

Workshop on

Participation of Private Sector
in Overcoming Energy Poverty in SAARC
Member States

**Understanding Energy Poverty and
Challenges/Solutions for Electrification,
Clean Cooking and Heating**

By

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Energy Poverty is
*the lack of access
to modern fuels*

Energy impoverished tend to

- consume low amounts of energy overall
- rely on human and animal power for mechanical tasks
- devote considerable time to procuring and processing fuel
- spend a relatively large portion of their income on fuel

2.5 billion people rely on solid biomass for cooking/heating
1.1 billion people do not have access to electricity

There are several different approaches to define energy poverty

- Minimum amount of energy necessary to cook, light and heat someone's home.
- Energy being used by households below the known expenditure or income poverty line
- Percentage of income spent on energy
- Level of energy demand as it relates to household income.

Definition from Practical Action

A person is in 'energy poverty' if they do not have access to at least:

(a) the equivalent of 35 kg LPG for cooking per capita per year from liquid and/or gas fuels or from improved supply of solid fuel sources and improved (efficient and clean) cook stoves

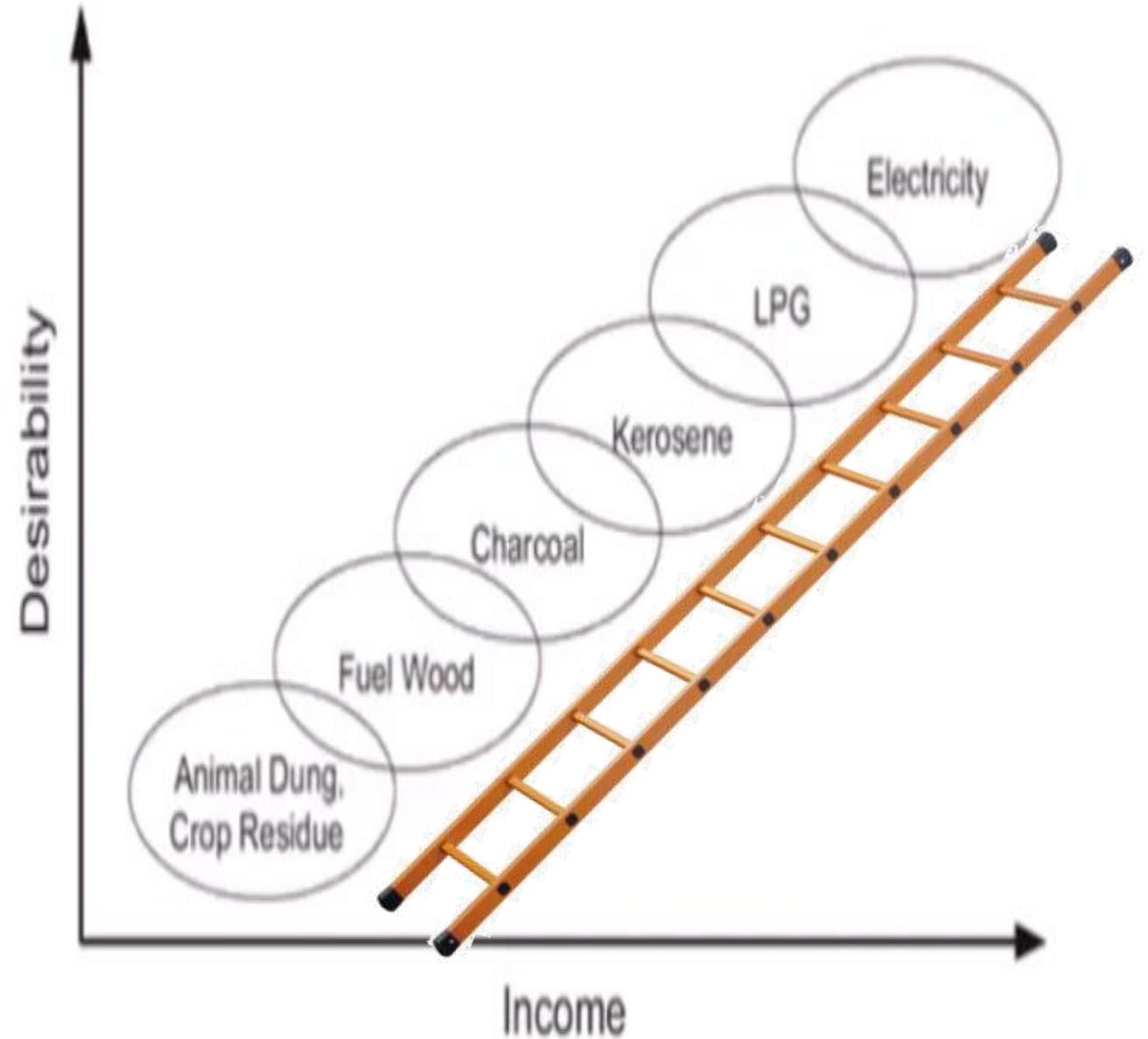
(b) 120kWh electricity per capita per year for lighting, access to most basic services (drinking water, communication, improved health services, education improved services and others) plus some added value to local production

An improved energy source for cooking is one which requires less than 4 hours person per week per household to collect fuel, meets the recommendations WHO for air quality (maximum concentration of CO of 30mg/M³ for 24 hours periods and less than 10mg/ M³ for periods 8 hours of exposure), and the overall conversion efficiency is higher than 25%.

Typical end uses by energy source in developing countries.

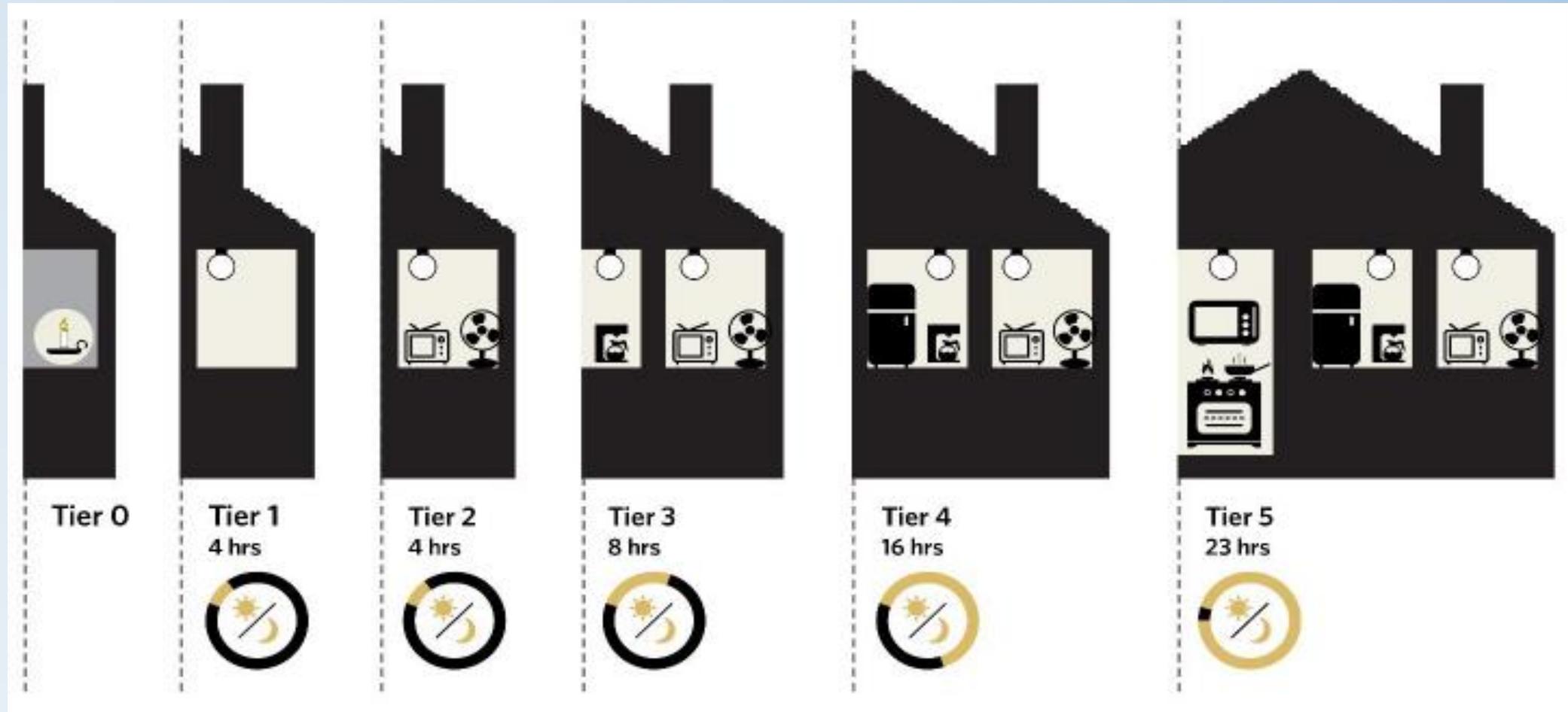
Typical end uses	Income level		
	Low	Medium	High
Household			
Cooking	Wood, residue, dung	Wood, charcoal, residues, dung	Wood, charcoal, LPG, coal
Lighting	Candles, kerosene	Candles, kerosene	Kerosene, electricity
Space heating	Wood, residues, dung	Wood, residues, dung	Wood, residues, dung, coal
Radio/television	None	Grid electricity and batteries	Grid electricity and batteries
Space air-conditioning	None	Electricity (fans)	Electricity, kerosene, LPG
Agriculture			
Tilling	Human labor	Draft animals	Animal, gasoline, diesel
Irrigation	Human labor	Draft animals	Diesel, grid electricity
Processing	Human labor	Draft animals	Diesel, grid electricity
Industry			
Milling/mechanical	Human labor	Human labor, draft animals	Grid electricity, diesel
Process heat	Wood, residues	Coal, charcoal, wood, residues	Coal, charcoal, wood, resid.
Cooling/refrigeration	None	None	Electricity, LPG, kerosene
Services			
Transport	Human labor	Draft animals	Diesel, gasoline
Telephone	None	Batteries	Grid electricity

Energy Ladder:
households tend to
transition from less
desirable fuels to more
desirable as income
increases [16]



Energy-related livelihood strategies.

Livelihood strategy	Means
Gaining additional income by retailing energy services up the "energy ladder"	<ul style="list-style-type: none">• Fuels (wood, charcoal, dung, crop residues, kerosene, LPG)• Conversion technology (stoves, lamps, batteries, motors, PV systems)
Gaining access to improved energy services at the household level by saving time, or fuel switching	<ul style="list-style-type: none">• Improved biomass stoves• Improved lighting (from candles to kerosene to electricity initially from batteries)
Gaining access to improved energy services, by increasing production efficiency	<ul style="list-style-type: none">• Improved energy services result in increased productivity (e.g., through mechanization), which results in a greater ability to pay for improved energy services. Opportunities range from the lowest technologies and the smallest scales upwards (for example, agro-processing, small and microenterprises)
Grouping with others to obtain access to improved energy services, for production, household consumption or for community services (health centers, schools, security lighting, and information and communication technology)	Community-based activities enable labor to be converted into capital (e.g., through civil works) and capture the economies of scale associated with energy supply technologies, such as connecting to the grid (transformers and distribution systems) and installing microhydro generators, small diesel engines or acquiring mechanized transport services, and the like, or "pooling demand" to provide political or commercial pressure to gain access to energy services



SEforAll's Multi-Tier Framework (MTF)
Ladder of Energy Access

Rural Communities

Common Characteristics

- decentralized population
- geographic isolation
- underserved in terms of health care, education, clean water, sanitation, and other infrastructure
- unable to participate in regional and national markets



Fuel Choice Drivers

Quality



- High efficiency
- Controllable output
- Consistent performance
- Low/zero emissions

Convenience



- Point-of-use delivery/locally-available
- Reliable supply
- Little/no processing required
- Familiar/easy to use
- Versatile
- Safe
- Does not require storage

Cost



- Low fuel cost
- Low equipment cost
- Stable price
- Can be purchased in small or large quantities

Electrification Approaches

Solar Lanterns



Solar Home Systems



Energy Kiosks



Mini-Grids





THERE IS
NO SINGLE
SILVER BULLET
SOLUTION

Barriers and Challenges for Universal Access to Clean Cooking and Heating in the Country

- Most of the rural/off grid areas in Pakistan still depend on wood-burning stoves for food preparation and warmth. Inefficient traditional stoves emit copious amounts of smoke that lead to health issues such as acute respiratory infections and eye soreness. They also burn large amounts of fuel which means arduous hours collecting fuel and smoke-filled homes.
- With the depletion of gas reserves , rapid increasing prices and widening gap between demand and supply of gas, LPG cylinders demand is on the rise.
- LPG cylinder distribution under a subsidy scheme for the poor to help avert deforestation is still need to be focused upon.
- Laying off-grid distribution networks of liquefied petroleum gas (LPG)
- Reliable services for biogas plants in plain areas through Pakistan Council for Renewable Energy Technologies and Rural Support Programs have also assisted rural communities to have access to clean cooking/heating solutions.

National Strategies and Policies

- Mainstreaming clean cooking/heating in relevant Energy, Climate Change, Forest , Health and Poverty Alleviation Policies.
- Development of National Improved Cook Stoves Investment Plan
- Need of Clean Cooking Strategy much like the Electrification Strategy
- Biomass/Biofuel mapping
- Independent Research/Ranking of Available Stoves (Biomass based, Solar Cookers etc.)
- Synergy between Government Institutions, Innovation Fund, Local & International, Multi-lateral Institutions, Academic & Research Institutions, Global/Regional Alliance



Aga Khan Planning and Building Services, Pakistan
BUILDING AND CONSTRUCTION IMPROVEMENT PROGRAMME - BACIP

Research Report on BACIP Wood Stoves for High Mountain Areas

*Designs for Traditional Houses in the Northern Areas,
Including Warm Water Facility*

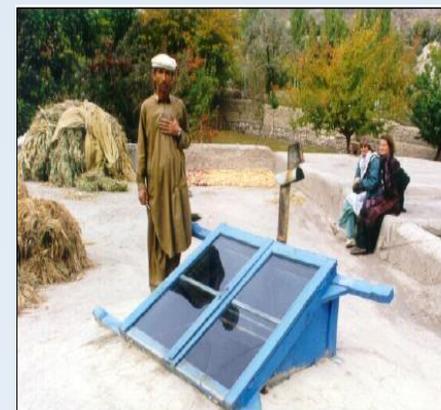
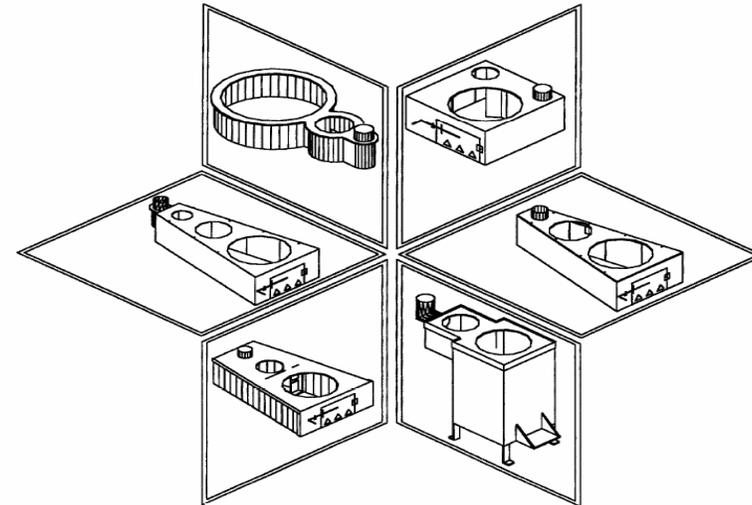


FIGURE 7. ROOF HATCH WINDOW CONTROL THE AIR FLOW/REDUCES FIREWOOD

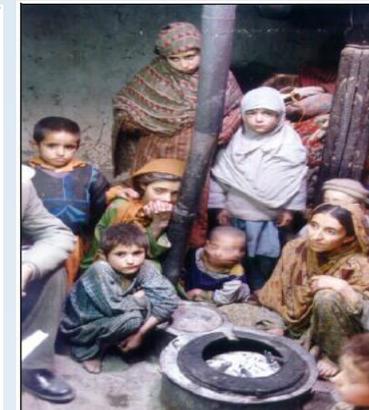


FIGURE 8. THE FAMILY USUALLY GATHERED AROUND THE HATCH WINDOW OF THE

Successful Interventions/Projects in Clean Cooking & Heating

- New Startups
- District Government Plans
- School Project
- NGOs involvement

A MANUAL
SGP Energy Efficient Cook-stove





Lighting a Million Lives Project



E-Mandi



Goats for Water



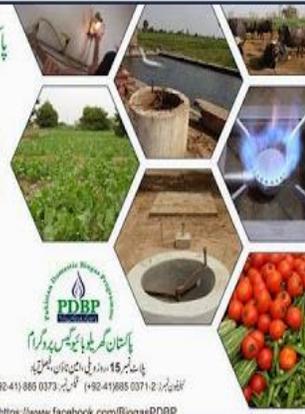
Goats for Solar




پاکستان بھر میں سب سے کم قیمت پر عالمی معیار کے 3,300 سے زائد بائیو گیس پلانٹ لگا دیے اور واحد ادارہ

بائیو گیس پلانٹ لگوائیں

- ٹیپ ویل چلائیں۔۔۔ ڈیزل کا خرچ چھائیں، کھیتوں کیلئے پانی مفت حاصل کریں
- چلہا گیس پر چلائیں۔۔۔ کھڑی اور سلٹرز کا خرچ چھائیں، مچھوں سے نجات پائیں
- بائیو سٹریلر پائیں۔۔۔ فضلوں کی پیور ہڈیاں بنائیں، کیمیائی کھادوں کا خرچ چھائیں



RSPN
رہول سپورٹ پروگرامز اینڈ ورک
7 ہنریٹ 49-614، اسلام آباد
www.rspn.org

علاقائی نمائندے کو اپنی کنٹرول سنٹرز

0307-5551317	نورپاک سنگھ	0308-5209513	میرعلی آباد
0301-8567260	شہباز احمد	0307-5551315	سرگودھا اور قنبرا
0301-8567261	ساجد علی	0307-5551316	ہنگام اور مینٹ
0302-8555873	امجد علی		

PDBP
پاکستان گریڈ بائیو گیس پروگرام
پلانٹ نمبر: 18، ڈھول ٹیپ، کمان، گلگت بلتستان
تلفون نمبر: 090-411885 0371، 090-411885 0371
https://www.facebook.com/BioGasPDGP

Solar Bibi --- Women Role---Shama Bibi



- SPIS Schemes
- DG Projects
- Poverty Alleviation Programs
- Contractor Models
- Pay As You Go Models
- Energy Service Company Models
- CSR Models

Decentralized Solar Through Easy Installments.

Solar energy is leapfrogging the electric grid, reaching places that have never seen connectivity. But the solar energy sector in Pakistan has been unable to deliver affordable and reliable solutions to people residing in rural settings.

Switch Life ON.



Pay As You Go

We offer long-term financing, so customers can pay in affordable installments, eventually owning the product.



Mobile Money

Integrated with telecom providers so that mobile wallets can be used for accurate, secure and on-time payments of loans.



Data driven credit scoring

Using consumer data we evaluate loan applicants via a quantitative credit scoring model to carefully select our customers.



Rural electrification and off-grid market

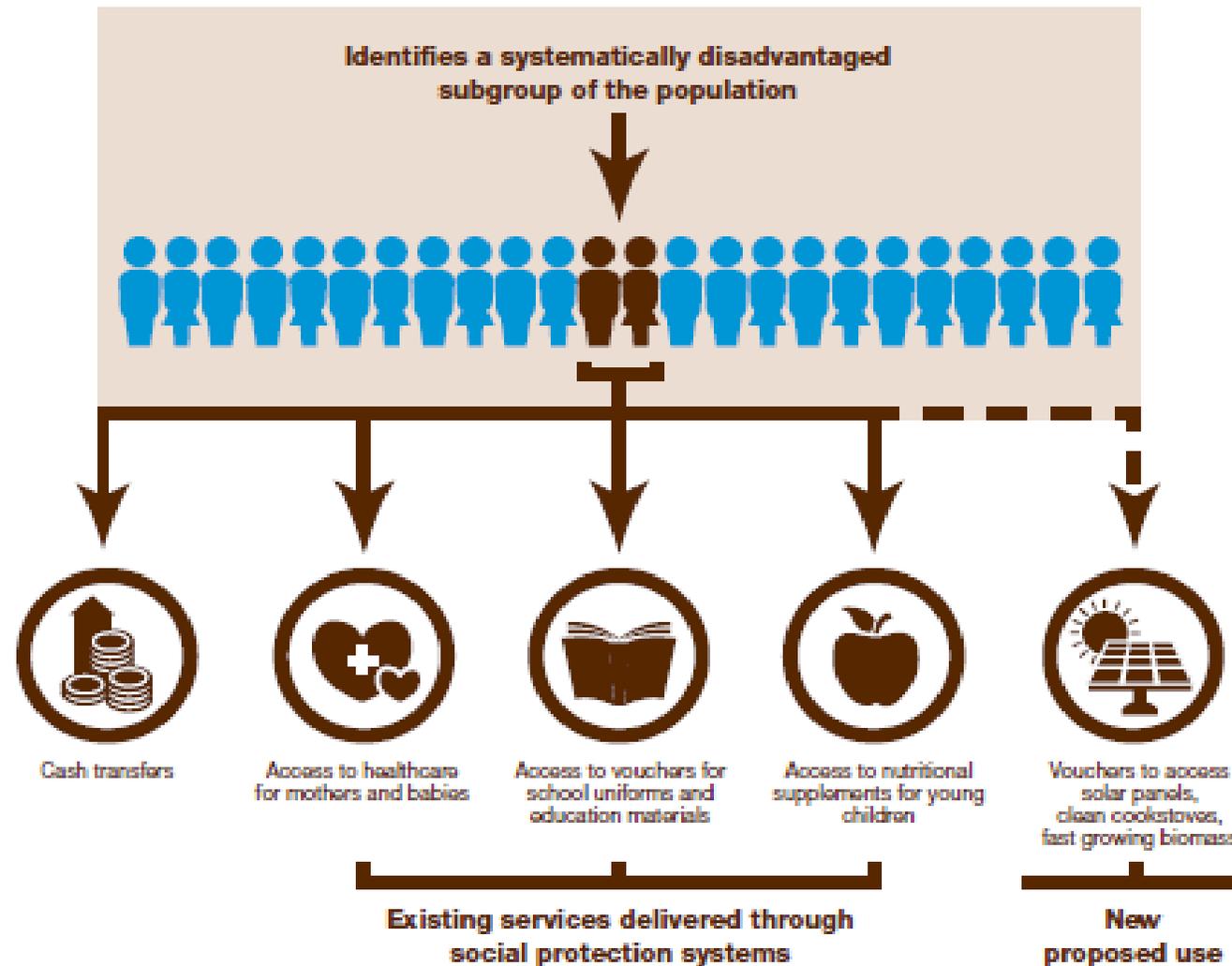
In the absence of the government policies, neither public sector nor private sector has put serious efforts for development of micro/mini-grids for rural electrification. Rural areas lack technical skills and no financial incentive for development and implementation of any such technology. There is a lack of standardization for solar PV which has resulted in the poor performance of small-scale systems. It also lowered end-user confidence in stand-alone systems.

The Private sector has highlighted the issues with the investment in rural areas such as:

- Solar PV installation offered in some region for free by Government and donor agencies;
- Commercial risks and higher investment costs;
- No information available of market potential;
- Lack of financing mechanism for solar installation for small scale solar installation;
- Lacking Government support.

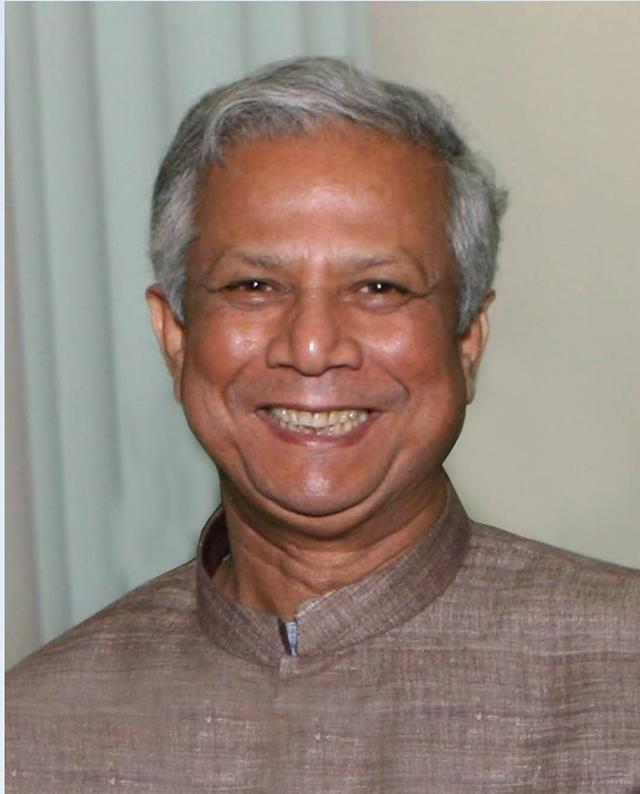
Pakistan Poverty Alleviation Fund and GIZ demand assessment study indicated that over 72% rural population are interested to take microloans for solar home systems. There are very limited facilities available which offer the loan to purchase the solar housing system. Though there is high demand but the absence of a market for financing. The government can play a very vital role in defining the policy implementation framework developing regulatory and policy guidelines. Nevertheless, the private sector is eager to provide an off-grid solution to rural areas if that regulatory and financial mechanism is in place.

Social Protection in Ending Energy Poverty



Targeted beneficiaries can include:

Labour constrained households | The elderly | Female headed households
People with disabilities | People living in chronic poverty



Grameen Shakti (Rural Energy), one of the companies developed by the 2006 Nobel Laureate, Dr. Muhammad Yunus, has since 1996 implemented an effective model to deliver renewable energy to the off-grid areas and rural poor in Bangladesh. The Grameen Shakti renewable energy program includes: solar energy through their Solar Home System (SHS); biogas for use as cooking fuel, electricity production and organic fertilizer; and improved cooking stoves (ICS). The model also includes a **social business component** that: creates employment; fosters entrepreneurship; empowers women, youth and communities; breaks the cycle of energy poverty; and contributes to the United Nations' SDG/MDG. The Grameen Shakti model is expanded rapidly in Bangladesh and begun to be replicated outside the country. Great strides in overcoming the problem of energy poverty can be achieved by expanding the replication of the Grameen Shakti model through cooperation between governments, corporations, investors, and/or social entrepreneurs.

Contribution of each factor to domestic energy poverty, by country



A new index that compares rates of [#energypoverty](#) across the [#EU](#) released today! Rankings confirm the need for social innovation in lowest ranking countries [#bulgaria](#) and [#hungary](#). While [#czechrepublic](#), [#poland](#) and [#romania](#) got higher scores than expected, the problem is far from solved!

Social Innovation to Tackle Energy Poverty!

“ We are looking for social innovators with solutions to tackle energy poverty in Poland, Czech Republic, Hungary, Romania and Bulgaria!

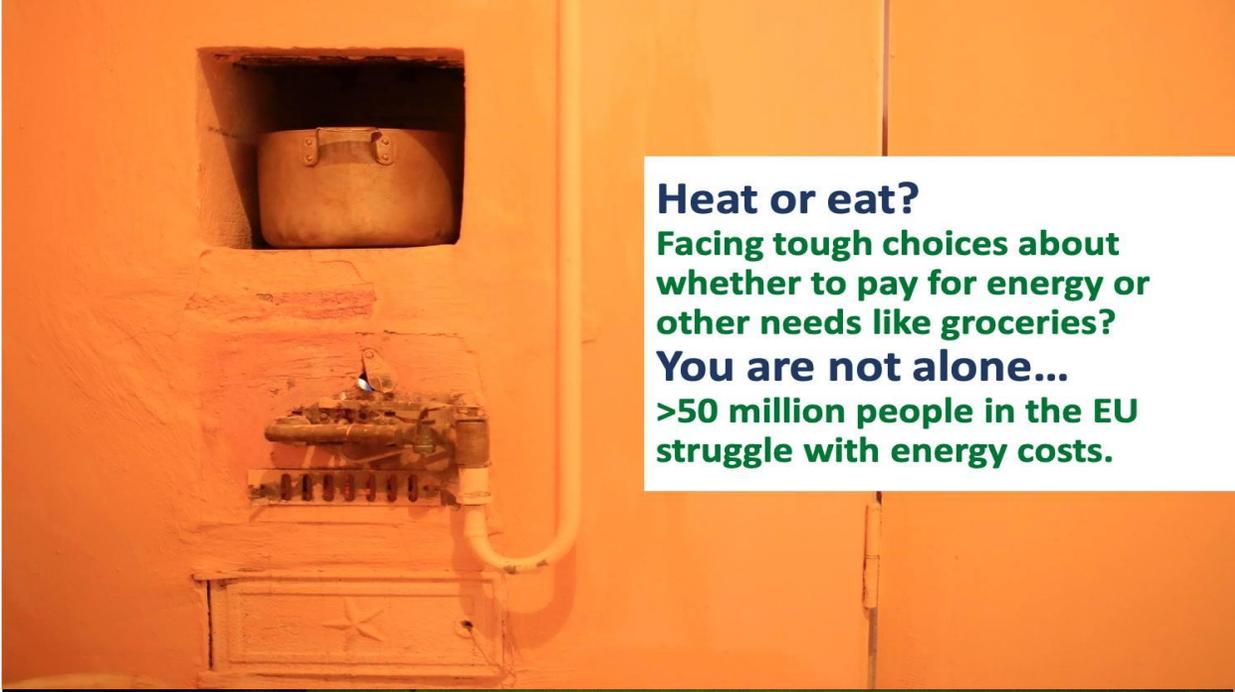
SOCIAL

INNOVATION

TO TACKLE ENERGY POVERTY

co-created by





Heat or eat?

Facing tough choices about whether to pay for energy or other needs like groceries?

You are not alone...

>50 million people in the EU struggle with energy costs.



Across Eastern Europe, low-quality homes are a major contributor to energy poverty.



Children are more vulnerable to cool temperatures. What looks like a cold brought home from school could be an effect of energy poverty.

In 2016, over 300 000 homes in Germany faced being disconnected from electricity systems because they couldn't pay their utility bills.



Casefilter

Timeline

Legend

Country



Poverty Reduction and



Practice Field



Case Details



Cross-Cutting Themes



Sectors



Geographical Scope



Last Update



Enabling Action Area:

Policy and Financing Mechanism for Off-Grid Rural Electrification-

- The goal of universal access to energy is not possible without 100 percent electrification of rural areas. There is a need for comprehensive rural electrification plan and tracking framework. Moreover, the off-grid / distributed solar system needs government policy and regulatory framework. Similarly, to promote mini-grids cannot achieve success in the absence of **clearly defined policy mechanism**.
- **The rural electrification programs are considered to be high-risk investment due to low income clientele.** Some studies propose that rural electrification cannot be sustained on client revenues and needs external financing. This result in governments offering subsidies, grants and concessional loans. However, some of these mechanisms indirectly destroy the market in which private sector can thrive with their innovative financing and product line. However, the government should facilitate the micro-financing mechanism for rural clients to develop a sustainable market-based model.

Conclusions & Way Forward

- **Energy services for poverty reduction are less about technology and more about understanding the role that energy plays in people's lives and responding to the constraints in improving livelihoods.**
- **Energy needs should be considered within the overall context of community life, and energy policies and projects should be integrated in a holistic way with other improvement efforts relating to health, education, agriculture and job creation.**
- Policies, programs and projects should start from an assessment of people's needs rather than a plan to promote a particular technology.
- The needs of different rural communities vary widely, and finding appropriate technologies and effective implementation strategies can be very site-specific.
- As a result; energy is needed for household uses, such as cooking, lighting, heating; for agricultural uses, such as tilling, irrigation and post-harvest processing; and for rural industry uses, such as milling and mechanical energy and process heat. Energy is also an input to water supply, communication, health, education and transportation in rural areas.

(END)
ENERGY POVERTY