

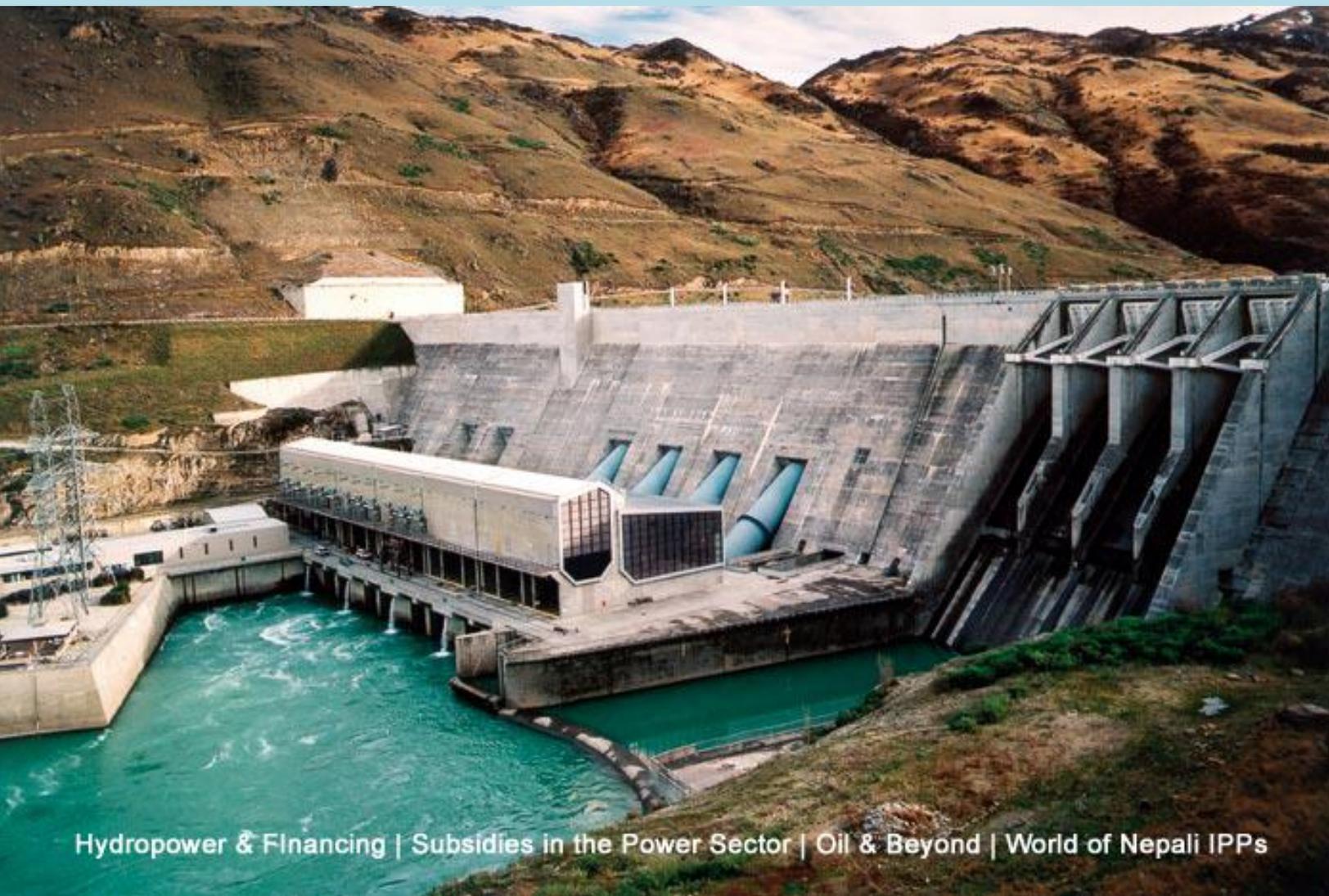


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Hydropower Development in Nepal

SUMMARY REPORTS



Perceptions and Reality

An Analysis on Hydropower Financing in Nepal

Nepal is said to have one of the highest hydropower potentials in the world, however at the same time it continues to suffer from energy crises with over eighteen hours of load shedding every day during the dry seasons. Financial resources and management capacities of the government continue to remain underdeveloped. Considering that the country's GDP is lower than the estimated costs for the envisaged hydropower development, the government is in no position to focus only on hydropower as there are still other key areas that need to be addressed, such as health and education. The Government of Nepal (GoN) has been steadily increasing the budget allocated for the energy sector with the budget almost doubling over the past four years; the allocated budget however continues to remain severely underutilized.

While the Government's shortcomings partly contribute towards the country's inability to harness its hydropower potential, one of the key factors is also its underdeveloped financial system. Growth in the finance sector in Nepal until the 1980s was minimal due to the lack of proper financial systems; however liberalization and major structural changes resulted in the involvement of the private sector, and subsequent development of the financial sector. The entry of the private sector in the financial market helped in the efficient mobilization of local resources, and boosted the financing capacities of Banking and Financial Institutions (BFIs). Additionally the introduction of the Build, Own, Operate, Transfer (BOOT) framework acted as greater incentive for the involvement of the private sector.

Nonetheless, the Nepali financial market as a whole continues to remain underdeveloped and lacking in terms of its capacity to meet large scale investment demands which acts as a major bottleneck for hydropower development. This study aims to understand the hydropower sector in congruence with financing for hydropower development. It delves into the financing capacities off the Nepali financial market, as well as foreign direct investment, and legal provisions for investment in the hydropower sector.

Incline in hydropower financing; however not sufficient to meet goals

A review of the financial market over five years indicates that there has been a steady incline in capital, credit and deposit over the years. Data from the NRB indicates that a total credit of NPR 21.38 billion (USD 213 million) was extended to the energy sector as a whole for the FY 2013/14, with NPR 17.35 billion (USD 173 million) being extended to the hydropower sector. However taking into consideration the Hydropower Development Plan and its budget of NPR 3.3 trillion (USD 33.61 billion) over a period of 20 years, a yearly budget of at least NPR 165 billion (USD 1.68 billion) will be required for the development of 25,000 MW of hydroelectricity within 20 years.

It therefore seems unlikely that domestic finances will be enough for development of the hydropower sector as per the Hydropower Development Plan. While the domestic financial market is still underdeveloped in terms of meeting the needs of

large scale hydropower development projects, it is still able to develop relatively smaller projects. The private sector realizing this is working to develop such micro hydro projects to meet domestic demand. According to the Independent Power Producer Association Nepal (IPPAN), as of 2010, BFIs have invested in about 25 hydro projects, totaling NPR 55 billion (USD 550 million). However, while BFIs have emerged as a key financing intermediary, the absence of adequate project financing models means that domestic BFIs often seek additional collateral for the security of their investments, therefore limiting the number of projects funded.

Constraints towards hydropower financing

There are various factors that act as bottlenecks and constrain financing for the hydropower sector. Some of the key constraints are:

- Hydropower projects are generally highly capital intensive and have longer gestation periods as well as repayment periods. BFIs are therefore often less interested in such long term infrastructure projects as their deposits are of short term nature.
- Weak project financing among BFIs due to it being a relatively new concept. BFIs therefore prefer short term loans based on securities.
- Limited experience and lack of in-house expertise to conduct due diligence of hydropower projects often result in BFIs only looking at the financial aspects in hydropower financing. Reliance on external consultants also results in inadequate due diligence and therefore higher risk in decision making.
- Lengthy decision making process resulting from the involvement of various ministries, departments and government authorities in granting approvals and licenses at different

stages of development also act as bottlenecks for the hydropower project.

- The various regulatory compliances for BFIs on hydropower financing such as the regulatory cap on a single corporate obligor of 50% of the core fund, sector exposure limits and provisioning of 100% for non-performing loans and advances also deter BFIs from providing non-recourse or project financing to hydropower projects.
- Weak financial viability or project feasibility of hydropower projects arising from poor Power Purchase Agreement (PPA) rates also result in lower involvement of BFIs.

Legal provisions to boost hydropower financing

Various legal provisions have been introduced for hydropower financing such as the Hydropower Development Policy-1992, Hydro Power Policy-2001, and NRB's Unified Directives. Key provisions that might directly or indirectly affect BFI financing towards the hydropower sector have been listed below:

- Directive to increase exposure limit of BFIs to 50% of core capital fund for hydropower projects.
- Directives to BFIs to increase lending to productive sectors which also constitute energy (hydropower and renewable energy) by 20% of their total loan portfolio by mid-July 2015.
- Special concession for restructuring and rescheduling of hydropower loans, provided BFIs can provision for 1% before rescheduling or restructuring loans for hydropower projects.

The aforementioned provisions are hoped to encourage BFIs towards increasing their lending in the hydropower sector.

Increased role of capital market in hydropower financing

While the Nepali capital market is still at its nascent stage there is a growing interest, with IPO subscriptions generally being oversubscribed. There has been an increased role of capital markets in the hydropower sector with companies raising finances through IPOs. The overwhelming response has resulted in hydropower companies collecting a total of NPR 53.6 billion (USD 536 million) from the primary market, with the IPOs generally oversubscribed by almost 100%. This therefore demonstrates the general mindset of investors and their confidence in the hydropower sector.

Way forward

In conclusion, while BFIs have the capacity to finance medium to small scale hydro projects; the Nepali financial market lacks the depth to finance large scale hydro projects. Additionally the participation of BFIs in the hydropower sector has not been encouraging due to various bottlenecks identified above. Listed below are some recommendations to improve the investment climate for hydropower financing.

- **Role of Government:** A supportive legal and institutional framework needs to be developed to attract private investment in hydropower. Similarly bottlenecks such as bureaucratic delays and lengthy decision-making processes need to be resolved, and tax incentives introduced for investments in the hydropower sector.
- **Nepal Electricity Authority:** Existing power tariff structures for electricity needs to be revisited with adequate rate of returns for investors. Unbundling of the utility also needs to take place so that there is a distinct electricity - Distribution, Transmission and Generation companies, with NEA focus primarily on transmission.
- **Private Investors:** Local stakeholders and project developers should be trained in project management and business skills as they are often less aware about various aspects of hydro projects and their implications.
- **Nepal Rastra Bank:** Provisioning requirement for hydropower financing needs to be further relaxed. The current consolidation drive to merge BFIs should be continued as it creates a larger capital base and enhances capacity to finance large and capital intensive infrastructure projects.
- **BFIs:** BFIs need to improve capacity and work on enhancing efficiency in managing longer term deposits which could be effectively channelized for infrastructure financing. Internal project appraisal systems need to be developed to conduct adequate due diligence for hydropower projects. Instruments such as credit derivatives should be introduced with support from NRB to encourage higher lending to hydropower projects.
- **Power Trading:** Deregulation of NEA should be considered for efficient and transparent power trading.

Oil and Beyond

An Analysis of the Petroleum Sector in Nepal

Nepal has one of the lowest energy consumption patterns in the world, a reflection of the slow pace of development within the country. Currently, the fuel requirement of the country is largely met through traditional sources; primarily fuel wood, with petroleum products meeting only 9.9% of the country's fuel requirements. Dependence on both these sources is worrisome for Nepal since the former is a depleting form of energy while the latter increases the import bill for Nepal as a result of having no natural oil resources of its own. The scope for growth in demand for other alternate sources such as hydroelectricity and other renewable products is therefore extremely high. Additionally, keeping in mind the need for increased conservation and preservation of forests, this switch over is deemed desirable.

Currently, the operational framework of the petroleum sector in Nepal is dominated by monopolistic structures. Starting with the source, the Memorandum of Understanding (MoU) signed in 1974 between IOC and NOC establishes IOC's complete monopoly in the Nepali market. NOC has a monopoly in the wholesale market and controls downstream business as the sole distributor. Petroleum transactions in downstream businesses are conducted as per the regulations and internal decisions of NOC. Thereafter, distribution of petroleum products is controlled by a cartel, leveraged by Nepal Petroleum Dealers' National Association (NPDNA). Although the distributors are appointed dealers who sell the products in the retail market, the dealers association determines profit margins for

petroleum products, with some known to adulterate the fuel with cheaper oils to increase profits.

The aforementioned state of the petroleum sector is putting a downward pressure on the economy on account of increase in imports and creation of an anti competitive environment. The consumption of petroleum products has been increasing every year. In fiscal year 2012-13, imports of petroleum products increased by 7.8% to reach 1.08 million KL. Petroleum products account for USD 1.07 billion or 19.14% of total imports made by Nepal. Of the petroleum products, diesel accounts for the highest share at 56% due to load shedding, followed by petrol at 17% and LPG at 16%. This is a major reason behind the increasing import bill over the years. The monopoly in this sector has resulted in the proliferation of an anti competitive environment which creates unnecessary barriers in terms of efficiency and makes the sector difficult to function and operate in. Issues arising out of these developments are discussed below.

Import related

- Restriction on imports from sources other than IOC hinders liberalization of and competition in the import of petroleum products.
- IOC currently owes around NPR 1.12 billion (USD 11.2 million) in customs duty refund to NOC, and NOC is estimated to receive around NPR 800 million (USD 8million) in duty refund annually. However, NOC is unable to recover the refund of customs duty due to lack of negotiation power.

Oil and Beyond: An Analysis of the Petroleum Sector in Nepal

- India has been unwilling to alter the MoU between IOC and NOC, especially NOC's request to end IOC's monopoly in import of petroleum products. As a result, policy initiatives regarding privatization would not be successful unless the terms of the MoU are altered.

NOC related

- Inefficient management owing to management lapse has resulted in NOC not addressing key issues such as overstaffing and cost cutting. Pressure on the management from the Board and political parties has also led to inefficiency.
- Labor unions often engage in anti competitive practices such as halting supply when officials are arrested, or backing up decisions to distribute bonus while incurring heavy losses. Restricting supply of essential goods is used as a means of bargaining.
- Lack of internal control systems to take stringent actions against unhealthy practice such as adulteration of fuel.
- NOC does not make adjustments to price based on international prices, which have led to involuntary subsidization of diesel and LPG, which is sold below market prices. Moreover, the imports and consumption of diesel and LPG are enormous as compared to other fuels; one of the major reasons for the high mounting loss of the NOC. Without price adjustments, NOC's losses will continue to mount.

Dealers related

- Supply and distribution of petroleum products are controlled by dealers' cartel and transportation cartel as they engage in collective price fixing, restrict entry of other

players and control supply based on their will rather than the demand.

- While the decision of the Government to allow dealers to fix their own profits was thought to promote healthy competition, it has resulted in collective price fixing which has increased the cost components of retail pricing.
- Dealer associations' protest against many government moves to liberalize primarily to safeguard their investments and commissions, restrict new entry and to avoid privatization since dealers would not be able to bear the subsidy burden thereafter.

GoN related

- Any reforms in price adjustments (price hikes) are refuted by politically affiliated student unions in the form of Nepal *bandhs* or protests on the streets, leaving NOC with little control over price determination. Additionally, the Board being appointed politically also leads to political interference in operations.
- NOC has to bear the subsidy provided to its customers since the Government does not compensate NOC directly for it. As a result, the losses are mounting.
- Additionally, the subsidy is inefficient in targeting the right group as it is used by all strata of society.

Overarching issues

- An inefficient market chain has led to adulteration and theft, resulting in increased financial burden for customers.

Given the aforementioned issues in the petroleum sector in Nepal, various future courses of action have therefore been identified in the report to improve efficiency levels in the petroleum sector. Recommendations are as follows.

Way Forward

- Removal of monopoly at different stages starting from altering the MoU between IOC and NOC in order to start exploring other markets for sourcing of fuel. Also, syndicate system of dealers and transporters should be scrapped and pricing cartels abolished. A clear cut policy of appointing dealers and transporters should be set in place along with strict monitoring and evaluation.
- Development of alternative energy sources such as hydropower, natural gas, solar power, etc. Considering this future switch to alternative sources of energy, it is high time that the private sector also tap into this growth potential by avoiding the present interruptions and disturbances in supply chain, and participate in the business along with the public sector.
- Strengthening of regulatory mechanisms is a must for the petroleum sector. A strong sectoral policy should be formulated, an autonomous and authoritative pricing and regulatory body set up, and inclusion of private players into this sector made. An effective implementation of the competition- and consumer right-related laws is also vital to ensure fair and competitive market environment in the petroleum sector.
- In order to absorb the fluctuation in profits as a result of volatile international prices in the market, NOC can adopt a mechanism whereby they can set aside a certain proportion of profits year wise and create a loss equalization fund.

The World of Nepali IPPs

An Analysis of Independent Power Producers in Nepal

Nepal is said to have one of the highest hydropower potentials in the world with an electricity generation capacity of 83,000 MW of which 42,000 MW is said to be economically feasible. While these resources could be developed to transmit large scale benefits for the country, only 712.63 MW; which constitutes less than 1.70% of the economically feasible capacity, has been harnessed. Additionally hydropower comprises of only 2% of the total energy consumed within the country despite the various hydropower projects under development.

Hydropower projects in Nepal are generally undertaken through Nepal Electricity Authority (NEA), Independent Power Producers (IPPS), or micro hydro projects wherein the private sector and local communities work towards generating electricity. NEA is a major player in the electricity sector with 65% of hydropower projects in operation being owned by it. IPPs on the other hand constituting primarily of private players own approximately 35% of hydropower projects in operation.

The problem therefore lies behind the country's inability to fully take advantage of its hydropower potential and develop fully functioning hydropower projects. This primarily stems from a business atmosphere fraught with bottlenecks and political instability which therefore fails to inspire confidence among investors - public and private. This inability to facilitate substantial investments in the hydropower sector has subsequently led to significant negative impacts on the economic

development of the country. Additionally, focus primarily on seeking foreign aid and grants, rather than developing projects via private and foreign investments has also significantly contributed towards the slow pace of growth. Lessons learned from the Khimti and Bhotekoshi Power Projects also indicate how private power development is being discouraged through adoption of non-financeable policies to protect the government owned and controlled utilities.

Some of the main reasons behind the country's inability to adequately take advantage of its hydropower potential report have been identified below.

- Most projects promoted by NEA fall behind schedule, and therefore incur losses in billions. While demand is slated to increase over the next few years, development of hydropower projects continue to be fraught by delays.
- There is a high dependence on electricity generated through Run of the River (RoR) projects, due to which there is a significant gap in the demand and supply of electricity in the dry seasons.
- The inability of NEA to meet the annual peak demand for electricity has resulted in additional imports from India, further increasing the trade deficit.
- NEA projections of increase in demand are based on current demand which is centered on load shedding. Projected future demand is therefore restricted due to load shedding and

will therefore be significantly higher on availability of electricity.

- Energy demands are currently met primarily through traditional sources; firewood or petroleum products, energy substitution with electricity could therefore result in further increases in demand. Future economic development also warrants further increases in per capita consumption of electricity. There is however no studies to identify this latent demand for electricity, which must be taken into consideration to adequately identify future demand and supply.
- While Nepal has high hydropower potential, it is also one of the lowest per capita energy consumers in the world. The energy crisis during the dry seasons in particular has had negative effects on industries, particularly manufacturing.

There is no certainty and security for investors in the energy sector in Nepal, which would otherwise have led to projects being executed on time, and wherein the contribution of IPPs to the national grid would have surpassed that of NEA by now. Some issues that have resulted in the poor participation of IPPs or caused hindrances towards the development of the sector are listed below.

Nepal Electricity Authority

As the NEA is the sole buyer of electricity in the Nepali market it holds a monopoly over power producers, additionally it is also involved in hydropower development. While NEA is fraught with in-house inefficiencies and limited financial capacities, therefore resulting in projects being delayed and incurring high cost over runs, it still manages to reserve the good projects for itself. NEA also has long term financing sources at interest rates lower than the market as it has access to soft loans from the government and its

subsidiaries. This therefore acts as an uneven playground for IPPs.

Operational inefficiencies and prices being administered by the Electricity Tariff Fixation Commission (ETFC) also means that the NEA has been unable to transfer its costs to its buyers. NEA therefore does not have stable financial health and lacks credit worthiness. IPPs therefore have to take into consideration NEA's ability to make future payments when considering entering the hydropower market.

Lastly NEA has stopped signing additional Power Purchase Agreements (PPAs) for projects with an installed capacity above 25MW. The absence of other private distributors of electricity in Nepal therefore means that investments in hydropower projects are stuck for the next 5-7 years until the NEA may potentially sign new PPAs.

Domestic Investment

Domestic investment in hydropower is difficult to come by as the government lacks the capacity as well as capability to invest in the hydropower sector. Banks and Financial Institutions (BFIs) in Nepal are also underdeveloped and lack the managerial capacity to implement such huge projects. Additionally as investment in hydropower projects is highly technical and risky compared to other sectors, despite growing interest, participation of Nepali BFIs has not been encouraging.

Project financing is also a relatively new concept in a market still working under collaterals and personal guarantee backed financing. Generally longer gestation and repayment periods for hydropower projects further means that BFIs often show hesitancy in financing such long term projects.

Foreign Direct Investment

While FDI is essential for hydropower development, there are various issues that have emerged such as the failure to arrive at a common denomination of currency for PPAs. This in addition to the absence of Project Development Agreements (PDA) between the government and power producers, results in IPPs being exposed to various risks, which therefore acts as a key deterrent to FDI in hydropower projects. Additionally while contribution of IPPs is key to hydropower development in Nepal, FDI to this sector has been discouraged due to unnecessary and baseless allegations.

Others

There are various other risks other than those identified above, such as construction risks, insurance risks, political, legal and regulatory risks, lack of an internationally accredited credit rating system in Nepal, involvement of multiple entities in the development of hydropower projects rather than a single one, all of which often leads to difficulties in coordination and increases overall time and costs involved. To unleash the country's potential in hydropower, concerted efforts of multiple stakeholders is required with the role of the private sector, international donors, government and local communities better identified.

With government finances proving to be inadequate in developing the hydropower sector, private and foreign investments are essential for overall development of the sector. While there have been various issues in bringing in foreign investments, adequate support from the government will help in inspiring confidence among private and foreign investors. Hydropower development can therefore positively impact the

country's economy and its balance of payments position.

To ensure energy security through hydropower, certain recommendations have been listed below to facilitate investment in the hydropower sector.

- **Restructuring of NEA** as NEA activities currently includes generation, transmission and trading and distribution of electricity. Weak management and inadequate resources has spawned inefficiency resulting in low quality of services. NEA needs to be restructured to focus primarily on the distribution business, and create a favorable environment for private sector involvement in hydroelectricity.
- **Establishment of a regulatory body** for more active regulation of the hydropower sector.
- **Revisit demand forecast** which is likely to increase based on the ease of obtaining a connection and subsequent energy substitution from LPG and firewood to electricity. Other factors such as upgrading from a two-phase to a three-phase electrical power distribution system, and urbanization with increased usage of electrical appliances, should also be taken into consideration.
- **Open market to the private sector** in generation, distribution and transmission of power to not only encourage private sector investments but also create a level playing field.
- **Transparency in NEA** particularly in licensing is a must as most licenses for projects are held by individuals or institutions that do not have the technical or financial capacities to implement hydropower projects.

- **Project Development Agreements** is essential to inspire confidence among foreign investments, and without which various projects will not be successful.
- **Tariff Rates** need to be relooked at as various hydropower projects have postponed investment plans due to unattractive tariff structures.
- **High voltage transmission lines** need to be developed to keep pace with power generation.
- **Dollar based PPAs** need to be developed to attract large scale investments, with a clear policy on determining the rate and denominations for greater operational clarity.
- **Hedge risks** through dollar based revenue models to hedge against volatility in USD, and local currency bonds should be issued by multilateral agencies to mitigate foreign exchange fluctuations risks.
- **Inclusion of USD and NPR components in PPA** while ensuring free flow of foreign investment will at the same time help in mitigating foreign exchange risk.

Nepali World of Subsidies

Understanding Subsidies in the Power Sector in Nepal

Energy sources in Nepal comprise primarily of traditional sources with commercial sources prevalent among urban population, of which LPG is the most widely used source of energy. With Nepal lacking in petroleum resources of its own, it relies solely on imports from the Indian Oil Corporation (IOC) to meet the ever increasing demand for petroleum products within the country. With alternative sources of energy such as hydropower still severely underdeveloped, import is particularly essential to meet the energy demands of the nation which thereby creates a negative impact on the trade balance of the country.

The petroleum and electricity sector in Nepal functions in such a way that the pricing system isn't optimal for the state monopolies. The retail price for petroleum products includes the import cost (determined by IOC) with the addition of custom duties, costs of transportation, profit margins and other applicable taxes. Meanwhile with the NPR pegged to the INR the Nepali market is inevitably affected by forces affecting the Indian market. Under the current pricing system, the prices of petroleum products are heavily regulated by the Government; consequently miniscule profits are made only through petrol and kerosene, and heavy losses made on LPG and diesel.

Electricity, on the other hand, has different power purchase rates for the dry and wet seasons; with the rate almost doubling during the dry seasons. With most hydropower projects being run of the river projects, the gap between demand and supply

is at its peak during the dry seasons, due to which a big share of electricity has to be imported from India to meet demand. The selling price for electricity is generally set by the Electricity Tariff Fixation Committee (ETFC), which takes into consideration various factors such as units of consumption, electricity voltage and sectors of electricity consumption. While NEA which is the sole purchaser and distributor of electricity and buys electricity at seasonal prices, the prices for the end consumers more or less remain the same.

The prevalent pricing system in Nepal has significant impacts on the state monopolies as well as the economy. Some of these impacts are listed below.

- Since NOC is not reimbursed by the Government for the losses incurred on petroleum products, NOC subsequently bears the subsidized amount, thereby **providing an involuntary subsidy on the products on which it incurs losses.**
- Both energy **institutions have been incurring losses on account of the pricing system**; while NOC has been making losses due to the regulation of prices by the GoN, NEA on the other hand has been making losses due to inefficiency in pricing, and the inability of the ETFC to fix prices that can recoup operating costs. Additionally price escalations in Power Purchase Agreements (PPAs), increase in crude oil prices in the international market, and the devaluation of the INR; and subsequently the NPR against

the USD, only adds to the mounting losses of the state monopolies.

- Increased demand for energy means that more and more electricity and petroleum products have to be imported. This coupled with increased price negatively impacts the trade balance.

Faced with deteriorating financial health and ballooning losses, the GoN has had to **substantially increase its loan provisioning as a form of indirect subsidy** to these two state owned monopolies. The key issue in the energy sector arises from an increased demand for energy stemming from urbanization and population pressures, resulting in increased imports which further widen the negative gaps in trade balances. This has left both institutions in a permanent cycle of loss and inability to make profits. Subsidies therefore have to be provided by the GoN and donor agencies to ease the financial burden on these institutions and ensure regular supply.

Apart from the involuntary subsidy provided by NOC and the indirect subsidy provided by the Government, direct subsidies have been recently introduced for the renewable energy sector under the Subsidy Policy for Renewable Energy 2069 BS (2012 AD) to support the development of micro and pico hydropower projects. Other than this, no direct subsidies exist. These subsidies are generally provided to producers by the government or donor agencies to ease financial burdens in production or operational processes in the form of grants, loans and concessions. While indirect subsidies by the government have been focused on the petroleum sector, subsidies from donor agencies are more focused on the hydroelectricity generation sector.

While there are no provisions for pre-tax subsidies for the energy sector in Nepal, given the price regulation by the GoN on the sale of petroleum products, consumers are recipients to an involuntary subsidy, of which NOC generally bears the cost. The post-tax subsidy in Nepal for petroleum products however is generally lower than that in other countries. This is due to the negligible negative ramifications to the environment, as most of the petroleum products are imported and processing and refining of crude oil takes place elsewhere.

Given the increased dependence on petroleum products, scaling up of energy generating capacities through investment in the sector is essential particularly during the dry seasons which is when Nepal faces its most severe energy crisis. Currently, the key recipients of government investment have been NEA and the Alternative Energy Promotion (AEP) for renewable energy. A total of NPR 1.09 billion was allocated for investments in the energy in the FY 2068-69.

However, a comparison of government investments and indirect subsidies indicate that subsidies are far greater than investments, with investments comprising only 2%-6% of the subsidies within the last six fiscal years. This is indicative of the precarious situation of the country's energy sector, wherein the government is more reactive in its efforts, rather than being proactive and investing towards development of the energy sector. Meanwhile a comparison of government investments with donor contributions in the forms of loans and grants indicates that donor investments and contributions are still significantly higher than that of government investments, but still substantially lower than government subsidies.

As identified above, the current energy scenario of the country is such wherein a majority of the energy has to be imported to meet demand. While the government has made energy subsidies an important budgetary component, this has proven to be ineffective in terms of providing pro-poor subsidies as the existing subsidy policies do not differentiate between income-levels of subsidy recipients. The low-income households that are generally targeted by these subsidies are often not the actual recipients, with the subsidies often taken advantage of for commercial purposes.

Some recommendations are provided below focusing on shifting towards an alternative (renewable) energy sector, increased levels of community participation, and prospects of developing pro-poor subsidies in potential energy sectors.

- **Extra electricity generation:** There is vast potential for extra electricity generation in Nepal. Governmental focus on investing in this area rather than using it in the form of soft loans to the NOC and NEA will be more fruitful in the long run.
- **Switch to electricity:** Statistics indicate that a majority of the population either use traditional sources of energy or petroleum products as a source of energy. Switching to electricity will therefore help in reducing the country's dependence on petroleum products, thereby facilitating the reduction

in the country's BOP deficit, of which petroleum imports is a key component. However, this is contingent on the country successfully generating extra electricity to meet this latent demand.

- **Remove barriers to switch:** The barriers to switch from petroleum products to electricity is greater for producers rather than consumers, investment therefore needs to be made in scaling up electricity generation plants, and transmission and distribution lines.
- **Pro-Poor subsidies:** While energy subsidies impose substantial fiscal and economic costs particularly for developing countries, pro-poor subsidies are likely to be more successful if they are embedded within a broader reform agenda. For instance, a system of cash subsidies directly aimed at the poor through the distribution of cash coupons to low-income households will directly benefit the poor, as in India.
- **Cross subsidization:** This is another successful mechanism to provide pro-poor subsidies. For instance, the recently introduced NOC system of using color-coded LPG cylinders—red for domestic use and blue for commercial purposes—is an effective example of ending subsidies towards commercial users and utilizing the profit earned towards providing subsidies to households which is the targeted group.