Load shading crisis in nepal

History

Nepal is being ravaged by the electricity crisis. The electricity crisis of this millennium began in 2006. Nepal saw the last electricity crisis of the last millennium in 1999 and, with the commissioning of Khimti project in 2000, there was no load shedding through till 2005. Nepal was grappling with the problem of flood in the first week of August 2008, with resultant loss of life and limb as well as property in the hilly areas and Terai of the west Nepal. NEA was imposing a load shedding of 2 hours each day, two days a week.

With effect from 27th August, 2008 the load shedding hours was increased to 16. 5 hours/week. The increase of load shedding by more than 4 times was ascribed to (a) inability to import power from India, due to collapse of a particular transmission tower in east Nepal caused by the breach of Koshi embankment, and consequent flooding of the area and (b) low water level in Kulekhani reservoir. There was one more reason behind the " augmentation" of load shedding hours which can be gleaned by studying following table closely . Why Load Shedding?

It is rather normal for people to wonder why we have to put up with load shedding in a country that is endowed with an economic potential of 43, 000 MW of hydropower. It is more surprising, knowing that relevant officials did have prior knowledge of what will be the demand for electricity in the country in specific years to come. NEA and other policy makers must have been in a position to prepare plans for an increase in generation. However, it is saddening to note that generation expansion has not kept pace with consumption growth.

One of the problems behind this is thefailureto complete project construction and commission in time – Middle Marsyangdi project is a prime example

which was supposed to be completed in 2004 originally. However, looking at the magnitude of power deficit, it is not difficult to see that even with this project completed in a timely manner Nepal would have faced load shedding as the projects in the pipeline is not commensurate to growth of electricity consumption. Demise of Arun III and Load Shedding

With the country facing load shedding due to supply constraint, people, ranging from the thenfinanceminister (an economist, possessing doctorate degree) and many electricity experts (self proclaimed and otherwise), have been ascribing the current electricity crisis to the cancellation of Arun III in 1995, which was scheduled to be completed in 2005. Silver lining Like in all dark cloud, some silver lining has been seen in the load shedding problem of Nepal. Candle industry, which is a flourishing cottage industry of Nepal, has further flourished due to the electricity crisis obtaining in the country.

It is heart warming to note, as candle industry has high level of backward linkage, that it must be contributing to the economy significantly. Perhaps many a marital relationships, undergoing some crisis, must have taken a turn for the better due to ubiquitous candle light during dinners frequently, even at homes! Similarly, sale of inverters, batteries, generators, solar panels, etc. also has increased by a magnitude. There is nothing to be happy about the increased turnover of these, as these have to be imported.

In the case of inverters, the experts opine that use of inverters at home exacerbates the problem further as these mediums store energy inefficiently. Similarly, increase in the sales of generators has contributed to aggravation the fossil fuel crisis in the country besides contributing to environmentalpollution. Due to time constraint, this paper is not able do an

in-depth analysis of this aspect. Adverse impact Obviously the primary impact of load shedding is on NEA in terms of loss of revenue. In FY 2007/08 the deficit of electricity was 309. 46 GWh and at average revenue rate of Rs 6. 70/kWh

NEA could have earned Rs 2. 07 billion incremental revenue and would have been able to post a net profit of Rs 761 million, instead a net loss of Rs 1. 312 billion, but for this crisis. There was a time when even hospitals suffered due to shortage of oxygen which was ascribed to unavailability of electricity. Similarly, factories operating for 3 shifts had to operate only 2 shifts and those operating 2 shifts had to scale down to 1 shift. It even became difficult to operate a factory for a particular shift contiguously as the load shedding occurred in the middle of a shift which posed a new kind of challenge..

In order to mitigate this problem, a number of industries acquired standby generators which increased the fossil fuel crisis by a magnitude. On the other hand, even after procurement of standby generators many industries were forced to stand idly by as they were unable to operate even the standby generators due to shortage of fossil fuel to operate them. Further, the load shedding problem also aggravated and compounded the fuel crisis as various factories, even shops and some households started using generators to mitigate the problem of load shedding.

Besides, the use of fossil fuel as an alternative to electricity increased environmental pollution (due to industries, shops[20] etc. using backup generators) including indoor pollution. Anomaly There is a note worthy anomaly in all this – spilling of electricity (wasting generation capacity) in the midst of load shedding. In fiscal year 2007/8, as mentioned earlier, the

energy demand totaled 3, 490. 12 GWh while available energy was 3, 180. 66 GWh only resulting in a deficit of 309. 46 GWh. However, NEA spilled 223. 378 GWh of this precious commodity during the same period .

On the other hand, consumption pattern in Nepal is diametrically opposite of generation by RoR projects – high quantum of electricity consumption in the dry season (winter) and low consumption during wet (rainy) season. Kulekhani I and II – totaling 92 MW – is the only storage project in Nepal, generation from which could be tailored to the demand. GoN Policy and Load Shedding Nepal's Water Resource Strategy[24]stipulates that " by 2017, 2230 MW hydropower developed to meet projected demand of 2230 MW, including 400 MW for export."

According to load forecast prepared by NEA (table 5 above) peak demand in FY 2017/18 is estimated at 1770. 2 MW and to meet this level of demand the installed capacity will have to be at least or more than 3500 MW as power plants generate at around 50% of the installed capacity. Therefore, with 2230 MW in the system it will generate only about 1115 MW during the dry season and, therefore, the plan to export 400 MW will not be possible. Nepal can even escape from current petroleum product crisis significantly by electrifying transportation system (ranging from electric train, trolley bus, cable car, ropeway, electric bike, etc to even hybrid car).

Actually Nepal should aim to maximize use of power generated by harnessing its water resource domestically and also benefit by forward linkaged benefits. Use electricity to lift water to irrigate, to run cold storage, to set up agro-processing industries, use for industrialization of Nepal, also to set up energy intensive industries. The policy and strategy adopted by the

government based on the assumption that Nepal has excess hydropower potential, the only use of which is exporting it to a neighboring country is at the root of all the problems.

Presently the policy is focused on getting free energy by allowing developers to implement projects as export oriented. Which results in cheap and better quality electricity being exported (example is West Seti, Upper Karnali and Arun III) while condemning people in Nepal to live in the dark due to load shedding, leaving industries to starve for energy and continuing with long queues for petroleum products that pollute theenvironmentand make people sick, increasing the absenteeism from work, and spend hard earnedmoneyon medicine and medical treatment.

Way forward All problems have solutions and load shedding problem is not different. In following lines an attempt is being made to come up with certain suggestions as to how the problem is best mitigated. However, due to time and space constraint, all the issues could not be dealt with here exhaustively, although one could come up with many more suggestions. GoN Policy: Nepal government should have a policy to implement as many hydropower projects as possible with domestic investment so that investment linkaged benefit will percolate into the economy.

This does not mean that we should close our doors to foreign direct investment. As long as the electricity is used for the benefit of the country who is investing in the project does not matter. Secondly, Nepal should allow projects to be implemented by the investor/s (domestic or foreign) that will generate the electricity at the lowest cost. Nepal should purchase all such power (at lowest possible price) and electrify the nation massively (not just

for lighting a few bulbs in houses, though) and export the electricity that Nepal is not able to consume at premium .

What Nepal should do is, instead of dedicated export oriented power projects, she should plan to export energy during wet seasons and off peak hours when she needs to spill her electricity generation capacity while during the same window of time the electricity demand in south is at its peak, thus commanding premium tariff. In this manner we could easily get out of the trap of long term PPAs and also take advantage from the complementarity of electricity market of Nepal and India implemented at the end of the survey license period.

Infrastructure: Private investors have discovered that investment in electricity generation project is a lucrative business. However, they are constrained by lack of infrastructure like transmission network and access road.. Therefore, NEA should launch a campaign to build transmission network and if it is constrained by financial considerations, then she should, to use an old euphemism, beg, borrow or steal to build the transmission network where it enjoys both comparative and competitive advantage.

Becomes clear by looking at the highest priority accorded to Dhalkebar-Muzaffarpur trans-border transmission line that will be used to evacuate power from Arun III and Tamakoshi projects in Nepal. Moreover, all the connection points proposed across the border in India, like Gorakhpur, Purnea and Muzaffarpur (except for Silguri), are load centers suffering power deficit. Delayed Completion of Projects: A part of the load shedding problem is attributable to construction delays. Implementation of hydropower projects

by NEA is fraught with both cost overrun and time overrun risks as the experience shows.

Therefore, the best use of national resource is to have hydropower projects implemented by private sector that seems to be able to implement projects effectively and efficiently both in terms of cost and time. In order to mitigate this problem NEA should review structure and content of construction/supply contracts that it signs with contractors and suppliers and adopt construction/supply contracts which are not open ended (fixed time and fixed price) – not affording any latitude for increase in cost or completion time (to use the popular phrase with no scope for any “ variation order”).

System Mismatch: With the total installed capacity of over 687 MW now, the system is generating less than half of that during the dry season when the demand is at its peak, thereby creating electricity crisis. Nepal not only needs to have a reliable storage project in its stable but she should also supplement peak period demand by implementing daily pondage projects. NEA should also seek the cooperation of private sector to solve the system mismatch problem, by introducing bulk besides the seasonal variation in the tariff as it has now adopted for projects of up to 25 MW.

Investment friendly environment: In order to assess the role of investment friendly environment in the implementation of hydropower projects, it’s educative to compare the target and achievement of 9th and 10th five year plans. Loss control: NEA announced that its net system loss was 25. 15% in 2007/08 and 26. 71% in 2006/07 This is total of both technical and non-technical loss. Technical loss can be significantly reduced by up to 7-8

percentage points by strengthening the transmission network which will definitely help in reducing load shedding duration

Smart Retail Tariff: At present NEA has a specific slab structure of tariff for all kinds of domestic consumers irrespective of whether their demand for electricity is elastic (whether consuming it for luxurious uses like operating air conditioner, refrigerator or laundry machine) or not (use it just to ward off darkness). NEA has a social tariff of Rs 4/kWh up to 20 kWh – at which rate NEA doesn't recover its cost (of generation, transmission plus distribution).

Under the current policy the social tariff is not limited to indigent people only, NEA tariff should be amended to make social tariff available to only those who deserve it – poorest of the poor. Under a crude estimate, just with this one change NEA will earn incremental revenue of Rs 1 billion. Encourage Private Sector to Install More Capacity: Due to increase in the cost of construction materials like steel, cement, etc. private developers are asking for an increase in bulk tariff NEA offers to the private sector.

GoN needs to understand that it doesn't make sense for it GoN to earn revenue while NEA is hemorrhaging because NEA is also fully owned by GoN. Instead of revenue from duties, GoN should vie to reap benefit by the multiplier effects that will be caused by electrification of the country. What the government needs to remember is that sacrifice of revenue by it to increase domestic consumption will eventually enrich the macro economy, hence the government, gaining from the multiplier effect on the economy due to forward linkages of electricity uses. Same is not true in the case of export oriented projects Conclusion

It is rather tragicomic to have a country like Nepal, richly endowed with water resources, suffer from the problem of load shedding. Besides, the problem is not too difficult to solve if only the hydrocracy (intelligentsia, politicos and bureaucracy involved in hydropower sector) starts to think outside the box. The problem is rooted in the tunnel vision. Because, although NEA has promised respite from it by 2013/14, it is clear from above discussion that even if the projects in the “ pipeline” are commissioned by the promised date, the load shedding will not vanish.

The load shedding is not happening because the decision makers are unable to figure out what will be the demand for the years to come or such data is not available to them. with regard to policy as well as with regard to when to start implementation of specific project to augment generation capacity – are not taken at appropriate time, the bureaucracy is unable to ensure that the projects under implementation are completed within expected time.