



**PAKHTUNKHWA ENERGY DEVELOPMENT  
ORGANIZATION (PEDO)  
KHYBER PAKHTUNKHWA  
PAKISTAN**

*June 2017*

# ABOUT PEDO

- 1986 - Establishment of “Small Hydel Development Organization” (SHYDO)
  - ✓ To identify and develop hydel potential up to 5 MW
  - ✓ To construct small hydel stations for isolated load centers
  - ✓ To operate and maintain small hydel stations
  
- 1993 - Conversion of SHYDO into an autonomous body
  - ✓ To identify and construct medium size hydel stations
  - ✓ To operate, maintain and regulate small and medium hydel stations
  - ✓ To involve private sector in the development of the hydel potential
  
- 2013 The Organization was re-named as PHYDO “Pakhtunkhwa Hydel Development Organization”
  
- 2014 The Organization was re-named as PEDO “Pakhtunkhwa Energy Development Organization”

# Achievement of PEDO

- A total of 105MW projects are completed and generating revenue of Rs. 2.5 Billion Per Year
- A total of Six (8) Projects of 269 MW Capacity are in the phase of construction
- A total of Seven (7) Projects of 668MW Capacity are in the process of award to the **Private Sector Investment**
- Five (5) LOIs issued to **Private Sponsors** for Solar Projects having capacity of 203.5MW

# WHY INVEST IN KHYBER PAKHTUNKHWA?

- 70% of overall national hydel potential is in KP (30,000 MW)
- PEDO has 29 projects on anvil = 3,902 MW
- Approx project cost for above projects - US\$ 12.0 Billion (*current \$ & Rupee terms*)
- Develop plan to exploit this huge potential
- Open avenues of investment, both local and international
- “KP Hydro Power Policy 2016 and Guidelines”  
developed/approved

# WHY INVEST IN KHYBER PAKHTUNKHWA?



- Sites bearing potential for 30,000 MW is identified
- Bankable feasibilities available for 17 sites
- 6 Solicited HPPs advertised to Private Sector
- EIA already carried out



## Comparative Natural Advantages

- Favorable hydrology and natural high heads
- Sites with least environmental hazards

## Investment-friendly regulatory environment

- Investment Friendly **NEW** Hydropower Policy 2016 in Place with **Guidelines**
- Unflinching political and administrative backing
- Issuance of Lol and LoS under provincial Hydel Power Policy 2016
- Issuance of Sovereign Guarantee by Federal Government



# **Pre-Feasibility level Semi-Raw sites**

# Pre-Feasibility Completed Projects For Development in Private Sector

Sr. No	Name of Project	District	Potential (MW)	Est. cost US\$	(M)	Remarks
1	<a href="#"><u>Bhimbal Katha</u></a>	Mansehra	7.86	21.72		Advertised to the Private Sector Investment
2	<a href="#"><u>Saiful Maluk Katha</u></a>	Mansehra	7.43	27.20		
3	<a href="#"><u>Ayun Gol</u></a>	Chitral	15.17	30.20		
4	<a href="#"><u>Barum Gol</u></a>	Chitral	24.93	39.25		
5	<a href="#"><u>Chowkel Khwar</u></a>	Swat	12.00	19.01		
6	<a href="#"><u>Kedam Khwar</u></a>	Swat	17.14	20.02		
7	<a href="#"><u>Nila Da Katha</u></a>	Mansehra	2.47	4.28		
8	<a href="#"><u>Sharmai HPP</u></a>	Dir Upper	150			Awarded to Private Investors
9	<a href="#"><u>Gandiqar HPP</u></a>	Dir Upper	3.21			
10	<a href="#"><u>Mastuj River HPP</u></a>	Chitral	48			
11	<a href="#"><u>Balkani HPP</u></a>	Shangla	7			
<b>Total</b>			<b>296</b>			

**Feasibility Completed  
Solicited sites**

## Hydel Projects - Feasibility Study Completed Project Features

Sr. No	Name of Scheme	Capacity (MW)	Energy (GWh/a)	Head (Meters)	Discharge (Cumeecs)	Estimated cost (M US\$)
1	<a href="#"><u>Naran HPP, Mansehra</u></a>	188.00	705.46	352.00	70.00	440
2	<a href="#"><u>Ghor band Khwar, Shangla</u></a>	20.60	111.40	288.50	8.50	74
3	<a href="#"><u>Nandihar Khwar, Batagram</u></a>	12.30	69.84	224.50	6.50	50
4	<a href="#"><u>Arkari Gol, Chitral</u></a>	99.00	378.00	335.00	36.00	183
5	<a href="#"><u>Shogo Kach HPP, Lower Dir</u></a>	102.00	566.00	91.00	150.00	320
6	<a href="#"><u>Bata Kundi, Mansehra</u></a>	96.00	430.50	259.00	48.00	368
7	<a href="#"><u>Barikot Patrak, Dir Upper</u></a>	47.00	230.00	253.00	230.00	148
8	<a href="#"><u>Patrak-Shringal, Dir Upper</u></a>	22.00	120.00	80.00	35.00	83
9	<a href="#"><u>Mujigram-Shoghor, Chitral</u></a>	64.26	277.72	298.00	27.00	182
10	<a href="#"><u>Ghrait- Swir Lasht, Chitral</u></a>	370.00	1500.00	109.00	430.00	1811
11	<a href="#"><u>Istaru Booni, Chitral</u></a>	72.00	256.00	96.60	94.00	276

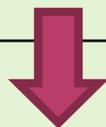
Advertised to Investors



## Hydel Projects - Feasibility Study Completed Project Features

Sr. No	Name of Scheme	Capacity (MW)	Energy (GWh/a)	Head (Meters)	Discharge (Cumeecs)	Estimated cost (M US\$)
12	<u>Booni Zaith (Toren More Kari) HPP</u>	350	1535	150.25	305	753
13	<u>Jashmil More Lasht HPP</u>	260	1158	117	305	616

Hydel Projects – Feasibility Studies in progress



S.No.	Name of Scheme	Location	Capacity (MW)	Cost (Million USD)
1	Torcamp-Guddubar HPP Chitral	Chitral	409	1,534
2	<b>Gabral- Kalam HPP Swat</b>	<b>Swat</b>	<b>110</b>	<b>413</b>
3	Kari- Mushkur HPP Chitral	Chitral	446	1,748
<b>Sub-Total</b>			<b>965</b>	<b>3,694</b>

THANK YOU

## GOLDEN OPPORTUNITY FOR INVESTMENT IN HYDRO POWER GENERATION PROJECTS UNDER NEW INVESTMENT FRIENDLY "KP HYDRO POWER POLICY 2016"

Development of:  
12 TO 188 MW  
HYDRO POWER PROJECTS



Government of Khyber Pakhtunkhwa intends to develop the following Hydropower Potential Solicited Sites (Feasibility Studies completed) in Private Sector on Build Own Operate & Transfer (BOOT) basis under KP Hydro Power Policy 2016 through International Competitive Bidding (ICB).

S#	Name of Project	District	Capacity MW
1	Naran HPP	Mansehra	188
2	Shigo Kas HPP	Dir Lower	102
3	Arkari Gol	Chitral	99
4	Bata Kundi	Mansehra	96
5	Ghorband Khwar	Shangla	21
6	Nandihar Khwar	Batagram	12

- Applications are invited from interested private sponsors / firms having experience in hydel sector and strong financial capability.
- Security Package under a Tri-Partite LOS is available in collaboration with PPIB / GOP.
- The interested firms can apply for these projects as per procedure given in the KP Hydro Power Policy 2016. The last date for submission of SOQs is **17<sup>th</sup> May 2016 at 1400 hrs.**
- Registration for a specific project and purchase of Pre-qualification documents (PQDs) can be made on submission of pay order in favour of CEO PEDO, amounting to following fee / equivalent in PKR:
  - Registration fee ( US\$ 100)
  - PQD fee (US\$ 1500 for Project up to 100 MW & US\$ 3000 for Project above 100 MW.)
- Firms that had already registered and purchased PQDs against our advertisement dated 2<sup>nd</sup> April 2015, may register and collect revised PQD free of cost for the same projects as the same has been paid previously. However they have to submit fresh SOQs in accordance with Revised PQDs.
- KP Hydro Power Policy 2016, Policy Guidelines and Executive Summaries of the HPP's are available on PEDO website ([www.pedo.pk](http://www.pedo.pk)). Further info can be obtained on the given address.



**Pakhtunkhwa Energy Development Organization (PEDO)**

Government of Khyber Pakhtunkhwa

Director (Private Power), 38/B-2, phase-V, Hayatabad, Peshawar

Tel: (+92-91) 9217329, 9217484 Fax (+92-91) 9217331, e-mail [irfan.pp@pedo.pk](mailto:irfan.pp@pedo.pk)



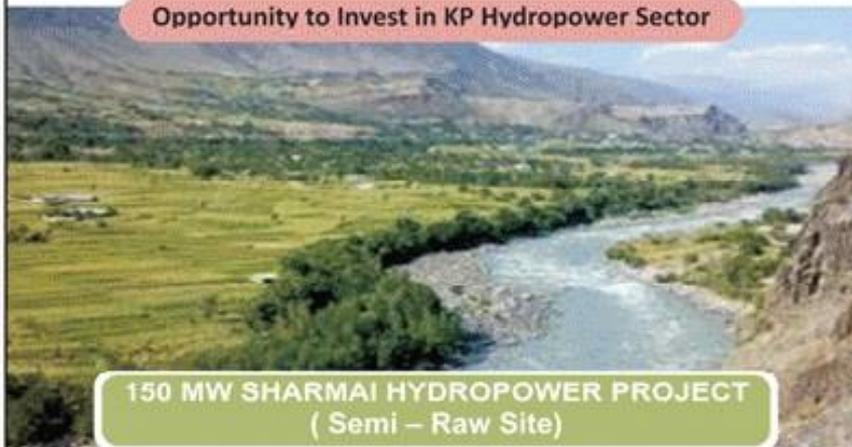


Government of Khyber Pakhtunkhwa  
Energy & Power Department  
Pakhtunkhwa Energy Development Organization (PEDO)



## EXPRESSION OF INTEREST

Opportunity to Invest in KP Hydropower Sector



### 150 MW SHARMAI HYDROPOWER PROJECT ( Semi – Raw Site)

- ◆ The Government of Khyber Pakhtunkhwa (GoKP) has been consistently encouraging the participation of private investor in the power generation sector of Khyber Pakhtunkhwa. Pakhtunkhwa Energy Development Organization (PEDO), a one window facilitator on behalf of GoKP.
- ◆ Applications are invited from interested private sector entrepreneurs, having experience in hydel sector and strong financial capability, for development of 150 MW Sharmai Hydro Power Project, District Dir.
- ◆ Security Package under a Tri-Partite LQS is available in collaboration with PPiB/GoP.
- ◆ The project shall be implemented under the new **KP Hydro Power Policy 2016**, which inter alia provides attractive set of incentives to the private sector for investing in Hydro Power Generation Projects in Khyber Pakhtunkhwa. The details of the Project, Policy and Guidelines are available at PEDO's website: [www.pedo.pk](http://www.pedo.pk)
- ◆ Proposal can be submitted for project by interested party (ies) after completing pre-requisites of registration and purchasing of Expression of Interest (EOI) Document of the project. Parties will be selected based on the terms, conditions and the evaluation criteria set forth in the respective EOI Document.
- ◆ EOI Document can be obtained from PEDO office upon payment of **US \$ 100** for registration and **US \$ 3000** for EOI Document fee. Payments will also be accepted in equivalent Pakistan Rupees through demand draft/pay order drawn in favor of **CEO Pakhtunkhwa Energy Development Organization, Peshawar**.

Last Date For Submission of Proposals

22<sup>nd</sup> June 2016 16:00 Hrs

Director (Private Power)  
PEDO House, Room No. 222, Plot No. 38/ B-II,  
Hayatabad, Phase V, Peshawar, Pakistan,  
Tel +92-91-9217484, Fax + 92-91-9217331  
Email: [irfan.pp@pedo.pk](mailto:irfan.pp@pedo.pk), [imran.halim@pedo.pk](mailto:imran.halim@pedo.pk)  
Website: [www.pedo.pk](http://www.pedo.pk), [www.kpkep.gov.pk](http://www.kpkep.gov.pk)





Government of Khyber Pakhtunkhwa  
Energy & Power Department  
Pakhtunkhwa Energy Development  
Organization (PEDO)



## EXPRESSION OF INTEREST

Opportunity to Invest in KP Hydropower Sector



### 7 PRE-FEASIBILITY HYDROPOWER PROJECTS

- The Government of Khyber Pakhtunkhwa (GoKP) has been consistently encouraging the participation of private investor in the power generation sector of Khyber Pakhtunkhwa. Pakhtunkhwa Energy Development Organization (PEDO), a one window facilitator on behalf of GoKP.
- Applications are invited from interested private sector entrepreneurs, having experience in hydel sector and strong financial capability, for development of below Seven (7) Hydro Power Projects as Semi-Raw Sites in Khyber Pakhtunkhwa.

#### Pre-Feasibility Hydro Power Projects

Sr. No.	Name of Projects	District	Potential (MW)
1	Ayun Gol	Chitral	15.17
2	Barum Gol	Chitral	24.93
3	Saiful Makuj Katha	Manshera	7.43
4	Nila Da Katha	Manshera	2.47
5	Bhimbal Katha	Manshera	7.86
6	Kedam Khwar	Swat	17.14
7	Chowkol Khwar	Swat	12.00
<b>TOTAL</b>			<b>87 MW</b>

- Security Package under a Tri-Partite LOS is available in collaboration with PPPIB/GoP.
- The projects shall be implemented under the new KP Hydro Power Policy 2016, which inter alia provides attractive set of incentives to the private sector for investing in Hydro Power Generation Projects in Khyber Pakhtunkhwa. The details of the Projects, Policy and Guidelines are available at PEDO's website: [www.pedo.pk](http://www.pedo.pk)
- Proposals can be submitted for projects by interested party (ies) after completing pre-requisites of registration and purchasing of Expression of Interest (EOI) Document of the projects. Parties will be selected based on the terms, conditions and the evaluation criteria set forth in the respective EOI Documents.
- EOI Documents can be obtained from PEDO office upon payment of US \$ 100 for registration and US \$ 1500 for EOI Documents fee. Payments will also be accepted in equivalent Pakistan Rupees through demand draft/pay order drawn in favor of General Manager(Hydel) Pakhtunkhwa Energy Development Organization, Peshawar.

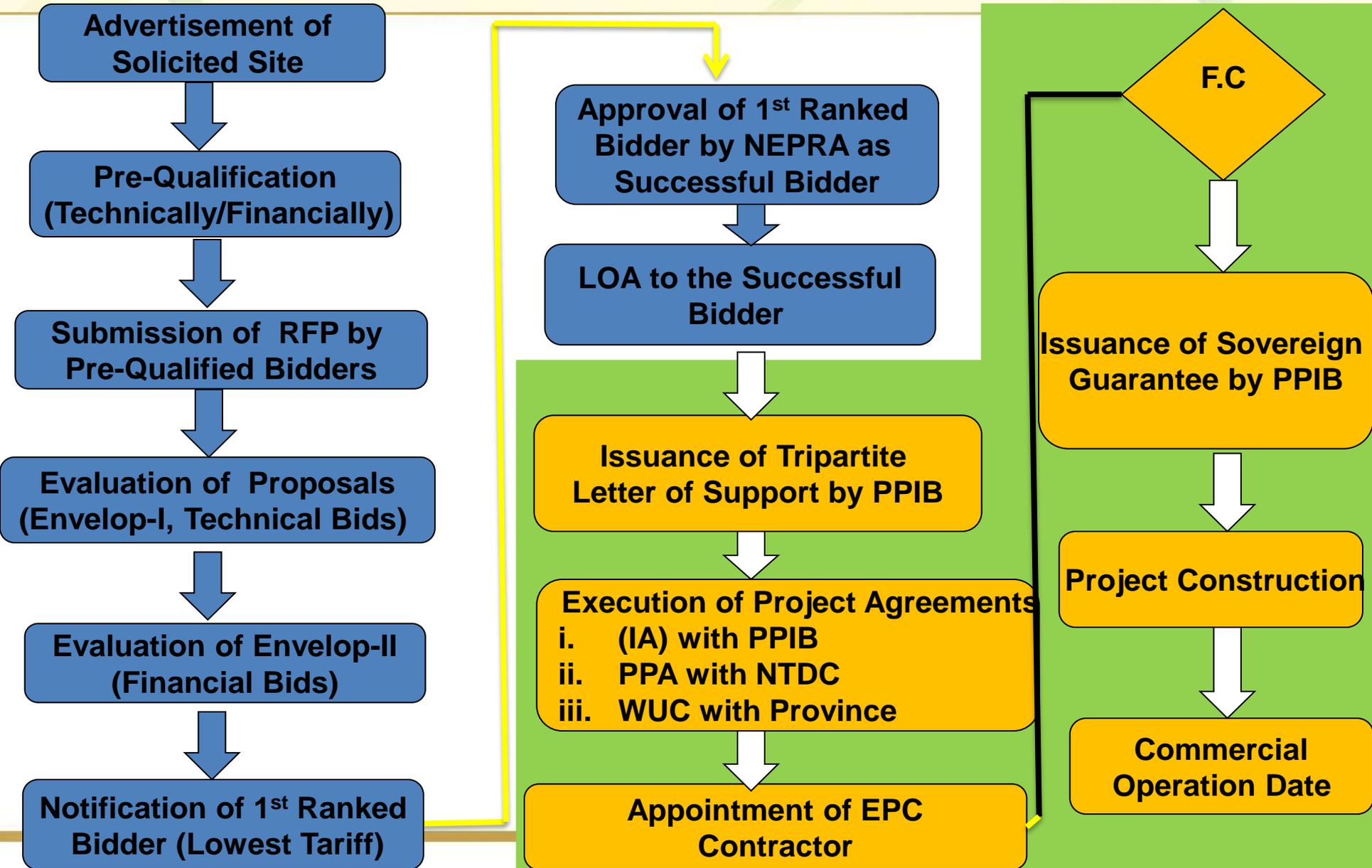
Last Date For Submission of Proposals  
26<sup>th</sup> April 2017 - 16:00 Hrs

Director (Private Power/ Renewable Energy Projects)  
PEDO House, Room No. 329, Plot No. 38/ B-II, Phase-V,  
Hayatabad, Peshawar, Pakistan.  
Tel + 92-91-9217331, 9217484  
Email: [imran.halim@pedo.pk](mailto:imran.halim@pedo.pk), [aziz.ahmad@pedo.pk](mailto:aziz.ahmad@pedo.pk), [fawad.rauf@pedo.pk](mailto:fawad.rauf@pedo.pk)  
Website: [www.pedo.pk](http://www.pedo.pk), [www.kpkp.gov.pk](http://www.kpkp.gov.pk)

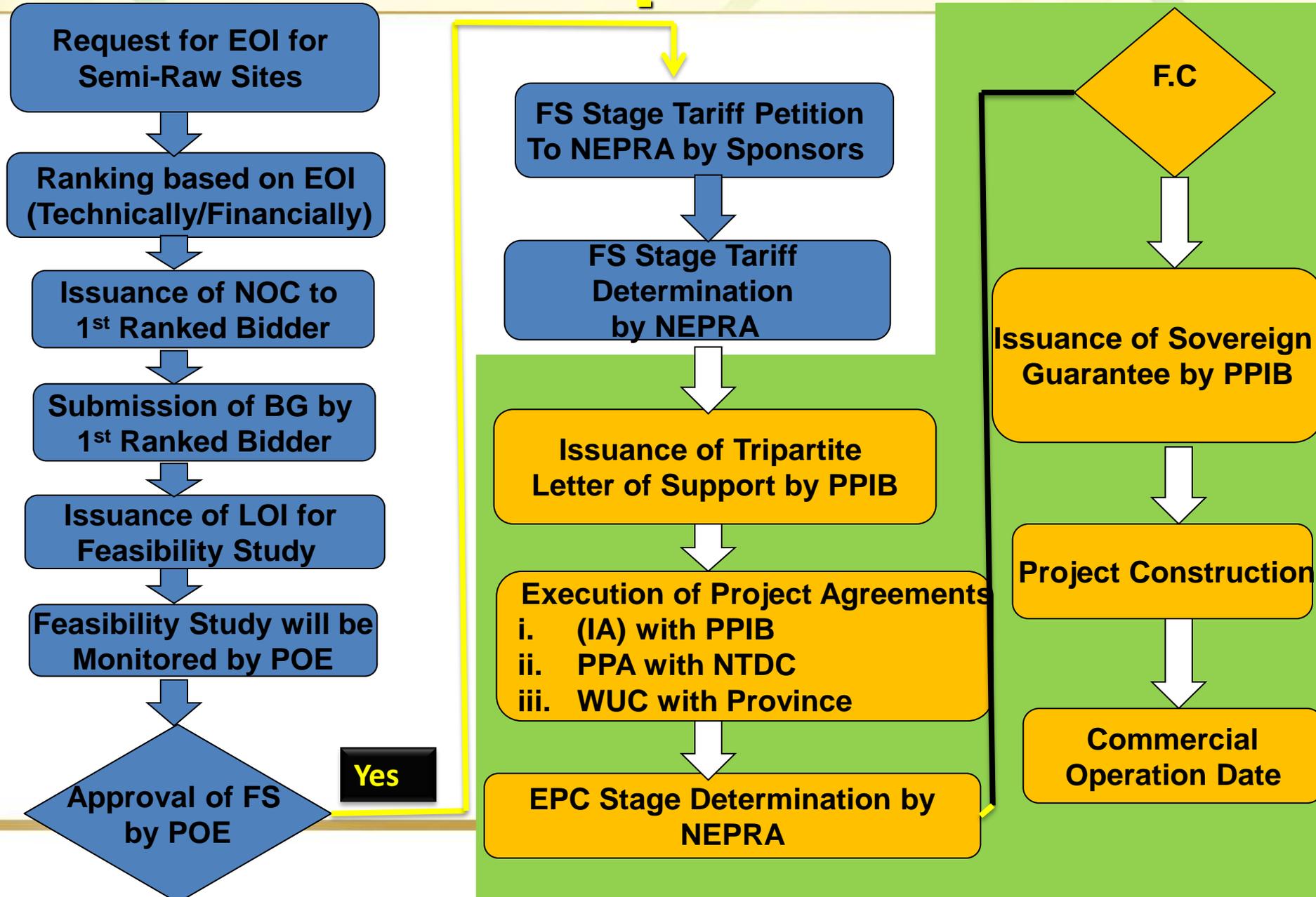


# PROCESSING OF HYDEL PROJECT

# Flow Chart - Tripartite LOS – Solicited Site



# Flow Chart - Tripartite LOS SEMI-RAW SITE



Request for EOI for Semi-Raw Sites

Ranking based on EOI (Technically/Financially)

Issuance of NOC to 1<sup>st</sup> Ranked Bidder

Submission of BG by 1<sup>st</sup> Ranked Bidder

Issuance of LOI for Feasibility Study

Feasibility Study will be Monitored by POE

Approval of FS by POE

Yes

FS Stage Tariff Petition To NEPRA by Sponsors

FS Stage Tariff Determination by NEPRA

Issuance of Tripartite Letter of Support by PPIB

Execution of Project Agreements  
i. (IA) with PPIB  
ii. PPA with NTDC  
iii. WUC with Province

EPC Stage Determination by NEPRA

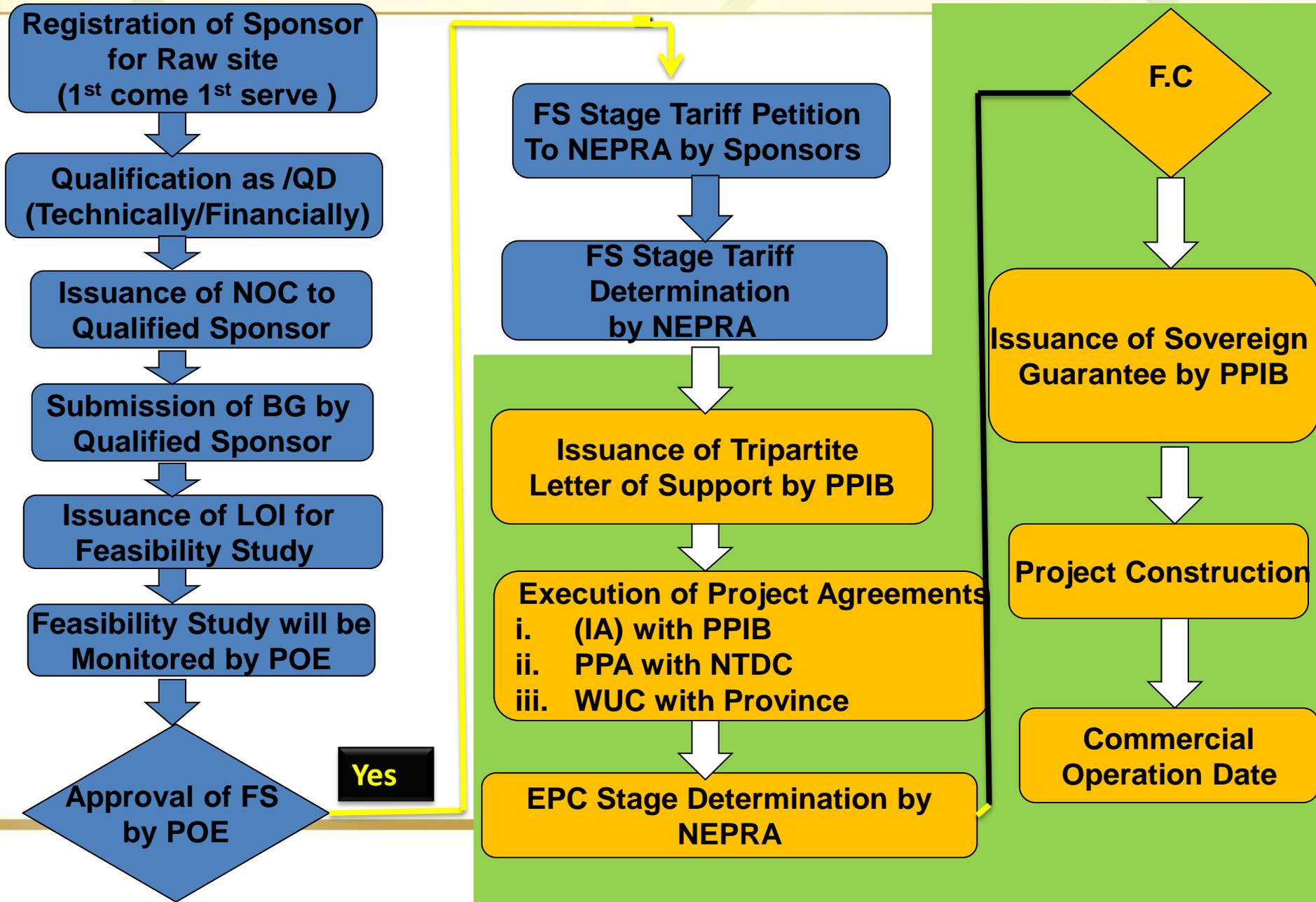
F.C.

Issuance of Sovereign Guarantee by PPIB

Project Construction

Commercial Operation Date

# Flow Chart - Tripartite LOS-RAW SITE



# Completed Projects



# COMPLETED PROJECTS

S #	Name of Project / Location	Capacity (MW)	Status
1 .	Malakand-III HPP, Dargai	81	Completed
2 .	Pehur HPP, Swabi	18	Completed
3 .	Reshun HPP (Extension 1.4 MW) Chitral	4.2	Completed
4 .	Shishi HPP (Up gradation) , Chitral	1.8	Completed
	<b>Total</b>	<b>105</b>	Revenue: PKR 2.5 billion/year

# **Ongoing Projects In Public Sector**

# SUMMARY OF ONGOING PROJECTS

	Name of Project	Capacity (MW)
1	356 Mini Micro Hydro projects	35
2	Ranolia HPP Distt: Kohistan	17
3	Machai Canal HPP Distt Mardan	2.6
4	Daral Khwar HPP Distt: Swat	36.6
5	Jabori HPP Distt Mansehra	10.2
6	Karora HPP Distt Shangla	11.8
7	Koto HPP Distt Temergarah	40.8
8	Lawi HPP Distt Chitral	69
9	Matiltan HPP Distt Swat	84

# INVESTMENT OPPORTUNITIES



# **SUPPORTING DATA**



**Location**

**Naran, District Mansehra**

**Latitude (N) 34<sup>0</sup> – 56' – 11''**

**Longitude(E) 73<sup>0</sup> – 44' – 23''**

**Name of River**

**Kunhar**

**Design Discharge**

**70**

**m<sup>3</sup>/s**

**Gross Head**

**336**

**m**

**Design Capacity**

**188**

**MW**

**Mean Annual Energy**

**705.46**

**GWh/a**

**Reservoir Capacity**

**14.636**

**Hm<sup>3</sup>**

**Length of Power Channel**

**6.9**

**Km**

**Length of Tunnel**

**11**

**Km**

**Plant Factor**

**43**

**%**

**Inter Connection to Balakot Grid**

**60**

**km**

**Total Estimated Cost**

**440**

**M. US \$**

**Cost per MW**

**2.34**

**M. US \$**



<b>Location</b>	<b>Arkari Gol HPP, Latitude(N) 36<sup>0</sup> – 01' – 10'' Longitude(E) 71<sup>0</sup> – 44' – 11''</b>	
<b>Name of River</b>	<b>Arkari Gol</b>	
<b>Design Discharge</b>	<b>36</b>	<b>m<sup>3</sup>/s</b>
<b>Gross Head</b>	<b>335</b>	<b>m</b>
<b>Design Capacity</b>	<b>99</b>	<b>MW</b>
<b>Mean Annual Energy</b>	<b>378</b>	<b>GWh/a</b>
<b>Reservoir</b>	<b>1.06</b>	<b>Hm<sup>3</sup></b>
<b>Length of Tunnel</b>	<b>5.6</b>	<b>Km</b>
<b>Plant Factor</b>	<b>44</b>	<b>%</b>
<b>Connectivity to the Proposed Drosh Grid</b>	<b>60</b>	<b>km</b>
<b>Total Estimated Cost</b>	<b>183</b>	<b>M. US \$</b>
<b>Cost per MW</b>	<b>1.85</b>	<b>M. US \$</b>



<b>Location</b>	<b>Nandihar Khwar, Latitude (N) 34° 46' – 00'' Longitude(E) 72° 54' – 54''</b>	
<b>Name of River</b>	<b>Nandihar Khwar</b>	
<b>Design Discharge</b>	<b>6.5</b>	<b>m<sup>3</sup>/s</b>
<b>Gross Head</b>	<b>224.50</b>	<b>m</b>
<b>Design Capacity</b>	<b>12.30</b>	<b>MW</b>
<b>Mean Annual Energy</b>	<b>69.84</b>	<b>GWh/a</b>
<b>Reservoir</b>	<b>NIL</b>	<b>ROR</b>
<b>Plant Factor</b>	<b>65</b>	<b>%</b>
<b>Length of Tunnel</b>	<b>5.7</b>	<b>Km</b>
<b>Connectivity to Thakot Grid</b>	<b>7</b>	<b>km</b>
<b>Total Estimated Cost</b>	<b>50</b>	<b>M. US \$</b>
<b>Cost per MW</b>	<b>4.17</b>	<b>M. US \$</b>



<b>Location</b>	<b>Ghor Band Khwar , Latitude (N) 34<sup>0</sup> 53' – 14.5'' Longitude(E) 72<sup>0</sup> 45' – 42.3''</b>	
<b>Name of River</b>	<b>Ghorband Khwar</b>	
<b>Basic Data</b>		<b>Unit</b>
<b>Design Discharge</b>	<b>8.5</b>	<b>m<sup>3</sup>/s</b>
<b>Gross Head</b>	<b>288.50</b>	<b>m</b>
<b>Design Capacity</b>	<b>20.60</b>	<b>MW</b>
<b>Mean Annual Energy</b>	<b>111.40</b>	<b>GWh/a</b>
<b>Reservoir capacity</b>	<b>RoR</b>	<b>Peaking</b>
<b>Plant Factor</b>	<b>62</b>	<b>%</b>
<b>Length of Tunnel</b>	<b>5.8</b>	<b>Km</b>
<b>Connectivity to Besham Grid</b>	<b>12</b>	<b>km</b>
<b>Total Estimated Cost</b>	<b>74</b>	<b>M. US \$</b>
<b>Cost per MW</b>	<b>3.52</b>	<b>M. US \$</b>



Location	Shogo Kach, Latitude(N) 34° 45' 24.73" Longitude(E) 71° 48' 11.87"	
Name of River	Panjkora	
Design Discharge	150	m <sup>3</sup> /s
Gross Head	91	m
Design Capacity	102	MW
Mean Annual Energy	520	GWh/a
Reservoir	8.07	Hm <sup>3</sup>
Plant Factor	58	%
Length of Tunnel	10.5	Km
Connectivity to Chakdara Grid	20	km
Total Estimated Cost	320	M. US \$
Cost per MW	3.14	M. US \$



<b>Location</b>	<b>Bata Kundi , District Mansehra Latitude(N) 34<sup>0</sup> – 55' – 12'' Longitude(E) 73<sup>0</sup> – 48' – 20''</b>	
<b>Name of River</b>	<b>Kunhar</b>	
<b>Design Discharge</b>	<b>52</b>	<b>m<sup>3</sup>/s</b>
<b>Gross Head</b>	<b>221</b>	<b>m</b>
<b>Design Capacity</b>	<b>96</b>	<b>MW</b>
<b>Mean Annual Energy</b>	<b>369</b>	<b>GWh/a</b>
<b>Plant Factor</b>	<b>44%</b>	<b>%</b>
<b>Length of Tunnel</b>	<b>4.41</b>	<b>Km</b>
<b>Connectivity to Balakot Grid</b>	<b>70</b>	<b>km</b>
<b>Total Estimated Cost</b>	<b>368</b>	<b>M. US \$</b>
<b>Cost per MW</b>	<b>3.83</b>	<b>M. US \$</b>



Location	Istaru Booni HPP, Latitude(N) 36° 15' 29" Longitude(E) 72° 18' 23"	
Name of River	Turkuho River	
Design Discharge	94	m <sup>3</sup> /s
Gross Head	96.6	m
Design Capacity	72	MW
Mean Annual Energy	256	GWh/a
Reservoir	2.71	Hm <sup>3</sup>
Plant Factor	41	%
Length of Tunnel	4.024	Km
Connectivity to Drosh Grid (Proposed)	110	km
Total Estimated Cost	276	M. US \$
Cost per MW	3.83	M. US \$



Location	Mujigram-Shoghor HPP, Latitude(N) 36 <sup>0</sup> 00' 4 3.4" Longitude(E) 71 <sup>0</sup> 75' 34.2"	
Name of River	Lotkoh River	
Design Discharge	27	m <sup>3</sup> /s
Gross Head	298	m
Design Capacity	64.26	MW
Mean Annual Energy	277.72	GWh/a
Reservoir	0.367	Hm <sup>3</sup>
Plant Factor	52	%
Length of Tunnel	13.75	Km
Connectivity to Drosh Grid(Proposed)	70	km
Total Estimated Cost	182	M. US \$
Cost per MW	2.84	M. US \$



Location	Barikot Patrak , Latitude(N) 35 <sup>0</sup> 25' 16.22" Longitude(E) 72 <sup>0</sup> 11' 0.72"	
Basic Data		Unit
Design Discharge	23	m <sup>3</sup> /s
Gross Head	253	m
Design Capacity	47	MW
Mean Annual Energy	225	GWh/a
Reservoir	0.476	Hm <sup>3</sup>
Plant Factor	55	%
Length of Tunnel	10.6	Km
Connectivity to Chukiatan Grid (Dir)	55	km
Total Estimated Cost	148	M. US \$
Cost per MW	3.15	M. US \$



Location	Patrak Shringal, District Dir Latitude(N) 35 <sup>0</sup> 19' 16.22" Longitude(E) 72 <sup>0</sup> 02' 39.93"	
Name of River	Panjkora	
Design Discharge	35	m <sup>3</sup> /s
Gross Head	79	m
Design Capacity	22	MW
Mean Annual Energy	120	GWh/a
Plant Factor	56.6	%
Length of Tunnel	5.05	Km
Connectivity to Chukiatan Dir Grid	35	km
Total Estimated Cost	83	M. US \$
Cost per MW	3.77	M. US \$



Location

Laspur-Miragram,

Latitude(N) 35<sup>0</sup>–59'– 0.5''

Longitude(E) 72<sup>0</sup> – 25' – 32''

Name of River

Laspur River

Design Discharge

30

m<sup>3</sup>/s

Gross Head

953

m

Design Capacity

230

MW

Mean Annual Energy

874

GWh/a

Reservoir

Nil

ROR

Plant Factor

43

%

Length of Tunnel

32.40

Km

Cost of Feasibility studies

4.60

M. US \$

Connectivity to Drosh Grid (proposed)

130

km

Total Estimated Cost

552

M. US \$

Cost per MW

2.40

M. US \$



## 377MW Ghrait- Swir Lasht

Location	Ghrait- Swir Lasht Latitude(N) 35°31'46.38" Longitude(E) 71°45'32.26"	
Name of River	Chitral River	
Design Discharge	430	m <sup>3</sup> /s
Gross Head	109	m
Design Capacity	377	MW
Mean Annual Energy	1579	GWh/a
Plant Factor	49	%
Length of Tunnel	14.50	Km
Connectivity to the Drosh Grid	20	km
Total Estimated Cost	1811	M. US \$
Cost per MW	4.8	M. US \$



Location

Shogo-Sin, District Chitral

Latitude(N) 34<sup>0</sup> 55' – 12''

Longitude(E) 73<sup>0</sup> 48' – 20''

Name of River	Luthkho	
Design Discharge	65	m <sup>3</sup> /Sec
Gross Head	249	Meter
Design Capacity	132	MW
Mean Annual Energy	585	GWh
Plant Factor	51	%
Reservoir	RoR	NIL
Length of Power Tunnel	7.59	Km
Connectivity to proposed Grid at Drosh	60	km
Estimated Cost	270	Million US \$
Cost Per MW	2.05	Million US \$



## Sharmai HPP, 150 MW, Dir Upper

Location	150 MW Sharmai Distt: Dir Upper	
Name of River	Panjkora	
Design Discharge	88	m <sup>3</sup> /Sec
Net Head	193.6	Meter
Design Capacity	150	MW
Mean Annual Energy	682	GWh/a
Length of power tunnel	7.803	Km
Total Estimated Cost	359	Mil US\$
Cost per MW	2.39	Mil US\$
Plant Factor	52	%
Status of Project	Advertised as Semi Raw Site	



## SHUSHGHAI-ZHENDOLI HYDROPOWER PROJECT DISTRICT

### CHITRAL

#### Salient Features:

Location	Shushgai-Zhendoli, District Chitral Latitude 36° – 14' – 28'', Longitude 72° – 10' – 16''	
Name of River	Turkho	
Design Discharge	28	m <sup>3</sup> /s
Gross Head	615	m
Design Capacity	144	MW
Plant Factor	49 %	
Mean Annual Energy	612	Gwh/a
Reservoir	(RoR)	NIL
Length of Power Tunnel	8.5	Km
Connectivity to Drosh Grid	120	km
Estimated Cost	288	Million US \$
Cost Per MW	2	Million US \$



## 4. 350MW Booni Zaith HPP, District Chitral

### Salient Features:

Location	Booni Zaith (Toren More Kari) HPP, District Chitral Latitude(N) 36° 15' 45", Longitude(E) 72° 14' 49"	
Design Discharge	305	m <sup>3</sup> /s
Gross Head	150.25	m
Design Capacity	350	MW
Mean Annual Energy	1535	GWh/a
Reservoir	NIL	RoR
Plant Factor	49	%
Length of Tunnel	14.1/9.7Dia	Km
Connectivity to Drosh Grid	80	km
Total Estimated Cost	753	M. US \$
Cost per MW	2.15	M. US \$
Status of Project	Feasibility Study completed	



## Jamshil More Lasht HPP, District Chitral

### Salient Features:

Location	Jamshil More Lasht, District Chitral Latitude 36 <sup>0</sup> -06'- 11.91", Longitude 72 <sup>0</sup> - 03' - 26.29"	
Design Discharge	305	m <sup>3</sup> /s
Gross Head	117	m
Design Capacity	260	MW
Mean Annual Energy	1158	GWh/a
Reservoir	Nil	RoR
Plant Factor	50.8	%
Length of Tunnel	13.6	Km
Cost of Feasibility studies		M. US \$
Cost of Access Road (3 KM)	2.85	M. US \$
Connectivity to Grid Proposed Drosh Grid	50	km
Total Estimated Cost	616	M. US \$
Cost per MW	2.37	M. US \$
Status of Project	Feasibility Study Completed	

# **Pre-Feasibility Sites**

## **SUPPORTING DATA**



# Ayun Gol HPP

Location	Ayun District Chitral	
Name of River	AyunGol	
Design Discharge	7	m <sup>3</sup> / Sec
Gross Head	255	Meter
Design Capacity	15.17	MW
Mean Annual Energy	83.06	GWh/ a
Reservoir	Nil	(ROR)
Length of Power Tunnel	5.4	Km
Cost of Access Road (KM+bridge)	0.07	M.US\$
Cost of Transmission Line (30KM)	0.71	M.US\$
Total Estimated Cost	30.2	M.US\$
Cost per kW	1990	US\$/ KW
Status of Project	Pre-Feasibility study completed	



# Barum Gol HPP

Location	Tehsil Mastuj, District Chitral	
Name of River	BarumGol	
Design Discharge	6.0	m <sup>3</sup> / Sec
Gross Head	507	Meter
Design Capacity	24.93	MW
Mean Annual Energy	137.72	GWh/ a
Reservoir	Nil	(ROR)
Length of Power Tunnel	4.4	Km
Cost of Access Road (1 KM+bridge)	1.90	M.US\$
Cost of Transmission Line	0.85	M.US\$
Total Estimated Cost	39.25	MUS\$
Cost per kW	1544	US\$/ KW
Status of Project	Pre-Feasibility study completed	



# Saiful Maluk Katha HPP

Location	Naran District Mansehra	
Name of River	SaifulMaluk Katha	
Design Discharge	1.93	m <sup>3</sup> / Sec
Gross Head	457	Meter
Design Capacity	7.43	MW
Mean Annual Energy	35.63	GWh/ a
Reservoir	Nil	(ROR)
Length of Power Channel	3.6	Km
Cost of Access Road (3 KM+ bridge)	1.07	M.US\$
Cost of Transmission Line (75 KM)	1.43	M.US\$
Total Estimated Cost	27.2	M.US\$
Cost per kW	3669	US\$/ KW
Status of Project	Pre-Feasibility study completed	



# Nilada Katha HPP

Location	Farid Abad Kaghan	
Name of River	Nilada Katha	
Design Discharge	1.37	m <sup>3</sup> / Sec
Gross Head	220	Meter
Design Capacity	2.47	MW
Mean Annual Energy	12.04	GWh/ a
Reservoir	Nil	(ROR)
Length of Power Channel	3.25	Km
Cost of Access Road (Existing road up gradation)	0.03	M. US\$
Cost of Transmission Line (35 KM)	0.67	M. US\$
Total Estimated Cost	4.28	M. US\$
Cost per kW	1735	US\$/ KW
Status of Project	Pre-Feasibility Study Completed	



# Bhimbal Katha HPP

Location	Bimbalkaghan	
Name of River	Bimbal Katha	
Design Discharge	4.23	m <sup>3</sup> / Sec
Gross Head	223	Meter
Design Capacity	7.86	MW
Mean Annual Energy	39.73	GWh/ a
Reservoir	Nil	(ROR)
Length of Power Channel	2.37	Km
Cost of Access Road (3 KM+1 bridge)	0.92	M.US\$
Cost of Transmission Line (65 KM)	1.24	M.US\$
Total estimated cost	21.72	M.US\$
Cost per KW	2764	US\$/ KW
Status of Project	Pre-Feasibility study completed	

# Chowkel Khwar HPP



Location	Chokel Swat	
Name of River	ChokelKhwar	
Design Discharge	7.30	m <sup>3</sup> / Sec
Gross Head	195	Meter
Design Capacity	12	MW
Mean Annual Energy	47.6 4	GWh/ a
Reservoir	Nil	(ROR)
Length of Power Channel	2.06	Km
Cost of Access Road (3KM +2 bridges)	0.90	M.US\$
Cost of Transmission Line (30KM)	0.57	M.US\$
Total Estimated Cost	19.0 1	M.US\$
Cost per kW	1585	US \$/ KW
Status of Project	Pre-Feasibility study completed	

# Kedam Khwar HPP



Location	Kedam, District Swat	
Name of River	KedamKhwar	
Design Discharge	3.13	m <sup>3</sup> / Sec
Gross Head	670	Meter
Design Capacity	17.1 4	MW
Mean Annual Energy	68.7 7	GWh/ a
Reservoir	Nil	(ROR)
Length of Power Channel	2.45	Km
Cost of Access Road (8.1 KM+bridge)	0.09 5	M.US\$
Cost of Transmission Line (22KM)	0.43	M.US\$
Total Estimated Cost	20.0 2	M.US\$
Cost per kW	1124	US\$/ KW
Status of Project	Pre-Feasibility study completed	