

Productive Use of Renewable Energy (PURE)

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A. Approaches in rural electrification

There are four principle alternative situations or approaches in rural electrification observed which will determine the options and activities of promoting the productive use of electricity there.

(1) The extension of the public grid in rural areas

In this case the owner of the public grid or the leaseholder who has the right to transmit and distribute electricity through this extension to the new accessible rural area would have a strong interest to promote - next to the consumptive use - the productive use of electricity to increase his sales in the new area. He could do this either directly by establishing his own internal service of “productive use marketing” or by facilitating contacts between potential clients and related existing external public or private services to use electricity productively. The consequences of those two options will be dealt with below.

(2) The electricity supply by an IPP to the public grid

This case is a slight diversion from the first one. The IPP takes initiative. He will not only sell to the public grid, but will also assure the distribution of electricity within the vicinity of his transmission line between the location of electricity production (e.g. Hydro power station, bio gasifiers or digesters) and the public grid. This case will only apply if the owner of the public grid will not take own initiative or will sub-contract the new area to the IPP.

(3) An isolated or stand-alone local grid in remote rural areas or in single villages

In this case the owner of the local grid (Rural Energy Service Company – RESCO/ REE - or a commune based organisation – CBO) will provide electricity to its immediate rural area / neighbourhood/ village or number of villages. He has a great interest to maximize the sales of electricity by promoting its productive use next to its consumptive use targets. In particular in the case of a hydro power 24 hour service he needs to identify opportunities at low consumption periods (after midnight or during day times) to increase the load factor. In any case the RESCO or CBO needs to cover cost and to generate some profit to remain sustainable.

(4) An individual household electricity supply situation

In this case the owner runs its own electricity supply (diesel generator, SHS, wind or water turbine, bio gasifier, etc.) for direct use or recharging batteries for later use. All these systems could be used – next to consumptive applications such as lighting, TV or radio – for some income-generating

activities such as soldering, welding, grinding, sewing, hair cutting etc by appropriate productive use applications as well.

B. Productive Use Approaches

Productive use of electricity is closely related to the promotion of small and micro business promotion to create employment and introduce income-generating activities.

This could be done by activities such as

- rapid appraisal of rural business potentials and markets;
- accessing small investment opportunities (pre-feasibility studies);
- providing micro credit facilities or small investment loans,
- demonstration of appropriate technologies in local / regional trade fairs or road shows;
- Others such as a technology catalogue (Mongolia), marketing support, etc.

Not all those opportunities might necessarily use electricity, but most of them are closely linked. (Processing of agricultural or forest products, repair or other services such as restaurants, accounting, transport etc.)

As to those four rural electrification situations several approaches of the RESCO, the public energy supplier or concerned government agencies to enhance the productive use of electricity could be considered:

- (1) **Facilitating contacts to existing public or private services** such as commercial banks, credit unions, Small Business Development Agencies, urban hardware dealers/ suppliers, chambers of craft trades, commerce or industry, concerned NGOs, etc. In this case the RESCO could either ask the service providers to assess the situation themselves or provides information on its own rapid assessment of likely opportunities in his area of operation.
- (2) **Setting up own PU promotion services.** If the area of new electricity supply is substantial (e.g. 2 – 3 MW capacity to about 10,000 rural households), it could be feasible/cost-covering for the RESCO to establish its own services to promote the productive use of electricity (activities: see above). In particular in cases where already a larger number of diesel-driven engines or electricity generators exist, it could demonstrate the use and advantage of electric engines or the direct use of plough-in productive use of electricity. The RESCO could become a dealer of this equipment and provide cheap repayment facilities/ loans.
- (3) **Providing special government services.** In the case of small REE and commune-based isolated grids or in the case of individual households it might be useful that the government through its BDS agencies or in cooperation with donor-funded rural electrification programmes would intervene to encourage the productive use of electricity to create new income opportunities. E.g. providing information on available equipment and technologies, cheap loans or contacts to banking facilities, marketing support, etc.

The choice of promotional approaches depends on the existing situation and must be decided case-by-case. There are many options which have not been elaborated here.

PURE – The case of Badakhshan, NE-Afghanistan

Situation:

- Remoteness of buying and selling markets
- Low education, vocational and entrepreneurial skills
- Social order determines economic position in rural communities
- Low cash income (subsistence and barter economy)
- Hampered access to technology (affordability, accessibility, lack of know-how)
- Crime (weak property rights)
- Inefficient energy use (heating, cooking, boiling, lighting, businesses).

Socio-economic pattern:

- Consumption comes in most HH first (esp. house improvement)
- Saving time and money for domestic and subsistence work can lead to potential for productive use. This is more when HH do not lack essential needs such as nutrition and health care. Therefore it is more plausible to focus with PURE promotion more on middle income households rather than on very poor (at least for enterprise promotion).
- Role of opportunity costs is crucial. Household poverty remains high and people chose their livelihood strategies according to existing opportunities. They often have to maximize short term benefits (incomes).

Preconditions for PURE:

- Quality energy necessary. 200-300 KW/meter, 3-phase connections available, stable electricity at reasonable prices (QEP).
- Community activation and participation during planning and implementation of energy supply.

PURE Approach - Sequences:

- Matching supply (hydro-power potentials) with demand (energy demand in businesses)
- Community based implementation of MHP: Additional income by cash for work in the community
- Circulation of funds in the community by local operation of MHP

- Consumptive savings on fuels on HH level
- Substitution of inefficient energy sources in micro-businesses

- Gatherings of businessmen for awareness creation
- Business trainings for PURE
- Promotion of business plans with pro-poor potentials
- Productive Finance

Which products can have success on the market and on which market?

1. Import substation

2. Value addition or enhancement in productivity in agriculture and livestock
3. Product improvement (enhancement)
4. Product innovation (additional products) / changes in market structures etc.

Challenges:

- Avoid crowding out and one thing more: avoid it!
- Link remote areas with (prospering) economic centres
- Facilitate responsible finance – avoid abusive or inappropriate finance for PU
- Show innovate business start-ups and how to replicate them

Guidelines for interventions:

- Structures and measures need to be transparent
- Access to technology should be sustainable (without the project)
- Market interventions should be replicable (feasible)
- Business perspectives need to be promising (viable)
- Interventions should focus more on production rather on services in the beginning of PURE

Challenges

- As an energy programme there are only limited funds for PURE promotion
- Most rural people will invest savings and additional incomes in livestock and house improvements and not (re-) investment in micro-businesses
- Unawareness of natural resources (herbs, spices, semi-precious stones etc.)
- Drug economy hampers business growth by providing very high opportunity costs
- *Economic logic needs to meet ecological logic. Poor and deprived people will mainly follow economic incentives and accept positive ecological impacts as an extra benefit.*
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Monitoring:

- It makes no sense to monitor until something is found fulfilling the indicators. *Monitoring has to be something which is done as part of the programme management and as a guiding function, esp. in business promotion.*

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