# General and Financial overview

**Company: Brahmayani Hydropower Company Pvt. Ltd** 

**Project** :Brahmayani Hydropower Project –35.47MW

**And** 

**Company: Integrated Hydro Fund Nepal Pvt. Ltd** 

**Project**: Upper Brahmayani Hydropower Project –15.15 MW

( Jugal Rural Municipility, Sindhupalchock )

## **Pre Consortium Meeting**

#### Presented by:

Narayan Poudel, CA (Financial Analyst) Nov, 2021 ( Kartik 2078)



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## **General Aspects**

**General Information, Project Arrangements** 

**PPA Information** 

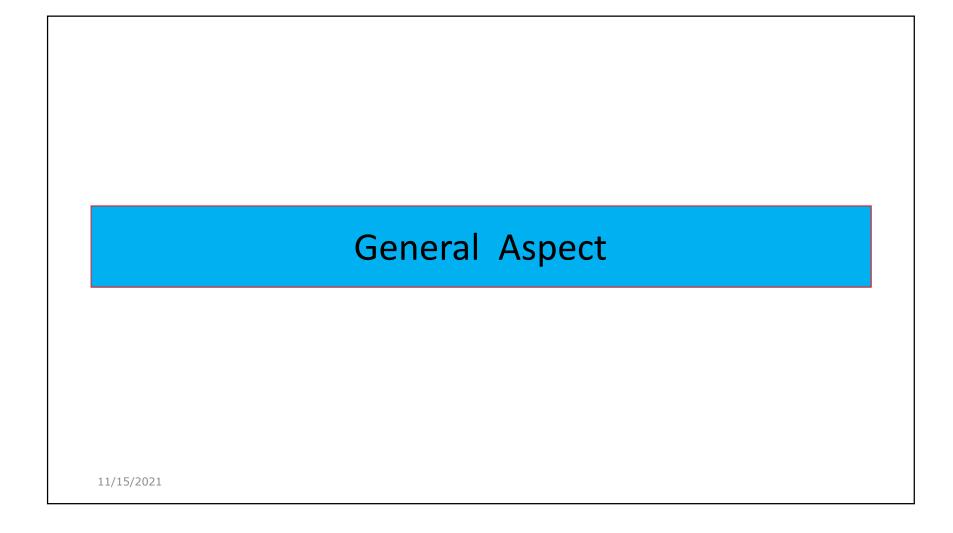
**Project Components, Salient feature - Summary** 

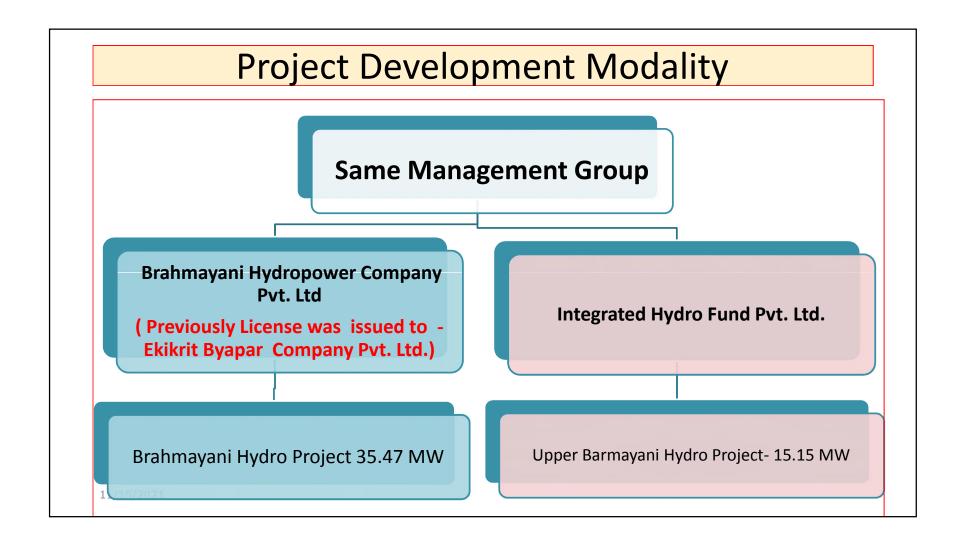
### **Financial Aspects**

Project Cost, Energy, Revenue, Operation Cost

Financial Analysis, Assumptions, data, Indicators Results

**Summary, Conclusion** 





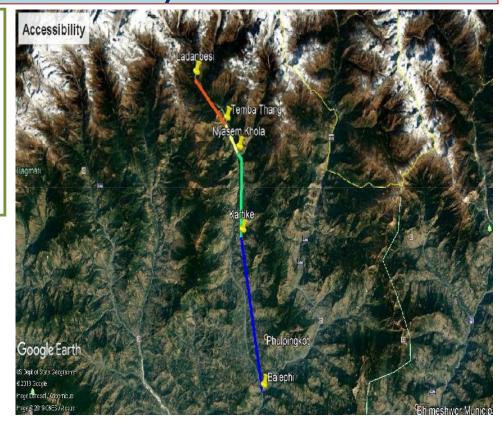
# Accessibility

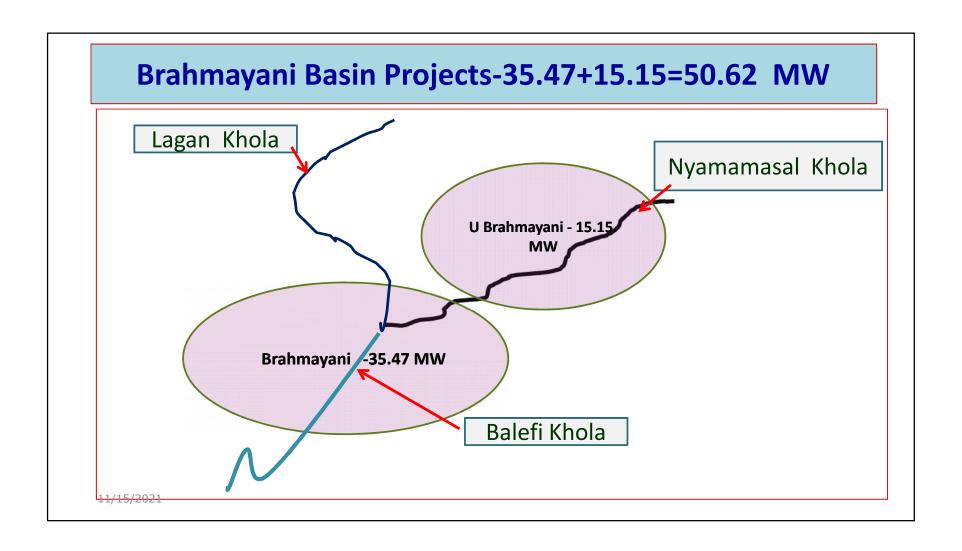
#### Road Access

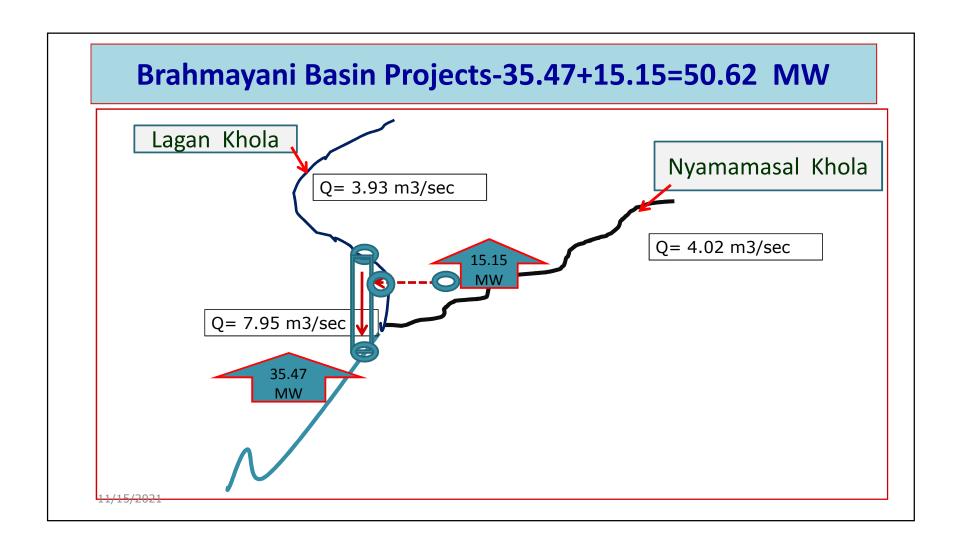
Kathmandu- Balephi = 72 Km Balephi – Kartike = 1 8 Km Kartike – Nyasem = 15 Km Nyasem – Tembathan = 6 Km Tembathan - Ladanbesi = 7 Km Total 118 KM

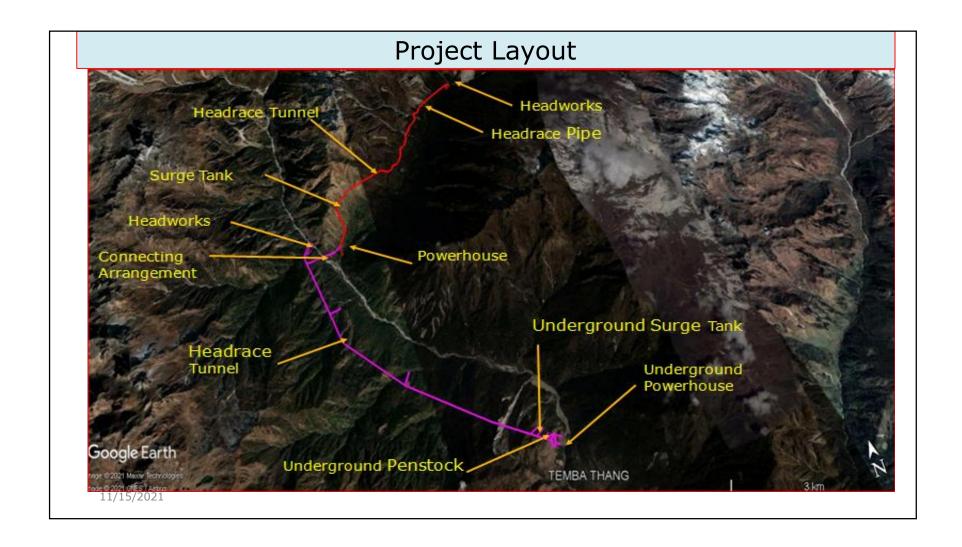
Access Road required constructing for

Project Area is 15 Km









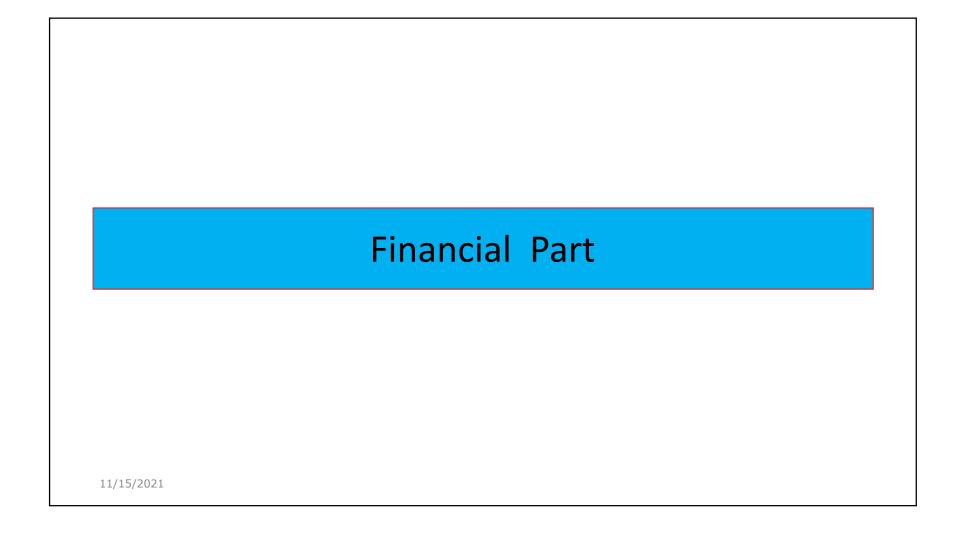
General Information					
Particulars	35.47 MW ( Brahmayani)	15.15 MW Upper Brahmanyani			
Company	Brahmayani Hydropower Co. Pvt. Ltd	Intrigrated Hydrofund Nepal Pvt. Ltd			
Khola	Nyamamasal + Lagan Khola	Nyamamasal			
Catchment Area	86.08Sqkm+ 110.63 Sqkm =196. 71 Sqkm	110.63 Sq KM			
Design Discharge	Upper Bramayani Tail water ( Nyamamasal) 4.02 Cu.m/Sec + Lagan Khola – 3.93 Cu.m/Sec = 7.95 Cu.m/Sec	4.02 Cu.m/Sec			
Operation Plan ( Discharge)	Both = Operational through out the year	Own River			
Structure	Headworks in Lagan + Tapping through Own Headworks meters Tailrace tunnel from Upper Brahmayani Project totunnel to Brahmayani				
Cost Sharing 11/15/2021	Rs 6 Cr to contribute to Upper Brahmayani Project.	Headworks Cost Contribute from Brahmanyani.			

General Feature					
Particulars	35.47 MW ( Brahmayani)	15.15 MW Upper Brahmanyani			
Head ( Gross )	535 Meter	463 Meter			
Design Discharge	7.95 m3/Sec ((at 57%PoE)	4.02 m3/Sec ((at 45%PoE)			
PPA Energy ( Yearly )	208.43 GWh -100% (Per MW-5.88 GWH)	89.05 GWH -100% (Per MW – 5.88 GWH )			
Dry ( Marga 16 to Jestha 15)	63.59 GWh ( Per Year ) – 30.51 %	26.72GWh ( Per Year ) – 30.01 %			
Wet ( Jestha 16 to Marga 15 )	144.84 GWh ( Per Year ) - 69.49%	62.33GWh ( Per Year ) - 69.99%			
Revenue	122.94 Crore ( First Year )	52.36 Crore (First Year)			
Per MW Revenue	3.46 Crore /Per MW	3.45 Crore / PM			
Cost Total	Total Rs 700 Crore Rs 294 Crore				
Cost Per MW	Rs 19.73 Crore / Per MW	Rs 19.40 Crore / Per MW			

Project Technical Summary					
Particulars	35.47 MW (Brahmayani)	15.15 MW (Upper Brahmanyani)			
Weir	Concrete Ogee Spillway	Boulder Weir			
Intake	Orifice Type Side Intake	Orifice Type Side Intake			
Approach Canal	No approach Canal	No approach canal			
		Surface, Intermittent Flushing (45.0m x 6.0m x 5.7m)-2 chamber each			
<b>Headrace Pipe</b> 1.8 m dia & 1507.0 m length 1.80 m dia, 2743		1.80 m dia, 2743.0 m length			
Headrace Tunnel	Inverted D – Shaped Pressurized Type of Size (3.2m x 3.5m) & length of 6036.50 m.	D – Shaped Pressurized Type of Size (2.8m x 3.0m) & length of 1450.0 m.			
Adit	4 nos. of Adit; each size of (3.2m x 3.5m)	No adit			
Surge Tank Underground Circular Concrete of dia 5.0 Underground Circular Concrete		Underground Circular Concrete dia 5.0m & height of 23.0 m.			
Penstock Pipe	Dia 1.5m & length 1019.08 m	Dia of 1.2 m & length 538.0 m			
Power House	Underground Type (53.71m x 15.40m x 16.64m)	Surface Type (42.8m x 13.80m x 17.50m)			
Tailrace canal	Rectangular Free Flow Type, Length =343.70 m	Open Channel type, Length= 9m			

Project Salient Feature					
Particulars	35.47 MW ( Brahmayani)	15.15 MW Upper Brahmanyani			
Total Alignment Length	Approx 8,200 meters	Approx 1,500 mtr			
Transmission Line	132 Kv Single Circuit – 16 KM	132 KV Sigle Circuit – 5km KM			
EM Equipment	3 units	2 units			
Connection	Up Pangtang S/S	Brahmayani Switchyard			
Access Road	Available-Nearest (Nyase	em- Balephi Confluence)			
Access Road	Under Construction				
<b>Construction Power</b>	500kw ( 300kw Peak Power)				
Construction Material	Available on site/ Procured from Nepal Market				
Design Consultant	Techno Quarry Consults Pvt. Ltd.				
Hydrology	Hydrometric Gage Station at confluence of N	yamya masal & Lagan Khola)			
Geology	Rock Class 2- 35%, Class 3 – 35%, Class 4 – 20%, Class 6 -10% (ERT/SRT test – Headworks, Surge tank, Adit and PH-No any fault - Gneiss rock	Rock Class 2- 30%, Class 3 – 40%, Class 4 – 20%, Class 6 -10% (ERT/ SRT test – Headworks, Surge tank, Adit and PH)			
Construction	2078/08/01 – 2082/02/21 RCOD as per PPA (2080/04/13)	2078/08/01 – 2082/02/21 RCOD as per PPA(2080/04/13)			

Progress Status till date					
Particulars `	35.47 MW (Brahmayani) 15.15 MW Upper Brahmanyani				
Connection and PPA	Completed Completed				
Udyog License	Under Process				
Generation License	Not issue yet				
Access Road	Under Construction				
Land procurement	Ungoing				
DPR	Completed	Completed			
Tender Documentation	Ready Ready				
TL Survey License	Obtained				
Plan for Construction start	2078 Poush 2078 Poush				



# Cost of the Project,

## Amount in Crore - NPR

S. N.	Descriptions	35.47 MW	15.15 MW	<b>Total= 50.62 MW</b>
1	Pre- Operating Expenses	10.15	4.50	14.65
2	Civil Construction Cost	317.21	106.67	423.87
3	Metal works Cost	40.27	34.62	74.89
4	Plant and Machinery Cost	90.50	40.32	130.82
5	Transmission Line and Switchyard	24.75	17.63	42.38
6	Land Purchased and Development	5.75	2.50	8.25
7	Site Office Building	5.50	5.50	11.00
8	Office Equipment Cost	1.80	0.75	2.55
9	Vehicle Cost	6.50	3.00	9.50
10	Infrastructure Development Cost	28.62	7.31	35.93
11	Environment/ Social Mitigation Cost	6.50	2.00	8.50
12	Supervision/ Management & Engineering	35.29	16.65	51.94
13	Miscellaneous Expenses and Insurance	5.00	2.00	7.00
14	Physical Contingency	36.88	13.51	50.38
15	Interest During Construction and Charge	85.28	37.04	122.33
	Total with Financing	700.00	294.00	994.00

# Loan, Equity,

### Amount in Crore (NPR)

S. N.	Descriptions	35.47 MW	15.15 MW	Total= 50.62 MW
1	Loan - 75%	525.00	220.00	745.00
2	Equity - 25%	175.00	74.00	249 .00
	Total Cost	700.00	294.00	994.00
	Per MW Cost in Crore	19.73	19.41	19.64
	Total Contingency	36.88 Cr	13.50 Cr	50.38 Cr
	Net Cost Per MW ( Without Contingency)	18.69	18.51	18.64

Upfront Equity if 50 % of Rs 250 Cr/ 2 = Rs 125 Cr

# Basis of Costing,

#### **Amount in Crore**

### **Updated Cost Estimate**

### **Based on DPR Report**

Analysis is based on Market Rate (Sept, 2021) Exchange Rate Based on (US\$1=118 NRs)

#### 1. Civil Works -

Base Cost – As per BOQ

Contingency – 8 % for Surface works Structure on total cost

- 10% for Underground Structure on total cost

VAT - 13 % on base Cost

#### 2. Metal Works -

Base Cost: Steel pipe import and Pipe fabrication and special items as per BOQ base

Contingency - 5% on total cost

Value added tax – 13% on fabrication and erection

Custom – 1% for import items +1% other charge

(Rate pipe Rs 205 Base cost + Custom + Vat+ Con)

Special items – As per market rate

# Basis of Costing,

#### **Amount in Crore**

### 3. EM Equipment& SS Equipment

Base Cost -205 \$/Kw( 35.47 MW) and 210\$/kw (15.15 MW)
Contingency - 5%
Custom - 1% + other charge 1%

#### 4. Transmission Line -

TL Line 132 KV – Single Circuit @135 Crore /KM Cost Sharing Per MW basis
Upper Brahmayani single -6 Km + 16 Km –Cost Sharing

- 5. Access Road / Bridge As per BOQ and Estimate
- 6. Project Camp/ Building- As per Estimate/ Drawing/ BOQ
- 7. Vehicle and Office equipment As per estimate

# Basis of Costing,

Amount in Crore, NPR

- 8. Social and Environment mitigation cost As per Environmental Impact Assessment (EIA Act ) provision Budget provision
- 9. Management and Engineering and Supervision

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    Cost for Construction period
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(42 Months -35.47 MW and 36 Months-15.15 MW)

Management/ Supervision = Rs 35.29+ Rs16.65 = Rs 51.94 Cr

10. Miscellaneous/ Insurance

11. IDC -

Loan interest rate - 11%

Loan management fess – 0.75%

Construction period -1+3 years

( IDC Rs 85 Cr for 35.47 MW and 37 Cr for 15.15 MW)

Per MW IDC - Rs 2.40 Cr and 2.44 Cr

12. Contingency - NPR 36.87+13.50 = 50.37 Crore ( Per MW1 Cr)

11/15/2021

VAT / Tax / Custom Charge is Consider on Cost.

Energy (As per PPA)					
	35.47 N	ЛW	15.15	5 MW	
Gross Head	535Meters		463Meters		
Design Discharge	7.95 m3/sec		4.02 m3/sec		
Seasons	Total energy  GWh  **Total energy************************************		Total energy GWh	%	
Dry Season Energy	63.59	30.51%	26.72	30.01%	
Wet Season Energy	144.84	69.49%	62.33	69.99%	
Total	208.43 100.00%		83.05	100.00%	
Per MW Energy	5.88GWh		5.88GWh		

PPA rate 6 Months Wet and 6 Months Dry

# Per unit – Rate of Energy

(PPA rate)

Month	Rate	Rate Per Unit	Year 1	Year2	Year3	Year4	Year5	Year6	Year7	Year8	Year9
Dry - 6 months	NPR	8.40	8.40	8.65	8.90	9.15	9.40	9.66	9.91	10.16	10.41
Wet - 6 Months	NPR	4.80	4.80	4.95	5.08	5.23	5.37	5.52	5.66	5.80	5.95

Every year 3% price escalation up to 9<sup>th</sup> year then after fixed till 30 years

Revenue,	Rs in Crore	
Descriptions	35.47 MW	15.15 MW
1st year (Rs in Crore )	122.94	52.36
9th year	152.44	63.36
Per MW Revenue(1st year)	3.46	3.45
Per MW Revenue(9th year)	4.30	4.28
Dispatch able Clause ( 10% of Ashad to Kartik Revenue – Loss on Total revenue)	4.86%	4.91%
Net Effect	Rs 5.98 to Rs 7.41	Rs 2.57 to Rs 3.18

## Dispatch able effect has been considered in financial analysis

# Financial Analysis -

### **Assumptions**

- 1. Loan Equity Ratio 75% Loan 25% Equity
- 2. Construction Period 1+3 years = 4 years ( for IDC calculation)
- 3. Interest rate on loan -11%
- 4. Loan Arrangement Fees 0.75% of loan amount
- 5. Loan Repayment Period 12 years (EQI)
- 6. Royalty As per Government Norms

<b>Particulars</b>	Basis	1- 15 Years	16 to 30 years
<b>Capacity Royalty</b>	Fixed per year	Rs 1 lakh / Per MW	Rs 10 lakh per MW
Revenue Royalty	Based on Revenue	2%	10%

7. Corporate Tax ( Tax holiday for infrastructure and hydro sector )

Particulars	1-10 Years	11 to 15 years	16 to 30 years
Corporate Tax	0%	10%	20%

<del>11/15/2021</del>

# Financial Analysis -

#### Assumptions

8. Energy rate

Rs 8.40- (per unit) – Wet season

Rs 4.80 – (per unit )- Dry season

- 9. Escalation of energy rate 3% for next 8years
- 10. Operation and maintenance Cost (4% to 6% of revenue)
  - a. Office, Site Operation and staff Cost
  - b. General repair Regular repair
  - c. Insurance Project Assets / Properties and Loss of profit (Revenue)

(Insurance coverage maximum 6 months revenue)

- 11. Major repair / Runner replacement cost -5% of EM cost for every 5 years
- 12. Depreciation based on the license period or PPA Period (Lower) 30 years

# Financial Analysis — Data , Amount in Crore (NPR)

S. N.	Descriptions	35.47 MW	15.15 MW	Total= 50.62 MW
1	Total Project Cost (With IDC)	700.00	294.00	994.00
2	Total Loan (75%)	525.00	220.00	745.00
3	Total Equity (25%)	175.00	74.00	249.00
4	Net Revenue First year ( after dispatchable)	(123.00-6.00 ) = Rs 117	(52.37-2.57) =Rs 49.80	Rs 166.80
5	Net Revenue after 8th year	Rs 145	Rs 61.75	Rs 206.75
6	Yearly O& M cost	4.38	2.79	7.17
7	First Year Royalty (At the starting)	2.70	1.14	3.84
8	Yearly Royalty After 15 years	18.80	8.00	26.80

Financial Analysis – Results , Amount in Crore								
S. N.	Descriptions	35.47 MW	15.15 MW					
1	IRR (Internal rate of return)	14.64%	14.52%					
2	EIRR / ROE ( Return on Equity)	21.52%	21.21%					
3	NPV (Net present value Crore	185.75	75.24					
4	Cost per kW	1672	1645					
5	BC Ratio (benefit Cost Ratio)	1.33	1.32					
6	Pay back Period -Simple	5.96	6.00					
7	Pay back Period - Discounted	9.66	9.78					
8	Average BEP (10 Years BEP Sales)	51%	51%					
9	Cost Sensitivity (Increments up to ) at 11% IRR	36%	34%					
10	Revenue Sensitivity (Decrease up to) at 11% IRR	23%	21%					
11	DSCR In 12 Years Average	1.62	1.62					
12	Loan Repayment	As per sch	As per sch					
13	Revenue Per MW in Crore	3.47	3.46					
14	Cost Per MW in in Crore	19.74	19.41					

# 35.47 MW - Simple Cashflow @11% Interest (80% Revenue)

year	1	2	3	4	5	6	7	8	9	10	11	12
Gross Income (95%)	116.96	120.47	123.98	127.48	130.99	134.50	138.01	141.52	145.03	145.03	145.03	145.03
20% Less	(23.39)	(24.09)	(24.80)	(25.50)	(26.20)	(26.90)	(27.60)	(28.30)	(29.01)	(29.01)	(29.01)	(29.01)
Considered Income	93.57	96.37	99.18	101.99	104.79	107.60	110.41	113.22	116.02	116.02	116.02	116.02
Total exp	(7.66)	(7.98)	(8.31)	(8.65)	(15.14)	(9.36)	(9.74)	(10.13)	(10.54)	(16.96)	(11.13)	(21.35)
Net Surplus for Bank	85.91	88.39	90.87	93.34	89.66	98.24	100.67	103.08	105.48	99.06	104.89	94.67
Interest	56.84	54.27	51.40	48.20	44.63	40.65	36.22	31.28	25.77	19.63	12.79	5.17
Principle	22.48	25.05	27.92	31.13	34.69	38.67	43.10	48.04	53.55	59.69	66.53	74.15
Total - Kista	79.32	79.32	79.32	79.32	79.32	79.32	79.32	79.32	79.32	79.32	79.32	79.32
Balance	6.59	9.07	11.55	14.02	10.34	18.92	21.35	23.76	26.16	19.74	25.57	15.35

Year	1	2	3	4	5	6	7	8	9	10	11	12
Gross Income (100%)	49.79	51.29	52.78	54.27	55.77	57.26	58.75	60.25	61.74	61.74	61.74	61.74
Less: 20%	(9.96)	(10.26)	(10.56)	(10.85)	(11.15)	(11.45)	(11.75)	(12.05)	(12.35)	(12.35)	(12.35)	(12.35)
Considered Income	39.83	41.03	42.22	43.42	44.61	45.81	47.00	48.20	49.39	49.39	49.39	49.39
Total exp	(4.18)	(4.34)	(4.51)	(4.68)	(7.61)	(5.04)	(5.23)	(5.43)	(5.64)	(8.55)	(5.96)	(10.24)
Net Surplus for Bank	35.66	36.69	37.72	38.74	37.00	40.77	41.77	42.77	43.75	40.85	43.44	39.15
Interest	23.82	22.74	21.54	20.20	18.70	17.03	15.18	13.11	10.80	8.23	5.36	2.17
Principle	9.42	10.50	11.70	13.04	14.54	16.20	18.06	20.13	22.44	25.01	27.88	31.07
Total - Kista	33.24	33.24	33.24	33.24	33.24	33.24	33.24	33.24	33.24	33.24	33.24	33.24
Balance	2.42	3.45	4.48	5.50	3.76	7.53	8.53	9.53	10.52	7.61	10.20	5.91

# Financial Status till date, As on Kartik 2078

Sources	35.47 MW	15.15 MW	Total
Share Capital	11.82	9.63	21.45
Payable	0.62	0.35	0.97
Total	11.44	9.98	22.42
Utilization			
Project and Land Advances	8.36	4.97	13.33
Project Cost Expenses	3.02	4.90	7.92
Bank & cash In Hand	0.06	0.11	0.17
Total	11.44	9.98	22.42
Total Equity Required	175	74	249
Injected	6.75%	0.13%	8.62%

Conditions of Termsheet										
S.No	Particulars         35.47 MW         15.15 MW         50.62									
1	Lead Bank	Sa	Same for both							
2	Members	Max : 4 Ban	Max : 4 Banks for both the Projects							
3	Loan ,Equity Ratio		75:25%							
4	Total Cost	700	294	994						
5	Loan	525	220.	745.						
6	Equity	175	74	249.						
7	Term Loan	525	220	745						
8	BG Loan	35	15	50						
9	LC Limit	150	90	240						
10	Working Capital	20	10	30						
11	Interest Rate	WAI	BR+1.5% to 1%							
12	Loan Management Fees	0.25%	to 0.75% of Loan							
13	Annual Charge		0.10%							
14	Drawdown Period		1+ 3 years							
15	Upfront Equity-50%	87.50	37	124.50						
16	Loan repayment Period		12 Years							
17	LC Margin	5%								
18	PG - Securities	Board	d+ more than 5%							
19	LC Commission		0.125%							

# Tentative Plan for Commitment, Amount in Cr.

	35.47 MW	15.15 MW	50.62 MW
Total Loan Rs in Crore	525	220	745
Lead Bank (TL- 100+ WC -15) Shortfall -10+	150	70	220
Bank -2	125	50	175
Bank -3	125	50	175
Bank- 4	125	50	175
Total	525	220	745

# **Financial Conclusion**

- Financially Viable
- Good net worth Shareholders
- •All indicator and results are acceptable
- •Sufficient cash flow status in all the years to payback loan

# Conclusion

### <u>Financially - Viable</u>

- •All indicator and results are acceptable
- •Sufficient cash flow status in all the years to payback loan
- •It is worthy investment Project

## **Discussion Matter**

- •Request for Consortium form
- •Site Visit Tentative plan and date if required
- •Tentative time for Closure
- Member Banks

### **Request**

Loan amount - Rs 745 Crore (525+220)

