

UPPER DUDH KHOLA HYDROPOWER PROJECT

SALIENT FEATURES

SN	FEATURES	CHARACTERISTICS
GENERAL		
1	Name of Project	Upper Dudh Khola Hydropower Project
2	Type of the Scheme	Run of River
3	Gross Head	304.5 m
4	Net rated Head	293.91 m
5	Installed Capacity	30.40 MW
6	Average Annual Energy after Outage	187.231 GWh

PROJECT LOCATION

1	Latitude	28°33'17" to 28°35'30" N
2	Longitude	84°23'19" to 84°25'30" E
3	Project Area	Manang, Province 4
4	Intake Site	Karche Village (84°25'8" E, 28°35'29" N)
5	Powerhouse Site	Upstream of Tilche Village (84°23'34" E, 28°33'23" N)

TECHNICAL INFORMATION

1	Hydrology	
	Catchment Area	324 Km ²
	Mean Annual Discharge	19.59 m ³ /s
	Design Discharge (at 41.83%PoE)	12.3 m ³ /s
	Riparian Release	10% of Monthly Flow
	Design Flood Discharge	302 m ³ /s (100 year's return period flood)
	Average Annual Precipitation	1230 mm

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2	Diversion Weir	
	Type of Weir	Free Overflow, Boulder Riprap with Central Concrete Core Weir
	Length of Weir	30 m
	Crest Elevation	2690.5 msl
	Spillway type	Free overflow Spillway
	Under Sluice Opening (WxH)	2 m x 2.5 m
	Under Sluice Crest Level	2684.78 masl
3	Intake Structure cum Gravel Trap	
	Type of Intake	Orifice Side Intake
	Nos. of Opening	4
	Size of Intake (WxH)	2.5 m x 1.8 m each
	Intake Sill Level	2688.20 masl
	Length of Gravel Trap	12 m
	Width of Gravel Trap (Avg)	6.25 m
	Overall depth	3.0 m
	Particle size to be trapped	5 mm
	Flushing Channel	0.8 m x 0.8 m
4	Approach Canal	
	Type	Box Canal (Pressurized)
	No. of canal	4
	Length	Two with 30 m and two with 50 m
	Size (WxH)	2.5 x 1.4 m
5	Settling Basin	
	Type	Conventional with intermittent flushing
	Dimension (LxBxH)	75.00 m x 7.00 m x 3.0 m (4 nos.)
	Inlet Transition Length	21.25 m
	Particle Size to be settled	0.15 mm
	Trapping Efficiency	87% (Vetter's)
6	Headrace Pipe and Tunnel	
	Pipe Type	Mild Steel (Pipe)
	Internal Diameter	2.6 m
	Length	700 m (Head pond to Tunnel inlet portal)
	Steel Thickness/Type of Lining	10 mm
	Nos. of Anchor Blocks	10 nos.
	Tunnel Type	D Shaped
	Internal Diameter	3.5 m
	Length	3900 m

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7	Surge Tank/Forebay	
	Type	Simple Circular/Underground
	Effective Depth	36.25 m
	Diameter(Or size)	7.0 m
	Up surge Level	2699.59 masl
	Down surge Level	2675.68 masl
	Normal Operation Level	2684.42 masl
8	Steel Penstock Pipe	
	Type	High Strength Steel
	Internal Diameter	2.1 m
	Length (Underground)	90 m vertical and 125 m horizontal
	Length (Exposed)	360 m
	Steel Thickness	8 to 24 mm
	Nos. of Anchor Blocks	5
	Nos. of Saddle Supports	30
9	Powerhouse	
	Type	Surface
	Size (LxW)	50 m x 16.7 m
	Height	20 m
	Turbine Axis Level	2386 masl
10	Tailrace	
	Type	Concrete, Box canal
	Tailrace Length	40.0 m
	Size (WxD)	1.5 x 1.5 m
	Tailrace Water Level	2383.12 masl
11	Turbine	
	Type	Vertical Pelton
	Number	3
	Rated Output Capacity per unit	10.56 MW
	Turbine Axis Level	2386 masl
	Net Head	293.91 m
	Discharge per unit	4.1 m ³ /s
	Efficiency	90.00 %
12	Governor	
	Type	Electronic with PID flow Adjustment
	Adjustment for Speed Drop	Between 0 to 5%

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13	Generator	
	Type	Synchronous, Three phase
	Rated Output Capacity per Unit	11.92 MVA
	Power Factor	0.85
	Generation Voltage	11 kV
	Frequency	50 Hz
	No. of Units	3
	Excitation System	Brushless
	Efficiency	96.00%
14	Transformer	
	Type	Single Phase, Oil Immersed, Outdoor
	Rated Capacity	11.92 MVA each
	Voltage Ratio	132/11 kV
	No. of Units	3+1
	Vector Group	YNd11
	Frequency	50 Hz
	Efficiency	99.0%
15	AT Dharapani s/s substation	
	Type	Outdoor single phase
	Rated Capacity	11.92 MVA
	Voltage Rati	220/132
	No. of Units	4
	Vector Group	YNyno
	Frequency	50 Hz
	Efficiency	99%
16	Transmission Line	
	Voltage level	132 kV
	Length	8 km approx..
	Conductor type	Wolf
	From	Switchyard of Project
	To	Dharapani switching sub-station, Manang

CURRENT STATUS OF THE PROJECT

1	Feasibility Study	Completed
2	Detailed Project Report	Contracted out and is undergoing
3	EIA/IEE	Estimated to complete by Dec 2019
4	PPA and PPA Rate	Under PPA phase, rate is standard fixed tariff
5	Land Acquisition	No.

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DEVELOPMENT MODALITY

1	Development modality	Joint Venture or EPCF
2	Role of Foreign Partner	Equity and/or loan investment, or EPCF strategic partner
3	Role of Local Developer	Managing local affairs, compliance and supporting development of the project
4	Development Period	
	a. Pre-Construction Period	2.5 Years since obtaining
	b. Financial Closure	1 Year
	c. Construction Period	4 years
	d. Concession Period	30 year

INDICATIVE FINANCIALS

1	Total Project Cost (including Interest During Construction)	47.83 Million USD
2	Interest Rate (including hedging cost)	10 %
3	Project IRR	16.77%
4	Project Benefit-Cost Ratio	45.79%

CONTACT DETAILS

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