

Mini-Grid & Productive End Use (PEU) Development Case study from Nepal

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Asian Development Bank
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Energy Access and PEU as vehicle for Inclusive Growth



Preconditions for successful deployment of PEU

- Knowledge and skill on how to use electricity for profitable enterprise
- Technical and financial management capacity
- Availability of credit and micro-credit
- A policy and institutional environment conducive to business development
- Access to markets
- Availability of complementary infrastructure services

Source: Fishbein, R.E. (2003)



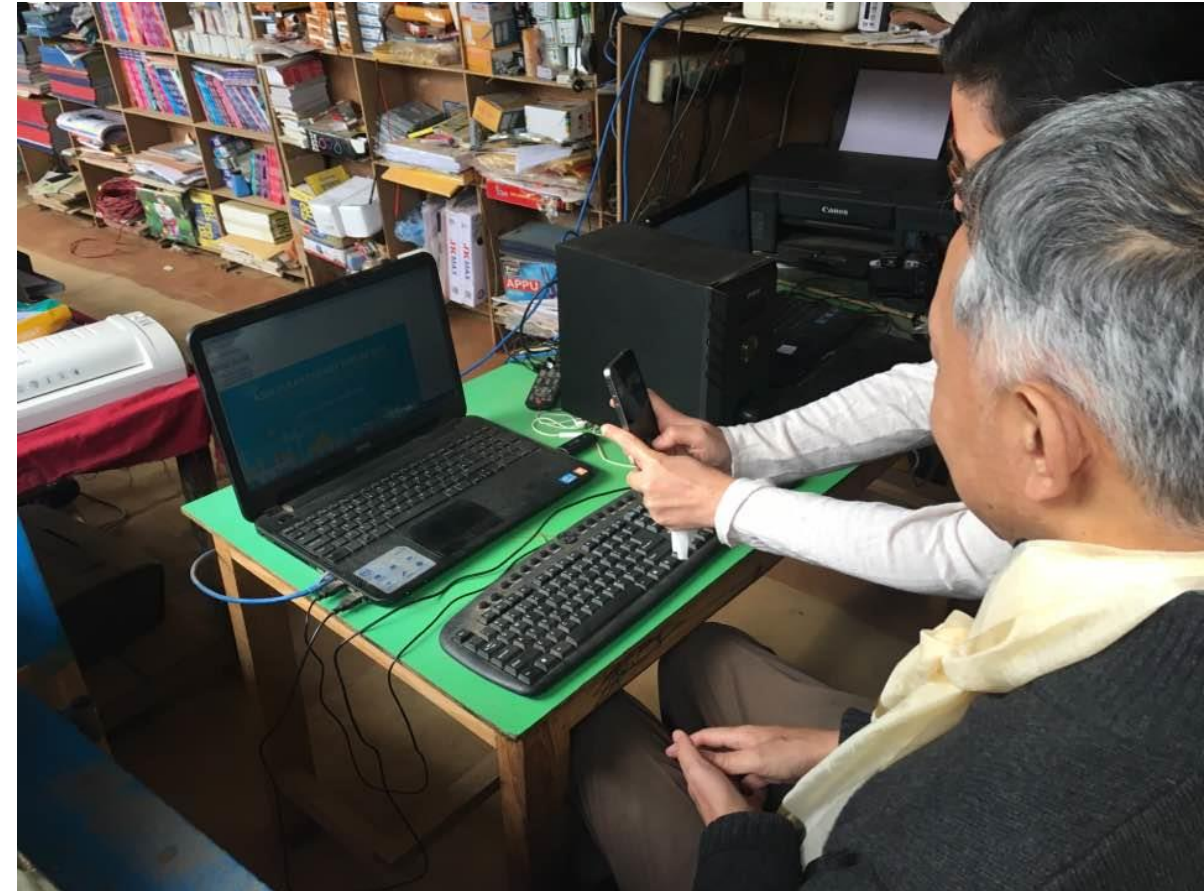
Case Study- Halesi Solar Micro Grid Project

- Pilot developed for 3 villages(Harkhapur, Chayasmitar and Kaduwa of Okhaldhunga & Khotang district)
 - Total size: 35 kW initially; increased to 72 kW in phase 2
 - 25 businesses, 83 households
 - Partial Financial assistance from Asian Development Bank (ADB)
- **Funding Sources:**
 - Equity investment from Community and Gham Power
 - Debt financing from national commercial bank-NMB Bank
 - Technical assistance from ADB, AEPC and Winrock
- **Implementation Model:**
 - Project owned by a SPV with community representation
 - Gham Power provides EPC + O&M services for 10 years
 - After 10 years, project ownership transferred to community

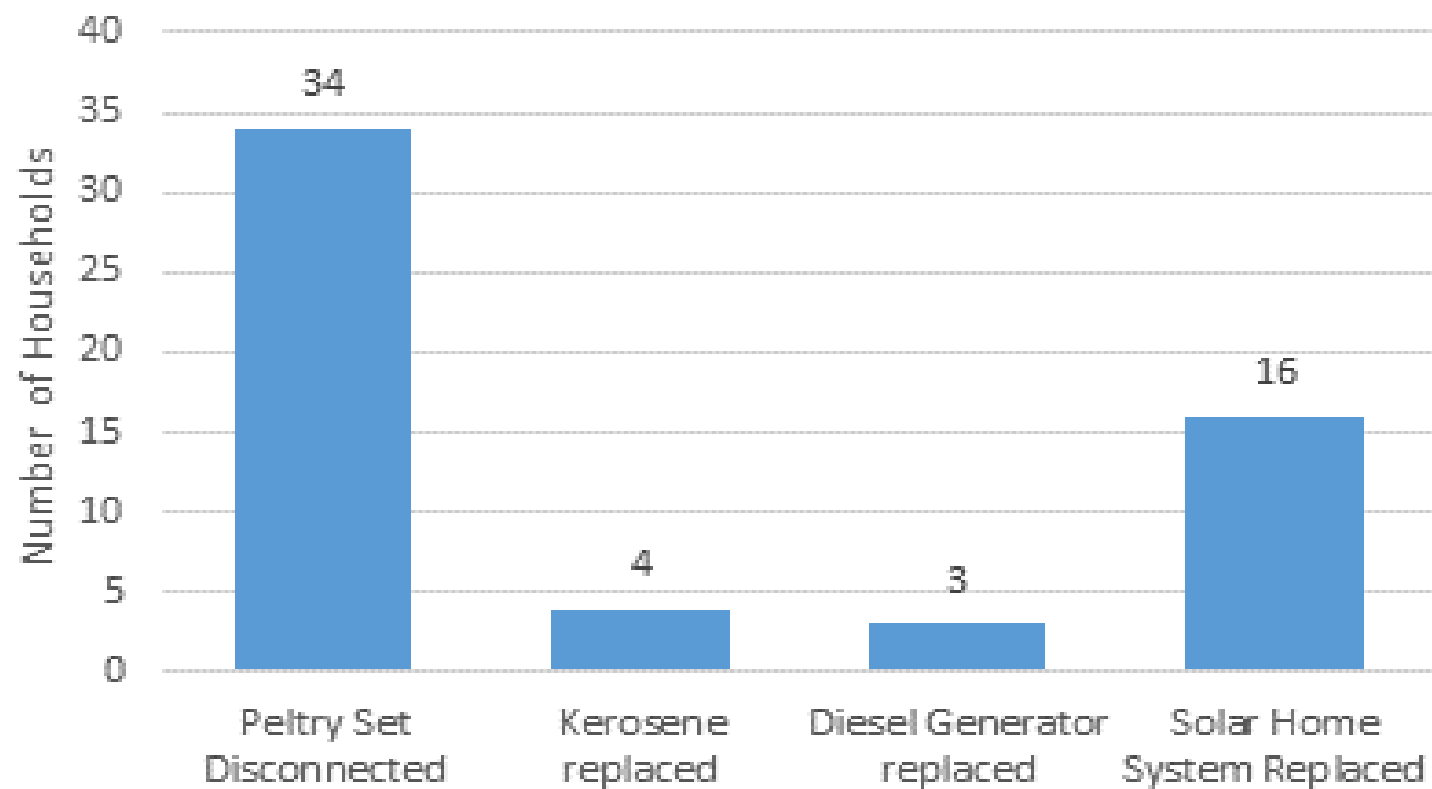


Case Study- Halesi Solar Micro Grid Project

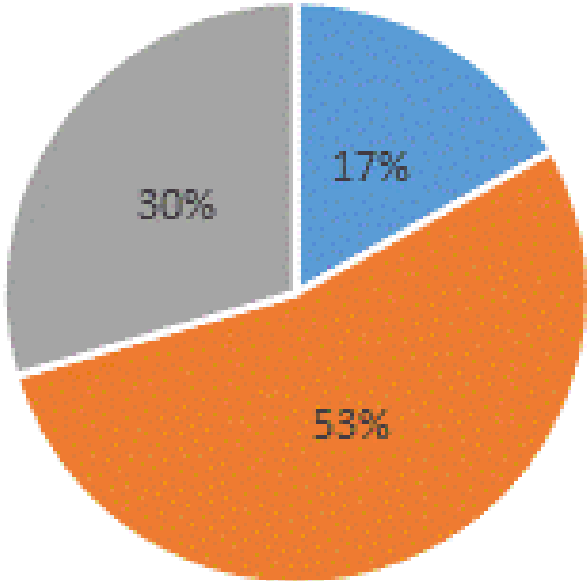
- **Aggregation:** 3 dispersed, remote villages combined into one larger project for viability
- **Sustainability:** Locals trained for operations & maintenance in case of power supply emergencies
- **Innovative Technologies:** Pre-paid metering/mobile payment for regular payment collection and data collection
- **Wide Range of Productive End Use:** Telecom tower, Fuel Station, Hotels, Poultry, Internet Cafe etc.



Moving to higher energy ladder

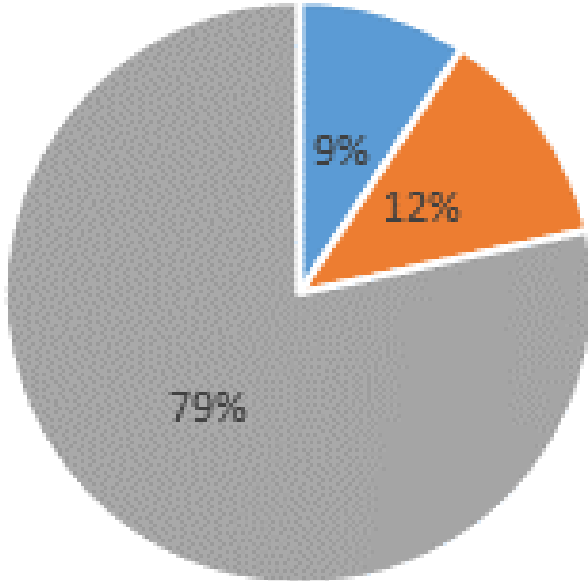


Revenue of the mini grid by consumer types



■ Households ■ Businesses ■ Tower

Harkhapur

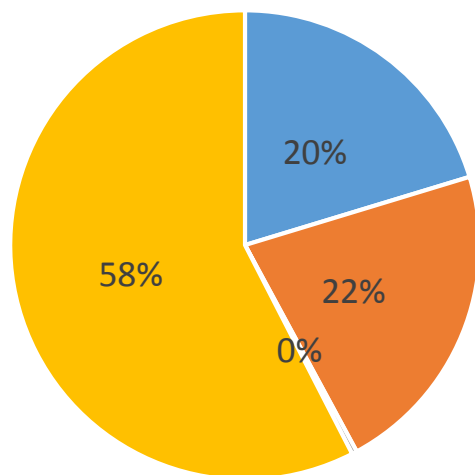


■ Households ■ Businesses ■ Tower

Chayasmitar

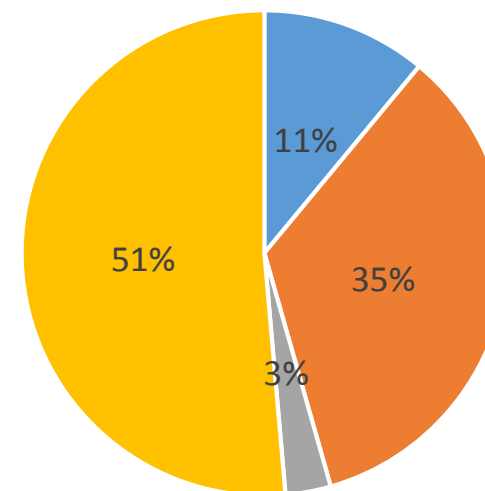


Mobile Phone as PEU- Icing on the cake



- DTH Topup
- Mobile Topup
- Balance Transfer
- P2P & Bank Transfer

Harkhapur

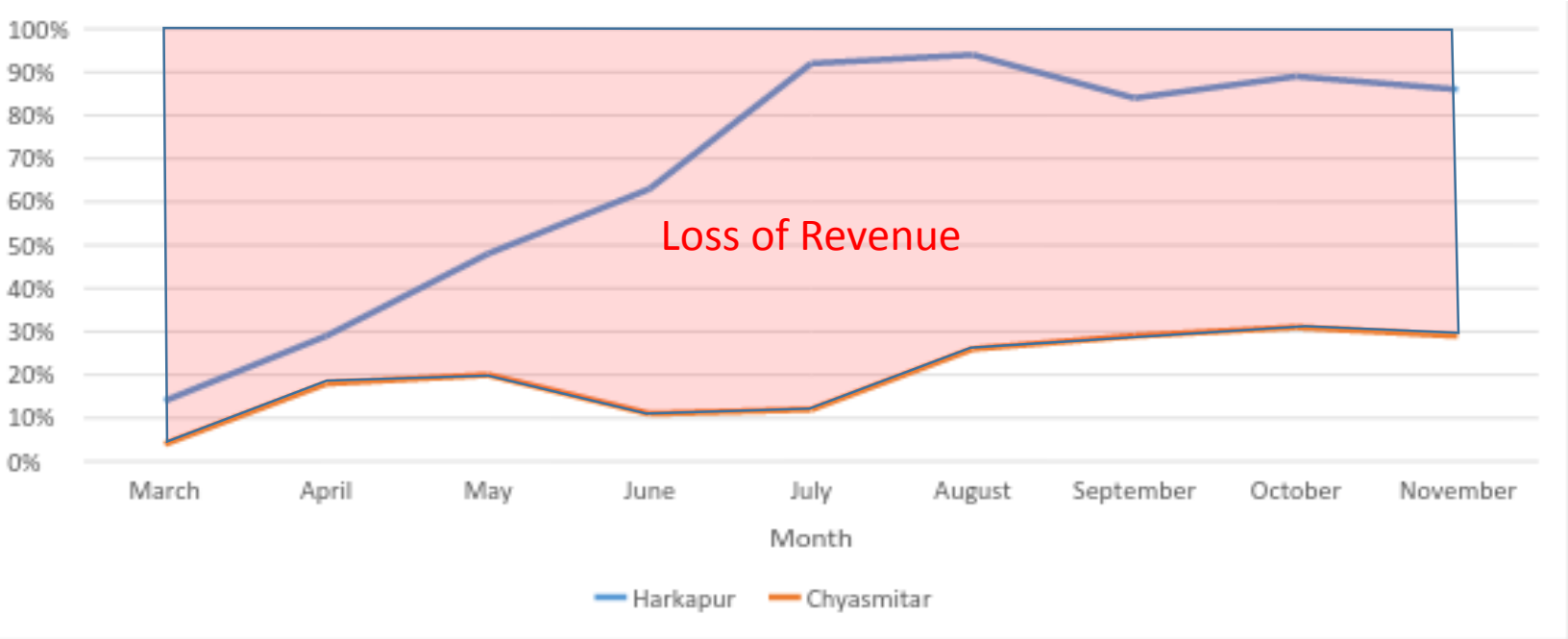


- DTH Topup
- Mobile Topup
- Balance Transfer
- P2P & Bank Transfer

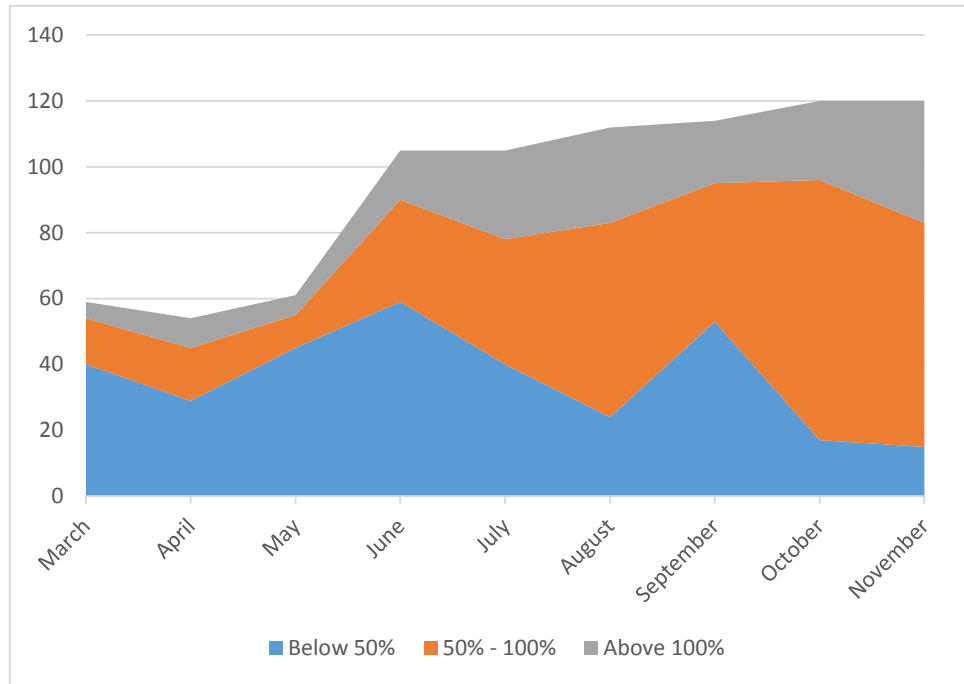
Chayasmitar



The plant factor

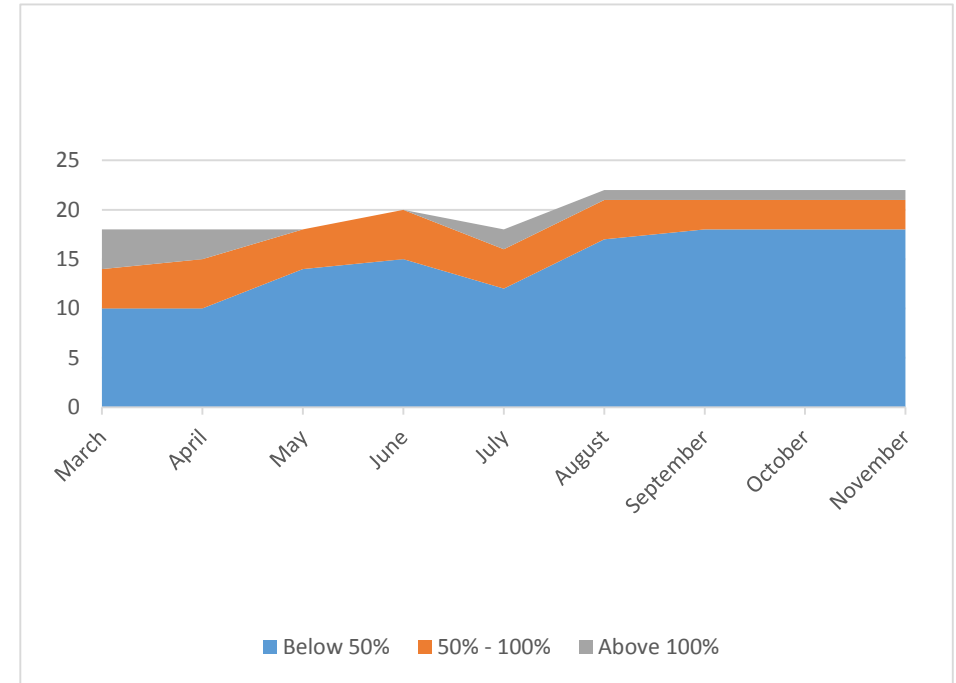


Consumption V/S Allotted Quota



Harkhapur

IRR: 11%



Chayasmitar

IRR: 4%



Key Take Away

- Every sites are unique and the opportunities and challenges they offer;
- Diffusion of PEU via mini-grid
 - Easier at sites with already some PEU activities (e.g. trekking routes, market centers);
 - Equally difficult at sites without any existing or limited PEU- Set your inputs/assumption carefully.
- Rationalize Tariff Regime as per site conditions-the revenue collected from the household shall alone sustain the system at the site with lower PEU prospect .
- Planning for PEU of electricity right from project identification help usability of the mini grid right from an early stage.



Acknowledgement

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Gham Power

Thank You