

Expression of Interest for Sale of Hydro Power

(1) SJVN Arun-3 Power Development Company Pvt Ltd (SAPDC)- (Subsidiary Company) :

SJVN ARUN-3 Power Development Company Pvt. Ltd. (“SAPDC” or “Company”) was incorporated as private limited company under the Nepalese Company Act 2063 on 25th April 2013. SAPDC is single shareholder company owned by SJVN Limited (a joint venture of Government of India and Government of Himachal Pradesh). The Authorised and paid-up capital of SAPDC as on 31.03.2022 is NPR 4342.96 Cr and NPR 3368.66 Cr respectively. The registered address of the Company is at Lokhantali, Madhyapur (Thimi), Bhaktapur, Nepal and project office is located at Tumlingtar, Sankhuwasabha Nepal.

Arun-3 Hydroelectric Project (a BOOT project for 25 years commercial Generation) is in advanced stage of development with capacity of 900 MW (“the Project”) on Arun River. The project is a run-of the river scheme with 4 hours peaking and will generate 3924 MU of energy and the project is scheduled to commence the commercial production in the year 2023-24.

The foundation stone of Arun-3 project was laid on 11.05.2018 jointly by Indian Prime Minister Sh. Narendra Modi and Right Hon’ble Prime Minister of Nepal Sh. K.P.Sharma Oli.

In addition to Arun-3 Project (900 MW), Govt. of Nepal has also allotted Lower Arun Project (669 MW) to SJVN Ltd and MOU was signed between SJVN Ltd and Investment Board of Nepal on 11.07.2021 for development of project on BOOT basis for 25 years of commercial Generation. The Lower Arun Project is scheduled to commence commercial generation in the year 2027-28 (Indian fiscal) and shall operate in tandem with Arun-3 HEP. The DPR of the project was approved by GoN on dated 31.03.2022 and other approvals from GoI/GoN are in process.

(2) SJVN Limited (Holding Company):

SJVN Ltd a Mini Ratna, Category-I and Schedule –‘A’ CPSE under administrative control of Ministry of Power, Govt. of India, was incorporated on May 24, 1988 as a joint venture of the Government of India (GOI) and the Government of Himachal Pradesh (GOHP). SJVN is now a listed Company having shareholders pattern of 59.92 % with Govt. of India, 26.85% with Govt. of Himachal Pradesh and rest of 13.23 % with Public. The present authorized capital and paid up capital of SJVN

is Rs. 7,000 Crore and Rs. 3,929.79 Crore respectively. The Net Worth as on 31.03.2021 is Rs.12761.84 Crore.

Beginning with a single project and single State operation (i.e. India's largest 1500 MW Nathpa Jhakri Hydro Power Station in Himachal Pradesh), the Company has commissioned seven projects totaling 2016.5 MW of installed capacity and 86 km 400 KV Transmission Line. SJVN is presently implementing or operating power projects in Himachal Pradesh, Uttarakhand, Bihar, Maharashtra, Uttar Pradesh, Punjab, Gujarat and Arunachal Pradesh in India besides neighboring countries of Nepal and Bhutan.

(3) Back Ground of EOI:

SAPDC through its Arun-3 HEP (900 MW) & Lower Arun HEP (669 MW) is scheduled to Generate 3924.03 MU & 2921 MU and intend to enter into Long Term Power Purchaser agreements (15 years to 25 years) from interested Discoms/Trading Companies/Bulk Customer or Corporates for supply of power from its Hydro Plant. The power from these projects shall be available at interconnection point at Sitamari in Bihar. The PPA can be signed for off take at bus-bar or at Sitamarhi, Bihar.

The EOI is requested from the eligible parties in India/Nepal or Bangladesh. The parties interested in purchase of Power from SAPDC should have followings qualifications:

1	Discoms eligibility:
	<ul style="list-style-type: none"> • Should be having the license from appropriate Government for distribution of Power. • Have the experience of distribution of power twice the Power purchase interest shown. • Should be financially sound for fulfilling the power Purchase obligations.
2	Bulk Corporate Customer's eligibility
	<ul style="list-style-type: none"> • Should establish the requirement of Power demanded or interest shown. • Should have the long-term requirement of electricity as per the corporate plan. • Should be financially sound for fulfilling the power Purchase obligations.
3	Trading Licensee Eligibility:
	<ul style="list-style-type: none"> • Should have the experience of trading in exchange or have license of trading of power from appropriate Government. • Should be financially sound for fulfilling the power Purchase obligations

- ❖ **The Interested parties should have a minimum annual turnover of INR 60.00 Crore or equivalent amount in last three years.**
- ❖ **The EOI for purchase of power should be minimum of 100 MW.**

(4) Objective of EOI:

SAPDC is developing the projects on BOOT basis and yearly Generation from the project is available for sale to prospective consumer at market rates. Therefore, in order to find out attractive tariff, SAPDC is seeking the applications from financially sound parties,.

(5) Salient features:

(A) Arun-3 project (900 MW) & its construction progress till date is furnished as Annex A and;

(B) Lower Arun (669 MW) is furnished as Annex B.

(6) Power Generation Schedule:

Tentative Power Generation Schedule of both the Projects are attached as Annex “C”.

(7) Tax and Duties in Nepal

All indirect taxes payable in Nepal for Generation/sale of electricity shall be borne by the SAPDC and tariff rates shall be at Bus bar rates or Tariff at interconnection Point in Sitamarhi, Bihar.

(8) Submission of EOI

Interested parties are requested to submit the complete application as per enclosed Performa as Annex “D” along with supporting documents regarding eligibility. The application can be submitted through email on mail id ppm.sapdc@gmail.com with the subject as “Expression of Interest for PPA”.

(9) Disclaimer:

Prospective respondent (Applicants) to this EOI acknowledges and agrees that:

SJVN Arun-3 Power Development Company Ltd has issued this Expression of Interest with the best intention to explore the market for eligible and interested consumer and has no compulsions to enter into definitive contractual agreements. This EOI does not guarantee conversion of this EOI into any definitive contractual agreements.

It is also agreed that SAPDC in its sole discretion, may reject any and all proposals made by prospective buyers and also may change the conditions relating to the EOI or cancel this EOI at any time without assigning any reason.

Prospective buyers (s) acknowledge and agree that response to the EOI is purely voluntary action on their part and for any expenditure on this account shall be borne by the respondent(s).

SAPDC will have no obligation or liability to the respondent(s) in the event of cancellation of EOI.

Note: Applicants are requested to keep themselves updated with the website <https://sapdc.com.np> on regular basis for any addition / deletion / modification / clarification or notification in respect of this, at EOI stage.

Annex A

ARUN-3 HEP (900 MW) ,NEPAL SALIENT FEATURES			Current Progress Status
1.	Location		
	River	Arun,a tributary of Kosi River in Eastern Nepal	
	District	Sankhuwasabha	
	Nearest Railway Head	Jogbani, Bihar (Broad Gauge) about 300 km from project site	
	Nearest Airport	Tumlingtar, Nepal 60 km	
2.	Hydrology		
	Catchment Area at Diversion Site	26747 sq. km	
	Design Flood	PMF-8880 cumec GLOF-6830 cumec	
3.	Reservoir		
	Submergence area at FRL	66.3 Ha	
	Reservoir Capacity/ Gross storage at FRL	13.94 MCM	
	Full Reservoir Level (FRL)	El 845 m	
	Max. Water Level (MWL)	El 849 m	
	Minimum Draw Down Level (MDDL)	El 835 m	
	Inactive Storage (below MDDL)	8.29 MCM	
	Active storage /Peaking volume	5.65 MCM	
4.	Diversion Tunnel	429 m long, 11 m diameter Horse shoe-shaped to divert 1300 cumec Diversion flood	# Diversion Tunnel 100% work completed
5.	Dam		
	Type of Dam	Concrete Gravity Dam	# 24.42 lacs cum. excavation completed out of total 25.42 lacs cum.
	Dam top Level	El.849 m	
	Average river bed Level	El. 790 m	
	Deepest Foundation Level	El. 769.0 m	
	Height above deepest Foundation Level	80 m	
	Length of Dam at Top	233 m	
	Top Width of Dam	7 m	
6.	Upstream Cofferdam		
	Type	Colcrete dam	

	Top level	El 818.00 m	#Colcrete work is in progress. #U/s & D/s wall work is in progress. # Permeation grouting work for cutoff wall in u/s Coffor Dam is in progress
	Height	27 m	
	Length	108 m	
7.	Downstream Coffor Dam		
	Type	Rock fill dam	
	Top level	El 794.25 m	
	Height	5.25 m	
	Length	70.639 m	
8.	Spillway		
	Design Flood	PMF-8880 cumec GLOF -6830 cumec	
	Energy Dissipation System	Trajectory Bucket type	
	i)Sluice spillway No. Size	5 9.0 m (W)X 14.85 m (H)	
	ii)Overflow spillway No. Size	1 4.0 m (W)X 3.0 m (H)	
	Crest Level	El 795 m-Sluice Spillway El 842 m-Overflow Spillway	
9.	Power Intake		
	No. & Type	2 Nos., Straight intake with bell mouth	
	Invert Level	El. 819 m	
	Top Level	El. 849 m	
10.	Intake Tunnels		
	No. & Type	2 Nos., 7 m diameter, horse-shoe shaped	# Intake Tunnel 100% work completed
	Length	231 m each	
	Centre line of Intake Tunnel	El 822 m	
11.	Head Race Tunnel		
	Shape & Size	Horse-shoe, 9.5 m diameter	# 7749 m. heading completed out of total 11837 m.
	Length of Tunnel	11837 m	
	Design Discharge	344.68 cum / sec	

	No. of Adits & size			4 Nos., 7 m X 7 m D - shaped			
	ADIT	ADIT LENGTH (m)	RD OF HRT(m)	Distance between Adits (m)	Work From Adit		
					U/s (m)	D/s(m)	
	1	504 m	790 m		790	2310	# Adit tunnel 100% work completed
	2	683 m	5156 m	4366	2056	1558	
	3	387 m	8272 m	3116	1558	1757	
	4	333 m	11786 m	3514	1757	51	
12.	Surge Shaft						
	Size & shape			Open to sky, Restricted Orifice 1No., 24.0m diameter, Circular			#Excavation upto EL 900.50 completed. # Excavation depth completed = 45.50 m
	Height			155.00 m			
	Top Level			El 946.00 m			
	Gates, No. & Size			2 Nos., 5.5m (W)X 5.5m (H)			
13.	Butterfly Valve Chamber- Underground						
	Size			83.05m (L) X 12m (W) X 21m (H)			# Excavation upto final EL 779.7 m completed on 30.08.21.
	Butterfly Valve			2 nos, 5.5 m diameter			
14.	Pressure Shaft			Underground, 2 Nos.			
	Type & Size			Circular, each 5.5 m dia bifurcating into two nos of 4.0 m diameter to feed four units			
	Length of pressure shafts 1 and 2						
	Pressure shaft-I	431.937 m	Pressure shaft-2	404.442 m	# PS-1, PS-2 Excavation completed		
	Branch 1	70.650 m	Branch 3	70.650 m	# Branch-1,2 & 4 excavation completed.		
	Branch 2	58.150 m	Branch 4	58.150 m	# Branch-3 work in progress 59m completed.		
15.	Power House Complex						
	Type			Underground on left bank			

	P/H Cavern	179.50 m (L)X22.5 m (W)X49.5m (H)	# 154700 cum. excavation completed out of total 158000 cum.
	Design Head (net)	286.21 m	
	Gross Head	307.67 m	
	Turbine	4 Nos., Vertical Francis turbine, 225 MW each	
	Rated speed of Turbine	250 rpm	
	Generation voltage	15.75 kV	
	Service Bay Floor Level	El. 539.00m	
	Generator Floor Level	El. 534.00 m	
	Turbine Floor Level	El. 529.00 m	
	Distribution Centre Line Level	El. 525.00 m	
	MIV Floor Level	El.520.50 m	
	Maximum Tail Water Level	El. 536.463 m	
	Transformer	Single phase, 12+1 (Spare), 92 MVA 15.75 kV/420/ $\sqrt{3}$ kV	
16.	Transformer Hall		
	Size	146.14 m (L)X 16 m (W)x 23 m (H)	# Benching Excavation completed on 14.10.2021
	Transformer Hall Floor Level	El. 552 m	
	Design Discharge per unit	86.17 cumec	
	Design Energy in a 90 % dependable year	3924.03 MU	
	Annual Load Factor	50.98 %	
	Weighted average efficiency of TG Set	93 %	
17.	Tail Race Tunnel		
	No., Type & Size	1 No., Horse-shoe shaped, 10.00 m diameter 151.97 m long	# 62% excavation work completed.
	Adit for TRT Construction	D-shaped 7.0m dia., 392 M long	
18.	Switchyard		
	Elevation	El 557 m	
	Size	160 m (L)X 80 m (W)	
19	Levelized Tariff at present cost to completion	INR 4.50 to 5.00 Per Unit at Sitamarhi, Bihar	The tariff is indicative and same may change based on completion of project.
19.	Transmission Line		
	Total no of Tower	578 Nos	
	Total stringing length	217	

20.	Project Cost		
	Generation Component	INR 5723.72 Cr. at May, 15 price level	Total Expenditure till date is INR 2285.88 cr.in Generation Component
	400 kV Transmission Line	INR 1236.13 Cr. at June, 17 price level	Expenditure till date is INR 431.92 cr.
	Total Cost	INR 6959.85 Cr.	Total expenditure is INR 2717.8 cr.
21	Tariff		
	Levelized tariff	INR 4.50 to 4.80	
22	Financial Tie ups	The project is to be funded with 70:30 debt equity ratio. The equity of 30% has been inducted by promoter up front.	
		The debt component of INR 6333.4 cr. (including stand by line of credit of INR 1420.06 cr.) has been arranged from consortium of 7 Banks. Lead bank is SBI with door-to-door tenure of 20 years.	

Lower Arun Hydro Electric Project-669 MW		SALIENT FEATURES
LOCATION		
Country	Nepal	
District	Sankhuwasabha	
Vicinity	All components of project are on Left bank of River Arun. The Intake Works are at village Pukhwa and Power House at village Beteni about 10 Km upstream of Tumlingtar.	
HYDROLOGY		
Design Flood at Lower Arun PH Site including GLOF		
10,000 Year	10134 m ³ /s	
GLOF	6830 m ³ /s	
Design Flood	16964 m ³ /s	
Flood Level	313.00 m	
Design Discharge	344.68 m ³ /s (<i>Only the tail waters of Arun-3 HE Project will be utilized</i>)	
TAIL RACE OUTFALL POND (To be constructed as a part of Arun-3 HEP)		
Null Level	537.00 m	
Maximum water level	544.00 m	
Top elevation of structure	545.00 m (Corresponding to Design flood of 15710 m ³ /s at TRT Outfall in Arun-3 and Maximum water level in pond during Tandem Operation)	
INTAKE STRUCTURE		
No. of intake	1 No.	
Intake Gates	2 Nos. 6.00 m wide x 7.00 m high	

Length of HRT to be constructed with intake	100 m
SPILL TUNNEL	
Type	Horse shoe, concrete lined
Taking off at	STA 437.229 m of HRT
Size	10.5 m dia
Length	327.80 m up to centerline of HRT
Spill tunnel invert level at exit	537.00 m
Spill Tunnel Gate	1 No 10.5 m wide X10.5 m high
HEAD RACE TUNNEL	
Type	Horse Shoe, concrete lined
Size (finished diameter)	10.50 m
Length	17.3 km
Velocity	3.77 m/s
No. of Adits	6 Nos.
Access Gate at the Plug of Adit-3	1 No 2.50m wide X 2.50 m high
SURGE SHAFT	
Numbers	One
Type	Restricted Orifice, open to sky
Diameter	33.84 m
Depth	134.75 m from centerline of HRT
Connecting Shaft	35m deep (EL. 462.5 to 497.5)
Elevation of center line of head race tunnel	445.25 m
Elevation of invert of surge shaft	452.5 m
Maximum upsurge	569.95 m

Minimum down surge	502.70 m			
BUTTERFLY VALVE HOUSE				
Type	Underground			
Size of valve house	91 m long x 12m wide x 21 m high			
No. of butterfly valves	2 Nos.			
Size of valves	5.5 m internal dia.			
PRESSURE SHAFT/PENSTOCKS				
Numbers	2 number, bifurcating into 4			
Size	5.85/4.14 m circular, steel lined			
Type	Main Pressure Shaft underground and branch Penstock on surface.			
Length				
No.	Pressure Shaft 5.85 m diameter	Penstock 4.14 m diameter		Total
		Branch 1	Branch 2	
P1	627.185 m	58.053 m	58.053 m	685.238 m
P2	635.767 m	58.053 m	58.053 m	693.82 m
Velocity in 5.85 m dia portion		6.41 m/sec		
Velocity in 4.14 m dia portion		6.40 m/sec		
POWER HOUSE COMPLEX				
Type	Surface			
Installed capacity	669 MW			
Size	150 m long x 24 m wide x 53 m high			
Type of Turbine	Francis, vertical axis			
Speed of Turbine	214.3 RPM			
Gross head	229.44 m			
Design Net head	212.68 m			

Design Discharge	344.68 cumec
Generators	4 x 167.25 MW, 0.9 pf, generation voltage 13.8 kV
Step up unit Transformers	13 Nos. 3x71MVA single phase 13.8/420 kV/ $\sqrt{3}$ kv ODWF type
Special Features	Lower Arun HEP will operate in Tandem with Arun-3 HEP
TAIL RACE CHANNEL	
Type of tail	Rectangular Concrete lined and cast in situ concrete blocks.
Size	50 m wide
Length -Tail race Channel	72.93 m
TRT OUTFALL	
Normal tail water level for power generation (Q = 344.68 cumec)	EL 307.56 m
Minimum tail water level (Q = 8.617cumec 10% of one unit Discharge)	EL 305.50 m
Maximum tail water level (Q = 379.148 cumec @10% overload)	EL 307.71 m
SWITCHYARD	
Type	Surface 400 kV Switch Gear GIS type with double bus bars arrangement.
It is proposed to evacuate the power generated at Lower Arun Hydro Electric Project by LILO of 400 kV	
POWER GENERATION	
Annual design energy generation in 90% Dependable year	2916.38 GWh
Plant Load Factor	49.84%
COST ESTIMATE (PRICE LEVEL SEPT 2021)	

Total Cost	INR 4796.78 Crore
SALE RATE / UNIT AT BUS BARS	
Year	Tariff (INR/KWh)
Levelized tariff	INR 4.60 to 5.00 per Unit at Sitamahari, Bihar

Tentative Generation Data**Annex “C”**

Month	Generation in MU	
	Arun-3	Lower Arun
	900 MW	669 MW
Apr	192.41	142.98
May	250.92	186.45
Jun	556.36	413.52
Jul	636.12	472.85
Aug	633.34	470.74
Sep	575.37	427.65
Oct	352.58	262.01
Nov	218.99	162.73
Dec	139.84	103.92
Jan	115.72	85.99
Feb	109.51	81.37
Mar	142.86	106.16
Total	3924.03	2916.38

Annex “D”**Format of Expression of Interest for procurement of Power from SAPDC**

Name of the Company		
Location where electricity is to be consumed (Place/District/State)		
Demand likely to be contracted (MW)		
Approximate energy requirement per day (MU)		
Connection to Grid-Voltage Level (KV)		
Point of transaction (Generator Bus Bar/Interconnection with Indian grid at Sitamarahi, Bihar, India)		
Supply Period	Wet Season (April to Nov)	Dry Season (Dec to March)
Arun-3 Project (900 MW) 3924 MU Yearly		
Lower Arun (669 MW) 2921 MU Yearly		
Duration of contract (From date to date)		
Details of Contact Person		
Name & Designation		
Contact No.		
E-Mail		
Any other detail		