MINI-GRIDS IN NEPAL:

PACE OF IMPLEMENTATION



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Background

- Nepal is currently facing a crippling energy crisis.
- Despite the techno-economic potential to generate 43,000 MW of hydroelectric power in Nepal, approximately 710 MW of the potential has been developed by the state-owned, vertically integrated electricity utility, Nepal Electricity Authority (NEA), and private independent power producers.
- The total domestic generation capacity is merely 760 MW for a population of 27.8 million and an area of 147,181 km².

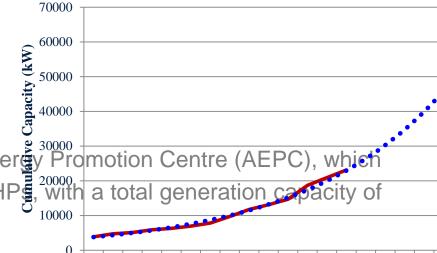


Country context

- About 70 percent of the population in Nepal is estimated to have connections to on-grid (about 45 percent) and off-grid (about 25 percent) electricity.
- Of the 25 percent off-grid electrified households, MHPs supply approximately 20 percent and solar home systems supply the remaining 5 percent.
- Load shedding in the grid is up to 12 hours per day.
- The remaining 30 percent of the country's population, mostly in rural and remote areas, have access to neither on-grid nor off-grid electricity.



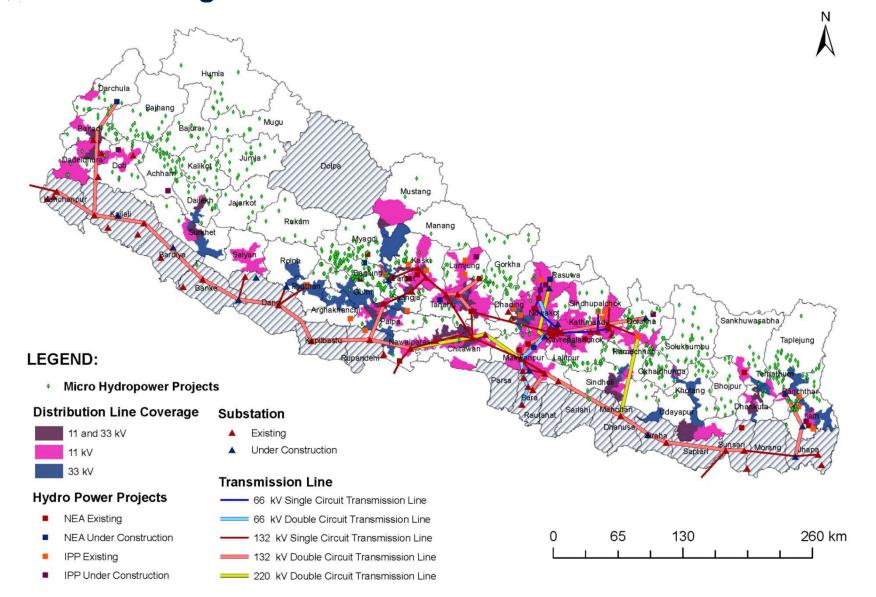
• By 2014, with support from the Alternative Energy Promotion Centre (AEPC), which was established in 1996, more than 1,000 MHPs, with a total generation capacity of 25MW (or 25,000 kW), had been developed.



	Total	Grid encroached	Grid connected	Mini-grid
Number	1,400	90	None*	1
Capacity (kW)	25,000	2,700	NA	107
Number of	400,000	27,000	NA	1,300
HHs				

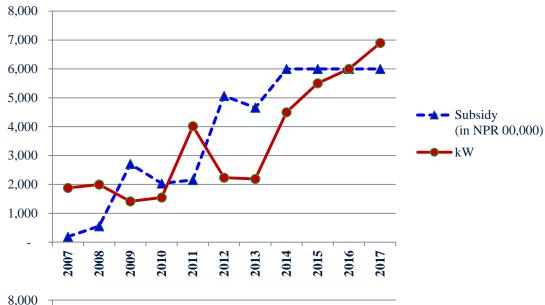
The Government of Nepal aims to install an additional 25 MW of mini/micro hydropower, as part of the National Rural and Renewable Energy Programme (NRREP), currently being implemented by AEPC for five years (2012 - 2017), to provide electricity to an additional 150,000 rural households by 2017 (refer to Figure 2).



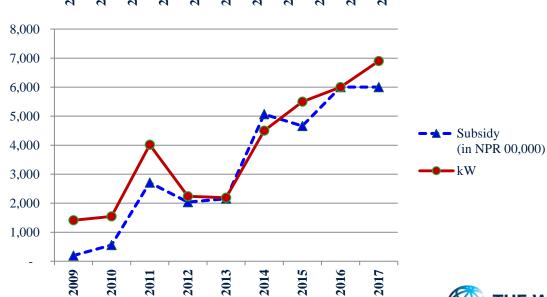




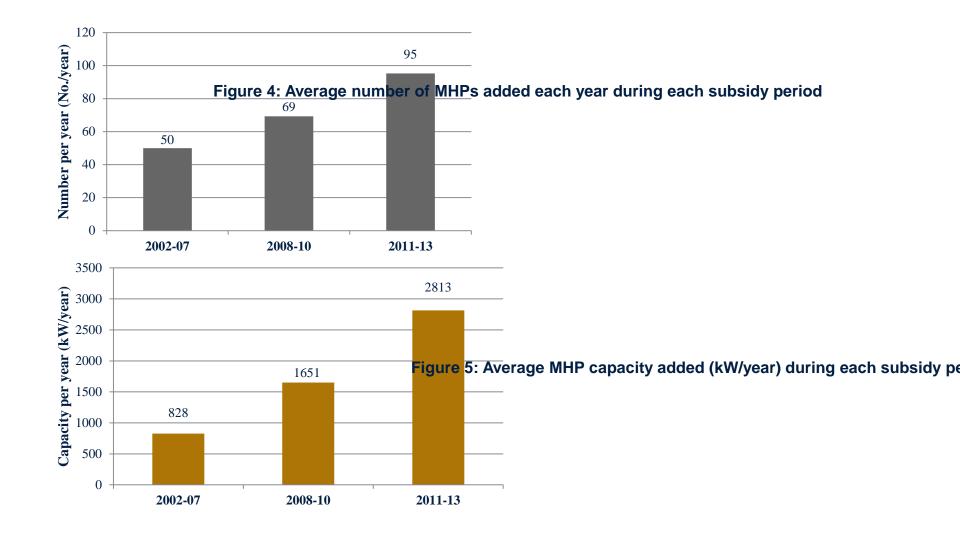
Impact of subsidy on installed capacity (when compared at same base year)



Impact of subsidy on installed capacity with two years shift



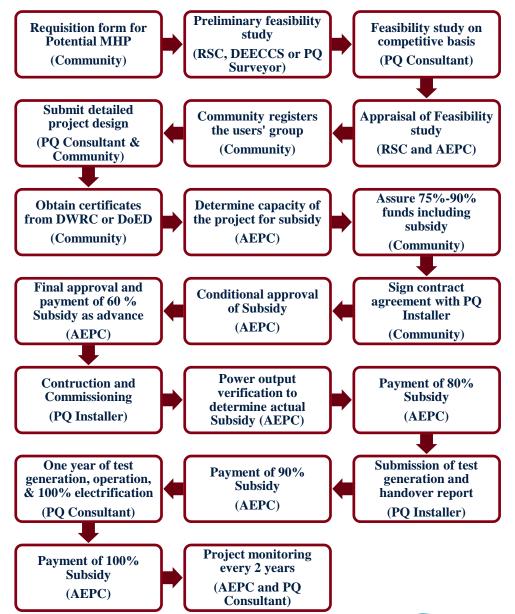




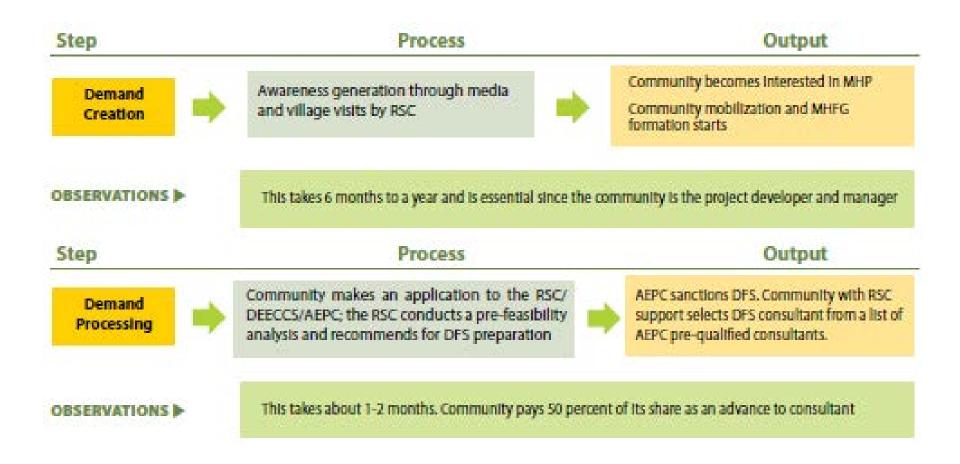


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MHP Project Cycle









Step Process Output DFS is prepared by the consultant and report DES. DFS is revised and/or accepted. Conditional submitted to RSC. AEPC releases 40 percent of Preparation approval for subsidy release is made by subsidy for DFS preparation. RSC verifies DFS and and submits to AFPC which verifies it and either AFPC to CRFE. Approval asks for revisions or accepts It Community releases 50 percent of its share of DFS cost. OBSERVATIONS > This process may take up to 6-9 months depending on AEPC workload and quality of DFS. This is a bottleneck currently, mainly on account of quality of the DFS. Process Output Step MHFG begins mobilization of balance of funds MHFG mobilizes the funds and deposits 80 from the community, VDC, DDC, other donors Mobilization percent of it in cash in a designated comand banks. of Funds munity managed account. RSC provides handholding support This is a make or break step. This takes about 1-3 years. Some communities may fall away at this step. However, this step makes the community take strong ownership of the project and readies them for the project implementation stage. OBSERVATIONS > Some soft loans would help speed up the process, but equity in hard cash should not be diluted too much given that they run the MHP as a social enterprise.



Process Output Step Lowest bidder is selected as the installer and MHFG enters into a contract for installation and commis-RSC calls for online bidding from presioning of MHP. MHFG releases 50 percent of its Selection qualified installers, forms a Bid Evalushare as advance; AEPC gives 60 percent of subsidy of installer ation Committee which includes the as advance against bank guarantee. After a joint site MHEG Chairman visit by the installer, RSC and DFS consultant, the balance 10 percent is released to them This takes about 2-3 months. This process is well laid out and is understood well by all stakeholders. Selection of the lowest bidder has reportedly resulted in several new installers quoting 50 percent lower than the estimated amount in the DFS. AEPC should carry out an analysis of all bids received in a year and OBSERVATIONS > especially verify abnormal bids. The process of the joint site visit before installation starts, puts great onus on the DFS consultant to do a sound job and also provides the installer an opportunity to verify the DFS before signing the contract with the MHFG Output Step Process MHP Installation is complete and ready for testing Civil works by MHFG and electroand commissioning. Bank guarantee is released on Installation mechanical by installer, installer is delivery of electro-mechanical equipment at site. of MHP responsible for all aspects of MHP Community pays its share simultaneously. installation RSC/DEECCS provides verification This takes about 1-2 years depending on the terrain and funds flow. Some installers reportedly do not OBSERVATIONS complete the task on time and misuse the funds given to them. MHFG is at their mercy during this stage.



Step Process Output

Power output test (POT) and Verification



POT is done by RSC in the presence of MHFG, installer and AEPC, and the plant is commissioned. Power output verification (POV) is conducted by a 3rd party inspector usually during November-May (lean flow season)



Successful POT results in a commissioning report and release of 20 percent to installer. After POV, another 10 percent is released. Quantum of final subsidy amount its determined after POT and POV. If generation is less, subsidy is reduced and excess payment recovered from installer. At the end of 1 year another check is conducted. If satisfactory, balance 10 percent subsidy is released to installer.

OBSERVATIONS >

POT takes 2-3 months. POV is done usually within the year of commissioning. Largely, the QA only verifies the power output and is at the end of commissioning. There is no material and in-process verification of electromechanical components that attract 50-60 percent of total costs. In effect, the quality of the work under the direct control of the installer is verified only after commissioning. Oversight of civil works is not stringent as installer deputes a technical person only for providing marking and level. RSC cannot physically serve many installation sites with their manpower. Thus, QA is a weak link in the MHP installation and commissioning process; especially the quality of electromechanical equipment.



How the key issues were addressed?



How long it took to resolve these issues?



What were the results?



What lessons can be drawn from the experience/results



What is the replicability of this model?



What needs to happen to scale up and sustain this effort?



Main Title

Subtitle



Insert Section Title

Insert Section Subtitle



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