BEFORE THE NATIONAL ELECTRIC POWER REGULATORY AUTHORITY

COST-PLUS TARIFF APPLICATION

IN RESPECT OF 2 MW BIRMOGH GOLEN HYDRO POWER PROJECT DISTRICT CHITRAL

Dated: 30.10.2017

Filed for and behalf of: SARHAD RURAL SUPPORT PROGRAMME

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1. Introduction

Sarhad Rural Support Programme is filing a Cost-Plus Tariff Petition (the "Petition") under Section 31 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 (the "NEPRA Act") read with Rule 3 of the NEPRA (Tariff Standards and Procedure) Rules, 1998, whereby any licensee, consumer or person interested in the tariff may file a petition with the Authority by filing it with the Registrar along with such fees as may be determined by the Authority from time to time.

2. Petitioner's Details

a) Petitioner's name: Sarhad Rural Support Programme (the "Company" or "SRSP").

- b) Authorized representatives: Mr. Masood ul Mulk S/O Khushamad ul Mulk, bearing CNIC No. 15201-8413435-9, the Chief Executive officer of the Company and Mr. Zahid Khan S/O Fazal Mehmood, bearing CNIC No.15602-0255609-3, the Project Manager of the Company.
- c) Address of the Petitioner: No. 109 Street 2-B, Defense Officer's Colony, Khyber Road, Peshawar, Khyber Pakhtunkhwa, Pakistan.

3. Grounds for Petition

Under the NEPRA Act, the National Electric Power Regulatory Authority is solely and exclusively responsible, *inter alia*, for the grant of generation, transmission and distribution licenses to companies and for determination and approval of tariffs, rates, charges and terms and conditions for the supply of electric power to the end consumer by the generation, transmission and distribution companies in Pakistan.

Sarhad Rural Support Programme (SRSP) is registered under Section 42 of the Companies Ordinance, 1984 (XLVII OF 1984) with Company Registration No. P-00337 and is the largest nongovernment, non-profit organization operational in Khyber Pakhtunkhwa and Federally Administered Tribal Areas (FATA). It is one of the 11 Rural Support Programmes established to reduce rural poverty and ensure sustainable means of livelihoods in urban and, especially, rural areas of Khyber Pakhtunkhwa Province of Pakistan.

The European Union has granted SRSP a financial award worth Euros 40,000,000 for the development of sustainable and innovative initiatives in order to eliminate poverty, curb employment and initiate capacity building through mobilization of the locals of the Chitral District. Further details in respect thereof have been annexed herewith.

By way of the aforesaid grant, SRSP, *inter alia*, intends to provide electric power to the locals of Khyber Pakhtunkhwa Province, in particular District Chitral through a 2 MW Hydropower Project at Birmogh Golen, District Chitral (the "**Project**") for tapping the hydropower potential in the district and achieve the aforesaid objectives of poverty elimination and community building. The Company will be responsible for the operations and management of the Project, which can either be undertaken itself or by engaging a competent O&M operator.

In order to comply with the requirements of Section 24 of the NEPRA Act and to have a specific objective of constructing, owning and operating a power generation facility, the Board of Directors of SRSP have approved the amendment of the Memorandum and Articles of Association of SRSP to include the planning, development and operations and management of hydropower projects as one of SRSP's objectives. The same has been submitted to the Securities

and Exchange Commission of Pakistan (SECP) for approval and it has been informed that the processing of the same is in advanced stage and will be decided favorably in due course. The approval of the Board of Directors for the aforementioned is attached hereto as **Annex [.]**. Once the approval of SECP is obtained, a copy thereof shall be submitted to NEPRA, prior to the final determination of this Petition.

Simultaneously with this Petition, the Company has already submitted its Generation License Application before NEPRA which is currently being reviewed by the Registrar Office. The Generation License Application before NEPRA is supported with all the pertinent documents, including but not limited to, a Feasibility Design Report, conducted by a well-recognized technical expert, namely DESIGNMEN Consulting Engineers (Pvt.) Limited, on the abovementioned site. The Feasibility Design Report would demonstrate the technical and financial viability of the Project. It is requested that the contents of the Generation License Application, to the extent that they are relevant, may kindly be read as an integral part of this Petition. However, the consultant will remain available to assist the learned Authority and satisfy any issues and provide necessary clarifications wherever required.

4. Background

SRSP was established in 1989 and since then it has been able to support development of over 40,733 community based organizations covering over 6.4 million population. SRSP enjoys a reputation based on its innovative initiatives undertaken as per needs of the poor and marginalized members of the society. On one hand, the investment of SRSP in the shape of programmatic, financial, technical, strategic and capacity building initiatives has led to the development of three tier level local institutions (community, village and union councils), while on the other hand, it has significantly contributed to social, economic and political development of rural areas and communities through various development packages.

SRSP's vision of development is to create a society where poverty is reduced and sustainable means of livelihood are ensured, while building social capital through mobilization of communities for poverty reduction in the Province of Khyber Pakhtunkhwa. It is the largest organization with an extensive presence in all 25 districts of Khyber Pakhtunkhwa and 13 tribal areas. Since its establishment, SRSP has expanded its programme from 2 to 25 districts and all 13 tribal areas. Extensive coverage in mentioned districts, strong presence at local level and network of established offices are few comparative advantages of SRSP to facilitate partners in development to initiate projects and programmes as per needs of local communities.

SRSP's core competencies include strengthening and improving rural livelihoods through formation of community based three tier institutions, developing their technical and managerial capacities, undertake community physical infrastructure schemes, extending micro credit loans through innovative products and packages, improving management of natural resources, support gender development and environment preservation.

The other stream of programme comprises responding immediately to large scale natural or man-made disasters. Recovery, relief through provision of food and non-food items and rehabilitation through delivering need based projects and programmes are some of the key aspects focused in humanitarian programmes.

For ease of reference, the core competencies of SRSP are briefly explained in a separate annex appended with this Petition as **Annex A**. Further details have been provided in SRSP's Profile,

attached hereto as Annex B. For further details, the website of the Petitioner may kindly be viewed i.e. web.srsp.org.pk.

5. Brief Description of Project Financing

In order to develop the Project, the Company was required to raise the capital to meet the project cost. In its efforts, the Company, *inter alia*, explored various options and identified the provision of European Union Grant, which could be utilized to meet the objective. After protracted negotiations, SRSP entered into a Grant Contract No. DCI-ASIE/2011/283-011 on 08.08.2012 with the European Union, represented by the European Commission, whereby the European Union has granted a total amount of Euros 40,000,000 to SRSP (the "Grant") under its Programme for Economic Advancement Community Empowerment (PEACE). The Implementation Period for the execution of PEACE is sixty-sixty (66) months.

The entire project cost incurred in the Project has been borne by the Company without seeking any commercial loans and debt financing. This project cost represents the 100% equity contribution.

6. Hydropower Generation in District Chitral

Currently, Pakistan is facing a huge electric power crisis as a result of failure of the Independent Power Producers (IPPs) to produce enough electricity to fulfill their available capacity. The country is in dire need of sustainable and reliable sources of energy generation for the social, technological and educational advancement and economic sustenance of the country. The main reasons for non-utilization are largely the shortage of gas and the increasing price of furnace oil in the last few years, making the generation of electricity extremely costly. Moreover, there is a limit to which the Government can subsidize tariffs and the deficit every year rounds to PKR 450 billion, that the Government bears.

The current energy deficit as well as the high electricity prices has extreme repercussions on the economy, which calls for short-term, medium-term and long term solutions. Given the rising prices of oil and shortage of gas, Pakistan will not be able to sustain on thermal based electricity generation, and it requires a shift to hydropower on a rigorous basis; there seems to be no other conclusive solution to the energy crisis.

Hydropower generation of electricity is based on the most essential and scarce source of natural resource: water. Despite its scarcity, using water for energy conversion is perhaps the oldest renewable technique that is pollution free and environmentally friendly. If coupled with mature technology, hydro power can be extremely efficient and operationally flexible.

Pakistan has great potential to develop its hydropower given the presence of high mountainous ranges, glaciers, rivers and its tributaries, in addition to monsoon and seasonal rains that increase the perennial flow pattern in the river system. The hydropower potential, based on the projects identified so far, has been assessed to be more than 50,000 MW. Whereas, the dams and run-of-river hydropower schemes are not being completely utilized and implemented.

In light of the above, it is essential that all resources are utilized to develop the hydropower potential on barrages and canal system of Punjab, Sindh and KPK, where several waterfalls can become a cheaper, sustainable and indigenous resource.

7. Private Sector Constraints in Electric Power Generation

The private sector is confronted with the following problems in setting up power generation plants in Pakistan:

- i. Lack of local machinery has forced many to import equipment- requiring hefty funds-that has increased power generation costs.
- ii. Power projects require a large amount of capital that the prospective investor has to arrange for.
- iii. Besides being capital-intensive, power projects have a long gestation period and can take a considerable amount of time to develop.
- iv. Local private investors find it difficult to arrange for foreign equity or joint venture partners.
- Arranging finances through local or foreign loans is cumbersome for the sponsors of private power projects since financial institutions are overly cautious in approving such loans and require time.
- vi. The gradual shift to hydro-thermal mix has increased production costs and led to higher tariffs.
- vii. Procedural rigidities also discourage private investors from venturing into this sector.
- viii. Depletion of gas reserves in the country is a major threat.
- ix. Increasing prices of RFO and Diesel in the last 20 years.

In view of the above, it is pertinent that hydel resources of the country are developed and utilized.

8. Project Summary

a) Project Site and Summary Description:

In response to severe energy crisis in Malakand Division1, SRSP initiated a six years' (2012-2018) integrated programme with the financial support of European Union (EU). The programme namely 'Programme for Community Advancement and Economic Development (PEACE)' comprise five components i.e. establishment of community institutions, infrastructure development, establishment of community managed micro hydro projects, women empowerment and growth of economic activities. Among these establishment of community managed hydro projects (MHPs) occupies half of the budget share (49%). The major focuses of establishing MHPs is to utilize immense potential of hydro resources available in Malakand division to produce clean, renewable, sustainable and affordable electricity through initiation and completion of 165 mini/micro/small hydro projects ranging from 25 kilowatt to 2 megawatt. These projects are expected produce 21 megawatt of electricity and provide clean 24/7 uninterrupted electricity to more than 75,000 households with a total cost of PKR 2.22 billion generating 21.7 MW and benefitting, predominantly, off-grid households at low cost when compared with national level tariff. SRSP's PEACE programme would, therefore, essentially focus on expanding energy infrastructure in underserved areas to benefit impoverished population. SRSP is making every endeavor to explore and harness the available water resources to achieve the goal socio-economic up-lift of rural communities and local development through construction of new power projects and improve the existing power generation & Distribution network of electricity.

¹ Malakand Division comprises 7 districts; Chitral, Buner, Shangla, Swat, Malakand, Upper and Lower Dir

The location of Chitral as the Project site is ideal for the development of hydropower generation project due to its hilly terrain, abundance of glaciers and waterfalls. The proposed Birmogh Golen Hydropower Project is a 2 MW project located in Birmogh Village, on left bank of Golen Gol River in Chitral District of Khyber Pakhtunkhwa (KP) and is being developed in the private sector under the management of Sarhad Rural Support Programme (SRSP). The Project is located some 34 km North-East of the city of Chitral and is expected to provide electricity to more than 25,000 households, civilians, children and military headquarter hospitals, laboratories, clinics and local administrative offices.

Chitral District is located at latitude 35.12°-36.50°N and longitudes 71.20°-73.55°E, 365 KM to Peshawar and 550 KM to the north of Islamabad. Chitral is an administrative district in the extreme north of Khyber Pakhtunkhwa Province of Pakistan. It has common borders with the districts of Dir and Swat in the South, Ghizer in the North-East and Afghan provinces of Badakhshan and Nuristan in the North and North-West. It is separated from Tajakistan by the narrow Wakhan Corridor. Border villages/valleys of Chitral like Arandu, Kalash valleys, Garamchashma areas starting from Arandu up to Boroghil, are connected with Afghanistan through porous borders and mountain passes. Total area of Chitral is 14850 Sq K.M, of which 4% has forest cover, 2% cultivable waste and about 3% cultivated area. Remaining area of the district consists of mountains, barren lands with sparse vegetation, especially in case of upper Chitral. Although mountains of upper Chitral are bare, and do not contribute any type of support in provision of fuel to local community.

The Project site is located at 35^o - 55' to 35^o - 56' N latitude and 72^o 01' to 72^o 02' E longitudes near Birmogh Village, located 34 KM from Chitral City. The access to the site is through 20 KM road from Chitral (Chew Bridge) up to Khogazi Police station leading towards the Project location. From Khogazi police station, it continues 3 KM to Golen Gol Power House Site location and then further a track of about 11 KM (with a couple of sharp curves) leads to the Birmogh Village. In this section of the route some important improvements of road and structures are required as described below:

- Entire track (preferably travelled via jeep) needs to be improved for transport of material and equipment for construction of Birmogh Golen HPP.
- Wooden Culvert before Roahilli Gol needs to be replaced with RCC Culvert.
- RCC Culvert in the start of the track near Uzghor village also needs improvement.
- Road realignment along power channel route will be required near intake area.

b) Salient features of the Project:

Salient Features							
Province	Khyber Pukhtunkhwa						
Nearest town	Chitral						
River	Golen River						
Project location	Village Birmogh, union council Koh, District Chitral						

Project Characteristics							
Installed capacity 1 MW x 2							
Rated discharge	2 Cumecs for each unit						

Gross head	62 Meter	
Net head at rated discharge	57 Meter	

	Hydrology
Average annual rainfall	500-1,00mm
Period of recorded river flow	15 years
Local river flow gauging station	Mastuj Bridge at Golen Gol Stream
Plant Factor	95.17%

Hydro Mechanical Equipment								
Type Francis Turbine – Horizontal type								
No. of units	2 Units							
Rated discharge per unit	2 Cumecs							
Capacity per unit	1 MW							
Unit speed	750 rpm & Ns 150 rpm							
System frequency	50 Hz							

Power House Dimension Length 22.2 meter							
Height	8.33 meter						

Forebay Tank								
Length 9								
Width	5							
Height	7.3							

Head Race Canal								
Length of headrace channel	615 meter							
Design discharge	6.5 cumecs							
Bed width (B)	3 m							
Depth of water (D)	1+0.2							
Flow area	3 m							
Wetted perimeter	5m							
Hydraulic radius	0.66							
Side slopes of headrace channels (HV)	Rectangular section							
Water surface slop of headrace channel	1:400							

7	Tail Race Canal						
Length of tailrace canal 70 meter							
Design discharge	6.5 Cumecs						
Bed width	3 meters						
Depth of water (D)	1 meter						
Flow area	4.5 m2						
Velocity	2.373 m/sec						
Slide slope of tailrace	Rectangular section						

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9. Hydrology and Generation

- a) The gauge station Golen Gol at Mastuj Bridge is the nearest one and just downstream of the Birmogh Golen Hydropower Project and its catchment area characteristics also resemble best with the project area. The Birmogh Gol Stream, on which the Birmogh Golen Hydropower Project is proposed, is one of the parental streams of the Golen Gol River. Although the intake site of the Birmogh Golen HPP is not a gauged site, also there is no other gauging station on Golen Gol River upstream of the Mastuj Bridge Station. Consequently, the 15 years discharge data of Golen Gol at Mastuj Bridge Station has been used to derive the flows at intake site for the Birmogh Golen Hydropower Project. The monthly flow data of Golen Gol at Mastuj Bridge is presented in Table 4-1.
- b) It is pertinent to bring to the Authority's attention that the annual plant factor of the Project is quite high as confirmed by the Feasibility Design Report as well as the actual operation of the plant.
- c) The estimated mean monthly flows are represented graphically below:

Vanr	Mean Monthly Flows (m ³ /s)											
rea	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1996	6.211	5.266	6.330	8.579	13.94	36.31	41.24	37.93	19.40	11.34	8.920	7.292
1997	6.567	6.272	6.046	7.884	10.90	28.56	45.04	32.23	24.62	13.85	9.977	9.186
1998	7.920	5.527	4.747	6.224	11.34	18.34	32.79	27.10	23.09	16.59	12.88	11.02
1999	9.073	8.138	8.157	9.630	15.96	31.53	38.24	37.49	25.75	12.90	11.78	10.29
2000	9.334	7.577	6.756	7.490	11.75	19.41	22.36	22.30	16.61	10.48	8.775	8.220
2001	7.923	7.218	6.863	6.709	9.70	13.93	15.98	18.58	15.12	11.58	10.31	8.911
2002	8.319	6.856	6.780	7.761	12.91	18.66	23.08	21.79	15.30	10.49	8.554	6.882
2003	5.414	4.902	4.428	5.320	8.448	25.01	31.70	22.80	15.33	11.23	8.308	7.009
2004	6.153	5.816	6.318	6.699	10.10	21.07	23.51	19.11	14.46	10.51	7.862	7.247
2005	6.040	5.26	5.96	9.19	13.69	30.25	44.07	31.03	20.48	12.92	10.86	9.442
2006	8.792	8.374	8.452	9.084	12.53	19.05	23.38	25.96	17.57	10.98	9.395	7.852
2007	6.991	6.658	7.111	9.802	15.97	28.1	36.64	27.99	20.11	11.76	7.394	7.121
2008	5.771	5.548	6.454	7.519	11.65	20.67	20.82	17.92	13.77	9.946	8.071	6.434
2009	6.53	6.33	6.19	7.40	10.57	18.82	30.49	28.05	17.39	12.12	10.2	8.430
2010	7.711	7.783	8.228	8.748	11.00	17.15	39.12	50.74	16.32	10.70	10.11	8.995
Monthly Mean	7	7	7	8	12	23	31	28	18	12	10	8

Table 4-2 : MEAN MONTHLY FLOWS OF GOLEN GOL AT MASTUJ BRIDGE

d) The estimated average annual energy production is calculated as being as 16.019GWh, which gives a Plant Factor of 93.88%. Because of its simplicity in applications for run of river projects, flow duration curve method of estimating power and energy has been used for evaluating the generation and energy of project. The flow duration curve constructed/developed for the years 1960-2010 with derived flows from Golen Gol River at Mastuj station reveals that the discharge for the Golen Gol River varies from 22.30m3/sec to 3.50m3/sec from 10% to 100% of time exceedance respectively. Usually, projects having available discharge for 50% of time exceedance are considered as viable schemes provided the economic analysis also favorably recommend the selected plant capacity. In our case for

this Project, flows of 4.0m3/sec have been selected for estimation of energy and power production, which is available for about 98% of time.

e) The estimated mean monthly power generation is represented graphically below:



Figure 5-1 : AVERAGE MONTHLY ENERGY GENERATION

f) The annual energy potential for the period 1996 TO 2010 and the average generation thereof is presented in the chart below:



Figure 5-2 : AVERAGE ANNUAL ENERGY GENERATION

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Table 5-2 : POWER AND ENERGY ESTIMATION POWER AND ENERGY ESTIMATION 2 UNITS = 4.0 CIMECS

Rated Dis	charge	= 4.0 m	7s	Rated Discharge/Unit = 2.0 m ³ /s							Environmental Flows = 1.2 m³/s			
Units Inst	alled =	2		In	stalled (Capacity	= 2.0 MV	v		Each	ı Unit C	apacity =	1.0 MW	
MONTH	ENERGY GENERATED (GWh)												Energy Generated Yearly	
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ост	NOV	DEC	E (GWH)	
1996	1.31	0.94	1.34	1.38	1.43	1.38	1.43	1.43	1.38	1.43	1.38	1.43	16.28	
1997	1.41	1.20	1.26	1.38	1.43	1.38	1.43	1.43	1.38	1.43	1.38	1.43	16.55	
1998	1.43	1.01	0.90	1.27	1.43	1.38	1,43	1.43	1.38	1.43	1.38	1,43	15.91	
1999	1.43	1.29	1.43	1.38	1.43	1.38	1.43	1.43	1.38	1.43	1.38	1.43	16.84	
2000	1.43	1.29	1.43	1.38	1.43	1.38	1.43	1.43	1.38	1.43	1.38	1.43	16.84	
2001	1.43	1.29	1.43	1.38	1.43	1.38	1.43	1.43	1.38	1.43	1.38	1.43	16.84	
2002	1.43	1.29	1.43	1.38	1.43	1.38	1.43	1.43	1.38	1.43	1.38	1.43	16.84	
2003	1.08	0.85	0.81	1.02	1.43	1.38	1.43	1.43	1.38	1.43	1.38	1.43	15.07	
2004	1.29	1.08	1.34	1.38	1.43	1.38	1.43	1,43	1.38	1.43	1.38	1.43	16.40	
2005	1.26	0.94	1.24	1.38	1.43	1.38	1.43	1.43	1.38	1.43	1.38	1.43	16.13	
2006	1.43	1.29	1.43	1.38	1.43	1.38	1.43	1.43	1.38	1.43	1.38	1.43	16.84	
2007	1.43	1.29	1.43	1.38	1.43	1.38	1,43	1.43	1.38	1.43	1.38	1.43	16.84	
2008	1.18	1.01	1.38	1.38	1.43	1.38	1.43	1.43	1.38	1.43	1.38	1.37	16.20	
2009	1.40	1.21	1.30	1.38	1.43	1.38	1.43	1.43	1.38	1.43	1.38	1.43	16.60	
2010	1.43	1.29	1.43	1.38	1.43	1.38	1.43	1,43	1.38	1.43	1.38	1.43	16.84	
Min	1.08	0.85	0.81	1.02	1.43	1.38	1.43	1.43	1_38	1.0	1.38	1.37	15.07	
Average	1.36	1.15	1.31	135	1.43	1_38	1.43	1.43	1_38	1.0	1.38	1.43	16.47	
Max	1.0	1.29	143	1.38	1.43	1.38	1.43	1.43	1.38	1.0	1.38	1.0	16.84	

Plant Factor = 93.88 %

= 93.88 %

Outages = 10 days Annually

Net Generation = 16.019GWh

10. Environmental Impact

The environmental benefits of hydro-electricity are well known. SRSP has made a remarkable contribution in providing renewable, clean and sustainable energy to local population in programme areas, which has reduced usage of fossil fuels, besides reducing pressure on precious forests. The irrigation channels to channelize water to the MHP has improved vegetation and helped in developing social cohesion. Increasing reliability of electricity would encourage households/businesses to stop use of other makeshift measures, such as costly diesel/gasoline generators both at households and commercial levels, leading to a handsome amount of savings. In addition to useful savings for businesses and local community members, transition to clean energy would result in reducing air pollution (SO2 and CO2 emissions) that would otherwise result from burning of diesel or other fossil fuels.

An analysis based on standard procedures and calculation reveals that the Golen unit producing 2 megawatt would be a major contributor in reduction of CO2 emissions by 4,435 tons per year. Similarly, the MHP would reduce the cost incurred on kerosene oil of beneficiary 25,000

households from 9 to 1 liters per day. The substantial decrease in usage of kerosene oil from 9 to 1 litre per month per household for lighting, cooking or heating would also contribute in improving health of women and children. Similarly, the MHP would also contribute in regeneration and preservation of local forests.

Copy of the approved IEE Report for the Project has been submitted along with the Generation License Application of SRSP and it is requested that the same may be read as an integral part of this Petition.

11. Implementation Schedule

Having raised the entire revenue requirement for the development of the Project, the construction of the Project was commenced on December 2014. The procurement process for the purchase of equipment and construction related works was initiated through transparent bidding. Tenders were floated and advertised in leading national dailies and after careful evaluation, the most competitive bidder was selected on the basis of suitability and technical experience.

The details of procurement process, copies of advertisement, the tender documents, the bid evaluation report and the executed contracts are a part of this Petition and annexed as Annex F to the Generation License Application of SRSP. It is requested that the same may be read as an integral part of this Petition.

Being a not-for-profit entity, special care has been given to ensure the transparency in the procurement process to demonstrate the prudency in the development of the Project.

The construction period comprises of twenty-six (26) months, which the learned Authority would appreciate is a reasonably quick time considering the nature of the Project. The construction phase of the project has completed and the Project is ready to undergo testing and commercial operations.

12. Provision of Land for the Project

The land for the development of the Project, the coordinates of which have been mentioned here above, has been obtained on a long term lease by the Company, which comprises of lease amount together with commitment of the Company to utilize local human resource and development programmes in the territories close to the Project site.

The total area comprising of the Complex, the power house, administrative and residential facility utilized for the Project roughly comprises of three (3) acres and without any resettlement costs or construction of tunnel etc.

The Company will expend an amount of PKR twenty million, including an establishment of micro hydro power plant of 50 KW for the exclusive utilization of the community.

13. Scope of the Project

a) Technical Parameters:

Gross Capacity	1MW x 2
Auxiliary Consumption	10Kw
Net Capacity	1.90 MW
Annual Generation	16.47 GWH

Number of Units	2 Units
Design Head	62 meter
Unit Discharge	2 Cumecs

b) Civil Works:

The Cost break-up of the key components is already a part of **Annex C** appended with the Petition, which may be read as an integral part of this Petition, in addition to the documents attached with the Generation License Application of SRSP.

c) Electrical and Mechanical Equipment:

The Cost break-up of the key components is already a part of **Annex C** appended with the Petition, which may be read as an integral part of this Petition, in addition to the documents attached with the Generation License Application of SRSP.

14. Proposed Tariff and Assumptions

a) Key project tariff parameters:

Capacity	2 MW
Net annual generation (average hydrology)	16.673 GWh
Plant factor	95.17%
EPC cost	Rs. 324,517,798
Total project cost	Rs. 383,215,955

b) Proposed tariff:

All figures in PKR/kWh	Year 1-30
Water use charge	-
Fixed O&M	2.0241
Insurance	0.2298
Return on Equity	3.9071
Withholding Tax	0.2930
Total tariff	
Levelized tariff (Year 1-30) (PKR/kWh)	6.4541
Levelized tariff (Year 1-30) (US cents/kWh) (@PKR 105/USD)	6.1468

c) Project Cost Assumptions:

Total Project Cost of Rs. 383,215,955, expressed in Pak Rupee, is based on the actual spend during the construction of the project. Break up of project cost is given below;

Description	Rs.
EPC Cost	324,517,798
Construction of Residential & Offices	7,000,000
Equipment and capital purchases	17,809,836
General and administrative costs	33,888,321
Total Project Cost	383,215,955

d) Capital Structure:

The Project is financed on the basis of hundred percent (100%) equity. The capital is injected solely by SRSP from the funds provided to it by the European Union for the development of District Chitral.

ROE of 17% is assumed (exclusive of 7.5% withholding tax on dividends) over 30 years. Return on Equity During Construction has not been assumed because funds have already been injected and the construction phase of the project has completed and the Project is ready to undergo testing and commercial operations.

e) EPC cost break-up:

SRSP executed project under various contracts instead of a turn-key EPC Contract. The contractors and machines were selected through a competitive bidding process.

Description	Rs.
EPC Cost	
Project feasibility, Designing & Consultant Fee	7,459,654
Crops & Land compensation and local development cost	9,500,000
Mini Hydel Power Station (Civil cost)	174,577,881
Electrical and Mechanical Equipment (EME)	110,057,325
Transmission and Distribution (T&D)	22,922,938
Total EPC Cost	324,517,798

f) Non-EPC costs:

i. Construction of Residential & Offices of Rs. 7,000,000 is assumed in the total Project Cost. As Project is situated in an area where it receives heavy snowfall in winter season, all roads to the Project site are covered with snow and roads are virtually closed. In addition, it is very difficult to commute on a daily basis. Therefore, it is required to construct a reasonable and safe residential accommodation for the team working on the operations and maintenance of the Project. Project is under evaluation of tenders and construction is going to start shortly. Please see Annex D for details of the same.

- ii. Equipment and capital purchases amount to Rs. 17,809,836. This includes purchase of various hardware and engineering equipment used during construction of the project.
- General and administrative costs amount to Rs. 33,888,321. This includes office and vehicle rent, repair and maintenance of vehicle, staff salaries paid during construction of the project.

g) Operating Assumptions

Fixed O&M expense include:

- costs associated with daily operations, scheduled maintenance, routine maintenance, services required for unscheduled maintenance, and any spare parts and consumables; and
- ii. costs associated with rents, utilities, travelling, entertainment, audit, legal and financial consultants, technical consultants, generation license fees, administrative cost, salaries of staff and other allied expenses for running the offices during operations.

h) Insurance:

The Insurance component will be adjusted annually upon the submission of an invoice of actual premium payment to an insurance company. For the purposes of tariff calculation, SRSP has assumed 1.00% of the EPC Price as an annual insurance cost.

Insurance cost component of tariff will be adjusted only on account of US \$/PKR exchange rate variation annually, not exceeding the insurance cost actually incurred.

i) Water Use Charge:

Water Use Charge is not assumed in the tariff and will be a pass through item in case it is levied in future during the term of the Project.

15. Hydrological Risk

This tariff structure and methodology assume that the hydrological risk shall be borne by SRSP itself and in case of non-availability of water flow, no capacity payments shall be made to the Company by the power purchaser.

16. Tariff Indexations

Various components of tariff will be adjusted on pre-determined formula and reference parameters. Indexation formula have been prepared taking into account NEPRA's recent determinations and the provisions of the standard drafts of energy purchase agreement.

The following indexations have been assumed for the purposes of this Application:

Component of Tariff	Indexations
Fixed O&M	Changes in US Dollar and US CPI
Insurance	Changes in US Dollar
Return on Equity (ROE)	Changes in US Dollar

17. Pass Through Items

SRSP requests the Authority that if the Company is obligated to pay any tax on its income from generation of electricity from small hydro, or water use charges/IRSA charges/other such levies or charges, not being refundable in nature, are payable by the Company for generation of electricity from small hydro or any duties and/or taxes, not being of refundable nature, are imposed on the Company up to the commencement of its commercial operations for import of its plant, machinery and equipment, the exact amount paid by the Company on these accounts shall be reimbursed by the power purchaser on production of original receipts. This payment should be considered as a pass-through payment spread over a twelve months period. Furthermore, in such scenario, the Company shall also submit to the power purchaser details of any tax/levies/charges savings and the power purchaser shall deduct the amount of these savings from its payment to the company on account of taxation.

The Company further requests that the adjustment for duties and/or taxes is restricted only to the extent of duties and/or taxes directly imposed on the Company. No adjustment for duties and/or taxes imposed on third parties such as contractors, suppliers, consultants, etc., be

imposed. Further, it is requested that withholding tax on dividend may appropriately be allowed as a pass through item.

18. Power Purchaser

In the Province of Khyber Pakhtunkhwa, Peshawar Electric Supply Company (PESCO) has the exclusive license (Distribution License No. 07/DL/2002 dated 30.04.2002) to engage in distribution service and to make sales of electric power to consumers in its Service Territory and its Concession Territory (as prescribed by its aforementioned Distribution License) subject to and in accordance with the terms and conditions of its Distribution License. By way of this exclusivity solely exercised in Khyber Pakhtunkhwa, PESCO is the most suitable body to evacuate power from SRSP's Project.

PESCO vide letter No. 1670/Hydel/Birmogh Golian dated 19.02.2017 has issued its No Objection Certificate (NOC) for power evacuation from SRSP's 2 MW Hydropower Project. However, the aforesaid NOC is conditional upon, *inter alia*, signing of Power Purchase Agreement (PPA) with Central Power Purchasing Agency Guarantee Limited (CPPA-G).

As the Authority is aware, it has previously decided that small hydropower generation companies, should have the option to sell electric power to either CPPA/NTDC on behalf of distribution companies at any voltage level or to the relevant distribution company at 132 KV or below. In order to provide clarity on the matter, the Authority has also notified the National Electric Power Regulatory Authority (Sale of Electric Power by Renewable Energy Companies) Guidelines, 2015, (the **"2015 Guidelines"**) which are also applicable to small hydropower projects of 50 MW or less capacity. With the notification of the 2015 Guidelines, ambiguities/barriers faced by small hydropower projects, regarding the identity of power purchaser are removed, whereby, a Renewable Energy Company, under the 2015 Guidelines, may sell electric power to a Distribution Company at 132 kV or below and/or to CPPA-G on behalf of Distribution Companies at any voltage level including 11 kV and above.

The Petitioner's preference would be to execute the power purchase agreement with PESCO, which is already off-taking power from SRSP and has so far received more than 2 million units of electric power, which not only confirms its willingness to offtake but also the fact that the necessary infrastructure required for the offtake is in place and fully energized. The Petitioner will not object if the Authority determines either CPPA or PESCO to act as SRSP's power purchaser.

19. Grid Interconnection

Hydropower project is by nature a site-specific project which requires the development and construction of necessary infrastructure facility in order to enable the power purchaser to offtake its generated output. Invariably, all hydropower projects require construction of infrastructure facility which can connect the grid with the bus bar of the project. In the case of the Company, the situation of the interconnection facilities provides a unique structure which is currently being utilized for the supply of electric power to PESCO, which the Company requests may be considered and treated as pre-COD sale, *inter alia*, allowing the components of tariff which, during such sales, are offered to comparable projects excluding the repayment of debt component, interest and return on equity.

The infrastructure and transmission facility which connects the Project with the grid comprises of 33 kV line which is in three separate segments. The Company has established a distribution

line of 33 kV stretched over an area of 7 KM which links the Company with the nearest distribution line owned and operated by PEDO, and which is further connected with the PESCO substation located at a distance of 33 KM at Judilasht.

As the Company intends to solely restrict its business to the generation activity, it is ready and willing to hand over its distribution infrastructure to the entity which the learned Authority determines to be best-suited to operate and maintain the distribution line. Upon the transfer of the asset to such entity, the Company requests the learned Authority to make appropriate determinations with respect to the reimbursement of the capital expenditure incurred for the development of the distribution structure on such terms and conditions which are applicable in these circumstances. The Company has particularly observed care and attention in the construction of the distribution line, including procurement of infrastructure following NTDC standards and safety benchmarks. Resultantly, this has enabled PESCO to off-take approximately 1 million units of electricity from the Project into the grid.

A Grid Interconnection Study, prepared by Welt-Konnect, was submitted to PESCO and accordingly approved. A copy of the GIS has been submitted with SRSP's Generation License Application dated 12.10.2017 and it is requested that the same may be read as an integral part of this petition. As instructed by PESCO in its letter dated 19.01.2017, appended herewith as **Annex E**, the Company submitted a copy of the GIS to NTDC for their comments and approval and it is anticipated that NTDC would process the same and intimate its approval to NEPRA during the pendency of this Petition. PESCO has further communicated vide letter No. CE (Dev)/3446-48 dated 21.07.2017 (attached herewith as **Annex F**) that SRSP's proposed interconnection scheme has been found technically feasible.

It is imperative that the learned Authority may determine the interconnection arrangement in a manner which enables the Company to generate its electric power and sell the same to the power purchaser seamlessly and uninterrupted.

A brief description of the interconnection arrangement would demonstrate that the 2 MW Birmogh Golen Hydropower Project is located in Birmogh Village, on the left bank of Golen Gol River in Chitral District of Khyber Pakhtunkhwa (KP). The Project is located some 34 km North-East of the city of Chitral at 35^o - 55' to 35^o - 56' N latitude and 72^o 01' to 72^o 02' E longitudes near Birmogh Village (34 KM from Chitral City). The access to the site is through a 20 KM road from Chitral (Chew Bridge) up to Koghazi Police station leading towards the Project location. From Khogazi police station, it continues 3 KM to Golen Gol Power House Site location and then further a track of about 11 KM (with a couple of sharp curves) leads to the Birmogh Village.

The contents of the Generation License Application may kindly be read as an integral part of this Petition.

20. Assumptions

The Petitioner's proposed tariff has been calculated on the basis of the following non-exhaustive list of assumptions - any change in relation thereto will require an appropriate adjustment in the proposed tariff:

- a) Project is under operations and construction has already been completed. Project has sold over 2195762 units to PESCO without any tariff arrangement.
- b) Project cost of Rs. 383,215,955 Loan~Equity ratio of 0~100.

- c) Annual plant factor of 95.17% is calculated on the basis of actual water flow and units produced in a year are 16,673,784 kWh.
- d) The Power Purchaser will NOT assume hydrological risk and will pay as per the availability of the Project.
- e) Insurance during construction is not assumed as project has already been constructed.
- f) 100% of the equity is provided by the donor agencies of SRSP.
- g) IRR of 17% is assumed (exclusive of 7.5% withholding tax on dividends) over 30 years. ROEDC has not been assumed as project has already completed the construction.
- h) Exchange Rate (PKR/US\$) is taken @ PKR 105.0 per US\$.
- Taxes (Federal, Provincial, Local or district), stamp duties and levies etc. are not factored in the tariff calculation and will be claimed separately under Tariff. Thereafter, the project cost in the tariff will be adjusted accordingly or will be treated as Pass-Through items in term of EPA.
- j) 7.5% withholding tax on dividend is assumed. Tariff doesn't include withholding tax of 7.5% and will be claimed to Off-taker as and when dividend is paid. Any changes in the aforesaid withholding tax regime will be "Pass-Through" to the Power Purchaser. General Sales Tax and all other taxes will also be treated as a "Pass-Through "
- k) The Zakat deduction on dividends (currently 2.5%), if levied, will be considered as "Pass-Through".
- The Power Purchaser will exclusively be responsible for the financing of construction, operation and maintenance of the Interconnection and Transmission Lines as per the prevailing policy at the time of tariff determination and any monies spent by the Petitioner shall be reimbursed by the power purchaser/system operator in accordance with the prevailing regime of NEPRA.
- m) Any other assumptions that are not expressly stated herein but are identified at the time of finalization of EPA between the Petitioner and the Power Purchaser may lead to changes in the Reference Generation Tariff.
- n) The payments to Workers Welfare Fund and Workers Profit Participation Fund have not been accounted for in the Project budget and it is assumed that the same shall be reimbursed at actual by the Power Purchaser.
- Any incentives given to any other small HPP will also be given to the Project and the Petitioner.
- p) The Petitioner will be entitled to raise further and additional grounds at subsequent stage and at the time of tariff hearing.
- q) In the tariff no adjustment for certified emission reductions has been accounted for. However, upon actual realization of carbon credits, the same will be distributed between the power purchaser and the power producer in accordance with the government policy, as amended from time to time;
- r) The tariff will be applicable for a period of thirty years (30) from the commencement of commercial operations;

21. General Submissions

The Company requests the Authority:

- a) that any general assumptions not covered in this Petition may be dealt with as per the standard terms of the Power Purchase Agreement and applicable NEPRA laws and policy;
- b) to allow pre-COD sale to SRSP, subject to the terms and conditions of the Power Purchase Agreement, at the determined tariff excluding principal repayment of debt component and interest component. Pre-COD sale will not alter the required commercial operations date stipulated by the Power Purchase Agreement in any manner;

- c) to allow emission/carbon credits as per policy applicable to the Company and as instructed by NEPRA from time to time;
- d) to allow SRSP indexation applicable to local interest as allowed to comparable hydropower projects;
- e) to allow SRSP indexation applicable to return on equity as allowed to comparable hydropower projects;
- f) to allow adjustment of insurance component;
- g) that since the Project has already been commissioned and is supplying units of electric power to PESCO, the Authority may kindly determine the plant factor after adjustment of auxiliary consumption of on gross installed capacity;
- h) that the tariff may kindly be determined for a period of thirty (30) years from the commencement of commercial operations;
- that it may kindly consider allowing the upfront_tariff for green field hydropower IPPs to SRSP in accordance with the provisions of the National Electric Power Regulatory Authority Interim Power Procurement (Procedures and Standards) Regulations, 2005;
- j) to consider the financing structure of the upfront tariff for small hydro power plants, whereby the debt equity ratio assumed in the upfront tariff is not subject to adjustment based on actual and the upfront tariff does not place any restriction on the actual debt equity ratio for any project; and
- k) to allow return on equity of 17% to SRSP, as is allowed in upfront tariff of small hydro power plants.

22. Approval Sought

In light of the aforesaid, SRSP requests the Authority to kindly approve the abovementioned proposed tariff.





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EXTRACTS FROM RESOLUTION PASSED BY THE BOARD OF DIRECTORS OF SARHAD RURAL SUPPORT PROGRAMME DATED 16th Feb, 2017

RESOLVED that Sarhad Rural Support Programme (the "**Company**") shall apply for a Cost-Plus Tariff in respect of the Company's 2 MW Small Hydro Power Project in Village Golen Birmogh, Union Council Koh, District Chitral of Khyber Pakhtunkhwa Pakistan (the "**Project**"), and in relation thereto, sign all requisite documentation, pay all applicable fees and undertake all other necessary and ancillary acts and deeds.

RESOLVED FURTHER that an application for a Cost-Plus Tariff be made to NEPRA with regards to the Project (the "Tariff Application").

RESOLVED FURTHER that Mr. Mr. Masood ul Mulk S/O Khushamad ul Mulk, bearing CNIC No. 15201-8413435-9, the Chief Executive officer of the Company and Mr. Zahid Khan S/O Fazal Mehmood, bearing CNIC No.15602-0255609-3 and Mr. Shahid Abbas S/O Sultan Muhammad, bearing CNIC No. 37405-6240030-9, be and are hereby authorized to sign the Tariff Application and any documentation ancillary thereto, represent before and provide any information required by the National Electric Power Regulatory Authority in relation to the Tariff Application, do all lawful acts and deeds necessary and ancillary for the processing, completion and finalization of the Tariff Application, and authorize legal advisors to represent the Company before the National Electric Power Regulatory Authority in respect of the Tariff Application.

CERTIFIED TO BE TRUE COPY lasood ul Mulk CEO SRSP/Company Secretory had Rural Support Programme 101 125

CERTIFICATION

CERTIFIED, that, the above resolution was duly passed by the Board of Directors of Sarhad Rural Support Programme in their meeting held on 16.02.2017, for which the quorum of directors was present.

FURTHER CERTIFIED, that the said resolution has not been rescinded and is in operation and that the said resolution has not been rescinded and is in operation and that the said resolution has not been rescinded and is in operation and that the said resolution has not been rescinded and is in operation and the said resolution has not been rescinded and is in operation and the said resolution has not been rescinded and is in operation and the said resolution has not been rescinded and is in operation and the said resolution has not been rescinded and is in operation and the said resolution has not been rescinded and is in operation and the said resolution has not been rescinded and is in operation and the said resolution has not been rescinded and is in operation and the said resolution has not been rescinded and is in operation and the said resolution has not been rescinded and is in operation and the said resolution has not been rescinded and is in operation and the said resolution has not been rescinded and is in operation and the said resolution has not been rescinded and is in operation and the said resolution has not been rescinded and is in operation and the said resolution has not been rescinded and is in operation and the said resolution has not been rescinded and the said resolution has not been rescinded and the said resolution and the said resolution has not been rescinded and the said resolution and the said resolution has not been rescinded and the said resolution and the said resolution has not been rescinded and the said resolution and the said resolution has not been rescinded and the said resolution and the said resolu

Masood ul Mulk CEO/Company secretory SARHAD RURAL SUPPORT PROGRAMME