An Interview with Mr. Mukesh Raj Kafle

Managing Director
Nepal Electricity Authority, Government of Nepal

In light of ongoing discourses, at present, on prevailing energy crisis and the hydropower development in Nepal, HYDRO Nepal felt this an opportune moment to review and assess the present energy scenario of Nepal. This time, HYDRO Nepal takes pleasure in presenting an interview with Mr. Mukesh Raj Kafle, Managing Director, Nepal Electricity Authority with Mr. Upendra Dev Bhatta, Editor-in-Chief of HYDRO Nepal Journal.

Energy is the backbone of economy and provides vital services to the people. How do you assess the present energy scenario of Nepal?

Nepal's energy situation is not so praiseworthy; to be frank, it is deplorable. Eighty four percent 84 % of country's energy need is fulfilled by traditional resources; i.e., 14% by petroleum products and only 2% by electricity. Being one of the richest hydro power resourced nation, I would like to delineate the energy to the respect of hydropower. We have 105 years long history of hydropower development. After completion of nation's first 500 kW Pharping hydropower plant on 11th May 1911 AD, only 785 MW capacity of hydropower projects are developed resulting to a huge gap between supply and demand. Merely 58% of the populations are connected to the national grid and nation's annual per capita electricity consumption is below 140 kWh which is the lowest among the South Asian Countries. Available power is not sufficient to cater to the present demand and the country is facing acute load shedding up to 13 hours a day. On the top of that, some of the power transmission lines are also congested. In 2015, peak power demand was 1292 MW and we had to curtail load of 585 MW, which is 45% of total demand. Out of the power actually supplied, 357 MW was contributed by NEA hydro, 125 MW by IPPs hydro and 225 MW was imported from India. This year we are expecting peak power demand of 1423 MW. The annual power demand is increasing at the rate of about 10% per year. Currently, NEA is delivering electricity supply to about 3.5 million customers.

In Integrated Nepal Power System (INPS), a total of 838 MW power plants, including 53 MW thermal plants are linked. Out of 785 MW hydropower developed in Nepal, 473 MW hydropower power plants are developed by NEA and 312 MW hydropower plant are developed by IPPs. About 230 MW power is imported from India. We have 2850 circuit km of existing 132 kV and 66 kV T/L, 2300 circuit km of 400 kV, 220 kV and 132 kV T/L are under construction. Likewise, the total existing capacity of 132 and 66 kV Substations are 2150 MVA and substations with the total capacity of 500 MVA are under construction.

By the end of the FY 2015/16, PPA has been signed with 185 IPPs for 2920.86 MW of power. Among them hydropower plants with the total capacity of total 324.5 MW has already been connected to the INPS and total 2596.4 MW different hydropower projects are under construction. Eleven different hydropower projects of 1044 MW capacity owned and developed by NEA and its subsidiary companies are under construction. Similarly, NEA has planned for the development of total 2177 MW capacity of hydropower projects. After three years, with the completion of these hydropower projects, power demand during monsoon will be fulfilled by the country's own generation. Nevertheless, the country will not have enough power to meet the demand of dry period as all the hydropower plants except 106 MW Kulekhani I, II and III are Run-of-River (RoR) types. During the dry period, the only option will be to augment the current power import quantum from India which is now about 300 MW.

The contribution of distributed power plants (micro/mini hydro, solar, wind, etc) is very limited and minimal in the Country. Very few People living in remote areas of the countries are benefitted from such distributed power plants.

What is the situation of load forecasting in terms of actual vs. suppressed demand in Nepal?

NEA forecasts the annual power and energy demand based on the power consumption data, country's macro-economic indicators and electrification expansion programs. NEA has already been forecasted the power and energy demand up to FY 2033/34 AD. According to the forecast, power and energy demand in the year 2015/16, 2020/21 and 2025/26 shall be 1423 MW – 6921 GWh, 2204 MW – 10541 GWh and 3203 MW -15460 GWh respectively.

In the Concept paper and action plan issued by the Government of Nepal (GoN) in February 2016 for National Energy Crisis Reduction and Power Development Decade (NECRPDD), the demand forecasted by NEA has been referred as suppressed demand. The GoN has envisioned more industrialization in the country, technology advancement, higher GDP and better lifestyle of people in coming years. And demand of power and energy will raise around three times the NEA's forecast in next ten years. Accordingly, the GoN has assumed the total power demand of 10000 MW in next ten years, whereas the NEA forecast shows the demand of only 3203 MW and, hence, it is denoted as suppressed demand. Definitely the economic growth and industrialization of a nation as well as the quality lifestyle of the people has direct effect on power and energy demand. That is the reason why periodically revision is necessary to have more accurate energy and power demand forecast and NEA is doing it on regular

basis.

Despite large hydro potential, Nepal has become dependent on ever increasing imports of fossil fuels. How is NEA planning to reduce this dependency while harnessing its indigenous hydropower potential?

We are spending huge sum of money for the import of petroleum products (Diesel, Petrol, Aviation Fuel and LPG gas). Country's total export is quite smaller than the import of petroleum products and is the major cause of a huge trade deficit affecting the nation's economy. One and only way of limiting the use of petroleum products is the extensive use of electricity in transportation, industrial and development activities and day to day activities of people. This necessitates the production of more and more electricity through the development of hydropower projects, construction of the required transmission line network and substations which requires a huge sum of investment and strong commitments of Government.

Nepal is facing energy deficit even during wet season resulting to load shedding. What are the NEA's plan and program to minimize and/ or eliminate the load shedding in the long run?

I have already described the situation of load shedding in Nepal that has crippled the daily life of people and adversely affected the overall growth of the country. Besides NEA, the GoN and its entities have fully committed to eliminate the load shedding to the earliest and consequently have proposed different plans and programs. With the sole purpose of minimizing the current energy crisis and abolishing load shedding forever, the GoN has dispensed 99 points National Energy Crisis Reduction and Electricity Development Decade (NECREDD) Action Plan, 2072 BS in February 2016. Being executing agency and one of the major stakeholders, the NEA Board of Directors has acknowledged the NECREDD, action plan for necessary implementation. The Action plan has outlined the role of different government entities (MoEn, MoF, NPC, IBN, NRB, MoFSC, MoLJPA etc.) both comprehensively and concisely. It has pointed out the requirement for all the necessary legal reforms and policy that is a must to achieve the goal of completion of additional 10000 MW power plants in next 10 years. The action plan has analyzed the problems noticed on institutional management, electricity market management, land acquisition and environmental clearance procedures, procurement, distribution management and openly delineated the activities required in Generation, Transmission, Distribution sector as well as necessity of policy reforms. Clear plans and concepts are detailed in NECREDD Action Plan.

A Study has revealed that total 1450 MW power will be added in the INPS and power plant capacity will reach up to 2209 MW in the next 3 years (i.e., fiscal year 2018/19). Out of 1450 MW, 600 MW will be obtained from the hydropower projects developed by the IPPs and 830 MW power will be obtained from the hydropower projects and solar projects developed by NEA and its subsidiary company. In the year 2018/19, forecasted power demand will be about 1903 MW and there will be no load shedding during wet period of the year. By the year 2018/19, through 400 kV Dhalkebar-Muzaffarpur Cross border Transmission Line we will be able to import 600 MW power. The imported power from different points at different voltage levels will also shrink the load shedding hours and ease the situations even in dry periods. In next ten years, we have assumed the completion of 117 RoR hydropower projects of capacity 2587 MW, 11 reservoir type hydropower projects of capacity 5373 MW and 5 peaking RoR hydropower projects of capacity 1975 MW. At the same time, the under construction and new transmission lines, substations will be completed for the effective and congestion free transmission of power. Hence, we can expect the end of load shedding by the year 2018/19.

And what is your assessment on importing energy from India to reduce load shedding?

Import of power from India has become the most appropriate solution to diminish the current power crisis in the country, since we have no other options that can supply the reliable power in short duration except via Diesel generators which we don't want due to the high cost of the energy.

India and Nepal have very long history of Power Import and Export. Since early 1970, India and Nepal have been exchanging power at different points to provide electricity to nearby villages along the Border. Still, there exists Indo-Nepal Power Exchange Committee to coordinate and manage this power exchange. In the year 1990 - 2000, Nepal was importing power at different 17 locations and exporting India from different five locations (Raxaul, Jogbani, Thakurgunj, Ramnagar and Valmikinagar). Most of these Power Import/Export links are still in operation. From India, we are receiving power through power exchange program (about 50 MW), against the treaties and agreements (e.g.; 70 million free units from Tanakpur) and rest is purchase from the market. After the promulgation of Indian Electricity Act 2003, Indian Electricity Sector turned to be the market-oriented. As of now, we are importing total power from India around 310 MW, including 80 MW from Indo - Nepal, 400 kV Dhalkebar – Muzaffarpur Cross border Transmission Line charged at 132 kV. The import quantum of power will be increased for a couple of years. By 2017, we are planning to import about 250 MW power through Dhalkebar - Muzaffarpur Cross border Transmission Line charged at 220 kV and total Import quantum of power will be around 400 MW. GoN and the NEA are committed for sustainable development of hydropower projects in Nepal. Since number of hydropower projects promoted by the NEA, its subsidiary companies and IPPs are under construction and expected to be completed on scheduled time, we will be exporting power to India by the year 2019/20 at least in wet periods. The current hydropower development scenario indicates the requirement for the continuation of power import from India in the dry season for next 5-10 years. Ultimately, we will be exporting power to India as the hydropower developments and required infrastructures like Cross border Transmission lines are being developed.

Completion of some HEPs are lingering with

time and cost overruns where as the nation is reeling under severe energy crisis affecting the household to overall economy. How is NEA planning to ascertain the early commissioning of these projects?

It is very unfortunate that Chamelia, Kulekhani III, U Trishuli 3 A, Upper Tamakoshi hydropower projects could not be completed in the scheduled time. There are many reasons associated, but among them land acquisition, environmental and social safeguards issue, forest clearances and local disturbances are the major ones. On the top of that vested political interests sometimes also created problems in execution. However, this may be due to the political instability and poor law and order situation. These projects were also badly hit by the devastating earthquake of the April/May 2015 and the blockade at major Indo-Nepal borders, further delaying the completion time. These lingered projects are in the stage of completion and soon will be completed. NECREDD Action Plan delivered by GoN in February 2016, has created positive and enthusiastic atmosphere for the hydropower development. It is supposed to solve many problems faced by the hydropower developers, especially licensing anomalies, PPA related issues, environmental constraints, financing problems, social complications, security glitches, land acquisition and forest clearances. I am sure this is a huge and most anticipated move for hydropower development in the country. It will certainly deliver the preferred output in the electricity sector.

Large public utilities are run with specific plans and programs. What are the NEA's plan related with hydropower generation, transmission line expansion, and human resources development? Is there corporate development plan in operation in NEA?

Hydropower Development Policy, 2001 opened the door for the private sector into the monopolistic NEA power sector in the field of power generation. Since then many IPPs have appeared for the hydropower production. However, establishment of hydropower plants is neither happening in the coordinated and planned manner, nor in the basis of requirement so as to support regional balance and system stability, or we can say the hydropower resources are not optimized. The basic approach of Least Cost Generation Expansion Plan (LCGEP) concept has not yet been applied in the country and it is very difficult to apply at this stage, as MoEn or its entities have neither long term generation planning nor bears the lists of feasible hydropower projects since it has not carried out the study to the required extent. Hydropower Projects are being developed in an uncontrolled manner, i.e., the developer himself decides which project is appropriate for him. As there are many developers (IPPs, NEA, other GoN entities like IBN & Jalvidyut Bikas Samitis, etc.) involved in power generation, the Government should develop LCGEP and implement strictly to optimize the hydropower resources.

Regarding NEA, Engineering Directorate performs the feasibility study of a number of hydropower projects and among the technical and financial feasible projects the most attractive (least cost) projects are chosen for the development. We are still doing the study of different hydropower projects and have plans to develop nine different hydropower projects of capacity 2177 MW. All these nine projects are in the different stage of development. So far NEA is solely responsible for the construction and operation of the transmission system and distribution system. We have a transmission line master plan for the period up to 2035 and consequently T/L and S/S are being constructed. We are also preparing a distribution master plan with the financial assistance from ADB. O and M survey is being carried out on a regular basis for efficient HR planning. We have also widened the use of information technology in all generation, transmission, distribution and administrative sector of NEA to attain better efficiency.

The electricity tariff has recently been increased by ETFC providing some relief to NEA financial health. Timely adjustment of tariff can be justified, but without NEA's institutional reforms, non-technical loss control, recovery of arrears, selection of the best projects and ensuring effective and efficient sercvices to the public, only tariff increment cannot be justfied in the long run. What are the NEA's plans in these areas?

Electricity is a commercial commodity and its appropriate pricing is very important to maintain good financial strength of an organization. Until and unless a utility becomes financially strong, it can't make the required investment in electricity generation, transmission, distribution, its operation and management, which may lead to the poor delivery of services, deprived reliability and in worst case power cut as well. Tariff rate must be able to reflect the real cost of electricity, cost of service and marginal profit. NEA can't fix its own tariff rate and other cost of services. Conferring the section 40 of the Electricity Act 1992, Electricity Tariff Fixation Commission (ETFC) proposed in 1994 to fix the tariff rate and cost of other services and in the same year Electricity Tariff Fixation Rules (ETFR) 1994 was enforced. Since then, the commission has been fixing the electricity tariff rate and cost of services for NEA Consumers. Tariff fixation is a continuous process and must be regular as the price of electricity is affected by many factors like the operating cost of the plant, cost of fuel, O and M cost of organization, inflation of foreign currency exchange rates, consumer price index etc; which do not remain fixed. Due to these changing variables, the financial health of an organization can't be maintained by selling electricity at the same rate for a long time. From 1994 to 2001, there was a timely revision of electricity tariff rate, but after 2001 NEA suffered a lot though it made multiple requests to ETFC to review and determine the new tariff rate. Over 11 years later in August 2012, ETFC fixed the new tariff rate and cost of services with the average increment of 20%. Then it took four years to have another revision of electricity tariff and recently in June 2016, ETFC has determined new tariff with the cumulative increment of around 19%. Electricity tariff revision and fixation is not being done properly as NEA expected and on timely manner. This is one of the causes

of swelled loss of NEA of about NRs 27000 Million (as of July 2015). We would prefer to have an automatic revision in Tariff each year, which is also provisioned in ETFR 1994, according to which a formula is set up and based on the change in the cost of fuel, consumer price index etc, GoN or such Corporate Body can change the tariff structure once a year not exceeding to 5%. Electricity leakage, arrears, staff productivity, O and M cost and some internal managerial issues are also responsible for the surged financial loss of NEA. We are quite aware of it and rectification process has already begun. If appropriate electricity tariff rate is determined which indicates the true cost of energy delivered to the end consumer's considering all those relevant parameters like PPA rate of IPPs, O and M cost, fuel cost of diesel plants, purchase rate of power imported from India, consumer price index, cost of services, etc. and revision done in a regular manner, it will help a lot to improve the financial strength of NEA and thereby supports the electricity development of the nation as well.

What are the major constraints faced by NEA ?

After the promulgation of the Nepal Electricity Authority Act 1984, NEA is established to arrange the power supply by generating, transmitting, and distributing electricity in an efficient, reliable and convenient manner. NEA has many restrictions and limitations; institutional, technical and managerial restrictions are linked up with each other. The major constraints are: sandwiched between the social obligations and commercial responsibilities, Government's directions and policies, power purchase, structure of NEA Board, Tariff rate and Political interferences.

Since its establishment, NEA could not run as a commercial organization due to its social responsibilities. It has social obligations like rural electrification, community electrification, subsidized tariff, etc. The NEA has to follow the Government's policy and directions which are most of the time not profitable. Government policies and directions are inconsistent and keep on changing with the Government. Every new Government comes up with popular and unmanageable plans of ending the power crisis and hydropower development that compel to power purchase from IPPs at an unreasonable price, power purchase from India and running diesel plants. The NEA Board holds the excessive decision making power, Board members are not elected rather nominated by the GoN and sometimes found unprofessional to take appropriate decisions. Further, Board members are changed along with the Government causing havoc and void in the Board. Political interference is always there that directly or indirectly affects the NEA management decisions. All these influencing NEA's activities, NEA management have never been in the state of overcoming these restraints and make own decisions to run it as a vibrant and viable commercial organization. The electricity tariff is not revised in a regular manner as provisioned in ETFR, 1994. Consequently the NEA's financial strength has become so weak that its cumulative financial loss as of F/Y 2014/15 reached to NRs. 27000 Millions. The majority of the revenue earned is spent on purchasing power with the IPPs and power import from India. This amount is estimated to be 81% of total revenue by next year. Due to the poor financial strength, we are unable to make enough capital investment in generation, transmission and distribution activities. We have insufficient generation plants, most of the transmission lines are congested. Substations and distribution lines are overloaded. We are still using outdated technologies and couldn't apply or introduce modern technologies, couldn't spend required funding for capacity building of the organization and its employees. If we fail to take appropriate action on time, NEA's position will decelerate day by day. NEA management is working very seriously to overcome this bleak situation. Despite working very close with the Government and being a fully owned entity of the Government, we are not getting any privilege from the Government. Rather, we are treated similar to IPPs and we have to follow each and every rule that an IPPs has to follow for license, environment and forest clearance processes, land acquisition procedures, taxes etc;

The concept of NEA unbundling has been a discourse since long time. And it is taking longer time resulting implication on NEA's long term planning and execution. What is your opinion on NEA unbundling?

Hydropower Development Policy, (HDP) 2001 has envisaged the free electricity market. While preparing the policy, the Government realized that NEA must be unbundled to improve efficiency through competition and commercialization which is also outlined in the HDP, 2001. The task of unbundling was to separate NEA into three different entities as Transmission, Generation and Distribution and it also required the establishment of an independent regulator to regulate the market and maintain good governance. At the time, several studies were carried out. Being a small market, unstable socio-political situation, capital intensive nature of hydropower and the urgent need to expand rural electrification – a phased approach toward power sector reform is considered suitable to create a sustainable and efficient power industry. Accordingly, internal unbundling of NEA began in 2003/2004 and four different business groups Generation, Transmission, Distribution and Engineering were formed making them responsible and accountable for their task. Further, 18 Distribution Centers were chosen to run it commercially, and performance agreements were signed with the Distribution center chiefs; communities were encouraged for rural electrification and distribution system operation and, Community Rural Electrification Bylaw enforced to regulate communities activities. NEA had already started signing PPA with IPP since 1994 when NEA signed the PPA with Himal Power limited for Khimti HEP (60 MW). We are still internally unbundled but due to socio-political reasons and many other issues associated with the NEA, it has not become so effective as it was expected before.

The GoN has expressed its commitment of unbundling and added a brick to the power sector reform

by registering Nepal Transmission Grid Company in July 2015. Similarly, NECREDD Action plan has outlined the formation of a NEA holding Generation Company and numbers of NEA holding Distribution Companies. And a National Generation Company is on the way of establishment to fulfill midterm and long term power demand. Vertically integrated utilities are believed to be natural monopolies and inherently inefficient. Electricity utilities are being restructured around the world and it is a proven best practice. Since NEA alone can't go in the other direction, we are not disfavoring the unbundling. However, we prefer authorities to take decisions and initiate activities of unbundling with vigorous discussion and consultation, keeping NEA at center because there are many issues like asset management, staff management, operational management, etc. associated with it which can't be ignored for successful unbundling of NEA.

From our perspective, it appears that Nepali hydro development has been hindered by institutional incongruities, policy instability and a lack of coordination among the major stakeholders'. What are your experiences so far?

Coordinated approach among the stakeholders is the most important for the success of any plan or development activities since it saves time and resources, ensures partners to be working together, avoids possible overlaps, gives way to the success and reinforces the benefits. Major stakeholders for the electricity development in the country are MoEn, DoED, WECS, ETFCS, MoFSC, MoPE, NPC, AEPC and, of course, concerned Administrative Offices. There are already well-defined rules and regulations and each stakeholder has its own distinct roles and responsibilities for the certain activities which come under the process of development of hydropower, transmission line, substations, etc. Nevertheless, it has been felt that *there was a lack of appropriate coordination between the stakeholders causing waste of time,* resources, money and sometime leading a project towards failure.

We are very hopeful to the action plans forwarded by the government for NECREDD, where some of the procedures related to the environmental study, land acquisition and forest clearances have been revised and eased to the acceptable extent. Further, certain committees are envisaged to coordinate with different stakeholders at different levels. Obviously, it will relieve the hydropower and electricity infrastructure developers, and encourage the new investors to participate in the electricity development of the country.

What are your experiences in dealing with trade unions in NEA?

At NEA, we have five different active trade unions. I have observed that all five trade unions are striving for betterment of the organization and well-being of the employees. Furthermore, they have understood the position and the goal of the organization. These trade unions are very communicative and have become very helpful to solve some of the organizational issues. Relevant issues raised by the trade unions have awakened the management to plan and adopt appropriate measures. It does not mean that we never have any problems with the trade unions, but, so far, we have been able to resolve the raised issues by mutual discussions. Actually, both the management and trade unions have similar views regarding the advancement of NEA. So far I have not experienced any difficulties with the trade unions, Indeed it also depends on the way you adopt the ways, deal the issues and tackle with the trade unions.

What is your assessment on quality of Nepal's Engineering Colleges and their products:

At present, most of our technical resources (engineers and technicians of different disciplines) are educated from engineering colleges in Nepal. They all are efficient and have good theoretical knowledge and skills. However, they have some insufficiency in field works. We regularly organize different training courses for engineers and technicians in our Training Centre at Bhaktapur to improve their practical skills. With the needs and requirement of the organizations, members of engineers are also trained in overseas countries. It will be more beneficial if the engineering colleges include more practical classes in their curriculum. In brief, I am happy with the quality of the Engineering college products in general.

Lastly, would you like to convey any final message to the readers of HYDRO Nepal?

Action Plan regarding National Energy Crisis Reduction and Power Development Decade (NECRPDD) has paved way for making the country independent on electric energy by developing hydropower and other renewable energy resources. The nation's goal of eliminating load shedding and generating 10000 MW power in next 10 years has given huge responsibilities to NEA. In this regard, NEA's contributions are not limited to the development of the hydropower projects of its share. Rather, it has to focus more on construction and operation of required transmission lines, sub-stations, building stable system, efficient and reliable distribution of energy to the valued customers through construction of standard distribution lines.

We are capable, sincere, and serious for these challenges. Despite having different concerns and issues within and outside the organizations, I believe that we are capable to fight and resolve all the glitches so as to attain the desired goal and take the NEA to a new height. If everything goes well in a planned way, I anticipate a bright future for Nepal from perspectives of hydropower development and NEA can play a pivotal role as a leading participant in this sector.

- -