



नेपाल विद्युत प्राधिकरण

(नेपाल सरकारको स्वामित्व)

योजना, अनुगमन तथा सूचना प्रविधि निर्देशनालय
विद्युत व्यापार विभाग

पत्र संख्या: ने.वि.प्रा. ०७७७८ वि.व्या.वि. च.नं. ३४८

मिति: २०७७०७२८

श्री विद्युत नियमन आयोग
सानो गौचरण, काठमाण्डौ ।

विषय:- थप कागजात तथा विवरण सम्बन्धमा ।

(मनाङ्ग मर्स्याङ्गदी जलविद्युत आयोजना, १३५ मे.वा.)

ताहाँको प.सं. २०७७०७८ च.नं. १४६ मिति २०७७०६२७ को पत्रानुसार माग गरिएका निम्नानुसारका विवरणहरु तथा थप कागजातहरु यसैसाथ संलग्न गरी पठाइएको व्यहोरा अनुरोध छ । साथै माग बमोजिमका कागजातका अभौतिक प्रति (Soft copy) ताहाँको इमेलमा पठाइएको व्यहोरा अनुरोध छ ।

बुँदा नं. ७ का सम्बन्धमा

प्राधिकरणका संचालनमा रहेका आयोजना तथा निजी क्षेत्रका जलविद्युत आयोजनाहरुले अवलम्बन गरेका मान्यताहरुलाई नै आधार मानी विकास गरेको वित्तीय मोडेलको ढाँचा कम्पनीलाई उपलब्ध गराइएकाले सोही अनुसार वित्तीय विवरण पेश भएको हो ।

बुँदा नं. १२ का सम्बन्धमा

आयोजनाबाट उत्पादन हुने विद्युतको अनुमानित तालिका हिसाव गर्दा आयोजनाको डिजाइन डिस्चार्ज अनुसार आयोजना चल्ने कूल संचालन घण्टा हिसाव गरिएको छ । पिकिङ्ग मोड तथा अफ् पिकिङ्ग मोडमा पनि जडित क्षमता मै परुणरूपमा संचालन हुने गरी उर्जा एकिन भएकाले केवल वास्तविक हेड मात्र समान रूपमा प्रयोग गरिएको हो । पिकिङ्ग मोडमा बाहेक अन्य समयमा नदी प्रवाहमा आधारित रहेर आयोजना संचालन गर्ने अवस्थामा फरक फरक हेडमा हिसाव गर्ने गरिएता पनि यस आयोजनाको हकमा पिकिङ्ग तथा अफ् पिकिङ्ग मोडमा जडित क्षमता अनुसार पूर्णरूपमा संचालन हुने गरी उर्जा एकिन गरिएको छ ।

बुँदा नं. १३ का सम्बन्धमा

१०० मेगावाट माथिका विद्युत आयोजनाहरुमा वैदेशिक लगानी रहने भएको र ती आयोजनाहरुमा विदेशी वित्तीय संस्था/लगानीकर्ताहरु संलग्न हुने भएकाले अंग्रेजी भाषामै मस्यौदा तयार भई ने.वि.प्रा. संचालक समितिबाट स्वीकृत गरिएको एवं यसअघि गरिएका वैदेशिक लगानीका जलविद्युत आयोजनाहरु खिम्ती, भोटेकोशी, माथिल्लो मर्स्याङ्गदी ए, काबेली ए, रसुवा भोटेकोशी र अपर त्रिशुली-१ जलविद्युत आयोजनाहरुको विद्युत खरिद विक्रि सम्झौता समेत अंग्रेजी भाषामै रहेको व्यहोरा अनुरोध गरिन्छ ।

✓ श्री डा.राम प्रसाद धिताल
✓ श्री रामकृष्ण खतिवडा
✓ श्री रामेश्वर प्रसाद कलवार
✓ श्री भागिरथी भट्टराई ज्ञवाली
✓ श्री सचिव

बोधार्थः
श्री प्रशासन शाखा

श्री आर्थिक प्रशासन शाखा
श्री भण्डार शाखा

✓ श्री २०७७ शान्ति जी,

विद्युत नियमन आयोग

वर्तन नं. ३२५

मिति २०७७/०७/२८

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(प्रवल अधिकारी)
निर्देशक

मनाङ्ग मर्स्याङ्गदी हाइड्रोपावर कम्पनी प्रा.लि., काठमाण्डौ ।

फोन.नं. ४१५३११०, ४१५३२३३, ४१५३२३४ फ्याक्स : ४१५३१११ Web: www.nea.org.np

Manang Marshyangdi Hydropower Company Pvt. Ltd.

विद्युत व्यापार विभाग

दर्ता नं.: १६५५ दर्ता मिति: ०६६६/२६

Registered No: 78222/067/068
PAN No: 304575565

च.नं. २०.३९९

श्री नेपाल विद्युत प्राधिकरण
दरबारमार्ग, काठमाडौं ।

१. कारोबार विकास (BD)	२. विभाग कोषाध्यक्ष (CV)
३. व्यापार तथा अर्थ (CF)	४. संसाधन व्यवस्थापन (RM)
५. अन्य.....	६. अन्य.....
क) आ.का. गर्ने	ख) छलफल गर्ने
ग) पेश गर्ने	घ) फाइल गर्ने
च) पापत्र	छ) अन्य.....

मिति: २०७७/०९/२५

६/२६

विषय : थप कागजात तथा विवरण पेश गरिएको बारे ।

श्री भिमजी
आ.का.
२०७७/०६/२६

उपरोक्त विषयमा विद्युत नियमन आयोगको मिति २०७७/०६/२९, च.नं. १४६ को पत्र मार्फत १३५ मेगावाट जडित क्षमताको मनाङ्ग मर्स्याङ्दी जलविद्युत आयोजनाबाट उत्पादन हुने विद्युतको खरिद बिक्री दर निर्धारण साथै आयोजनाको प्रवर्द्धक मनाङ्ग मर्स्याङ्दी हाइड्रोपावर कम्पनी प्रा.लि. तथा नेपाल विद्युत प्राधिकरण बीच विद्युत खरिद सम्झौताका लागि विद्युत नियमन आयोगबाट सहमति प्रदान गर्न उक्त आयोगले थप कागजात पेश गर्न तहाँ पत्राचार गरेको हुनाले माग भएबमोजिमको निम्न कागजात पेश गरिएको व्यहोरा अनुरोध छ ।

१. प्रवर्द्धक कम्पनीको सञ्चालकको नागरिकता, ठेगाना, कार्यकाल सहितको दर्ता किताब ।
२. आ.व. २०७६/०७७ लेखापरिक्षण नसकिएकोले आन्तरिक राजस्व कार्यालयमा २०७७/०९/२९ सम्म समयावधी थप गरिएको विवरण ।
३. २८२ मे.वा. बराबरको जडित क्षमता रहेको नदीको बहाबमा आधारित आयोजनालाई १३५ मे.वाट. जडित क्षमताको अर्ध जलाशययुक्त आयोजनाको रूपमा अध्ययन गर्नको निम्ति ने.वि.प्रा.बाट सैद्धान्तिक सहमति लिई आयोजनाको परिवर्तित डिजाइनका कारण जलाशय क्षेत्र थप हुदाँ तथा अन्य संरचनामा परिवर्तन हुदाँ पर्ने असरको तुलनात्मक विवरण सहितको पूरक वातावरणीय अध्ययन प्रतिवेदन नेपाल सरकार, वन तथा वातावरण मन्त्रालयको मिति २०७७/०४/२१ मा स्वीकृत भइसकेको पत्र र यसको कार्यकारी सारांश यसैसाथ संलग्न गरिएको छ ।
४. PING AN BANK, CHINA (平安银行) बाट २८ मार्च २०१९ मा र INDUSTRIAL AND COMMERCIAL BANK OF CHINA (中国工商银行) बाट २६ मार्च २०१९ मा प्रेषित उक्त आयोजनामा ऋण लगानी गर्ने आशयपत्र ।
५. ने.वि.प्रा. को विद्युत खरिद बिक्री सम्झौताको मस्यौदा तयार गर्नु पूर्व सम्पन्न गर्नु पर्ने आयोजनाको वित्तीय मूल्यांकन तथा प्राविधिक मूल्यांकन सम्बन्धी कागजात तथा सो अध्ययनको भौतिक तथा अभौतिक प्रति नेपाल विद्युत प्राधिकरणसंग सम्बन्धित छ ।
६. आयोजनाको स्वपूँजी तथा ऋण लगानी सम्बन्धी विस्तृत वित्तीय योजना सहित प्रवर्द्धक कम्पनीले आयोजनाको अनुमानित पुँजीगत लागत, आम्दानी, खर्च, अपेक्षित प्रतिफल, आयोजनाको ऋण सम्बन्धी विवरण, स्वपूँजी लगानी

Current Contact Office
BPC Complex, Buddhanagar-313
P.O.Box: 11728
T 00977-1-4784026
F 00977-1-4780994

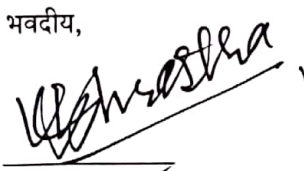
[Signature]



Registered Office
Dhumbarai - 4, Kathmandu
Email: mmhpp777@gmail.com

७. प्रवर्द्धक कम्पनीले तयार गरेको वित्तीय मोडेलमा प्रयोग गरिएका वित्तीय, प्राविधिक लगायतका अनुमान / मान्यता बुदाँ नं. ६ को तालिकामा समावेश गरिएको छ ।
८. आयोजनाको अद्यावधिक निर्माण तालिका संलग्न छ ।
९. उक्त आयोजना हाललाई बुटवल पावर कम्पनी लि.ले लगानी गरिरहेको र अन्य शोयसधनी समावेश पश्चात् आयोजना कार्यान्वयनको समयमा उक्त आयोजनामा संलग्न कम्पनीको सेयर लगानीको अनुपातमा स्वपूँजी लगानी गरिनेछ । ऋण लगानीको आधारमा स्वपूँजी लगानीको तालिका निश्चित हुने र उक्त कार्य ऋण सम्झौता भएपछि मात्र तय हुने ।
१०. आयोजनाको अनुमानित पूँजीगत लागतको मुख्य शिर्षक तथा उप- शिर्षकहरूको विस्तृत विवरण अध्ययन प्रतिवेदनको इकाई “ख”मा समावेश गरिएको छ जुन यसैसाथ संलग्न गरिएको छ ।
११. तल्लो तटमा रहेको आयोजना पनि एकै प्रवर्द्धकद्वारा क्यासकेड, पिकिङ्ग मोडलमा विकास गरिएकोले यस आयोजनाको विद्युत गृहबाट निस्किएको पानी “तल्लो मनाङ मस्यौडी जलविद्युत आयोजना”को हेडरेस टनेलमा पठाइने हुदाँ तल्लो तटिय आयोजनालाई असर नहुने देखिएको छ र सोको सम्बन्धमा तल्लो तटिय आयोजनाको कुनै आपत्ती नभएको व्यहोरा खुलाईएको पत्र यसैसाथ संलग्न गरिएको छ ।
१२. नेपाल विद्युत प्राधिकरणसंग सम्बन्धित छ ।
१३. नेपाली भाषामा लिपिबद्ध गरिएको विद्युत खरिद सम्झौताको मस्यौदा नेपाल विद्युत प्राधिकरणसंग सम्बन्धित छ ।
१४. जग्गा अधिग्रहण प्रक्रिया, विस्फोटक पदार्थको स्वीकृति, रुखको कटान प्रक्रिया सम्बन्धी विवरण सहित अन्य जानकारी अद्यावधिक भएको आयोजनाको प्रगति प्रतिवेदन यसैसाथ संलग्न छ । हाल सम्म भएको पूँजीगत खर्च यहाँ पेश भएको प्रगति विवरण अनुसार निर्माण भएका संरचना एवं अन्य पूँजीगत खर्चहरू पूँजीकरण हुन बाँकी रहेको र पूँजीकृत भएको खर्च यसैसाथ संलग्न छ ।
१५. पूँजीगत खर्च समयानुसार परिवर्तन हुने भएकाले प्रवर्द्धकले विभिन्न समयमा पेश गरेको पूँजीगत खर्च सम्बन्धी विवरणमा असमानता देखिएको भन्ने सम्बन्धमा हालसम्म पूँजीकृत भएको खर्च बुदाँ नं. १४ को खर्च विवरणबाट स्पष्ट हुन्छ ।
१६. विद्युत खरिद सम्झौताको सहमतिको लागि निवेदन दिने सम्बन्धमा कम्पनीको सञ्चालक समितिको निर्णयको प्रतिलिपी संलग्न छ ।
१७. नेपाल विद्युत प्राधिकरणसंग सम्बन्धित छ ।
१८. प्रवर्द्धक कम्पनीले ने.वि.प्रा. मा विद्युत खरिद विक्री सम्झौताको लागि निवेदन पेश गरेको पत्र यसैसाथ संलग्न गरिएको छ ।

भवदीय,



उत्तर कुमार श्रेष्ठ

प्रमुख कार्यकारी अधिकृत



Manang Marshyangdi Hydropower Company Pvt. Ltd

Registered No: 78222/067/068
PAN No: 304575565



श्री रजिष्टार ज्यू
कम्पनी रजिष्टारको कार्यालय
त्रिपुरेश्वर, काठमाण्डौ ।

मिति: २०७३/११/०२

विषय: संचालकहरुको दर्ता किताब अभिलेख गरी पाउँ ।

महोदय,

उपरोक्त सम्बन्धमा यस मनाङ्ग मर्स्याङ्गदी हाइड्रोपावर कम्पनी प्रा. लि. (Manang Marshyangdi Hydropower Company Pvt. Ltd.) "कम्पनी" को संचालकहरुको दर्ता किताब निवेदनका साथ पेश गरेको छु । संचालकहरुको दर्ता किताब अभिलेख गरी पाउँ ।

सलग्न कागजातहरु त्यस कार्यालयमा पेश गर्न, सोको प्रमाणित प्रति बुझीलिन तथा सो सम्बन्धी सम्पूर्ण आवश्यक काम कारवाही गर्न कानुन अधिकृत श्री निरज कुमार पोखरेललाई अधिकार प्रदान गरिएको छ ।

सलग्न कागजातहरु :

क्र.सं.	विवरण	थान	कैफियत
१.	अद्यावधिक संचालकहरुको दर्ता किताब	२	

निवेदक

नाम : उत्तर कुमार श्रेष्ठ

पद : संचालक

Current Contact Office
BPC Complex, Buddhanagar-313
P.O. Box 11728
T 00977-1-4784026
F 00977-1-4780994

Registered Office
Dhumbarai - 4, Kathmandu
Email: mmhnp777@gmail.com

मनाङ्ग मस्योङ्गदी हाइड्रोपावर कम्पनी प्रा. लि.

बालुवाटार, काठमाडौं, म.न.पा, नक्सा नं ०४, नेपाल

संचालकहरूको कार्यालय, कित्ताब

प्रा.लि.नं.- ७८२२२२/०६७/६८

यस मनाङ्ग मस्योङ्गदी हाइड्रोपावर कम्पनी प्रा.लि.को नाममा एन. २०६३ को रकम १०७ को प्रयोजनका लागि कम्पनीको संचालकहरूको

क्र.सं	संचालकको नाम र थर	पद	ठेगाना	ना. प्र. नं./ राहदानी नं.	पेशा/व्यवसाय	संचालकनियुक्तभ मिति	बहालमा रहने अवधि
१.	प्रदीपकुमार श्रेष्ठ	संचालक (अध्यक्ष)	गुण गल्ली, पुल्चोक, ललितपुर	१९२७१५६	व्यवसाय	२०७५.१२.१३	२ वर्ष
२.	शेरधनी बृटवल पावर कम्पनी लिमिटेडद्वारा नियुक्त विजयबहादुर श्रेष्ठ	संचालक	अद्वैत मार्ग, वासवजोरा, काठमाडौं	२७	व्यवसाय	२०७५.१२.१३	२ वर्ष
३.	उत्तर कुमार श्रेष्ठ	संचालक	बुद्धनगर, काठमाडौं	३६१६।५७	सेवा	२०७५.१२.१३	२ वर्ष
	शेरधनी बृटवल पावर कम्पनी लिमिटेडद्वारा नियुक्त						

प्रमाणित गर्नेको

हस्ताक्षर

[Signature]

नाम : उत्तर कुमार श्रेष्ठ

पद : संचालक

मिति : २०७६.११.१०

नेपाल सरकार
अर्थ मन्त्रालय
आन्तरिक राजस्व विभाग
आन्तरिक राजस्व कार्यालय टंगाल

करदाता सम्बन्धी विवरण

सविन नं: 770026126549

This Record Has Been Verified On 2077.06.28.

स्था. ले. नं. : ३०४५७५५६५

नाम : मनाङ्ग मर्स्याङ्गदी हाईड्रोपावर कम्पनि प्रा. लि.

फोन : 9851093601

ठेगाना	घर नं. :	वार्ड नं.:	गाउँ / टोल र बाटोको नाम:	<input checked="" type="checkbox"/> म न ण <input type="checkbox"/> न ण	<input type="checkbox"/> र म न ण <input type="checkbox"/> गा छि म	जिल्ला:
		4	धुम्बाराही	काठमाडौं		

आर्थिक वर्ष:

बढाइएको कर विवरण दाखिला म्याद:

दती मिति:

२०७६.०७७

२०७७.०९.२९

२०७७.०६.२८

म्याद बढाउनु परेको कारण:

audit not finalized yet

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अधिकृत कोड:

नाम:



नेपाल सरकार
वन तथा वातावरण मन्त्रालय

EX: पो. व. नं.: ३८८७
सिंहदरबार, काठमाण्डौ

वातावरण तथा जैविक विविधता शाखा

वातावरण मन्त्रालय
सिंहदरबार, काठमाण्डौ

पत्र संख्या :-

पलानी नं.: ४८

प्राप्त पत्र संख्या र मिति :-

मिति: २०७७/०४/२६

श्री ऊर्जा, जलस्रोत तथा सिंचाइ मन्त्रालय
सिंहदरबार, काठमाण्डौ ।

विषय:-मनाङ्ग मर्स्याङ्गदी जलविद्युत (१३५ मे.वा.) आयोजनाको पूरक वातावरणीय प्रभाव
मूल्याङ्कन प्रतिवेदन स्वीकृत गरिएको बारे ।

तहो मन्त्रालयको प.सं. ०७६/०७७ च.नं. ११५१ मिति २०७७/०१/३० को पत्रसाथ प्राप्त श्री मनाङ्ग मर्स्याङ्गदी हाइड्रोपावर कम्पनी प्रा.लि. प्रस्तावक रहेको मनाङ्ग मर्स्याङ्गदी जलविद्युत (१३५ मे.वा.) आयोजनाको पूरक वातावरणीय प्रभाव मूल्याङ्कन प्रतिवेदन उपर कारवाही हुँदा प्रस्तावकबाट प्राप्त परिमार्जित पूरक वातावरणीय प्रभाव मूल्याङ्कन प्रतिवेदन (June, 2020) प्रचलित कानूनको विपरित नहुनेगरी प्रस्तुत दस्तावेजमा कार्यान्वयन र पालना गर्ने भनी प्रतिवद्धता जनाइएका विषयहरूको प्रस्तावकले पुर्ण कार्यान्वयन गर्नेगरी तपशिलका शर्तसहित वातावरण संरक्षण नियमावली, २०७७ को नियम ११ को उपनियम (५) बमोजिम नेपाल सरकार (मा.मन्त्रीस्तर) को मिति २०७७/०४/२१ को निर्णयानुसार स्वीकृत गरिएको व्यहोरा अनुरोध छ ।

शर्तहरू:-

१. प्रस्ताव कार्यान्वयनको क्रममा थप/नयाँ वातावरणीय प्रभावहरू देखिएमा प्रस्तावकको आफ्नै खर्चमा न्युनिकरण/निराकरण गर्नु पर्नेछ ।
२. प्रस्ताव कार्यान्वयन तथा संचालनको सन्दर्भमा वातावरण तथा आयोजनासँग सम्बन्धित निकायबाट जारी ऐन,नियम,निर्देशिका, मापदण्ड तथा परिपत्रको पुर्ण पालना गर्नु पर्नेछ ।
३. प्रस्ताव कार्यान्वयनको क्रममा गरिने वातावरणीय अनुगमन/मूल्याङ्कनको वार्षिक प्रगती प्रतिवेदन यस मन्त्रालय लगायत अन्य सरोकारवाला निकायहरूमा नियमित रूपमा पठाउनु पर्नेछ ।
४. वातावरणीय प्रभाव मूल्याङ्कन प्रतिवेदनमा उल्लेख भएअनुसार आयोजना कार्यान्वयन क्षेत्रमा वासस्थान रहेका स्थलीय एवं जलीय जीवजन्तु तथा वनस्पतीको वासस्थान र पारिस्थिकिय प्रणालीमा कम भन्दा कम असर पर्नेगरी निर्माण कार्य गर्नु पर्नेछ ।
५. आयोजना कार्यान्वयन गर्दा निस्कने फोहर पदार्थहरूको विर्सजन भविष्यमा नकारात्मक प्रभाव नदेखिनेगरी गर्नु पर्नेछ ।

फोन नं.: ४२११७०३, ४२११७३७, ४२११७५५, ४२११८६४ फ्याक्स नं.: ४२११८६८



नेपाल सरकार

वन तथा वातावरण मन्त्रालय

EX: पो. व. नं. : ३८८७
सिंहदरबार, काठमाण्डौ

वातावरण तथा जैविक विविधता विभाग

- पत्र संख्या : ८८ गराउनु पर्नेछ ।
पलानी नं. ८८ गराउनु पर्नेछ ।
प्राप्त पत्र संख्या : ८८ गराउनु पर्नेछ ।
६. आयोजना निर्माण सम्पन्न भएको जानकारी प्राप्त भएकाले अन्य सरोकारवाला निकायलाई जानकारी गराउनु पर्नेछ ।
८. आयोजना कार्यान्वयन गर्दा सरोकारवाला निकायहरूसँग गर्नुपर्ने आवश्यक समन्वय प्रस्तावकले गर्नु पर्नेछ ।
९. आयोजना निर्माणको क्रममा तल्लो तटीय क्षेत्रमा पर्ने असरहरूको निराकरणका लागि गरिने कार्यहरूको कार्यान्वयन गर्दा सरोकारवालाहरूसँगको समन्वयमा गर्नु पर्नेछ ।
१०. प्रस्तावित आयोजनाको मिति २०७१ असार २ गतेको तत्कालिन नेपाल सरकार, विज्ञान, प्रविधि तथा वातावरण मन्त्रालयको (सचिवस्तर) निर्णयानुसार स्वीकृत भएको वातावरणीय प्रभाव मुल्याङ्कन अध्ययन प्रतिवेदन पूरक वातावरणीय प्रभाव अध्ययन प्रतिवेदनको अभिन्न अङ्ग हुनेछ ।

(अमर बहादुर ओली)
समाजशास्त्री

बोधार्थ:-

श्री वातावरण विभाग, बबरमहल, काठमाण्डौ ।

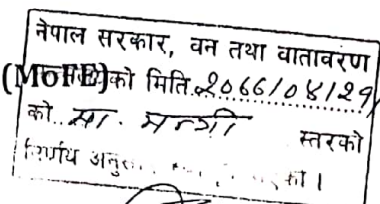
श्री मनाङ्ग मस्यङ्गदी हार्डिङ्गोपावर कम्पनी प्रा.लि. का.म.न.पा. ४, काठमाण्डौ ।

**SUPPLEMENTARY ENVIRONMENTAL IMPACT ASSESSMENT
(SEIA) STUDY
OF
MANANG MARSYANGDI HYDROELECTRIC PROJECT
(135.0 MW), MANANG, GANDAKI PROVINCE, NEPAL**



Submitted To:

Government of Nepal
Ministry of Forests and Environment (MoFE)
Singhadurbar, Kathmandu



Through

Department of Electricity Development
&
Ministry of Energy, Water Resources and Irrigation (MoEWRI)
Singhadurbar, Kathmandu

[Signature]

Submitted By:

**Manang Marshyangdi Hydropower
Company Pvt. Ltd.**
Kathmandu-4, Nepal
Tel: 014427913
Email: MMHEP777@gmail.com

Prepared by:

**Nepal Environmental & Scientific Services [NESS]
(P) Ltd.**
GPO Box 7301, Jitjung Marg-26, Thapathali, Kathmandu, Nepal
Tel: 977-1-4244989/4241001; Fax: 977-1-4226028
E-mail: ness@mos.com.np; Web: www.ness.com.np



June, 2020

कार्यकारी सारांश

पृष्ठभूमि

मनाङ्ग मर्स्याङ्दी जलविद्युत आयोजनाको प्रवर्द्धक मनाङ्ग मर्स्याङ्दी जलविद्युत कम्पनी प्रा. लि. हो। यो आयोजना गण्डकी प्रदेश अन्तर्गत मनाङ्ग जिल्लामा पर्दछ। सन् २०१४ को स्वीकृत वातावरणीय प्रभाव मूल्याङ्कन अनुसार यो आयोजनाको क्षमता २८२ मेगावाट थियो। हालको सम्भाव्यता अध्ययनको निर्यालवाट यो आयोजना क्षमता १३५ मेगावाट मात्र कायम गरिएको छ। यस पूरक वातावरणीय प्रभाव मूल्याङ्कन प्रतिवेदनमा आयोजनाको हालको परिवर्तित आकार, प्रकार संरचना, क्षमता, प्रभावहरू आदिलाई पूर्व स्वीकृत वातावरणीय प्रभाव मूल्याङ्कन प्रतिवेदनसँग दाँजेर तैयार गरिएको हो।

वातावरण संरक्षण नियमावली, २०५४ अनुसार यस आयोजनाको पूरक वातावरणीय प्रभाव मूल्याङ्कन गर्नुपर्ने आधारहरू प्रष्ट गरिएको छ। १. आयोजनाको भौतिक संरचनाहरू पूर्व स्वीकृत वातावरणीय प्रभाव मूल्याङ्कन प्रतिवेदनमा उल्लेखित चारकिल्ला भित्र रहनु, २. २८२.० मे.वा. वाट आयोजनाको जाडोत क्षमता १३५.० मे.वा. हुनु, ३. आयोजनालाई आवश्यक वन क्षेत्र ३५.५३ हे. वाट घटेर २८.२४ हे. हुने हुदा १०% भन्दा बढी वन क्षेत्र नबढ्नु र ४. आयोजनाको कारण कुनै पनि थप ब्याक्ति वा घरपरिवार विस्थापित नहुने भएकाले पूरक वातावरणीय प्रभाव मूल्याङ्कन गरिएको हो।

आयोजनाको विवरण:

प्रस्तावित आयोजना वेसीशहरदेखि ६५ कि. मि. र काठमाडौं देखि २३५ कि. मि. पश्चिममा रहेको छ। आयोजनाको चार किल्ला २८°३२'०५" उ - २८°३३'३७" उ र ८४°१५'३८" पू - ८४°२०'००" पू भित्र रहेको छ। आयोजनाको संरचनाहरू मनाङ्गको चामे र नासो गाउँपालिकामा पर्ने कोतो, चिटीयू, थानचोक, तिमाङ, स्याकू र दानक्यूमा पर्दछ। यो आयोजनाको Headworks वाट नर खोला र मर्स्याङ्दी खोलाको दोभानभन्दा करिब ५०० मि. तलको कोतो गाउँमा प्रस्ताव गरिएको छ। यस आयोजनाको विद्युतगृह चिनो खोला र मर्स्याङ्दी नदीको दोभानभन्दा १.४ कि.मि. माथि बगरछापमा मर्स्याङ्दी खोलाको देब्रे किनारामा अवस्थित छ।

प्रस्तावित आयोजनामा २४ मि. अग्लो बाँध (Concrete gravity dam) रहने छ। मर्स्याङ्दी खोलाको पानीलाई ६०७५ मि. लामो Head Race Tunnel (सुरुङ्ग) मार्फत विद्युतगृहमा पुर्‍याएर १३५ मेगावाट विद्युत उत्पादन गर्न प्रयोग गरेर पुनः सो पानीलाई मर्स्याङ्दी नदीमा मिसाइने छ। यो आयोजनाको टेलरेसलाई तल्ला मनाङ्ग मर्स्याङ्दी जलविद्युत आयोजनाको हेडवर्क्समा लगेर जोडिएको छ। यस आयोजना पूर्णतः अन्नपूर्ण संरक्षण क्षेत्र भित्र पर्दछ। यो आयोजनाको विद्युतगृह ७०० मि. माथि सन्नु बाहेक भौतिक पूर्वाधारहरूमा कुनै परिवर्तन भएको छैन।

आयोजनाको तुलनात्मक विवरण:

विशेषता	(१३५ मे.वा.) पू.वा.प्र.मू.२०२०	(२८२ मे.वा.) वा.प्र.म २०१४
१. साधारण	मनाङ्ग मर्स्याङ्दी हाइड्रोपावर (एम १) हाइड्रो- ईलेक्ट्रिक प्रोजेक्ट	
आयोजनाको नाम	मर्स्याङ्दी खोला	
नदी	अर्ध जलाशययुक्त	
आयोजनाको प्रकार	नदीको प्रवाह	
अवस्थिति	गण्डकी	
प्रदेश	मनाङ्ग	
जिल्ला	चामे र नासो	
गाउँपालिका		
आयोजनाको चार किल्ला		
अक्षांश	२८°३१'२७" उ देखि २८°३३'३७" उ	२८°३२'०५" उ देखि २८°३३'३७" उ
देशान्तर	८४°१५'३८" पू देखि ८४°२०'२०" पू	८४°१५'३८" पू देखि ८४°२०'००" पू
मुहानको अवस्थिति	मर्स्याङ्दी खोला र नर खोलाको संगमको करिब ५०० मीटर तल	
विद्युतगृहको अवस्थिति	मर्स्याङ्दी खोला र चिनो खोलाको संगमको माथि करिब १४०० मी	मर्स्याङ्दी खोला र चिनो खोलाको संगमको उपस्ट्रिम करिब ६०० मी मा
नजिकको वस्ति	वेसी शहर, लमजुङ	
२. सस्था		

प्रयत्नक	मनाङ्ग मर्स्याङ्दी हाइड्रोपावर कम्पनी प्रा. लि	
३ जल विज्ञान / प्रवाह	१६३५ कि.मी ^२	
जलाधार क्षेत्र	१६३५ कि.मी ^२	
डिजाइन वहाव	३७.७८ m ^३ /s (Q _{40.8})	७४.०० (Q ₃₃)
सरदर वार्षिक प्रवाह	५५.९९ m ^३ /s	१११.९९ m ^३ /s
४. भू-गर्भ	दक्षिणमा मुख्य केन्द्रीय थ्रस्ट र उत्तरमा दक्षिण लिब्वती डिटेचमेन्ट फाल्ट सिस्टम	
५. सरचनाहरू	पानी फर्काउने सरचना	
बाँधको प्रकार	नन् ओभरफ्लो कक्रिटको बाँध	गेट भएको बाँध
बाँधको लम्बाई	८९.५ मी.	
वढी पानी बग्ने वाटोको आकार	८ मी. X ८.५ मी.	१२.०० मी. X १५.०० मी.
संख्या	२	३
पूर्ण क्षमता विन्दू	२५८२ masl	२५८० masl
उच्चतम विन्दू	२५६३ masl	२५६५ masl
वाढीको डिजाइन	६९.०० cumecs (Q _{५०})	१९८९.०० cumecs (Q _{२००})
गेटको प्रकार	गोलाकार	
अन्डर स्लसुईसको आकार	३ मी. X ८.५ मी.	
	इन्टेक	
प्रकार	बाँधसँगैको छेउको मुहान	
संख्या	२	४
आकार	६ मी. X ५ मी.	५.३० मी. X ५.०० मी. X १.५० मी.
इन्टेक इन्भर्ट लेभल	२५७७ masl	२५६८.३० masl
	नहर सरचना	
प्रकार	आयातकार	ढलान गरिएको गोलाकारको स्पष्ट व्यास ५.६० मी.
संख्या	१	
लम्बाई	४३.५ मी	
आकार	१० मी. X ६-६.४ मी.	
	थिग्रान सरचना	
प्रकार	सतह	भूमिगत
संख्या	२	४
आकार (ल X चौ X ऊ)	१६० मी. X १४ मी. X १३.६ मी.	१३२ मी. X ९.६० मी. X १९.९०
थिग्रानको आकार	०.१ mm	>०.२ mm (आकारमा)
दक्षता	८६.६% (०.१५ mm, माथि ८६.६%)	
	नदीमा बग्ने सरचना	
प्रकार	डि अकारको कल्भर्ट	
लम्बाई	५१.३२७ मी.	
आकार (W X H)	३.५ मी. X ३.३ मी.	
	सुरुङ्गा	
प्रकार	घोष्टिएको डि	निर्माण पछि गोलाकार र घोडाको टोप आकारमा उत्खनन
आन्तरिक व्यास (W X H)	४.४-५.३ मी. X ४.९५-५.३ मी.	व्यास ५.०० मी.

लम्वाई	६०७५.५० मी.	५५५०.०० मी.
निर्माण अडिट	संख्या ३	
प्रकार	ढलान	
सर्ज शाफ्ट		
प्रकार	ठाडो शाफ्ट	आरिफिस
व्यास	६ मी.	१४ मी.
गहिराई संरचना	८३.३ मी.	७०.०० मी.
पेनस्टक		
विभाजित हुनु अधिको लम्वाई	९६५.४२ मी.	५३७.८३ मी.
आन्तरिक व्यास (m)	३.३ मी.	४.६० मी. घोडाको टाँप आकार सहितको सुरुङ सहित व्यास ६.१० मी.
प्रकार	गोलाकार स्टिल	
विद्युत गृह		
प्रकार	सतह	
आकार (L x W)	६६ मी. x २५	१०२.२० मी. x १९.७० मी.
उचाई	३५ मी.	२१.७० मी. (संरचनाको उचाई) र १३.०० मी. (संरचनाको उचाई)
टरवाईन लेवल	२१५१.८० masl	२१२५ masl
६. टरवाईन		
प्रकार	पेल्टन	
संख्या	२	४
प्रति युनिट क्षमता	६९.५८ मे.वा.	७०.५ मे.वा.
टरवाईनको लेवल	२१५१.८० masl	२१२५.०० masl
हेड	४१८.९ मी.	४५५ मी.
७. गभर्नर		
प्रकार	पि.आई. डि	
स्पिड ड्रिपको समायोजन	३०% भन्दा कम र बराबर	
८. जेनेरेटर		
प्रकार	सिंक्रोनस ३ फेज	
क्षमता	६७.५ मे.वा.	७०.५ मे.वा.
पावर फ्याक्टर	०.८५	
भोल्टेज	११ के.भि	
आवृत्ति (Hz)	५० Hz	
ईकाइ	२	४
उत्साह प्रणाली	स्थिर प्रकार	स्थिर / ब्रसलेस
दक्षता	९७%	
९. ट्रंसफरमर		
क्षमता	८० MVA	२७.६५ MVA
ईकाई संख्या	२	१३ (१२+१ अतिरिक्त)
भोल्टेज अनुपाल	२२०/११ (के.भि)	
ट्रंसफरमर दक्षता	९९%	९९.५%
१०. प्रसारण लाइन		
भोल्टेज स्तर	२२० के.भि	२२० के.भि (एकल सर्किट)
प्रसारण लाइनको लम्वाई	२ कि.मी	१०० कि.मी.(मध्य मर्स्याङ्दी हव)
सुरु ~ अन्त्य	आयोजनाको सिन्धुखुम्बु जिल्ला नेपाल	मनाङ्ग मर्स्याङ्दी हाइड्रोपावर

	विद्युत प्रधिकरणको प्रस्तावित धारापानी सब स्टेशन	प्रोजेक्ट ~ प्रस्तावित नयाँ सब स्टेशन
११. शक्ति र उर्जा		
जडित क्षमता	१३५ मे.वा	४ X ७.५० मे.वा
सुख्खा महिनाको उर्जा	२२९ GWh (३०.५%)	१४७.०२ GWh
बर्खा महिनाको उर्जा	५२२ GWh (६९.५%)	१२४६.४९ GWh
१२. जमिनको आवश्यकता		
स्थायी	३४.०३ हे	१९.९५ हे
अस्थायी	१९.७ हे	३२.१६ हे
१३. वित्तिय सुचक		
क) कूल लागत ब्याज बाहेक (अमेरिकन डलरमा)	२८६ मिलियन	३२२.९४ मिलियन

तुलनात्मक विद्यमान वातावरणीय अवस्थिति:

भौतिक वातावरण

प्रस्तावित आयोजना मनाङ्ग जिल्लाको अन्नपूर्ण संरक्षण क्षेत्रमा पर्दछ । यसको भू-वनोट भिरालो चट्टानयुक्त छ । आयोजनाले ओगट्ने क्षेत्रको उचाई ४८०० मी. देखि २९०० मी. भित्र पर्दछ । आयोजना क्षेत्रमा gneiss र schist जस्ता चट्टान पाइन्छन् । आयोजना स्थल टुन्ड्रा/ चिसो जलवायु क्षेत्रमा पर्दछ । आयोजना क्षेत्रमा जहाँ वार्षिक ४२७ मि.मी वर्षात हुन्छ । यस आयोजनाको मुख्य जलाधार भनेको तिलिचो ताल हो । जसमा सहायक नदीहरु Thorong Khola र नार खोलाले पनि योगदान गर्दछन् । १६३५ वर्ग कि.मी जलाधार क्षेत्र भएको यस आयोजनाको design discharge ३६.७८ m³/s रहेको छ । भूकम्पीय जोखिमको हिसावले यस आयोजना मध्य जोखिमयुक्त क्षेत्रमा पर्दछ । नेपालका अन्य हिमाली क्षेत्र भन्दा यस क्षेत्रमा हिमताल विस्फोटनको संभावना न्यून रहेको छ ।

तसर्थ आयोजनाको भौतिक वातावरण तर्फ पहिलेको २८२ मे.वा. को आयोजना भन्दा यस १३५ मे.वा. को आयोजनाको भौतिक आधारभूत (baseline) वातावरणमा खासै फरक छैन ।

जैविक वातावरण

यो आयोजना क्षेत्रको वनमा गोब्रे सल्लाको वाहुल्यता रहेको छ । हेडवर्क्स क्षेत्रमा १० प्रजातिका रुख, २९ प्रजातिका झाडी, १६ प्रजातिका घाँस पाइन्छन् भने विद्युतगृह क्षेत्रमा १८ प्रजातिका रुख, ५२ प्रजातिका झाडी, र २६ प्रजातिका घाँस पाइन्छन् । आयोजना क्षेत्रमा पाइने ओखर र सुनाखरी संरक्षित वनस्पतिका प्रजातिमा पर्दछन् । चितुवा, रतुवा मृग, घोरल, बाँदर, दुम्सी, स्याल लगायत ५५ प्रजातिका स्तनधारी प्रजाति रहेको ACAP को ठम्याई छ । १९ प्रजातिका चरा, ८ प्रजातिका घस्रने जीव, ३६ प्रजातिका पुतलीका प्रजाति यस क्षेत्रमा पाइन्छन् । यस आयोजना क्षेत्रमा पर्ने मर्स्याङ्दी नदीमा अध्ययनको क्रममा माछा प्रजातिहरु भेटिएनन् । यसरी जैविक वातावरणीय अवस्थितिमा कुनै परिवर्तन भएको पाइएन ।

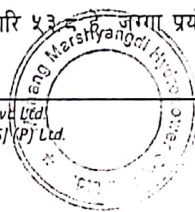
सामाजिक तथा आर्थिक वातावरण

प्रस्तावित आयोजना मनाङ्ग जिल्लाको चामे र नासो गा.पा. मा पर्दछ । चामेको जनसंख्या ११२९ घरधुरी संख्या २७९ रहेको छ भने नासोको जनसंख्या १९३८ र घरधुरी ४५४ रहेको छ । चामेमा १२ जातीय समूह छन् भने नासोडमा ८ जातीय समूह रहेका छन् । बौद्ध, हिन्दू र जीववाद (animism) यस आयोजना क्षेत्रमा मानिने प्रमुख धर्म हुन् । बहुसंख्यक वासिन्दाले नेपाली भाषा बोल्ने यो क्षेत्रमा गुरुङ्ग र तिब्बती भाषा पनि बोलिन्छ । यस आयोजना पर्ने गाउँपालिकामा ३ वटा सरकारी विद्यालय रहेका छन् । यस क्षेत्रका वासिन्दाहरुको मुख्य आयश्रोत पर्यटन, कृषि तथा पशुपालन नै हो । यो आयोजना प्रभावित जिल्लामा १ जिल्ला स्वास्थ्य कार्यालय, १ जिल्ला अस्पताल रहेको यस आयोजना क्षेत्रमा लघुविद्युत आयोजनाले नै विजुलीको मागपूर्ति गरिरहेका छन् । यो आयोजना क्षेत्र सन् २०१२ मा नेपाली सैनिकले निर्माण गरेको मार्ग (ट्याक) द्वारा सडकसँग जोडिएको छ । ९८% घरधुरीमा खानेपानी सुविधा रहेको यस क्षेत्रमा शिक्षा तथा रोजगारीको लागि ठूलो मात्रामा प्रवासन भईरहेको छ । यसरी स्थानीय तहको पूनसंरचना बाहेक आयोजना क्षेत्रको सामाजिक अवस्थामा समेत खासै परिवर्तन आएको छैन ।

नकारात्मक प्रभावहरु

भौतिक प्रभाव

- ३४.०३ हे. स्थायी र १९.७० हे. अस्थायी गरि ५३.७३ हे. जग्गा प्रयोग हुनेछ र पहिलाको भन्दा आयोजनाले बढी जग्गा चर्चिनेछ ।



- १८.४ मे.ट दलहन र ४०.८ मे.ट नगदे वालीमा हुने क्षति ।
- सामाजिक संरचनामा हुन सक्ने परिवर्तन ।
- स्थानीय पूर्वाधार जस्तै स्वास्थ्य चौकी, विद्यालय, बजार, संचार, पर्यटन आदिमा चाप बढ्नु ।
- थिगान, भू-क्षय र जमिनको अस्थिरताका कारण हुने प्रभावहरु
- नदीको प्रवाहमा हुने परिवर्तनको असर ।
- हावा, जल तथा ध्वनि प्रदूषणका कारण हुने प्रभाव ।
- जलाशयको बाँध भत्कीएमा हुने प्रभाव ।
- जलवायुको सूक्ष्म परिवर्तनका कारण हुने प्रभाव ।
- बाढीको पुनरावृत्तिको कारण हुने प्रभाव

यसरी नदी प्रवाहमा आधारित (RoR) बाट अर्ध जलाशययुक्त (PRoR) आयोजना हुँदा जमिन उपयोग, अर्ध जलाशययुक्त बाँधका कारण हुन सक्ने प्रभाव र जलवायुको सूक्ष्म परिवर्तनका कारण थपिन सक्ने प्रभावहरुको सूक्ष्म विश्लेषण गरिएको छ ।

जैविक प्रभाव

- आयोजनाको कारण २१२९ रुखहरु, २३८३ पोल, ८८८४ विरुवा (seedlings) र १०७५८ Sapling कटान गर्नुपर्ने
- अन्नपूर्ण संरक्षण क्षेत्रको जैविक विविधता, जनावरका प्रजातिहरुको आप्रवासन, प्रजननमा हुने सामान्य प्रभाव, अवैध शिकार तथा चोरी निकासीमा हुन सक्ने प्रभाव ।
- यसरी हेर्दा आयोजनाको पहिला प्रस्तावित ७५ रुखबाट बढेर अहिले २१२९ वटा काटनु पर्ने भएकोले रुखको सख्या वृद्धि भएको छ ।

सामाजिक तथा आर्थिक तथा सांस्कृतिक प्रभाव

आयोजनाका सदैव सामाजिक तथा आर्थिक तथा सांस्कृतिक प्रभाव ई.सं २०१४ को स्वीकृत वातावरणीय प्रभाव मूल्याङ्कनकै रहेका छन् । पहिला १९.९५ हे. जग्गा स्थायी अधिग्रहण गर्नुपर्नेमा अहिले ३४.०३ हे. जग्गा अधिग्रहण गर्नुपर्ने हुन्छ । आयोजना प्रभावित घरधुरीको सङ्ख्या ३५ बाट बढेर ११३ भएको छ ।

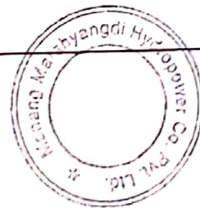
सकारात्मक प्रभावहरु

- स्थानीयवासीहरुलाई रोजगारको अवसर
- स्थानीयवासीहरुलाई जलविद्युत आयोजना र त्यही प्रकृतिका निर्माण व्यवसाय सम्बन्धी तालिम
- स्थानीयवासीहरुलाई विकास र व्यवसायमा वृद्धि
- कमसल र बाँफो खेतहरुको आयोजनाद्वारा प्रयोग
- स्थानीयवासीहरुलाई सीप र क्षमता अनुसारको रोजगारी
- स्थानीय ग्रामिण विद्युतीकरण
- वेशीसहर- मनाङ सडकको स्तरोन्नति
- अन्नपूर्ण संरक्षण क्षेत्रसँग आयोजनाको सहकार्यको कारण जैविक विविधताको संरक्षण
- सामुदायिक सहयोग कार्यक्रमको कारण विभिन्न सामुदायिक क्रियाकलापहरुमा टेवा
- स्थानीय सरकारलाई राजश्व

न्यूनीकरण उपायहरु

भौतिक प्रभाव न्यूनीकरणका उपायहरु

- आयोजनाको मुख्य स्थानहरुमा नदीको तट संरक्षण गर्नुपर्ने (जस्तै : Gabion Wall निर्माण कार्य)
- निर्माण कार्य गर्दा निस्कने Spoil लाई उचित ठाउँमा व्यवस्थापन गर्ने ।
- व्यवस्थित निकास प्रणाली (drainage System) विकास गरी स्थानीय विरुवा तथा घाँस लगाउने ।
- बाँधको तल्लो तटीय क्षेत्रमा e-flow कायम गर्ने ।
- आयोजनाको काममा प्रयोग हुने विभिन्न सवारी साधनहरुको इन्जिन समय समयमा परिक्षण गरेर सरकारको मापदण्ड अनुरूप संचालन गर्ने । निर्माण स्थलमा धुलो उड्ने ठाउँमा पानी छर्कने व्यवस्था मिलाई वायु प्रदूषण कम गर्ने ।



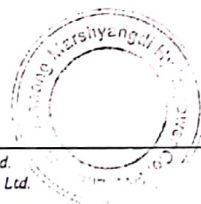
जैविक प्रभाव न्यूनीकरणका उपायहरू
कटान गरिएका रुखलाई क्षतिपूर्ति हुने हिसावले १ रुखको सट्टामा २५ वटा रुख बराबरको नेपाल सरकारले तोकेका दररेट अनुसारको सोधभर्ना प्रस्ताव गरिएको छ । उक्त सोधभर्ना वापतको रुखहरू रोप्दा स्थानीय प्रजातिका बोटपिरुवाहरूलाई प्राथमिकता दिइनेछ । उक्त सरकारी वन क्षेत्रको जमिनको सोधभर्नाको लागि वन तथा वातावरण मन्त्रालयको आर्थिक मान्यताको आधारमा रकम समेत विनियोजित गरिएको छ ।

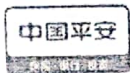
सामाजिक, आर्थिक तथा सांस्कृतिक प्रभाव न्यूनीकरणका उपायहरू यसको लागि जग्गा अधिग्रहण उचित कार्य योजना सहित अगाडि बढाउनुपर्ने हुन्छ । यस कार्यको लागि आयोजनाले जग्गा प्राप्ति ऐन, २०३४, जग्गा अधिग्रहण निर्देशिका, २०५१, जग्गा प्राप्ति, पुनर्वास नीति, २०७१ अनुसार काम कारवाही अगाडि बढाउनेछ ।

[illegible]

निष्कर्ष

पहिचान गरिएका प्रायः नकारात्मक प्रभावहरु स्थानीय क्षेत्रमा तथा निर्माण अवधिभर मात्र सिमित रहने प्रकृतिका छन्। यी प्रभावहरु खास गरी निर्माण कार्यसँग सम्बन्धित छन्। पहिचान गरिएका प्रायः नकारात्मक प्रभावहरु यस प्रतिवेदनमा प्रस्तावित न्यूनीकरणका उपायहरुका कार्यान्वयनबाट रोकथाम वा न्यूनीकरण गर्न सकिन्छ। प्रस्तावित आयोजनाका कार्यान्वयनले स्थानीय वातावरणमा रोकथाम वा न्यूनीकरण गर्न नसकिने खासै महत्वपूर्ण प्रत्यक्ष तथा स्थायी तवरले पर्ने नकारात्मक प्रभावहरु देखिदैनन्। प्रस्तावको कार्यान्वयन गर्दा यस प्रस्तावमा उल्लेखित वातावरणीय व्यवस्थापन कार्ययोजनालाई पूर्ण रुपमा लागु गरिएमा त्यसले आयोजना क्षेत्रको भौतिक, जैविक तथा सामाजिक वातावरणमा दिर्घकालीन नकारात्मक प्रभाव नपर्ने देखिन्छ। राजश्वको वृद्धि, उद्योग तथा आय आर्जनका क्रियाकलापहरुको प्रवर्द्धन, तथा समग्र आर्थिक, वातावरणीय तथा सामाजिक क्षेत्रको विकास भई नेपाल सरकारको गरीबी निवारण गर्ने लक्षमा समेत सहयोग पुर्याने देखिन्छ। यस अध्ययन प्रतिवेदनले प्रस्तावित आयोजना कार्यान्वयन गर्न सान्दर्भिक रहेको छ।





平安银行
PING AN BANK

28 March 2019

To: SCIG International Limited

Subject: **Letter of Intent**

Dear Sir/Madam,

We, Chengdu Branch of Ping An Bank, understand that SCIG International Limited (the "Company") who has opened the account in our bank since 2018 with all transactions with our bank satisfactory is investing and developing Manang Marsyangdi Hydropower Project with an estimated total investment of USD 322 million and a proposed installed capacity of 135 MW located at Gandaki Zone, Manang District, Nepal (the "Project") with other Chinese investors and Nepalese local partner.

We express our willingness to finance the Project subject to satisfactory lender's due diligence, internal approval from the Board of Directors and execution of the financing documents. We also confirm that we will be able to arrange consortium members to finance the Project if necessary.

In addition to other Project related assets, we typically need fully bankable Power Purchase Agreement and Project Development Agreement as part of the due diligence. In light of this, please procure the Project Development Agreement and other required documents timely for our bank to proceed for necessary evaluation.

The above information is given to you on strictly and confidential basis without any responsibility on our part or any of our officers, and all shall be subject to the final opinion of our bank and the formal contract signed.

For and behalf of
Chengdu Branch,
Ping An Bank

[BANK STAMP AND SIGNATURE]

地址: 深圳市深南东路5047号 邮政编码: 518001 服务热线: 95511-3 传真: 86 755 8208 1018 www.bank.pingan.com
Add NO 5047, Shennan Road East, Shenzhen, China Post code: 518001 Tel: 95511-3 Fax: 86 755 8208 1018

**中国工商银行**

INDUSTRIAL AND COMMERCIAL BANK OF CHINA

Letter of Interest

March[26], 2019

To: SCIG International Limited

Subject: Manang Marsyangdi Hydropower Project with a proposed installed capacity of 135MW and an estimated total investment of USD 322 million, Nepal

CC: Nepal Rastra Bank-Central Bank of Nepal, Investment Board Nepal, Ministry of Energy, Nepal, Department of Electricity Development, Nepal

Dear Sirs:

We are in the interest of providing buyer credit facility for the captioned project. The aggregate loan amount should not exceed 85% of the portion originating from China of the captioned project.

The specific terms and conditions of this intended credit facility are to be set forth and confirmed by us after we negotiate with relevant parties and before the credit loan is officially provided.

Please also be advised that this letter is not an offer or a legally binding financing commitment. It may not be relied or enforced in any court or tribunal.

This Letter of Interest is for the sole confidential use of the persons to whom it is delivered and may not be reproduced or used for any other purpose or disclosed to any other persons without the prior written consent of ICBC and this provision is legally binding. This Letter of Interest shall be governed by the PRC laws. Any dispute that is not resolved firstly on the basis of mutual consultation shall be finally settled by arbitration at the request of any Party at the Beijing Sub-commission of the China International Economic and Trade Arbitration Commission ("CIETAC").

This letter of Interest will be valid within 6 months from the date above written.

Yours sincerely,

Shen Min

Deputy General Manager of Banking Department
Industrial and Commercial Bank of China Ltd.



由 扫描全能王 扫描创建

ESTIMATED CONTRACT ENERGY TABLE
Manang Marsyangdi Hydropower Project

Calculated Capacity: 135,000 kW
 Net Discharge for Q42.72%: 16.7%
 Minimum Release: 10% of flow
 Losses: 2%
 Peak in: 430.20

Rated Unit:
 Turbine
 Generator
 Transformer
 Confirmed

91.50%
 97.00%
 99.00%
 87.87%

Nepali Calendar	No. of Days	Discharge River m³/s	Plant Flow m³/s	Operation Hours		Net Head m	Power kW	Energy, kWh			Contract Energy, kWh		
				Total	Peak			Total	Peak	Non-peak	Peak	Non-peak	Total
Baisak	31	24.13	36.78	14.17	1.66	418.91	134.150	58,335,495	6,814,125	51,501,370	6,697,638	50,471,146	57,168,784
Jyestha	31	54.10	36.78	24.00	1.66	418.91	134.150	98,809,517	3,306,911	95,502,606	3,240,793	92,261,813	95,813,126
Asadha	32	121.27	36.78	24.00	0.00	418.91	134.150	101,996,921	0	101,996,921	0	101,996,921	99,956,982
Shrawan	31	156.38	36.78	24.00	0.00	418.91	134.150	98,809,517	0	98,809,517	0	98,809,517	96,813,126
Bhadra	31	131.74	36.78	24.00	0.00	418.91	134.150	98,809,517	0	98,809,517	0	98,809,517	96,813,126
Ashwin	31	76.86	36.78	24.00	0.00	418.91	134.150	98,809,517	0	98,809,517	0	98,809,517	96,813,126
Kartik	30	33.54	36.78	19.70	0.00	418.91	134.150	78,481,108	0	78,481,108	0	78,481,108	76,911,469
Mangsir	29	15.47	36.78	9.08	1.66	418.91	134.150	34,988,724	3,086,409	31,902,315	3,024,740	28,877,575	34,288,449
Poush	30	12.95	36.78	7.60	1.66	418.91	134.150	30,396,455	6,613,663	23,782,792	6,441,566	17,341,226	29,690,576
Magh	29	11.22	36.78	6.88	1.66	418.91	134.150	26,515,794	6,313,401	20,202,393	6,265,513	13,936,880	25,085,478
Falgun	30	10.97	36.78	6.44	1.66	418.91	134.150	25,606,230	6,613,663	19,002,567	6,441,566	12,560,991	25,154,455
Chaitra	30	13.11	36.78	7.71	1.66	418.91	134.150	30,317,629	6,613,663	23,703,966	6,441,566	17,262,399	30,101,276
	365	45.19	36.78	7.71	1.66	418.91	134.150	782,318,411	39,462,715	742,855,696	38,671,460	704,184,236	766,993,344

Net Season Energy	231,511,641	kWh	30.20%
Net Annual Energy	515,082,602	kWh	69.80%
Net Season Peak Energy	766,593,643	kWh	100.00%
Net Season Non-peak Energy	192,837,540	kWh	

66.15%

Plant Factor

Note:

The energy table is derived on the basis of the hydrological data provided by Manang Marsyangdi Hydropower Company Pvt. Ltd. The developer is solely responsible for the authenticity of the provided data.
 The developer agrees to update the hydrological data based on the presently available data. Accordingly the energy table will be revised within the PPA capacity mentioned above.
 The energy table, if required may be revised accordingly as per the clause no. 3 of letter issued by DoED (Registered no.1030) on date 2075/10/18.



Signature

Signature

(Salient Features of the Project) Manang Marsyangdi Hydropower Project

1. Project Location

Province No.	:	4
Zone	:	Gandaki
District	:	Manang
Intake Site	:	About 350 m Downstream of the Confluence Marsyangdi and Nar Khola
Powerhouse site	:	About 1250 m Upstream From the Confluence of Marsyangdi and China Khola
Geographical Coordinates	:	
Latitude	:	28° 31' 27" N to 28° 33' 37" N
Longitude	:	84° 15' 38" E to 84° 20' 00" E

2. General

Name of river	:	Marsyangdi
Nearest town	:	Chame, Manang
Type of scheme	:	P-RoR
Gross head	:	430.20 m
Net Head at Design Discharge	:	418.91 m
Installed Capacity	:	135 MW
Outage	:	Auxiliary Consumption: 1%
	:	Transmission Losses: 0.1%
	:	Annual Forced Outage: 0.9%
		Total overall outage: 2%
Average Annual Energy after Outage	:	766.593GWh

3. Hydrology

Catchment Area	:	1635 Km ²
Mean Annual Discharge	:	55.19 m ³ /s
Design Discharge (at 42.72% PoE)	:	36.78 m ³ /s
Least Riparian Release	:	10% of each monthly flow
Design Flood Discharge	:	692 m ³ /s
Average Annual Precipitation (Rainfall)	:	930 mm

4. Diversion Structure

Type of weir/dam	:	None Overflow Concrete Gravity Gated Dam
Length of Dam at Crest	:	89.5 m
Spillway Gate Size (WxH)	:	8 m x 8.5 m
No. of Spillway Gates	:	2
Full Supply Level	:	2582 masl
Maximum Dam Height from Foundation	:	24 m
Spillway Crest Elevation	:	2563 masl
Undersluice opening (WxH)	:	3 m x 8.5 m
Undersluice invert level	:	2563 masl

5. Intake Structure cum Gravel Trap

Type of Intake	:	Side intake
No. of opening	:	2
Size of intake (WxH)	:	6.0 m x 7.0 m

Intake invert level : 2577 masl

6. Approach Canal

Type : Rectangular
No. : 1
Length : 50.50 m
Size (WxH) : 10.0m×(7.0 ~ 7.4)m

7. Settling Basin

Type : Surface
No. of bays : 2
Dimensions (LxBxH) : 155 m x 14 m x 13.5 m
Inlet transition length : 30 m
Particle size to be settled : 0.10 mm
Trapping efficiency : 86%

8. River Crossing

Type : D-shaped Culvert
Length : 51.30 m
Size (WxH) : 3.5 m x 3.5 m

9. Headrace Tunnel

Type : Inverted D
Internal Dia (WxH) : 4.4 ~ 5.3 m X 4.95 ~ 5.3 m
Length : 6075.50 m

Type of Lining : Concrete

10. Surge Shaft

Type : Vertical Shaft with Extended Upper Chamber
Effective depth : 83.3 m
Dia. of Vertical Shaft : 6 m
Upper Chamber Size nos & size (WxHxL) : 2 nos, 4.5m x (5.2 ~ 6.1)m x 90 m
Length of Upper Chamber : 180 m
Maximum Upsurge level : 2589.21 masl
Minimum Downsurge level : 2556.26 masl
Normal operation level : 2576.20 masl

11. Steel Penstock Pipe

Type : Circular steel
Internal Diameter : 3.3 m
Length before bifurcation : 1053.926 m
Dia. after bifurcation : 2.2 m
Length after bifurcation : 47.08 m

12. Powerhouse

Type : Surface
Size (LxW) : 66.0 m x 25.0 m
Height : 35.0 m
Turbine axis level : 2151.8 masl

13. Tailrace

Type	:	Covered canal to tail-race pond
Length	:	6.40 m
Size (B x H)	:	3 m x 3.6 m
Tailwater level	:	2147 masl

14. Turbine

Type	:	Pelton
Number	:	2
Rated Output Capacity per Unit	:	69.58 MW
Turbine setting level	:	2151.80 masl
Net head	:	418.91 m
Discharge per unit	:	18.39 m ³ /s
Efficiency	:	91.50%

15. Governor

Type	:	Potential Integral Differential (PID)
Adjustment for Speed Drop	:	0 to 10%

16. Generator

Type	:	Synchronous, 3 Phase
Rated output	:	79.41 MVA
Power factor	:	0.85

Voltage	:	11kV
Frequency	:	50 Hz
No. of units	:	2
Excitation system	:	Static
Efficiency	:	97%

17. Transformer

Rated capacity	:	80 MVA
Voltage Ratio	:	220/11 kV
No. of units	:	2
Vector group	:	YNd11
Efficiency	:	99%

18. Transmission line

Voltage level	:	220 kV
Length	:	7 KM
Conductor type	:	D/C BISON Conductor
From	:	Switchyard of Powerhouse
To	:	Dharapani Switching station.



19. Project Cost Estimate

Total cost of project	:	322.95 Million USD
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20. Construction period	:	4 years
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Facilities for Black Start, Off Grid Mode Operation or Local Grid Mode Operation Shall be incorporated in the Project

Note: Dimensions given above are approximate values. Dimensions and other minor details given above which do not adversely affect the performance of the project as required by or envisaged in this PPA, may change during detail engineering and construction phase, provided that such deviations/changes are approved by Coordination Committee


✓ or 
By 



NEA

5. Discussions and Decisions

5.1 Initialization and Signing of the Power Purchase Agreement for Manang Marsyangdi Hydropower Project owned by the Company

The Board of Directors discussed that the Company shareholder Butwal Power Company and the Chinese team were informed by the Nepal Electricity Authority (NEA) that its board had

decided to initialize and sign the Power Purchase Agreement of Manang Marsyangdi Hydropower Project (the "MM Project").

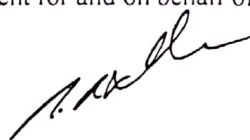
The Board of Directors also discussed that the NEA verbally agreed to enter into separate Power Purchase Agreements with other project companies of Marsyangdi Cascade projects namely the Upper Marsyangdi - 2 Hydropower Project (the "UM - 2 Project") Lower Manang Marsyangdi Hydropower Project (the "LMM Project"). However, the NEA would formally decide on entering into the separate Power Purchase Agreements once the project companies formally propose to the NEA to execute the same.

Likewise, the Board of Directors also discussed that as informed by the NEA, the NEA board has decided the following with regards to the Power Purchase Agreement of MM Project:

- i. The outage percentage will be as decided by the developer;
- ii. The dry season excess energy rate shall be applicable only to the cascade LMM Project and in accordance with ROR hydropower project rate;
- iii. The tariff will be in accordance with the Nepal Electricity Regulatory Commission's guidelines and decision;
- iv. Although the tariff is reflected in Nepalese currency, the draft of Power Purchase Agreement states that hedging of foreign currency exchange risk shall be as per the Hedging Rules, 2075 issued by the Government of Nepal;
- v. The NEA will recommend the Company's proposal of 2/3 (two third) cost-sharing of hedging to the concerned Ministry for further approval.

The Board of Directors discussed the draft of the Power Purchase Agreement of Manang Marsyangdi Hydropower Project circulated by Nepal Electricity Authority with its initials. The Board of Directors further discussed that the Company will take that basis for the purpose of negotiation and finalization of the Power Purchase Agreement. After the discussion, the Board Meeting resolved that:

- (a) "Resolved Unanimously to put initials on the Power Purchase Agreement of Manang Marsyangdi Hydropower Project circulated by Nepal Electricity Authority provided in Annexure 1 which will form basis for the purpose of negotiation and finalization of the Power Purchase Agreement with Nepal Electricity Authority.
- (b) "Resolved Unanimously to authorize Mr. Uttar Kumar Shrestha, Director to initial the Power Purchase Agreement for and on behalf of the Company"



MANANG MARSHYANDI (M1)

HYDROELECTRIC PROJECT

Financial Assumptions and Results

Input Parameters

Project Name

M1

Installed capacity (MW)
Per MW Cost (USD '000)
Base Project Cost with VAT (USD '000)
Average energy per year (GWh)
Base Exchange Rate
PPA Exchange Rate for tariff conversion
Dollar Payment Tenure by NEA (Years)
Annual FOREX Escalation
Tariff Rate (NPR/kWh)
Tariff Rate (US\$/kWh)
Tariff USD Component (US\$/kWh)
Tariff NPR Component (NPR/kWh)
Hedging Cost % of \$ Investment
Investors Contribution in Hedging Cost
Hedging on Interest
Hedging on Principal
Discount rate
Inflation rate in O&M
Tax rate
Bonus and Welfare (% of Profit)

135				
2,388.97				
278,145				
766.59				
120.00				
120.00				
10.00				
3%				
5.890				
4.908	Weighted %	Escalation (%)	(Years)	
0.000	0.0%	3.0%	8	
5.890	100.0%	3.0%	8	
2.00%				
33.33%				
1	1: to include, 0: to exclude			
1	1: upfront 0 on Drawdown			
8.00%				
4.0%	Tax free Yrs	50% Tax upto Yr		
20.0%	10	15		
2%				

Financing Terms

Loan Amount (in '000 USD)
Grace Period (years after COD)
Repayment period (years)
Financing fee (% of loan amount)
Agency Fees
Interest Rate

Major Term Loan	
258,008	
0	
10	
0.50%	
0.10%	
6.80%	

Working Capital	
900	
0	
10	
0.00%	
0.00%	
0.00%	

Construction Period (Years)

4.0

Disbursement Schedule

Total	Year 0	Year 1	Year 2	Year 3	Year 4
100.00%	7.00%	20.00%	25.00%	25.00%	23.00%

Operation and Maintenance Cost

O&M cost (% of base cost)
Insurance cost/year (% of base cost)

	Base Year	base cost
✓ 1.50%	3,599	278,145 USD '000
✓ 0.85%	2,039	278,145 USD '000

* O&M and Insurance is calculated with Forex Adjustment

Reserve

Major Maintenance Reserve ('000 USD)

697.43 per year
11,158.90 Total MMR

Maintained upto 20% of HM&EM Cost

DSRA Reserve ('000 USD)

894.26 per year
8,942.56 Total DSRA

Maintained upto one Forthcoming Installment

Royalty

Capacity Royalty (NPR per KW)
Energy Royalty (% of Revenue)

Initial 15 Yrs	After 15 Yrs
✓ 200	1,500
✓ 2%	10%

Output Parameters

Base Project Cost
IDC
Financing fee
Hedging Cost During Construction
Total Project Cost after Financing

278,145	86.24%
33,183	10.29%
1,645	0.51%
9,538	2.98%
322,511	100.00%

Total Equity
Total Debt
Total Project Cost

64,503	20.00%
258,008	80.00%
322,511	100.00%

Project IRR
Equity IRR
DSCR Minimum
Average DSCR

US\$ Cash Flow NPR Cashflow	
5.80%	8.97%
6.76%	9.96%
0.74	0.74
0.93	0.93

IDC Calculation Sheet

All Amount in '000 USD

Project Base Cost	278,145
Loan Amount	229,722
Interest Rate	6.80%
Financing Fees	0.50%
Agency Fees	0.10%

Before Financing

Debt	82.59%
Equity	17.41%

Total Loan Amount	258,008
Total Interest Payment	99,694
Total Debt Service	357,702

Disbursement Schedule

Total	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
100.00%	7.00%	20.00%	25.00%	25.00%	23.00%	0.00%	0.00%	0.00%	0.00%
Year Ending	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
Capital Drawdown	TOTAL	19,470	55,629	69,536	69,536	63,973	-	-	-
Equity Outlay	278,145	19,470	9,685	12,106	12,106	11,137	-	-	-
Debt Outlay	64,503	-	45,944	57,431	57,431	52,836	-	-	-
Cumulative Debt outlay	213,642	-	45,944	103,375	160,806	213,642	-	-	-
Hedging cost on P	6,880	1,720	1,720	1,720	1,720	1,720	-	-	-
Hedging cost on I	2,658	665	665	665	665	665	-	-	-
IDC and Financing Fees	34,829	-	3,226	6,003	10,495	15,105	-	-	-
Total Debt	258,008	-	51,555	65,818	70,310	70,325	-	-	-
Total Project Cost	322,511	19,470	61,239	77,924	82,416	81,462	-	-	-

Revenue Calculation sheet

Year End	Prevailing Exchange Rate NRs/USD	Year	Year Form COD	Tariff (NPR)	Energy (GWh)	Contribution from M2 ('000 NPR)	Revenue ('000 NPR)	Actual ('000 USD)
2019.00	120.00	0	0	-	0		0	0.00
2020.00	123.60	1	0	-	0		0	0.00
2021.00	127.31	2	0	-	0		0	0.00
2022.00	131.13	3	0	-	0		0	0.00
2023.00	135.06	4	0	-	0		0	0.00
2024.00	139.11	5	1	-	0		0	0.00
2025.00	143.29	6	2	5.89	766.59		4,515,032	32,455.89
2026.00	147.58	7	3	6.07	766.59		4,650,483	32,455.89
2027.00	152.01	8	4	6.24	766.59	360,000.00	5,145,934	34,867.63
2028.00	156.57	9	5	6.42	766.59	360,000.00	5,281,385	34,743.12
2029.00	161.27	10	6	6.60	766.59	360,000.00	5,416,836	34,596.28
2030.00	166.11	11	7	6.77	766.59	360,000.00	5,552,287	34,428.52
2031.00	171.09	12	8	6.95	766.59	360,000.00	5,687,738	34,241.19
2032.00	176.22	13	9	7.13	766.59	360,000.00	5,823,189	34,035.56
2033.00	181.51	14	10	7.30	766.59	360,000.00	5,958,640	33,812.86
2034.00	186.96	15	11	7.30	766.59	360,000.00	5,958,640	32,828.02
2035.00	192.56	16	12	7.30	766.59	360,000.00	5,958,640	31,871.87
2036.00	198.34	17	13	7.30	766.59	360,000.00	5,958,640	30,943.56
2037.00	204.29	18	14	7.30	766.59	360,000.00	5,958,640	30,042.29
2038.00	210.42	19	15	7.30	766.59	360,000.00	5,958,640	29,167.27
2039.00	216.73	20	16	7.30	766.59	360,000.00	5,958,640	28,317.74
2040.00	223.24	21	17	7.30	766.59	360,000.00	5,958,640	27,492.95
2041.00	229.93	22	18	7.30	766.59	360,000.00	5,958,640	26,692.19
2042.00	236.83	23	19	7.30	766.59	360,000.00	5,958,640	25,914.74
2043.00	243.94	24	20	7.30	766.59	360,000.00	5,958,640	25,159.95
2044.00	251.25	25	21	7.30	766.59	360,000.00	5,958,640	24,427.13
2045.00	258.79	26	22	7.30	766.59	360,000.00	5,958,640	23,715.66
2046.00	266.55	27	23	7.30	766.59	360,000.00	5,958,640	23,024.92
2047.00	274.55	28	24	7.30	766.59	360,000.00	5,958,640	22,354.29
2048.00	282.79	29	25	7.30	766.59	360,000.00	5,958,640	21,703.19
2049.00	291.27	30	26	7.30	766.59	360,000.00	5,958,640	21,071.06
2050.00	300.01	31	27	7.30	766.59	360,000.00	5,958,640	20,457.34
2051.00	309.01	32	28	7.30	766.59	360,000.00	5,958,640	19,861.49
2052.00	318.28	33	29	7.30	766.59	360,000.00	5,958,640	19,283.00
2053.00	327.83	34	30	7.30	766.59	360,000.00	5,958,640	18,721.36
Total								826,863

HYDROELECTRIC PROJECT
Income Statement

Years from Construction start date	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Years after COD / Operation Period	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Revenues														
Income from sale of power	826,863	32,456	34,868	34,743	34,596	34,429	34,241	34,036	33,813	32,828	31,872	30,944	30,042	29,167
Total Revenues	826,863	32,456	34,868	34,743	34,596	34,429	34,241	34,036	33,813	32,828	31,872	30,944	30,042	29,167
Operational Expenses														
O & M Costs														
Capacity royalty	124,640	3,599	3,669	3,705	3,741	3,777	3,814	3,851	3,888	3,926	3,964	4,003	4,041	4,081
Energy royalty	13,875	194	188	183	178	172	167	163	153	149	144	140	136	132
Insurance	43,582	649	697	695	692	689	685	681	676	657	637	619	601	583
Total Operational Expenses	223,270	6,482	6,451	6,444	6,417	6,392	6,369	6,348	6,328	6,294	6,263	6,235	6,209	6,185
Operating Income (loss)	603,593	25,974	28,396	28,299	28,179	28,036	27,872	27,688	27,485	26,534	25,608	24,709	23,834	22,982
Hedging Expenses														
Hedging Cost based on revenue														
Hedging Cost based on Interest	2,041	551	446	350	284	189	73	35	10	(0)	-	-	-	-
Hedging Cost base on Principal	8,689	1,595	1,319	1,167	1,004	829	642	442	229	-	-	-	-	-
Total Hedging Expenses	10,730	2,146	1,769	1,431	1,192	954	715	477	238	(0)	-	-	-	-
Operating Income (loss) Includ Hedging														
Cost	592,863	23,828	24,097	24,727	24,869	25,082	25,157	25,211	25,247	25,534	25,608	25,709	25,834	25,982
Depreciation	323,511	12,900	12,900	12,900	12,900	12,900	12,900	12,900	12,900	12,900	12,900	12,900	12,900	12,900
Benefit in repayment from hedging	86,601	4,915	5,813	6,686	7,533	8,355	9,154	9,929	10,682	11,412	-	-	-	-
Management Fee														
Interest on Term Loan	99,694	17,075	15,770	14,375	12,883	11,287	7,752	5,797	3,707	1,470	(0)	(0)	(0)	(0)
Interest on Short Term Loan	565	90	84	78	71	64	46	36	25	13	-	-	-	-
Agency Fee @ 0.10% OF Outstanding Loan	1,303	239	219	198	175	151	96	66	34	-	-	-	-	-
Total Management Fees	17,404	16,074	14,451	13,129	11,501	9,759	7,894	5,900	3,746	1,483	(0)	(0)	(0)	(0)
Operating profit (or loss) before Tax and Bonus	255,390	(1,561)	916	8,372	10,941	13,577	16,291	19,092	21,993	24,272	12,708	11,808	10,933	10,082
Income Taxes	21,684	-	-	-	-	-	-	-	-	-	-	-	-	-
Profit After Tax	233,706	(1,561)	916	8,372	10,941	13,577	16,291	19,092	21,993	24,272	12,708	11,808	10,933	10,082
Bonus and Welfare	4,709	-	19	117	219	272	326	382	440	485	229	213	197	181
Net Profit	238,997	(1,561)	917	8,205	10,722	13,306	15,965	18,710	21,553	23,766	11,208	10,415	9,443	8,892

HYDROELECTRIC PROJECT
Income Statement

Years from Construction start date	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
Years after COD / Operation Period	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Revenues																
Income from sale of power	826,863	826,863	826,863	826,863	826,863	826,863	826,863	826,863	826,863	826,863	826,863	826,863	826,863	826,863	826,863	826,863
Total Revenues	826,863	826,863	826,863	826,863	826,863	826,863	826,863	826,863	826,863	826,863	826,863	826,863	826,863	826,863	826,863	826,863
Operational Expenses																
O & M Costs	124,640	124,640	124,640	124,640	124,640	124,640	124,640	124,640	124,640	124,640	124,640	124,640	124,640	124,640	124,640	124,640
Capacity royalty	13,875	13,875	13,875	13,875	13,875	13,875	13,875	13,875	13,875	13,875	13,875	13,875	13,875	13,875	13,875	13,875
Energy royalty	43,582	43,582	43,582	43,582	43,582	43,582	43,582	43,582	43,582	43,582	43,582	43,582	43,582	43,582	43,582	43,582
Insurance	41,173	41,173	41,173	41,173	41,173	41,173	41,173	41,173	41,173	41,173	41,173	41,173	41,173	41,173	41,173	41,173
Total Operational Expenses	223,270	223,270	223,270	223,270	223,270	223,270	223,270	223,270	223,270	223,270	223,270	223,270	223,270	223,270	223,270	223,270
Operating Income (loss)	603,593	603,593	603,593	603,593	603,593	603,593	603,593	603,593	603,593	603,593	603,593	603,593	603,593	603,593	603,593	603,593
Hedging Expenses																
Hedging Cost based on revenue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hedging Cost based on Interest	2,041	2,041	2,041	2,041	2,041	2,041	2,041	2,041	2,041	2,041	2,041	2,041	2,041	2,041	2,041	2,041
Hedging Cost base on Principal	8,689	8,689	8,689	8,689	8,689	8,689	8,689	8,689	8,689	8,689	8,689	8,689	8,689	8,689	8,689	8,689
Total Hedging Expenses	10,730	10,730	10,730	10,730	10,730	10,730	10,730	10,730	10,730	10,730	10,730	10,730	10,730	10,730	10,730	10,730
Operating Income (loss) incl'd Hedging Cost	592,863	592,863	592,863	592,863	592,863	592,863	592,863	592,863	592,863	592,863	592,863	592,863	592,863	592,863	592,863	592,863
Depreciation	322,511	322,511	322,511	322,511	322,511	322,511	322,511	322,511	322,511	322,511	322,511	322,511	322,511	322,511	322,511	322,511
Benefit in repayment from hedging	86,601	86,601	86,601	86,601	86,601	86,601	86,601	86,601	86,601	86,601	86,601	86,601	86,601	86,601	86,601	86,601
Management Fee																
Interest on Term Loan	99,694	99,694	99,694	99,694	99,694	99,694	99,694	99,694	99,694	99,694	99,694	99,694	99,694	99,694	99,694	99,694
Interest on Short Term Loan	565	565	565	565	565	565	565	565	565	565	565	565	565	565	565	565
Agency Fee @ 0.10% OF Outstanding Loan	1,303	1,303	1,303	1,303	1,303	1,303	1,303	1,303	1,303	1,303	1,303	1,303	1,303	1,303	1,303	1,303
Total Management Fees	1,303	1,303	1,303	1,303	1,303	1,303	1,303	1,303	1,303	1,303	1,303	1,303	1,303	1,303	1,303	1,303
Operating profit (or loss) before tax and Bonus	255,390	255,390	255,390	255,390	255,390	255,390	255,390	255,390	255,390	255,390	255,390	255,390	255,390	255,390	255,390	255,390
Income Taxes	21,684	21,684	21,684	21,684	21,684	21,684	21,684	21,684	21,684	21,684	21,684	21,684	21,684	21,684	21,684	21,684
Profit After Tax	233,706	233,706	233,706	233,706	233,706	233,706	233,706	233,706	233,706	233,706	233,706	233,706	233,706	233,706	233,706	233,706
Bonus and Welfare	4,709	4,709	4,709	4,709	4,709	4,709	4,709	4,709	4,709	4,709	4,709	4,709	4,709	4,709	4,709	4,709
Net Profit	228,997	228,997	228,997	228,997	228,997	228,997	228,997	228,997	228,997	228,997	228,997	228,997	228,997	228,997	228,997	228,997

Cash Flow Statement

Year	Years Ending after COD																	Year	
	Total	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		16
Operating Income	603,593	-	-	-	-	-	25,974	26,004	28,136	28,359	28,179	28,016	27,688	27,485	26,534	25,608	-	-	-
Account receivable	(62,568)	-	-	-	-	-	(2,705)	(2,906)	(2,896)	(2,883)	(2,899)	(2,869)	(2,852)	(2,818)	(2,736)	(2,656)	-	-	-
Change in working capital	16,794	-	-	-	-	-	719	697	678	656	634	612	590	569	547	525	522	520	517
Cash cash flow before interest & tax	(843)	-	-	-	-	-	(1,986)	(2,222)	(2,119)	(2,121)	(2,108)	(2,076)	(2,062)	(2,031)	(1,959)	(1,878)	-	-	-
Direct Capital Outlay	462,751	-	-	-	-	-	23,989	25,982	28,177	28,188	28,169	28,028	27,866	27,683	26,593	25,686	-	-	-
Working capital loan inflow	(278,145)	(19,470)	(55,629)	(69,536)	(69,536)	(63,972)	-	-	-	-	-	-	-	-	-	-	-	-	-
Free Cash Flow before Maint Ret, Debt service & Tax	325,505	(19,470)	(55,629)	(69,536)	(69,536)	(63,972)	24,088	25,982	28,177	28,288	28,169	28,028	27,866	27,683	26,593	25,686	-	-	-
Maintenance Reserve	(11,159)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSRA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSRA Flowback	-	-	-	-	-	-	(894)	(894)	(894)	(894)	(894)	(894)	(894)	(894)	(894)	(894)	8,943	(69,7)	(69,7)
Free Cash Flow Before Debt Service & Tax	314,346	(19,470)	(55,629)	(69,536)	(69,536)	(63,972)	23,994	25,088	27,282	27,393	26,578	26,437	26,274	26,092	25,891	25,001	33,931	24,086	23,209
Income Taxes	(21,684)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bonus and Welfare	(4,709)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Project Cashflow	287,953	(19,470)	(55,629)	(69,536)	(69,536)	(63,972)	23,994	25,069	27,165	27,236	26,359	26,165	25,948	25,710	25,451	24,516	32,431	22,693	21,919
Project Internal Rate of Return (PIRR)	5.80%	-	-	-	-	-	(19)	(19)	(117)	(167)	(219)	(272)	(326)	(382)	(440)	(485)	(223)	(213)	(1,093)
Net Present Value (NPV)	(46,093)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Hedging Expenses	(10,730)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benefits in repayment from hedging	86,801	-	-	-	-	-	(2,146)	(1,908)	(1,469)	(1,431)	(1,192)	(954)	(715)	(477)	(218)	0	-	-	-
Net Cash Flow Before Debt Service	343,824	(19,470)	(55,629)	(69,536)	(69,536)	(63,972)	26,783	28,975	32,182	31,328	33,522	34,365	35,162	35,915	36,625	36,638	32,431	22,693	21,919
Debt Service	(238,008)	-	-	-	-	-	(18,696)	(20,000)	(21,395)	(22,887)	(24,484)	(26,192)	(28,019)	(29,972)	(32,064)	(34,300)	-	-	-
Interest expenses on long term loan	(99,694)	-	-	-	-	-	(17,075)	(15,770)	(14,325)	(12,883)	(11,287)	(9,579)	(7,752)	(5,797)	(3,707)	(1,470)	0	0	0
Agency Fees on Long term Loan	(1,303)	-	-	-	-	-	(239)	(219)	(196)	(175)	(151)	(124)	(96)	(66)	(34)	-	-	-	-
Principal repayment of Working Capital	(900)	-	-	-	-	-	(56)	(62)	(68)	(75)	(83)	(91)	(100)	(110)	(121)	(133)	-	-	-
Interest expense on working capital loan	(565)	-	-	-	-	-	(90)	(84)	(78)	(71)	(64)	(56)	(46)	(34)	(25)	(13)	-	-	-
Total debt service	(168,470)	-	-	-	-	-	(16,156)	(16,134)	(16,092)	(16,067)	(16,041)	(16,013)	(15,983)	(15,953)	(15,917)	(15,877)	0	0	0
Net Cash Available after Debt Service	175,354	(19,470)	(55,629)	(69,536)	(69,536)	(63,972)	9,393	(7,161)	(3,333)	(2,764)	(2,545)	(1,676)	(851)	(68)	674	721	32,431	22,693	21,919
Cash Flow To Equity	216,996	(19,470)	(9,685)	(12,068)	(12,066)	(11,137)	(9,393)	(7,161)	(3,333)	(2,764)	(2,545)	(1,676)	(851)	(68)	674	721	32,431	22,693	21,919
Equity Internal Rate of Return (EIRR)	6.15%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Equity Present Value(NPV)	(13,567)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exchange Rate	120	124	127	131	135	139	143	148	152	157	161	166	171	176	182	187	193	198	198
NPV Equity Cashflow '000	(2,316,419)	(1,197,013)	(1,541,153)	(1,587,387)	(1,594,208)	(1,306,275)	(1,026,103)	(588,411)	(420,089)	(398,523)	(398,523)	(270,276)	(141,317)	(118,745)	130,933	6,063,201	4,349,840	4,347,418	4,347,418
Equity IRR (NPV)	9.94%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Debt Service Coverage Ratios (DSCR)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Coverage before Tax	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
of Debt Service	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AVERAGE	0.74	0.93	0.74	0.80	0.89	0.92	0.93	0.95	0.98	1.00	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
Pay back Period	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cashflow	287,953	(19,470)	(55,629)	(69,536)	(69,536)	(63,972)	23,994	25,069	27,165	27,236	26,359	26,165	25,948	25,710	25,451	24,516	32,431	22,693	21,919
Cumulative cash flow	(19,470)	(75,099)	(144,635)	(214,171)	(278,145)	(325,151)	(229,082)	(201,917)	(174,691)	(148,332)	(122,167)	(96,219)	(70,509)	(45,058)	(20,542)	11,689	34,582	56,501	56,501
Simple payback time	10.63	-	-	-	-	-	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.63	0.63

Cash Flow Statement

	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year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Balance Sheet

Year Ending	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Years Ending after COD	0	0	0	0	0	1	2	3	4	5	6	7	8	9	10	11	12
ASSETS																	
Current assets																	
Cash + Reserve	-	-	-	-	-	(8,499)	(14,766)	(17,805)	(19,674)	(20,627)	(20,713)	(19,971)	(18,447)	(16,182)	(13,869)	5,834	25,058
Accounts receivable	-	-	-	-	-	2,705	2,705	2,906	2,895	2,883	2,869	2,853	2,836	2,818	2,736	2,656	2,579
Total current assets	-	-	-	-	-	(5,794)	(12,061)	(14,899)	(16,779)	(17,744)	(17,843)	(17,117)	(15,611)	(13,364)	(11,133)	8,490	27,637
Non-current assets																	
Total plant value	19,470	75,099	144,635	214,172	278,145	278,145	278,145	278,145	278,145	278,145	278,145	278,145	278,145	278,145	278,145	278,145	278,145
Capitalized financing expenses	-	3,326	9,229	19,724	34,829	34,829	34,829	34,829	34,829	34,829	34,829	34,829	34,829	34,829	34,829	34,829	34,829
Helding Cost Capitalized	2,384	-	-	7,153	9,538	9,538	9,538	9,538	9,538	9,538	9,538	9,538	9,538	9,538	9,538	9,538	9,538
Cumulative Depreciation	-	-	-	-	-	12,900	25,801	38,701	51,602	64,502	77,403	90,303	103,204	116,104	129,005	141,905	154,806
Total fixed assets	19,470	80,709	158,633	241,049	322,511	302,611	296,711	283,810	270,910	258,009	245,109	232,208	219,308	206,407	193,507	180,606	167,706
Total assets	19,470	80,709	158,633	241,049	322,511	303,817	284,649	268,911	254,131	240,265	227,266	215,091	203,697	193,043	182,374	189,096	195,343
LIABILITIES AND SHAREHOLDERS' EQUITY																	
Current liabilities	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Accounts payable	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total current liabilities	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
External debt	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
External debt repayment	-	51,555	117,372	187,683	258,008	239,312	219,313	197,918	175,030	150,547	124,355	96,337	66,364	34,300	-	-	-
Working Capital Financing	-	-	-	-	-	843	781	713	638	555	464	364	254	133	-	-	-
Total Liabilities	-	51,555	117,372	187,683	258,008	240,875	220,790	199,309	176,324	151,736	125,432	97,291	67,187	34,980	523	522	520
Shareholder's equity																	
Equity investment	19,470	29,155	41,260	53,366	64,503	64,503	64,503	64,503	64,503	64,503	64,503	64,503	64,503	64,503	64,503	64,503	64,503
Retained earnings	-	-	-	-	-	(1,561)	(645)	5,099	13,303	24,026	37,331	53,296	72,007	93,559	117,346	124,071	130,320
Total shareholders' equity	19,470	29,155	41,260	53,366	64,503	62,942	63,859	69,602	77,807	88,529	101,835	117,800	136,510	158,063	181,849	188,574	194,823
Total liabilities & shareholders' equity	19,470	80,709	158,633	241,049	322,511	303,817	284,649	268,911	254,131	240,265	227,266	205,091	203,697	193,043	182,374	189,096	195,343
Return on Assets (ROA)	0.00%	0.00%	0.00%	0.00%	0.00%	-0.51%	0.32%	2.14%	3.23%	4.46%	5.85%	7.42%	9.19%	11.16%	13.04%	5.93%	5.33%
Return on Equity (ROE)	0.00%	0.00%	0.00%	0.00%	0.00%	-2.48%	1.44%	8.35%	10.54%	12.11%	13.07%	13.55%	13.71%	13.64%	13.08%	5.94%	5.35%
Earning Per Share (EPS)	0.00%	-	-	-	-	(2.42)	1.42	8.90	12.72	16.62	20.63	24.75	29.01	33.41	36.88	17.38	16.15
Current Ratio	0.00%	-	-	-	-	(8.06)	(17.32)	(21.96)	(25.57)	(29.15)	(32.99)	(36.99)	(41.42)	(46.42)	(51.93)	16.27	53.19
Debt to Equity Ratio	-	1.77	2.84	3.52	4.00	3.80	3.43	2.84	2.25	1.70	1.22	0.82	0.49	0.22	-	-	-

Balance Sheet

Year Ending	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
Years Ending after COD	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ASSETS																		
Current assets																		
Cash + Reserve	38,032	51,003	63,972	77,191	90,149	103,106	116,061	129,015	141,968	154,919	167,869	180,817	193,764	193,810	193,854	193,897	193,939	193,980
Accounts receivable	2,504	2,431	2,360	2,291	2,224	2,160	2,097	2,036	1,976	1,919	1,863	1,809	1,756	1,705	1,655	1,607	1,560	1,515
Total current assets	40,535	53,434	66,332	79,482	92,373	105,266	118,158	131,051	143,944	156,838	169,731	181,626	193,520	195,515	195,509	195,504	195,500	195,495
Total plant value																		
Capitalized financing expenses	278,145	278,145	278,145	278,145	278,145	278,145	278,145	278,145	278,145	278,145	278,145	278,145	278,145	278,145	278,145	278,145	278,145	278,145
Hedging Cost Capitalized	34,829	34,829	34,829	34,829	34,829	34,829	34,829	34,829	34,829	34,829	34,829	34,829	34,829	34,829	34,829	34,829	34,829	34,829
Cumulative Depreciation	9,538	9,538	9,538	9,538	9,538	9,538	9,538	9,538	9,538	9,538	9,538	9,538	9,538	9,538	9,538	9,538	9,538	9,538
Total fixed assets	167,706	180,606	193,507	206,407	219,308	232,208	245,109	258,009	270,910	283,810	296,711	309,611	322,511	322,511	322,511	322,511	322,511	322,511
Total assets	154,806	141,905	129,005	116,104	103,204	90,303	77,403	64,502	51,602	38,701	25,801	12,900	-	-	-	-	-	-
LIABILITIES AND SHAREHOLDERS' EQUITY	195,341	195,339	195,337	195,586	195,577	195,569	195,561	195,553	195,546	195,539	195,532	195,526	195,520	195,515	195,509	195,504	195,500	195,495
Current liabilities	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Accounts payable	517	515	514	763	754	746	738	730	723	716	709	703	697	691	686	681	676	672
Total current liabilities	517	515	514	763	754	746	738	730	723	716	709	703	697	691	686	681	676	672
External debt	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
External debt repayment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Working Capital Financing	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Liabilities	517	515	514	763	754	746	738	730	723	716	709	703	697	691	686	681	676	672
Shareholder's equity																		
Equity investment	64,503	64,503	64,503	64,503	64,503	64,503	64,503	64,503	64,503	64,503	64,503	64,503	64,503	64,503	64,503	64,503	64,503	64,503
Retained earnings	130,320	130,320	130,320	130,320	130,320	130,320	130,320	130,320	130,320	130,320	130,320	130,320	130,320	130,320	130,320	130,320	130,320	130,320
Total shareholders' equity	194,823	194,823	194,823	194,823	194,823	194,823	194,823	194,823	194,823	194,823	194,823	194,823	194,823	194,823	194,823	194,823	194,823	194,823
Total liabilities & shareholders' equity	195,341	195,339	195,337	195,586	195,577	195,569	195,561	195,553	195,546	195,539	195,532	195,526	195,520	195,515	195,509	195,504	195,500	195,495

Return on Assets (ROA)	4.94%	4.55%	4.18%	2.18%	1.90%	1.63%	1.37%	1.11%	0.86%	0.62%	0.38%	0.15%	-0.10%	4.88%	4.66%	4.46%	4.25%	4.06%
Return on Equity (ROE)	4.95%	4.56%	4.19%	2.19%	1.91%	1.64%	1.37%	1.11%	0.86%	0.62%	0.38%	0.15%	-0.10%	4.89%	4.68%	4.47%	4.27%	4.07%
Earning Per Share (EPS)	14.95	13.79	12.65	6.61	5.77	4.94	4.14	3.36	2.60	1.87	1.15	0.45	(0.30)	14.78	14.13	13.50	12.89	12.29
Current Ratio	78.34	103.67	129.15	104.21	122.51	141.18	160.19	179.52	199.17	219.10	239.32	259.79	280.50	282.77	284.95	287.03	289.03	290.93
Debt to Equity Ratio	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Manang Marshyangdi Hydropower Project (135 MW)
Detail of Project Cost with IDC

S.No.	Particulars	Total Cost (M NRs.)	Percentage
1	Project Development		
2	Environmental Mitigation & Management	190.80	0.49%
3	Land Acquisition	229.20	0.59%
4	Infrastructures	4,682.40	12.10%
5	Vehicles & Others	-	0.00%
6	Civil Construction Work	11,508.00	29.74%
7	Hydro-Mechanical Equipments	2,325.60	6.01%
8	Electro-Mechanical Equipments	4,173.60	10.78%
9	Transmission Line & Interconnection Facilities	276.00	0.71%
10	Engineering & Construction Supervision	3,973.20	10.27%
11	VAT Taxes and Duties	4,098.00	10.59%
12	Physical Contingencies	1,920.61	4.96%
13	Total price Contingencies		
13 a	Price Contingencies (Civil)		
13 b	Price Contingencies (Electrical)		
13 c	Price Contingencies (Hydro Mechanical)		
Total Cost Without Interest During Construction		33,377.41	86.24%
	Bank Charges (Loan Arrangement fee)	197.42	0.51%
	Interest During Construction	3,982.01	10.29%
	Hedging Cost During Construction	1,144.53	2.96%
Total Cost With Interest During Construction		38,701.38	

Net Asset Except Land (NRs.)	38,472.18	
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	NPR	US\$
Cost per kw with out idc \$	247,240.04	2,060.33
Cost per kw with idc \$	286,676.86	2,388.97

Manang Marshyangdi Hydropower Project (135 MW)

Assumptions

Capacity	135,000	kW
Dry Season Rate (Peaking)	8.50	NRs/kw
Dry Season Rate (Non Peaking)	8.40	NRs/kw
Wet Season Rate	4.80	NRs/kw
Dry Energy Peaking (6 months)	38.673	Gwh
Dry Energy Non Peaking(6 months)	192.84	Gwh
Wet Energy (6 months)	535.08	Gwh
Project Cost w/o IDC (NRs.)	33,377.41	M NRs
Project Cost with IDC	38,701.38	M NRs
Net Asset except Land	38,472.18	M NRs
Exchange Rate	120	NRs/US\$
Project Construction Start Year	2021	AD
Fiscal Year (COD- ...)	2025	
Loan %	80%	of total project cost with financing
Debt Servicing Period	10	Years
Capital Drawdown % (0,1,2,3,4) Years	6.04%,18.99%,24.16%,25.55%,25.26%	
Fund Disbursement % in Preconstruction	100%	of Equity
Fund Disbursement % in 1st Year	84.19%	of Loan
	15.81%	of Equity
Fund Disbursement % in 2nd Year	84.46%	of Loan
	15.54%	of Equity
Fund Disbursement % in 3rd Year	85.31%	of Loan
	14.69%	of Equity
Fund Disbursement % in 4th Year	86.33%	of Loan
	13.67%	of Equity
Escalation on Revenue	3%	For 8 Years after COD
Income Tax	20.0%	
Waive-Off of Income Tax	50.0%	For 5 Years after 10th year of COD
Discount Rate	8%	
Interest Rate on Loan during construction	6.80%	
Interest Rate on Loan after construction	6.80%	
Inflation Rate on O & M, Expenses	3.00%	
Sensitivity Factor for Project Cost		
Sensitivity Factor for Revenue		
Sensitivity Factor for Interest Rate		
Loan Arrangement Fee (one time)	0.50%	
Annual O & M Costs	1.50%	of Base Cost
Insurance Premium	0.85%	of Base Cost
Annual Royalty for first 15 years (NRs M)		117.34
Annual Royalty after 15 years (NRs. M)		762.60

Results

Total Cost with IDC (M NRs.)	38,701
Total Cost without IDC and Hedging Fees (M NRs.)	33,377
Equity Net Present Value (NPV) NRs. M	4,257
BC Ratio (times)	1.06
Internal Rate of Return (IRR)	8.27%
IRR base Return on Equity (RoE)	10.36%
Debt Coverage Bearing Ratio (DCBR) Min	0.74
Simple Payback (Yrs)	9.35
Discounted Payback (Yrs.)	26.47
Cost per kw with idc \$	2,388.97

Manang Marshyangdi Hydropower Project (135 MW)

Installed Capacity : 135 MW

Location: Manang District

Financial Evaluation Summary of base case at 6.8% Interest rate

Assumptions		135 MW	
1	Installed Capacity	4	Years
2	Construction Period (Loan drawdown Period)	80:20	Ratio
3	Loan Equity Ratio (With IDC)	10	Years
4	Loan Repayment Period Yearly Basis	6.80%	PA
5	Bank Loan Interest	0.50%	% On Total Loan
6	Bank Loan Arrangement Fees	8.40	Per Unit
7	Dry Season Rate	4.80	Per Unit
8	Wet Season Rate	8.50	Per Unit
9	Peak Period Rate	3%	on base rate
10	Price Increment in energy rate for 8 years (after)	3%	Yearly
11	Operation & maintenance cost yearly increase by	200	Per KW
12	Royalty on Capacity for 15 Years	1500	Per Kw
13	Royalty on Capacity after 15 Years	2%	On Revenue
14	Royalty on Revenue for 15 Years	10%	On Revenue
15	Royalty on Revenue after 15 Years	3%	
16	Cost Escalation by		
17	Generation loss effect by	2%	On Profit before Tax
18	Staff Bonus Provision	20%	Holiday If COD with in
19	Income Tax -(100% Holiday for 10 years- 50% h	8%	On Net Profit
20	Discount factor (As per Current Scenerio)	3.33%	30 years
21	Depreciation rate is as per Life of Project	20%	of HM & EM Cost
22	Machine replacement cost is part of Operation an		

Additional Assumptions		Amount	
1	Annual Forex Escalation	3%	
2	Additional Revenue from M2 to M1 after 2nd year of operation	360,000.00	Amount in ,000
Hedging Assumption			
3	Hedging Fees	2%	on Pricipal and Interest Balance
4	Developer Contributions	33.33%	

Basic Data		Amount	
1	Total Project Cost (With IDC)	38,701,376	Amount in ,000
2	Total Loan (80%)	30,961,001	Amount in ,000
3	Total Equity (20%)	7,740,375	Amount in ,000
4	Net Revenue (After Loss provision) for First year	4,516,957	Amount in ,000
5	* Net Revenue (After Loss provision) for Nineth	5,601,026	Amount in ,000
6	Yearly O & M cost	500,661	Amount in ,000
7	NEA Penalty (If Late COD)	225,848	5% of Revenue
8	Insurance Cost	283,708	Amount in ,000
9	First Year Royalty (At the starting)	117,339	Amount in ,000
10	Yearly Royalty After 15 years	762,603	Amount in ,000

Results			
1	IRR (Internal rate of return)	8.27%	
2	EIRR / ROE (Return on Equity)	10.36%	
3	NPV (Net Present Value)	4,257,299	<i>Amount in ,000</i>
4	Cost per kW (1 US\$=120)	2388.97	Amount in \$
5	BC Ratio (benefit Cost Ratio)	1.06	Ratio
6	Pay back Period -Simple	9.35	Years
7	Pay back Period - Discounted	26.47	Years
8	Loan Repayment including interest	42,924,306	<i>Amount in ,000</i>
9	Revenue Per MW in NRs (Avg)	40,285	<i>Amount in ,000</i>
10	Cost Per MW in NRs	286,677	<i>Amount in ,000</i>

Season	Energy GWh	Rate (NRs.)
Dry peaking	38.67	8.50
Dry non peaking	192.84	8.40
Wet Energy	535.08	4.80

Project Status	Year	Total Project Cost Including IDC	IDC/Fin Costs	Hedging Fees during Const	Capital Excluding IDC and Hedging Cost	Debt @%	Equity @%	Weighted Avg Tariff	Net Energy	Revenue from energy sales	Revenue from M2 contributions	Total Revenue	Insurance Cost @ ...%	O & M Cost @%	Capacity Royalty	Revenue Royalty
		A				A(i)	A(k)					B	C	D	E	F
	Year	NRs. M	NRs. M	NRs. M	NRs. M	NRs. M	NRs. M	NPR	GWh	NRs. M	NRs. M	NRs. M	NRs. M	NRs. M	NRs. M	NRs. M
Total		38,701.38	4,179.44	1,144.53	33,377.41	30,961.00	7,740.37			163,152.47	10,080.00	173,232.47	8,511.24	23,819.16	3,442.50	9,984.28
Pre Construction		2,336.42	-	-	2,336.42	-	2,336.42									
Construction Period	1.00	7,348.70	387.09	286.13	6,675.48	6,186.56	1,162.14									
	2.00	9,950.83	720.34	286.13	8,344.35	7,898.15	1,452.68									
	3.00	9,889.94	1,259.45	286.13	8,344.35	8,437.26	1,452.68									
	4.00	9,775.49	1,812.55	286.13	7,676.80	8,439.01	1,336.45									
Operation	5.00							5.89	766.59	4,516.96		4,516.96	283.71	500.66	27.00	90.34
	6.00							6.07	766.59	4,652.47		4,652.47	283.71	515.68	27.00	91.05
	7.00							6.25	766.59	4,787.97	360.00	5,147.97	283.71	531.15	27.00	95.76
	8.00							6.42	766.59	4,923.48	360.00	5,283.48	283.71	547.09	27.00	98.47
	9.00							6.60	766.59	5,058.99	360.00	5,418.99	283.71	563.50	27.00	101.18
	10.00							6.78	766.59	5,194.50	360.00	5,554.50	283.71	580.40	27.00	103.89
	11.00							6.95	766.59	5,330.01	360.00	5,690.01	283.71	597.82	27.00	106.60
	12.00							7.13	766.59	5,465.52	360.00	5,825.52	283.71	615.75	27.00	109.31
	13.00							7.31	766.59	5,601.03	360.00	5,961.03	283.71	634.22	27.00	112.02
	14.00							7.31	766.59	5,601.03	360.00	5,961.03	283.71	653.25	27.00	112.02
	15.00							7.31	766.59	5,601.03	360.00	5,961.03	283.71	672.85	27.00	112.02
	16.00							7.31	766.59	5,601.03	360.00	5,961.03	283.71	693.03	27.00	112.02
	17.00							7.31	766.59	5,601.03	360.00	5,961.03	283.71	713.82	27.00	112.02
	18.00							7.31	766.59	5,601.03	360.00	5,961.03	283.71	735.24	27.00	112.02
	19.00							7.31	766.59	5,601.03	360.00	5,961.03	283.71	757.29	27.00	112.02
	20.00							7.31	766.59	5,601.03	360.00	5,961.03	283.71	780.01	202.50	560.10
	21.00							7.31	766.59	5,601.03	360.00	5,961.03	283.71	803.41	202.50	560.10
	22.00							7.31	766.59	5,601.03	360.00	5,961.03	283.71	827.52	202.50	560.10
	23.00							7.31	766.59	5,601.03	360.00	5,961.03	283.71	852.34	202.50	560.10
	24.00							7.31	766.59	5,601.03	360.00	5,961.03	283.71	877.91	202.50	560.10
	25.00							7.31	766.59	5,601.03	360.00	5,961.03	283.71	904.25	202.50	560.10
	26.00							7.31	766.59	5,601.03	360.00	5,961.03	283.71	931.38	202.50	560.10
	27.00							7.31	766.59	5,601.03	360.00	5,961.03	283.71	959.32	202.50	560.10
	28.00							7.31	766.59	5,601.03	360.00	5,961.03	283.71	988.10	202.50	560.10
	29.00							7.31	766.59	5,601.03	360.00	5,961.03	283.71	1,017.74	202.50	560.10
	30.00							7.31	766.59	5,601.03	360.00	5,961.03	283.71	1,048.27	202.50	560.10
	31.00							7.31	766.59	5,601.03	360.00	5,961.03	283.71	1,079.72	202.50	560.10
	32.00							7.31	766.59	5,601.03	360.00	5,961.03	283.71	1,112.11	202.50	560.10
	33.00							7.31	766.59	5,601.03	360.00	5,961.03	283.71	1,145.48	202.50	560.10
	34.00							7.31	766.59	5,601.03	360.00	5,961.03	283.71	1,179.84	202.50	560.10

Discounted Cashflow to Equity	Project Cashflow	Cumulative Project Cashflow	Simple Payback Period	Project Discount Cashflow	Cumulative Discounted Project Cashflow	Discounted Payback Period	Cashflow Before Debt Service	Debt Service	DSCR	Cost	Benefit
NPV	NRs. M	NRs. M	Years	NRs. M			NRs. M	NRs. M	Avg	NPV	NPV
	NRs. M	NRs. M		NRs. M			NRs. M	NRs. M	0.93	NRs. M	NRs. M
4,257.30	75,769.61		9.35	927.74		26.47	109,645.6	42,924.3	Min	43,601.5	46,049.0
(2,336.42)	(2,336.42)	(2,336.42)		(2,336.42)	(2,336.42)				0.74	2,336.42	-
(1,076.06)	(7,348.70)	(9,685.12)		(6,804.35)	(9,140.77)					7,348.70	-
(1,245.44)	(9,250.83)	(10,935.95)		(8,016.83)	(17,157.60)					9,350.83	-
(1,152.15)	(9,889.94)	(12,925.89)		(7,850.95)	(25,008.55)					9,889.94	-
(962.34)	(9,775.49)	(13,701.38)		(7,185.28)	(32,193.83)					9,775.49	-
(745.72)	3,490.65	(35,210.53)	1.00	2,375.81	(29,818.02)	1.00	3,192.31	4,292.43	0.74	1,026.11	4,516.96
(609.00)	3,599.35	(31,611.15)	1.00	2,268.20	(27,549.82)	1.00	3,326.02	4,292.43	0.77	1,053.12	4,652.47
(279.71)	4,059.40	(27,551.78)	1.00	2,368.62	(25,181.20)	1.00	3,813.06	4,292.43	0.89	1,088.58	5,147.97
(185.51)	4,165.81	(23,385.98)	1.00	2,250.66	(22,930.54)	1.00	3,948.33	4,292.43	0.92	1,117.68	5,283.48
(158.56)	4,162.14	(19,223.84)	1.00	2,082.11	(20,848.44)	1.00	3,975.47	4,292.43	0.93	1,256.85	5,418.99
(84.65)	4,263.45	(14,960.35)	1.00	1,974.82	(18,873.62)	1.00	4,104.67	4,292.43	0.96	1,291.02	5,554.50
(20.36)	4,353.78	(10,596.58)	1.00	1,871.55	(17,002.07)	1.00	4,244.95	4,292.43	0.99	1,326.23	5,690.01
35.33	4,452.98	(6,133.60)	1.00	1,772.31	(15,229.76)	1.00	4,381.39	4,292.43	1.02	1,367.54	5,825.52
63.32	4,561.04	(1,572.56)	1.00	1,677.08	(13,552.68)	1.00	4,519.02	4,292.43	1.05	1,399.99	5,961.03
80.12	4,577.77	2,955.20	0.35	1,541.53	(12,011.15)	1.00	4,527.77	4,292.43	1.05	1,433.26	5,961.03
186.73	5,985.03	8,940.24		1,886.73	(10,124.42)	1.00	5,985.03			(374.39)	5,961.03
1,252.63	4,291.45	13,231.68		1,252.63	(8,871.78)	1.00	4,291.45			1,321.17	5,961.03
1,153.60	4,265.08	17,500.77		1,153.60	(7,717.98)	1.00	4,269.08			1,345.57	5,961.03
1,062.67	4,246.04	21,746.81		1,062.67	(6,655.41)	1.00	4,246.04			1,370.71	5,961.03
978.36	4,222.32	25,969.13		978.36	(5,677.05)	1.00	4,222.32			1,396.60	5,961.03
722.83	3,369.10	29,338.23		722.83	(4,954.22)	1.00	3,369.10			2,014.37	5,961.03
664.75	3,346.22	32,684.45		664.75	(4,289.47)	1.00	3,346.22			2,061.84	5,961.03
611.17	3,323.65	36,007.10		611.17	(3,628.30)	1.00	3,323.65			2,090.13	5,961.03
561.76	3,298.38	39,305.48		561.76	(3,116.54)	1.00	3,298.38			2,119.27	5,961.03
516.21	3,273.38	42,578.85		516.21	(2,600.33)	1.00	3,273.38			2,149.29	5,961.03
499.80	3,422.86	46,001.71		499.80	(2,100.53)	1.00	3,422.86			2,004.97	5,961.03
459.60	3,401.59	49,403.29		459.60	(1,640.63)	1.00	3,401.59			2,031.55	5,961.03
423.09	3,379.68	52,782.98		423.09	(1,217.54)	1.00	3,379.68			2,058.94	5,961.03
389.14	3,357.12	56,140.09		389.14	(828.40)	1.00	3,357.12			2,087.14	5,961.03
357.62	3,333.88	59,473.97		357.62	(470.59)	1.00	3,333.88			2,116.19	5,961.03
328.93	3,309.94	62,783.91		328.93	(141.65)	1.00	3,309.94			2,145.11	5,961.03
302.30	3,285.29	66,069.20		302.30	160.65	0.47	3,285.29			2,176.93	5,961.03
277.74	3,259.89	69,329.09		277.74	438.39	0.00	3,259.89			2,208.67	5,961.03
255.11	3,233.73	72,562.82		255.11	693.50	0.00	3,233.73			2,241.37	5,961.03
234.24	3,206.79	75,769.61		234.24	927.74	0.00				2,275.05	5,961.03

B/C Ratio: 1.06

Project IRR 8.27%

Power Project (135 MW)
SIS OF PROJECT

Total Operation cost	Hedging Fees During Operation	EBITDA	Govt. Grant	Bank Interest @% p.a	Depreciation SLM	Earning before Bonus and welfare	Bonus and Welfare	Earnings before Tax	Income Tax	Post Tax Earnings	DSRA	MMRA	Dis. Factor @10%	Principle amount	Free Cash Flow to Equity
$G=(C+D+E+F)$ NRS. M	X NRS. M	H=(B+G-X) NRS. M	I NRS. M	J NRS. M	K NRS. M	L=(H+I-J-K) NRS. M	M NRS. M	N=L-M NRS. M	O NRS. M	P=(N-Q) NRS. M	Y	Z	Q NRS. M	R=(A+B)+P+K- [Q-Y-Z] NRS. M	
45,757.18	1,618.60	125,856.70	-	11,967.30	38,701.38	75,192.02	1,504.29	73,687.73	9,544.64	64,143.09			8%	30,961.00	62,187.71
													1.00		(2,136.42)
													0.93		(1,162.14)
													0.86		(1,452.68)
													0.79		(1,452.68)
													0.74		(1,136.46)
901.71	298.54	3,316.71		2,048.94	1,290.05	(22.28)	-	(22.28)	-	(22.28)	124.40		0.68	2,243.49	(1,100.17)
919.44	273.33	3,459.70		1,892.45	1,290.05	277.20	5.54	271.66	-	271.66	128.13		0.63	2,399.98	(966.41)
937.62	246.34	3,964.02		1,725.04	1,290.05	948.93	18.98	929.95	-	929.95	131.98		0.58	2,567.39	(479.37)
956.26	217.48	4,109.74		1,545.96	1,290.05	1,273.74	25.47	1,248.26	-	1,248.26	135.94		0.54	2,746.47	(344.10)
975.39	186.67	4,255.94		1,354.38	1,290.05	1,612.51	32.25	1,580.26	-	1,580.26	140.02	109.20	0.50	2,938.05	(316.96)
995.00	153.82	4,405.68		1,149.44	1,290.05	1,966.19	39.32	1,926.87	-	1,926.87	144.22	112.47	0.46	3,142.99	(187.76)
1,015.12	118.82	4,556.06		930.21	1,290.05	2,335.81	46.72	2,289.09	-	2,289.09	148.54	115.85	0.43	3,362.22	(47.48)
1,035.77	81.59	4,708.16		695.68	1,290.05	2,722.43	54.45	2,667.98	-	2,667.98	153.00	119.32	0.40	3,596.75	88.95
1,056.95	42.02	4,862.06		444.79	1,290.05	3,127.22	62.54	3,064.67	-	3,064.67	157.59	122.90	0.37	3,847.64	226.59
1,075.98	-	4,885.05		176.41	1,290.05	3,418.60	68.17	3,350.23	-	3,350.23	162.32	126.59	0.34	4,116.03	235.34
1,095.58		4,865.45			1,290.05	3,575.41	71.51	3,503.90	350.29	3,153.61	(1,671.87)	130.39	0.32		5,985.03
1,115.76		4,845.27			1,290.05	3,555.22	71.18	3,484.12	349.41	3,134.70		134.30	0.29		4,291.45
1,136.55		4,824.47			1,290.05	3,534.43	70.69	3,463.74	346.37	3,117.37		138.33	0.27		4,269.08
1,157.97		4,803.06			1,290.05	3,513.01	70.26	3,442.75	344.25	3,098.48		142.40	0.25		4,246.04
1,180.02		4,781.00			1,290.05	3,490.96	69.82	3,421.14	342.11	3,079.02		146.75	0.23		4,222.32
1,206.32		4,758.70			1,290.05	3,468.66	69.39	3,400.27	340.27	3,059.00		151.16	0.21		4,197.60
1,234.72		4,736.30			1,290.05	3,446.36	68.96	3,378.40	338.40	3,038.00		155.69	0.20		4,172.88
1,264.22		4,713.90			1,290.05	3,424.06	68.53	3,356.53	336.53	3,016.99		160.36	0.18		4,148.16
1,294.82		4,691.50			1,290.05	3,401.76	68.10	3,334.66	334.66	2,995.98		165.17	0.17		4,123.44
1,326.52		4,669.10			1,290.05	3,379.46	67.67	3,312.79	332.79	2,974.97		170.13	0.16		4,098.72
1,359.32		4,646.70			1,290.05	3,357.16	67.24	3,290.92	330.92	2,953.96			0.15		4,074.00
1,393.22		4,624.30			1,290.05	3,334.86	66.81	3,268.05	329.05	2,932.95			0.14		4,049.28
1,428.22		4,601.90			1,290.05	3,312.56	66.38	3,245.18	327.18	2,911.94			0.13		4,024.56
1,464.32		4,579.50			1,290.05	3,290.26	65.95	3,222.31	325.31	2,890.93			0.12		4,000.00
1,501.52		4,557.10			1,290.05	3,267.96	65.52	3,200.44	323.44	2,869.92			0.11		3,975.44
1,540.82		4,534.70			1,290.05	3,245.66	65.09	3,177.57	321.57	2,848.91			0.10		3,950.88
1,582.32		4,512.30			1,290.05	3,223.36	64.66	3,154.70	319.70	2,827.90			0.09		3,926.32
1,626.02		4,489.90			1,290.05	3,201.06	64.23	3,131.83	317.83	2,806.89			0.09		3,901.76
1,671.92		4,467.50			1,290.05	3,178.76	63.80	3,108.96	315.96	2,785.88			0.08		3,877.20
1,720.22		4,445.10			1,290.05	3,156.46	63.37	3,086.09	314.09	2,764.87			0.08		3,852.64
1,771.02		4,422.70			1,290.05	3,134.16	62.94	3,063.22	312.22	2,743.86			0.07		3,828.08
1,824.32		4,400.30			1,290.05	3,111.86	62.51	3,040.35	310.35	2,722.85			0.07		3,803.52
1,880.22		4,377.90			1,290.05	3,089.56	62.08	3,017.48	308.48	2,701.84			0.06		3,778.96
1,938.72		4,355.50			1,290.05	3,067.26	61.65	3,000.61	306.61	2,680.83			0.06		3,754.40
2,000.02		4,333.10			1,290.05	3,044.96	61.22	2,977.74	304.74	2,659.82			0.05		3,729.84
2,064.32		4,310.70			1,290.05	3,022.66	60.79	2,954.87	302.87	2,638.81			0.05		3,705.28
2,131.72		4,288.30			1,290.05	3,000.36	60.36	2,931.99	301.00	2,617.80			0.04		3,680.72
2,202.32		4,265.90			1,290.05	2,978.06	59.93	2,909.12	299.12	2,596.79			0.04		3,656.16
2,276.22		4,243.50			1,290.05	2,955.76	59.50	2,886.25	297.25	2,575.78			0.03		3,631.60
2,353.72		4,221.10			1,290.05	2,933.46	59.07	2,863.38	295.38	2,554.77			0.03		3,607.04
2,435.02		4,198.70			1,290.05	2,911.16	58.64	2,840.51	293.51	2,533.76			0.02		3,582.48
2,520.32		4,176.30			1,290.05	2,888.86	58.21	2,817.64	291.64	2,512.75			0.02		3,557.92
2,609.82		4,153.90			1,290.05	2,866.56	57.78	2,794.77	289.77	2,491.74			0.02		3,533.36
2,703.72		4,131.50			1,290.05	2,844.26	57.35	2,771.90	287.90	2,470.73			0.01		3,508.80
2,802.32		4,109.10			1,290.05	2,821.96	56.92	2,749.03	286.03	2,449.72			0.01		3,484.24
2,905.82		4,086.70			1,290.05	2,799.66	56.49	2,726.16	284.16	2,428.71			0.01		3,459.68
3,014.32		4,064.30			1,290.05	2,777.36	56.06	2,703.29	282.29	2,407.70			0.01		3,435.12
3,128.02		4,041.90			1,290.05	2,755.06	55.63	2,680.42	280.42	2,386.69			0.01		3,410.56
3,247.32		4,019.50			1,290.05	2,732.76	55.20	2,657.55	278.55	2,365.68			0.01		3,386.00
3,372.72		4,000.30			1,290.05	2,710.46	54.77	2,634.68	276.68	2,344.67			0.01		3,361.44
3,504.72		3,974.70			1,290.05	2,688.16	54.34	2,611.81	274.81	2,323.66			0.01		3,336.88
3,643.72		3,952.30			1,290.05	2,665.86	53.91	2,588.94	272.94	2,302.65			0.01		3,312.32
3,790.32		3,929.90			1,290.05	2,643.56	53.48	2,566.07	271.07	2,281.64			0.01		3,287.76
3,944.02		3,907.50			1,290.05	2,621.26	53.05	2,543.20	269.20	2,260.63			0.01		3,263.20
4,105.32		3,885.10			1,290.05	2,598.96	52.62	2,520.33	267.33	2,239.62			0.01		3,238.64
4,274.72		3,862.70			1,290.05	2,576.66	52.19	2,497.46	265.46	2,218.61			0.01		3,214.08
4,452.32		3,840.30			1,290.05	2,554.36	51.76	2,474.59	263.59	2,197.60			0.01		3,189.52
4,638.72		3,817.90			1,290.05	2,532.06	51.33	2,451.72	261.72	2,176.59			0.01		3,164.96
4,834.32		3,795.50			1,290.05	2,509.76	50.90	2,428.85	259.85	2,155.58			0.01		3,140.40
5,039.52		3,773.10			1,290.05	2,487.46	50.47	2,405.98	257.98	2,134.57			0.01		3,115.84
5,254.72		3,750.70			1,290.05	2,465.16	50.04	2,383.11	256.11	2,113.56			0.01		3,091.28
5,480.52		3,728.30			1,290.05	2,442.86	49.61	2,360.24	254.24	2,092.55			0.01		3,066.72
5,717.32		3,705.90			1,290.05	2,420.56	49.18	2,337.37	252.37	2,071.54			0.01		3,042.16
5,965.72		3,683.50			1,290.05	2,398.26	48.75	2,314.50	250.50	2,050.53			0.01		3,017.60
6,226.32		3,661.10			1,290.05	2,375.96	48.32	2,291.63	248.63	2,029.52			0.01		2,993.04
					1,290.05	2,444.83	48.90	2,395.93	479.19	1,916.75			0.02		3,206.29
															10.36%

MANANG MARSYANGDI HYDROELECTRICAL POWER PROJECT (135 MW) Construction Schedule

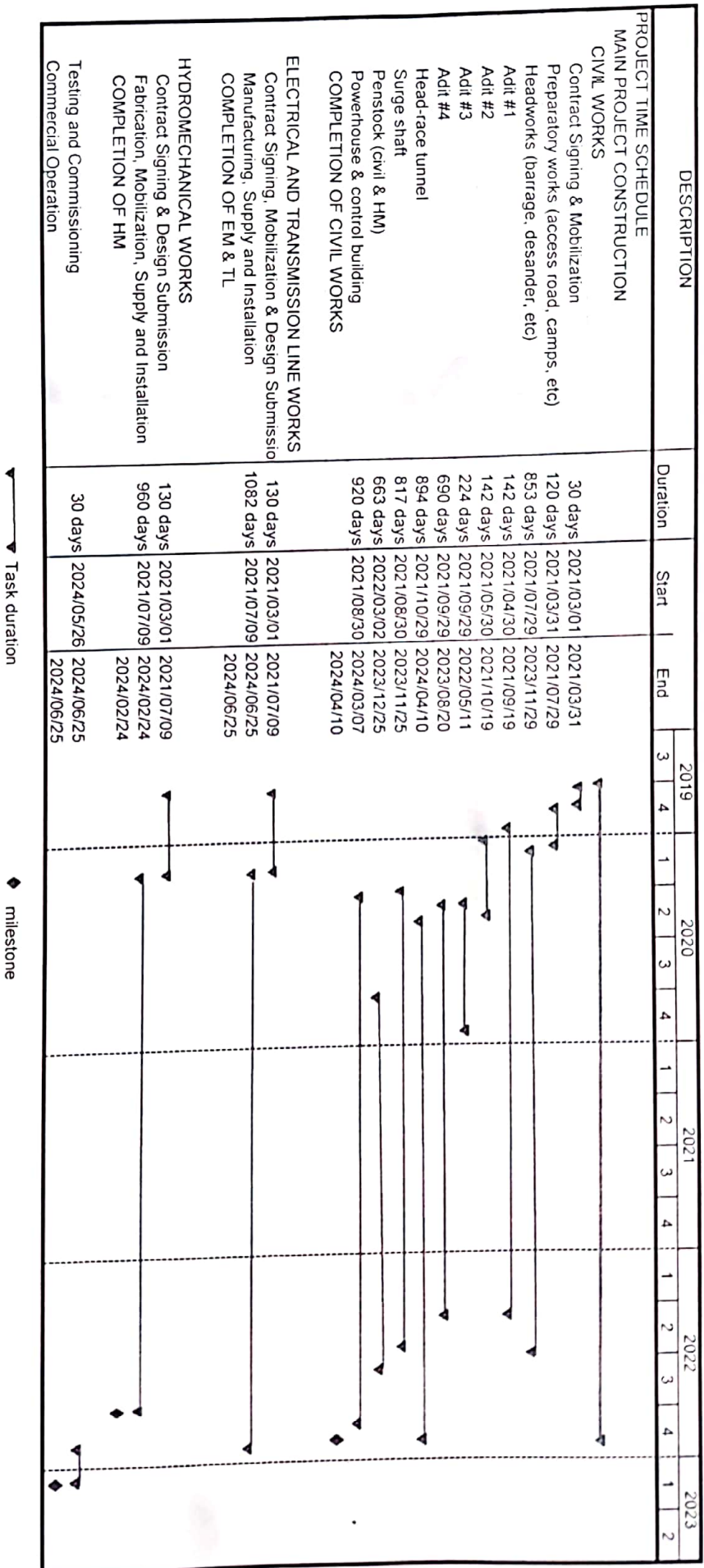


Table 2: Project General Cost Estimate

S.No.	Works or Expenses	Amount (US\$ '10,000)	VAT Complying %	VAT Complying Amount (US\$ '10,000)
A	Civil Works			
I	Headworks			
1	Spillway and undersluice works	834.96		
2	Retaining dam works	264.36		
3	Water intake works	80.41		
4	Desanding chamber works	1,727.93		
	Sub-total of Headworks	2,907.65		
II	Waterways			
1	Headrace Tunnel	3,845.44		
2	Surge Chamber	494.77		
3	Penstock tunnel and penstock civil Works	857.19		
	Sub-total of Waterways	5,197.40		
III	Powerhouse and switchyard works			
1	Powerhouse foundation works	471.04		
2	Powerhouse superstructure works	318.90		
3	Plant area works	259.09		
4	GIS building works	186.69		
	Sub-total of Powerhouse and Switchyard	1,235.73		
IV	Tailrace Channel	125.84		
V	Miscellaneous	123.19		
	Total of Main Civil Works	9,589.82	100%	9,589.82
B	Infrastructure Works			
1	Roadway Works	873.22		
2	Housing and Building Works	343.68		
3	Auxiliary works for construction such as temporary camps, haulage road construction, etc.	2,685.52		
	Total of Infrastructure Works	3,902.42	100%	3,902.42
C	Electromechanical equipment and installation works			
	Equipment Cost	2,295.06		
	Installation Cost	822.90		
	Total cost of EM Works	3,478.08	10%	347.81
D	Hydromechanical structure equipment and installation works			
	Equipment Cost	336.30		
	Installation Cost	1,489.81		
	Total cost of HM Works	1,937.57	50%	968.78
E	Transmission Line Works	230.05	50%	115.02
F	Environmental and Social Cost	159.09	100%	159.09
G	Land acquisition and resettlement cost	191.42	90%	172.28
H	Engineering Cost			
	Project Study and Design Cost	1,595.27		
	Construction Supervision Cost	1,659.98		
	Other engineering cost	55.26		
	Total of Engineering Cost	3,310.51	100%	3,310.51
I	Taxes			
	VAT Amount	2,413.55		
	Duties and other taxes	1,001.24		
	Total of Taxes	3,414.78		
J	Contingencies			
I	Physical Contingencies			
	Contingencies in Civil Works	766.78		
	Contingencies in Infrastructure Works	312.03		
	Contingencies in EM Works	173.90		
	Contingencies in HM Works	96.88		
	Sub-total	1,349.59		
II	Price Contingencies			
	Price Contingencies in Civil Works	766.78		
	Price Contingencies in EM Works	173.90		
	Price Contingencies in HM Works	96.88		
	Sub-total	1,037.56		
	Total of Contingencies	2,387.15		
K	Total Project Cost without IDC (Total of A to J)	28,600.90		
L	Interest During Construction Period (IDC)	3,693.61		
M	Total Project Cost Including IDC	32,294.51		

Table 3: Estimate of Auxiliary Works for Construction

No.	Works or Expenses	Units	Qty.	Unit Price (US\$)	Total (10,000 USD)
	Auxiliary works for construction				3034.64
I	Construction traffic works				1384.54
1	Road works				417.00
	1# temporary road, 4.5m wide, clay bound macadam pavement	km	2	1350000	270.00
	2# temporary road, 4.5m wide, clay bound macadam pavement	km	1.5	300000	45.00
	3# temporary road, 4.5m wide, clay bound macadam pavement	km	0.6	300000	18.00
	4# temporary road, 4.5m wide, clay bound macadam pavement	km	0.5	300000	15.00
	6# temporary road, 4.5m wide, clay bound macadam pavement	km	0.5	300000	15.00
	Upper surge chamber road, 4.5m wide, clay bound macadam pavement	km	1.2	450000	54.00
2	Bridge works				90.00
	Temporary crossing Bailey bridge, spanning 48m, 3.7 wide	Nos.	2	450000	90.00
3	Adit works				770.83
(1)	Headrace tunnel adit				609.73
	Overburden excavation	m3	3240	4.59	1.49
	Rock open excavation	m3	2160	15.04	3.25
	Rock tunnel excavation	m3	49635	53.28	264.46
	C25 lining concrete	m3	1351	343.00	46.34
	Outside anchor $\Phi=25\text{mm}$, L=3m	Pcs	185	38.54	0.71
	Inside anchor $\Phi=25\text{mm}$, L=3m	Pcs	9072	44.01	39.93
	Reinforcement fabrication and installation	t	290	1654.87	47.99
	Slope shotcrete	m3	43	342.80	1.47
	Tunnel shotcrete	m3	3039	366.57	111.40
	Steel support	t	112	2489.92	27.89
	Grouting duct $\Phi 50\text{mm}$	m	3762	75.48	28.40
	Drilling for consolidation grouting	m	1774	8.96	1.59
	Consolidation grouting	t	390	638.01	24.88
	Backfill grouting	m ²	2203	42.92	9.46
	Detailed structure	m3	1351	3.45	0.47
(2)	Penstock adit				161.10
	Overburden excavation	m3	540	3.19	0.17
	Rock open excavation	m3	540	13.08	0.71
	Rock tunnel excavation	m3	11776	50.95	60.00
	C25 lining concrete	m3	461	343.00	15.81
	Outside anchor $\Phi=25\text{mm}$, L=3m	Pcs	46	38.54	0.18
	Inside anchor $\Phi=25\text{mm}$, L=3m	Pcs	2377	44.01	10.46
	Reinforcement fabrication and installation	t	89	1654.87	14.73
	Slope shotcrete	m3	11	342.80	0.38
	Tunnel shotcrete	m3	739	366.57	27.09
	Steel support	t	38	2489.92	9.46

No.	Works or Expenses	Units	Qty.	Unit Price (US\$)	Total (10,000 USD)
	Grouting duct Φ50mm	m	1284	75.48	9.69
	Drilling for consolidation grouting	m	605	8.96	0.54
	Consolidation grouting	t	133	638.01	8.49
	Backfill grouting	m ²	752	42.92	3.23
	Detailed structure	m ³	461	3.45	0.16
4	Facility maintenance and management	km·month	1022.4	1043.72	106.71
II	Construction power supply works				92.85
1	Investment in external construction power supply works (allocated)	Nos.	1	852600	85.26
2	Power transformation and distribution facilities	Nos.	9	8000	7.20
3	Power supply service fee	Month	42	92.65	0.39
III	Water supply system works for construction	Nos.	1	400000	40.00
IV	Air supply system works for construction	Nos.	1	200000	20.00
V	Communication works for construction	Nos.	1	300000	30.00
VI	Construction management information system works	Nos.	1	50000	5.00
VII	Material yard cover removal and protection works				4.81
	Useless layer removal	m ³	20738	2.32	4.81
VIII	Sand and gravel production system works				110.79
1	1 [#] sand and gravel production system	Nos.	1	350000	35.00
2	2 [#] , 3 [#] and 4 [#] sand and gravel production systems (allocated)	Nos.	1	757900	75.79
IX	Concrete production and pouring system works				50.72
1	1 [#] mixing station system	Nos.	1	250000	25.00
2	2 [#] , 3 [#] , 5 [#] and 6 [#] mixing station systems	Nos.	5	20000	10.00
3	4 [#] mixing station system (allocated)	Nos.	1	157200	15.72
X	River diversion works				119.35
1	River diversion works of headworks				119.35
	Overburden excavation	m ³	7727	3.31	2.56
	River dredging	m ³	1320	3.26	0.43
	Boulder blasting	m ³	144	16.23	0.23
	Earth-rock filling	m ³	10743	4.50	4.83
	Woven bag loaded gravelly soil	m ³	1157	41.09	4.75
	Cushion layer materials	m ³	1409	42.08	5.93
	Geotextile membrane	m ²	2822	21.40	6.04
	C20 concrete	m ³	2557	199.96	51.13
	Reinforced gabion	m ³	628	75.88	4.77
	Reinforcement fabrication and installation	t	167	1578.64	26.36
	Dowel φ20mm, L=2m	Pcs	160	22.26	0.36
	Demolition of earth-rock cofferdam	m ³	10634	4.90	5.21
	Demolition of concrete	m ³	1614	41.83	6.75
XI	Safety monitoring during construction period	Nos.	1	100000	10.00
XII	Water data collection and distribution during construction period	Nos.	1	106600	10.66
XIII	Construction and implementation management facility construction works				349.02
1	Site formation	m ²	23500	4	9.40
2	General construction warehouse	m ²	700	160	11.20

No.	Works or Expenses	Units	Qty.	Unit Price (US\$)	Total (10,000 USD)
3	Explosive magazine	Nos.	1	200000	20.00
4	Oil depot	m ²	500	240	12.00
5	Auxiliary processing plant	m ²	2300	200	46.00
6	Office and living camp	m ²	6000	340	204.00
7	Outdoor works	%	10	3026000	30.26
8	Facility maintenance and management	m ²	9550	16.92	16.16
XIV	Other auxiliary works for construction				806.90
1	Slag yard protection works				471.10
	Overburden excavation	m ³	21323	0.90	1.92
	Rock open excavation	m ³	864	8.11	0.70
	Earth and rock backfilling	m ³	12612	2.60	3.28
	Block stone backfilling	m ³	501	21.22	1.06
	Filter material	m ³	105	42.08	0.44
	C15 retaining wall concrete	m ³	8915	167.85	149.64
	C15 drainage ditch concrete	m ³	1378	286.89	39.53
	C25 culvert concrete	m ³	3525	230.25	81.16
	Reinforcement fabrication and installation	t	339	1578.64	53.52
	Geotextile	m ²	573	2.98	0.17
	Drainage pipe 80	m	2294	8	1.84
	Dry masonry stone revetment	m ³	33343	41.34	137.84
2	Ventilation facilities and operation cost	Nos.	1	1575800	157.58
3	Other auxiliary works for construction	%	8	22277400	178.22

Table 4 : Construction Engineering Estimate Sheet

No.	Works or Expenses	Units	Qty.	Unit Price (US\$10,000)	Total (US\$10,000)
	Construction work				12247.66
I	Water retaining structures				1242.26
1	Spillway and undersluice works				943.53
	Overburden excavation	m3	15846	3.31	5.25
	Rubble backfill	m3	2798	21.22	5.94
	Earth and rock backfilling	m3	1308	4.50	0.59
	Filter material	m3	1051	42.08	4.42
	C10 backfill Concrete	m3	1769	120.17	21.26
	C25 blanket concrete	m3	3817	184.46	70.41
	C25 water contraction wall concrete	m3	168	219.96	3.70
	C25 sluice base slab concrete	m3	3219	184.18	59.29
	C25 pier concrete	m3	7658	222.22	170.18
	C25 breast wall concrete	m3	594	220.30	13.09
	C25 phase-II concrete	m3	290	306.08	8.88
	C30 precast concrete for access bridge	m3	56	368.02	2.06
	C25 apron side wall concrete	m3	554	214.01	11.86
	C25 apron framed girder concrete	m3	1680	272.38	45.76
	C40HF concrete	m3	696	315.73	21.97
	Reinforcement fabrication and installation	t	1089	1578.64	171.91
	Hole making for concrete diaphragm wall	m ²	3667	548.76	201.23
	Pouring of concrete diaphragm wall	m3	2934	245.56	72.05
	Sporadic steel structure	t	128	1500	19.20
	Hoist chamber	m ²	90	450	4.05
	PVC drain pipe	m	689	4.50	0.31
	Temperature control measures	m3	20501	4.00	8.20
	Detailed structure	m3	20501	10.69	21.92
2	Retaining dam works				298.73
	Earth excavation	m3	50712	3.31	16.79
	Rock excavation	m3	3525	13.14	4.63
	Rock tunnel excavation	m3	572	69.44	3.97
	Earth and rock backfilling	m3	14214	4.50	6.40
	C25 dam body concrete	m3	7871	190.59	150.01
	C25 lining concrete	m3	205	307.29	6.30
	C25 framed girder revetment concrete	m3	161	259.22	4.17
	Reinforcement fabrication and installation	t	254	1578.64	40.10
	Slope shotcrete	m3	80	353.56	2.83
	Anchor Φ28mm, L=6m	Pcs	238	89.29	2.13
	Anchor Φ32mm, L=6m	Pcs	124	101.10	1.25
	Backfill grouting	m ²	131	42.92	0.56
	Curtain grouting hole making	m	1561	61.33	9.57
	Curtain grouting	t	546	802.90	43.84
	Drain pipe	m	366	4.50	0.16
	Temperature control measures	m3	7871	4.00	3.15
	Detailed structure	m3	8237	3.48	2.87
II	Conveyance structure				7901.80
1	Water intake works				90.85
	Earth and rock backfilling	m3	1069	4.50	0.48

No.	Works or Expenses	Units	Qty.	Unit Price (US\$10,000)	Total (US\$10,000)
	C10 backfill Concrete	m3	2326	120.17	27.95
	C25 base slab concrete	m3	753	184.18	13.87
	C25 pier concrete	m3	433	222.22	9.62
	C25 phase-II concrete	m3	118	306.08	3.61
	C25 upstream revetment concrete	m3	486	219.96	10.69
	C30 precast concrete for access bridge	m3	141	368.02	5.19
	Reinforcement fabrication and installation	t	102	1578.64	16.10
	Masonry revetment	m3	93	92.83	0.86
	Drain pipe	m	83	4.50	0.04
	Detailed structure	m3	4257	5.74	2.44
2	Desanding chamber works				1952.56
	Earth excavation	m3	311464	3.31	103.09
	Rock excavation	m3	15202	13.14	19.98
	Earth and rock backfilling	m3	27538	4.50	12.39
	C25 headrace channel base slab concrete	m3	2742	184.84	50.68
	C25 headrace channel side wall concrete	m3	3477	219.96	76.48
	C25 desanding chamber base slab concrete	m3	21663	184.18	398.99
	C25 desanding chamber side wall concrete	m3	22492	214.01	481.35
	C25 undersluice pier concrete	m3	1293	222.41	28.76
	C25 water distribution pier concrete	m3	645	222.22	14.33
	C25 outlet gate pier concrete	m3	4148	190.59	79.06
	C25 undersluice concrete	m3	1208	245.83	29.70
	C25 framed girder concrete	m3	347	272.38	9.45
	C25 river protection concrete	m3	1481	214.01	31.69
	C30 phase-II concrete	m3	192	396.42	7.61
	C30 framed bent concrete	m3	395	438.38	17.32
	C40 overflow weir concrete	m3	260	251.44	6.54
	C40HF concrete	m3	1157	315.73	36.53
	Reinforcement fabrication and installation	t	2757	1578.64	435.23
	Anchor $\Phi 28\text{mm}$, L=6m	Pcs	516	89.29	4.61
	Reinforced gabion	m3	2385	75.88	18.10
	Drain pipe	m	728	4.50	0.33
	Temperature control measures	m3	61500	4.00	24.60
	Detailed structure	m3	61500	10.69	65.74
3	Headrace tunnel works				4345.35
	Overburden excavation	m3	6739	3.31	2.23
	Rock open excavation	m3	2250	13.14	2.96
	Rock tunnel excavation	m3	189034	49.30	931.94
	C15 backfill concrete	m3	2090	122.98	25.70
	C25 base slab concrete	m3	9238	245.92	227.18
	C25 side arch lining concrete	m3	17426	343.41	598.43
	C25 culvert concrete	m3	1054	230.25	24.27
	C25 plugging concrete	m3	4680	222.71	104.23
	C40HF concrete	m3	1092	312.04	34.07
	Reinforcement fabrication and installation	t	5069	1654.87	838.85
	Rock block dump fill	m3	1872	21.22	3.97
	Backfill grouting	m3	20671	42.92	88.72
	Drilling for consolidation grouting	m	29160	8.96	26.13
	Consolidation grouting	t	6415	638.01	409.28

No.	Works or Expenses	Units	Qty.	Unit Price (US\$10,000)	Total (US\$10,000)
	Sporadic steel structure	t	15	1500	2.25
	Slope shotcrete	m3	156	353.56	5.52
	Pre-placed net shotcrete in tunnel 15cm	m3	8100	366.57	296.92
	Anchor Φ 22mm, L=3m	Pcs	19079	40.53	77.33
	Slope anchor Φ 25mm, L=4.5m	Pcs	360	58.71	2.11
	Pre-placed net shotcrete in tunnel 10cm	m3	5851	378.36	221.38
	Reinforcement fabrication and installation	t	111	1654.87	18.37
	Tunnel anchor Φ 22mm, L=3m.	Pcs	16047	40.53	65.04
	Locked anchor Φ 28mm, L=4.5m	Pcs	13777	73.17	100.81
	Grouting duct Φ 50mm	m	8420	75.48	63.55
	Steel support	t	631	2564.73	161.83
	Detailed structure	m3	35580	3.45	12.28
4	Surge chamber works				402.19
	Rock tunnel excavation	m3	6880	56.87	39.13
	Rock shaft excavation	m3	5197	63.03	32.76
	C25 base slab concrete	m3	336	244.95	8.23
	C25 side arch concrete	m3	1317	343.00	45.17
	C25 shaft concrete	m3	2399	280.25	67.23
	Reinforcement fabrication and installation	t	541	1654.87	89.53
	Pre-placed net shotcrete in tunnel 15cm	m3	40	366.57	1.47
	Backfill grouting	m ²	1242	42.92	5.33
	Drilling for consolidation grouting	m	2471	8.96	2.21
	Consolidation grouting	t	544	638.01	34.71
	Anchor Φ 22mm, L=3m	Pcs	79	40.53	0.32
	Pre-placed net shotcrete in tunnel 15cm	m3	752	366.57	27.57
	Reinforcement fabrication and installation	t	30	1654.87	4.96
	Anchor Φ 22mm, L=3m	Pcs	1377	40.53	5.58
	Locked anchor Φ 28mm, L=4.5m	Pcs	1501	73.17	10.98
	Grouting duct Φ 50mm	m	396	75.48	2.99
	Steel support	t	85	2564.73	21.80
	Detailed structure	m3	4052	5.49	2.22
5	Penstock works				968.63
	Overburden excavation	m3	12061	3.19	3.85
	Rock excavation	m3	28144	13.08	36.81
	Penstock flat segment in rock tunnel excavation	m3	12198	66.75	81.42
	Rock shaft excavation	m3	7341	122.22	89.72
	C25 backfill concrete	m3	12120	290.55	352.15
	C25 outer wrapped concrete	m3	4680	175.60	82.18
	C25 inspection shaft concrete	m3	62	470.02	2.91
	Reinforcement fabrication and installation	t	381	1654.87	63.05
	Slope shotcrete	m3	364	338.51	12.32
	Anchor Φ 22mm, L=3m	Pcs	3502	40.53	14.19
	Slope anchor Φ 25mm, L=4.5m	Pcs	174	58.71	1.02
	Slope anchor Φ 28mm, L=9m	Pcs	174	332.13	5.78
	Anchor pile 3 Φ 28mm, L=15m	Pcs	51	1000.80	5.10
	Backfill grouting	m ²	3108	42.92	13.34
	Contact grouting	m ²	2279	50.22	11.45
	Curtain grouting hole making	m	352	64.20	2.26
	Curtain grouting	t	123	802.90	9.88

No.	Works or Expenses	Units	Qty.	Unit Price (US\$10,000)	Total (US\$10,000)
	re-placed net shotcrete in tunnel	m3	1643	366.57	60.23
	Reinforcement fabrication and installation	t	25	1654.87	4.14
	Anchor Φ22mm, L=3m	Pcs	3502	40.53	14.19
	Locked anchor Φ28mm, L=4.5m	Pcs	5822	73.17	42.60
	Grouting duct Φ50mm	m	1971	75.48	14.88
	Steel support	t	158	2489.92	39.34
	Detailed structure	m3	16862	3.45	5.82
6	Tailrace channel works				142.22
	Overburden excavation	m3	57508	3.79	21.80
	Earth and rock backfilling	m3	6500	4.40	2.86
	C25 culvert concrete	m3	289	231.63	6.69
	C25 tailrace base slab concrete	m3	313	185.44	5.80
	C25 tailrace side wall concrete	m3	1108	216.40	23.98
	C25 plate girder column concrete	m3	65	434.47	2.82
	C25 pier concrete	m3	1027	219.34	22.53
	C25 tailwater pool base slab concrete	m3	468	201.39	9.43
	C25 tailwater pool side wall concrete of	m3	794	211.78	16.82
	M7.5 masonry revetment	m3	102	92.83	0.95
	Reinforcement fabrication and installation	t	168	1578.64	26.52
	Detailed structure	m3	4065	4.96	2.02
III	Power generation buildings				1185.38
1	Power generation foundation works				532.26
	Overburden excavation	m3	440431	3.79	166.92
	Rock open excavation	m3	9400	13.59	12.77
	Earth and rock backfilling	m3	12100	4.40	5.32
	C15 backfill concrete	m3	3210	124.92	40.10
	C25 powerhouse substructure concrete	m3	7750	219.94	170.45
	C30 powerhouse substructure concrete	m3	635	233.49	14.83
	Reinforcement fabrication and installation	t	725	1578.64	114.45
	Temperature control measures	m3	8285	4.00	3.31
	Detailed structure	m3	8285	4.96	4.11
2	Powerhouse works				360.35
	C30 powerhouse superstructure concrete	m3	3844	310.40	119.32
	C40 powerhouse superstructure concrete	m3	117	338.80	3.96
	Reinforcement fabrication and installation	t	669	1578.64	105.61
	Building and decoration	m ²	3700	350.00	129.50
	Detailed structure	m3	3960	4.96	1.96
3	Plant area works				292.77
	Overburden excavation	m3	3540	3.79	1.34
	Earth and rock backfilling	m3	630	4.40	0.28
	C20 floor concrete	m3	778	175.72	13.67
	C20 retaining wall concrete	m3	4290	216.40	92.84
	C25 revetment concrete	m3	550	266.82	14.68
	C25 framed girder revetment concrete	m3	1875	263.26	49.36
	C25 upstream trench reconstruction concrete	m3	1690	225.30	38.08
	Reinforcement fabrication and installation	t	144	1578.64	22.73
	Drain hole	m	9160	6.25	5.72
	Drainage ditch masonry	m3	240	88.49	2.12
	Slope shotcrete	m3	980	338.51	33.17

No.	Works or Expenses	Units	Qty.	Unit Price (US\$10,000)	Total (US\$10,000)
	Slope anchor $\Phi 25\text{mm}$, L=4.5m	Pcs	720	58.71	4.23
	SNS flexible protective net	m ²	800	125.00	10.00
	Detailed structure	m3	9183	4.96	4.55
IV	Step-up transformation buildings				210.97
1	GIS building works				210.97
	C25 foundation concrete	m3	1380	219.94	30.35
	C30 superstructure concrete	m3	1690	310.40	52.46
	C40 crane beam concrete	m3	71	338.80	2.41
	Reinforcement fabrication and installation	t	435	1654.87	71.99
	Building and decoration	m ²	1550	330.00	51.15
	Detailed structure	m3	3141	8.31	2.61
V	Traffic works				1179.68
1	Road works				986.74
	Concrete pavement of dam access road	km	0.3	500000	15.00
	Road to 4# adit, 4.5m wide, clay bound macadam pavement	km	5.8	450000	261.00
	Left bank road of headworks, 4.5m wide, clay bound macadam pavement.	km	3	500000	150.00
	Investment in external road reconstruction and expansion works (apportioned)	Nos.	1	5447400	544.74
	Walking road reconstruction works	Nos.	1	160000	16.00
2	Access tunnel of surge chamber				192.94
	Overburden excavation	m3	2588	3.53	0.91
	Rock open excavation	m3	6038	13.34	8.05
	Rock tunnel excavation	m3	6010	54.78	32.92
	C25 base slab concrete	m3	299	244.95	7.32
	C25 side arch lining concrete	m3	733	343.00	25.14
	Pre-placed net shotcrete in tunnel 15cm	m3	173	366.57	6.34
	Slope shotcrete	m3	208	342.80	7.13
	Reinforcement fabrication and installation	t	99	1654.87	16.38
	Anchor $\Phi 22\text{mm}$, L=3m	Pcs	412	40.53	1.67
	Anchor $\Phi 25\text{mm}$, L=4.5m	Pcs	309	67.34	2.08
	Locked anchor $\Phi 28\text{mm}$, L=4.5m	Pcs	923	73.17	6.75
	Drilling for consolidation grouting	m	937	8.96	0.84
	Consolidation grouting	t	206	638.01	13.14
	Backfill grouting	m ²	829	42.92	3.56
	Pre-placed net shotcrete in tunnel 10cm	m3	291	378.36	11.01
	Reinforcement fabrication and installation	t	5	1654.87	0.83
	Anchor $\Phi 22\text{mm}$, L=3m	Pcs	700	40.53	2.84
	Grouting duct $\Phi 50\text{mm}$	m	119	75.48	0.90
	Steel support	t	35	2489.92	8.71
	Detailed structure	m3	1032	3.45	0.36
VI	Housing and building works				388.36
1	Centralized control room and duty room of headworks	m ²	200	450	9.00
2	Plant complex	m ²	1000	620	62.00
3	Owner camp investment (apportioned)	Nos.	1	1989400	198.94
4	Kathmandu Office investment (apportioned)	Nos.	1	1184200	118.42
VII	Safety monitoring works	Nos.	1	100000	10.00

No.	Works or Expenses	Units	Qty.	Unit Price (US\$10,000)	Total (US\$10,000)
VIII	Hydrologic data collection and distribution works	Nos.	1	142100	14.21
IX	Fire fighting works	Nos.	1	150000	15.00
X	Labor safety and industrial hygiene works	Nos.	1	120000	12.00
XI	Other works				88.00
1	Power line works	Nos.	1	450000	45.00
2	Lighting line works	Nos.	1	30000	3.00
3	Communication line works	Nos.	1	120000	12.00
4	Water supply and drainage works in plant dam area	Nos.	1	100000	10.00
5	Earthquake monitoring station (platform) network works	Nos.	1	150000	15.00
6	Others	Nos.	1	30000	3.00

Table 5: Budget Estimation for Environmental Protection and Soil and Water Conservation Special Project

No.	Works or Expenses	Units	Qty.	Unit Price (US\$10,000)	Total (US\$10,000)
	Special projects for environmental protection and water and soil conservation				179.77
I	Environmental protection special project				131.46
1	Water environmental protection project	Nos.	1	554500	55.45
2	Terrestrial plant and animal protection project	Nos.	1	60000	6.00
3	Aquatic biological protection project	Nos.	1	241100	24.11
4	Atmospheric environmental protection project	Nos.	1	72900	7.29
5	Sound environment protection works	Nos.	1	5400	0.54
6	Solid waste disposal	Nos.	1	25500	2.55
7	Population health protection	Nos.	1	294200	29.42
8	Environmental monitoring	Nos.	1	41000	4.10
9	Other environmental protection works	Nos.	1	20000	2.00
II	Soil and water conservation special project				48.31
1	Engineering measures	Nos.	1	386100	38.61
2	Vegetation measures	Nos.	1	44600	4.46
3	Temporary works for construction	Nos.	1	52400	5.24

Table 6: Estimate of Mechanical and Electrical Equipment and Installation Works

No.	Name & Spec.	Units	Qty.	Unit Price (US\$10,000)		Total (US\$10,000)	
				Equipment fees	Installation fees	Equipment fees	Installation fees
1	M&E equipment and installation works					2593.42	929.88
	Power generation equipment and installation works					1995.00	736.68
	Turbine and installation works					502.04	91.07
	Turbine CJ(X)-270/6×22.3	Set	2	1424500	385273.28	284.90	77.05
	Governor CJWT6/6-6.3	Set	2	200000	42450.16	40.00	8.49
	Oil pressure unit YZ-1.6-6.3	Set	2	57000	23156.71	11.40	4.63
	automation element	Set	2	290000	4500	58.00	0.90
	Freight and miscellaneous charges in China	%	5.44			21.45	
	Freight and miscellaneous charges outside China	Nos.	1	801395		80.14	
	Tariff	Nos.	1	47533		4.75	
	Turbine oil	t	10	1400		1.40	
2	Generation equipment and installation works					710.56	90.84
	Generator SF67.5-20/5600	Set	2	2736000		547.20	
	Excitation equipment	Set	2	69000		13.80	
	Generator installation cost	Set	2		454199.92		90.84
	Freight and miscellaneous charges in China	%	5.44			30.52	
	Freight and miscellaneous charges outside China	Nos.	1	1124680		112.47	
	Tariff	Nos.	1	65738		6.57	
3	Inlet valve equipment and installation works					158.49	36.12
	Ball valve QF430.2-WY-190	Set	2	637000	180608.4	127.40	36.12
	Freight and miscellaneous charges in China	%	6.97			8.88	
	Freight and miscellaneous charges outside China	Nos.	1	207060		20.71	
	Tariff	Nos.	1	14998		1.50	
4	Lifting equipment and installation works					82.91	21.58
	Lifting equipment and installation of main powerhouse					79.83	16.33
	Bridge crane 200t/50t/10t, Lk=21m	Set	1	555000	85771.72	55.50	8.58
	Track QU100	Duplex 10m	6.5		7973.12		5.18
	Track stopper	t	1.34		5803.88		0.78
	Trolley conductor	Three-phase, 10m	6.5		2755.08		1.79

QYEC in Association with HCE

No.	Name & Spec.	Units	Qty.	Unit Price (US\$10,000)		Total (US\$10,000)	
				Equipment fees	Installation fees	Equipment fees	Installation fees
	Freight and miscellaneous charges in China	%	7.74			4.30	
	Freight and miscellaneous charges outside China	Nos.	1	193000		19.30	
	Tariff	Nos.	1	7300		0.73	
						3.08	5.25
(2)	Lifting equipment and installation for GIS building	Set	1	21000	19130.45	2.10	1.91
	Electric single-girder bridge crane LD10-10	Duplex 10m	4.5		4452.78		2.00
	Track installation P43	t	0.19		5041.42		0.10
	Track stopper				2755.08		1.24
	Trolley conductor	Three-phase, 10m	4.5			0.16	
	Freight and miscellaneous charges in China	%	7.74			0.79	
	Freight and miscellaneous charges outside China	Nos.	1	7860			
	Tariff	Nos.	1	296		0.03	
5	Hydraulic machinery and auxiliary equipment and installation works					62.04	81.20
(1)	Oil system	Set	2	1000		4.70	0.77
	Pressure filter LY-100	Set	1	7800		0.78	
	Turbine oil filter ZJCQ-6	Set	4	750		0.30	
	Gear oil pump 2CY-6.0/3.3-1	Set	1	5000		0.50	
	Vacuum oil separator ZJA6BY	Nos.	2	3700		0.74	
	Turbine oil tank V=12m3	Nos.	2	5000		1.00	
	Insulating oil tank V=20m3	Nos.	1	410		0.04	
	Electric heating drying oven DX-1.2	%	10.16			0.36	
	Freight and miscellaneous charges in China	Nos.	1	7398		0.74	
	Freight and miscellaneous charges outside China	Nos.	1	434		0.04	
	Tariff	%	17.81				0.77
	Oil system installation cost					10.16	1.12
(2)	Compressed air system	Set	2	6400		1.28	
	Medium pressure air compressor Q=1.0m3/min	Set	2	24000		4.80	
	Low pressure air compressor Q=5.3m3/min	Nos.	1	2300		0.23	
	Medium pressure gas storage tank V=2.0m3	Nos.	2	6900		1.38	
	Low pressure gas storage tank V=5.0m3						

Table 6: Estimate of Mechanical and Electrical Equipment and Installation Works

No.	Name & Spec.	Units	Qty.	Unit Price (US\$10,000)		Total (US\$10,000)	
				Equipment fees	Installation fees	Equipment fees	Installation fees
	M&E equipment and installation works					2593.42	929.88
I	Power generation equipment and installation works					1995.00	736.68
1	Turbine and installation works					502.04	91.07
	Turbine CJ(X)-270/6×22.3	Set	2	1424500	385273.28	284.90	77.05
	Governor CJWT6/6-6.3	Set	2	200000	42450.16	40.00	8.49
	Oil pressure unit YZ-1.6-6.3	Set	2	57000	23156.71	11.40	4.63
	automation element	Set	2	290000	4500	58.00	0.90
	Freight and miscellaneous charges in China	%	5.44			21.45	
	Freight and miscellaneous charges outside China	Nos.	1	801395		80.14	
	Tariff	Nos.	1	47533		4.75	
	Turbine oil	t	10	1400		1.40	
2	Generation equipment and installation works					710.56	90.84
	Generator SF67.5-20/5600	Set	2	2736000		547.20	
	Excitation equipment	Set	2	69000		13.80	
	Generator installation cost	Set	2		454199.92		90.84
	Freight and miscellaneous charges in China	%	5.44			30.52	
	Freight and miscellaneous charges outside China	Nos.	1	1124680		112.47	
	Tariff	Nos.	1	65738		6.57	
3	Inlet valve equipment and installation works					158.49	36.12
	Ball valve QF430.2-WY-190	Set	2	637000	180608.4	127.40	36.12
	Freight and miscellaneous charges in China	%	6.97			8.88	
	Freight and miscellaneous charges outside China	Nos.	1	207060		20.71	
	Tariff	Nos.	1	14998		1.50	
4	Lifting equipment and installation works					82.91	21.58
(1)	Lifting equipment and installation of main powerhouse					79.83	16.33
	Bridge crane 200t/50t/10t, Lk=21m	Set	1	555000	85771.72	55.50	8.58
	Track QU100	Duplex 10m	6.5		7973.12		5.18
	Track stopper	t	1.34		5803.88		0.78
	Trolley conductor	Three-phase, 10m	6.5		2755.08		1.79

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No.	Name & Spec.	Units	Qty.	Unit Price (US\$10,000)		Total (US\$10,000)	
				Equipment fees	Installation fees	Equipment fees	Installation fees
	Freight and miscellaneous charges in China	%	10.16			0.78	
	Freight and miscellaneous charges outside China	Nos.	1	15980		1.60	
	Tariff	Nos.	1	938		0.09	
	Compressed air system installation cost	%	11.95				1.12
(3)	Water system					27.23	8.68
	Technical water supply and borehole submerged pump of unit Q=450m ³ /h	Set	4	21000		8.40	
	Tailwater cooler Q=500m ³ /h	Set	2	60000		12.00	
	Submerged sewage pump Q=25m ³ /h	Set	1	2100		0.21	
	Freight and miscellaneous charges in China	%	10.16			2.09	
	Freight and miscellaneous charges outside China	Nos.	1	42828		4.28	
	Tariff	Nos.	1	2514		0.25	
	Water system installation cost	%	34.52				8.68
(4)	Hydraulic measurement system					19.95	6.36
	Measuring system of plant	Set	1	41000		4.10	
	Measuring system in unit segment	Set	1	110000		11.00	
	Freight and miscellaneous charges in China	%	10.16			1.53	
	Freight and miscellaneous charges outside China	Nos.	1	31378		3.14	
	Tariff	Nos.	1	1842		0.18	
	Installation cost of hydraulic measuring system	%	34.52				6.36
(5)	Pipeline						64.27
	Oil pipeline	t	11		9941.70		10.94
	Compressed air pipeline	t	9		10963.14		9.87
	Water pipeline	t	50		8692.27		43.46
6	Electrical equipment and installation works					205.35	317.51
(1)	Generating voltage device					120.27	26.06
	Generator neutral cabinet	Set	2	17000		3.40	
	12KV switchgear XGN2-12GY	Set	12	50000		60.00	
	12KV switchgear KYN28-12GY	Set	12	23000		27.60	
	Freight and miscellaneous charges in China	%	10.16			9.25	

No.	Name & Spec.	Units	Qty.	Unit Price (US\$10,000)		Total (US\$10,000)	
				Equipment fees	Installation fees	Equipment fees	Installation fees
(2)	Freight and miscellaneous charges outside China	Nos.	1	189098		18.91	
	Tariff	Nos.	1	11102		1.11	
	Installation cost of generating voltage installation	%	23.47				26.06
	Busbars						63.06
(3)	Busbars	m/single-phase	510		1236.55		63.06
	Electrical system of plant					73.06	16.37
	Power transformer SCB11-1250/11GY	Set	2	30000		6.00	
	Power transformer SCB11-2000/11GY	Set	1	48000		4.80	
	Power transformer SCB11-1000/11	Set	1	27000		2.70	
	Diesel generator set Pn=400kW, Un=400V	Set	1	73000		7.30	
	Low voltage distribution panel 0.4kV	Set	21	14000		29.40	
	Power supply box 0.4kV	Set	8	2600		2.08	
	Lighting system	Set	1	30000		3.00	
	Freight and miscellaneous charges in China	%	10.16			5.62	
(4)	Freight and miscellaneous charges outside China	Nos.	1	114872		11.49	
	Tariff	Nos.	1	6744		0.67	
	Installation cost of auxiliary power system	%	24.28				16.37
	Electrical testing equipment						0.97
	Electrical laboratory equipment level-II standard	Set	1	91000		12.02	
	Freight and miscellaneous charges in China	%	10.16			9.10	
	Freight and miscellaneous charges outside China	Nos.	1	18910		0.92	
	Tariff	Nos.	1	1110		1.89	
	Installation cost of electrical test equipment	%	8.78			0.11	
	Power cables	km					0.97
(5)	Power cable 35kV	km	1		100076.99		200.25
	Power cable 15kV	km	10		63264.71		10.01
	Low voltage power cable 0.6/1kV	km	40		31745.61		63.26
	Tray						126.98
7	Cable tray	t	60		1800		10.80
	Control and protection equipment and installation works					206.98	89.01

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No.	Name & Spec.	Units	Qty.	Unit Price (US\$10,000)		Total (US\$10,000)	
				Equipment fees	Installation fees	Equipment fees	Installation fees
(1)	Control and protection system					97.56	18.10
	Switchgear room fault recorder cabinet, microcomputer type	Set	1	21000		2.10	
	220kV transformer protection cabinet, microcomputer type	Set	4	17000		6.80	
	Plant transformer protector, microcomputer type	Set	3	6800		2.04	
	220kV line protection cabinet, microcomputer type	Set	4	19000		7.60	
	220kV bus protection cabinet, microcomputer type	Set	1	30000		3.00	
	Generator protection cabinet, microcomputer type	Set	2	21000		4.20	
	Unit fault recorder cabinet, microcomputer type	Set	1	21000		2.10	
	Plant power standby unit of plant	Set	4	2700		1.08	
	Unit temperature measuring brake cabinet	Set	2	8200		1.64	
	Unit vibration swing cabinet	Set	1	11000		1.10	
	Energy metering system	Set	1	120000		12.00	
	Dispatcher automation system	Set	1	145000		14.50	
	Inverter power supply cabinet	Set	1	8200		0.82	
	Control box and terminal box	Nos.	8	800		0.64	
	Auxiliary monitoring system	Set	1	142000		14.20	
	Freight and miscellaneous charges in China	%	10.16			7.50	
	Freight and miscellaneous charges outside China	Nos.	1	153398		15.34	
	Tariff	Nos.	1	9006		0.90	
	Installation cost of control and protection system	%	20.1				18.10
(2)	Computer monitoring system					66.08	8.91
	Computer monitoring equipment	Set	1	500000		50.00	
	Freight and miscellaneous charges in China	%	10.16			5.08	
	Freight and miscellaneous charges outside China	Nos.	1	103900		10.39	
	Tariff	Nos.	1	6100		0.61	
	Installation cost of computer monitoring equipment	%	14.61				8.91
(3)	Industrial television					17.97	4.03
	Digital industrial television system	Set	1	136000		13.60	
	Freight and miscellaneous charges in China	%	10.16			1.38	

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No.	Name & Spec.	Units	Qty.	Unit Price (US\$10,000)		Total (US\$10,000)	
				Equipment fees	Installation fees	Equipment fees	Installation fees
	Freight and miscellaneous charges outside China	Nos.	1	28161		2.82	
	Tariff	Nos.	1	1659		0.17	
	Installation cost of industrial television	%	24.28				4.03
(4)	DC system					25.37	5.44
	DC power supply unit of station 300Ah, 220V	Set	1	110000		11.00	
	DC power supply unit of lock head 150Ah and 220V	Set	1	82000		8.20	
	Freight and miscellaneous charges in China	%	10.16			1.95	
	Freight and miscellaneous charges outside China	Nos.	1	39898		3.99	
	Tariff	Nos.	1	2342		0.23	
	Installation cost of DC system	%	23.24				5.44
(5)	Control and protective cable						52.53
	Control cable	km	40		13132.41		52.53
8	Communication equipment and installation works					66.63	9.35
(1)	fiber-optic communication					50.48	6.10
	Optical transmission device 2.5G	Set	2	136000		27.20	
	Optical transmission device SDH155	Set	1	110000		11.00	
	Freight and miscellaneous charges in China	%	10.16			3.88	
	Freight and miscellaneous charges outside China	Nos.	1	79280		7.93	
	Tariff	Nos.	1	4660		0.47	
	Optical fiber communication installation	Set	3		20341.25		6.10
(2)	Production scheduling communication					11.42	2.76
	Program-controlled switchboard 120 sets	Set	1	64000		6.40	
	Automatic telephone set	Set	40	55		0.22	
	Distribution box	Nos.	3	320		0.10	
	PULL BOX	Nos.	3	120		0.04	
	Security distribution cabinet 300 loops	Set	1	1800		0.18	
	Security distribution cabinets 100 loops	Set	1	1400		0.14	
	Moisture-proof box of telephone	Nos.	2	140		0.03	
	Outlet box of telephone	Nos.	80	140		1.12	
	Test instrumentation	Set	1	4100		0.41	

No.	Name & Spec.	Units	Qty.	Unit Price (US\$10,000)		Total (US\$10,000)	
				Equipment fees	Installation fees	Equipment fees	Installation fees
	Freight and miscellaneous charges in China	%	10.16			0.88	
	Freight and miscellaneous charges outside China	Nos.	1	17854		1.79	
	Tariff	Nos.	1	1054		0.11	
	Production dispatching communication installation	Nos.	1		27567.27		2.76
(3)	Power supply unit					4.73	0.49
	High frequency switching power supply -48V/120A	Set	2	6900		1.38	
	Maintenance-free battery 48V/120Ah	Set	2	11000		2.20	
	Freight and miscellaneous charges in China	%	10.16			0.36	
	Freight and miscellaneous charges outside China	Nos.	1	7539		0.75	
	Tariff	Nos.	1	437		0.04	
	Installation cost of power supply unit	Set	4		1217.94		0.49
II	Step-up transformation equipment and installation works					356.83	84.04
1	Main transformer equipment and installation works					212.11	19.11
	Main transformer SFPI11-H-75000/220	Set	2	825000	72444.44	165.00	14.49
	Track installation 50kg/m	Duplex 10mm	9		4925.95		4.43
	Track stopper	t	0.32		5803.88		0.19
	Freight and miscellaneous charges in China	%	6.60			10.89	
	Freight and miscellaneous charges outside China	Nos.	1	342108		34.21	
	Tariff	Nos.	1	20068		2.01	
2	High-voltage electrical equipment and installation works					144.72	18.12
(1)	GIS high-voltage combination electrical equipment					115.24	16.34
	252kV GIS circuit breaker interval	Interval	3	230000		69.00	
	252kV GIS PT space	Interval	1	182000		18.20	
	Freight and miscellaneous charges in China	%	10.16			8.86	
	Freight and miscellaneous charges outside China	Nos.	1	181202		18.12	
	Tariff	Nos.	1	10638		1.06	
	Installation of GIS high voltage combined electrical equipment	Interval	4		40851.29		16.34
(2)	High-voltage electrical equipment and installation works	Set				29.48	1.78
	220KV lightning arrester Y10W5-200/520GY	Set	3	2800		0.84	

No.	Name & Spec.	Units	Qty.	Unit Price (US\$10,000)		Total (US\$10,000)	
				Equipment fees	Installation fees	Equipment fees	Installation fees
	Capacitor voltage transformer TYD-220 3-0.005H	Set	3	8200		2.46	
	Main transformer neutral equipment 200KV	Set	2	21000		4.20	
	33KV switchgear XGN17-40.5GY	Set	4	37000		14.80	
	Freight and miscellaneous charges in China	%	10.16			2.27	
	Freight and miscellaneous charges outside China	Nos.	1	46399		4.64	
	Tariff	Nos.	1	2721		0.27	
	High-voltage electrical equipment installation cost	%	6.53				1.78
3	One-time wiring						
	Steel core aluminum wire	m/three-phase	3500		133.75		46.81
III	Safety monitoring equipment and installation works	Nos.	1	337500	112500	33.75	46.81
IV	Hydrological measuring and forecasting equipment and installation works	Nos.	1	56800	14200	5.68	11.25
V	Fire-fighting equipment and installation works						1.42
	Deluge valve unit DN100	Set	2	4100		31.99	5.92
	Deluge valve unit DN150	Set	2	5000		0.82	
	Pressure reducing and regulating fire hydrant box SG20A65	Nos.	7	280		1.00	
	Pressure reducing and regulating indoor fire hydrant box SG24A65-P	Set	4	140		0.20	
	Outdoor fire hydrant SS-100/65-1.0	Set	2	270		0.06	
	Sand box 2m3	Set	8	270		0.05	
	Fireproof (4 sets)	Nos.	19	75		0.22	
	Fire extinguisher box (2 sets)	Nos.	15	45		0.14	
	Firefighting shovel	Nos.	20	30		0.07	
	gas mask	Set	10	75		0.06	
	fire proof partition	t	2	1900		0.08	
	Fire alarm cabinet	Set	1	6800		0.38	
	Fire alarm controller	Set	1	6800		0.68	
	Fire linkage controller	Set	1	6800		0.68	
	Fire broadcasting host	Set	1	1400		0.68	
	Fire standby power supply	Set	1	8200		0.14	
		Set	1			0.82	

No.	Name & Spec.	Units	Qty.	Unit Price (US\$10,000)		Total (US\$10,000)	
				Equipment fees	Installation fees	Equipment fees	Installation fees
	Monitoring module	Nos.	12	90		0.11	
	Control module	Nos.	50	90		0.45	
	Failure isolation module	Nos.	10	90		0.09	
	Module box	Nos.	3	140		0.04	
	Fire broadcaster	Nos.	20	70		0.14	
	Manual alarm	Nos.	20	110		0.22	
	Audible and visual alarm	Nos.	20	230		0.46	
	Intelligent temperature and smoke detector	Nos.	40	90		0.36	
	Linear smoke detector	couple	4	180		0.07	
	Infra-Red Flame detectors	Nos.	100	380		3.80	
	Cable line-type fixed temperature detector	km	5	2800		1.40	
	Gas fire extinguishing device	Set	2	2800		0.56	
	Portable ammonium phosphate fire extinguisher 2kg (fire extinguishing grade 1A)	Nos.	26	45		0.12	
	Portable ammonium phosphate fire extinguisher 4kg (fire extinguishing grade 2A)	Nos.	98	50		0.49	
	Portable ammonium phosphate fire extinguisher 4kg (fire extinguishing grade 55B)	Nos.	10	100		0.10	
	Portable ammonium phosphate fire extinguisher 5kg (fire extinguishing grade 3A)	Nos.	10	120		0.12	
	Trolley type ammonium phosphate fire extinguisher 20kg (fire extinguishing grade 183B)	Nos.	3	300		0.09	
	Wire and cable	Set	1	3700		0.37	
	Freight and miscellaneous charges in China	%	10.16			1.53	
	Freight and miscellaneous charges outside China	Nos.	1	5188		5.19	
	Tariff	Nos.	1	3046		0.30	
	Installation cost of fire fighting equipment	%	28.78				5.92
	Fireproof plug and coating	t	33	3000		9.90	
V1	Labor safety and industrial hygiene equipment and installation works	Nos.	1	70000	15000	7.00	1.50
VII	Other equipment and installation works					163.17	89.07

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No.	Name & Spec.	Units	Qty.	Unit Price (US\$10,000)		Total (US\$10,000)	
				Equipment fees	Installation fees	Equipment fees	Installation fees
1	Dam area feed equipment and installation works					21.97	4.92
	Plant transformer SCB11-400/11	Set	1	23000		2.30	
	Plant transformer SCB11-400/33	Set	1	26000		2.60	
	Diesel generators 300kW, 0.4kV, cos ϕ =0.8	Set	1	64000		6.40	
	Low voltage distribution panel MNS, 0.4kV	Set	4	12000		4.80	
	Power box XL-21, 0.4kV	Set	2	2600		0.52	
	Freight and miscellaneous charges in China	%	10.16			1.69	
	Freight and miscellaneous charges outside China	Nos.	1	34636		3.46	
	Tariff	Nos.	1	2028		0.20	
	Installation cost of auxiliary power system	%	24.28				4.92
2	Water supply and drainage equipment and installation works	Nos.	1	60000	7500	6.00	0.75
3	Centralized control center equipment and installation works	Nos.	1	757900	189500	75.79	18.95
4	Ventilation and heating equipment and installation works					10.21	4.68
(1)	Fan					2.90	0.86
	Axial flow fan BT35-11 No4.0 n=1450 G=4208 H=100 N=0.25	Set	3	700		0.21	
	Axial flow fan T35-11No5.6 n=960 G=8471 H=103 N=0.37	Set	19	700		1.33	
	Axial flow fan BT35-11No4.0 n=1450 G=2846 H=73 N=0.12	Set	4	450		0.18	
	Ventilator SF5277 N=0.06 G=1260	Set	5	100		0.05	
	Fire damper and grille vent	Set	36	120		0.43	
	Freight and miscellaneous charges in China	%	10.16			0.22	
	Freight and miscellaneous charges outside China	Nos.	1	4472		0.45	
	Tariff	Nos.	1	268		0.03	
	Fan installation cost	%	32.11				0.86
(2)	Air conditioner					7.31	1.05
	Constant temperature and humidity cabinet air conditioner Q1=12.5 Q2=14 N=7.6	Set	3	8000		2.40	
	Constant temperature and humidity cabinet air conditioner Q1=7.2 Q2=9.6 N=3.9	Set	1	7500		0.75	

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No.	Name & Spec.	Units	Qty.	Unit Price (US\$10,000)		Total (US\$10,000)	
				Equipment fees	Installation fees	Equipment fees	Installation fees
	Constant temperature and humidity cabinet air conditioner Q1=5.1 Q2=6.8 N=3.9	Set	1	7000		0.70	
	Dehumidifier CLF (Z) 10 G=4000 T=10 N=4.3	Set	4	1200		0.48	
	Fan heater ZH-10 G=3000 N=10	Set	8	1500		1.20	
	Freight and miscellaneous charges in China	%	10.16			0.56	
	Freight and miscellaneous charges outside China	Nos.	1	11491		1.15	
	Tariff	Nos.	1	675		0.07	
	Installation cost of air conditioners	%	15.52				1.05
(3)	Pipeline system						2.77
	Colored steel air duct	t	1		20117.96		2.01
	Water pipe thermal insulation material	m3	20		380		0.76
5	Machine maintenance equipment and installation works					2.30	0.26
	Vertical driller Z52B	Set	1	3000		0.30	
	Radial driller Z32K	Nos.	1	8000		0.80	
	Bench drill Z512-2	Nos.	2	300		0.06	
	DC welder AX-320	Set	2	800		0.16	
	DC welder AX1-500	Set	1	900		0.09	
	AC welder BX1-330	Nos.	2	600		0.12	
	Bench grinder S3ST-100	Nos.	2	150		0.03	
	Floor-type grinder S3SL-200	Nos.	1	180		0.02	
	Flexible shaft grinder S3SR-100	Set	2	250		0.05	
	Pneumatic grinder S-60	Set	2	150		0.03	
	Pneumatic grinder S-150	Set	2	150		0.03	
	Oxygen cylinder	Nos.	10	50		0.05	
	Freight and miscellaneous charges in China	%	10.16			0.18	
	Freight and miscellaneous charges outside China	Nos.	1	3616		0.36	
	Tariff	Nos.	1	212		0.02	
	Installation cost of machine repair equipment	%	12.33				0.26
6	Earthquake monitoring station (platform) network equipment					15.00	4.00

No.	Name & Spec.	Units	Qty.	Unit Price (US\$10,000)		Total (US\$10,000)	
				Equipment fees	Installation fees	Equipment fees	Installation fees
	Earthquake monitoring station (platform) network equipment and installation	Nos.	1	150000	40000	15.00	4.00
7	Traffic equipment	Set				31.90	
	Motor truck	Set	1	60000		6.00	
	Tool car	Set	1	45000		4.50	
	Trolley	Set	3	38000		11.40	
	Bus	Set	1	75000		7.50	
	Ambulance	Set	1	25000		2.50	
8	Plant earthing	t	80		6938.49		55.51

Table 7: Estimate of Metal Structure Equipment and Installation Works

No.	Name & Spec.	Units	Qty.	Unit Price (US\$10,000)		Total (US\$10,000)	
				Equipment fees	Installation fees	Equipment fees	Installation fees
I	Metal structure and equipment and installation works					380.02	1683.49
	Water retaining structures					256.55	79.34
	Gate equipment and installation works					103.58	44.97
	Spillway service gate flap, radial gate, 110t/set	t	220	2000	808.92	44.00	17.80
	Spillway service gate slot	t	26	1800	1867.51	4.68	4.86
	Spillway bulkhead gate flap, sliding gate, 48t/set	t	48	1750	929.45	8.40	4.46
	Spillway bulkhead gate slot	t	36	1600	1867.51	5.76	6.72
	Undersluice bulkhead gate flap, radial gate, 40t/set	t	40	2000	1299.83	8.00	5.20
	Undersluice service gate slot	t	10	1800	1941.06	1.80	1.94
	Undersluice bulkhead gate flap, sliding gate, 16t/set	t	16	1750	977.60	2.80	1.56
2	Undersluice bulkhead gate slot	t	12	1600	1867.51	1.92	2.24
	Weighting block	t	12	850	159.56	1.02	0.19
	Freight and miscellaneous charges in China	%	10.16			7.96	
	Freight and miscellaneous charges outside China	Nos.	1	162774		16.28	
	Tariff	Nos.	1	9562		0.96	
	Hoists and installation works					152.97	34.37
	Hydraulic hoist 2×1800kN	Set	2	300000	77155.51	60.00	15.43
	One-way portal crane 1000kN	Set	1	332500	62991.51	33.25	6.30
	Hydraulic hoist 2×800kN	Set	1	225000	62147.62	22.50	6.21
	Track QU80	Duplex 10m	12		4994.95		5.99
II	Track stopper	t	0.88		5041.42		0.44
	Freight and miscellaneous charges in China	%	10.16			11.76	
	Freight and miscellaneous charges outside China	Nos.	1	240528		24.05	
	Tariff	Nos.	1	14122		1.41	
	Conveyance structure					123.47	1604.15
	Gate equipment and installation works					58.94	34.06
	Sand trench undersluice flap, fixed-wheel gate, 8t/set	t	8	1800	1167.82	1.44	0.93
	Sand trench undersluice slot	t	6	1600	1941.06	0.96	1.16
	Desanding chamber inlet service gate flap, fixed-wheel gate, 26t/set	t	104	1800	1103.74	18.72	11.48

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No.	Name & Spec.	Units	Qty.	Unit Price (US\$10,000)		Total (US\$10,000)	
				Equipment fees	Installation fees	Equipment fees	Installation fees
	Desanding chamber inlet service gate slot	t	32	1600	1941.06	5.12	6.21
	Desanding chamber outlet service gate flap, fixed-wheel gate, 16t/set	t	32	1800	1103.74	5.76	3.53
	Desanding chamber outlet service gate slot	t	12	1600	1941.06	1.92	2.33
	Undersluice flap, fixed-wheel gate, 3t/set	t	12	1800	1112.21	2.16	1.33
	Undersluice slot	t	16	1600	1941.06	2.56	3.11
	1# adit closure gate flap, hinged gate, 4t/set	t	4	1750	1167.82	0.70	0.47
	1# adit closure gate slot	t	2	1600	1941.06	0.32	0.39
	2# adit closure gate flap, hinged gate, 4t/set	t	4	1750	1167.82	0.70	0.47
	2# adit closure gate slot	t	3	1600	1941.06	0.48	0.58
	Tailrace channel service gate flap, fixed-wheel gate, 8t/set	t	8	1800	1112.21	1.44	0.89
	Tailrace channel service gate slot	t	5	1600	1941.06	0.80	0.97
	Weighting block	t	13	850	159.56	1.10	0.21
	Freight and miscellaneous charges in China	%	10.16			4.49	
	Freight and miscellaneous charges outside China	Nos.	1	97262		9.73	
	Tariff	Nos.	1	5390		0.54	
2	Hois and installation works					43.52	9.12
	Fixed winch hoist 250kN	Set	2	22200	6441.97	4.44	1.29
	Fixed winch hoist 2×250kN	Set	4	33300	8326.00	13.32	3.33
	Fixed winch hoist 2×160kN	Set	2	29600	7660.35	5.92	1.53
	Fixed winch hoist 160kN	Set	4	16650	5832.79	6.66	2.33
	Fixed winch hoist 2×100kN	Set	1	22200	6441.97	2.22	0.64
	Freight and miscellaneous charges in China	%	10.16			3.31	
	Freight and miscellaneous charges outside China	Nos.	1	72544		7.25	
	Tariff	Nos.	1	3972		0.40	
3	Trash equipment and installation works					21.01	4.21
	Rotary trash rack, rack body	t	40	1980	443.74	7.92	1.77
	Rotary trash rack, slot	t	4	1580	1672.5	0.63	0.67
	Vortex gate, body	t	40	1650	443.74	6.60	1.77
	Freight and miscellaneous charges in China	%	10.16			1.54	
	Freight and miscellaneous charges outside China	Nos.	1	41438		4.14	

No.	Name & Spec.	Units	Qty.	Unit Price (US\$10,000)		Total (US\$10,000)	
				Equipment fees	Installation fees	Equipment fees	Installation fees
	Tariff	Nos.	1	1848		0.18	
4	Steel tube making and installation works						1556.76
	Main pipe Q345R, D=3.3m, $\delta \leq 14\text{mm}$	t	212		4396.32		93.20
	Main pipe Q345R, D=3.3m, $\delta \leq 20\text{mm}$	t	111		3990.04		44.29
	Main pipe Q345R, D=3.3m, $\delta \leq 32\text{mm}$	t	831		3749.39		311.57
	Main pipe Q345R, D=3.3m, $\delta \leq 40\text{mm}$	t	146		3697.17		53.98
	Main pipe CF610, D=3.3m, $\delta \leq 32\text{mm}$	t	234		4356.05		101.93
	Main pipe CF610, D=3.3m, $\delta \leq 40\text{mm}$	t	935		4063.46		379.93
	Main pipe CF610, D=3.3m, $\delta \leq 52\text{mm}$	t	697		4205.11		293.10
	Branch pipe Q345R, D=2.2m, $\delta \leq 16\text{mm}$	t	209		4380.43		91.55
	Manifold pipe CF610, D=3.3m, $\delta \leq 30\text{mm}$	t	292		6137.33		179.21
	Corrugated bellow	Nos.	1		80000		8.00

Table 8: Compensation Estimation for Land Acquisition and Resettlement

No.	Works or Expenses	Compensation cost for affected zone of reservoir inundation (10,000 USD)	Compensation cost for hydroproject construction area (10,000 USD)	Total (10,000 USD)	Investment Item I~V in Table 5 (%)
I	Rural part	15.52	198.14	213.66	99.93
II	Clean-up operation cost	0.16		0.16	0.07
	Total	15.68	198.14	213.82	100.00

Table 9: Estimate of Independent Costs

No.	Works or Expenses	Units	Qty.	Unit Price (10,000 USD)	Total (10,000 USD)
	Independent cost				4688.32
I	Construction management cost				1875.78
1	Upfront cost of the project	Nos.	1	620000	62.00
2	Construction and implementation management cost				585.29
	Calculation according to the building and installation cost	%	3.00	183204400	549.61
	Calculation according to permanent equipment cost	%	1.20	29734400	35.68
3	Construction supervision cost				552.1
	Calculation according to the building and installation cost	%	2.90	183204400	531.29
	Calculation according to permanent equipment cost	%	0.70	29734400	20.81
4	Advisory service fee				186.39
	Calculation according to the building and installation cost	%	0.92	183204400	168.55
	Calculation according to permanent equipment cost	%	0.60	29734400	17.84
5	Technical and economic evaluation cost of the project	%	0.40	212938800	85.18
6	Quality inspection and testing cost of hydropower project	%	0.23	183204400	42.14
7	Management fee compiled as per hydropower project quota standard	%	0.12	183204400	21.98
8	Project acceptance cost	%	0.60	212938800	127.76
9	Premium of the project	%	1.00	212938800	212.94
II	Production preparation cost	%	2.10	29734400	62.44
III	Scientific research, survey and design cost				1802.65
1	Construction scientific research cost	%	0.50	183204400	91.6
2	Survey and design cost				1711.05
	Feasibility study stage	Nos.	1	7797700	779.77
	Bid and design stage	Nos.	1	2416300	241.63
	Detailed construction design stage	Nos.	1	6896500	689.65
IV	Other taxes and dues				947.45
1	Transfer fee of development right	Nos.	1	9000000	900.00
2	Compensation fee for water and soil conservation facilities	Nos.	1	108100	10.81
3	Others	%	0.20	183204400	36.64

Table 10: Annual Investment Summary

No.	Project	Total (10,000 USD)	Construction Period (Year)			
			1	2	3	4
I	Hydroproject	21048.88	2194.76	5134.48	10785.04	2934.60
I	Auxiliary works for construction	3034.64	1092.47	1608.36	333.81	
II	Construction work	12247.66	1102.29	2327.06	6981.17	1837.14
III	Special projects for environmental protection and water and soil conservation	179.77		149.21	10.79	19.77
IV	M&E equipment and installation works	2613.37		139.48	1846.68	627.21
V	Metal structure and equipment and installation works	2973.44		910.37	1612.59	450.48
II	Compensation for land acquisition and resettlement	213.82	145.40	42.77	17.10	8.55
III	Transmission project	245.00			159.25	85.75
IV	Independent cost	4688.32	2271.04	711.30	1239.70	466.28
I	Construction management cost	1875.78	243.85	431.43	919.13	281.37
II	Production preparation cost	62.44			31.22	31.22
III	Scientific research, survey and design cost	1802.65	1117.64	270.40	270.40	144.21
IV	Other taxes and dues	947.45	909.55	9.47	18.95	9.48
	Total of I, II, III and IV	26196.02	4611.20	5888.55	12201.09	3495.18
V	Basic reserve fund	1309.80	230.56	294.43	610.05	174.76
	Static investment of the project (total of I~V)	27505.82	4841.76	6182.98	12811.14	3669.94

Table 11: Capital Flow Summary

No.	Project	Total (10,000 USD)	Construction Period (Year)			
			1	2	3	4
I	Building and installation works	18075.44	2898.41	5209.88	6703.46	3263.69
	Annual workload completed	18075.44	2194.76	4224.11	9172.45	2484.12
	Advance payment	2711.31	813.39	1897.92		
	Deduction of advance payment	-2711.31		-700.94	-2010.37	
	Retainage	-903.77	-109.74	-211.21	-458.62	-124.20
	Retainage repayment	903.77				903.77
II	Permanent equipment engineering	2973.44	252.30	1257.12	941.43	522.59
	Annual workload completed	2973.44		910.37	1612.59	450.48
	Advance payment	1189.38	252.30	801.94	135.14	
	Deduction of advance payment	-1189.38		-364.15	-645.04	-180.19
	Retainage	-297.34		-91.04	-161.26	-45.04
	Retainage repayment	297.34				297.34
III	Compensation for land acquisition and resettlement	213.82	145.40	42.77	17.10	8.55
	Annual workload completed	213.82	145.40	42.77	17.10	8.55
IV	Transmission project	245.00			159.25	85.75
	Annual workload completed	245.00			159.25	85.75
V	Independent cost	4688.32	2271.04	711.30	1239.70	466.28
	Annual workload completed	4688.32	2271.04	711.30	1239.70	466.28
	Total of I~V	26196.02	5567.15	7221.07	9060.94	4346.86
	Annual workload completed	26196.02	4611.20	5888.55	12201.09	3495.18
	Advance payment	3900.69	1065.69	2699.86	135.14	
	Deduction of advance payment	-3900.69		-1065.09	-2655.41	-180.19

No.	Project	Total (10,000 USD)	Construction Period (Year)			
			1	2	3	4
	Retainage	-1201.11	-109.74	-302.25	-619.88	-169.24
	Retainage repayment	1201.11				1201.11
	Total of I~V	26196.02	5567.15	7221.07	9060.94	4346.86
	Basic reserve fund	1309.80	230.56	294.43	610.05	174.76
	Total static investment	27505.82	5797.71	7515.50	9670.99	4521.62
	Price contingency	865.86		123.66	517.57	224.63
	Interest During Construction Period	2843.03	404.91	597.40	1031.73	808.99
	Total project investment	31214.71	6202.62	8236.56	11220.29	5555.24

Date: 2075/09/13 (December 28, 2018)

Ref: 15/2018

The Director General
Department of Electricity Development (DOED)
Sano Gaucharan, Kathmandu

Subject: No Objection Letter

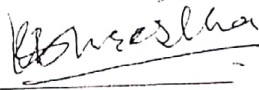
Dear Sir,

As Lower Manang Marsyangdi Hydroelectric Project is being planned to develop in tandem with its upstream project Manang Marsyangdi HEP (MMHEP), we have no objection to Manang Marsyangdi Hydropower Company Pvt Ltd to develop MMHEP as PROR project.

Thanking you,

Yours faithfully,

for Butwal Power Company Limited



Uttar Kumar Shrestha
Chief Executive Officer



दिष्ट
दाता नं ३२५५ ३२५६
मिति ०६५१५१३

Project Progress Report

1. General

Marsyangdi Cascade Hydropower Project (the “**Cascade**”) is situated on the Marsyangdi River of Manang and Lumjung District of Nepal and consists of three hydropower plants, namely Manang Marsyangdi (“**MM**”), Lower Manang Marsyangdi (“**LMM**”) and Upper Marsyangdi – 2 (“**UM-2**”), having a total investment of approximately 1.3 billion USD and a total capacity of 601MW.

In 2017, for better development of LMM Project owned by Butwal Power Company Limited (“**BPC**”), BPC and three Chinese investors, i.e. Sichuan Provincial Investment Group Co., Ltd. (“**SCIG**”), Chengdu Xingcheng Investment Group Co., Ltd. (“**CXIG**”) and Sichuan Qingyuan Engineering Consulting Co., Ltd. (“**QYEC**”), have decided to establish a FDI Joint Venture, namely S.C.I.G. International Nepal Hydro Joint Development Co., Pvt. Ltd. (the “**Company**”).

Upon the incorporation of the Company, Chinese investors proposed to acquire both MM Project and UM-2 Project, which are located respectively on the immediate upstream and downstream of LMM Project, aiming to develop and operate the three projects in cascade mode to make best utilization of the water resources.

To realize the cascade vision, BPC along with the Chinese investors had entered into a Share Purchase Agreement with an Indian sellers for acquiring UM-2 Project in May 2018 and completed the share transfer in December 2018 following the approval of Investment Board Nepal (“**IBN**”). For MM Project, BPC decided to acquire the project on its own from another Indian seller and sell part of the shares of MM Project to Chinese investors. Under such a circumstance, BPC and Chinese investors had entered into a Share Purchase Agreement for MM Project and is pending the final FDI approval of Department of Industry (“**DoI**”) and Electricity Regulatory Commission (“**ERC**”).

2. Engineering & Cascade Optimization

Along with the share acquisition of MM Project, BPC and the Chinese investors had conducted the Feasibility Study Reports of MM Project and LMM Project together from the perspective of cascade operation and overall planning. As per the latest Feasibility Study Report, MM Project has been optimized to 135MW and LMM Project has been optimized to 139MW by changing the layouts and submitted to DOED for approval. Particularly, LMM Project has been optimized in such a way that it can directly tap the tail water of MM Project from its powerhouse. In order to tap the tail water, the headworks of LMM is removed and the upper boundary of LMM Project is changed to the powerhouse site of MM, after taking consent from Department of Electricity Development (“**DOED**”). For UM-2 Project, since both BPC and Chinese investors wished to sell power to the domestic market of Nepal considering the growing demand of the nation, the project has been downsized from 600MW exported oriented to 327MW domestic oriented as per NEA’s Q40 requirement, whose

Feasibility Study Report and the total investment has been approved by IBN in June 2020.

3. License, Permits & Commercial Agreements

Generation License (GL): The Generation License of MM Project and LMM Project were granted by DOED at the capacity of 282MW and 140MW respectively in the end of 2018. However, as per the latest Feasibility Study Reports, the installed capacity of MM Project and LMM Project are required to be optimized to 135MW and 139MW respectively. In light of the above, the respective project companies have submitted relevant applications to DOED, Ministry of Energy, Ministry of Environment & Forest for changing the boundary, updating the Generation License and Supplementary Environment Impact Assessment ("SEIA"). As for UM-2 Project, the General License is still in application process. In principle approval for change in the type, capacity and boundary for the cascade projects have already been received from the authority.

Connection Agreement (CA): For Connection Agreement, both MM Project and LMM Project have signed the same with Nepal Electricity Authority ("NEA"). And UM-2 is currently in negotiation with NEA for finalization of the Connection Agreement.

Power Purchase Agreement (PPA): For MM Project, draft PPA has already been signed in October 2019 and is negotiating on Foreign Exchange Risk (FERV) mitigation with NEA for finalizing it. Hedging Regulations published in 2019 and amended in 2020 still has not been able to bring clarity with respect to FERV mitigation with respect to hedging fee and its cost sharing between the developer, off-taker and the government. LMM Project is in the advanced stage of amending the already approved connection agreement due to the change in capacity brought out by the optimization of the cascade project. UM-2 Project has also submitted the application for PPA to NEA and has concluded the negotiation for the energy table and is in the process of connection agreement. Besides, since there is strict requirement in the Generation License terms that PPA shall be signed within 1 year from issuance date and Financial Closure shall be achieved within 2 years from issuance date, BPC and Chinese investors are in an urgent situation to swiftly settle the foreign exchange risk mitigation under the PPA to start the project construction.

Project Development Agreement (PDA): PDA is inevitable for project financing, hence both MM and LMM Project have submitted the application to DOED and Ministry of Energy for processing, while UM-2 Project is currently in negotiation with IBN for finalizing the draft.

Supplementary Environmental Impact Assessment (SEIA): EIA for all three MM, LMM and UM2 projects have already been approved by the Government of Nepal previously. But due to the changes in the structures brought out by the optimization from the cascade development perspective, it was mandatory to have the SEIA for each project to be carried out. SEIA report for the MM project has been approved by Ministry of Forest and Environment (MOFE). Final report for LMM SEIA report has been submitted to DOED to be forwarded to MOFE for approval. Similarly UM2 final SEIA report has been submitted to IBN for further processing to MOFE.

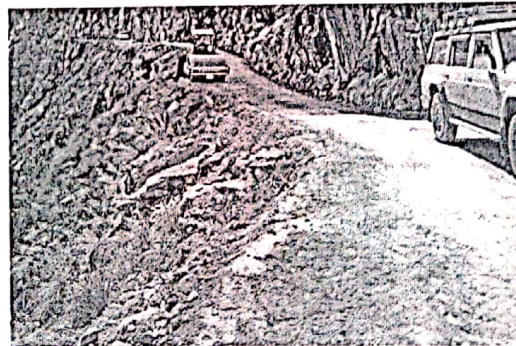
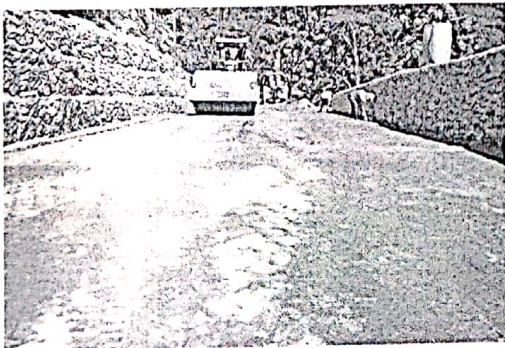
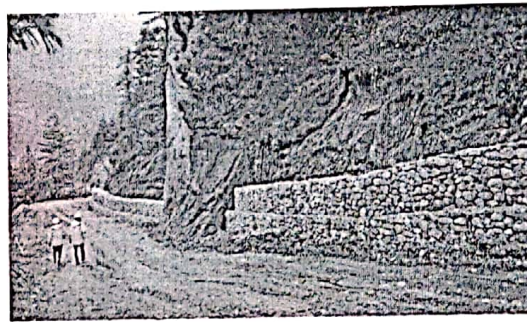
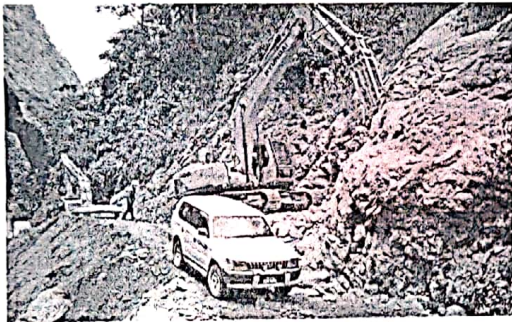
By end of August of 2019, permits / licenses in relation to the construction of the three projects were obtained, such as construction permit from Road Department for the access road construction, blasting permit from Ministry of Home Affairs, construction power supply consent from NEA, aggregates quarry mining Permit from Chame Rural Municipality, and other clearances, license and permits to meet regulations / bylaws for the project execution.

4. Construction

Below is a brief summary of the construction completed by the project:

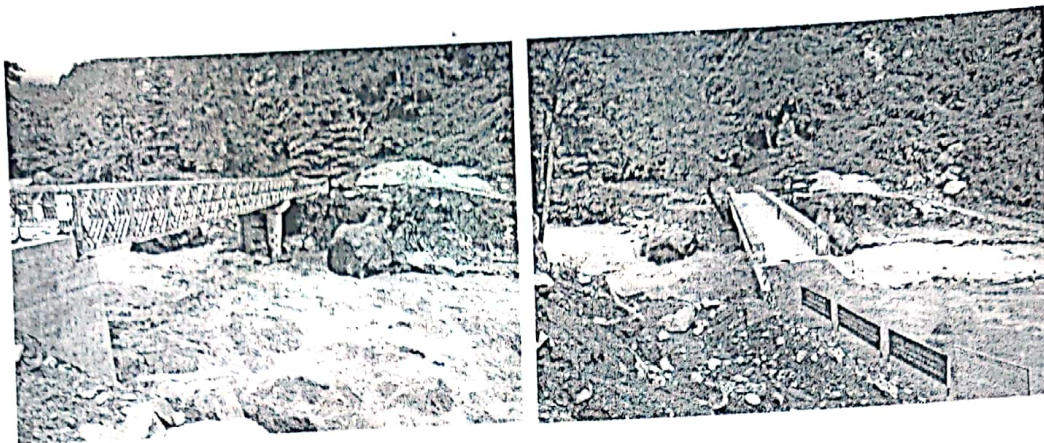
- **External access road**

The Beshisahar – Chame road track was opened by Nepal Army. It used to take 6 ~ 7 hours on a 4x4 small vehicle to access the Project site from Besisahar with narrow width, high gradient and undulated road surfaces. Improvement to the road has been carrying on since 2018 by Marsyangdi Cascade Project including MM Project. The travel time has been reduced to 3 hours now. A 30-t truck was able to arrive at Danakyu of Bargarchhap. Some photos recently taken are as presented below.



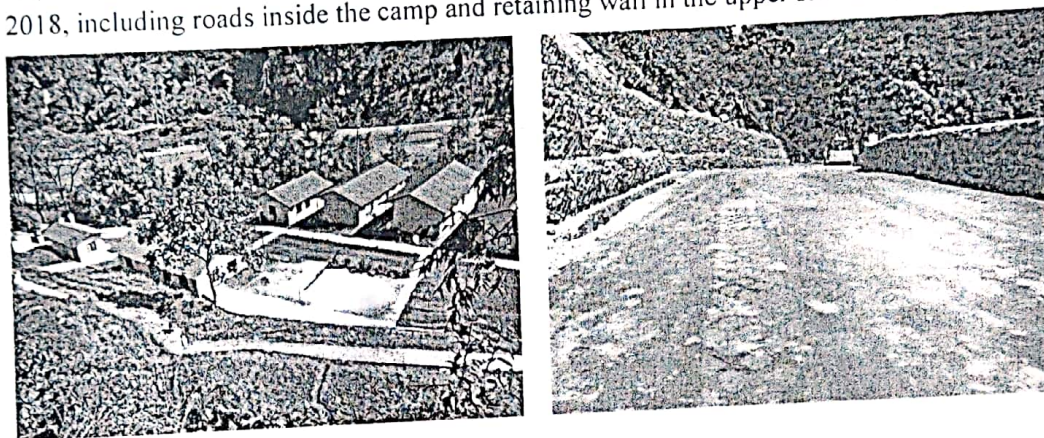
- **Linking roads in Project area**

The linking roads to temporary camps, aggregate quarry sites, explosive bunker and bailey bridge to the powerhouse have been complete.



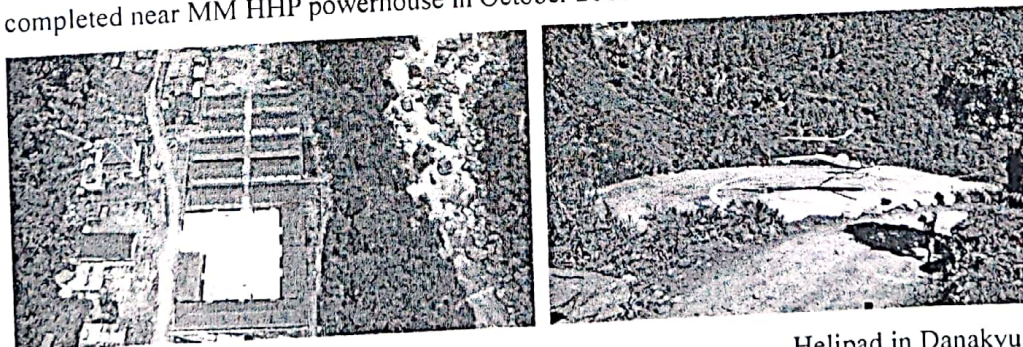
- **Temporary works and facilities - Owner's Camp**

Repairing work for owner's camps transferred from GMR was completed in December of 2018, including roads inside the camp and retaining wall in the upper side of the camp.



- **Contractor's Camp Temporary works and facilities - Contractor's Camp & Helipad**

By April 2019, first stage construction for the Contractor's camp in Danakyu was completed to satisfy the condition for living and office purpose. For emergency purpose, a helipad was completed near MM HHP powerhouse in October 2018.



Contractor's camp in Danakyu

Helipad in Danakyu

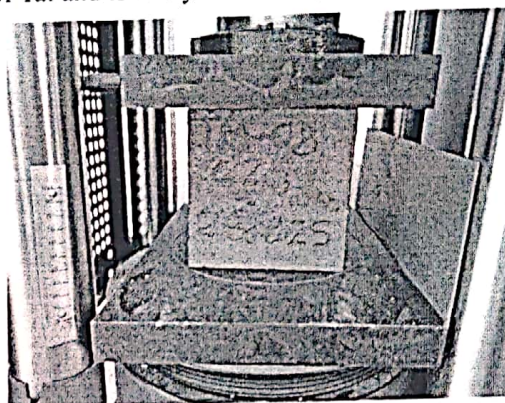
- **Aggregates quarry**

By April 2019, linking roads to and site preparation of the aggregate quarry site at Tal were completed and ready for material preparation for preliminary constructions.



- **Laboratory**

By April 2019, the construction material testing laboratory is completed in the right bank of Marsyangdi river just about 1.5km upstream of Tal and is ready for testing.



- **Land lease**

By end of August of 2019, 22 land lease agreements have been signed with local residents, with an area about 225,600 m², including Ngadi transfer station, Tal quarry field, Danakyu camp, explosive bunker and other construction areas.

Location	Nos of Lease Agreements	Area (m ²)
Ngadi transfer station	12	32,757
Tal quarry field	7	44,543
Danankyu Camp	2	35,000
Explosives warehouse	1	1,000
Total	21	225,600

- **Explosive**

DOED has been requested for facilitation to buy and import following quantities of explosive for geotechnical investigation and during construction phase.

Table 1 Explosive required for geotechnical investigation

SN	Name of Explosive	Quantity	Import From
1	Emulsion Explosive	450 Ton	Solar Industries India Limited. 11-Zade Layout, Bharat Nagar, Nagpur (M.S.). 440033, India.
2	Detonators	5,00,000 Pcs	
3	Detonating Cord	5,00,000 Mtr	

Table 2 Total Explosive required during construction phase including Geotechnical Investigation

SN	Name of Explosive	Quantity	Remarks
1	Emulsion Explosive	883.5 Ton	
2	Detonators	9,72,000 Pcs	
3	Detonating Cord	10,45,000 Mtr	

• **Tree Cutting**

New Supplementary Environmental Impact Assessment (SEIA) study shows that 2129 trees needs to be felled down. Following procedure will be adopted for cutting down trees.

- Pegging and enumeration of the plant and vegetation in the permanently acquired forest areas
- Identification and marking of trees and vegetation required for felling for structural location of the project only (joint inspection of engineer, Forest office, and environmental specialist)
- Felling of the marked trees and vegetation only to the requirement of the project structural location. Unmarked trees located outside the structural position even within the permanently acquired areas will be protected from felling and damage.
- Compensatory forestation as per the forest guideline 2006.

NRs. 462,649,969 has been allocated for felling, plantation, and caretaking for the lost trees.

21 Project Work-In-Progress (WIP)

Amount in NRS

Expenditure headings	Balance as at 31 Asadh 2076	Additions	Elimination	Balance as at 31 Asadh 2077
Administrative Expenses	9,093,746	-	-	9,093,746
Personnel Expenses	15,632,144	-	-	15,632,144
Financial expenses	43,882	-	-	43,882
Depreciation	278,984	-	-	278,984
Professional and Consultancy Expenses	25,230,996	-	-	25,230,996
Site Expenses	46,735,015	-	-	46,735,015
Rent	426,110	-	-	426,110
Adjustment	(6,291,189)	-	-	(6,291,189)
PPA and PDA fee	-	-	-	49,860,810
Total	91,149,688	-	-	141,010,498

Manang Marshyangdi Hydropower Company Pvt. Ltd.

Registered No: 78222/067/068

MINUTE OF THE MEETING OF THE BOARD OF DIRECTORS OF MANANG MARSHYANGDI HYDROPOWER COMPANY PRIVATE LIMITED

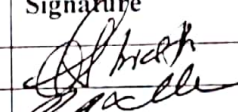
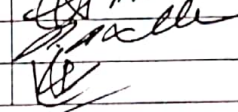

Dated October 11, 2019

[Conducted through Teleconference]

Registration No. 7822/067/068

1. PRESENT

Board of Directors

S. No.	Name	Designation	Signature
1.	Mr. Pradeep Kumar Shrestha	Chairman	
2.	Mr. Bijaya Bahadur Shrestha	Director	
3.	Mr. Uttar Kumar Shrestha	Director	

2. Time: 1:00 p.m. (Nepal Time)

3. Agenda

Time	No.	Topic	Type
1:00 pm	5	Opening of the meeting	Decision
	5.1	Initialization and Signing of the Power Purchase Agreement for Manang Marsyangdi Hydropower Project owned by the Company	Decision
1.30 pm	6	Close of meeting	Decision

4. Commencement of Proceedings

(a) The board meeting was conducted through teleconference.

(b) Mr. Pradeep Kumar Shrestha, Chairman of the Company took chair.

All the Directors confirmed that the telephone connection was good and sufficient to hear the conversation over all teleconference. The Chairman called the meeting to order.

Current Contact Office
BPC Complex, Buddhanagar-313
P O Box: 11728
T 00977-1-4784026
F 00977-1-4780994

Registered Office
Dhumbarai - 4, Kathmandu
Email mmhpp777@gmail.com

5. Discussions and Decisions

5.1 Initialization and Signing of the Power Purchase Agreement for Manang Marsyangdi Hydropower Project owned by the Company

The Board of Directors discussed that the Company shareholder Butwal Power Company and the Chinese team were informed by the Nepal Electricity Authority (NEA) that its board had

decided to initialize and sign the Power Purchase Agreement of Manang Marsyangdi Hydropower Project (the "MM Project").

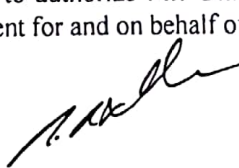
The Board of Directors also discussed that the NEA verbally agreed to enter into separate Power Purchase Agreements with other project companies of Marshyangdi Cascade projects namely the Upper Marsyangdi - 2 Hydropower Project (the "UM - 2 Project") Lower Manang Marsyangdi Hydropower Project (the "LMM Project"). However, the NEA would formally decide on entering into the separate Power Purchase Agreements once the project companies formally propose to the NEA to execute the same.

Likewise, the Board of Directors also discussed that as informed by the NEA, the NEA board has decided the following with regards to the Power Purchase Agreement of MM Project:

- i. The outage percentage will be as decided by the developer;
- ii. The dry season excess energy rate shall be applicable only to the cascade LMM Project and in accordance with ROR hydropower project rate;
- iii. The tariff will be in accordance with the Nepal Electricity Regulatory Commission's guidelines and decision;
- iv. Although the tariff is reflected in Nepalese currency, the draft of Power Purchase Agreement states that hedging of foreign currency exchange risk shall be as per the Hedging Rules, 2075 issued by the Government of Nepal;
- v. The NEA will recommend the Company's proposal of 2/3 (two third) cost-sharing of hedging to the concerned Ministry for further approval.

The Board of Directors discussed the draft of the Power Purchase Agreement of Manang Marsyangdi Hydropower Project circulated by Nepal Electricity Authority with its initials. The Board of Directors further discussed that the Company will take that basis for the purpose of negotiation and finalization of the Power Purchase Agreement. After the discussion, the Board Meeting resolved that:

- (a) "Resolved Unanimously to put initials on the Power Purchase Agreement of Manang Marsyangdi Hydropower Project circulated by Nepal Electricity Authority provided in Annexure 1 which will form basis for the purpose of negotiation and finalization of the Power Purchase Agreement with Nepal Electricity Authority.
- (b) "Resolved Unanimously to authorize Mr. Uttar Kumar Shrestha, Director to initial the Power Purchase Agreement for and on behalf of the Company"



6. Closing

There being no additional agenda for the meeting, Chairman declared close of the meeting with vote of thanks to those participating in the meeting.

Three handwritten signatures in black ink. The first signature on the left is a stylized 'V' with a horizontal line underneath. The middle signature is a more complex, cursive scribble. The signature on the right is a simple, horizontal line with a small loop at the end.