

# IPPAN

AUGUST 2013

INDEPENDENT POWER PRODUCERS' ASSOCIATION, NEPAL

## Message from IPPAN President

I am proud to bring forward a power summit 2013, after 5 years of long interval at our doorsteps. The two days summit on 26<sup>th</sup> and 27<sup>th</sup> of August, being hosted by Independent Power Producers' Association, Nepal (IPPAN) with the patronage of the Government of Nepal, Ministry of Energy and the Investment Board is proposed to analyze different aspects of hydropower development, prepare strategy and direction and give them momentum so as to give smooth sailing of the power sector in the days to come. The summit is going to be jointly organized by IPPAN, PTC India Limited (PTC) and Non-Resident Nepali Association (NRNA).

The summit has an objective to catalyze the power development sector because there is a general feeling that, the enthusiasm and momentum which was in the sector since 2006 seems to be dwindling away. The summit will be geared to conduct critical review of where we have reached since 2006, what we lack,

and what needs to be in place to hasten the pace of development of the hydropower sector in Nepal. After a historical peoples movement in 2005 and tremendous interest shown by domestic and international investors in Hydropower development with power summit 2006, 2007 and 2008 there have been only 180 megawatts added to the national grid, 110 by the private sector and 70 by NEA. We need to find the root causes of the state of affairs and the structural challenges that slowed our progress. The main objective of the summit is to accelerate the pace of hydropower development. We have, therefore, chosen the theme of the Power Summit 2013 – **"Hastening the Pace of Hydropower Development"** in Nepal.

At present there are 337 projects being surveyed with an estimated capacity of 9021 MW, 74 projects that have applied for generation license to generate 3908 MW, 111 projects that have signed a power purchase agreements with a generation capacity of 1598 MW, as well as 70 projects that are at advanced stages of construction with a capacity of 1978 MW. The Power Summit 2013 is dedicated creating an enabling environment for the successful completion of all these projects. As a country we need to dedicate our efforts to raising the current energy consumption from a mere 86 KWh per capita to at least 500 KWh in the next five year.

The contents of the Power Summit 2013 are designed to cover all the major areas such as political commitment, legal and regulatory framework and its harmonization,



Dr. Subarna Das Shrestha

**“The main objective of the summit is to accelerate the pace of hydropower development. We have, therefore, chosen the theme of the Power Summit 2013 – “Hastening the Pace of Hydropower Development” in Nepal.**”

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### Mission of IPPAN

- ▶ Lobby for private sector friendly policies, regulations and their prompt and effective implementation.
- ▶ Disseminate information through media, seminar, conferences to political parties, government, Officials, civil societies and the people.
- ▶ Build capacity of IPPs and related stakeholders.
- ▶ Develop linkages for regional co-operation in power Sector.

### Vision of IPPAN

To be the umbrella organization of IPPs that advocates for an investor-friendly environment for power development in Nepal.

realistic electricity demand forecast, electricity pricing, project financing, construction of transmission lines and managing local expectations. In order to take the proceedings forward we shall cover the above issues in four separate categories: Projects with local investments and for domestic consumption; Projects for domestic market with FDI components; Export oriented projects with FDI and; Power trading and market mechanism.

The outcome of the summit will help us build a status report, a clear picture of the state of affairs and establish a plan of action with designated roles and responsibilities. The two day event will bring together relevant stakeholders from Brazil, China, Czech Republic, France, India, Korea, Nepal, Norway, USA and other countries for focused discussions on hydropower development in Nepal. Key dignitaries of Government of Nepal, India, China, Norway and international agencies like WB, ADB, IFC will be attending the event.

We believe that the outcome of summit will also assist to formulate unanimous strategy and working direction to all Political parties in their election manifesto so as to come up with common consensus for the accelerating pace of Hydropower development in Nepal.

It has been three years since I took over the mantle of leading IPPAN as its President. All of us know that developing hydropower projects in Nepalese context is not a "smooth sailing" at all. However, I am honest enough to continue Lobbying and advocacy for promotion of private investment in Nepal's hydropower development. To make the IPPAN common platform of all stake holders I have been putting my full effort to bring together all IPPs and stake holders, which resulted a significant increment of members by mere 39 to above 100 since I took over as president. This is I believe my honest effort to make IPPAN strong.

Despite the difficult situation that country is reeling at the steps of fulfilling its obligation on timely conducting election in second time for constitution assembly, there has been nos of measures government has initiated during the past years in Hydropower sector. Re-introduction of Income tax holidays for 10 years full and 5 years half from the COD; introduction of PDA template to stake holders and initiation of negotiation with IPPs; formulation and establishment of Investment Board to smooth deal with above 500 MW; refinancing policies introduced by NRB; compulsory lending ratio to energy and agricultural sector in tune of at least

12 % of total loan portfolio; measures initiated by MoE to safeguard from financial risk to PPA and under construction projects by providing posted ppa rate and allotment of 13.5 billion Rupees to the construction of major transmission line of 456 km and about 12.5 billion rupees to government under construction project for its timely construction through budget of fiscal year 2070/71 are the major areas of government initiation focused on hydropower development.

However, since hydropower development is long term investment with considerably high risk associated, government still need to focus many areas to make the sector vibrant, attractive and make it investment friendly assuring reasonable return on investment. Some of the areas government need to concentrate its focus are creation of equal level playing field; guarantee reasonable return on equity and investment; Bankable and internationally acceptable PDA; protection against change in Law; establishment of water right; VAT subsidy in tune of 10 million Rupees per MW for making project slightly competitive with some improvement of cash flow for the initial years of operation and as a result offer significantly more tax and revenue by industrialization and commercialization; introduction of market based PPA rate tie up with CPI index ; timely PPA with IPPs ; waiver of Pay for Environment Services (PES) and private land substitute policy introduced by Forest ministry which only creating barrier rather giving benefit to the nation etc. Introduction of multiple buyers market by offering PTCN; independent Transmission line company with wheeling mechanism and NERC act are other major areas that government need to focus soonest possible. Timely reviewing of both PPA and consumer tariff in respect to market trend are other major area of Government and NEA to be focused in.

Similarly, bilateral relation with India focusing cross boarder transmission line for future integrity of power between two countries are other major area that both government need to give due attention. Custom duties of import and export of power, open access, renewable of license in each year are few of it requiring due attention of Nepal and India. However, recent announcement of revision of "Import Policy" from Indian government that electricity is a free commodity is one the measures to help bilateral integrity of electricity between these countries. BIPPA is one of the major result oriented agreement between Nepal and India for smooth sailing of bilateral business relationship. Focusing the tremendous interest from northern border country China with more than 3600 nos of business registrations last year in Nepal need to establish multi dimensional business relationship between two countries to uplift Nepal's economy. Construction sector business, equipment supply are the major areas of involvement of them in Nepal. BIPPA could be one of the major measures to strengthen bilateral relation between China and Nepal. The history of relationship of these two countries also goes back to centuries when Ansubarna, Araniko and Bhrikuti paved Silk Road for it.

Establishment of Nepal Business Forum is another area of way forward to bring across the table both public and private sector to resolve the issues. Being the co chair of Infrastructure working group IPPAN has raised few major issues which needed early attention. Some of them are PDA, harmonization of law, PPA, vat subsidy, PES etc. After much persuasion, lobbying and advocacy through NBF, Ministry of energy formed a task force together with representation of Ministry of Finance. The

task force after rigorous exercise comes to conclusion to refund vat in tune of 10 million Rs/MW, within 3 months of commercial operation, and same recommended to MoE and MoF. The lack of coordination between Ministry of Energy and Ministry of Finance, the long awaiting subsidy is not materialized yet. However, both ministries have taken the issues seriously so IPPAN hope for positive decision in short period of time.

I want to share with you information on two important Research Projects, implemented by IPPAN that will have a long term impact in Nepal's hydropower development, if translated into action. They are: Review of Model Project Development Agreement "PDA" and Harmonization of Laws related to Hydropower Project.

#### **Review of Model Project Development Agreement:**

The Ministry of energy had given opportunity on request of IPPAN to review the model PDA so as to make it investor and lender friendly. IPPAN with the help of Pioneer Law Associates and expert mr. Vijaya Shankar shrestha together with outcomes from stakeholders interaction come up with recommendation which was handed over to the Government of Nepal, Ministry of Energy on July 7, 2013 in an program organized by IPPAN in hotel Yak and Yeti. . The basic objective of the recommendation on the model PDA to make the project agreements bankable, acceptable to the international practices and appropriately share the benefit and risk of the project. The main recommendations basically focused on: protection against change in law; payment guarantee; Force Majeure, Government Approvals process, time and procedures, Lender's Right, Conditions Precedents, Water Use Rights, Taxes and other Incentives, Change of Control; Government Guarantee for NEA Obligations; Company's obligations etc. The project was kindly supported by Royal Norwegian Embassy and implemented by IPPAN.

On this back drop, the PDA negotiation with NWEDC of 216 MW, Upper Trishuli 1 HEP is under progress with MoE where as GMR's Upper Karnali, SJVNL's Lower Arun, and SN Power's Tamakoshi are under PDA Negotiations with Office of Board of Investment.

#### **Harmonization of laws and regulations related to Hydropower Project:**

One of the major areas that needed for acceleration for hydropower development is harmonization of laws of different ministries with Electricity Act and regulation. The spirit of Electricity Act, in many instances was not supported by other acts, laws and regulations. IPPAN with the funding from IFC together with Investment Board did a comprehensive study by employing external legal firm, Sinha & Verma Law Concern, with an objective to harmonize the existing laws with the Electricity Act. The study contained two parts, the first part was those laws and regulations that were under the authority of the government to change and in which immediate actions could be taken and the other were those that were to be recommended for drafting new electricity act. It is important to note here that the draft report was shared with the concerned policy makers of the ministry of Energy, Ministry of Finance, Ministry of Industry, Ministry of Forest, Ministry of Environment, Ministry of Home, Ministry of Defense, NEA, Department of Electricity Development, WECS etc. Presentation on

**Mr. Pashupati Dhungel**  
New Executive Manager of IPPAN



Mr. Pashupati Dhungel had joined IPPAN as an Executive Manager from 15th May, 2013. He is a Mechanical Engineer graduated from Kathmandu University. Previously he worked as a Senior Engineer in Likhu IV Hydroelectric Project (120 MW) group of Bhilwara Energy Limited, India and Triveni Energy, Nepal. He has also worked as Energy Development Officer (EDO) in Rural Energy Development Programme (REDP/UNDP).

findings of harmonization of Law was conducted on June 8, 2012 to the stake holders and 5<sup>th</sup> of August 2013 to the political parties and on 12<sup>th</sup> August to government officials. The final report with two parts as mentioned above will be handed over to Government for appropriate consideration.

Similarly, IPPAN is proposing Independent **Load Demand Study** as a national document owned by government of Nepal, National Planning Commission. After electricity sector was privatized in 1990 and NEA remained as national electric utility it became a competitor in the power generation sector; at the same time it was allowed to be the single-buyer of electricity produced by independent private producers. NEA became a de-facto power development planning organization, doing generation expansion planning, load forecast and transmission planning. The current load forecast of NEA show around 10% growth per year. Ministry of Energy issues license to the power producers irrespective of demand forecast. Hence, there is a planning anomaly. Also NEA basing on its demand forecast is reluctant to enter into new power purchase agreement for most of the augmentation. Viewing this dilemma IPPAN proposed an independent load forecast study to be carried out by Water and Energy Commission (WECS) and approached National Planning Commission and Ministry of energy with the proposal for taking ownership of it. The ministry had informed about a comprehensive study (Vision 2050) being under study and will serve as a guideline for demand forecast. According to the Ministry of Energy the study was supposed to be made public by July 2013. However, recent approach to Minister for energy Mr. Umakant Jha positively concluded to conduct independent study on Energy Demand Forecasting Project to update the energy demand trend. National Planning Commission will be once again approached to take the ownership of the project.

The news that technical proposals will shortly be opened for the construction of Dhalkebar - Mujjafarpur Cross Border Transmission Line is a matter of joy for us. We can hope that the real construction work will start soon. Similarly, ADB is keen in the feasibility survey of the Second Bardghat - Gorakhpur Cross Border Transmission Line. These Cross Border Transmission Lines will eventually help Nepal's Grid System to link with Indian Grid System and finally with SAARC Grid System by offering optimum utilization of available resources between South Asia region countries. Similarly, construction of domestic Transmission Lines is equally important. It is high time to plan East West Transmission Line running parallel to the mid hills Highway, before it becomes impossible to construct transmission lines along the probable alignments, because of rapid urbanization..

The introduction of new fee for Survey, and Generation License disappointed many developers, especially to domestic developers. IPPAN believes that license fee must not be guidelines to judge sincerity of project developers. It only stops further interest in Hydropower study which ultimately harms the development process. Non renewable and non application of licenses in recent days shows failure of fee hike. We hope for reconsideration by learning the lesson.

The Super six projects awarded with competitive bidding process by DoED has not materialized till date due to reluctance of NEA to do PPA and issuing of Generation license from DoED, have been facing serious problem. The Ministry of Energy must full fill its own commitment written in bidding document and MoU signed during award of these projects to the developer and give positive message to investor.

We strongly urge the Government to set up a separate Nepal Grid Company that will take care of planning, construction, operation and maintenance of Transmission Line Network. Enough home work was done in the past to set up the company. IPPAN, at the request of the ministry of energy, had also submitted its suggestions regarding the implementation modality of the proposed Grid Company. We hope that we will have opportunity to hear about the progress made in the establishment of the company during Power Summit - 2013.

We, similarly, need to reform the legal and policy level hurdles to attract foreign direct investment. Since the country needs to generate massive employment — to check youth leaving for foreign employment.

The recent decisions of the HIDCL, to provide loan to power projects will help develop domestic projects, which are struggling with financial crunch. It is also organizing Power Summit to attract International investors to invest in Nepal's power development. We welcome HIDC's moves and would like to extend every possible help and co-operation from IPPAN in this regard. However, HIDCL, we believe has to come up with affordable interest rate to the IPPs.

Last, but not the least, we must gear up for the sustainable development of Hydropower development in Nepal. Our economic development has been severally constrained by energy crisis. The policy makers in the government must introduce good governance in the bureaucracy and show their commitment in taking prompt decisions, approvals, permits etc.

IPPAN is always ready to work closely with the Government of Nepal in the creation of investment Climate for hydropower development. The current energy crisis can only be solved by the joint efforts of the government and IPPs. We are grateful to the Government of Nepal in general, and ministry of Energy, in particular for consulting with IPPAN regularly in the matters related to Hydropower development.

IPPAN is worried about the recent local disturbances at hydropower project site. We strongly urge the Government to curb such activities and help maintain law and order in the project areas. We also take the recent revoking of stay order by the honorable supreme court of Nepal as one positive step in making enabling environment for the hydropower development.

It is very important that political parties come up with a common vision to utilize Nepal's hydropower potential and remain unchanged so frequently.

Thank you  
Dr. Subarna Das Shrestha

## MEETINGS

### IPPAN Delegation Team meets

**Hon'ble Minister Mr. Umakant jha,**  
Minister for Energy



IPPAN deligation team led by IPPAN's President Dr. Subarna Das Shrestha meets with Honorable Mimister Mr. Umakant jha to congratulate him on his appointment as the Energy Minister as well as to bring to his attention the subject of hydropower development in Nepal (on 22nd March 2013 and a follow up meeting on 28th March 2013).

Dr. Subarna Das Shrestha, IPPAN President, congratulated Hon'ble Minister Mr. Umakant Jha, on his appointment as the minister for energy and presented him with the Hydropower Book, published by IPPAN. Mr. Shrestha put forth different issues of IPPs before the minister including: VAT Exemption, Nepal Rastra Bank's refinancing policy issues, PPA Tariff adjustment etc.

**Hon'ble Minister Mr. Shankar Koirala,**  
Minister for Finance



IPPAN deligation team led by IPPAN's President Dr. Subarna Das Shrestha meets with Honorable Minister Mr. Shankar Koirala to congratulate him on his appointment as the Finance Minister as well as to bring to his attention the subject of hydropower development in Nepal on 3rd April 2013 including the issues of IPPs.

### Application of Photo Voltaic Systems: Can it reduce Load Shedding in Nepal?

**Dr. Jagan Nath Shrestha**  
 Prof. Institute of Engineering  
 Feb 2, 2012

Nepal is passing through an unprecedented energy crisis phase and will have to bear it's the brunt for many years to come. According to the survey conducted with relevance to its ways and means from the 319 domestic consumers (Upper Middle Class) for coping load shedding, 54.5 % of the consumers reported that they have resorted to inverter plus battery to cope up with the energy crisis. 30.1 % of the consumers were found feeling helpless in the energy crisis.

Ways of managing load shedding	Percentage
Inverter Battery System	54.5
Bear the inconvenience	30.1
PV Battery System	9.7
No answer	6.0
Diesel Generator	4.1
Petrol Generator	0.6
LPG Generator	0.3

According to one Survey conducted to know the willingness of consumers to pay for a reliable 24



hours , seven days a week power supply, 10 % of the respondents wanted to pay as high as 74 (Seventy Four) Rupees per kwh of energy. 20 % of the surveyed indicated their willingness to pay as high as 20.1 Rs per unit. It shows how desperate the general people for a reliable power supply.

The ways of reducing load shedding are:

1. Reduce system loss
2. Awareness programs – domestic users (energy efficiency, use of LEDs)
3. Change ordinary choke to electronic
4. Awareness programs – Industrial Consumers (Energy Auditing)
5. Alternative energy to Hydropower
6. Pumping Reservoir type Hydropower
7. Bio-liquid, Thermal power plant generation
8. Enable both Hydropower plants and Thermal power plants to full swing
9. Introduce day light saving
10. Introduce two time zones
11. Introduce PV Grid Connect System
12. Introduce Stand Alone PV SHS also in urban areas as soon as possible

Nepal has also potential for solar electricity production. It is to be noted that 0.01 % area of Nepal can produce 8 Gwh of energy per day i.e. 2920 Gwh per year i.e. equivalent to of having 1777 MW HPS without any system loss.

The solar plant installed at the Centre for Energy Studies at Institute of Engineering, Pulchowk has made the centre self sufficient in energy needed for the centre. Recently, 680 KWp solar plant, established to pump drinking water during load shedding hour, has been grid connected.

It is important to note that nothing is costlier than not to have electricity at any cost in the 21st century. This poses as an ultimate challenge for the power companies and the consumers alike.

In conclusion, more awareness programs on grid connected photo voltaic cell and isolated solar plant should be encouraged and implemented to address need of Nepal's rural electrification need for lightning.

**Mr. Sharad Karmacharya**  
 Consultant to ADB  
 June 22, 2012

The electricity value chain includes generation, transmission network, distribution and retail. The generation and retail are considered to be areas where competition can be introduced. Whereas the transmission and distribution aspects are considered to be regulated natural monopoly.

Electricity market is regulated by Acts, Regulations and Codes . Incentives and motivation for action also play a bigger role in the Electricity Market. Electricity Market is considered to be a sound market when there is a reliable power supply, sufficient investments, free competition and compliance with environmental and other social goals are easily met.

The vibrancy of electricity market depends upon various factors like degree of market opening, degree of unbundling, ownership, tariff regulation, open access mechanism, balancing mechanism and capacity mechanism etc.

The present paper deals with the electricity reforms carried out in Karnataka, Delhi and Orissa States of India in 1990s.

Before the major electricity reforms were carried out in 1990s, vertically integrated public monopolies, called State Electricity Boards (SEBs) were functioning. Because of highly subsidized agricultural consumers, and significant distribution losses (theft and technical inefficiencies), and lack of investment by SEBs, the State Electricity Boards were financially distressed. The gap between supply and demand was increasing incessantly.

The financial crisis of the central government of India in 1990 mandated the need for electricity reforms. Also, poor management, poor operational efficiency and financial deterioration of public utility companies (SEBs) also proved to be triggering factors for electricity reforms.

The lessons learnt from the case studies of Brazil showed that Long term contracts takes away demand risks from generators and that Time led contracts ensures timely constructions.

Experience of Delhi shows that effective regulation could result in efficiency gains (through incentives to reduce distribution losses). Ensuring grid discipline through market based approach using frequency as indicator worked in India.

Rationing with incentives helped to avoid load-shedding in Brazil (about 20% consumption was reduced).

The privatization of distribution companies in Orissa and Delhi showed a need of state support as far as financial liabilities were concerned. Unbundling the monopoly needs to be supported by other institutions that can coordinate investment planning with load forecasting. Accurate energy accounting, transparent subsidy mechanism and identification of loss making zones are key requirements to reduce revenue losses of distribution companies in India.



## Hydroelectricity Investment and Development Company Ltd. - new perspectives in development of hydropower in Nepal

**Mr. Deepak Rauniyar**  
 CEO, Hydropower Investment and Development Company Limited, (HIDCL)  
 March 22, 2013

Access to long term loan with high bank interest rate had been one of the most serious constraints for hydropower development in Nepal. The Independent Power Producers' Association, Nepal (IPPAN) had been lobbying consistently for the establishment of an Infrastructural Development Bank, specialized in hydropower development.

Though, the financial institution established in the form of HIDCL was different from the proposed one, conceived in the Concept Paper of IPPAN, nevertheless, IPPAN's constant lobbying and advocacy did pay off in the end.

Mr. Deepak Rauniyar, CEO of the newly established Hydropower Investment and Development Company Limited shared the vision, mission and goals of HIDCL during his presentation in IPPAN's Friday Forum on March 22, 2013.

HIDCL is a Public Company established in July 2011, with the objective of harnessing the immense potentials of hydropower of Nepal. The company has been recognized as a Finance Company by the government of Nepal and Nepal Rastra Bank. The company has current assets worth Rupees 8.64 billion and also possesses the mandate to invest and finance for the generation, transmission and distribution projects in Nepal.



Regarding its project portfolio, so far it has debt financing in 42 MW Mistri Khola Hydro-electric Project and equity financing in Power Transmission Company, Nepal (PTCN). PTCN was established to construct the Nepal portion of the Mujjafarpur - Dhalkebar High Voltage Cross border Transmission Line.

HIDCL has a strong capital base, with an authorized capital of NRs. 50 billion and issued capital of NRs. 10 billion. It can invest as either debt or equity in hydropower projects, larger than 25 MW. It has been allowed to invest in hydropower projects through bank consortiums. It can also borrow loans and receive grants from the foreign donors and international financial resource bases, as well as issue financial instruments

such as bonds, debentures, and certificate of deposit for long term capital mobilization.

Regarding the existing impediments in the way of hydropower financing in Nepal, there are problems like, difficulty in raising equity, limited instruments for long term financing, insufficient capacity of the local banks to finance medium to large projects, expensive domestic funds, different perceptions of energy forecasts and foreign exchange risks, volatile floating risks, limited horizon on markets, instruments and financial partners, very little experience in raising funds from domestic and international markets insufficient hedge mechanism to protect against volatility and limited capacity of insurance companies.



## Feasibility Study for Turbine Manufacturing and Testing Facility in Nepal

**Dr. Bhola Thapa**, Dean, School Of Engineering, Kathmandu University  
**Mr. Biraj Singh Thapa**, and Faculty-in-Charge of Turbine Testing Lab at Kathmandu University  
 September 21, 2012

Kathmandu University (KU) has established Turbine Testing Lab (TTL) at its premises at Dhulikhel, Nepal, with contribution and support from Norwegian Agency for Development Cooperation (NORAD), Nepalese Hydropower industries and Waterpower Lab at Norwegian University of Science and Technology (NTNU).

Kathmandu University has been continuously working on R&D for hydraulic turbines. It aims to develop the newly constructed Turbine Testing Lab as a Center of Excellence for R&D for hydraulic turbines, specialized for sediment laden hydropower projects. Resources and services at TTL are open to all for the overall development of hydropower. Experimental validation of the model runner designed with new design philosophy will be a milestone to minimize sediment erosion with prospects of new business ventures.

The primary aim of this lab is to conduct R&D works relating to hydro turbines, and develop competence regarding turbine design which can handle sediments. Major ongoing activities at TTL include development of Francis turbine with new design philosophy and feasibility study for turbine manufacturing industry in Nepal. KU had conceived the idea of building a turbine testing facility way back in 1997 with the aim to support hydropower development in the country.



Kathmandu University (KU) is one of Nepal's prominent institutes with significant experience in R&D of hydro turbines for minimizing sediment problems as its major focus area [1]. To further support the research on hydro turbines, KU has recently established "Turbine Testing Lab" (TTL), which will be beneficial for performance analysis of hydro turbines of various designs. It hopes to become Centre of Excellence for Nepal and for South Asian Region.

Recently, TTL has initiated a new US\$ 10 m project titled "Development of Francis Turbine Manufacturing and Testing Facility in Nepal", which started from June 2012 and is scheduled to be complete by December 2018.

The NEW NORAD Project - "Feasibility Study for Turbine Manufacturing and Testing Facility in Nepal" will eventually:

- ▶▶ Forecast the needs of turbine types and size required for the existing and upcoming hydropower projects in the Himalayan basins,
- ▶▶ Recommend and verify new designs of Francis turbines capable of minimizing effects of sediment erosion under erosive environment,
- ▶▶ Identify possibility of future investments on development of turbine manufacturing and testing facilities in Nepal,
- ▶▶ Bring the local and international institute and industry at a common platform with the common goals to create a new turbine manufacturer in Nepal
- ▶▶ Be a Stepping stone for KU to establish TTL as a Center of Excellence for R&D of hydraulic turbines for minimizing sediment erosion.

## ICH Seminar on Concession Agreements:

International Centre for Hydropower (ICH) and Independent Power Producers' Association, Nepal (IPPAN) jointly organized an International Training Course on "Concession Agreements" from bidding through negotiations to conclusion from November 5th – 9th, 2012 at Tulsi Hotel Pokhara, Nepal.

About 30 participants from Nepal, Bhutan, China and Norway participated in the five day residential training course.

The course mainly focused on the strategies and processes involved in making Concession Agreements, and highlighted on the necessary interconnections between the various factors that need to be considered. The planning process of a project, with emphasis on the economic and financial considerations and assessments, will also be elaborated.

The main topics of the training course were:

- » Relevant agreements for project-financed Hydropower projects
- » Timely completion of Hydropower projects
- » Examples of challenges experienced in the projects in Nepal
- » Concession Agreements – legal and practical challenges
- » Economic and Financial assessments, investment decision, negotiation strategy, export challenges
- » Survey Licenses and feasibility studies, challenges from the investors' point of view
- » Experiences from Laos regarding foreign investments and export to Thailand
- » Investors' challenges, International Financial Institutions



- » Negotiating Concession Agreements, strategy and potential risks
- » Experiences from performance of negotiations related to investments in the electricity supply industry – in particular with reference to negotiation of Concession Agreements

The course was designed to complement the ICH/IPPAN course on Hydropower Financing and Project Economy held at Mirabel resort Hotel, Dhulikhel from 14th to 18th November 2011 and it also forms the first part of a two part programme in Negotiation Techniques. The second part of this two part programme is planned for the first half of 2013. The second part will focus on the practical

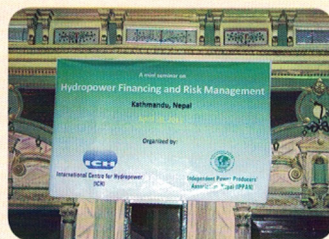
aspects of Negotiation Techniques, and requirement criteria for participation will be the completion of the first part of the two –part programme.

The participants of Nepal were from Ambeshwar Engineering, Bhotekoshi Power Company, Butwal Power Company, Employees' Provident Fund, Himal Power Limited, IDS Energy, IPPAN, Nepal Hydro & Electric Limited, Nepal Investment Bank Limited, Nepal Industrial and Commercial Bank Ltd., Nyadi Group Pvt. Ltd., S N Power, Sanima Hydropower (P) Ltd., Sinhala and Vera Law Firm, Tara Energy Put Ltd. Tundi, Power Company, Upper Solu Hydro-electric Company and Upper Tamakoshi Hydropower Limited.

## ICH mini seminar on 'Hydropower Financing and Risk Management'

A half day mini seminar on 'Hydropower Financing and Risk Management' was organized in Kathmandu at Hotel Yak and Yeti, on 18th April, 2013. The target group for the course was mainly the people from financial sectors involved in hydropower and investments in Nepal. Jointly organized by ICH and IPPAN, altogether 37 participants from different commercial and development banks as well as Insurance companies attended this International Course.

This seminar was basically an introduction to the topic however the main course which will go much into detail will be organized in the month of November of this year in Nepal.



The seminar included a paper presentation from Mr. Kjell Haagenen, an expert on this field.

This recent ICH Seminar on Hydropower Financing and Risk Management' was the fourth ICH seminar, jointly organized by ICH and IPPAN in Nepal.



## ICH International Course on "Negotiation Techniques"

**ICH International Training** Course on "Negotiation Techniques: Practical Training in Negotiation Techniques through Role Play based on realistic scenarios," was organized jointly by ICH and IPPAN from January 28 – February 1, 2013 at Hotel Radisson Suites Bangkok, Thailand. The training was about Negotiation Techniques to be followed during Negotiations between power developers and the government for a successful outcome, ensuring win – win situation for both the negotiating parties.

Since it was a follow-up meeting of the ICH Seminar on Concession Agreement (held in Pokhara last November, 2012), the participants were mostly selected from among the participants that took part in the Pokhara ICH Seminar.

The ICH Seminar on "Negotiation Techniques" was basically a Practical Training in Negotiation Techniques through Role Play based on the realistic scenarios.



Eighteen representatives from different member companies and organizations participated in the seminar. The participants were divided into two teams; Government and Private developers' team and the mock government team was led by Mr. Khadga Bisht and the Private developers' team was led by Mr. Narendra Prajapati. The Chief Negotiator from the Private developers was Mr. Tom Larsen.

The training was facilitated by Resource Persons:

- ▶ Mr. Kjell Haagensen
- ▶ Mr. Truls Holtedahl
- ▶ Mr. Robert Kay
- ▶ Mr. Jan Cederwall

The participants found the training extremely useful, especially in the context of Government of Nepal's recent decision to sign Project Development Agreements with independent power companies, working in Nepal, irrespective of the size or market of the power projects.

## Handover Ceremony of Final Review of the Project Development Agreement (PDA) Template

A Workshop on "Review of MoEn, PDA Template" was organized by IPPAN on July 7, 2013 at Hotel Yak & Yeti, Kathmandu. IPPAN had carried out the review of the Project Development Agreement (PDA) Template of the Ministry of Energy at their request. The "Review of the MoEn PDA Template" was funded by the Royal Norwegian Embassy, Nepal while the consultants for the review work were from Pioneer Law Associates along with Mr. Vijaya Shanker Shrestha (Technical Consultant). In the review work, Mr. Bharat Uprety, Mr. Anup Uprety and Mr. Narayan Chaulagain construed as Team Leaders, deputy Team Leader and as members from the Pioneer Law Associates.

Seated on the dais were: **Mr. Biswo Prakash Pandit**, Secretary, Ministry of Energy, **Mr. Krishna Chandra Paudel**, Secretary, Water & Energy Commission Secretariat (WECS), **Mr. Keshav Dhoj Adhikari**, Joint Secretary, Ministry of Energy, **Mr. Radhesh Pant**, CEO, Investment Board and Mr. Bharat Uprety, Pioneer Law Associates.

Present in the workshop were representatives from the World Bank, IFC, Power Companies, Ministry of Energy, Department of Electricity Development (DoED), and energy relevant journalists.

Addressing to the Workshop President IPPAN Dr. Subarna Das Shrestha Highlighted importance of project development agreement which is an effective tools to attract much awaited investment in the power sector by mitigating and sharing risks perceived in it.

He further added that Hydropower sector needs huge capital investment with longer time for its payback. Longer period of its construction and pay back accelerate the risk of cost increment, legal changes, change in tax regime and sometimes invite political change consequences by effecting fundamental principles of license condition issued by Government.

Thus protection of investment with associated risk is one of the major requirements of investors, be it

domestic, be it international, PDA with government, thus put on primary pre-requisite for calling investment in hydropower sector.

Mr. Anup Uprety presented a Power Point Presentation based Review Work of PDA Template, on behalf of the Legal Consultant, Pioneer Law Associates. Following the presentation Dr. Subarna Das Shrestha handed over the PDA template to **Mr. Bishwa Prakash Pandit**, Secretary, Ministry of Energy..

The following are the main areas where recommendations are being proposed in the PDA:

- ▶ Failure to consummate the PDA
- ▶ Changes in Law/Tax
- ▶ Force Majeure
- ▶ Government Approvals
- ▶ Lender's Rights
- ▶ Condition Precedents
- ▶ Water Use Rights
- ▶ Taxes and other Incentives
- ▶ Change of Control
- ▶ Government Guarantee for NEA Obligations
- ▶ Company's Obligations

### Mr. Radhesh Pant, CEO, Investment Board

Investment Board's PDA Negotiations were guided by the following nine tenets / principles.

Nine Principles of Project Development Agreement PDA:

1. Meet the energy needs of Nepal
2. Ensure fair share of economic benefits to the country
3. Ensure best use of river basins
4. Make provision for keeping the plants in good operating conditions at the end of the generation license.



5. Ensure that design risks, hydrological risks are borne by investors
6. To balance, developer will receive fair returns
7. Incorporate High Environmental and Safety Standards
8. Make it Industrial and employee benefit oriented: energy intensive industries to consume the energy
9. Is Model Community Benefit based: CSR Activities to benefit the communities?

### Mr. Keshav Dhoj Adhikary, Joint Secretary, Ministry of Energy

Ministry of Energy is rigorously scrutinizing the recommendations received from the different quarters. Our view is that PDA should be self automated document meaning, if there are problems later on between the two parties, it should be able to obtain solutions from within the PDA Document itself.

Today's Review Report was based on the PDA Template that we had shared with IPPAN last year. Since then,



many amendments have been made and most of the recommendations presented here have been incorporated accordingly. Those relevant recommendation not incorporated will be given due consideration.

For example, Change in Tax has also been included in Protection against Change in Law.

We have also prepared a critical path of government approvals that will make sure that they are secured in time.

Similarly, there are some conflicting legal provisions, e.g. Bonus and Registration Fee. We need to address these issues by enacting amendments through ordinance. We are also exploring, whether we can get these amendments enacted by ordinance within a short period of time.

Instead of Condition Precedents, we are thinking about Condition Subsequent.

**Mr. Biswo Prakash Pandit, Secretary, Ministry of Energy**

NEPAL's Power Sector is ready for take-off. What we need is only the fuel and it is nothing more or less than investment!

Predictability is very much important in Hydropower investment. The Investors need to know beforehand about the policy environment for hydropower development.

PDA document should basically address these two issues: Investment Security and Government's Concern for the benefit of the people. It should be acceptable to all parties.



Dr. Subarna Das Shrestha addressing the program

**Dr. Krishna Chandra Paudel, Secretary, Water and Energy Commission Secretariat**

By optimum utilization of Nepal's hydropower potential, Nepal's economy can be doubled, tripled and even quadrupled. PDA document should be such that it creates a win-win situation for both the private sector and the government as well.

## Meeting of the Infrastructure Working Group of Nepal Business Forum

21 May, 2013

The meeting of the Infrastructure Working Group of Nepal Business Forum was held on 22 May, 2013 at NBF Secretariat, Tripureshwore. The Co-chairs of Public Sector Mr. Hari Ram Koirala, Energy Secretary, Ministry of Energy (MoEn) and the Co-chairs of Private Sector Dr. Subarna Das Shrestha, IPPAN President were also present at the meeting. The other participants were Mr. Sriranjana Lacoul, Joint Secretary, MoEn, Mr. Keshav Dhoj Adkari, Joint Secretary, MoEn, Mr. Raju Maharjan, CDE, MoEn, representative from Ministry of Forest, Mr. Ashish Rauniar, IFC, Mr. Narendra Prajapati, representative from IPPs and Treasurer- IPPAN, Mr. Gopal Tiwari, Co-ordinator, NBF Secretariat and Mr. Pashupati Dhungel, EM- IPPAN.

IPPAN had delved on the new issue "Establishment of an Independent Power Trading Company in Nepal" currently, the Nepal Electricity Authority (NEA) is the only power purchaser in the country and has unofficially stopped Power Purchase Agreement (PPA) with IPP's above 25 MW Projects henceforth. The fear existing among the IPPs is that NEA can at any time impose limitations on the capacity in respect to Q value by stopping opportunity of optimization of the project.

This will consequently kill the potential of the river and incur more hikes on project development costs. We strongly believe that competitiveness is the only tool that can introduce market mechanism and establish ground for equal level playing field. Therefore, establishment of a new Power Trading Company we believe brings dynamism in this sector, raises the competition level, explores the market which ultimately helps to achieve economic efficiency and security of

supply and helps to develop a vibrant power market in the country.

The Co-chairs of Private Sector Dr. Subarna Das Shrestha, IPPAN President presented the status of earlier adopted issues in the meeting.

Following decisions were made in the meeting:

- ▶ VAT subsidy on construction materials per MW of electricity (rupees one crore per MW installed capacity) to increase the competitive power in this sector: For this the meeting instructed WG focal person Mr. Raju Maharjan of the Ministry of Energy to hold a meeting on May 2 inviting relevant officials and also to review the status and submit the same to the Secretary for further progress.
- ▶ Private sector engagement in domestic transmission line network: A task force is to be formed to work out the details in this sector to expedite the engagement of private sector investors in transmission line network. This issue will be discussed in details in the next forthcoming WG meeting.
- ▶ Involvement of the private sector in finalizing the Project Development Agreement (PDA): IPPAN to exercise more on PDA and submit the comments to MoEn accordingly in the upcoming meeting.
- ▶ Ministry of Forest is to acquire the land for the plantation of trees as compensation by the power developers rather than the power developers themselves: The issue is to be taken to the cabinet to urge them to review again and take further steps with active involvement of MoEn.
- ▶ Elimination of Pay for Environment Services (PES) provision which requires power developers to contribute up to 5% of the net profits to the fund: currently, MOF had introduced 1 % as flat from their net income. The meeting decided that the issue would be forwarded to the Cabinet for revoking the previous 1 per cent PES with the active initiative of Ministry of Energy within a month.

## Harmonization of laws and regulations related to Hydropower Project:



One window policy of Electricity Act 2049 has not worked the way Government of Nepal has envisioned and developers has expected. Even there was a provision of having one window there were numerous ministries and departments that a developer has to approach for approval and clearance purpose. Besides, the spirit of Electricity Act, in many instances was not supported by other acts, laws and regulations. IPPAN with the funding from IFC together with Investment Board did a comprehensive study by employing external legal firm, Sinha & Verma Law Concern, with an objective to harmonize the existing laws with the Electricity Act. The study contained two parts, the first part was those laws and regulations that were under the authority of the government to change and in which immediate actions could be taken and the other were those that were to be recommended for drafting new electricity act. It is important to note here that the draft report was shared with the concerned policy makers of the ministry of Energy, Ministry of Finance, Ministry of Industry, Ministry of Forest, Ministry of Environment, Ministry of Home, Ministry of Defense, NEA, Department of Electricity Development, WECS etc. Presentation of harmonization study was done by Sinha Verma Law concern on June 8, 2012 to the stake holders and 5th of August 2013 to the political parties and on 12th August to government officials. The final report with two parts as mentioned above will be handed over to Government for appropriate consideration. This is joint effort together with Office of Board of Investment and IFC.

## PPD Training to empower NBF working Group Secretariats:

8-9<sup>th</sup> May, 2013



"Public Private Dialogue" (PPD) was jointly organized by the Ministry of Industry, World Bank Institute and IFC/NBF Secretariat at Hotel ParkVillage. Thirty Five NBFG stakeholders attended from the Government and private sectors. Mr. Pashupati Dhungel, Executive Manager from IPPAN participated in this two day training/workshop on PPD. The training mainly focused on PPD process, research, advocacy and implementation of reforms in a coordinated approach.

The Hon'ble Minister for Industry, Finance, Commerce and Supplies Mr. Shanker Prasad Koirala, inaugurating

the program stressed on to include NBF as integral foundation for Nepal's efforts to improve the business environment and reforms implementation to all the concerned authorities. He also said that the Government of Nepal is always ready to support financially the initial efforts jointly organized by the public and the private sector. The Co-chairs from public and private sectors of working groups of the Nepal Business Forum were also present at the opening session. Mr. Benjamin Herzberg of WBI trained the participants of PPD process and reforms achieved.

## Meeting with Integrated Research and Action for Development/ SARI Team

June 6, 2013

Dr. Subarna Das Shrestha and Mr. Pashupati Dhungel met with Mr. L V Rao, Project Director, SARI/ Energy Integration and Mr. R. C. Dup, Technical Specialist, SARI/ Energy Integration on 6th June, 2013. IRADe is a fully autonomous Advanced Research Institute, which aims to conduct research and Policy Analysis and connect various Stakeholders including Government, Non-Governmental Organizations (NGOs), Corporations, Academic and Financial Institutions. Its research covers many areas including Energy & Power Systems, Urban Development, Climate Change & Environment, Poverty Alleviation & Gender, Food Security & Agriculture, as well as the Policies that affect these areas. Dr. Shrestha, on the occasion, acquainted the team about policy and regulatory issues related to Nepal's Power Sector.

## UPCOMING EVENT

### Power Summit 2013

Kathmandu, Nepal  
August

Independent Power Producers' Association, Nepal (IPPAN) is hosting Power Summit 2013 in Kathmandu on August 26-27, 2013 with the patronage of the Government of Nepal, Ministry of Energy and the Investment Board. The summit is going to be jointly organized by IPPAN, PTC India Limited (PTC) and Non-Resident Nepali Association (NRNA).

Power Summit 2013 with a theme of '**Hastening Pace of Hydropower Development**' has an objective to catalyze the power development sector because there is a general feeling that, the enthusiasm and momentum which was in the sector since 2006 seems to be dwindling away. The summit will be geared to conduct critical review of where we have reached since 2006, what we lack, and what needs to be in place to hasten the pace of development of the hydropower sector in Nepal.



The contents of the Power Summit 2013 are designed to cover all the major areas such as political commitment, legal and regulatory framework, realistic electricity demand forecast, electricity pricing, project financing infrastructure, construction of transmission lines and managing local expectations. In order to take the proceedings forward we shall cover the above issues in four separate categories

- » Projects with local investments and for domestic consumption,
- » Projects for domestic market with FDI component,
- » Export oriented projects with FDI and
- » Power market mechanism.

The outcome of the summit will help us build a status report, a clear picture of the state of affairs and establish a plan of action with designated roles and responsibilities.

The two day event will bring together relevant stakeholders from Brazil, China, and Czech Republic, France, India, Korea, Nepal, Norway, USA and other countries for focused discussions on hydropower development in Nepal.

A joint meeting was held between IPPAN and Hydroelectric Investment and Development Company (HIDCL) recently wherein a follow-up event 'Hydropower Meet' is going to be organized by HIDCL on 28-29 August 2013, right after the conclusion of the Summit.

# NEWS FROM MEMBERS

## 216 MW Upper Trishuli-1 Hydro-electric Project

Nepal Water and Energy Development Company (NWEDC) is going to develop the 216 MW Upper Trishuli - 1 (UT-1) Hydro-electric Project in Rasuwa District. The project is being promoted by KOSEP, Daelim and Kyeryong Companies of South Korea, International Finance Corporation and a Nepali promoter, the lenders being IFC, ADB, Proparco

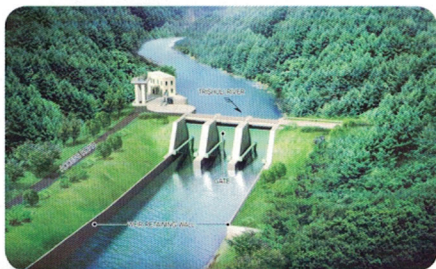
Environment and Connection Agreement has been signed with NEA. Drilling and Drifting Works and Track Opening for the Access Road have been completed. About 74 Ropani of private land has already been acquired, 20 Ropani of land has been leased for camp facilities and land acquisition works for the Guthi land are under process. About



Test Tunnel Completion Ceremony



Warm Hand shake after Connection Agreement



Bird's Eye View of the proposed Intake



CSR Activities of NWEDC

(France), DEG (Germany), FMO (The Netherlands) and Korean Development Bank. The EPC Contractors are Daelim and Kyeryong. KOSEP will be the O & M Contractor. The project will generate 1456 GWh of energy. The project is expected to start commissioning in March 2019.

The project site is located at a distance of 76 km West from Kathmandu, and proximity with Kathmandu Load centre makes it one of the most attractive sites in Nepal for power development. The project will add to existing installed capacity by almost one-third (216 MW). The UT-1 plant will have a high firm power of approx. 104 MW and will add around 50% (1456 GWh) of electricity to the current annual electricity generated in Nepal.

### Achievements:

Design of the project has been completed. EIA Report has been approved by the Ministry of

80 ha of Government Land is being leased for project activities. With the recent signing of share subscription agreement in August, 2013 and subsequent approval by DoI and NRB, financial agreement of equity capital has been completed. The IEE study is being carried out for the 10 km Interconnecting Transmission Line from UT1 plant to the Upper Trishuli- 3B hub. With the tree cutting approval recently from the Nepal Government, Council of Ministers, the project has entered into important phase of construction. The construction of 15 km long Access Road will start soon.

Currently, Project Development Agreement (PDA) and Power Purchase Agreement (PPA) are in process.

(NWEDC is on web too! Please visit [www.nwedcpl.com](http://www.nwedcpl.com) for update on project activities)

## Sanima Hydro: A glimpse

Sanima Hydropower is one of the leading companies in hydropower development, consulting and construction -supervision business. Few projects

that this group is currently developing in Nepal are Mai Hydropower Project (22 MW) and Mai Cascade (7 MW) in Ilam, eastern part of Nepal. The construction

Jade Consult Pvt. Ltd.



Jade Consult Pvt. Ltd. is a private consulting company estd. in 2001 with the mission to meet the energy & infrastructure needs of Nepal. Jade Consult is committed to provide excellent consultancy services for hydropower, transmission line, road and civil structure projects in national as well as international market. Till date Jade Consult has been involved in over 2300 MW of Projects all over Nepal at the different stages of development,

Currently Jade Consult is involved in Detail Design of Budhi Gandaki (600 MW) HEP. Nepal Electricity Authority (NEA) has signed contract with Tractebel

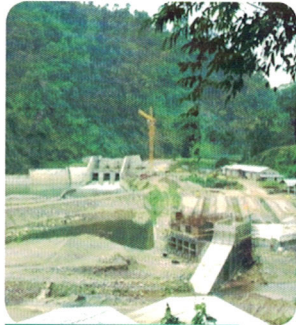


Test Tunnel excavation work at Budhigandaki HEP

Engineering S.A. France in association with Jade Consult Pvt. Ltd. Nepal to provide Consulting Services for the Feasibility Study and Detailed Design of Budhigandaki Hydropower Project, for which the company is carrying out site investigation like geological investigations (Core drilling – 1800 m, test tunnel – 690 m, ERT-3100 m, SRT-7100m, and detail geological mapping), establishment of gauging station, periodically discharge measurement and flood analysis including sediment sampling. Further, the LiDAR survey has already been completed in about 115 km<sup>2</sup> area and data processing is under progress. Jade has been working as Owners Engineer for Upper Trishuli-I (216 MW) HEP where Detail Design Review is going on. Till date Jade Consult is the only one company in Nepal, involved in High voltage transmission line. At present Jade is involved in Nepal's first High Voltage Cross Boarder Transmission line 400kV Hetauda-Dhalkebar-Duhabi. Preliminary construction supervision works are being carried out.



Penstock progress



Headworks progress of Mai



Powerhouse Progress



Locals during the process of share application of 22 MW Mai HPP

progresses of these two projects are above 75 % and 10 % respectively. One of the visiting card projects of this company is Sunkoshi Small Hydropower Plant (2.5 MW) which is in operation since 2005. Simultaneously, the consulting wing of the company Sanima Hydro and Engineering provides consulting services to domestic as well as international projects in an internationally acceptable level. More than 30 Hydropower project companies including international with capacities ranging from 500kW to 415 MW have received services from Sanima Hydro. The company succeeded in short span of time period since its establishment in 1999 due to involvement of highly professional and dedicated engineers as its core team and professional guidance of highly enthusiastic and motivated Non-Resident Nepalese. The local support and cooperation are other major factors to achieve a progress of above 75 % in Mai Hydropower Project. The commercial operation date of Mai Hydropower Project falls on July 14, 2013. The evacuation of power generated by it to INPS directly depends upon completion of 1st section up to Godak Substation of 132 kV Damak Kabeli Corridor. The corridor is one of the critical aspects for Mai

project which NEA needs to take care of, ensuring timely input in national grid to reduce load shedding and minimize import through Purnia Duhabi.

The civil contractors of these projects are Himal Hydro and High Himalaya Hydro where as APP China, Structo and Aster India are equipment supplier, penstock pipes fabricator and transmission line erection and construction contractors respectively.

The project company of Mai Hydro successfully issued the Initial Public Offering (10% of paid up capital) to local people of 9 Village Development Committees of project area and people of Ilam district. And the company is going to offer the IPO (20% of paid up capital) for general public very soon.

The other upcoming projects with project company Tamor Sanima Energy (P) Ltd. are 285 MW Upper Tamor Hydropower Project and 54 Middle Tamor Hydropower Project which are in the stage of power purchase agreement with NEA.

The ultimate goal of Sanima Hydro is to contribute nation through hydropower development and try to make the country as "energy sufficient country".

## Name List of IPPAN Members

### Corporate Members

- |   |   |
|---|---|
| 1 Bhote Koshi Power Co. Pvt. Ltd.         | 39 Rara Hydropower Devt. Co. Pvt. Ltd.        |
| 2 Butwal Power Co. Ltd.                   | 40 Sanima Mai Hydropower Pvt. Ltd.            |
| 3 Himal Power Limited                     | 41 Tara Energy Pvt. Ltd.                      |
| 4 Himtal Hydropower Company Pvt. Ltd.     | 42 Nimrung Hydropower Co. Pvt. Ltd.           |
| 5 Lamjung Electricity Devt. Company Ltd.  | 43 River Falls Hydropower Devt. Pvt. Ltd.     |
| 6 Molnia Power Ltd                        | 44 Nyadi Group Pvt. Ltd.                      |
| 7 Sanima Hydropower (P) Ltd.              | 45 Baishno Devi Hydropower Co. Pvt. Ltd.      |
| 8 Annapurna Renewable Energy (P) Ltd.     | 46 Synergy Power Development Pvt. Ltd.        |
| 9 Khudi Hydropower Ltd.                   | 47 Energy Engineering Pvt. Ltd.               |
| 10 Himalayan Hydropower Pvt. Ltd          | 48 Upper Mai Hydro Devt. Pvt. Ltd.            |
| 11 Rairang Hydropower Devt. Co. Pvt. Ltd. | 49 GMR Upper Karnali Hydropower Ltd.          |
| 12 Mai Valley Hydropower Pvt. Ltd.        | 50 Lower Arun Hydro Electric Pvt. Ltd.        |
| 13 Manang Trade Links (P) Ltd.            | 51 Sinohydro-Sagarmatha Power Co. (P) Ltd.    |
| 14 Balephi Hydropower Company Ltd.        | 52 Essel - Clean Solu Hydropower Pvt. Ltd.    |
| 15 IDS Energy Pvt. Ltd                    | 53 Chirkhwa Hydropower Pvt. Ltd.              |
| 16 PAN Himalaya Energy Pvt. Ltd.          | 54 Mailun Khola Hydropower Co. Pvt. Ltd.      |
| 17 Pashupati Energy Dev. Co. (P) Ltd.     | 55 Liberty Energy Hydropower Co. Ltd.         |
| 18 Tundi Power Co. Pvt. Ltd.              | 56 Sikles Hydropower Pvt. Ltd.                |
| 19 Mukdishree Pvt. Ltd.                   | 57 Hira Ratna Hydropower Pvt. Ltd.            |
| 20 Cemart Power Dev. Co (P) Ltd.          | 58 Ambeshwor Engineering Hydropower Pvt. Ltd. |
| 21 Ru Ru Jalbidhyut Pariyojana Pvt. Ltd.  | 59 Alliance Power Nepal (P) Ltd.              |
| 22 Radhi Bidyut Company Ltd.              | 60 Jumdi Hydropower (P) Ltd.                  |
| 23 Upper Maiwa Hydropower Pvt. Ltd.       | 61 Mount Kailash Energy Company Pvt. Ltd.     |
| 24 Upper Madi 0 Hydro Pvt. Ltd.           | 62 Daraudi Kalika Hydro P. Ltd.               |
| 25 Super Khudi Hydropower Pvt. Ltd.       | 63 C.E.D.B. Hydro Fund Ltd.                   |
| 26 Unique Hydrel Co. (P) Ltd.             | 64 Nepal Water & Energy Development Company   |
| 27 Shikhar Hydropower Co. Pvt. Ltd.       | 65 Kalanga Hydro Pvt. Ltd.                    |
| 28 Ankhu Hydropower (P) Ltd.              | 66 Eastern Hydropower (Pvt.) Ltd.             |
| 29 Annapurna Group (P) Ltd.               | 67 Sanvi Energy Pvt. Ltd.                     |
| 30 Grid Nepal Company Pvt. Ltd.           | 68 Tamor Sanima Energy Pvt. Ltd.              |
| 31 Welcome Energy Devt. Co. (P) Ltd.      | 69 Panchthar Power Company Pvt. Ltd.          |
| 32 Nepal Hydro Developer Pvt. Ltd.        | 70 Triyog Energy and Development Pvt. Ltd.    |
| 33 Dordi Khola Jalabidyut Co. Ltd.        | 71 United Modi Hydropower (P) Ltd.            |
| 34 Himalayan Power Partner Pvt. Ltd.      | 72 Dovan Hydropower Pvt. Ltd.                 |
| 35 Naulo Nepal Hydroelectric Pvt. Ltd.    |   |
| 36 Numbur Himalaya Hydropower Pvt. Ltd.   |   |
| 37 Global Hydropower Associate Pvt. Ltd.  |   |
| 38 Nasa Hydropower Pvt. Ltd.              |   |

### Associate Members

- |   |   |
|---|---|
| 1 Shangrila Energy Ltd.                   | 15 Sunrise Bank Ltd.                                |
| 2 Clean Energy Development. Bank Ltd.     | 16 Nepal Investment Bank Ltd.                       |
| 3 Klen Tech Pvt. Ltd.                     | 17 ACE Development Bank Ltd.                        |
| 4 SN Power                                | 18 Feedback Ventures Nepal Ltd.                     |
| 5 Nepal Hydro & Electric Ltd.             | 19 Qiankang Allonward Hydro-Equipment Co. Pvt. Ltd. |
| 6 ICTC Pvt. Ltd                           | 20 Structo Nepal (P) Ltd.                           |
| 7 Himal Hydro & General Construction Ltd. | 21 Siddhartha Bank Ltd.                             |
| 8 Hydro Solutions Pvt. Ltd.               | 22 Laxmi Bank Ltd.                                  |
| 9 Jyoti Bikash Bank Ltd.                  | 23 DCBL Bank Ltd.                                   |
| 10 Nabil Bank Ltd.                        | 24 K-water (Korean Water Resources Corporation)     |
| 11 Himalayan General Insurance Co. Ltd.   | 25 Jade Consult Pvt. Ltd.                           |
| 12 Standard Chartered Bank Nepal Ltd.     | 26 GCE Group Pvt. Ltd.                              |
| 13 Bank of Asia Nepal Ltd.                |   |
| 14 Sanima Bank Ltd.                       |   |

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