

Report on

Catalysing Rapid Hydropower Development in Nepal: Understanding Underlying Constraints and Engaging Reform Constituencies

niti FOUNDATION
funding policy engagement


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BACKGROUND

Rapid hydropower development can contribute to the growth of industry and commerce, and significantly enhance the prospects of political and economic stability in Nepal. But the question is: *why has this not happened? And what should be done to make it happen?*

Nepal is currently in the grip of chronic electricity shortage. However, while severe, it certainly is not the first time this has happened. In what has been called a “flood-drought” syndrome since the 1970s, load shedding has inevitably followed a few years of surplus that resulted from the completion of a single big (for the Nepali system) hydropower project by government- and donor-led initiatives that saw no space for either the private sector or the community and consumer voices. This chronic four-decade long pathology of fatalism suggests deeper problems that will only temporarily be assuaged but not solved by merely insisting on fast-track hydropower construction at the generation end. There are critical issues that need to be addressed in the transmission and distribution side of the business (the technical aspects) as well as in the hitherto mostly ignored economic investment, institutional, legal and political aspects of the sector.

This exercise hoped to engage with a range of stakeholders to examine afresh the deeper underlying causes behind the malaise and to identify points of leverage and constructive engagement between different actors in the sector. A number of constraints, including rent seeking, security threats, red tape, political instability, regulatory impediments, excessive trade-unionism and an ineffective framework for Power Purchase Agreements (PPA from generators) as well as Power Sales Agreement (PSA retail tariff to consumers), are holding up required reforms and consequently the needed investments. While a number of efforts to reform the institutional and regulatory framework have been attempted before, the approaches have been technical rather than political. A careful mapping of exactly which constraints form the core impediments, who benefits from maintaining the constraints, how are rents realised in the system and what kind of political alliances are required to remove the constraints has never been hitherto attempted.

In this context, Niti Foundation, with the support from The Asia Foundation, carried out a study to understand and map the structural constraints in order to support rapid hydropower development in Nepal and the institutional reforms required for it. This report summarizes the overall context of hydropower development, the concerns of stakeholders and the outlines of a broad framework for policy reform.

Lessons of History

As the Integrated Nepal Power System (INPS) endures hitherto unprecedented power crisis, her domestic consumers as well as industry, commerce, electric transport and irrigation currently have to put up with 14 hours of power cuts that are slated to go up to 16, 18 or even 22 hours in the months and years ahead. Official pronouncements, as well as the lack of

credible plans, indicate that the situation could continue for five or more years at the current state of absent planning and search for alternative ways of doing business in the sector. The following section will recap these hamstringing factors before describing some major policy innovations of the last few decades in the electricity sector. It is after appreciating these lessons of history that this report will describe the approach and results of the constructive engagement that this policy exercise was about before making concluding recommendations.

Hamstringing Factors

For clarity's sake, the analysis of the factors mostly of geophysical or historical nature that have placed constraints on hydropower development can be divided into the following two main categories with their sub-categories. It must, however, be kept in mind that they are interlinked in complex patterns and decisions in one area influence, and are influenced by, happenings in others. These complexities give rise to different perceptions among the myriad stakeholders of the consequences of intervention into the river regimes; hence they also constitute the roots of much of the conflicts in water power development and its management.

A. Natural: Harnessing water resources on the southern face of the Nepal Himalaya is hydrogeologically a very different proposition from that in other parts of the world. Given the active nature of Himalayan plate tectonics, the uneven seasonal distribution of precipitation as well as the intensity of cloudbursts, the basic hydropower equation that factors in the topographic hydraulic head times average river discharge to estimate the power potential proves to be misleading and not quite the cornucopia it promised to be.

1. *Seismicity:* The larger and more expensive the dam, the greater the need to provide for high seismicity events. This makes the dam even more expensive in the Himalaya than in geologically stable Europe or North America, which the weak economies of Nepal and India (weak from the long-term perspective – the time-scale of dam building of 10 to 15 years minimum – and consumer purchasing power) would find difficult to sustain.
2. *Sedimentation:* The only real-time data of the impact of Himalayan cloudbursts on fragile Himalayan geology in Nepal is from the July 1993 cloudburst and the loss of dead storage life of the Kulekhani-1 storage reservoir. Sedimentation is seen to be 17 times higher on average than the best international estimates and 120 times larger for specific cloudburst events. Dam design methodologies have not been re-thought to handle this level of mass movement.
3. *River Hydrology:* Since snowmelt contributes on an average only about 4% of the average flow of the Ganga, it is groundwater recharge that sustains the river flow in the dry season. Depending upon the nature of the previous monsoon and the winter rains, the flow of the rivers in the dry season can be as low as a thousand times from that of the monsoon/immediate post-monsoon flows. This has a corresponding impact on the powerhouse size that is economic to design. Neither Nepal nor India price their electricity for seasonal or even daily peaking purposes, nor do they split the cost of development of a dam between different benefits such as irrigation and flood control.

This loading of all development cost onto the hydropower sector often overprices the electricity and reduces the financial benefits to accrue from it. So, while it is eminently justifiable economically to have seasonal storage and daily pondage, it makes no financial sense for the investor to do so.

4. *Reservoir Inundation*: Himalayan valleys that would be submerged permanently by reservoirs are in most cases the only fertile agricultural areas for the region and the people therein. What their permanent loss has upon the livelihoods dependent upon them is critical and have been dealt with most insensitively to date by official projects advocating these technologies. This aspect is not as serious for purely run-of-river projects in areas higher than the middle hills in the High Himal areas which rely on high heads for power and do not have serious inundation issues associated with them. However, the Integrated Nepal Power System has dire need for a medium-sized storage-type hydropower project (of the range of 200-300 MW at least) to boost the seasonal peaking capacity of 92 MW that is available from Kulekhani I&II. Developing this seasonal hydro capacity, which would make small private sector run-of-river projects more feasible as the grid could buy currently wasted flood energy from them to boost reservoir filling, would have serious resettlement, water rights and cost allocation issues associated with them that needs serious government policy reform measures in many areas.

B. Domestic Socio-Politics: Dam-building, especially at the bigger scale, is an enterprise that produces multiple goods and services from stored and regulated waters. Hydropower is but one important benefit, together with irrigation, water supply, flood control, navigation, fisheries, tourism etc. Each of these benefits has a different social carrier with different risk perceptions and values that come into conflict with each other. Nepal has not been able to devise, in the last half century, an institutional mechanism capable of mediating multipurpose water resource development. The one mechanism that could, the Water and Energy Commission, has been politically crippled by different governments since the mid-1980s. Hence the following issues that hamstring development of hydropower have not been addressed properly, whether in terms of policy or in terms of the laws and regulations that need reform if the crippling power shortages are to be done away with.

1. *Tariff*: The retail rates as well as the power purchase rates for electricity have not been revised for about a decade. The mechanism devised by the 1992 Act – the Tariff Fixation Committee, as well as the Department of Electricity Development (in contravention of the NEA Act) – have been totally dysfunctional. The latter has concentrated on hydropower license giving but not monitoring the implementation. The reasons lie in both political instability and overly populist politics of the streets.
2. *Domestic-Export Disjuncture*: Nepali politics is sharply divided over whether the country's hydropower should be developed for strengthening domestic production or used for export, and no consensus is in sight. The constitutional mechanism for this consensus building (Article 126 of the 1990 constitution and Article 156 of the current interim constitution) has not been properly used for this purpose in the past. While major political parties have advocated the export paradigm while in power

(including the Maoists with their 10,000 MW development announcement, only to be overtaken by the 25,000 MW proposal by the succeeding anti-Maoist coalition), they tend to actively oppose it once the party is out of power, while the grassroots cadres across the political spectrum, who often are the ones to be displaced or otherwise affected, oppose these projects even when their leaders are cabinet members.

3. *Federalism*: While decentralization has always been a burning issue in Nepal's resource management, the current debate on federalism has added an extra layer to hydropower development and overall resource rights. The central hydrocracy, together with their supporting major multilateral donor agencies, has always opposed decentralization in the power sector (e.g. it must be remembered that the nationalization of the sector occurred as part of the donor conditionality for the Marsyangdi loan). It also opposed the recommendations of the World Commission on Dams on the (wrong) grounds that it advocated "prior, informed consent" of the affectees. With Nepal's federalism politics, the challenge has intensified with regional and ethnic activists advocating the application of ILO 169 convention to hydropower development.

Edifying Policy Innovations

These difficulties outlined above are indeed of Himalayan proportion; but attempts have been made to overcome them, albeit in uncoordinated fits and starts as well as serendipitously, in the past. Significant among them were the following policy initiatives.

- A. Formation of WECS: In the early 1980s, a Water and Energy Commission was set up which continues to exist in emaciated form as a bureaucratic "shunting yard". It has secretaries of twelve ministries relevant to water and energy as its members; and the idea behind it is genuine "integrated water and energy resources management" wherein all multi-sectoral and multidisciplinary concerns of water and energy were to be weighed for final governmental decision-making. Its heydays were during the early 1980s when genuine Nepali (official) capacity was built to plan and strategically assess Nepal's options. With the dominance of the Southern riparian concerns since the mid-1990s, it has unfortunately been neglected in policy assessment and formulation. If this body did not exist, it would have to be created anew; and it needs to be brought into solving the current impasse and disjuncture within the sector.
- B. Sharing Benefits: The debates of the 1990s on Arun-3, Tanakpur, Mahakali etc. had the unintended beneficial side effects of slow changes in the Nepali laws, regulations and practices in the water sector, which surprisingly were found to be in better consonance with the recommendations of the World Commission on Dams as a result. The primary example is the devolving of 50% of Nepal government's revenues from hydroelectric dams to local bodies, an equity provision found in few countries in the world. The issue of local benefits from hydropower development thus acquires a new dimension in Nepal that still needs better legal formulation to avoid the kind of disruptive local agitations that have been observed in the past.

- C. Buy-back Rates: In 1997, a courageous water resources minister and deputy prime minister forced the NEA to announce a buy-back rate for the purchase of power from small private producers. This one decision has led to significant capacity building in Nepal, with currently some two dozen Nepali companies capable of building power plants of up to 10 MW capacity each with Nepali expertise and capital within the short time of two to five years.
- D. Communitization of Electricity: A policy change in May 2003 allows for any organized rural group to buy electricity in bulk from the NEA and retail by themselves. The result has been the growth of some 300 community rural electricity groups in Nepal where not only has theft come down to zero due to the institutional double accounting system (as opposed to urban areas in Nepal where leakage and theft have crossed 60%!) but it has led to rural capacity building and entrepreneurship with groups as diverse as Ama Samuha and Forest Users' Groups running their own distribution systems as per their needs and requirements, and making money in the process.
- E. WCD and Nepali Response: The World Commission's Dams and Development report is a landmark exercise in global benchmarking that will determine what kinds of dams are good that can be funded by international players and what are bad dams that cannot be. There was a need to engage with this exercise and examine Nepali laws accordingly. It was done between 2003 and 2005, showing the points where Nepali legislation needs tweaking and reform to meet global standards.
- F. Defining Article 126: Nepal and India will have to learn to cooperate in harnessing the potential of Himalayan rivers, but Nepal has always complained – for the last half century – of receiving a bum deal. To move beyond such an unsatisfactory state of affairs that has paralyzed policy making in this sector, it is imperative that a judicious use be made of the democratic provision of Article 126 (156 in the interim) constitution. The trouble has been the inability of parliaments in the past or the present to set the limits of the three defining adjectives therein of “pervasive, grave and long-term”. This exercise was done in May 2006 but has not been followed through, which it needs to be if a way out of the impasse is to be found.
- G. Opposition to Defective Act: The democratization of the INPS through the communitization of its distribution has had the impact of policy assertiveness from the grassroots. The community electricity users were able to mobilize their representatives from across the political spectrum (Maoists and Jana Morcha, through Nepali Congress and UML to RPP/Janashakti) to table 142 amendments to the “export-oriented” electricity bill tabled first by the Maoist-led and subsequently UML-led governments. These amendments reflect the need to develop Nepal hydropower primarily to meet Nepal's needs, and reflect genuine democracy in action as opposed to policy oligarchy under heavy external influence.

The Goal

In light of these natural and historical constraints within Nepal's hydropower sector, this policy engagement was designed to examine the various constraints to electricity

development as well as the impediments to proper management of the sector. It was also meant to identify who or what could be the leveraging catalyst that could contribute to building a “winning coalition” of interests that could propel the sector forward. It would be tautological to state that this overall situation prevails – as the currently exhibited pathology within the electricity sector indicates – because of a stagnant grip of vested interests. What could be a logic that would appeal to the self-interest of different vested groups that would wean them away from the untenable status quo or from confrontation and towards a new dynamism of constructive engagement? Could such a larger ‘winning coalition’ be envisaged? These are some of the ideas and goals with which this policy engagement exercise began.

Approach Design

This constructive engagement was designed with a few critical assumptions regarding policy and its making.[∇]

The first is that the current woes in the electricity sector represent what is called a “wicked problem”; one that contains within it nested and interlaced layers of other equally intractable problems that make defining “what the problem is” itself very problematic. Yes, there is a shortage of electricity generation, but that in itself is due to a set of other problems, many of them far from technical, that militate against a simple prescription such as “let us build more dams quickly”.

The second relates to the nature of the electric industry, an interconnected network which has the unique feature of being unable to produce its goods without the guarantee of instant consumption. One cannot generate electricity and stock it for future consumption, unlike other products such as say, rice or clothing. The converse corollary of this is that consumption demand that is not met is lost forever and cannot be recouped. In that sense, NEA has permanently lost billions in revenue from unmet demand, which should be brought into the general accounting framework.

The third follows from the second in that the past half century and more of electricity development policy ignored altogether the consumption aspect of the business with consequences that resulted in an overall lame policy. It is necessary to give timely attention to proper size and cost of generation but that alone is not sufficient to make for a healthy sector. Without sufficient attention to the transmission, and more importantly, distribution end of the business, addition of generation only has led to an unhealthy ‘flood-drought’ syndrome with periods of excess generation in the immediate aftermath of the commissioning of a big hydropower plant and loadshedding a few years after. Today it is lack of transmission possibility for evacuation of power produced that has stymied potential Nepali investors from

[∇] The design and study process was led by lead researcher Dipak Gyawali, a hydropower engineer-political economist and a former policy maker himself who introduced community electricity, the largest privatization to date of the BPC, as well as internal unbundling, seasonal tariff and performance accountability within the NEA as its chairman in 2002/03.

pushing ahead with their plans for the construction of new hydropower plants even though they have the money to invest. Similarly, poor distribution networks have not only led to high technical losses but also poor quality of power (low voltage) in the supply areas. What this means is that the institutional reform considerations must give due weight to the concerns of distributors of electricity, and address their problems with the reliability of supply through planning as well as legal means.

The fourth postulation was the Cultural Theory view that policy is about the exercise of power in society (policy options), which is deployed by different social solidarities differently. The most obvious actor is the government and its bureaucratic machinery which exercises power, mainly *coercive power*, through what is called ‘procedural rationality’, i.e. laws, rules, bylaws and regulations embedded in structured and bound hierarchic relationships. The market solidarity, guided as it is by ‘substantive rationality’ exercises *persuasive power* through unstructured and unbounded networks. The ‘ethics community’ which often speaks on behalf of the voiceless, fatalistic consumers exercises *critical power*, i.e. that which comes neither from the perspectives of market efficiency or profit, nor from the legality of procedures, but draws its sustenance from considerations of different values such as justice and equity.

The three primary social solidarities, coming as they do from different premises, see the problem in the prevailing “wickedness” differently, and hence proffer solutions that are, as a result, bound to be very different and even contradictory. As an example, what emerged during the discussions was that, while the developers were riled by a stagnant purchase price of electricity and argued for its increase, the regulatory managers within the NEA were unhappy about that proposal until the retail price was raised commensurately. Without such a raise, the NEA balance sheet would slip even further into the red. Consumer representatives did not sympathize with either of those views and were more concerned about the endless feeding a bottomless pit of malfeasance within the NEA: without commensurate efforts in plugging the leaks and theft as well as reforming the NEA of its wasteful habits (of free electricity to its employees and free vehicles to politicians), merely raising tariff to help the NEA’s balance sheet would be akin to blood transfusion while failing to staunch the hemorrhaging outflow from the wound.

It is with these considerations in mind that the engagement was designed in two phases to understand varied policy prescriptions advocated by different stakeholders:

1. the first phase consisted of three Consultative Dialogues primarily with representatives of the three social solidarities (e.g., consumers, developers and regulators) that were held on 22, 23 and 26 December 2010 consecutively; and
2. the second phase consisted of a Policy Roundtable that took the conclusions of the Consultative Dialogues to senior government policy makers and politicians, which was held on 7th February 2011.

Summary of Engagements

The engagements at both levels brought forth many interlinked issues within the sector from the perspectives of field operatives as well as higher policy makers. While perspectives and emphasis differed, there was general consensus as to what the core issues were. They are summarized below. The details of the discussion papers by the commissioned discussants as well as the comments from the participants, all of which are in Nepali (done deliberately so to encourage more free and frank discussions), are being edited and compiled into a Nepali book. In terms of content, which are still subject to a few more rounds of editing and re-writing, the chapters include some of the deepest insights into the current quagmire behind the overall electricity sector from the standpoint of different stakeholders and the best national experts therein. The book promises to be a valuable addition to the Nepali debate on the path and destination of its hydropower.

Broad Conclusions

The three rounds of Consultative Dialogues were designed to transcend the simplistic view that the current crippling load shedding can easily be rectified only if hydropower stations are built on a fast track basis. There are two reasons why a “fast track” approach is often counterproductive. First, is that the laws of engineering already ensure that properly planned projects move forward as fast as feasible anyway, and no amount of mere wishing can make their bulldozers and other equipment move any faster than their optimal design capacity. Second, if it is red tape that is holding up the rapid development of hydropower projects, those red tapes must be removed for all present and future projects and not just selected ones. Such privileging of particular projects would lead to favoritism and institutional distortions while delaying much needed reforms. As per the saying – “a rising tide lifts all boats” – the purpose of effective policy reform is to make sure that a level playing field must be created for all present and future entrants into this field in a manner that leads to the sector’s healthy development.

The “wicked problem” is chronic and ranges across the sector, not only in generation but also in transmission and distribution plus related ancillary areas such as surveys, policy planning, laws and regulation as well as an understanding of the legacy of history, the structural disjuncture that prevails. The broad conclusions that emerged from the Consultative Dialogues as well as the Policy Roundtable summarized below in terms of emerging policy themes, i.e. themes that constitute a “wicked problem” where deeper engagements are required to unearth “inconvenient truths” that would allow for “unconventional solutions”. It is, after all, conventional wisdom that has bred the complacency and practices which have brought about the current crisis.

Consumer Focus

Dilli Ghimire of the National Association of Community Electricity Users – Nepal (NACEUN) was commissioned to present a user-focused perspective on the current energy

crisis. Ghimire was successful in reminding the gathering that some 60% of the people of the country were under “permanent load shedding” with really no end in sight. Of the fortunate rural consumers who had access to electricity, the primary problem was poor quality of both the supplied electricity (in terms of voltage and outages) as well as institutional service. The current urban-focused institutional setup was inherently unprepared and unwilling to address the issues of concern to the vast majority of Nepalis in the informal economy, where there a lot of resources (money, skills and commitment) are ready for investment. Giving the example of rural consumers who have raised 75 crores that the government has not been able to match as per its 20:80 policy, Ghimire argued that the current arrangement does not allow consumers to become investors and condemns the majority of them to the status of perpetual fatalized buyers of bad quality products.

The main themes that emerged as a consensus in the discussions that followed were the following where serious re-thinking had to begin:

1. tariff restructuring, taking into account not just NEA’s balance sheet but social equity and NEA reform,
2. electricity quality and how to ensure upholding of standards so that consumers were not forced to accept bad quality product that damaged their equipment, and
3. institutional discrepancies that ignore consumer rights and do not make those who hold positions of public trust accountable.

Developer Focus

Dr Subarna Das Shrestha of Sanima Hydropower and Chair of IPPAN was commissioned to prepare a discussion paper from the perspectives of the hydro developers on the current crisis. Highlighting the fact that it was only in the 9th Five Year Plan that real progress was made in hydropower growth, he argued that unstable governments and government policies have brought about the current wholly unnecessary and avoidable load shedding. While it was the introduction of the flat purchase tariff in BS 2055 that led to the flowering of Nepali private developers, failure to revise the rates commensurate with inflation and bank interest rates has subsequently stymied forward momentum on this front. The other main factor had to do with the poor overall health of the NEA which made the only purchaser of power from private developers reluctant to do so. It also dampened NEA’s will to increase transmission capacity to evacuate power from not just private purchasers but also its own generating units and sell to a potential market reeling under shortages.

From the point of view of the developers, the main policy focus had to be:

1. realistic tariff restructuring to provide adequate returns to investors,
2. credible government plan around which the private developers could plan their complementary efforts, especially as related to seasonal storage plants, and
3. institutional restructuring, as with the earlier presentation, especially focused on the ‘wheeling concept’ that would allow private developers independent access to potential markets.

Vertically Integrated Regulator Focus

Uttar Kumar Shrestha, former Managing Director of the NEA was commissioned to prepare a discussion paper on the current crisis from the perspective of the state-controlled utility. His presentation highlighted how the NEA was never really allowed to function as an authority, but was politically and bureaucratically stymied in its corporate planning and implementation. Highlighting further the contradictory objectives dumped on the NEA – that of being a commercially viable entity and also bearing the huge social obligations of providing cheap electricity at commercially unviable rates to unviable regions – he argued for the necessity of moving the electricity profession out of competitive politics. The purpose of merging the Electricity Corporation and the Electricity Department in 1985 to create the NEA was to have a single ‘authority’ in matters electrical. However, DoED and ETFC were also created effectively nullifying the objective of the NEA Act. The result is that crucial elements needed for a healthy power sector were left unattended. Who would make the official load forecast and least-cost generation expansion plan? If DoED was to only give license for new private generation, who was to look after its implementation or non-implementation? If ETFC was to only look after retail tariff, which body was responsible for the purchase price of electricity? If the government had declared an ‘energy emergency’ with a 38-point to address the crisis, why was there no timeline for ending the load-shedding?

The main themes highlighted for requiring further thinking were:

1. tariff, not just that buying rates from developers but also retail rates
2. institutional restructuring, as above, but to assure overall accountability for generation, transmission and distribution
3. balancing social needs with commercial needs in the electricity sector, and
4. the means and methods of educating the politicians and policy makers of the intricacies of this high-tech sector

Policy Roundtable

Based on the above three Consultative Dialogues, a Policy Roundtable was conducted on February 7, 2011. It saw five presentations from the perspectives of state, market and civic actors. In the discussions that ensued, there was broad agreement that the themes identified above by the three social solidarities were the core issues. Since this was a roundtable with higher level authorities, certain specific issues also found special mention. The representation from the tariff fixation commission let the roundtable know that the ETFC was unwilling to agree to an across the board tariff increase just to help the NEA’s balance sheet remain out of the red without a commensurate commitment to reform the NEA. Simple tariff increase without such efforts would be akin to blood transfusion without first stanching the hemorrhaging. There was also common acceptance that the new electricity bill pending in parliament was highly flawed and needed fundamental revision, that the unbundling of the

NEA was necessary for, *inter alia*, better overall system accountability, and that the building of storage hydropower plants as well as rural electrification would require strong government support and involvement. There was also general consensus that innovative means of financing needed to be explored, that if this was done, financing hydropower development would not be that insurmountable provided the government stepped in to provides such policy backup as necessary.

Emerging Policy Themes

The exercise saw the emergence of broad policy themes that needed further dialogue among the concerned stakeholders and the policy makers. They highlight the maturing of technical, economic and political/institutional understanding in Nepali public discourse surrounding the current concerns with the electricity crisis. The main themes identified were:

1. **Investment Capital:** This by itself is not an issue, although, because donor financing of yesteryears in hydropower is no longer going to be available, it may seem strange to a system addicted to foreign aid. The problem is mobilizing existing capital first before one can talk about foreign investment in the sector. Speakers highlighted how encouraging the diversion of just 10 percent of the roughly three trillion rupees per annum remittance inflow would provide significant capital for developing hydropower. Similarly, imposing just 5 percent tax on petroleum products would be an equally great source, not just of rapid electrification of all Nepal but also in helping displace imported fossil fuel through a pricing arrangement.
2. **Infrastructure:** While a strong domestic private sector base has been developed in Nepal over the last decade, one cannot do without strong state backup in this field as well. Government involvement may be phased out of run-of-river generation as well as the distribution end (with the involvement of municipalities and community rural electrification groups); however, transmission as well as storage projects with water rights, resettlement and land acquisition issues would need strong government involvement. This needs to be taken into account in institutional restructuring and NEA unbundling.
3. **Tariff:** A tariff restructuring is essential for this sector to regain its health, not just in purchase or retail tariff but also in the mechanism of regulatory approval that must be annual and must have provisions for more transparency and public involvement.
4. **Institutional Restructuring:** While the unbundling of the NEA is one issue, equally important is the need to address the energy sector as a whole (including petroleum, fuel wood, coal etc.) with adequate and effective national plans through both the Water and Energy Commission at the higher level and local government (district) at the lower lever. What the issue of electricity (and energy) governance will be like under federalism is something that no thought has yet been given even though issues such as ILO 169 have already emerged with all their strengths and contradictions.
5. **Community and Consumer Involvement:** Irrespective of how the issue of federalism plays itself out in the days and years ahead, the concern of consumers both urban and

rural in having an effective mechanism for addressing issues of electricity quality remains a common apprehension. Lack of accountability of the monopoly utility, especially when poor quality of electricity damages equipment or disrupts production processes, needs addressing through institutional and legal measures. Furthermore, in a situation as has currently developed with multiple players in the generation field, it is important to allow consumers the right to choose from different suppliers (as for instance is done in countries such as Finland). Implementing such democratic consumer rights regimes require rethinking the entire legal setup, a matter that must be taken up with the current bill in parliament.

6. **Laws and Regulations:** The proposed electricity act has already seen the tabling of 142 amendments by CA members from across the entire political spectrum. It indicates a serious political engagement and re-thinking – as well as wider national debate – about what the electricity act for the country should be like, as well as the ancillary rules, bylaws etc. While a separate “electricity emergency bill” has been discussed by the new government, what needs to be sorted out is what happens with the pending bill that has a more substantial and long-term impact on the sector. Given that even the extended life of the CA is drawing to a close in a month’s time, and given that there are serious issues of budget and other problems that are more important, one has to address what is realistically possible to address and take up other issues through other policy means.
7. **Export:** This matter has seriously distorted hydropower development for national growth and has in some not inconsequential manner contributed to the current electricity crisis. A clear national consensus is required, which needs to be followed through in policy and legal formulations.

Further engagement

In the next phase of the research Niti began engagement in the aforementioned policy themes starting with the issue of Tariff. In this regard, Niti collaborated with Nepal Hydropower Association and organized a workshop to facilitate between the various stakeholders – NEA, Ministry of Energy, Tariff Commission and hydropower developers – to address the issue of tariff restructuring.

Presentations were made by representatives from the government, consumer groups and the Tariff Commission. Issues on tariff restructuring were raised and discussed. At the end of the workshop a commitment was made by the representatives of the various stakeholders to hold a higher level discussion to take these issues forward and to reach a conclusion. The outcome of this discussion was then to be submitted to the government.

On March 23, 2011 the government declared an 'energy crisis' in the country and made decisions covering most of the issues raised repeatedly in the process of this research. However, the crisis was declared only for a period of four and a half years and for 2,500 MW. The stated policy and the draft unofficially in circulation has provisions of human rights violations as well as institutional distortions that have been criticized by the main part in the

current coalition and will probably see fundamental re-thinking. Niti intends to pursue an engagement with the Energy Commission and Energy Sub Committee members under the Natural Resource Committee of the Constitutional Assembly to address the above issues in the tabled electricity act (both old and new) and to get a proper electricity act passed that will address both the short and long term issues in the sector.

RECOMMENDATIONS

Policy Alternatives

The following table lists alternatives, which attempt to address the limitation of the existing hydropower development policy 2001. The existing hydropower development policy 2001 was developed with three core objectives: 1) to develop and decentralize hydropower projects to meet local demands in remote and isolated regions of the country; 2) to develop medium size hydropower projects to meet the national demand within national grid and export surplus energy and also to develop local capacity; and 3) to develop large scale multipurpose projects to meet regional demand for food (through irrigation), energy and flood control. With these objectives, the existing hydropower development policy 2001 is designed to attract Nepali and foreign investment in hydropower projects. However, it does not categorize on the basis of type of investment. Alternative 1 is developed with an additional categorization of hydropower project as per its type (with/without reservoir), size, importance of the project for Nepal (in relation to its foreign policy and natural resource management policy) and Investment modality. Alternative 2 captures a "nationalist" view that emphasizes building Nepal's capacity to manage its water resources and to build hydropower only for domestic consumption.

| Modality of Investment Type of Project | Hydropower Development Policy 2001 | Alternative 1 | Alternative 2 |
|---|---|--|--|
| | <i>Focus on Investment by market sector 70% and public sector 30%</i> | <i>Focus on Investment by market sector 40%, public sector 40% and community 20%</i> | <i>Focus on Investment by public sector 70% and market 30%</i> |
| Micro hydro | Community and private | Community and private | Community and private |
| Small and medium hydropower project for domestic consumption and surplus energy to export | Market or/and Public Private Partnership | -Private sector -Public sector -P.P. Partnership | Public sector |
| Hydropower project with Reservoir | | -Public sector | |
| Large hydropower project -export oriented | Public Private Partnership | Private and Public | Government but not a priority |
| Large hydropower project -Multipurpose | Government | Bilateral Cooperation | |

Investor's Recommendations

Power sector needs Government's initiatives:

- Timely revision of Electricity Rules & Regulations
- Revision of PPA Rates
- Fiscal incentives: VAT and custom duties
- Infrastructural development (roads & transmission lines)
- Forest & Environment laws to facilitate hydropower development
- Local problems: e.g. land acquisition, unlimited demands of local people need to be addressed
- Sharing of water & royalty
- Power development fund
- Restructuring of NEA
- Independent Transmission Line Company

With the above initiatives IPPs can produce

- about 1500 – 1700 MW of power by next 5 to 7 years, provided PPA rates revised
- NEA will generate about 600 MW of power during the same period.
- Which helps to reduce Load shedding up to 5-6 hours a day at that time where we expect 20 to 22 hours a day

Consumer's recommendation:

- Work that needs to be done by other stakeholders (Government, NEA and Private Sector)
- Policy to prioritize domestic and public investment
- Practical policy, laws and institutional structure
- Farsighted and participative hydroelectricity production policy/ Work plan formulation
- Arrangement for involvement and participation of local community and maximum stakeholders
- Public's participation in hydroelectricity production
- Aim to make electricity available to all
- Participative initiative for corruption control/minimization
- Arrangement for establishment of Rural Electrification Act, Fund and Board
- Development of accountable agency and institution
- Establishment and effective implementation of Acts like the Electricity Act, Laws, Electricity Conservation Act, and effective institutions
- Monitoring of private and public sector production
- Arrangement for determined percentage of natural resource right of local communities in the hydroelectricity

- Need to raise awareness regarding quality of electricity products
- Arrangement for a comprehensive compensation plan in case of accidents relation to electricity
- Arrangement for convenient meter reading and billing.

NEA's Recommendation

- Political consensus & commitment. For this a high level power sector committee must be formed
- Guarantee of security, law & order without any cost to IPPs.
- Simplification of procedural steps at Government level and NEA through One window policy and Coordination between the Ministries
- Social Responsibility (SRC) Cost. SRC must be borne by IPP should be fixed based on project site & project coverage area and rest if any by government
- Formation of High Power Local Level committee to address local problems
- Infrastructure Development by Govt. Agencies.
- Road other than limited access road.
- Transmission line Hub and expansion of High Voltage Transmission Line based on national need.
- Basin wise transmission line other than limited link Transmission Line.
- Priority for storage projects.
- Establishment of Cross Boarder Transmission Line.
- Review of PPA Rate & Electricity Tariff.
- Exemption of Tax & VAT on construction Material.
- Approval after timely review of proposed Electricity Act and NERC Act at earliest.

Recommendations for NEA

- NEA restructuring

Recommendations for Act

- All project licenses must be given on competition basis (as opposed to application basis)
- A single license holder should not be allowed to produce, transmit and trade with that one license as this will create lack of transparency as to how much has been produced, transmitted or traded and this will in turn increase the probability of tax evasion by the license holder
- In order to get a survey license an applicant must submit 10 percent equivalent cash or bank *jamanat* of the estimated total investment amount of the project and in the event

that the applicant is unable to implement the project within the targeted date the said amount should be appropriated.

- License holders should not be allowed to sell or handover their license.
- Code of conduct for grid, distribution and other related documents of National Electricity Transmission should be approved by Commission not company.
- Displaced people need to be guaranteed employment in the projects.

Issues of Local Stakeholders

- Address grievances of those affected by construction of hydropower projects
- How will local people be involved in hydropower projects especially in the event of the establishment of a federal structure?