

INNOVATIVE INITIATIVE: MINIGRID IN BAGLUNG DISTRICT

I Background

- There was a felt need of developing modality, both technical and managerial, to connect micro hydro (MH) with the grid, first to stop discarding MH due to the availability of grid electricity and next to generate additional revenue to community by selling MH electricity to grid (Nepal Electricity Authority- NEA).
- Despite continuous follow-up and percussion of REDP and AEPC, NEA, though agreed in principal, never came forward to open the door for connecting MH with grid. The issue is not much so with the technical reason, it is more of the negative "mind set" and the perceived managerial hassles from the unwanted initiatives.
- In 2001, in order to testify the feasibility of connecting MH with the grid, REDP has supported the Institute of Engineering, Electrical Department to conduct a R&D that has successfully connected its MH used for teaching purpose built in the lab with the national grid. The report was disseminated widely to stakeholders including NEA.
- Under the leadership of NPC Member, a number of joint meeting of NPC, NEA, REDP/AEPC were held to pilot a MH Grid Connection. As said earlier, though expressed positive view to the pilot initiative, it was never materialized. The meeting stopped to take place once the NPC member was changed along with the change of the government.
- In 2005, an innovative idea of piloting mini grid from a number of MHs was conceived under REDP/UNDP/AEPC to demonstrate "one stage" forward towards the connecting MH with the grid. Accordingly, the MECC Consultancy (P) Ltd., Gongabu, Kathmandu was contracted to conduct the pre-feasibility study for the Mini grid in three districts, namely Kavre, Sindhupalchowk and Baglung. Among the three potential sites, the site in Baglung was found the most appropriate.
- In 2007, REDP contracted the MECC Consultancy P) Ltd., Gongabu, Kathmandu for the "Detailed Feasibility Study for Mini Grid Development in Urja Upatyaka, Baglung" that has submitted the report in September 2007.
- The Baglung Mini Grid was included in 2008 work plan and initiated the work. However the progress was slower than anticipated due to both technical issues and local conflicts. The activity is thus continued in 2009 work plan, too.

II Main Purpose/ Expected Benefits

- Optimization of Electricity Generation
 - ✓ Balancing the surplus electricity of one or more MHs with the deficit electricity of another one or more MHs
 - ✓ Creating opportunity to establish bigger size industries at a time (mechanical workshops with welding machines and lathe machines, stone crushing machines, etc) requiring more electricity (upto 50 kW) than quantity generated from a normal MH of 20 to 30 kW.
 - ✓ Operating all plants at their full generation capacity round the clock without requiring of dumping the additional power into the Ballast as practiced in a normal MH (water immersed electric heaters).
 - ✓ Carrying out the vital maintenance activity (with plant shutdown) in any one/few plant (s) with beneficiary households still getting electricity to meet their basic household lighting requirement.
- Connection of Mini-grid with National Grid
 - ✓ Offering sizable load (electricity) to NEA for encouraging to connect the mini grid with the national grid.
- Achievement of System Sustainability
 - ✓ Increasing revenue for MHs from the increased uses/sale of electricity
 - ✓ Shifting from power based tariff system to energy based tariff system (in case of beneficiary households) with disciplined use of energy
 - ✓ Promoting better inter scheme co-ordination and sense of togetherness
 - ✓ Earning additional revenue from selling day time and night time excess electricity to National Grid
 - ✓ Procuring electricity from National Grid in case of severe power shortage in the Mini Grid System (2 or more plants having major breakdown simultaneously)
 - ✓ Requiring no closure of individual MS in case National Grid comes in the area in the immediate future

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III Salient features of Kalung Khola Urja Upatyaka MiniGrid (K2U2MG)

- Number of MHs: Seven (7)
- Total Power: 128 kW
- Total HHs: 1,272
- Estimated Total Cost of Mini Grid: Rs. 15,000,000 (Approximately US\$190,000)
- Financial Indicators (based on MECC consultancy report of September 2007):
 - ✓ Pay Back Period: 6.5 years
 - ✓ NPV at 4% discount rate of interest: Rs 5,239,136
 - ✓ Internal Rate of Return: 8.76%

IV Description of K2U2MG Working Committee

- Formed Working Committee from elected representatives from all seven MHs to be connected together.
- Deputed recently an Engineer with technical staff (with hands on training during installation of Mini Grid with additional Training for operation and maintenance of the Mini Grid System) and a Community Mobilizer.
- Initiated community mobilization and meeting with members to ensure the Mini Grid management with professional attitude for achieving common goal based on the strong feeling of togetherness.
- Being practiced regular meeting to sort out any managerial/financial/technical problems in its initial stage.
- Being motivated to:
 - ✓ Adopt the energy based tariff system for individual households (Rate to be decided on mutual consent).
 - ✓ Install bi-directional energy meters installed in different plants to record net energy transaction with the Mini Grid.
 - ✓ Maintain a common fund to meet the official expenses of Working Committee as also meeting common maintenance expenses
 - ✓ Maintain proper Log Books (operation) as well as tools and spare parts.
 - ✓ Maintain proper book keeping of all financial transactions.

V Benefits Sharing Mechanism

- Each plant will draw required electricity from the grid and also sell electricity in case of excess power generation. The bi-directional energy meter will maintain the log of selling and buying of electricity daily (periodically) with the net balance. This will optimize the electricity generation and utilization of individual MH thereby increasing its revenue.
- Once reached a strong financial stage, each MH can lend money to its members for various needs, primarily income generating activities.
- Establishment of bigger workshops like grill workshops (with welding machines etc), machining workshops (with lathe machines etc) and stone crushing machines will not only provide service at local level at reasonable price but also provide employment opportunities to local people, mostly from households with low income on a priority basis.
- Based on the financial situations, the profit will be shared among the participating MHs following an appropriate and equitable method. Each MH will then distribute its share /profit to its members equally covering all 100% households of the community. (REDP community mobilization requires/ensures participation of all 100% households in the community irrespective of caste, creed, sex and economic status).
- Emphasis will be given to encourage people from poor, dalits, women and ethnic groups) to undertake electricity based enterprises. They will be provided with financial supports on a priority basis from the enterprise fund created under Community Energy fund (CEF) of each MH. Certain portion of fund will be allocated for the purpose.

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VI Current/ Emerging Issues

- Technical and Financial
 - During initiation in 2008, it was found that the technical parameters and design proposed by the earlier consulting firm were deficient.
 - In the latter part of 2008, an experienced Indian firm "YTEK Controls", Dehradun, Uttarakhand, India was identified, approached and hired to conduct technical re-verification of site and re-do the design for the Mini Grid. The Team carried out the field visits and collected the data and information in the April 2009.
 - The consultant has submitted the Technical Report followed by the financial offer based on the Ex- Dehradun Price (Plant and Equipment to be imported from India) with terms and conditions. The offer is being studied.
- Mini Grid Connection to National Grid
 - NEA is positive to such an approach, however vigorous efforts are required to convince at higher levels.
 - Some certain technical criteria are to be met prior to such an interconnection and the plant with its protection system
 - Especially at point of interconnection was to be as per NEA requirements. Presently, NEA does not have specifically prepared norms/guidelines/standards etc for connecting Mini Grid (128kW) to national grid.
 - REDP/AEPC will continue to meet NEA once the implementation of Mini Grid gets started. It will then be easy to pursue and convince NEA for their cooperation. If needed, the supports of concerned ministries will also be sought.
 - There are professionals and political leaders who support to implement this innovative initiative.
- Local Conflicts
 - Kalung Khola Urja Upatyaka Mini Grid Development Working Committee (K2U2WC) formed from the representatives of all seven MHs and also got dissolved due to local conflicts triggered by the political vested interests.
 - K2U2WC was reconstituted following the democratic election process. However, the dispute is prevalent due to the frequent disturbances from the loosing groups.
 - REDP through DEES Baglung is working to settle the disputes and local conflicts amicably in the near future by intensifying the community mobilization process. The community people of all seven (7) MHs are supportive of this idea.
- Capacity Development
 - A new Mini Grid team has been made in DEES Baglung by appointing a new CM and a new Engineer. The EDO of DDEs is also a newly recruited staff.
 - So far REDP has envisaged to replicating its community mobilization process best practiced in a community covered by an individual MH. Experiences have shown that the process is not adequate to deal with seven communities. The subject is under discussion and will be developed specific modality and guidelines for Mini Grid after carrying out further consultation.