**COMMUNITY-BASED RENEWABLE ENERGY SOLUTIONS**

**TECHNOLOGY**

**KEY POINTS**

- Your community can generate electricity from Solar, Micro Hydro, Biomass, and Wind energy, depending on resource availability.

- Renewable energy (RE) systems can be on-grid, off-grid, or both. Off-grid systems can be sized for households, the community, or enterprises.

- Over the last 30+ years, over 5,000 off-grid RE systems have been developed, with close collaboration between communities and local RE entrepreneurs.

- Depending on the system size, off-grid RE can power lighting, phone charging, small appliances, cooking, water pumping, and agriculture processing.

- Micro hydro and biomass systems do not require battery storage, so they are often less costly. Off grid solar and wind energy systems require batteries, which are costly and need to be replaced. However, solar and wind water pumping systems do not need batteries.

- Financial viability, local technical capacity building, social cohesion, and the environment are important factors for long life of community-based RE.
Off-grid RE has flourished in Myanmar since the 1990s. In the scale of <1MW, as of 2020, 5,000+ small-scale hydro, 8,000+ biomass gasifiers, 50+ solar mini-grids, 240,000+ solar home lighting systems, 1,000s of solar and treadle pumps, and 2 wind systems have been installed. The rollout models and the actors involved in these installations provide insight on how to accelerate sustainable clean energy access.

Existing Renewable Energy Systems <1MW

**Biomass Projects (including enterprise-based systems)**
C.Grecean 2019, CSO Study 2014, private sector estimates 2019

**Micro Hydro Projects**
C.Grecean 2019, CSO Study 2014, Roland Berger 2019

**Solar Mini-grids**
Not including solar home, rooftop, & pumps.
Roland Berger 2019, private sector 2020

### SMALL-SCALE HYDRO MODELS

**Village Electrification Committee (VEC)**

- **Self-funded Example**
  Htan Hla Pin Micro Hydro, Shan State,
  Installed: 2004, Capacity: 20kW,
  Connections: ~150 households, flat tariff,
  Funding: 100% VEC funds,
  Financed by: Manufacturer-Supplier,
  Status: Used for lighting, TV, phone charging

- **Government-funded Example**
  Tarlapine Micro Hydro, Thaninthayri State,
  Installed: 2015, Capacity: 50 kW,
  Connections: 60 households, flat tariff,
  Funding: 100% Government funds,
  Status: Replaced with diesel generator

**Cooperative-owned**

- **Self-funded Example**
  Mae Muk Micro Hydro, Shan State,
  Installed: 2012, Capacity: 80kW,
  Connections: 700 households, metered,
  Funding: Cooperatives of 30+ members,
  Financed by: Cooperative members & investors,
  Status: Upgrading to 300kW for enterprise use

### BIOMASS GASIFIER MODELS

**Biomass Mini-Grid Examples**

- **Self-funded Example**
  Hlaingbone Gasifier, Ayeyarwaddy,
  Installed: 2015, Capacity: 200 kW,
  Connections: 300 households, metered,
  Funding: 100% VEC funds,
  Financed by: Manufacturer-Supplier,
  Status: Operating for all end uses

- **Subsidized Example**
  Betut Village Gasifier, Ayeyarwaddy,
  Installed: 2019, Capacity: 200 kW,
  Connections: 500 households, metered,
  Funding: 60% NEP subsidy, 20% VEC,
  Financing: 20% Manufacturer-Supplier,
  Status: Operating for all end uses

**Enterprise-based Biomass Gasifier Example**

- **Co-funded Example**
  Thein San Rice Mill, Ayeyarwaddy,
  Installed: 2019, Capacity: 200 kW,
  Financing: 60% RBF, 40% Rice Mill,
  Status: Operating

### SOLAR PV MODELS

**Village Electrification Committee (VEC)**

- **subsidized Mini-Grid**
  Kanti PV Mini-grid, Thaninthayri,
  Installed: 2015, Capacity: 49 kW,
  Connections: 500 households metered,
  Funding: 60% NEP subsidy, 20% VEC,
  Financed by: 20% Supplier, 20% VEC, Status: Operating

- **Solar Pumping**
  REAM PV Pumping Revolving Fund,
  Initiated: 2018, Capacity: 60-250 ft. head, 2,500-5,000 gal/day,
  Financing: A-Bank,
  Status: 10 farmers financed

- **Solar PV Cooking using Recycled Li-ion Batteries**
  SWITCH Batteries, AMPERES, REAM, Yi-Mon Electronics,
  Installed: 2020, Capacity: 1kW,
  Financing: Modern Energy Cooking Services (MECS),
  Status: 2 battery-packs built locally
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- Solar Mini-grids
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#### Small-Scale Hydro Models
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#### Solar PV Models
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  - **Subsidized Mini-Grid**
    - Kanti PV Mini-grid, Thaninthayri, Installed: 2015, Capacity: 49 kW, Connections: 300 households metered, Funding: 60% NEP subsidy, 20% VEC, Financed by: 20% Supplier and others, Status: Operating
  - **Solar Pumping**
    - REAM PV Pumping Revolving Fund, Initiated: 2018, Capacity: 60-250 ft. head, 2,500-5,000 gal/day, Financed by: A-Bank, Status: 10 farmers financed
  - **Solar PV Cooking using Recycled Li-Ion Batteries**
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