



Class A "Promoter Shares"

Class B "Ordinary Shares"

Ownership Structures



■ NEA
■ NTC
■ CIT
■ RBS
■ General Public
■ Locals - Dolkha
■ Contributors to EPF
■ Company & NEA Staffs
■ Lending Inst. & its Staffs

Key Personnel

1. Mr. Kul Man Ghising, *Chairman*
2. Mr. Bigyan Prasad Shrestha, *CEO*
3. Mr. Dinesh Jung Rana, *Project Chief*
4. Mr. Sanjeeb Bahadur Malla, *Project Dty. Chief*
5. Mr. Murali Prasad Sharma, *Legal Advisor*
6. Mr. Ram Sundar Shrestha, *Company Secretary*

Plan and Strategies

- Targeted date of Electricity Generation:** Originally, the project was scheduled to be completed by Mid-Chaitra 2072. However, following the barrier created by Earthquake (2072) and Economic Blockade at Nepal-India border, the project completion date was extended and electricity was projected to be generated from all 6 lots 20/01/2076. But now the deadline has again been extended to Mangshir 2076, reason being incompleteness of Concrete lining and Grouting of Headrace tunnel, problems in tunnel construction and delay in connection of steel penstock pipes along with Vertical shaft in Lot 2.
- Rolwaling Diversion Project:** The Company aims to generate additional 167 GWH electricity in the dry season by 2020/21 under its second phase of operation. For this, the company plans connecting the water of Rolwaling River to the reservoir of Upper Tamakoshi. In this process, approx. 180 m Water Head is expected to be formed between Rolwaling Headworks and Outlets of Rolwaling Tunnel, giving potential for generating 22 MW electricity. Company obtained the Survey License on 21/05/2074 for the same and has begun for construction of physical infrastructures.
- Tandem Project - Tamakoshi – V project:** NEA has started the construction of Tamakoshi-V HEP as a tandem project with the Upper Tamakoshi Project. Feasibility study was carried by NEA in fiscal year 2010/11. It shall utilize the water discharged by Upper Tamakoshi. The project though is stated to have 87MW capacity at the preliminary phase but it is projected to generate 99.8MW electricity at the production phase. The Company expects to collaborate with NEA and invest in the projects.

Board and Management

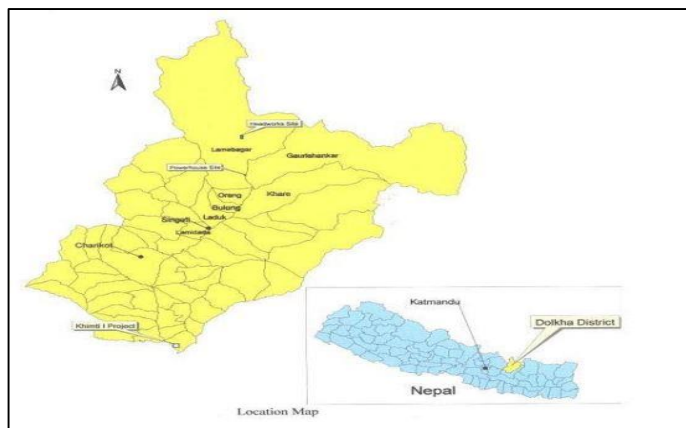
The Article of the company provision the formation of Board consisting of 11 members, including 2 Independents. Such Board carries representatives from the shareholders in following limit:

Shareholders	Board Members
Nepal Electricity Authority (NEA)	4
Nepal Telecom (NTC)	1
Employees' Provident Fund (EPF)	1
Locals of Project Affected Areas	1
General Public	1
Lending Institution and its Staff	1
Independent Directors	2
Total Directors	11



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Figure 1 Project Location Map



Source: Google image

At present, there are 6 members in the Board which consist representatives of: NEA (4), NTC (1), and EPF (1). (This is before the company issued IPO). Further, there are two Invitee Members from Citizen Investment Trust (CIT) and Rastriya Beema Sansthan (RBS), one from each.

The company has now issued the IPO shares to Public and the change in the composition of the Board can be expected in the near future. Therefore, the Board is likely to add one representative from Locals of Project Affected Areas, General Public and Lending Institution and its Staff. Two independent directors shall also be appointed.

The Board is chaired by **Mr. Kul Man Ghising** who is also the present Managing Director of NEA. Mr. Ghising is best known for his approaches in managing Electrical Demand and Supply and eliminating load shedding issues to a major extent in Nepal. Only 33.33% of the Board Members has the year’s long workings experience in the Hydro power sectors.

On the other hand, the company is led by Mr. Bigyan Prasad Shrestha as the Chief Executive Officer. He shares the 3 decades experience in the Hydro sectors. He is further assisted by the teams of diverse backgrounds ranging from project designer, supervisor, legal, finance, engineer etc. who are professionally sound and experienced.

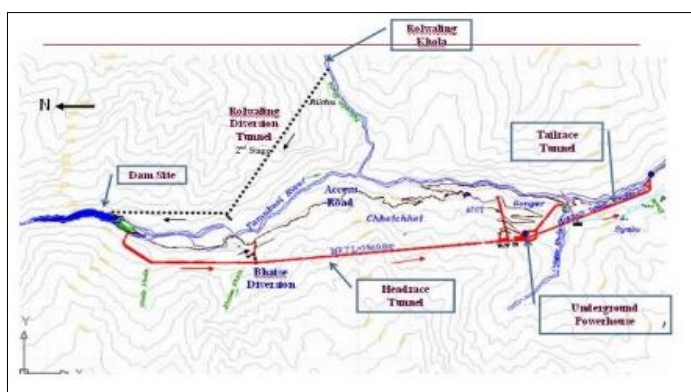
The strong personalities of the members in the Board and Management teams is likely to be the major strength of the company to counter the challenges involving financials, technological, licensing, legal disputes etc. The cascade projects of the company may not have the problems in getting the generation license, signing PPA, resolving legal and local issues.

Figure 2 Project Site



Source: Google image

Figure 3 Project Layout Map



Source: Google image

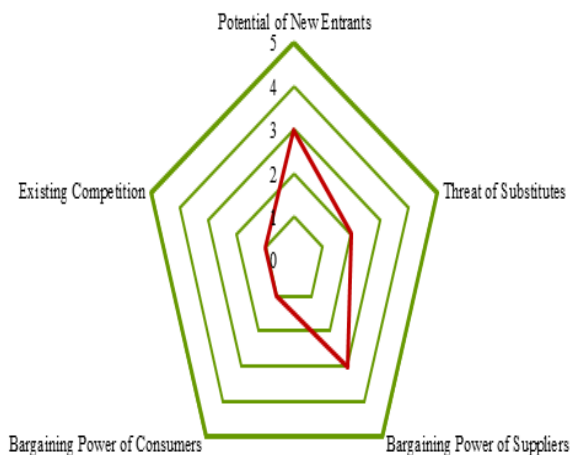
Shareholding Structures

The ownership is divided into Class “A” and Class “B” shareholders with holding of 51% and 49% ownership respectively. Class “A” includes the Institutional Shareholders which are NEA (41%), NTC (6%), RBS (2%) and CIT (2%). Class “B” includes General Public (15%), Locals of Project Affected areas (10%), Company & NEA staffs (3.84%), Contributor of EPF (17.28%) and Staff of Lending Institution (2.88%).



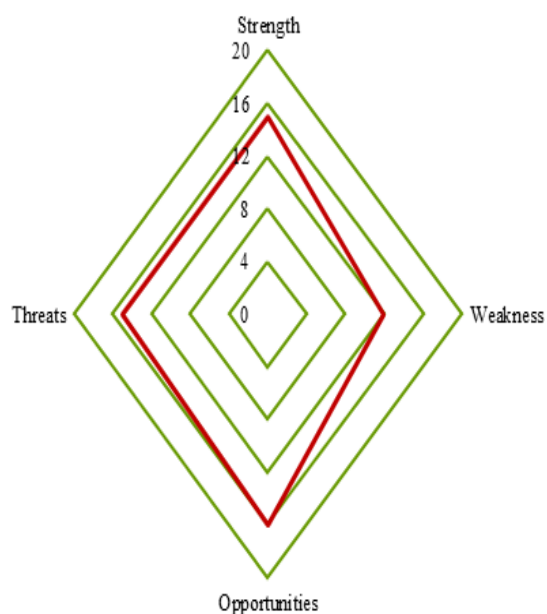
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Figure 4 Porter's 5 Forces Analysis



Source: Team Estimate

Figure 5 SWOT Analysis



Source: Team Estimate

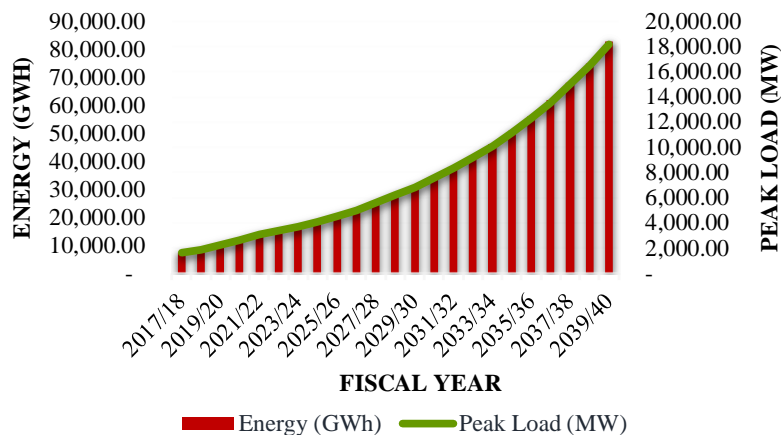
Industry Profile

- Untapped hydro resources with plethora potentials:** Ranked among the richest in Water resources, the theoretical hydro potential of Nepal is estimated to be 83,000 MW out of which 43,000 MW has been identified as economically feasible. However, the installed capacity is below 900 MW at present. Most of the projects are geographically concentrated in Province 3, 4 and 1. Statistics reveals that approx. one-quarter of the country population are deprived of electricity while on the other hand demand for the electricity to be increasing by more than 10% annually.
- Statistics of hydro projects:** At present, approx. 525 MW Hydro-projects are generated by NEA while approx. 350 MW are generated by Independent Power Producers (IPP). Projects under Construction as per NEA list - 114 Projects of 2,509.62 MW capacity having the Financials closure concluded and 119 Projects of 2,596.634 MW capacity without conclusion of Financial Closure. There are 3 Large Scale HEP of National Pride - Upper Tamakoshi, Budhigandaki and West Seti Projects of 456MW, 1200 MW and 750 MW capacity respectively.
- Highly leveraged industry:** The hydro-project requires the significant amounts of capital for the constructions and developments requiring longer time for construction. More than 65% of the financing in the project are made through debt and only a small contribution comes from equity. Debt usually has the maturity period of 12 years. Significant revenues are consumed by the repayment of principle and interest amounts.
- Consistent revenue flow:** It takes as much as six years on average for the hydro projects to come into commercial operation. Unlike other industries where the company passes from growth to matured stages, hydro-project potentially yields a constant revenues on y-o-y basis and has a finite period of revenue generation. Electricity generation are limited by its capacity and PPA with NEA defines the fixed selling per unit price (except the escalation facility allowed for certain years). Project commercially runs for 25 years (average), after which these are handed over to the government at technically nil values (under Built-Own-Operate-Transfer (BOOT) Model).
- Potential for immense capital inflow:** Government is aiming to develop 3,000 MW electricity in next 3 years, 5,000 MW in 5 years and 15,000 MW in next 10 years, necessitating the investment of approx. 25 billion USD. Nepal Investment Summit 2019 was held in Kathmandu on Chaitra 2075 with the theme "Energy for Economic Prosperity" where a deal of 5 out of 15 related to hydropower. Government is urging the national and international communities to make the investment in the hydro sector, forming and reforming more liberal and investor's friendly policies, e.g. capital subsidy, tax privileges.



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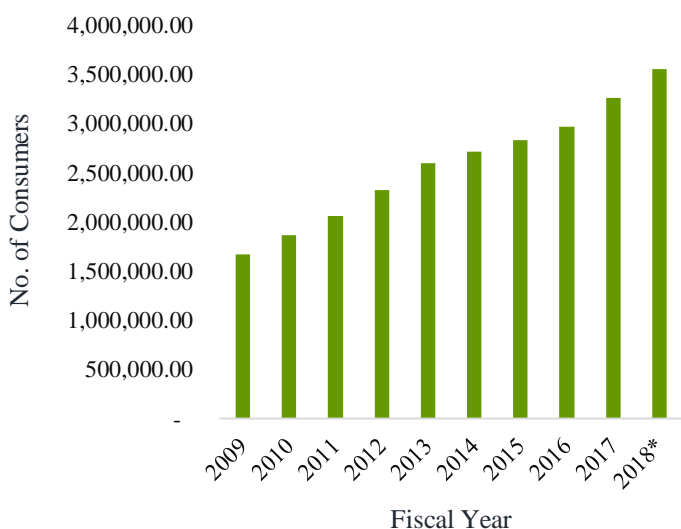
Figure 6 Electricity Demand



Source: NEA Annual Report 2073/74

The diagram shows the anticipation constant increment of electricity demands in the coming years.

Figure 7 Consumers Growth

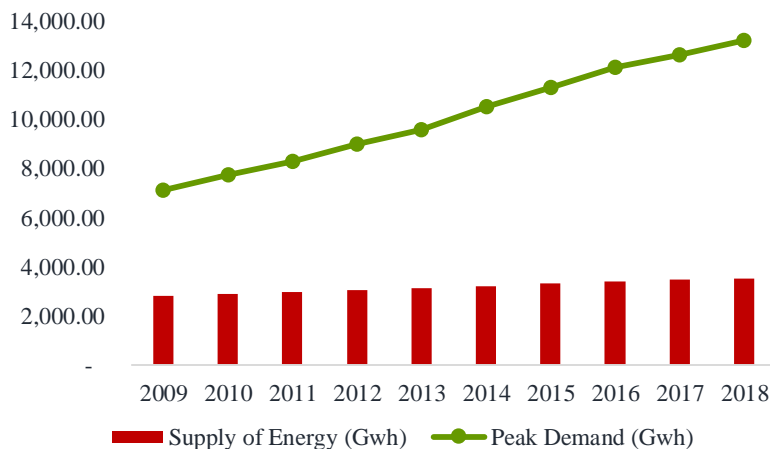


Source: NEA Annual Report 2073/74

*Provisional figures

- Transmission line and Distribution System – a major necessity:** As of 13th Falgun data, NEA has issued Transmission Construction Licenses for total of 114 hydro projects, majority comprising of 132kv voltage. Transmission network in Nepal consist of more than 2,129 circuit km of 132 kV, 511 km of 66 kV, and around 4,000 km of 33 kV power lines. NEA has been working to make high capacity transmission system, cross-border transmission lines with India, upgrade the distribution system and add more substations. Adequate transmission lines are necessary for evacuation of generated powers, increasing the installed capacity, for better power distribution, imports etc.
- Upper Project to be the largest one under current text:** The 456 MW Upper Tamakoshi Project will be the largest project under operation after its completion. The project alone is expected to supply approx. 50% of the current power availability in the country.

Figure 8 Demand Vs Supply



Source: NEA Annual Report 2073/74

The diagram depicts the significant gap between the demand and the supply of electricity in Nepal. Major supply is contributed by NEA hydro generation, followed by Power Purchase from India, NEA Thermal Generation and Power Purchase by IPPs. Electricity imports from India is increasing at a higher rates over the periods.



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Financial Analysis

Financial Ratios	03.74 Audited	03.75 Est.	03.76 Est.	03.77 Est.	03.78 Est.	03.79 Est.	(All) Avg. Est
Profitability							
Net Profit Margin	-	-	-	33.75%	15.13%	22.03%	55.67%
EBITDA Margin	-	-	-	149.58%	95.64%	95.09%	92.32%
Return on Assets (Avg.)	-	-	-	2.09%	2.15%	3.37%	-
Return on Equity (Avg.)	-	-	-	15.98%	14.49%	18.82%	14.01%
Financial Leverage and Solvency							
Debt to Equity	4.60	3.70	7.05	6.33	5.20	4.04	
Debt to Capital	63.19%	57.06%	87.58%	86.37%	83.88%	80.15%	
Equity Multiplier	7.29	6.49	8.05	7.33	6.20	5.04	
Interest Coverage	-	-	-	1.43	1.23	1.37	
Liquidity							
Current Ratio	0.91	0.46	0.28	32.15	30.96	2.35	
Quick Ratio	0.28	0.16	0.24	18.22	14.93	0.80	
Op. Cash Flow Ratio	-0.48	-0.27	2.58	21.01	-0.77	1.89	
Valuation and Growth							
Earnings Per Share	-2.30	-4.57	-4.59	17.21	18.16	27.23	94.52
BVPS	74.90	77.74	74.30	87.20	100.82	116.25	748.28
Div. Pay-out Ratio	-	-	-	-	-	18.36%	15.09%

No detail or information of any kind of lease of asset being hold by the company.

Annual Energy Generation	
Month	Contract Energy(kWh)
Sharwan	310,691,000
Bhadra	314,691,000
Ashwin	315,691,000
Kartik	207,397,000
Mangshir	117,761,000
Poush	87,512,000
Magh	68,377,000
Falgun	63,956,000
Chaitra	7,244,0000
Baishakh	119,547,000
Jestha	280,640,000
Ashad	322,552,000
Total	2,281,255,000 (kWh)

Source: Company Detail

Overall Financial Summary

We anticipate the fundamental of the company to improve in the coming years. Higher and constant revenue from sale of electricity, proportionately lower administrative and other expenses, falling effects of debt, tax privileges etc. are expected to be major contributors, whilst capex. especially the R&M of PPE may consume the revenues. Although the company is highly levered, we forecast its operating income to adequately meet the interest liabilities. We believe its ROE and ROA are par to current industry level. However, the company might struggle to maintain its liquidity ratio. Our bet for the company to maintain 15% floor dividend pay-out ratio throughout its operation.

Capital Mix

The capital structure is highly dominated by debt. Out of Rs.43.33 billion Capital employed as on Ashad 2074, 63.19% was loan (both secured and unsecured). Debt is projected to high up to Rs.58.5 billion on Ashad 2077, (86% of CE) since the lending institutions will flow money progressively. We anticipate the company to start repaying its loan from Q3 77/78, although the interest might be paid from Q3 76/77. The entire debt is projected to be paid off in 10 years.

Higher and Constant Revenue Flow

On its 1st full year of operation i.e. FY 2077/78, we figure Rs.9.53 billion revenues from sale of electricity and the amount to increase by 3% every year for next 8 years. On an average the company is likely to gross Rs.11.11 billion revenues yearly. The revenue could be contributed by other business income as well such as interest from cash and bank balance etc. We consider such income to grow significantly at later stage of operation. The company shall be eligible for government grant of Rs.5 million per MW which totals to Rs.2.28 billion, upon connection to National Grid and start generating electricity. Net profit is expected to average Rs.6.33 billion.



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Tariff Rates (As per PPA)

Years	Tariff:	
	Wet	Tariff: Dry
Ashad 31, 2077	3.63	6.96
Ashad 31, 2078	3.7389	7.1688
Ashad 31, 2079	3.851067	7.383864
Ashad 31, 2080	3.966599	7.6053799
Ashad 31, 2081	4.085597	7.8335413
Ashad 31, 2082	4.2081649	8.0685476
Ashad 31, 2083	4.3344098	8.310604
Ashad 31, 2084	4.4644421	8.5599221
Ashad 31, 2085	4.5983754	8.8167198
Ashad 31, 2086	4.7363267	9.0812214

Tariff rate will be same after FY 2086.

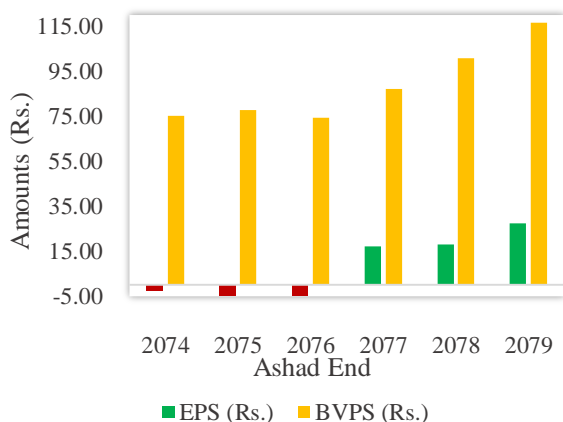
Source: Team Calculation

Du-Pont Analysis

Year	76/77E	77/78E	78/79E
Tax burden	100%	100.00%	100.00%
Interest burden	29.91%	18.53%	27.03%
EBIT Margin	112.86%	81.64%	81.50%
Asset Turnover	6.18%	14.23%	15.31%
Financial leverage	7.66	6.73	5.58
ROE	15.98%	14.49%	18.82%

Source: Team Calculation

Figure 10 Projected 5 Year EPS & BVPS



Business Expenses

We project the administrative expenses to increase by 9% annually and averages Rs.857.64 million. Salary and allowance alone consist 42.75%. In the FY 73/74, 44.47% of admin expenses was salary and allowances. The company also has to pay Royalty charges to government, which on our estimate averages Rs.267.88 million. Significant revenue is likely to be consumed by interest, which to our projection is 78.43%, 66.21% and 59.03% in FY 76/77, 77/77 and 78/79.

Capital Expenditure

Capex is Rs.54.44 million in FY 73/74. We project it to be Rs.3.57 million in 74/75 and Rs.64.63 billion in 76/77. The company is likely to capitalize the costs incurred in the construction phase after the completion of project, most probably in FY 76/77. Our projection has not considered a further capex and all R&M expenses are treated Revenue since we expect those figure to be minimal and the insurance are done, protecting from major machineries breakdown.

Breaking the ROE – Du Pont Analysis

Our projection yields an average of 14.01% ROE by the company throughout its operation. Since the company will not be generating electricity in FY 74/75 and 75/76, we have eluded it here. ROE is expected to fall over the years, yielding better till FY 85/86. Reason for the falls are Tax burden from FY86/87 which is 95%, 90 % (for 4 years), 85% and resting at 80% from FY92/93. Interest burden will be higher in earlier years but its effect on ROE will gradually lower until FY87/88. EBIT margin is also falling over times. Both asset turnover and financial leverage has low contribution on ROE, whose contribution as well is diminishing mode.

Z score test

Altman Z-Score model is applied and this indicates a weaker fundamental of the company in the earlier periods to counter any bankruptcy threats. We have applied the variables in the projected 5 years period only, whereby the company is expected to generate revenues from Q2 76/77. Therefore, the low score in that year is reasonable. We also finds the score to increase over the period, reflecting growing financial holds. We expect the company to exceed the score of 3 in the further 5 years horizon, since the debt level will gradually decrease and the bankruptcy prospect will virtually be zero from FY 87/88.

Valuation

We derive Rs.296.61 as the per share equity value of the company, factoring its potential cash flow over its entire periods of operation (DCF) and using the Residual income model (RIM). We have assigned 65% weight to the value derived as per DCF approach and 35% weight to RIM model. Higher weight to DCF is given because we believe the computed cash flow to not significantly deviate from the actual figures (assuming the company to operate smoothly and generate projected electricity). Lower weight is assigned to RIM model because the company is likely to have foreseeable positive cash flows and dividend histories ahead.



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Forward exchange rate

Periods	USD	EUR
Ashad end 2075	109.94 A	128.47 A
Ashad end 2076	114.23 E	136.82 E
Ashad end 2077	117.58 E	143.63 E

Source: Team Calculation

Target Interest Rate

Target Interest Rate	Remarks
Fed fund rate 2.50% AD	till 2021 Slow economic growth
Euro rate 0% 03/2076 0.25% 03/2077 6.50% 03/2076	economy under pressure
Nepal 6.00% 03/2077	Growing economy

Source: Team Calculation

Balance Foreign Currency paid in 3 years

Period	USD	EUR
Ashad end 2075	9,945,298.33	1,720,725.67
Ashad end 2076	9,945,298.33	1,720,725.67
Ashad end 2077	9,945,298.33	1,720,725.67

Note: Assume payment in equal basis

DISCOUNT RATES: BUILT UP METHOD

Risk Free Rate	5.93%
Market Return	16.55%
Avg. ROE	14.01%
Opportunity Cost	2.55%
Company Specific Risk Premium	2.00%
Volatility Risk Premium	1%
Liquidity Risk Premium	0.50%
Inflation Risk Premium	0.50%
Discount Rates	12.48%

Source: Team Calculation

Discounted Cash Flow Approach

While the approach applied here for valuation does not align the theoretical and correct practice of DCF model, we believe the cash flow derived here simply as the addition of *Net profit and Depreciation & amortization figures* provides reasonable assurance of the probability of not witnessing any significant differences with the actual ones. The company has not projected any Capex after the completion of projects and due to no suitable basis for us to measure / quantify the same, we gave nil effect in our valuation. Our valuation however is subject to be affected by working capital differences over the periods, though this will also have positive contribution to our cash flows as a dual effect.

Value per share derived under the above limitations is Rs.351.15 and weighting it at 65% give us the value of Rs.228.25.

Residual Income Model

The other valuation parameter used is the RIM approach, which sums the present value of the future residual income with the existing book value per share of the company. Residual income is the earnings left after equity charges which is the function of required rate of return and beginning book value.

The BVPS of company as on 31st Ashad 2074 is Rs.74.90 and the present value of its future residual income is Rs.120.41, totaling the value per share of Rs.195.30. Our assigned weight of 35% to the model provide us the value of Rs.68.36.

Discount Rate

Owing to several constraints and inappropriateness in using CAPM approach for computing discount rates, we adopted the concept of build-up approach here. Discount rate of thus 12.48% is derived by adding the several risk premiums (deemed reasonable) to the Risk free rate of 5.93%. These includes Company specific risk premium (2%), Volatility risk premium (1%), Inflation risk premium (0.50%) and Liquidity risk premium (0.50%). Further opportunity cost of 2.55% is added. Opportunity cost is derived by subtracting the (projected) average ROE of the company (14.01%) to the past 7 year's market return (NEPSE) (16.55%).

We believe the discount rate obtained by the process to reasonably quantify the current investor's required rate of returns.

Since we factored the likely cash flow of the company till its expected periods of operation, we have not considered terminal rate of return in our valuation.

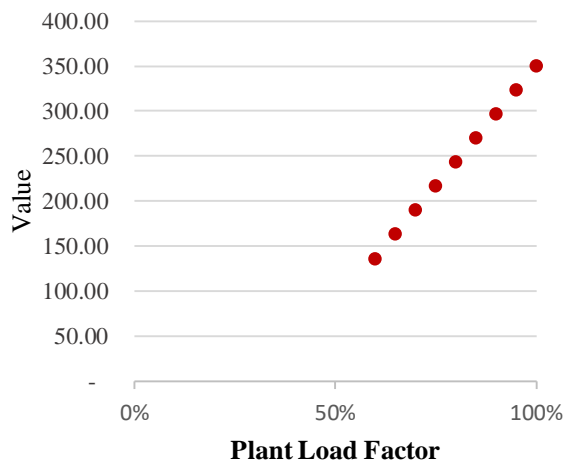
Risk free rate is the average of interest rates offered by Foreign Employment Saving Bonds, Citizens Saving Bonds and Development Bonds Auction issued by Nepal Government through Nepal Rastra Bank.

Sensitivity Check – Stressing the variable

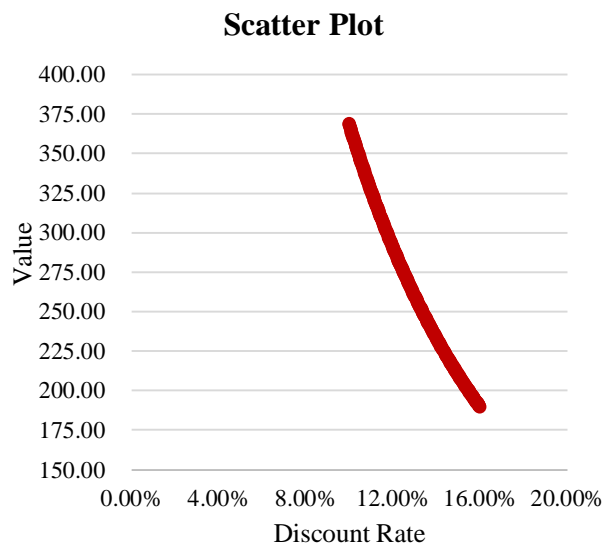
For sensitivity analysis, we try to assess the possible value per share of the company stressing the two variable on hypothetical ground. These variables are *Plant load factor and Discount rates*.



Ticker	Sector	LTP (09/04/2019)	Fair Value	12m Target Price
UPPER	Hydropower	Rs.233	Rs.296.61	Rs. 305

**Comment:**

With the lower PLF, the value per share has fallen.

**Comment:**

The scatter plot contains the 301 values derived after stressing the Discount factor.

Higher the discount rates, lower the values.

Source: Team Calculation

Plant Load Factor (PLF)

PLF shows the efficiency level of the company through the quantity of electricity generated by it. Tentatively, the average PLF of hydro-projects at present is 70%. We have stressed the PLF of the company from its 100% level to 60%, with a 5% gap. Discount rate of 12.48% is used. The output is presented below:

PLF	Value	PLF	Value
100%	350.98	75%	217.22
95%	324.26	70%	190.39
90%	297.53	65%	163.52
85%	270.80	60%	136.61
80%	244.02		

Discounting factor

We have stressed the discounting factors from 10% to 16%, with a 0.02% constant addition till 16%. While the possibilities remain for the discount rate to be lower than 10% or higher than 16%, we here consider the most possible scenarios. Further, we average the cash flow derived under the above PLF assumption.

Through the process, we figure Rs.328.27 when discount rate is 10% and Rs.166.28 when 16% discount rate. Higher the discount rate lower the value and vice-versa.

Investment Risks

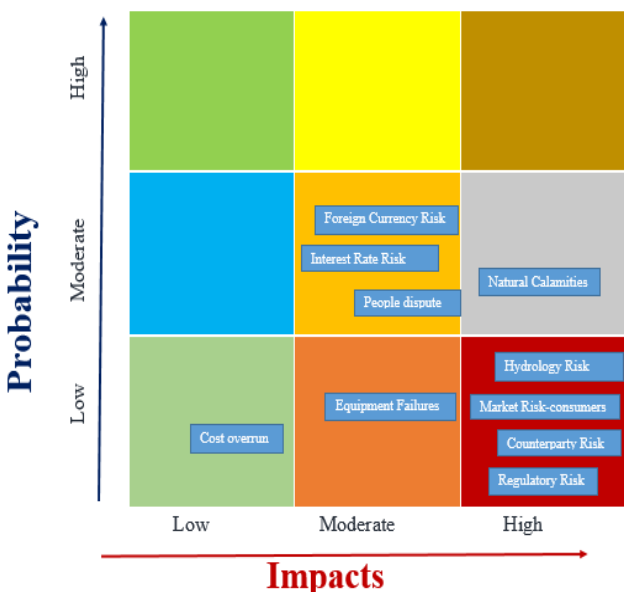
1. Exposure to foreign currency fluctuation risks (Moderate probability, Moderate Impact)

The company engages foreign contractors and consultant for the project requiring payment in foreign currency, exposing it to the foreign exchange risks particularly volatilities in USD and EUR currency relative to NPR. As per the FY 73/74 report, approx. USD 29.84 million and EUR 5.16 million are left to be paid and we expect it to be paid off by FY 76/77. Using the interest rate parity hypothesis, we anticipate the domestic currency to depreciate relative to both USD and EUR, reaching NPR/USD = Rs.114.23, NPR/EUR = 136.82 and NPR/USD = Rs.117.58 and NPR/EUR = Rs.143.63 in the FY 75/76 and 76/77 respectively. This will have a negative effects on its profitability. *Mitigant & Suggestion: No information from the company. Derivative product like Forward may be employed.*



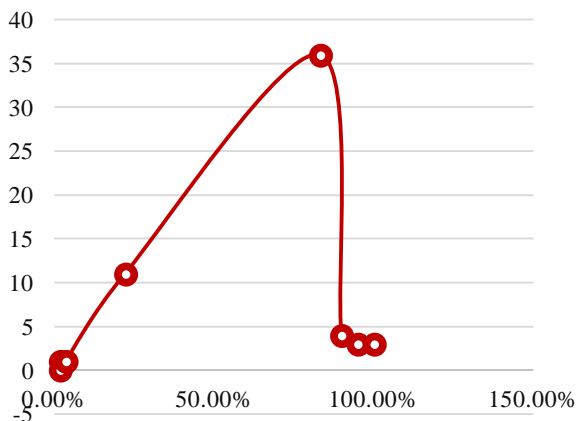
Ticker	Sector	LTP (09/04/2019)	Fair Value	12m Target Price
UPPER	Hydropower	Rs.233	Rs.296.61	Rs. 305

Figure 9 Risk Assessment



Source: Team Calculation

Return Distribution



Source: Team Calculation

Distribution is negatively skewed with a fatter tails, implying more negative return outliers

From a risk management perspective, investment in the stock has higher risks as indicated by excess kurtosis and negative skew.

2. Interest rate risks (Moderate probability, Moderate Impact)

Since the company is heavily debt financed and debt are expected to remain till FY 87/88 until fully repaid, we foresee the interest rate risk as considerable factors. The company has assumed interest rate on secured loan to be 12% in FY 74/75 and 11% thereafter while on unsecured loan it is 10.50%. Considering the tussle as witnessed in the recent period over the interest rate fluctuation owing to credit crunch situation resulting the rate to soar to 13% +, we expect the situation to persist in the years ahead as well. *Mitigan & Suggestion: No information from the company. Development of derivatives product could provide ways in future.*

3. Market risks – selling of electricity generated (Low probability, High impact)

The company has signed a Power Purchase Agreement (PPA) with NEA which virtually eliminates the worries concerning the finding of consumers for generated electricity. For other hydro-projects in future, this risk is minimal since the supply and demand gap of electricity is huge within the country. Further, demand from India, Bangladesh also provide export market. *Mitigant: PPA with NEA is made.*

4. Counterparty risk (Low probability, High impact)

Although PPA is made with NEA, there still remains the possibility of NEA defaulting on its liabilities due to the company. This is because NEA is the only counterparty in the country doing PPA with almost all hydro-projects. Inability of NEA to sell off the produced electricity presents systemic threats to all those hydro companies. NEA had the history making billion of rupees loss in the past, before finally reporting profits for consecutive two years in FY 73/74 and 74/75. *Mitigant: Government owned, no record of past default, timely payment to IPPs (Independent Power Producers).*

5. Area prone to natural calamities (Moderate probabilities, High impact)

Dolakha district lies in lower northern himalayan region, prone to various natural calamities especially landslide and earthquakes. This will have adverse effects on the projects development and operation like demolishing the construction, machineries and equipment, transportation, working environment etc. In the past also, the project was heavily affected by the earthquakes and landslides resulting project delays and cost overrun. Such external forces will have severe impacts on electricity generation activities, which can curtail the return potential of company. *Mitigant: Insurance of all the equipment and machineries including the workers is done, which could limit the financial hardship at such situation.*



Ticker	Sector	LTP (09/04/2019)	Fair Value	12m Target Price
UPPER	Hydropower	Rs.233	Rs.296.61	Rs. 305

Statistics

Mean	0.12%
Standard Error	0.43%
Median	(0.0042)
Mode	-
Standard Deviation	0.0328
Sample Variance	0.0011
Kurtosis	3.7413
Skewness	0.9431
Range	0.1983
Minimum	(0.0993)
Maximum	0.0989
Sum	0.0701
Count	59.0000

Bin Frequency Cumulative %

-0.099315068	1	1.69%
-0.070992926	0	1.69%
-0.042670783	1	3.39%
-0.014348641	11	22.03%
0.013973502	36	83.05%
0.042295644	4	89.83%
0.070617787	3	94.92%
More	3	100.00%

Value at Risk (VaR)

Parametric Method

Mean	0.12%		
Standard Deviation	3.28%		
	1 Day VAR	1 Week VAR	1 Month VAR
90% C.I.	-4.09%	-9.14%	-18.74%
95% C.I.	-5.28%	-11.81%	-24.21%
99% C.I.	-7.52%	-16.82%	-34.46%

Source: Team Calculation

6. Equipment and technology breakdown (Low probability, Moderate impact)

Breakdown of essential hydro and electro mechanical equipment will also risk the project operation and revenue potentials. As these equipment operate on regular basis, they could at time breakdown or become obsolete. This also reduces its efficiency and result low plant load factor. *Mitigan & Suggestion: Though insurance of the equipment is done, major capital should be apportioned for its R&M at time.*

7. People disputes/issues (Moderate probability, Moderate impact)

The project has garnered several disputes and conflict of interest among the companies, contractors, workers, locals and government at large. There has been an instances over the time regarding workers strikes, demand for more shares, claims of payments/wages, contractors intentionally stopping the works etc. Such operational issues has escalated the project completion time and costs. *Mitigant & Suggestion: Suitable compensation/incentives packages, better working environment.*

8. Possible cost overrun (Low probability, Low impact)

Since the project is still under construction phase (near 2% left), there is still possibility (remote) of cost escalation. RCOD of the project has been revised and extended at several occasion in the past that resulted project cost to mount. A delay in timely construction can incur as much as Rs.536.23 million interest expenses in a single month. There are expenses associated to wages, allowances, repair and maintenance, fixed charges etc. as well. *Mitigant & Suggestion: Timely completion of project.*

9. Hydrology risk (Low probability, High impact)

The project utilizes the water source of Tamakoshi rivers and any unexpected scenario leading to dry up or decrease in water source can have significant impact on electricity generation.

10. Regulatory risks – obtaining licenses for future projects (Low probability, High impact)

Environmental Social and Governance (ESG) Outlooks

Prudent investment requires the understanding and analysis of factors other than financial data's as well. This is because the profitability, returns and stock



Ticker	Sector	LTP (09/04/2019)	Fair Value	12m Target Price
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Expected Shortfall / CVAR

	1 Day VAR	1 Week VAR	1 Month VAR
90% C.I.	-4.72%	-10.54%	-21.61%
95% C.I.	-6.61%	-14.77%	-30.27%
99% C.I.	-16.83%	-37.64%	-77.14%

Source: Team Calculation

Comment:

While the VaR shows a potential loss at a given confidence interval in given time period, it fails to show the magnitude of such losses. Expected shortfall indicate average losses if VaR limit is exceeded.

1 day VaR at 90% C.I. imply that there is 90% probability of at most 4.09% potential loss, while the average losses is limited to 4.72%.

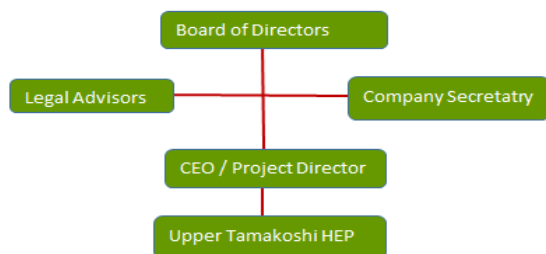
Note: Limitation of VaR

The method assumes Normal distribution of return while the historical return is not normally distributed.

Per MW Project Cost

Projects	Million
1 Mountain Hydro	198.59
2 Panchthar Power	175.5
3 Sanima Mai Hydro	149.8
4 United Modi	169
5 Andhi Khola	182.5
6 Iwa Khola	161.6
7 Upper Tamakoshi	145.13

Figure 11 Organization Chart



prices are positively correlated to such factors which even lead to the threat to going concern assumption. We have witnessed such issues in Enron, Walmart while in many countries government are forcefully shutting down the companies that has negative impact on environment like in China.

ESG has become a popular consideration for investment decision making, though in Nepal its importance is yet to be felt and realized. ESG investing also means Sustainable, Responsible and Impact investing (SRI).

Hydropower is one sector which necessitate the ESG outlook because it has both direct and indirect influence on the environment, community and governance aspects.

While we have not made a field visit for detailed assessment of Environmental and Social impacts (along with mitigation approaches) of the Upper Tamakoshi Hydro-project and we were not provided with the Environmental Impact Assessment (EIA) Report of the project, our outlook on the ESG in this report is more subjective which is based on the rationale understanding of the several factors of ESG likely to be impacted by the ongoing project and response received from the concerned personnel of the company on our questionnaires. Appendix 6 shows the severity of factors impacted by the project. The Corporate Governance of the company is tried to be assessed separately on appendix 7.

Environmental

The project is being developed in Lamabagar – 1, Bigu in Dolkha District tapping the Tamakoshi River. Areas like Lamabagar, Laduk, Bulung and Orang of Bigu Rural Municipality are the most affected ones while Gaurishankar, Khare etc. of Gaurishankar Rural Municipality are also affected by the project. Further, VDC like Lamidanda, Sunakhani, Sundrawati, Namdu, Gairimudi, Bhirkot, Malu, Japhe and Sahare are also affected with the construction of Transmission line and Roads. Through our assessment and understanding, the Project has the negative impacts to the environment and entails effective measures to be taken to limit the impacts.

Social

On the other hand, the investment in the company may be argued on the social value addition created by the Project. Annual report of 2073/74 highlights the contribution made by the company on the sectors like education, health, water, sanitation, agriculture, awareness program, tourism, remote roads, electricity, income oriented skills development etc. Also the company had helped in the reconstruction and development of the areas affected by the Earthquake of 2072.

Governance

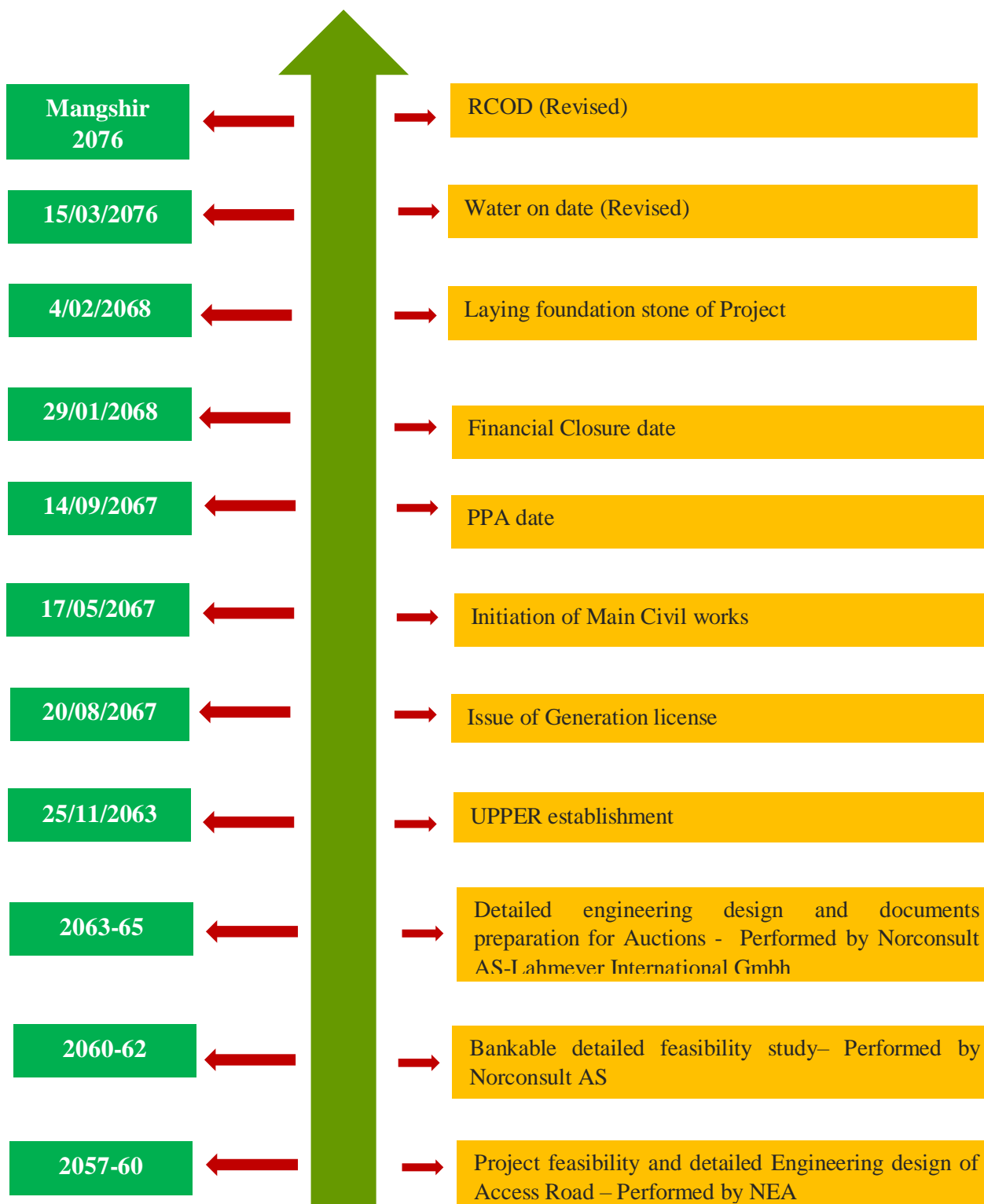
We have measured the company Corporate Governance quality on a scale of 1 to 10, scaling from High to Insignificant Threat to the Shareholders Rights. Accordingly, the company has a score of 7.05 showing the Low level of Threat to the Shareholders Interests. Our major concerns were the Conflicts of Interests of the Board Members, Lending Institutions and their workforce, transparency, no separate Risk management and Investors grievances committees. For detail check of the Governance computation, refer to the Appendix 7.



Ticker	Sector	LTP (09/04/2019)	Fair Value	12m Target Price
UPPER	Hydropower	Rs.233	Rs.296.61	Rs. 305

APPENDICES

Appendix 1: Important Dates of the Project





Ticker	Sector	LTP (09/04/2019)	Fair Value	12m Target Price
UPPER	Hydropower	Rs.233	Rs.296.61	Rs. 305

Appendix 2: Balance Sheet and Vertical Analysis

Particular	Ashad 74 A	Ashad 75 E	Ashad 76 E	Ashad 77 E	Ashad 78 E	Ashad 79 E
Capital & Liabilities						
Share Capital	79,42,500.00	105,90,000.00	105,90,000.00	105,90,000.00	105,90,000.00	105,90,000.00
Reserve and Surplus	-19,93,946.00	-23,56,926.90	-27,21,784.47	-13,55,165.66	87,148.75	17,20,697.18
Secured	173,83,418.00	200,00,000.00	395,24,206.00	416,98,037.33	396,13,134.46	354,43,328.73
Unsecured	100,00,000.00	105,00,000.00	159,62,028.00	168,00,034.47	159,60,033.75	142,80,029.30
Total Loan	273,83,418.00	305,00,000.00	554,86,234.00	584,98,071.80	555,73,168.21	497,23,358.03
Interest on LT Loans	100,04,744.00	147,21,995.00				
Total Capital & Liab.	433,36,716.00	534,55,068.10	633,54,449.53	677,32,906.14	662,50,316.96	620,34,055.21
Assets						
PPE	2,86,696.00	2,90,271.00	2,90,272.00	649,24,959.00	649,24,959.00	649,24,959.00
Less: Accu. Depreciation	-67,209.00	-77,302.81	-81,245.51	-14,16,015.49	-27,50,533.38	-40,84,780.26
	2,19,487.00	2,12,968.19	2,09,026.49	635,08,943.51	621,74,425.62	608,40,178.74
Capital WIP	433,44,516.00	544,67,514.00	646,34,688.17			
Sub Total	435,64,003.00	546,80,482.19	648,43,714.66	635,08,943.51	621,74,425.62	608,40,178.74
Inventory	9,029.00	1,500.00	1,530.00	1,561.00	1,592.00	1,624.00
Trade & Other Rec.	-	-	-	17,30,636.88	19,82,555.88	11,93,423.08
Prepaid exp. advance & Deposit	15,40,176.00	6,69,330.00	77,040.20	1,57,398.08	1,95,938.94	1,72,195.89
Cash and cash Equivalents	6,90,039.00	3,66,793.90	5,06,006.84	24,69,966.67	20,31,869.52	7,11,154.33
Sub Total (CA)	22,39,244.00	10,37,623.91	5,84,577.04	43,59,562.63	42,11,957.34	20,78,396.30
Trade & Other Payables	24,66,530.00	22,63,038.00	20,73,842.00	1,35,600.00	1,36,065.00	3,55,019.83
Provision for Dividend	-	-	-	-	-	5,29,500.00
Sub Total (CL)	24,66,530.00	22,63,038.00	20,73,842.00	1,35,600.00	1,36,065.00	8,84,519.83
Net Current Assets (WC)	-2,27,286.00	-2,25,414.09	-14,89,264.96	42,23,962.63	40,75,891.34	11,93,876.47
Total Assets	433,36,717.00	534,55,068.10	633,54,449.70	677,32,906.14	662,50,316.96	620,34,055.21

Particular	Ashad 74 A	Ashad 75E	Ashad 76E	Ashad 77E	Ashad 78E	Ashad 79E
Capital & Liabilities	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Share Capital	18.33%	19.81%	16.72%	15.63%	15.98%	17.07%
Reserve and Surplus	-4.60%	-4.41%	-4.30%	-2.00%	0.13%	2.77%
Secured	40.11%	37.41%	62.39%	61.56%	59.79%	57.14%
Unsecured	23.08%	19.64%	25.19%	24.80%	24.09%	23.02%
Total Loan	63.19%	57.06%	87.58%	86.37%	83.88%	80.15%
Interest on long term loans	23.09%	27.54%				
Assets	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
property, Plants and Equipment		0.54%	0.46%	95.85%	98.00%	104.66%
Less: Accumulated Depreciation		-0.14%	-0.13%	-2.09%	-4.15%	-6.58%
	0.51%	0.40%	0.33%	93.76%	93.85%	98.08%
Capital Work in Progress	100.02%	101.89%	102.02%	0.00%	0.00%	0.00%
Inventory	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%
Trade & Other Receivables	0.00%	0.00%	0.00%	2.56%	2.99%	1.92%
Prepaid expenses, Advance & Deposit	3.55%	1.25%	0.12%	0.23%	0.30%	0.28%
Cash and cash Equivalent	1.59%	0.69%	0.80%	3.65%	3.07%	1.15%
Trade & Other Payables	5.69%	4.23%	3.27%	0.20%	0.21%	0.57%
Provision for Dividend	0.00%	0.00%	0.00%	0.00%	0.00%	0.85%



Ticker	Sector	LTP (09/04/2019)	Fair Value	12m Target Price
UPPER	Hydropower	Rs.233	Rs.296.61	Rs. 305

Appendix 3: Income Statements and Vertical Analysis

Ashad end	Revenue	%	Royalty	%	Admin. Exp.	%	Op. Profit	%	Interest Exp.	%	Net Profit	%
2074A	-		-		207.59		- 185.13		-		- 182.36	
2075E	-		-		289.31		- 277.86		-		- 363.21	
2076E	-		-		256.61		- 240.96		-		- 364.86	
2077E	4,048.76	100%	126.58	3.13%	220.53	5.45%	6,056.25	149.58%	3,175.39	78.43%	1,366.62	33.75%
2078E	9,531.89	100%	236.24	2.48%	240.36	2.52%	9,116.77	95.64%	6,311.10	66.21%	1,442.31	15.13%
2079E	9,817.85	100%	241.96	2.46%	262.12	2.67%	9,335.65	95.09%	5,795.09	59.03%	2,163.05	22.03%
2080E	10,112.38	100%	247.85	2.45%	286.02	2.83%	9,599.81	94.93%	5,160.02	51.03%	3,044.69	30.11%
2081E	10,415.76	100%	253.92	2.44%	312.26	3.00%	9,870.87	94.77%	4,524.94	43.44%	3,933.17	37.76%
2082E	10,728.23	100%	260.16	2.43%	341.08	3.18%	10,148.27	94.59%	3,889.86	36.26%	4,827.98	45.00%
2083E	11,050.08	100%	266.60	2.41%	372.74	3.37%	10,432.03	94.41%	3,254.78	29.45%	5,728.80	51.84%
2084E	11,381.58	100%	273.23	2.40%	407.51	3.58%	10,722.13	94.21%	2,619.70	23.02%	6,635.84	58.30%
2085E	11,723.03	100%	280.06	2.39%	445.71	3.80%	11,018.55	93.99%	1,984.62	16.93%	7,549.07	64.40%
2086E	12,074.72	100%	287.09	2.38%	487.68	4.04%	11,321.23	93.76%	1,349.54	11.18%	8,468.45	70.13%
2087E	12,074.72	100%	287.09	2.38%	533.79	4.42%	11,275.12	93.38%	714.46	5.92%	8,593.57	71.17%
2088E	12,074.72	100%	287.09	2.38%	584.47	4.84%	11,224.44	92.96%	119.08	0.99%	8,621.91	71.40%
2089E	12,074.72	100%	287.09	2.38%	640.16	5.30%	11,168.75	92.50%			8,677.84	71.87%
2090E	12,074.72	100%	287.09	2.38%	701.37	5.81%	11,107.55	91.99%			8,623.83	71.42%
2091E	12,074.72	100%	287.09	2.38%	768.64	6.37%	11,040.28	91.43%			8,564.47	70.93%
2092E	12,074.72	100%	287.09	2.38%	842.58	6.98%	10,966.33	90.82%			8,027.05	66.48%
2093E	12,074.72	100%	287.09	2.38%	923.85	7.65%	10,885.06	90.15%			7,491.13	62.04%
2094E	12,074.72	100%	287.09	2.38%	1,013.20	8.39%	10,795.71	89.41%			7,421.05	61.46%
2095E	12,074.72	100%	287.09	2.38%	1,111.42	9.20%	10,697.49	88.59%			7,344.01	60.82%
2096E	12,074.72	100%	287.09	2.38%	1,219.41	10.10%	10,589.50	87.70%			7,259.32	60.12%
2097E	12,074.72	100%	287.09	2.38%	1,338.13	11.08%	10,470.78	86.72%			7,166.21	59.35%
2098E	12,074.72	100%	287.09	2.38%	1,468.66	12.16%	10,340.26	85.64%			7,063.83	58.50%
2099E	12,074.72	100%	287.09	2.38%	1,612.17	13.35%	10,196.74	84.45%			6,951.27	57.57%
2100E	12,074.72	100%	287.09	2.38%	1,769.97	14.66%	10,038.94	83.14%			6,827.50	56.54%
2101E	12,074.72	100%	287.09	2.38%	1,943.49	16.10%	9,865.42	81.70%			6,691.41	55.42%
2102E	12,074.72	100%	287.09	2.38%	2,134.29	17.68%	9,674.63	80.12%			6,541.77	54.18%
8/2102E	5,997.28	100%	165.55	2.76%	976.71	16.29%	4,863.90	81.10%			3,916.85	65.31%

Note:

- Figures in millions
- Revenue from sale of electricity is taken as base for vertical analysis.
- Revenue is expected to remain constant from FY 2085/86, since no further escalation on PPA rates.
- Company will be exempted from tax till Q2 86/87, then rebate of 50% be given on its 20% tax liability for next 5 years. It shall pay full 20% tax from Q2 91/92.

(Our analysis and projection is based on the assumption that the company will commence its operation i.e. to generate electricity from Magh 2076 and will continue till Mangshir 2102. Also the company will generate and sale electricity as per PPA.)



Ticker	Sector	LTP (09/04/2019)	Fair Value	12m Target Price
UPPER	Hydropower	Rs.233	Rs.296.61	Rs. 305

Appendix 4: Altman Z-Score Analysis

The Altman Z-Score Model is carried out to analyse and assess the probability of the company filing for bankruptcy, thereby checking its financial health. The model relies on discriminant analysis to generate a Z-score using 5 variables. Here, a Z-score of 1.80 indicates a firm has a high probability of bankruptcy and a score of approximately 3.00, indicates a firm is far from a high bankruptcy probability. So high Z-score is preferred.

Z-Score is derived as follows:

$$1.2*V1 + 1.4*V2 + 3.3*V3 + 0.6*V4 + 1.0*V5$$

Variables	2074/75	2075/76	2076/77	2077/78	2078/79
Current Assets	10,37,624	5,84,577	43,59,563	42,11,957	20,78,396
Current Liabilities	22,63,038	20,73,842	1,35,600	1,36,065	8,84,520
Total Liabilities	452,21,995	554,86,234	584,98,072	555,73,168	497,23,358
Total Assets	534,55,068.10	633,54,449.70	677,32,906.14	662,50,316.96	620,34,055.21
Retained Earnings	-23,56,927	-27,21,784	-13,55,165	87,150	17,20,697
Revenues	-	-	40,48,762.65	95,31,892.64	98,17,849.42
EBIT	-3,63,208	-3,64,858	45,69,345	77,82,255	80,01,402
Market Capitalization	256,27,800.24	256,27,800.24	256,27,800.24	256,27,800.24	256,27,800.24
Working Capital	-12,25,414	-14,89,265	42,23,963	40,75,891	11,93,876
DERIVED VARIABLES					
V1. Working Capital / Total Assets	-0.022924189	-0.023506872	0.062362046	0.061522594	0.019245501
V2. Retained Earnings/ Total Assets	-0.044091739	-0.04296122	-0.020007478	0.001315462	0.027737944
V3. EBIT / Total Assets	-0.006794639	-0.005758989	0.067461228	0.117467438	0.128984026
V4. Market Capitalization/ Total Liabilities	0.57	0.46	0.44	0.46	0.52
V5. Revenue/ Total Assets	-	-	0.06	0.14	0.16
ALTMAN Z-SCORE	0.23	0.17	0.59	0.88	0.96

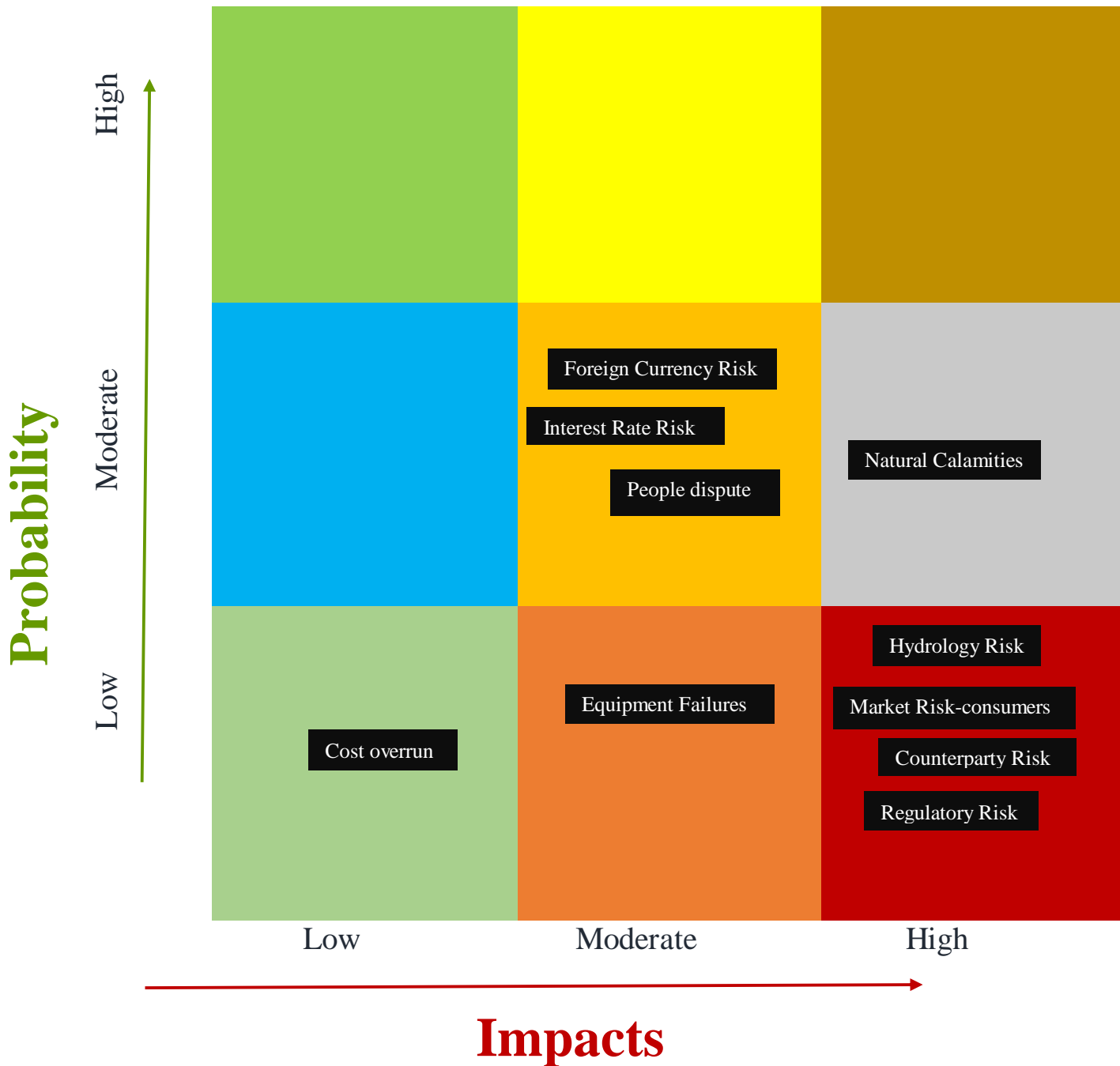
Notes:

- For market cap, we have used Rs.242 (average price) in all periods, assuming the stock to show mean reverting ability.



Ticker	Sector	LTP (09/04/2019)	Fair Value	12m Target Price
UPPER	Hydropower	Rs.233	Rs.296.61	Rs. 305

Appendix 5: Investment Risk Assessment





Ticker	Sector	LTP (09/04/2019)	Fair Value	12m Target Price
UPPER	Hydropower	Rs.233	Rs.296.61	Rs. 305

Appendix 6: Environmental and Social Outlooks

	S.N.	Factors	Impacts	Findings	Mitigation Approach Taken	Conclusion
Environmental	1.	Land area		NA	NA	
	2.	Forests		NA	NA	
	3.	Wildlife		NA	NA	
	4.	Aquatic Animal		NA	NA	
	5.	Biodiversity		NA	NA	
	6.	Water resources		NA	NA	
	7.	Air – Water quality		NA	NA	
	8.	Sound		NA	NA	
	9.	Green-house gas emission		NA	NA	
	10.	Eco-system		NA	NA	
Social	1.	Livelihoods of Locals		NA	NA	
	2.	Employments		NA	NA	
	3.	Workers Turnovers		NA	NA	
	4.	Culture and values		NA	NA	
	5.	Tourism		NA	NA	
	6.	Health		NA	NA	
	7.	Education		NA	NA	
	8.	Special Privileges & Facilities		NA	NA	
	9.	Infrastructures		NA	NA	
	10.	Social Responsibility		NA	NA	

Scale of Impacts of Colors used

	Negative
	Mixed
	Positive

Note: We could not obtain the EIA report from the Company and also the communication essential to verify and confirm the Appendix 6 details could not be established on a timely manner.



Ticker	Sector	LTP (09/04/2019)	Fair Value	12m Target Price
UPPER	Hydropower	Rs.233	Rs.296.61	Rs. 305

Appendix 7: Corporate Governance Appraisal

The score for Corporate Governance is provided based on the factors identified imminent for its appraisal by the Research Team of KCL Astute Capital Limited. The factors are believed to be the major ones to affect the interest of the Shareholders:

S.N	Appraisal of Corporate Governance	Weight	Assigned	Score
1	Board and Management		25%	
a	Appointment of Independent Directors as per regulatory requirements (2)	5%	10	0.50
b	Experience level of Board & Management Team	5%	7	0.35
c	Appointment of Women Directors	5%	10	0.50
d	Outside business relationship (Related party transactions) with Board/Mgmt./Staffs	5%	6	0.30
e	Election process of Board/CEO – Annual / Stagger	5%	8	0.40
2	Formation of Committees		25%	
a	Audit & Executive Committee	5%	10	0.50
b	Risk Management Committee	5%	2	0.1
c	CSR Committee	5%	10	0.50
d	Nomination, Compensation & Remuneration Committee	5%	8	0.40
e	Investors Grievances Committee	5%	2	0.1
3	Disclosure & Transparency		25%	
a	Timely and accurate dissemination of material reports and notices	5%	7	0.35
b	Communication of long term strategic plans to stakeholders	5%	8	0.40
c	Disclosure of Related Party transactions	5%	8	0.40
d	Cases of Inside trading, manipulation, fraudulent activities, law suit on/against Co.	5%	7	0.35
e	Disclosure about any foreseeable risks	5%	8	0.40
4	Others		25%	
a	Shareholders voting rights including Cumulative / Preemptive Rights	5%	8	0.40
b	Shareholders directors including provisions for Small shareholders	5%	8	0.40
c	Policies for protection of Minority, NRN or Foreign Shareholders	5%	7	0.35
d	Compliance to Regulatory Practices	5%	7	0.35
e	Provision of Class action	5%	0	0.00
Total Corporate Governance Score		100%		7.05
				Low Threat

Scale showing the level of Threat to Shareholders

1- 2	High	5 - 6	Moderate	9 – 10	Insignificant
3 – 4	Significant	7 – 8	Low		

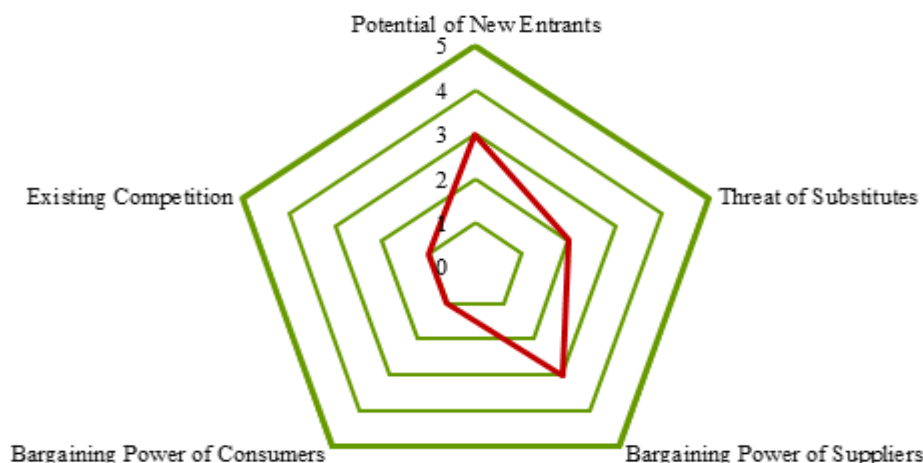
Comment:

- Factors selected for the Corporate Governance measurement are expected to uphold the basic and fundamental shareholders rights. Therefore, factor may include one not defined by the Companies Act, 2063.
- The company has gone public recently and the composition of Board will be governed by the Articles and Company Act 2063.
- Under the Formation of Committee Section, the company has not formed Risk Management Committee and Investors Grievances Committee yet, we have assigned 2 assuming the other committees to partly deal with such.
- Scores are tried to be assigned on a prudent basis, considering the Company published data's and news and overall week corporate governance and ethical concerns of Nepalese companies.



Ticker	Sector	LTP (09/04/2019)	Fair Value	12m Target Price
UPPER	Hydropower	Rs.233	Rs.296.61	Rs. 305

Appendix 8: Porter's Five Forces Analysis



Porter's Five Forces as coined by Michael Porter provides the attractiveness of the industries along with the competitive advantages, macro-economic outlooks and profitability over a long-term periods, through the interaction of five major forces.

- Potential of New Entrants:** *Moderate (3)*
 - Focus on to bring major investments in hydro sectors, opening door for national and foreign major players to invests.
- Threat of Substitutes:** *Low (2)*
 - Other than electricity, there are many traditional as well as alternative form of renewable and non-renewable energy available like biomass, solar, wind, bio-fuel, coal etc.
- Bargaining Power of Suppliers:** *Moderate (3)*
 - Hydro projects are both labor and capital intensive, requiring to find suppliers of equipment, human resources, investors, insurers etc. These suppliers are lacking in the country at present.
- Bargaining Power of Consumers:** *Insignificant (1)*
 - Since all most all Hydro projects in the country enters into the PPA with NEA at the pre-defined rates, the hydro company will not be affected by the bargaining of the energy consumers.
- Existing Competition:** *Insignificant (1)*
 - Though there are large numbers of hydro projects, the hydro company don't have to compete with each other because of the PPA made with NEA.

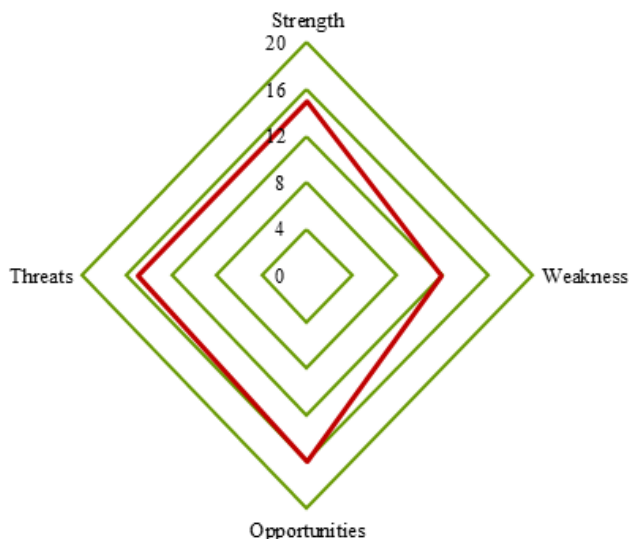
Conclusion: UTKHPL has the attractive industrial outlooks with consistent profitable potentials.

The Scale of Interaction		
0 No Interaction	2 Low	4 High
1 Insignificant	3 Moderate	5 Very High

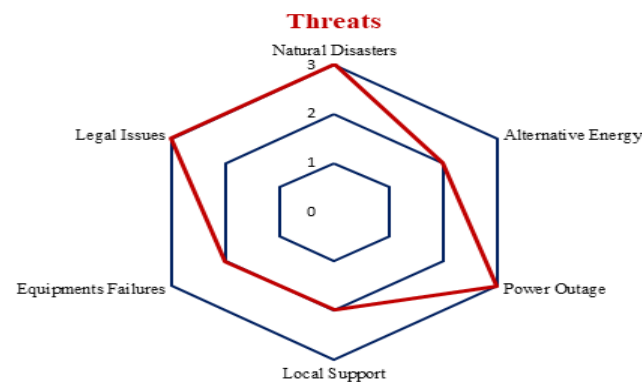
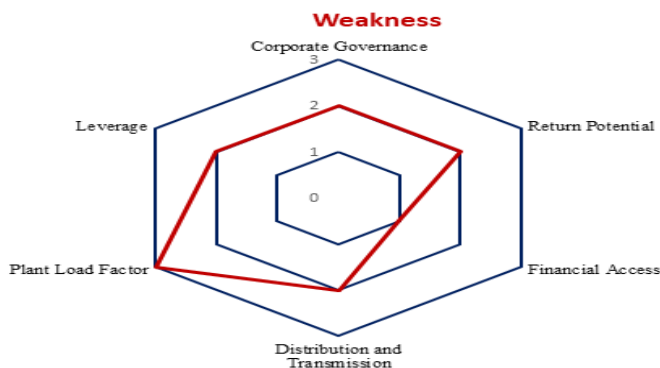
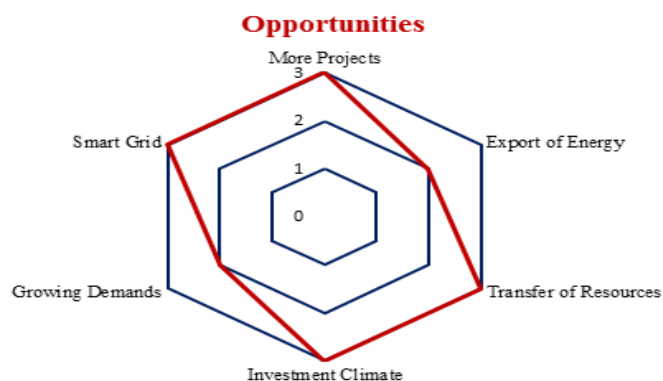
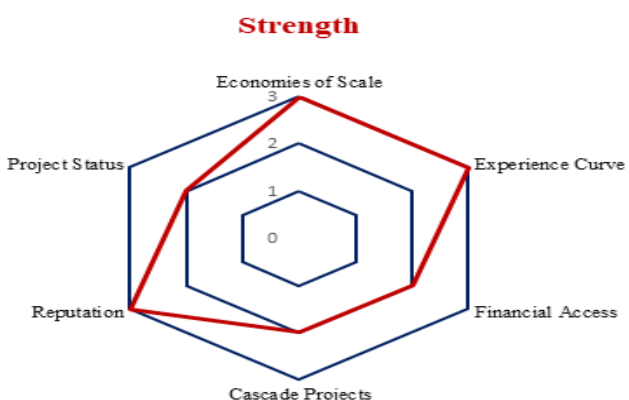


Ticker	Sector	LTP (09/04/2019)	Fair Value	12m Target Price
UPPER	Hydropower	Rs.233	Rs.296.61	Rs. 305

Appendix 9: SWOT Analysis



STRENGTH	WEAKNESS
<ul style="list-style-type: none"> Economies of Scale Experience Curve Financial Access Cascade Projects Reputation Project Status 	<ul style="list-style-type: none"> Corporate Governance Return Potential Financial Access Distribution & Transmission Leverage Plant Load Factor
OPPORTUNITY	THREAT
<ul style="list-style-type: none"> More Projects Export of Energy Transfer of Resources Smart Grid Investment Climate Growing Demands 	<ul style="list-style-type: none"> Natural Disasters Alternatives Energy Power outage Local Support Equipment Failures Legal Issues



The Significant of Scale			
0 Nil	1 Low	2 Moderate	3 High



Ticker	Sector	LTP (09/04/2019)	Fair Value	12m Target Price
UPPER	Hydropower	Rs.233	Rs.296.61	Rs. 305

Appendix 10: Division of Works and Present Status

The whole project work is structured into 4 major lots/phases that includes Civil, Hydro-mechanical, Electro-mechanical and Transmission line & Substation. *For details:*

Lots	Civil	Hydro-mechanical	Electro-Mechanical	Transmission Line & Substation
Contractor's Name	Sinohydro Corporation Ltd	Taxmaco Rail & Engineering Ltd.	Andritz Hydro GmbH	KEC International Limited
Contractor's Origin	China	India	Austria	India
Contract Date	16/04/2067 (1/08/ 2010)	16/11/2068 (28/02/2012)	14/11/2068 (26/02/2012)	26/09/2069 (10/01/2013)
Due date of Completion	02/12/2071 (16/03/2015)	17/01/2072 (30/04/2015)	02/12/2072 (15/03/2016)	15/03/2072 (30/06/2015)
First extension	14/06/2073 (30/09/2016)	23/03/2075 (07/07/2018)	16/09/2075 (31/12/2018)	16/09/2075 (31/12/2018)
Second extension	16/03/2075 (30/06/2018)			
Third Extension	Process Going on extension	Interim Extension	Interim Extension	Interim Extension
Revised Contract Amounts	NPR. 13,371,775,235 (65% USD & 35% NPR.)	EUR 10,574,458 + NPR. 292,068,057	USD 87,164,920 + NPR. 334,155,022	USD 19,971,745 + NPR. 546,849,975

Lots	Major works
Civil Works	Construction of diversion dam, intake, disyander, headrace tunnel, surge tank, penstock (Vertical Shaft and Horizontal Tunnel), power house (underground), tailrace tunnel etc. Further includes the regular repair and maintenance of Dolkha - Lamabagar 68 km Access Road and completion of remaining works at Singati - Lamabagar 28.5 km site.
Hydro-mechanical Works	Design, manufacturing, connection, test and comissioning of Gates, Stoplogs, Penstock pipes etc. at dam, intake, disyander etc. constructed by Lot 1
Electro-Mechanical	Design, manufacturing, connection, test and comissioning of essential Machines and Equipments of Project, eg. Turbine, generator, transformer, switchgear, valve etc.
Transmission Line & Substation	Construction of 220kV 47km long Gongor-Khimti Transmission Line and substation. Also includes the design, manufacturing, connection, test and comissioning of same. <i>(NEA to carry out the works)</i>

Technical Support for the Project

M/s Norconsult AS-Lahmeyer International GmbH was appointed for providing the consultancy services for the projects that includes carrying out Feasibility study, engineering design, project monitoring and supervision, quality control, estimation of overall project costs etc. The consultant company is a Joint Venture of Norconsult (*Norway based consultancy firm*) and Lahmeyer International GmbH (*German based engineering company*). The consultancy fee is agreed at USD 15,458,872 and Rs.252,559,520. *For detail:*

Consultant Name	Norconsult AS-Lahmeyer International GmbH
Origin	JV of Norway and German Company
Purchase Agreement Date	16/08/2067 (02/12/2010)
Agreed date of Completion	02/09/2072(17/12/2015) + 1 Year Defect Liability Period
First extention	02/09/2073 (17/12/2016) + 1 Year Defect Liability Period
Second extention	15/09/2075 (31/12/2018) + 1 Year Defect Liability Period
Revised Contract Amounts	USD 25,883,573 + NPR. 653,583,031



Ticker	Sector	LTP (09/04/2019)	Fair Value	12m Target Price
UPPER	Hydropower	Rs.233	Rs.296.61	Rs. 305

Present Status of Lots (As per Magh 2075 Report) – Summary

1. Lot 1: Civil Works

- Construction of Dam and Intake are in final stage
- Digging of 8.5 km long main Tunnel along with Invert Concrete work was finished on Mangshir 2074. With respect to Concrete Lining of the same tunnel, 582 m. out of 1,143 m. Concrete lining is carried out.
- Under Surge system, 100% of 1,258 m. long several tunnel has been dug.
- Digging of 373 m. height Lower Penstock Shaft and 311 m. height Upper Penstock Shaft is fully completed and before connection of Penstock pipe, installation of Encadrain for control of Water Seepage has been done.
- Concrete on Underground Power House and Transformer house and Invert Concrete and Concrete Wall on Tailrace Tunnel has been completed.
- Civil work related to Control Room Building and Take-Off Yard are in final stage of completion.
- Under Headworks, 170, 823 cumecs (99.3%) out of total 172,000 cumecs Concrete work has been completed. All major works of Headworks i.e. Diversion Dam, Intake and Disyander etc. are in final stage of completion.

2. Lot 2: Hydro-Mechanical Works

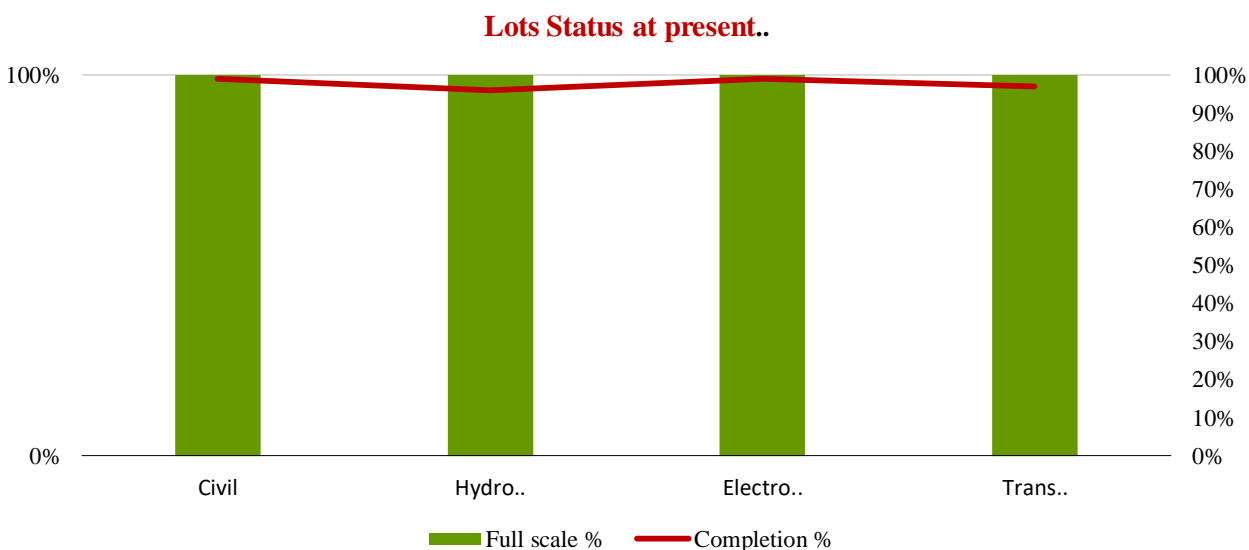
- Connection of gates to Dams are in final stage.
- Lot 3 Contractor shall involve in connection of Penstock pipe to Pressure Shaft.

3. Lot 3: Electro-Mechanical Works

- All machine and equipment essential under Lot 3 has been delivered to Project Site and connection of all equipment from Unit 1 to 6 has been done.

4. Lot 4: Transmission Line and Substation

- Construction of 47 km long 220 KV Transmission line is undergoing.
- As on Kartik 2075, works involving Earthing and connection of 124 and 115 Towers respectively, out of 127 Towers has been completed.
- Construction of 220/132 KV capacity of Substation near Phulasi of Ramechhap district.





Ticker	Sector	LTP (09/04/2019)	Fair Value	12m Target Price
UPPER	Hydropower	Rs.233	Rs.296.61	Rs. 305

Appendix 11: Facility Agreement / Financial Closure

The project involves debt financing in following manners:

S.N.	Institutions	Loan size	Agreement date	Loan types	Loan received till FY 2073/74	Balance Loan
1.	Employees Provident Fund	Rs.10 billion	14/04/2067	Secured	8,691,708,972.81	1,308,291,027.19
2.	NTC	Rs.6 billion	29/01/2068	Secured	5,215,025,707.63	784,974,292.37
3.	CIT	Rs.2 billion	21/08/2067	Secured	1,738,341,922.14	261,658,077.86
4.	Rastriya Beema Sansthan	Rs.2 billion	21/08/2067	Secured	1,738,341,490.67	261,658,509.33
5.	Government of Nepal via NEA	Rs.11.08 billion	17/12/2066	Unsecured	10,000,000,000	1,080,000,000
	Total	Rs.31.08 billion				

On 10/04/2067, signing on Shareholding agreement between NEA, NTC, CIT and Rastriya Beema Sansthan was made. Following, a Trial party agreement took place between NEA, Employees Provident Fund and Upper Tamakoshi Hydropower Limited on 14/04/2067. Similarly, on 21/08/2067, Signature on Loan Agreement document was made by Upper Tamakoshi Hydropower Ltd. with CIT and Rastriya Beema Sansthan separately. The financial closure took place with a Loan Agreement of the company with NTC on 29/01/2068.

Mortgages and Guarantee on Loan

- Middle Marshyangdi Powerhouse with a capacity of 70MW owned by NEA has been mortgaged in the name of Employees Provident Fund as a guarantee for loan taken.
- The land, PPE owned by the company itself at present and to be owed in future has been mortgaged in the name of NTC, CIT and Rastriya Beema Sansthan against the loan from these institutions.

The company intent to borrow additional Rs.7 billion from the lending institutions due to escalation in project costs. Talk for the same has been proceeded. *For details:*

S.N.	Institutions	Existing size	Additional loan	Loan types	Balance Loan
1.	Employees Provident Fund	Rs.10 billion	Rs.3.5 billion	Secured	Rs.13.5 billion
2.	NTC	Rs.6 billion	Rs.2.1 billion	Secured	Rs.8.1 billion
3.	CIT	Rs.2 billion	Rs.0.7 billion	Secured	Rs.2.7 billion
4.	Rastriya Beema Sansthan	Rs.2 billion	Rs.0.7 billion	Secured	Rs.2.7 billion
5.	Government of Nepal via NEA	Rs.11.08 billion	-	Unsecured	Rs.11.08 billion
	Total	Rs.31.08 billion	Rs.7 billion		Rs.38.08 billion

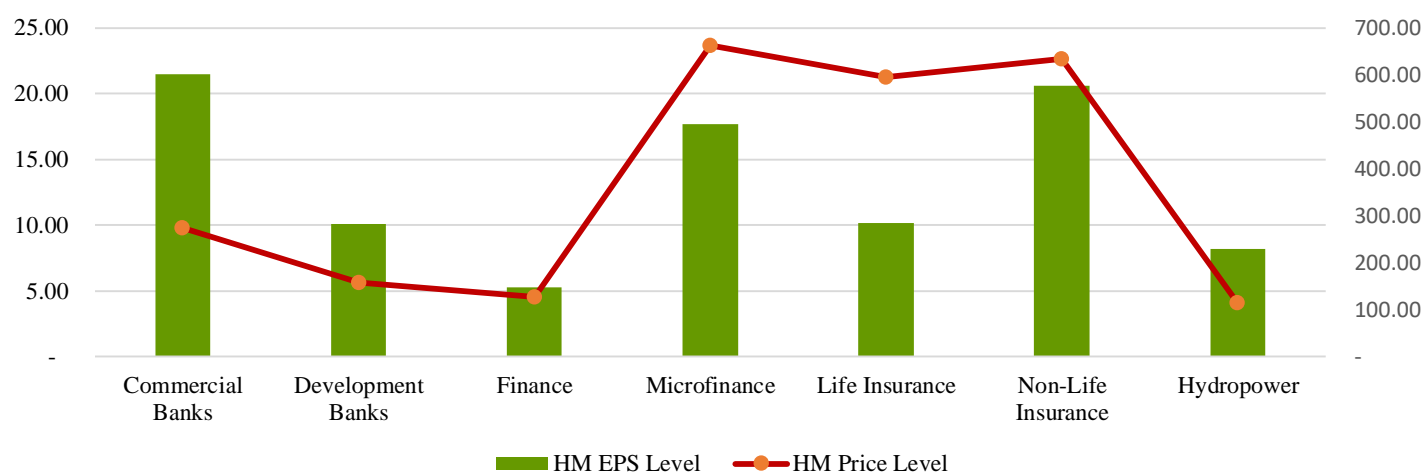


Ticker	Sector	LTP (09/04/2019)	Fair Value	12m Target Price
UPPER	Hydropower	Rs.233	Rs.296.61	Rs. 305

Appendix 12: Industry Pricing Outlook

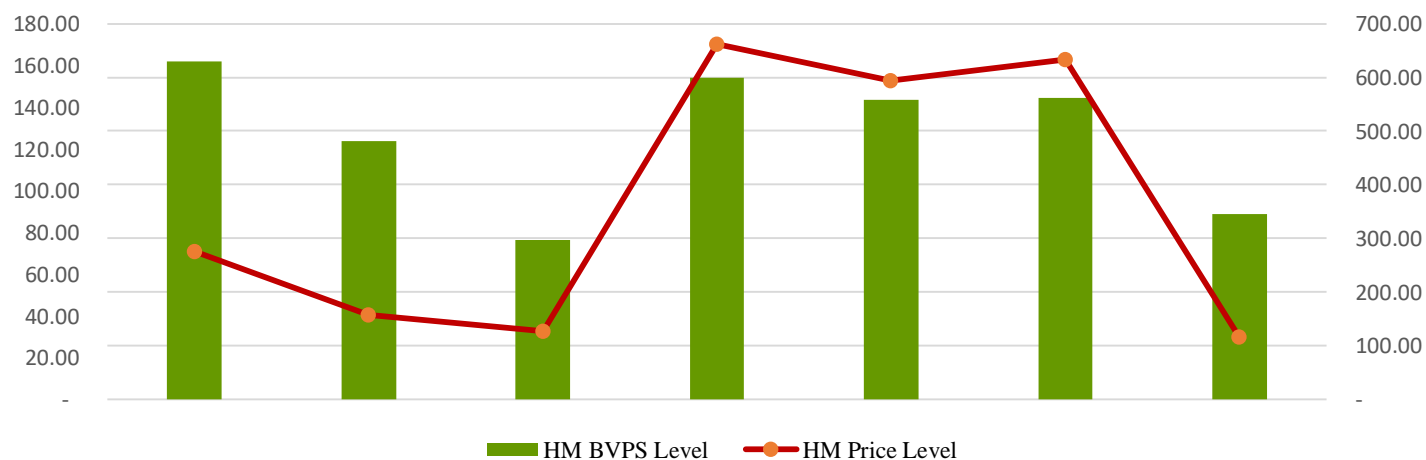
The chart is shown to have the outlook of how the market is pricing the major sectors based on its EPS and BVPS fundamentals. For this, the EPS and BVPS (as on 2nd Quarter 2017/18) of the listed companies under respective sectors are considered and harmonic mean is calculated. Harmonic mean of the closing price of stocks (as on 9/04/2019) falling under respective sectors are calculated. (Harmonic mean is taken to nullify the outliers present in the stocks. This approach however consider only the positive non-zero values. The presence of values other than positive non-zero are rare and negligible in our analysis. **Note:** We have considered the value > 1).

HM EPS vs. Price



The above chart shows that Hydropower has the second lowest harmonic EPS of Rs.8.17 which is priced Rs.119.74. BPCL has highest EPS of Rs.62.14 while RRHP has lowest of Rs.2.65.

HM BVPS vs Price



The above chart shows that Hydropower has the second lowest harmonic BVPS of Rs.88.57 which is priced Rs.115.48. BPCL has highest BVPS of Rs.281.6 while KKHC has lowest of Rs.23.36.



Ticker	Sector	LTP (09/04/2019)	Fair Value	12m Target Price
UPPER	Hydropower	Rs.233	Rs.296.61	Rs. 305

Appendix 13: Average Dividend Paid by Hydro Companies

S.N.	Ticker	Bonus	Cash	Total	Fiscal Year	LTP (9/4)
1	CHCL	22.50	14.00	36.50	2067/68-2074/75	505
2	BPCL	8.50	20.13	22.25	2067/68-2074/75	360
3	SHPC	10.00	5.00	15.00	2074/75	225
4	AHPC	12.00	13.00	12.39	2067/68-2074/75	104
5	RADHI	10.00	-	10.00	2073/74	168
6	NGPL	10.00	7.50	8.33	2072/73-2074/75	124
7	RHPC	7.00	10.53	7.71	2070/71-2074/75	95
8	API	6.00	-	6.00	2072/73-2074/75	134
9	UMHL	-	5.00	5.00	2073/74-2074/75	113
10	BARUN	5.00	-	5.00	2073/74	95
11	NHDL	4.00	-	4.00	2074/75	123
12	AKPL	-	-	-	-	171
13	HPPL	-	-	-	-	183
14	PMHPL	-	-	-	-	109
15	NHPC	-	-	-	-	72
16	SPDL	-	-	-	-	100
17	AKJCL	-	-	-	-	81
18	KPCL	-	-	-	-	92
19	JOSHI	-	-	-	-	147
20	RRHP	-	-	-	-	94
21	KKHC	-	-	-	-	79
22	CHL	-	-	-	-	102
23	DHPL	-	-	-	-	84
24	GHL	-	-	-	-	170
25	UPPER	-	-	-	-	233



Ticker	Sector	LTP (09/04/2019)	Fair Value	12m Target Price
UPPER	Hydropower	Rs.233	Rs.296.61	Rs. 305

Disclosures & Disclaimers

Ownership in the Subject Company:

KCL Astute Capital Limited, as on the date of preparing this Research Report does not hold in its Portfolio, any share of investment in the Subject Company.

However, the Portfolios of the Clients managed by KCL Astute Capital Limited under Portfolio Management Services does constitute the share of investment in the Subject Company.

The Author / Research Analyst involved in preparing this Report do not hold any share of the Subject Company as on preparation of this Report.

Sources of Information

The information set forth herein has been obtained or derived from sources generally available to the public through the medium like Company website, Annual Report, Prospectus for IPO, ICRA Ratings, NEA Annual Reports, Hydropower related News and Articles in various News portals.

Besides, the Author(s) obtained the Financial Statements and Projection Report and Monthly Progress Report of Magh 2075 from the Management of the Subject Company.

However, for Appendix 6 and 7, the Author(s) could not maintain a constant communication with the concerned officials to verify and confirm the same.

Validity of the Information

The information and data's obtained from the sources by the Author(s) is believed to be reliable and usable for the purpose.

However the Author(s) does not make any representation or warranty, express or implied, as to its accuracy or completeness and have not sought for this information to be independently verified.

The financial and projection report as provided by the Management were irrelevant for the purpose of this report. Therefore, the Author(s) had re-drafted the projected reports as per the basis stated by the Company and deemed ground of appropriateness.

Referral Fees

The Author(s) of this Report does not receipt any compensation or benefits form the Subject Company for this Research Report or its Recommendation and Conclusion.

Position as an officer or director:

The author(s), or a member of their household, does not serve as an officer, director or advisory board member of the Subject Company.

Market making

The author(s) does not act as a market maker in the Subject Company's securities.

Purpose of the Report

This Equity Research Report is prepared to make a comprehensive analysis of the Subject Company from the investment point of view.

Scope of the Report

The report aims to facilitate the market participants in the Investment analysis of the Subject Company. **However, the market participants are strictly suggested not to solely base this Research Report and the Recommendation herein, for taking any Investment decision or actions.**



Ticker	Sector	LTP (09/04/2019)	Fair Value	12m Target Price
UPPER	Hydropower	Rs.233	Rs.296.61	Rs. 305

Acknowledgement of Limitation

The author(s) / Research Analysts acknowledge that this Equity Research Report is not free from limitation and errors, including inherent ones. Major limitation do exist in the DCF Valuation approach since the cash flow only includes Net Profit and the Non-cash charges. The Research team has prepared the 5 years projected financial statements from FY 2074/75 till FY 2078/79 and this projections differs from the one prepared by the Management. The other limitation can be present in Appendix 6 and 7 since no verification or confirmation was made from the Subject company side.

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