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Energy Efficiency for Energy Access

Appliance Efficiency in Resource-Constrained Settings

Richenda Van Leeuwen
Executive Director, Energy Access
United Nations Foundation

www.unfoudnation.org
www.energyaccess.org
THE ENERGY ACCESS GAP

THE PROBLEM:
Over 1.1 billion people around the world have no access to electricity
and the many development benefits it brings – improving health, generating income,
enabling education, improving security, and empowering women.

THE NEED:
The International Energy Agency estimates that 60% of new electricity needs will have to be met by distributed (mini- & off-grid) solutions.

THE FRAMEWORK:
The UN-Led Sustainable Energy for All initiative seeks to achieve universal energy access by 2030 as one of its three goals, the others being doubling the rate of improvement in energy efficiency and doubling the share of renewables in the global energy mix.

THE SOLUTIONS:
A range of options exist and are ready for scale for off-grid rural electrification. Energy Access Practitioner Network members are working with technologies including:

- Solar Photovoltaic (PV) Systems
- Mini-Grids
- Biomass
- Small Hydro
- Small Wind

*Statistics based on responses from the UN Foundation’s 2014 annual survey: “Growing the Network: Building Impact”
"Ladder" of sustainable energy solutions & services

- **Tier 1** - Task lighting & phone charging/radio
- **Tier 2** – General lighting, television & fan
- **Tier 3** – Tier 2 & low-power appliances
- **Tier 4** – Tier 3 & medium-power appliances
- **Tier 5** – Tier 4 & high-power appliances

* Tiers of access are drawn from the Sustainable Energy for All initiative’s Global Tracking Framework.

Photo credits:
- d.light design, Greenlight Planet
- Leonics
- Solaric
- Zreyas Technology
- Sunbird Energy

Photo credits: Nano-Grids

Photo credits: Micro/Mini-Grids

Photo credits: Grid-connected
Solutions and entry points

Figure 1. Incremental Electricity Generation and Investment in the Universal Modern Access Case*, 2010-2030

- **Additional generation**: 952 TWh
  - Mini-grid: 42%
  - Urban grid: 33%
  - Grid connections**: 40%
  - Distribution: 39%
  - Transmission: 37%
  - Isolated off-grid: 18%
- **Additional investment**: $700 billion (2009 prices)
  - Mini-grid: 43%
  - Grid connections**: 37%
  - Generation: 20%
  - Isolated off-grid: 20%

*Compared with the New Policies Scenario
**Includes generation, transmission and distribution for both urban and rural grids


Off-grid Solutions

Hybrid Solutions

Grid Extension

Energy Efficient Equipment
Appliance efficiency is a crucial component in energy service delivery to maximize cost effectiveness and utility in load-constrained environments.

Increasingly, off-grid energy service providers are including energy-efficient appliances in “energy as a service” models, including TVs, fans, irons & more.
Role of appliance efficiency in medical settings

Main services requiring **reliable energy**:
- refrigeration (vaccine fridge, blood bank)
- light for operating rooms
- ventilation and air conditioning
- medical devices (e.g. Doppler, microscope, ultrasound)
- communication devices and other ICT, including phone charging
- sterilization (autoclave, dry heat sterilizer)
- water supply management

Energy-efficient medical appliances currently in use:
- direct-drive vaccine fridges (Dulas)
- fetal Doppler (We Care Solar - solar suitcase)
- battery-operated blood glucose monitors
- LED-lit microscopes for tuberculosis diagnosis

*Photo credit: We Care Solar*
*Photo credit: Dulas*
THE ENERGY ACCESS PRACTITIONER NETWORK

GOALS:

- PROMOTE NEW TECHNOLOGIES AND INNOVATIVE FINANCIAL & BUSINESS MODELS,
- PROVIDE A PLATFORM TO CONVENE AND CONNECT A RANGE OF STAKEHOLDERS AROUND NEW PARTNERSHIPS,
- FACILITATE THE DEVELOPMENT AND ADOPTION OF QUALITY STANDARDS.

AT A GLANCE

- The Practitioner Network supports primarily market-led decentralized energy applications towards

  **ACHIEVING UNIVERSAL ENERGY ACCESS BY 2030.**

- **OVER 2,000 MEMBERS, BASED IN 85 COUNTRIES AND OPERATING IN 170 COUNTRIES.**

VALUE

*Members value the Practitioner Network for:* information sharing, peer-to-peer learning, networking opportunities, connecting access to finance, enabling partnerships and increased visibility.

Statistics based on responses from the UN Foundation’s 2014 annual survey: *Growing the Network: Building Impact*
The Practitioner Network works closely with initiatives such as Global LEAP, E4A Coalition & Lighting Global to advocate for energy efficiency for energy access – in particular appliance efficiency in resource-constrained areas.