



Productive Use of Energy – PRODUSE A Manual for Electrification Practitioners



Structure of operational guidance



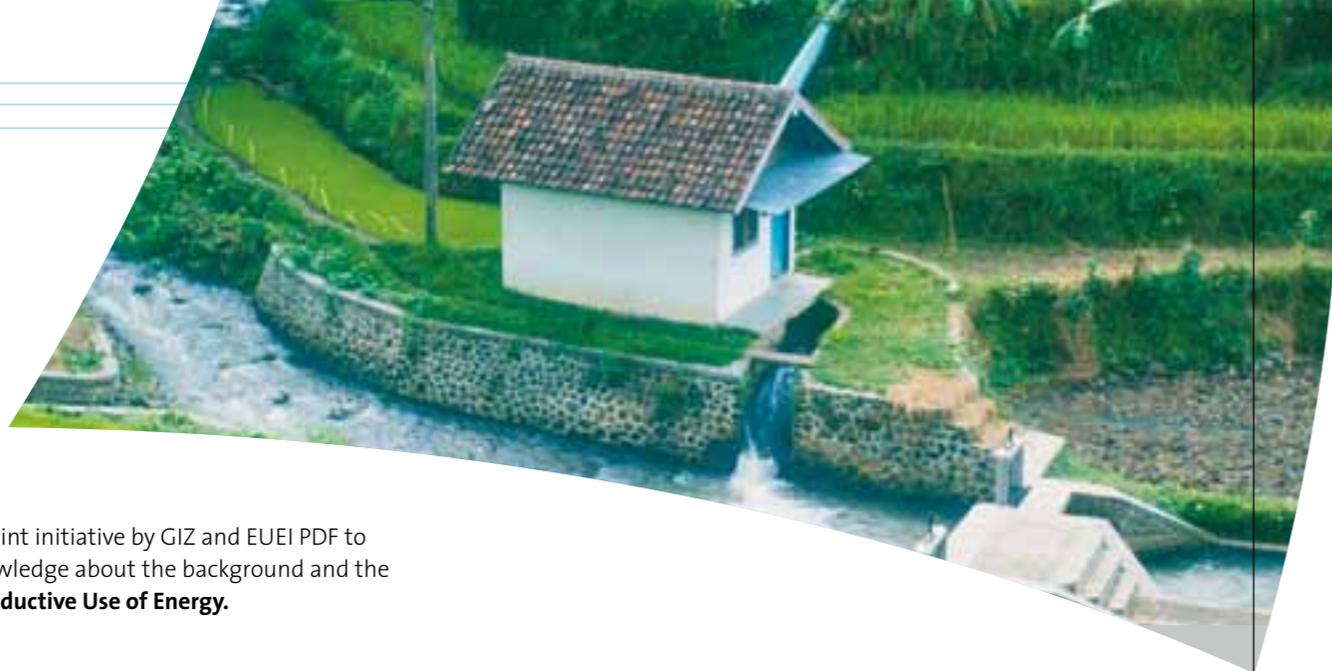
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PRODUSE is a joint initiative by GIZ and EUEI PDF to broaden the knowledge about the background and the promotion of **Productive Use of Energy**.

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Foreword



Energy is essential for poverty reduction, the improvement of human health, women's empowerment, education – and energy is an essential precondition for economic development. With access to reliable and affordable energy services, local entrepreneurs and companies of any size can generate local jobs, income and, thereby, promote local development, in particular in rural and peri-urban areas.

Experience, however, has shown that it is not enough to simply extend the electricity grid and hope for local economic activity to pick up just by itself. Far from it! Countless electrification programs have suffered from a demand response of the commercial sector that lagged behind plans and expectations. With two significant consequences: First, the hoped for local development impacts of the electrification programs did not materialize. Secondly, the electrification schemes suffered from a lack of new customers being able to pay for their electricity connection. Such developments have undermined the entire economic viability, and thus sustainability, of many electrification programs in developing countries.

GIZ and the Energy Sector Management Assistance Programme (ESMAP) of the World Bank started a joint project in 2006 in which the impacts of electrification on small and micro enterprises in Sub-Saharan Africa was systematically analysed. Based on this analysis, a rigorous methodology for monitoring the productive use of energy and its impacts on the local economy was developed.

One central working hypothesis emerged from this empirical work:
Concrete and dedicated activities should wherever possible complement energy access programs so that they result in the productive use of the newly available energy services and, thus, promote income generating activity and local job creation.

At the same time, useful examples and empirical analysis on how to practically promote the productive use of energy through, for instances, entrepreneurial training, business promotion and complementary financing services had not been documented well and were not at hand for development practitioners. In order to close this gap GIZ and the EUEI PDF decided to jointly start the 'PRODUSE' initiative. Based on manifold experiences from projects and programs around the world GIZ developed a Practitioners' Manual for the promotion of productive use of energy. The EUEI PDF then tested the draft Manual with two projects in Africa; the UNIDO project 'Lighting up Kenya' and the Energising Development project 'Access to Modern Energy Services' in Mozambique'. Based on these field tests, the Manual was subsequently revised. The publication in front of you is a product of this fruitful collaborative effort.



We are confident that this publication can make a valuable contribution to and act as a link between the two prominent issues on the international development agenda in the year 2012, namely the "promotion of universal energy access" in the context of the **UN International Year of Sustainable Energy for All** and the issue of "green jobs" in the run up to the **UN Conference on Sustainable Development, Rio +20**.

The **Productive Use of Electricity Manual** provides a simple framework and a systematic step-by-step approach with practical advice on how to plan, promote and implement productive use components in various electrification programs. We hope the Manual provides some valuable insights for your work. Please contact us if you have practical examples, tools, instruments, and lessons-learned you wish to share.

The Manual is a joint effort by many. We would like to especially thank the experts of the productive use working group of GIZ's Energy Sector Network Africa for their valuable inputs and comments during the development of this Manual. We would also like to thank the colleagues of the EnDev project in Mozambique and the UNIDO project in

Kenya, for their support in organizing stakeholder workshops for the field testing of the Manual. We consider the feedbacks from these stakeholders' invaluable contributions to the improvement of the Manual. Finally, we would like to thank the practitioners attending the Productive Use Practitioners Workshop, which was jointly organized by the Africa Electrification Initiative and EUEI PDF, in Nairobi in September 2011 for their dedication to the promotion of productive uses and valuable inputs to the Manual. It is our sincere hope that this active group of practitioners continues its lively network and exchanges know-how and experiences in the future.

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Acronyms and abbreviations

AC	Alternating current
BDS	Business development services
DC	Direct current
EnDev	Energising Development: Dutch-German energy partnership
ESMAP	Energy Sector Management Assessment Program
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit / German International Cooperation
ICT	Information and communication technology
ILO	International Labour Organization
LED	Local Economic Development
MFI	Microfinance institutions
MoU	Memorandum of understanding
MSME	Micro, small and medium-sized enterprises
M&E	Monitoring and evaluation
NGO	Non-governmental organisation
RE	Renewable energy
REA	Rural Electrification Agency
REF	Rural Electrification Fund
WB	World Bank

1. Introduction



Productive use of electricity¹ can be a significant driver of economic growth and social progress in developing countries. The use of modern forms of energy can:

- ▶ underpin the creation and upgrading of value chains
- ▶ facilitate diversification of economic structures and livelihoods
- ▶ reduce vulnerability to multiple stresses and external shocks.

Consequently, many energy access programmes in developing countries refer explicitly to productive use of electricity as one of their intended outcomes. Experience has shown, however, that in the absence of targeted activities promoting productive use, the level and pace of uptake of productive uses often lags far behind expectations, especially in rural areas. There is growing consensus among energy practitioners that active support is needed for productive use of electricity to ensure that providing access to electricity produces significant results.

Efforts to design and implement practical, effective programmes aimed at promoting productive use of electricity in developing countries still face challenges. Productive use of electricity lies at the interface between energy and economic development, which is why there is a lack of expertise among practitioners in both fields. Devising operational guidance for promoting productive electricity use requires successful interlinking of good-practice knowledge gained from energy programmes with expertise from programmes for local economic development and promotion of micro, small and medium-sized enterprises (MSME).

This is precisely what this manual sets out to do – **compiling know-how relevant to productive electricity use** and providing specific, **step-by-step guidance** on how to support productive uses of electricity that make sound business sense.

1.1 What are productive uses of electricity?

In simple terms, *productive* uses of electricity are those that **increase income or productivity** (that is, *they add value* which is taxable in the form of VAT if part of the formal economy). In rural contexts in developing countries, typical productive uses can be found in agro-processing (e.g. grain milling), various manufacturing industries such as carpentry, tailoring, welding and looming, and in the service sector, e.g. in bars and restaurants that use electricity for lighting, sound systems and refrigeration, as well as for charging mobile phones.²

- 1) While this manual specifically explores ways of promoting productive uses of electricity, many of the statements, concepts and practical approaches provided here apply equally to productive use of energy in a broader sense.
- 2) The lines between income generating and simple consumptive uses of electricity can sometimes be difficult to discern. There is significant overlap between productive and household uses of electricity, since many small commercial income-generating activities are run as home businesses and thus benefit from the typical *domestic* uses of electricity like lighting and small household ICT appliances.



Electricity is also often used productively for agricultural activities on various scales in rural areas, including subsistence farming, e.g. for irrigation (probably the most predominant productive use of electricity in rural settings) and electric fencing.³

Social uses of electricity, notably in the education and health sectors, are not discussed in detail in this manual even though they might be adding productive value to a region and are therefore sometimes included under productive uses (see *Cabraal et al, 2005*).⁴

For the purpose of this manual, productive uses of electricity are defined as agricultural, commercial and industrial activities involving electricity services as a direct input to the production of goods or provision of services.

1.2 What is the rationale behind promoting productive use of electricity?

Considering that the ultimate goal of rural electrification is economic and social development, support for productive usage is generally justified as a direct measure for enhancing the development outcomes of rural electricity access. Moreover, promoting productive uses can help to improve the economic and financial sustainability of rural electrification programmes and projects.

a. Promoting productive use to enhance economic and social development outcomes of rural electricity access

In the past, many electrification projects focused on providing energy access and/or services, either with the intention of fostering social development or with the assumption that enhancing access to electricity would inevitably boost economic development. In fact, experience has shown that expanding electricity access is a necessary (or at least conducive), but rarely a conclusively sufficient precondition for enabling income growth and employment generation. In the absence of well-targeted support measures, productive uses of electricity often catch on much slower or to a much lesser extent than initially expected.

Technical and financial assistance may encourage private actors to take advantage of electricity access for production processes and services. Measures geared to promote productive uses can therefore help translate electricity access into positive **economic and social development outcomes** in the form of increased incomes and employment, reduced workload (which, for example, can free time for other entrepreneurial activities⁵), availability of higher quality products, and lower consumer prices because products can be supplied locally, etc.

- 3) For some of these activities, energy input can also be mechanical (e.g. in the case of looming), while others depend by definition on electricity (e.g. mobile phone charging).
- 4) R. Anil Cabraal, Douglas F. Barnes, Sachin G. Agarwal (2005): Productive Uses Of Energy For Rural Development. Annual Review of Environmental Resources, 30: 117-44
- 5) Note that freed-up personal time might simply be used for leisure or convenience, and still represent an increased development impact.



b. Promoting productive use to improve economic and financial sustainability of rural electrification programmes and projects

Demand for electricity in rural regions of developing countries typically tends to be very low due to **low population densities** and **low energy consumption per household**.⁶ This, in combination with often dispersed settlement structures, renders investment in both power generation and distribution unprofitable in many rural areas. The higher the demand density (and the capacity to pay) for electricity, the easier it is to achieve **financial viability of rural electricity service provision (at given costs)**. *Rural grid extension plans therefore often focus on growth centres where local government infrastructure such as police stations, agricultural extension and health services are concentrated.* One important additional option for boosting the likelihood of rural electrification programmes despite limitations in public budgets is to increase demand for electricity by promoting productive and commercial uses. This reasoning, however, is valid only under the assumption that commercial users can **translate electricity use into higher firm profits** by either reducing production costs or augmenting revenues through increased output, higher quality, or new products and services.

⁶ The IEA (2010) assumes an electricity demand of 250 kWh per household per year in rural areas in developing countries after electrification.

1.3 Objectives and scope of this manual

Designing effective strategies for supporting productive use of electricity is a challenge. Only a few documents on **designing and implementing** projects and programmes for fostering productive electricity use exist. This manual is meant to fill this gap by providing:

- ▶ **concrete, pragmatic guidelines** for practitioners on how to plan, design and implement programmes for promoting productive use
- ▶ a systematic **overview of steps** to be taken throughout a productive use promotion programme or project cycle, and in each of these steps a checklist of issues for consideration by project managers
- ▶ a compilation of practical **recommendations**, good practice **examples, instruments and tools** for implementing each step.

1.4 Assumed scenario

Given the diversity of possible programme contexts within which productive use promotion may be anchored, a typical scenario is defined below. This is assumed as the point of departure, with an eye to keeping the manual concise. Adjustments to certain steps and tasks may be required for programme contexts that differ from the one defined here.

The scenario assumed for operational guidance is as follows:

- ▶ Productive use promotion efforts are launched to **supplement an ongoing rural electrification programme or project** with the aim of enhancing the sustainability and impact of electrification.
- ▶ Productive use promotion is undertaken only in **newly electrified areas** (as opposed to areas which have already had electricity access for several years).
- ▶ **Energy experts** lead the design and implement of the productive use programme or component.
- ▶ The energy supply technologies (grid or renewable energy technologies) used are chosen independently of protective use considerations.
- ▶ The area of intervention is primarily selected based on energy access targets, productive use considerations play a subordinate role.
- ▶ While some businesses in the area may already be using diesel or petrol generators, for the most part people are *electricity-illiterate*.
- ▶ Productive use promotion is generally planned and implemented in parallel with the energy programme.

Also, note that this manual:

- ▶ has **no sectoral focus**, i.e. its conceptual approach can be applied to all productive sectors (agriculture, manufacturing or services)
- ▶ covers both (i) **upgrading of existing economic activities** through uptake of electricity use, and (ii) support for the **creation of new businesses** that use electricity, including economic activities that are new to the programme area

- ▶ is not restricted to any certain type of enterprise that can use electricity, yet it **focuses on micro, small and medium-sized enterprises (MSME)**, as these are particularly relevant in the context of rural development and employment creation
- ▶ is particularly relevant for electricity use in **rural economies**, but many of the concepts and approaches suggested are equally useful for promoting productive use in (peri-)urban contexts
- ▶ provides more in-depth elaboration of interventions at the **micro and meso level**, i.e. field-level interventions that directly target business persons (micro level), and interventions to enhance the capacities of institutions that provide services to the target electricity users; while macro-level interventions aimed at improving the regulatory and policy-making environment for productive use development are touched upon, such efforts go beyond the primary focus of this manual.

1.5 Target audience

This manual addresses **practitioners** in the **energy sector**. This includes programme planners and implementers within government institutions, in particular Rural Electrification Agencies (REAs) and Funds (REFs), ministries of energy, public electricity utilities, and public or private energy service providers, as well as international donor agencies, international and domestic financing institutions active in the energy sector, NGOs and other organisations that implement energy access programmes. The manual is of course also relevant for practitioners from rural economic develop-



ment or private sector promotion programmes, etc., who are involved in planning and/or implementing a productive use promotion component.

1.6 Structure

The structure of this manual is aligned to a generic **project cycle**. It is composed of **six sequenced modules** for productive use promotion (see [Table 1](#)). This **step-by-step approach** provides a simple and useful instrument to guide practitioners in a systematic way through the full cycle of planning, designing, implementing, monitoring and evaluating productive use programmes.

Table 1 Structure of operational guidance to productive use promotion followed in this manual

Module	Sequence of practical tasks
PHASE I. Feasibility and initial planning	
Module 1: Decide whether to engage in productive use promotion	Task 1.1 Develop a concept note. Task 1.2 Determine if there is a case for productive use promotion. Task 1.3 Convene stakeholders to discuss the rationale and need for productive use promotion. Task 1.4 Avoid duplication of efforts: Map ongoing programmes for MSME promotion and rural economic development, etc. Task 1.5 Based on Tasks 1 to 4 above, decide whether to engage in productive use promotion.
Module 2: Set the cornerstones of the productive use programme	Task 2.1 Define the objectives. Task 2.2 Clarify what types of productive uses will help achieve the defined objectives. Task 2.3 Draft a results chain. Task 2.4 Define the scope of interventions. Task 2.5 Prioritise the area(s) for implementation of productive use promotion activities. Task 2.6 Map out stakeholders and implementing partners and their capacities. Task 2.7 Define the institutional set-up. Task 2.8 Identify synergies with other, ongoing programmes.



PHASE II. Analysis and programme design

Module 3: Analyse local economic structures and potentials for productive uses	Task 3.1 Take stock of economic activities found in the target area, and identify those which could be upgraded through electricity use. Task 3.2 Generate new business ideas that require electricity.
Module 4: Plan productive use promotion activities	Task 4.1 Identify key bottlenecks. Task 4.2 Assess the scale on which productive use opportunities are replicable. Task 4.3 Identify opportunities for linking up with ongoing programmes. Task 4.4 Develop a plan of productive use promotion activities.

PHASE III. Implementation

Module 5.1: Foster energy services	Task 5.1.1 Raise awareness of productive uses among energy service providers. Task 5.1.2 Encourage energy service providers to act as <i>technology facilitators</i> . Task 5.1.3 Consult energy service providers on options for a productive use-friendly tariff system.
Module 5.2: Raise awareness of productive electricity uses	Task 5.2.1 Define the target group. Task 5.2.2 Define the desired messages. Task 5.2.3 Select appropriate communication channels.
Module 5.3: Provide technical assistance to MSMEs	Task 5.3.1 Assess technical training needs among the target group. Task 5.3.2 Define a training strategy and identify partner institutions. Task 5.3.3 Design technical training courses.
Module 5.4: Facilitate access to financing	Task 5.4.1 Assess the hurdles to loan applications at the client level. Task 5.4.2 Take stock of existing regional and national MFIs and micro lending programmes. Task 5.4.3 Define measures for improving access to loans for productive use investments. Task 5.4.4 Monitor and evaluate productive use loan performance.

PHASE IV: Monitoring and Evaluation

Module 6: Ensure monitoring and evaluation (M&E)	Task 6.1 Set objectives and define a results chain. Task 6.2 Collect micro-level baseline data. Task 6.3 Monitor the institutions involved. Task 6.4 Monitor at the macro level. Task 6.5 Assess impacts. Task 6.6 Feed M&E results and lessons learned into further planning processes.
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Each module in the process contains references to:

- ▶ the importance and rationale of the module
- ▶ the practical tasks to be conducted
- ▶ outcomes of the module
- ▶ readily usable tools, instruments, methods and project examples that can directly support practical implementation of interventions to promote productive use.

Each module is intended to provide an overview of important aspects to be taken into consideration, noting potential activities as well as links to readily usable tools and instruments. None of the suggested lists of issues for consideration and possible interventions are exhaustive, and may need to be adapted and supplemented to fit the local context of any given programme.

The **sequence of tasks** as presented in these module should not be considered as universally applicable. The course of action to be followed, particularly during the planning phase, will depend on the specific circumstances under which the productive use programme materialises.

1.7 Various strategies for promoting productive use of electricity

Three strategies for promoting productive use of electricity are outlined below, corresponding to different levels of promotion intensity. Productive use programme planners may choose one of these strategies as most appropriate, depending on the financial and human resources available. It is also possible to pursue two or three of these strategies in parallel.





Figure 1 Four productive use promotion strategies, corresponding to different levels of resources available.



General awareness raising of the options and benefits offered by productive uses of electricity



2. A step-by-step guide to promoting productive use of electricity



Module 1: Decide whether to engage in productive use promotion

In brief

The decision whether or not to engage in efforts to promote productive uses in the context of an electrification programme should be based on two key determinants:

- 1) Will productive use of electricity be instrumental to the success of the electrification programme, or can it help to achieve other key development objectives set out for the selected area?
- 2) Is there a clear indication that productive use of electricity would not otherwise (fully) unfold in the absence of external support?

Productive use should in general be promoted if 1) and 2) can be answered with *yes*. However it may be necessary to do some background research beforehand.

Practical tasks

Task 1.1

Develop a concept note that defines a vision for and the benefits of productive use promotion

Promoting productive use of electricity within electricity access programmes can make sense for a variety of reasons:

- ▶ In certain cases it can enhance the financial viability of electricity infrastructure and services.
- ▶ It can enhance the economic impact of the energy access programme.
- ▶ It can be instrumental in achieving broader social and economic development objectives.

Hence, the very first step towards promoting productive use of electricity is to draft a brief concept note that spells out why it is deemed desirable or essential that productive use of electricity be taken up within the context of the given energy programme. This concept note shall then provide the basis for all subsequent steps, including communication with stakeholders, definition of objectives, and managing programme documentation, etc.

Table 2 in Module 2 may provide an initial reference point for drafting such initial concept notes.

Task 1.2

Determine if there is a case for productive use promotion

Investing in active productive use promotion makes sense only if electricity access alone is not sufficient to induce uptake of electricity-based productive activities on the expected scale. The assumption that key actors (entrepreneurs, financial institutions, electrical equipment suppliers, etc.) need support to take full advantage of the economic opportunities provided through modern energy access needs to be well established. The following can serve as relevant reference points to make a case for productive use promotion:

- ▶ Evidence that essential preconditions are not met for the target population to take up productive uses, e.g. no access to technical know-how of purchasing and running electrical machinery, limited availability of electrical equipment, or extremely limited access to financing (formal and informal), etc.
- ▶ Robust analysis of economic impacts of electrification in comparable contexts, demonstrating that effects on MSME performance are limited in the absence of productive use promotion (for further information please also see Module 3).⁷
- ▶ Systematic observations (e.g. in the context of an economic development programme) indicating widespread reluctance among MSME or farmers to adopt technical innovations that are proven to make economic sense.

A sound evidence base demonstrating that *productive use does not happen by itself*, will also be vital later to mobilise funding and stakeholder support for the programme.

Task 1.3

Convene stakeholders to discuss the rationale and need for productive use promotion

The decision to engage in productive use promotion should be backed and shared by a circle of stakeholders that goes beyond those partners directly involved in the electricity access programme. To account for the cross-sectoral nature of productive use of electricity, decision-makers from all sectors concerned with potentially targeted productive electricity users (rural enterprises, farmers, etc.) should be equally involved right from the very start.

Depending on the scope of the programme, the following institutions should be considered as stakeholders in any country:

- ▶ national ministry of energy and departments of energy at sub-national level
- ▶ rural electrification agencies or authorities, and rural electrification funds
- ▶ national utility or energy service providers
- ▶ national ministries and/or departments of agriculture and irrigation
- ▶ national ministry and/or departments of rural development
- ▶ national ministry of trade & industry, industrialisation and/or small enterprise development, etc.
- ▶ civil society or private sector associations working in the area of MSME development.

One viable option may be to **organise a half-day or one-day stakeholder workshop** to a) present the initial concept note and evidence on the need for productive use promotion (see *Tasks 1 and 2*), b) discuss how productive use would fit within overarching development strategies, plans and programmes, and c) facilitate a joint conclusion on whether productive use promotion would make sense in the given context. If there is broad-based support for the productive use promotion proposal, this stakeholder workshop could serve as a kick-off forum for **longer-term dialogue between**

⁷⁾ The 2011 GIZ-ESMAP study Productive Use of Electricity (PRODUSE) – Impact of Electrification on Small Businesses in Sub-Saharan Africa, for example, has explored MSME income in electricity access areas as compared to non-access areas in Benin, Ghana and Uganda.



decision-makers across all sectors concerned. At the same time, it provides an opportunity for exploring **potential roles of various institutions in the further planning and implementation process.**

Task 1.4

Avoid duplication of efforts: Map ongoing programmes for MSME promotion and rural economic development, etc.

Another essential question to be clarified at this point is **what ongoing programmes and projects for local economic development, MSME development and agricultural development, etc.,** could serve as ready entry points for promoting productive electricity use.

The following table contains example programmes and projects that could potentially have a large overlap with typical elements of a productive use promotion programme:

Table 2 Programmes and projects that may have a large overlap with typical productive use promotion activities.

Example programme / project	Area of potential synergies with productive use promotion
Local economic development, sustainable economic development, and economic diversification programmes	Analysis of local economic context to determine what productive use ideas are most viable
Entrepreneurship training	Training of MSME business owners to support uptake of electricity use and enhance business management skills
Micro-finance programmes	Improving access to financing for MSME to invest in electrical equipment
Agricultural extension	Promotion of irrigation and on-farm agro-processing equipment
Education programmes	Integration of syllabus components relevant to productive use of electricity (e.g. related to electrical equipment) into the curricula of vocational schools and training programmes

Task 1.5

Based on Tasks 1.1 to 1.4 above, decide whether productive use promotion is needed to achieving defined objectives

The decision to engage in productive use promotion should be taken:

- a) if evidence indicates that active promotion is necessary to ensure significant uptake of productive uses
- b) if there is broad stakeholder support for productive use promotion and
- c) if no ongoing economic development programmes are designed, or could be supplemented (with minor effort), to effectively promote productive electricity use.



TOOLS AND INSTRUMENTS

Readily usable tools and instruments

RWI (2011): Impact Evaluation of Productive Use – An Implementation Guideline for Electrification Projects. Ruhr Economic Paper No. 279.

This hands-on guide for designing evaluations of the impacts of productive electricity usage was developed by RWI in the framework of the GIZ/ESMAP study Productive Use of Electricity (PRODUSE) – VOLUME I – Measuring Impacts of Electrification on Small and Micro Businesses in Sub-Saharan Africa. It comprises three modules based on enterprise surveys and on anecdotal case studies. For each module, the implementation is described on a step-by-step basis including conceptual issues as well as logistics and methodological questions.

The ex-ante impact assessment methodology introduced in this guide can help to analyse whether and on which scale electricity access leads to PU up-take by MSME in absence of PU promotion measures, and how MSME benefit from PU. While it may be too costly to commission an extra study following such a methodology results from such studies conducted in similar contexts can be invoked for justifying PU promotion.

<http://www.rwi-essen.de/publikationen/ruhr-economic-papers/396/>

Outcomes of Module 1

- ▶ Concept note defining the rationale for productive use promotion to serve as a basis for formulating concrete objectives
- ▶ evidence on the need for active productive use promotion to serve as a basis for mobilising institutional and financial support
- ▶ mapping of stakeholders and potential partners
- ▶ mapping of relevant ongoing programmes and projects
- ▶ an initial, general idea of priority areas and target groups (based on stakeholder consultation).



Module 2: Set the cornerstones of the productive use programme

In brief

Once the decision has been taken to pursue productive use promotion, a number of basic programme parameters must be defined, including concrete **objectives**, the scope of the programme, and the institutional set-up.

The **sequence of tasks** as presented below is **context-specific**, and a reasonable sequence of preparatory steps may vary from case to case (for example, it can make sense to formulate concrete objectives before, or sometimes after the geographical focus is defined).

Practical tasks

Task 2.1

Define the objectives

Even if the principle rationale for productive use promotion may be to enhance financial sustainability of energy services in a newly electrified area, any productive use programme document should spell out economic and social development objectives that can be achieved through productive use of electricity. It is prudent to highlight the potential development outcomes of productive use that go clearly beyond what can be achieved through consumptive uses of electricity (such as provision of certain goods or

services by means of productive use that were not available in the region before, or empowerment of specific marginalised groups by creating new income opportunities).

The following set of **guiding questions** can help establish an initial basic idea of the development impacts specific to productive electricity use:

- ▶ What exactly are the intended economic impacts:
 - income growth at community or regional level?
 - employment effects? (*Note that electrification often enables streamlining of production processes and replacement of manpower by machinery*)
 - economic diversification to make the local economic system more resilient against external shocks?
 - other impacts?
- ▶ Does the programme seek to empower any specific groups like women, ethnic or religious minorities, young people, etc.? (*If so, note that these groups may need special encouragement and support for entrepreneurial activities, and that the programme must focus on productive activities that are culturally and socially appropriate for these target groups.*)
- ▶ Does the programme pursue any specific agriculture-related development objectives, such as food security, improved diets, strengthening resilience against climate risks, etc.?



Box 1 Some general economic considerations when reflecting on objectives

When describing potential economic benefits of productive electricity use, some points deserve special attention in order not to lose sight of the big picture:

- ▶ Technological innovations **do not necessarily translate into monetary benefits**. Electricity may enable provision of higher quality products and services, which the entrepreneur may or may not reflect in higher prices. In the latter case, the quality improvement is fully translated into a consumer surplus increase. One example is electric lighting in shops and bars while prices remain constant.
- ▶ If some enterprises in the target area take up electricity use and manage to attract new customers or increase their sales to local markets, they may take away business from competitors, resulting in a **zero-sum game at regional level**.
- ▶ Likewise, electricity use can increase the competitiveness of enterprises and enable upgrading

of value chains in a specific target area. This can result in the shift of **value addition and income from outside of the area to local producers**. It is therefore prudent when analysing economic effects of productive use to distinguish between pure re-allocation of incomes between small-scale producers from one area to another, and desirable economic effects like provision of new higher-value goods and services, poverty reduction through employment creation and empowerment of economic structures in the periphery, and more efficient processing of local raw materials, etc.

- ▶ It is important to distinguish between **medium-term objectives** like enhanced capacity of local partners at all levels (individual, institutional and structural) for improved framework conditions and **long-term objectives**, defined in terms of measurable impacts at the target population level (e.g. more resilient and diversified incomes).



Task 2.2

Clarify what types of productive uses will help achieve the defined objectives

Once the objectives are defined, planners should take a step back and reflect very broadly on the question as to what kinds of productive uses are suited to reaching these objectives, and which are not. For example:

If the programme aims to create employment over the short to medium term, planners should refrain from promoting mechanisation in local MSMEs that replaces manpower with electrical machinery.

If the programme seeks to empower a special target group, planners should promote business ideas that can be taken up by these groups within the given social and cultural context.

If the programme pursues other specific development objectives, like food security, improved diets, and strengthening resilience against climate risks, the programme must obviously focus on relevant productive use options.

Consider also the distinct economic benefits that can be expected from a new electricity connection within an existing business, as opposed to the emergence of productive activities that are altogether new in the region, as illustrated in [Table 3](#).

Task 2.3

Draft a results chain

Based on the outcomes of [Tasks 1](#) and [2](#), a results chain should be drafted to **link the promotion of productive uses to the defined objectives** through a series of logical steps of cause and effect. In principle, there are **two options** for this: a) Integrating productive use-specific elements into a results chain drawn up for the energy access programme; or b) formulating a separate results chain that comprises only productive use promotion activities.

Task 2.4

Define the scope of interventions.

A productive use programme can comprise various horizontal and vertical scopes. The horizontal scope of the programme refers to the **number of different productive uses** (i.e. business models that need electricity input) that are promoted. The vertical scope refers to the **number of different activities** through which productive use is promoted, intervening at **various stages along the respective value chains** (see [Box 2](#)). Even though concrete activities can only be defined at a later stage, the broad scope of the programme must be determined at this point.



Table 3 Some general economic considerations when reflecting on objectives

Type of productive activity and uptake of electricity use	Economic benefits of electricity use	Allocation of welfare gains
Energy source switch in existing businesses – e.g. welders working with diesel generators.	Reduced fuel costs => reduced production cost => reduced consumer price and /or increased profit and/or increase of production volumes.	Welfare gain shared between consumer and producer (as per demand and supply curve price elasticity);
Introduce modern energy use in existing economic activities that currently operate without energy input – e.g. rainfed agriculture, tailors.	Increase of production volumes and/or reduced production cost through reduced labour cost (note: in some cases off-set through increased capital cost – <i>electrification trap</i>); Possibly higher-quality goods or services.	Note: in case of export products, part of the welfare gain falls to consumers outside of the target region.
Type of productive activity and uptake of electricity use	Economic benefits of electricity use	Allocation of welfare gains
Local production of goods that are currently imported to the area, e.g. high-quality carpentry, processed food.	Shift of value added to the area (but losses in other areas); in some cases reduced consumer prices through elimination of transport cost (if small scale local production allows for level of production costs that is competitive with imported goods).	Shift of value added is absorbed by (new) producer (employment creation) ; In case of consumer price reduction through transport cost elimination: net gain for consumer
Introduction of new subsectors, goods and/or services for local consumption ; e.g. photocopying and internet access.	Overall upgrading of economic activities and structures in the area, and positive effects on other sectors (e.g. IT access for informed decision-making in agriculture); net impact linked to purchasing power development in the area; employment creation.	Welfare gain for consumer through satisfaction of previously unmet demand; Welfare gain for producer / service provider: new business and profit opportunities.
Uptake of production of export goods; e.g. food processing, as well as tourist lodging	Increase of income to the area; employment creation.	Welfare gain fully absorbed by producers.



Regarding the *horizontal scope*, experience has shown that, as a general rule, concentrating on a relatively small number of different business models, i.e. taking a **narrow horizontal scope**, can be more effective than scattering programme resources over many different value chains.

When reflecting on the *vertical scope* of the programme, it is useful to bring productive use support into perspective with a **value chain promotion** approach (see *Box 1*). Even though the business success of productive electricity use may depend on various factors along the value chain (like sustainable supply of input material, market opportunities for the final product, etc.), productive use promotion should focus on interventions that are directly related to electricity use (as part of an energy programme). It has emerged as good practice to limit interventions to a small number (1-3) of services that directly support uptake of electricity use (e.g. financing, technical training, and providing assistance for purchasing equipment). By contrast, overstretching the productive use programme with a wide range of different activities that address various business success factors for electricity using enterprises has proven difficult.

When considering the scope of the programme, also keep in mind that interventions at various levels are possible, and that each level requires different programme resources:

- ▶ **at community level:** working with individual entrepreneurs
- ▶ **at an intermediate level:** working to improve services that are available to individual entrepreneurs; e.g. equipment providers, educational institutions, financial institutes, etc.

- ▶ **at the policy-making and administrative level:** working to improve the regulatory framework to enable uptake of electricity use by individual entrepreneurs.

Task 2.5
Prioritise the area(s) for implementation of productive use promotion activities

If budget constraints dictate that productive use promotion efforts be limited to certain selected areas, the following criteria may be applied to rank and prioritise potential areas:

- ▶ **Market access:** For productive use of electricity to bring commercial success, businesses must have opportunities to bring new products to markets; existence of physical infrastructure (e.g. transport and telecommunication systems) and vibrant market structures may provide good breeding ground for productive use.
- ▶ **Overall development status and volume of productive use opportunities:** A certain level of economic and social development, including human capital, is a precondition for productive electricity use to catch on. To kick-start or pilot productive use activities, areas where good potential for productive use activities is clearly visible – so-called *low-hanging fruit* (e.g. agricultural processing in areas with surplus production of perishable food, or lodging in areas with high tourism potential) may be prioritised.
- ▶ **Population density:** A balance may have to be struck between the objective of boosting electricity demand in sparsely populated areas through productive use of power on the one hand, and achieving maximum economic impact through promoting productive use on the other. This is because areas with low population

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Box 2 Value chain analysis and complementary services

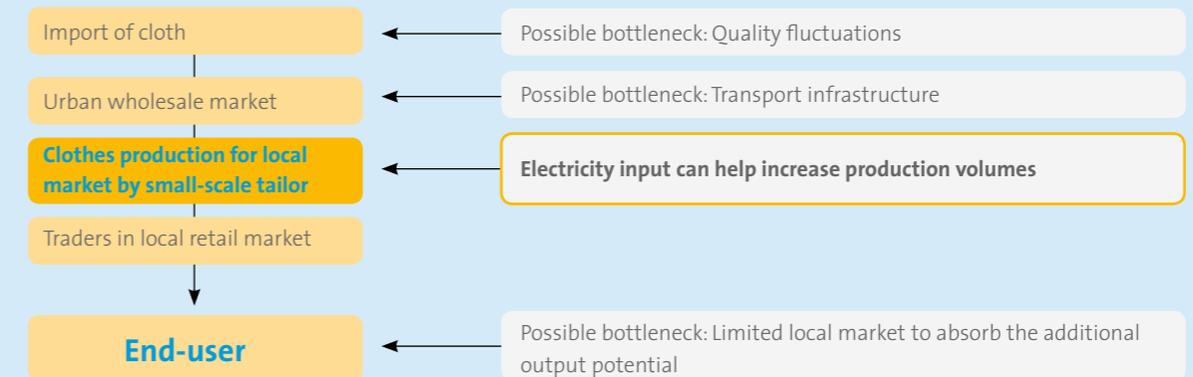
A value chain is an economic system that can be described as a *sequence of related business activities (functions)*, ranging from the provision of specific inputs for a particular product to primary production, transformation and marketing, right up to the final sale of the particular product to the consumer. Productive use can be relevant at various stages along a value chain: Electricity can transform **production processes**, both of goods for end consumers and for intermediary products; it can also facilitate the **trading and marketing** of products, and be relevant for **storage**, etc.

When exploring possible ways of promoting productive uses, considerations may start but should not end at the stage where productive electricity use directly affects a value chain. It is important to consider that various factors are pivotal to the prospering of a value

chain with productive use potential, including factors that are not directly linked to electricity use. For example, when tailors start to use electric sewing machines and thereby substantially increase their output volumes, it will depend on market potentials to absorb the increased output; what is more, the success of this technological change will depend on the availability of repair services for electric sewing machines.

In some cases effective promotion of productive use consists of supporting the provision of certain **complementary services**. Applying a value chain lens when planning a productive use promotion programme can help to ensure that major bottlenecks that could hamper the prospering of productive use-based business opportunities are addressed (see *Figure 2*).

Figure 2 Simplified garment value chain with productive electricity use as entry point.





densities are often characterised by weak infrastructure and poor market access, which in turn inhibit the outcomes of productive use promotion efforts.

- ▶ **Availability of business development and micro-finance services:** If business development services (BDS) and micro-finance services are already available and accessible to MSME in a particular area, it will be easier to promote new business ideas and the transformation of or investment in existing businesses.
- ▶ **Quantity of electricity supply:** In the case of energy access programmes in off-grid areas, productive use promotion should obviously prioritise zones where electricity supply currently exceeds demand for household requirements, and with sufficient distribution capacities.
- ▶ **Quality and reliability of electricity supply:** Emerging MSMEs can be adversely affected by unreliable power supply (frequent power outages or strong voltage fluctuations), which can interrupt production and service provision and ruin expensive machinery. In case of off-grid, renewable energy-based access programmes, be sure to align productive use promotion to energy supply quality, including in terms of area prioritisation.
- ▶ **Government and donor budget allocations for services relevant to productive use of electricity:** It can make sense to align productive use programmes to ongoing rural development programmes; if the government or other international donors have prioritised certain areas such as programmes for economic diversification or the development of a certain sector that provides a ready entry point for productive uses

(e.g. agricultural processing and tourism), there will be ample scope for synergies with productive use promotion.

- ▶ **Partners:** As a general rule, it is advisable to prioritise areas where local partners have indicated a **true interest in productive use promotion**, and can be expected to take full ownership of or even a leading role in the implementation of the programme. This can refer to local utilities or energy service providers, local and provincial governments and government agencies, private agencies, NGOs, training institutes and MFI, etc. In the case of energy access programmes in off-grid areas, if power generation is managed by community-based institutions (CBOs), it can make sense to select from a given pool of RE sites where CBO committees are particularly dynamic and competent.

Task 2.6

Map out stakeholders and implementing partners and their capacities specific to productive use of electricity

The **sustainability** of a productive use programme depends on the extent to which productive use promotion activities are sustainably embedded into the system, and on the depth of long-term structures created for productive use support. Supporting **capacity development** among local partners at all levels (individuals, institutions and systems) in various sectors is a vital element of any productive use programme.

Building on the stakeholder consultation that has catalysed the decision to pursue a productive use programme (*Mod. 1*), the **group of actively involved partners and stakeholders**

should be widened when actual programme planning and implementation come about: Civil society and private sector actors can play key roles in promotion efforts in addition to government actors. *Table 4* lists the various stakeholders

and a wide range of institutions that may have **inherent interests** in promoting productive electricity use or which could **contribute to the success** of the programme.

Table 4 Stakeholders and their potential roles in the productive use programme

Stakeholder	Role/Responsibility
Individual and institutional stakeholders in the private sector	
Micro, small and medium-sized enterprise owners and/or potential commercial consumers of electricity	<ul style="list-style-type: none"> ▶ programme beneficiaries and principal agents who judge on the viability of business ideas and new technologies, etc. ▶ key informants on market potentials for new products
Regional or local business associations	<ul style="list-style-type: none"> ▶ can provide data on existing businesses and their support needs ▶ can act as facilitators for productive use awareness raising, training programmes, and dissemination of information on electrical equipment, etc.
Energy service providers	<ul style="list-style-type: none"> ▶ have an inherent interest in augmenting energy consumption, and are therefore potential active contributors to all elements of the productive use programme ▶ have already established relationships with commercial customers, and are therefore key informants on productive use programme target groups
Financial service providers (formal and informal)	<ul style="list-style-type: none"> ▶ provide loans for facilitating electricity connections and purchasing of off-grid equipment ▶ potential informants on productive use programme target groups if relations with clients are already established ▶ offer expertise in financial analysis of new productive use business models
Vendors of electrical equipment and appliances	<ul style="list-style-type: none"> ▶ widespread uptake of productive electricity use helps them increase sales, presenting an inherent interest ▶ key informants on technical solutions who can therefore help to identify new business opportunities and provide related technical assistance ▶ have regular interaction with customers, enabling them to identify clients' support needs ▶ are the best placed actors for training in the installation, use and maintenance of electrical equipment

→ Table continues on page 36



Stakeholder	Role/Responsibility
Medium-sized and large enterprises	<ul style="list-style-type: none"> ▶ may have an intrinsic interest in disseminating a certain electrical appliance which facilitates the sale of their products (e.g. telecommunication service providers, distributors of food and beverages that require refrigeration, etc.) ▶ can help design specific business models that depend on electricity input, e.g. cell phone charging centres, phone service businesses, etc. ▶ can help finance business franchise packages ▶ may provide maintenance services for the machinery in question ▶ may help develop new technical solutions that support the sale of their products
Medium-sized to large enterprises (that are not a productive use programme target group) that depend heavily on electricity, e.g. in the tourism sector, agricultural processing, and mining	<ul style="list-style-type: none"> ▶ may take a pioneering role in bringing innovative energy solutions to the area; potential <i>agents of change</i> ▶ establish intense relationships with energy service providers to help ensure the quality and reliability of energy services
Public institutions and civil society	
Training institutions and extension agents (governmental and non-governmental)	<ul style="list-style-type: none"> ▶ should be given a lead role in designing and implementing technical and business management training ▶ pools of human resources for various programme elements
Universities and other institutes of tertiary education	<ul style="list-style-type: none"> ▶ engineering departments can help develop technical solutions ▶ social science and economics departments can contribute to the analytical phase (research on local economic system) ▶ social science and economics departments can play a key role in developing methods for and implementing M&E

Stakeholder	Role/Responsibility
Government ministries and agencies engaged in electrification and rural development programmes (e.g. rural electrification agencies, agencies for MSME promotion, agriculture departments and education agencies, etc.)	<ul style="list-style-type: none"> ▶ should be actively involved in productive use programme planning to ensure that all activities are aligned to ongoing programmes and potential synergies are utilised (e.g. with programmes for promotion of irrigation equipment through the country's ministry of agriculture, with economic diversification programmes through ministries of rural development, etc. ▶ key informants on target groups and existing infrastructure ▶ can support coordination between various relevant actors and programmes
Government agencies and ministries involved in trade issues	<ul style="list-style-type: none"> ▶ key informants on procedural requirements, export market potentials, minimum quality standards, export barriers and pricing, etc.
Community-based organisations	<ul style="list-style-type: none"> ▶ can facilitate outreach to potential new entrepreneurs, notably special priority target groups like women and young people ▶ can help disseminate knowledge and skills relevant to productive electricity use
International institutions	
International donors and international or national non-governmental organisations	<ul style="list-style-type: none"> ▶ programmes run by international donors or NGOs may offer synergies with productive use programmes ▶ key informants on target groups ▶ can bring in international expertise if needed

In many countries it has been observed that there are institutions with specific competences in the energy sector, and institutions with specific skills and knowledge in a certain productive sector, but very few institutions specialised in **electricity-based production processes (competence gap, see Figure 3).**

When assessing the capacities of potential partners and stakeholders in follow-up to stakeholder and partner mapping⁸, each institution's specific competences relevant to

productive electricity use should be analysed. If a *competence gap* emerges among these potential partners, the programme's capacity development strategy must be designed accordingly to close this gap over the medium term.

⁸ Obviously, as the programme planning proceeds, more institutions may be identified as potential partners (e.g. vocational training institutes in specific fields), and their capacities will then have to be assessed.

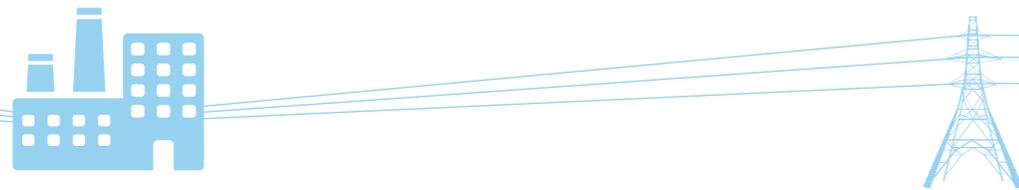
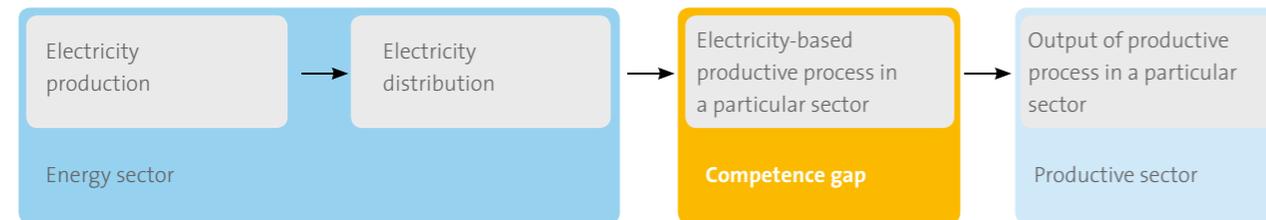


Figure 3 Competence gap between energy and productive sectors



Task 2.7

Define the institutional set-up

The aforementioned capacity assessment will also provide a basis for deciding which stakeholders can **assume which responsibilities in the further planning and implementation** of the programme. It can prove prudent to set up a **multi-sectoral** steering committee or a joint implementation group for productive use promotion in order to duly account for the fact that such promotion necessarily cuts across sector lines: Not only the electrical power sector should be represented among the productive use programme planners and implementers, but also institutions representing electricity users, i.e. from agricultural and industrial sectors.

Task 2.8

Identify synergies with other, ongoing programmes

Building on the outcomes of *Task 1.4*, potential synergies with other ongoing programmes and projects should be identified. Private sector support, local economic development and agriculture development programmes, etc., may all pursue objectives that are closely related with those of the productive use programme. They may offer ready op-

portunities for the productive use programme to hook into, for example by including productive use-specific content in business training, and integrating elements related to electricity use into the activities of agriculture extension services, etc.

Outcomes of Module 2:

- ▶ Defined programme objectives
- ▶ general idea of what kind of productive uses should be promoted
- ▶ results chain
- ▶ programme scope and budget
- ▶ institutional set-up
- ▶ priority areas for capacity development
- ▶ mapping of ongoing programmes and projects that offer synergies.

Readily usable tools and instruments

For selection of programme area (Task 2.5)

Integrated Southern Africa Business Advisory (INSABA) selection criteria for pilot regions; URL: www.insaba.org/images/stories/downloads/selectioncriteria.pdf

Under the INSABA programme (www.insaba.org), pilot regions were selected in different countries in Southern Africa for establishing SME support structures. A set of area selection criteria was developed (NB: criteria covered aspects of both energy supply from renewable sources and SME-driven energy demand), as well as templates that helped to screen regions for suitability.

For convening stakeholders and facilitating joint decision-making

Local Economic Development (LED) is a participatory development process that encourages partnership arrangements between the main private and public stakeholders of a defined territory, with the final objective of stimulating economic activity. The process enables the joint design and implementation of common strategies, by bringing local stakeholders around one table through a Local Forum helps to build trust, and encouraging the creation of social networks.

Sources of LED tools and materials

LED Knowledge platform: www.ledknowledge.org; online platform for sharing experiences and resources of people and organizations supporting LED processes at the local level.

World Bank (2006) The Local Economic Development (LED) Quick Reference Guide (QRG).

Provides a concise introduction to the concept and implementation of LED. Provides guidance for an analysis of the strengths and weaknesses in the local economic structures.

URL: <http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTURBANDEVELOPMENT/EXTLED/0,,contentMDK:20276741~isCURL:Y~menuPK:1330226~pagePK:148956~piPK:216618~theSitePK:341139,00.html>

For capacity assessment of stakeholders and potential partners

GIZ (2010) Capacity Assessment Methodological Guideline. Eschborn.

Provides orientation on how to appraise the capacities at individual, organisational and system level. Gives a general overview of the Capacity Assessment approach by contextualizing it in the Capacity Development Cycle and by describing its purpose, methodology, observation areas and fields as well as application areas.

GIZ (2010) Capacity Assessment Toolbox. Eschborn.

Supplements the GIZ Capacity Assessment Methodological Guideline by describing in detail the tools mentioned in this Guideline.





Module 3: Analyse local economic structures and potentials for productive uses

In brief

Under this module, the electricity supply situation and local economic structures are analysed in order to identify the most promising opportunities for electricity use. It is highly recommended to establish the technical and economic feasibility of productive use options before actually starting to plan concrete support activities.

Modules 3 and 4 follow a simple three-step approach, from spotting opportunities for productive electricity use, to checking economic and technical feasibility and identifying areas where support is needed (bottlenecks to business success) (Figure 4).

The analysis will build on

1. inputs from **experts and established information sources** (to understand market structures, electricity supply, availability of other inputs and technical feasibility, etc.) and
2. the **entrepreneurial sense** of the (future) business owners, who should take **centre stage** as the *productive electricity users*.

Productive use programme planners should contact individuals within the target communities who often possess profound understanding of the natural, human, and physical assets of the area, the relative strengths, weaknesses, opportunities and threats of the local economic system, and local market potentials.

Practical tasks

Task 3.1:

Take stock of economic activities found in the target area, and identify those which could be upgraded through electricity use.

In order to identify **opportunities for using electricity within existing business activities in the area**, the sequence of analytical steps outlined in Table 5 has proven to be a useful approach. Be aware that such analysis should cover both production processes and services that already use other forms of energy input (e.g. draught animals, diesel generators, etc.), and those that currently do not use any form of energy input.



Figure 4 Analytical process, starting with search for opportunities.

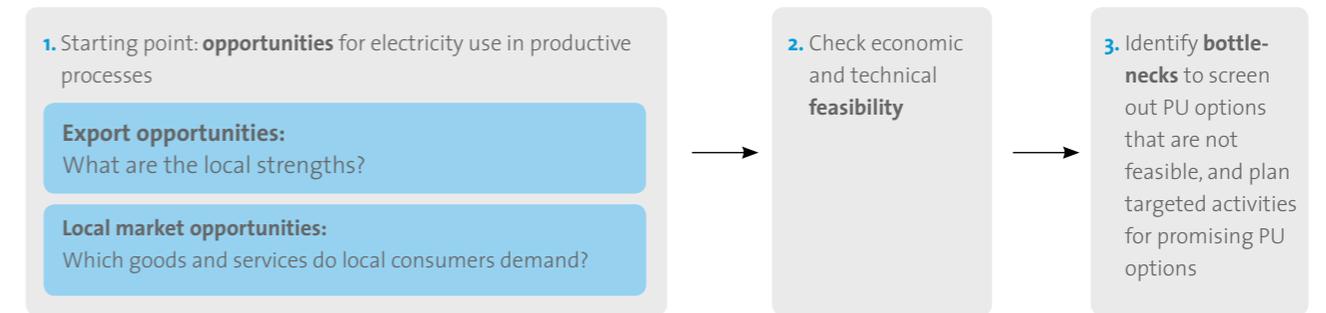




Table 5 Overview of key analytical steps for identifying viable productive use opportunities.

Generic steps	Information sources and how to tap them	Example: Agro-processing sector
1. Map out all productive / commercial activities in the target area and prioritise the most important sectors or those sectors with growth potential	Brainstorming in a community workshop	Backbone of the local economy: agriculture, more precisely staple crops
2. Apply an <i>electricity use</i> lens to the production processes and services in these sectors: Can the use of electrical equipment and machinery increase production efficiency or enable higher quality products and services?	Programme planners' advice, including assessment of business owners; examples from other areas	Grain milling: currently done with diesel-driven mills; electric mill could save costs per kg of grain milled
3. Technical analysis: a. Is appropriate machinery/equipment available? b. Can maintenance and repair services be provided? c. Does the available electricity supply sustain the use of this kind of machinery? d. What technical skills does it require to run the equipment? Match with entrepreneur?	Seek advice from experts, e.g. equipment vendors, institutes for industrial research, etc.	a. Electric mills available in provincial capital; b. Can be repaired by local technician; c. Needs xy kWh – only feasible with grid electricity d. Miller who has experience with a diesel mill can easily be trained how to operate an electric mill
4. Economic analysis: a. In case of increased production volumes and/or higher quality output: Is there a market potential? b. Savings in production costs? Can higher quality output be reflected in higher sales prices? c. Quantify profit gains d. Financing plan for investment needed	Business plan preparation undertaken by business owners under guidance from business training experts or MFI staff	a. High local demand for milling, market already established b. Savings in diesel: USD 0.10/kg c. In an average week, 50 customers with 100 kg maize; diesel savings: USD 0.10/kg x 100 kg = USD 10.00/week d. Investment cost comprising mill and electricity connection = USD 300.00; financing cost at 10% interest; payback period = xy months (assuming constant production volume and price).

Generic steps	Information sources and how to tap them	Example: Agro-processing sector
5. Apply a value chain lens: Other bottlenecks upstream or downstream along the value chain to be considered? a. Availability of skilled labour? b. Raw material input? c. Transport for market access? d. Prospects for major changes in market size in the foreseeable future? e. Competition expected to arise and grow stiffer? f. Environmental impacts, disposal of waste?	Guided reflection exercise for business owners	a. Miller and his apprentice can easily handle electric mill b. Ample maize cultivation in the area c. Local customers bring their produce to the mill for processing d. Demand can be expected to remain stable e. Established market, milling business f. Emissions reduction due to replacement of diesel with cleaner source of energy; otherwise, no environmental impacts
6. Re-check against productive use programme objectives: a. At what level(s) are benefits being achieved: Only for the business owner? Also for local consumers? b. Implications (positive or negative) for employment opportunities? c. Will business be taken away from other enterprises? Zero-sum game at regional level? d. Long-term impacts for the region in terms of economic up-grading? e. Outreach to main target group?	Productive use programme planners and steering committee	a. Benefits mainly for millers b. Electricity makes sense due to cost-savings potential at constant production volumes c. Electricity use for grain milling has high replication potential, as there are many millers in the area; underpins development of local know-how and skills relevant to productive use of electricity d. Mills are run as micro businesses by low-income strata – match with target group



Two energy services deserve special attention: **lighting and ICT**. This is because the various ways in which they can contribute to business success are rather generic by nature, and each are applicable to a wide range of businesses.

Productive use of lighting can come in the form of:

- ▶ extended working hours
- ▶ improved working conditions for higher precision and efficiency in a wide range of manufacturing tasks
- ▶ attracting customers after dark, due to safety and hygiene considerations.

ICT can contribute to business success by enabling:

- ▶ access to important market information (e.g. on prices, product quality, market size, and special sales events), both for sale of final products and purchase of input materials
- ▶ better customer relations
- ▶ opportunities for learning through innovative ICT based methods, including business management skills, technical skills, etc.

Experience shows that the use of lighting and ICT within existing enterprises has proven to need far less promotion and external support than the use of more specialised electrical equipment, because it does not require major transformations in business operations.

Task 3.2

Generate new business ideas that require electricity

In addition to identifying potentials for upgrading existing productive activities through electricity use, the programme can encourage electricity-based business *start-ups*. It can support efforts to take up new productive activities that need electricity input, satisfy untapped market potentials in the region, shift value added from neighbouring areas or urban centres to the region, and even to access export markets.

Workshops at community level with selected participants (economically active portion of the local population) are usually the most effective approach to identifying what kind of support people need to break such new ground. Sometimes people need outside *inspiration* to develop new electricity-based business ideas, while in other cases specific *hurdles* need to be removed to allow people to *put their ideas into practice*.

For a very systematic approach to generating new business ideas with electricity input, it is recommended to take market opportunities as a point of departure (Figure 4), by asking:

- a. What goods and services are in demand with local consumers (**local market opportunities**)?
- b. What resources (natural, physical and human) does the region have to offer that give it a comparative advantage over other regions and countries in the production of goods and services (**export opportunities**)?

To explore local market opportunities, the following questions should be discussed:

- ▶ What goods are **currently imported from other regions**, but could be locally produced with electricity input (e.g. preserved food items processed and packaged with modern equipment that runs on electricity)?
- ▶ Is there a proven **demand for services** that could not be provided locally due to lack of electricity, i.e. for which people travel to urban centres or neighbouring regions (such as photocopying services and mobile phone charging services)?

To analyse their export opportunities, communities should discuss the following questions and seek expert views:

- ▶ Does the area hold particular **wealth in natural resources** which, with electricity use, could sustain the production of marketable goods (e.g. non-timber forest products, minerals, fertile soil or good climate, etc.)?
- ▶ Does the local **agricultural system** offer opportunities for export of (surplus) processed crops, fruit, vegetables, fish, meat and dairy products?

- ▶ Do local inhabitants have any particular **skills**, e.g. in crafts, on which they could capitalise with the help of electricity use?
- ▶ Does the area offer opportunities for providing **services that require electricity, yet could attract external revenues** (e.g. tourism development)?

The new productive use business ideas that emerge from such market studies must be **systematically screened for feasibility**. Table 6 provides an overview of the key generic steps of such analysis.

Experience has shown that promoting business start-ups is more time- and funding intensive than promoting change in existing businesses. Inexperienced entrepreneurs-in-spe typically need strong hand-holding.

SUMMARY



Table 6 Feasibility screening for business ideas based on electricity use

Generic steps	To be undertaken by:
1. Describe the business idea: <ul style="list-style-type: none"> a. the product or service b. the production process a. where the business would be based b. who will run the business. 	Entrepreneur
2. Technical analysis: <ul style="list-style-type: none"> a. What electrical machinery and equipment would be needed, and where would it be available? b. Can maintenance and repair services be provided for this equipment and machinery? c. Does the available electricity supply sustain the use of this kind of machinery? How much electricity will be consumed to produce a certain quantity of output? d. What technical skills are required to operate the equipment? Match with entrepreneur? 	Entrepreneur with advice from technical experts, e.g. from equipment vendors and institutes for industrialisation, etc.
3. Operational analysis: <ul style="list-style-type: none"> a. What production inputs and raw materials will be needed, where they can be procured, and at what cost? b. How many people are needed for production, sales, and business administration, etc.? c. How much output can be produced with a given amount of inputs and within a certain period of time? d. Any regulatory provisions to be observed? Any safety provisions to be observed? 	Entrepreneur with advice from technical experts, e.g. from equipment vendors and institutes for industrialisation, etc.



Generic steps	To be undertaken by:
4. Economic analysis: <ul style="list-style-type: none"> a. What is the approximate market size? b. What would be the optimum price for the product(s) and/or service(s)? c. Considering possible output volumes, market size and price, how much would the monthly revenues be? d. How much would the input and operating costs be (materials and labour, electricity bill, rent, marketing costs, taxes and license fees, etc.) e. How much investment is required for electrical equipment, etc.? How could the required seed funding be mobilised? 	Entrepreneur under guidance from business training experts or MFI staff
5. Apply a value chain lens: Other bottlenecks or major impacts upstream or downstream along the value chain to be considered? <ul style="list-style-type: none"> a. Transport for market access? b. Prospects for major changes in market size in the foreseeable future? c. Competition expected to come up? d. Environmental impacts, disposal of waste, etc.? 	Guided reflection exercise for business owners
6. Check back with PU programme objectives <ul style="list-style-type: none"> a. At what level(s) are benefits achieved: Only for the business owner? Also for local consumers? b. Are there positive or negative implications for employment opportunities? c. Will business be taken away from other enterprises? Zero-sum game at regional level? d. Can long-term impacts be expected for the region in terms of economic upgrading? e. Is the business idea actually relevant for the main target group? f. Is the business idea compatible with the cultural and social norms of the target population? 	Productive use programme planners and steering committee



Outcomes of Module 3

- ▶ List of opportunities for taking up electricity use within existing economic activities with benefits for the entrepreneur
- ▶ list of opportunities for new electricity-based economic activities that are technically and economically feasible.

Possible direct outcomes for the target group:

- ▶ increased capacity among the (future) entrepreneurs to systematically think through a transformation in their business operations (i.e. change to electricity-run equipment) or a new business idea
- ▶ increased capacity among implementing partners to conduct technical and economic analysis of electricity-based businesses, and value chain analysis
- ▶ linkages between entrepreneurs, equipment vendors and providers of maintenance services, etc.



TOOLS AND INSTRUMENTS

Readily usable tools and instruments

For analyzing local economic structures and getting an overview of commercial activities in an area

Local Economic Development (LED) is a participatory development process that encourages partnership arrangements between the main private and public stakeholders of a defined territory, with the final objective of stimulating economic activity. The first phase in the LED process is a territorial analysis, aimed at acquiring knowledge about the local economy and its existing resources. It comprises a preliminary analysis of the major socio-economic and political data of the territory, particularly through statistics and surveys.

Sources of LED tools and materials: see [Module 2](#).

Method Finder's Practitioners' Guide: Participatory Appraisal of Competitive Advantage (PACA).

A methodology to launch or adjust LED Initiatives. A set of tools that permit rapid appraisal of the competitive advantages and disadvantages of local communities. Delivers concrete, practical proposals to stimulate the local or regional economy (PACA Exercise).

GIZ (2007) ValueLinks Manual. The Methodology of Value Chain Promotion.

[Module 1](#) "Selecting a Value Chain for Promotion" provides guidance on conducting and supporting **market research**.

[Module 2](#) "Analysing a Value Chain" introduces different methods for **mapping and economic analysis of value chains**, to generate a clear picture of economic potentials and limitations, and entry points for interventions to strengthen a value chain.

For generating new PU business ideas

Generate Your Business Idea trainings (developed by ILO as part of the Start and Improve Your Business (SIYB) training package). A materials-based training programme (2-3 days) for potential entrepreneurs to find out whether they are the right person to start a business and to develop a feasible business idea (micro or small-scale). Participants should be able to read, write, and make basic calculations. Has been implemented in over 90 countries in Asia, Africa and Latin America through a network of locally based certified trainers. Further information:

www.ilo.org/images/empent/static/seed/GYBfs0307.pdf.

ESMAP (2008), Maximizing the Productive Uses of Electricity to Increase the Impact of Rural Electrification Programs. Formal Report 332/08, ESMAP, Washington DC.

Proposes a systematic approach to analyze the technologies used in production processes in rural areas, and to see whether the use of electricity can help to remove limiting factors. Entails a thorough review of all productive or social activities taking place in a designated area, through substantial interaction with the anchor sectors in which these activities take place.



Module 4: Plan productive use promotion activities

In brief

Under *Module 4*, a plan of programme activities will be developed that supports the viable opportunities for productive electricity use (*identified under Module 3*) in the most effective way possible, and that matches the budget and intended scope of the productive use programme (*as defined in Module 2*).

Practical tasks

Task 4.1

Identify key bottlenecks

In order to determine the most (cost-)effective interventions to promote a set of prioritised opportunities for productive use of electricity, the main bottlenecks impeding the development of these business ideas should be identified. Clarity is needed on:

- ▶ factors that could possibly hamper the switch to electricity from other sources of energy, or the uptake of electricity in businesses that so far do not use energy sources
- ▶ possible challenges faced by business start-ups.

Such inhibiting factors can arise at a number of different levels, i.e. among the (future) business owners themselves, or when trying to ensure accessible services, or within the regulatory framework. *Table 7* can be used as an analytical tool to identify key bottlenecks at each of these different levels for a given productive use business opportunity.



Table 7 Guiding questions for overcoming key bottlenecks that impede development of productive use business opportunities

Context	Business owners	Available services	Regulatory framework
Decision for change / motivation for start-ups	What is the level of transformation that uptake of electricity use implies for business operations ? What is the scope of related risks ? What is the level of entrepreneurial spirit among the potential candidates for starting electricity-based businesses? (Experience from earlier private sector promotion programmes in the area? General level of business dynamics in the area?)	What information channels can be used to promote awareness of opportunities for productive use of electricity (e.g. via radio, television, newspapers, awareness-raising campaigns, and training)?	Are there any special regulations governing limited liabilities for business start-ups ?
Investment Connection to the grid and installation of RE system Acquisition of electrical machinery and equipment	What is the cash-flow situation of the businesses or the individuals who want to start a business? What is the general willingness to take out loans among the target group? Are entrepreneurs informed about loan availability and conditions? Do they have collateral?	What sources of financing are available to business owners (formal and informal)? What are the conditions for obtaining loans (interest rate, loan tenure, etc.)?	Are there any legal regulations governing accounting for accessing formal financing services that are difficult for MSMEs to meet? Does insecure land tenure hamper investment?
Equipment acquisition & installation	Do entrepreneurs have the capacity to make an informed purchasing decision for electrical equipment? Do entrepreneurs know about equipment vendors and installation services available in their area? Are the workplace conditions common among MSMEs suitable for installation of such equipment?	Is the required electrical equipment and machinery available in the area? If not, where can it be procured? Do equipment vendors provide warranties, support for installation, and training in correct and safe operation , etc.? Is there a neutral source of information on the technical aspects of this electrical equipment (performance, operating costs, and quality)? Is repair and maintenance know-how available locally?	What are the legal product standards for the electrical equipment?

Context	Business owners	Available services	Regulatory framework
Production process Operation of new equipment and machinery	Do entrepreneurs have the technical skills to operate the electrical equipment? Are there any safety concerns related to the use of the equipment?	Is the electricity supply sufficiently stable to allow safe operation of the equipment? Is the supply of input materials sufficient and stable? Does the available transport infrastructure enable sustained supply?	Are there any special safety requirements for businesses that are difficult for MSMEs to meet?
Business management Business skills, accounting, and management of human resources	What is the level of business administration skills required to manage production and marketing of the new products and/or higher quantities of products? Do businesses have informal obligations (e.g. family ties) to sustain a certain number of staff (so that they are unwilling to replace staff with electrical machinery)?	If new business models are significantly more complex than existing ones, how and where can business owners acquire advanced business management skills ?	What accounting regulations are in force?
Marketing	Are new marketing strategies and distribution models needed for the new products and services? What additional skills, capacities or access to information do entrepreneurs need to enter into export markets (e.g. language skills, knowledge of formalities and procedures, awareness of quality standards)?	What transport infrastructure and marketing channels are available for export of goods to other regions or overseas markets?	What quality standards and safety requirements apply in the domestic and export markets for the new products? What are the export procedures and formalities ?



The relevant information about individual entrepreneurs' capacities and availability of services and general business environment will come to light in interaction with the target communities, including meetings and workshops organised under [Module 3](#). If productive use programme planners need deeper insights into the circumstances that influence business owners' capacities and willingness to take up electricity use, (qualitative) interviews should be conducted with business people, service providers and community members interested in starting businesses.

Box 3 Experience from a micro hydropower project in Indonesia: Productive use requires a change in traditions

Experience from a micro hydropower project implemented by GIZ in Indonesia under EnDev demonstrates that taking up productive use of electricity requires a change in traditions.

In many remote villages [in Indonesia], subsistence farming still prevails. This means that most families produce much of what they need by themselves. Introduction of productive use of electricity requires a total break from this tradition owing to the differing divisions of labour and trading between families. This represents a major change in routines which have prevailed for centuries. Naturally, this process requires time and patience and cannot easily be imposed by outside development agents who visit the villages only periodically.

Task 4.2

Assess the scale on which productive use opportunities are replicable

Some productive use opportunities are relevant for a huge number of existing enterprises in the target area (such as lighting in bars and shops, and electric water pumping and electric grain mills in agricultural regions), and there are new business ideas offering extensive market potential to sustain a high number of local producers and service providers (e.g. mobile phone charging, and fruit processing for export markets). However, there are also electricity-based businesses that could not survive if multiple competitors vie within a limited area (e.g. photocopying services, welding, etc.). In order to utilise limited programme resources effectively, the planners of productive use programmes must distinguish between the former and the latter scenarios, and tailor support activities to the **replicability of productive use opportunities: Specialised support** (for selecting equipment, gaining access to installation and maintenance services, and providing specialised technical training, etc.) should be provided only if productive use opportunities are **widely replicable**; more **generic support activities** (business management training, access to financing) can be designed in such a way that **more exotic productive uses** also benefit.



Task 4.3

Develop a plan of productive use promotion activities

Planning of activities to promote productive electricity use should be based on the following criteria:

- Productive use promotion should **build on the existing strengths** among local private actors, promote **entrepreneurial talents** and pick up on the most obvious **opportunities**.
- The **key bottlenecks** inhibiting emergence of productive use opportunities should be addressed (keeping in mind that only business ideas whose economic viability has been established should be promoted, and which in the absence of such bottlenecks would emerge, driven by market forces).
- To ensure efficient utilisation of productive use programme resources, activities should be chosen for which there is plenty of fertile ground (**potential for replication**).
- Interventions should be prioritised in response to the **availability of partner institutions** that have or can develop the **capacities to implement** the selected measures.

[Table 8](#) provides an overview of possible productive use promotion activities, structured in line with the various levels and contexts in which bottlenecks may occur. The table contains an *indicative* set of **response options** rather than an exhaustive list of productive use promotion activities.





Table 8 Possible productive use promotion activities

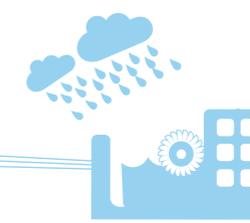
I. Interventions to address bottlenecks at the level of (potential) business owners		
	Bottleneck	Possible response measures
Decision for change	Aversion to high risks, lack of entrepreneurial spirit	<ul style="list-style-type: none"> Organise exposure visits to enterprises that already successfully practice the proposed productive use. Organise (regular or one-time) meetings of homogeneous groups of business persons to jointly review the options and risks involved, assess market opportunities, mutually analyse each other's business operations, and facilitate mutual encouragement.
Investment	Lack of awareness about credit facilities, lack of trust in MFI, lack of knowledge of formal requirements	<ul style="list-style-type: none"> Organise training and awareness-raising sessions with MFI representative(s). Invite MFI representative(s) to business association meetings to inform entrepreneurs about terms and conditions.
	Lack of knowledge needed to make informed purchasing decisions for new equipment	<ul style="list-style-type: none"> Organise electrical equipment fairs where equipment vendors and business owners can get together. Organise visits to urban markets and trade fairs for the equipment they need. Provide information material on technical performance, electricity consumption and quality criteria, etc. Invite vendors and manufacturers of electrical equipment to training workshops and business association meetings to present their products. Organise meetings of homogeneous groups of business persons for exchanging information and experience with equipment.
Production process	Lack of technical skills to operate new equipment and machinery	<ul style="list-style-type: none"> Organise technical training workshops, e.g. through local NGOs or existing training institutes. Organise meetings of homogeneous groups of business persons for exchange of technical know-how.



II. Interventions to address bottlenecks at the service provision level		
	Bottleneck	Possible response measures
Business management	Lack of business administration skills to manage the higher production volumes enabled through electricity use	<ul style="list-style-type: none"> Offer BDS courses and facilitate business persons' enrolment in existing training programmes. Organise meetings of homogeneous groups of business persons for exchange of business management know-how. Mentoring.
Marketing	Lack of skills, capacities and/or information enabling access to regional, national and/or export markets	<ul style="list-style-type: none"> Facilitate linkage with dealers operating at regional or national level and/or with exporters. Offer training or counselling services on product standards, packaging, formalities and procedures, pricing and translation services. Organise visits to national and international trade fairs. Facilitate access to ICT, e.g. the internet.
Decision for change	Lack of access to information about market opportunities	<ul style="list-style-type: none"> Establish a productive use information and demonstration centre, e.g. at the headquarters or regional offices of an energy service provider. Create a mobile information and demonstration unit. Facilitate access to ICT, e.g. the internet.
Investment	MFI have weak local structures and little outreach in the area; MFI lack experience with medium-term lending to MSMEs (3 to 5 years)	<ul style="list-style-type: none"> Facilitate service delivery by existing MFIs, e.g. by offering partial risk guarantees for productive use loans. Increase awareness of productive use potentials among MFIs through demonstration projects and sample business plans. Include MFI representatives in participatory business plan preparations with (would be) entrepreneurs Broker collective procurement of equipment to attain special price offers. Provide incentives for existing MFIs to strengthen services in the area. Set up special productive use funds managed by MFIs or development banks.



	Bottleneck	Possible response measures
Investment	Lack of local availability of electrical equipment and machinery needed for productive uses	Invite equipment vendors from an urban centre to visit the programme area for exhibitions and promotional activities at special events (e.g. agricultural machinery fair, market days, etc.). Organise visits to urban markets or trade fairs that feature the equipment needed.
	Lack of service providers in the area with technical expertise to repair and maintain the equipment	Initiate advanced training workshops at existing training institutes that professional technicians can attend. Work towards inclusion of relevant technical know-how in the curricula of local vocational schools, and train instructors accordingly.
Production process	Energy services are insufficient in terms of quantity and/or quality	Include representatives from energy service providers in productive use promotion planning to trigger and drive improvement of services for commercial clients. Broker special service contracts between energy service providers and commercial users. Set up industrial zones with reliable electricity supply that are not subject to load shedding.
	Weak capacities at vocational institutions for expertise in the field of productive electricity use; weak public services, e.g. agricultural extension	Organise training of trainers (ToT) measures for vocational school instructors and extension agents, including e.g. demonstration of new tools and equipment for special skills (agricultural mechanisation and processing, furniture-making, car repair, etc.).
	Lack of certain input materials needed for new productive use-based production processes	Help establish and expand linkage between input providers (based in urban centres) and local business owners.
	Special requirements with regard to space availability, terrain conditions for the new production processes	Set up industrial and commercial zones where terrain conditions are appropriate and businesses can use joint facilities (e.g. for waste disposal and energy supply, etc.).



	Bottleneck	Possible response measures
Business management	Lack of business training opportunities	<ul style="list-style-type: none"> ▶ Work towards integrating business training into the portfolio of tertiary education institutions and vocational schools. ▶ Extend outreach of existing entrepreneurship training programmes (often targeted at urban areas) to the productive use programme area; to be funded by electrification programmes, if necessary.
	Lack of mentoring and counselling services for business owners	<ul style="list-style-type: none"> ▶ Facilitate setting up business mentoring / counselling service in cooperation with business associations ▶ Extend outreach of existing MSME counselling services (often targeted at urban areas) to include the productive use programme area; to be funded by electrification programme if necessary
Marketing	Weak transport infrastructure for haulage of goods to other regions or export to overseas markets	<ul style="list-style-type: none"> ▶ Advocate for development of transport infrastructure through government programmes. ▶ Facilitate collective deliveries of goods to urban centres.
III. Interventions to address bottlenecks at the regulatory framework level		
	Bottleneck	Possible response measures
	Neglect of MSME promotion in rural areas in development strategies and policies	<ul style="list-style-type: none"> ▶ Advise ministries on integrating the objective of creating a more enabling regulatory environment for MSMEs in development strategies and policies, and on developing relevant programmes, including budgeting.
	Limited institutional MSME promotional competence among the responsible ministries and national authorities	<ul style="list-style-type: none"> ▶ Advocate for establishment of a national agency to promote MSMEs, with branch offices in outlying regions and provinces. ▶ Facilitate sharing of good practice experience between government ministries and regional and national-level agencies.
	Lack of attention to productive electricity use in national and sub-national rural electrification programmes	<ul style="list-style-type: none"> ▶ Share experiences and success stories from productive use programmes with decision makers responsible for rural electrification. ▶ Advocate for inclusion of productive use objectives and indicators in rural electrification strategies and programmes.

**Box 4** Promoting productive uses of renewable energy – technology-specific challenges and opportunities

The **unique features** of renewable energy (RE) sources, especially in the context of stand-alone systems, often directly imply particular restrictions to suitable productive use applications. Some of the most typical technological restrictions of stand-alone RE systems can be summarised as follows:

- ▶ First and foremost, the maximum **power output of RE-based systems is too low for many productive AC power uses**. Typical motive power applications like grinding, milling and sewing, etc., require more power than typical PV solar home systems (SHS) or micro hydro turbines can supply⁹.
- ▶ In addition, productive uses with high power demand can involve considerable **fluctuations in load** in stand-alone RE systems. To manage these load fluctuations, it may be inevitable to add a load control system to the RE scheme, which will imply substantial extra costs that need to be taken into account when planning productive uses of electricity. This is all the more important for motive applications which, depending on the characteristics of the motor used, may require 3-5 times higher power input for machinery start-up (so called **surge-current**).
- ▶ The availability of renewable energy resources is often subject to **seasonal fluctuations**; e.g., the output of a hydropower scheme can vary substantially over the course of the year. This fluctuation in power generating capacity needs to be taken into account when assessing productive use options.
- ▶ Some renewable energy resources also **fluctuate over the course of each day (i.e. on a 24h-cycle)**. This is always the case for solar energy, and to a lesser extent for wind energy. Often, peak power demand is not at the same hours as peak supply, creating a need for power storage. Therefore, productive use of power generated by RE systems works best whenever power demand for productive activities can be used to fill gaps in the demand curve in order to reduce storage and generation, e.g. productive electricity use that can be scheduled for times of excess supply. In solar powered systems, for instance, it is therefore typically good to explore (i) options for **daytime productive use applications** (because energy is produced at daytime and domestic loads are usually during the morning and evening), or (ii) applications that work with **alternative means of energy storage**, like pumping water for irrigation or livestock into a water basin.



- ▶ Hydro and wind power systems that generate motive power also offer a **direct drive** option for power applications as an alternative to transforming the generated power into electricity. With direct drive, machines are run directly by the turbine via a coupling or a belt and pulley transmission. The main advantages of such an arrangement are that the purely mechanical technology is usually very robust and relatively easy to handle, and that efficiency losses through transformation into electricity can be avoided. The main disadvantages are that the machines for productive uses must be installed on site where the power is generated.



9) While larger RE generators for such high-power productive uses are often technically feasible, they typically are economically less viable for such specific productive uses than alternative diesel generator sets due to the high upfront investment costs of RE, which requires a more constant distribution of demand over time than diesel generators.



Task 4.4

Identify opportunities for linking up with ongoing programmes

Productive use programme planners should now explore which of the prioritised productive use promotion activities can best be implemented in cooperation with ongoing programmes and projects in the areas of local economic development, private sector promotion and agricultural development, etc. (as mapped out under [Module 2](#)).

Task 4.5

Select partner institutions and determine what capacity development interventions will ensure the sustainability of productive use promotion

For those productive use promotion activities that have to be set up from scratch, partner institutions and service providers must be selected to implement the defined measures based on the mapping and capacity assessment carried out under [Module 2](#). Memoranda of Understanding (MoU) and/or Terms of Reference (ToR) must be drafted in close collaboration with these partners to ensure maximum inclusion of the partners' local expertise. As some of the selected partner institutions may need support for building capacities specifically relevant to productive electricity use, the productive use programme team should take an active role and, for example, establish linkage between the selected institutions and practitioners with expertise in the relevant fields.

Outcomes of Module 4

- ▶ Clarity on key bottlenecks that could hinder productive use uptake, marking entry points for productive use promotion activities
- ▶ plan of productive use promotion activities
- ▶ selection of cooperation partners and/or service providers (e.g. consulting firms, NGOs, and ongoing projects and programmes for local economic development, small enterprise promotion and agricultural development, etc.)
- ▶ plan for capacity development among these institutions, if needed
- ▶ MoUs or ToRs with qualified implementing partners.

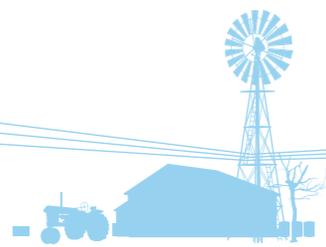
TOOLS AND INSTRUMENTS

Readily usable tools and instruments

GIZ (2007) ValueLinks Manual. The Methodology of Value Chain Promotion. [Module 2](#) "Analysing a Value Chain" provides guidance on how to identify entry points for interventions to strengthen a value chain.







Module 5 Implementation of productive use promotion activities

Modules 5.1 to 5.4 provide detailed guidance for implementation of a number of feasible productive use promotion activities, namely those that respond to the most frequently observed productive use bottlenecks. There is no preferential sequence for implementation of *Modules 5.1 to 5.4*, as this depends on the specific programme context and what steps are relevant or not.

Module 5.1: Energy services

In brief

In most cases, energy service providers and power utilities have an intrinsic interest in enhancing uptake of productive use of electricity, as increases in electricity demand in sparsely populated rural areas can improve the viability of underused lines and systems, and generate additional revenue. As outlined in previous modules, energy service providers can and should take an active role in all steps in the productive use programme cycle.

Practical Tasks

Task 5.1.1 Raise awareness of productive uses among energy service providers

As a precondition it is necessary that energy service providers are generally aware of the importance of productive

use promotion. Additionally energy service providers are capable it is beneficial when service energy providers can quantify the additional possible revenue that productive use promotion can offer. Productive use programmes may intervene to **make information available** to the energy service provider **on the electricity consumption of certain electrical appliances and the related business potential for customers**; a short collection of electricity-based business profiles, including calculations of their typical electricity consumption per month, can be an effective tool.

Task 5.1.2 Encourage energy service providers to act as technology facilitators

The established customer relations functions of the utility can be used to **disseminate information** on high-quality and energy-efficient electrical appliances and on **recommended suppliers**. Utilities could also become a **distribution channel** for such equipment themselves. This makes sense in particular for equipment of very generic productive use potential, like lighting and ICT equipment, or for agricultural machinery like pumps and irrigation equipment. For example, energy service providers can establish contractual relationships with equipment vendors, acquire demonstration models, and present these to their customers on suitable occasions, e.g. when connections are installed or rate charges collected. In order to retain high customer satisfaction, such service providers will have an intrinsic interest in ensuring that only good quality equipment is selected for promotion. These energy service providers could also act as a **first contact point for after-sale services** for the electrical appliances distributed in this way.

Task 5.1.3 Consult with energy service providers on options for supportive tariff systems

Electricity demand patterns in many rural and urban contexts call for a system of differentiated tariffs for clients of different demand volumes. Special **reduced tariffs for commercial users** can be an effective element of productive use support. Building on experiences with differentiated productive usefriendly tariff systems, productive use programmes can offer special consulting services for designing a productive use-friendly tariff system appropriate for the given electricity demand patterns.¹⁰

Outcomes of Module 5.1

- ▶ Increased awareness of the potential benefits of productive electricity uses among energy service providers
- ▶ defined role for energy service providers in disseminating information on and/or marketing electrical equipment for productive uses
- ▶ options explored whether a credit facilities for productive use equipment offered by energy service providers makes sense
- ▶ options explored for introducing a commercial tariff systems.

10) Tariff systems can also be designed in ways that help promote energy efficiency, particularly among commercial users. If environmental sustainability is part of the concrete productive use programme objectives, potential for applying this lever deserves further attention.



TOOLS AND INSTRUMENTS

Readily usable tools and instruments

For involving the energy service provider in various steps of the PU programme

NRECA International, Guides for Electric Cooperative Development and Rural Electrification. Module 9: Productive Uses of Electricity.

Provides concrete steps for electric cooperatives and companies to design a productive uses of electricity program, as a basic tool to move towards greater sustainability.

<http://www.nrecainternational.coop/resources/Publications/Documents/GuidesforDevelopment.pdf>



Module 5.2: Raise awareness of productive electricity uses

In brief

Access to electricity offers rural communities a completely **new range of options for economic activities**. Assuming that people in new access areas are to a large degree *electricity illiterate*, **educational outreach to inform inhabitants about safe, efficient and profitable utilisation of electricity** may be vital. The need for awareness raising about productive use opportunities depends typically on the degree of remoteness of newly electrified communities, and on the people's exposure to enterprises that already use electricity.

Awareness raising campaigns for productive electricity use can take different forms:

1. **sensitisation** to options for using electricity beyond light, phone charging and TV/radio, targeting the **general public**
2. **specific** awareness raising about a particular technology, targeting a specific group of **business owners or farmers** (e.g. the use of electric sewing machines and electricity-based irrigation systems, etc.)
3. awareness raising targeting **key decision makers** (e.g. local authorities, heads of business associations, MFI staff and energy service providers) on productive use opportunities and their expected economic and social benefits.

Practical tasks

Task 5.2.1

Define the target group

In order for a productive use awareness campaign to be effective, it is vital to precisely define and characterise the intended target group so that **messages and communication channels can be adapted** accordingly:

If the programme seeks to trigger start-ups of a certain type of business, the following should be considered when defining the target group:

- ▶ Is the productive use activity especially suited to be taken up by women or by men? By members of a certain ethnic or religious community? By a special age group?
- ▶ What level of education is needed to successfully manage this kind of business?
- ▶ Which skills are needed? Which existing artisans or business people have similar skills?
- ▶ Does the activity demand a great deal of entrepreneurial spirit, and would it only be appealing to young and/or highly dynamic community members who are prepared to take risks?
- ▶ an the productive use business be pursued as a part-time activity?
- ▶ Would it be carried out in private premises, or does it require special workshop facilities?
- ▶ How much start-up capital is needed, and what share should be covered by the entrepreneur's private savings?

Task 5.2.2

Define the desired messages

The key messages to be conveyed in a productive use awareness campaign should be well thought-through and designed in a way that they are most **relevant** for the target audience. The following elements should not be missing when introducing productive use ideas and seeking to catch attention:

- ▶ **potential economic benefits** (ideally presented in the form of **example calculations** of costs, revenues and profits of hypothetical or existing businesses)
- ▶ additional **social and economic co-benefits** (local employment, new services, local value added to local products)
- ▶ the level of investment needed for equipment, machinery and appliances
- ▶ evidence and examples of how the productive use business idea has worked in other locations
- ▶ Sources where the desired equipment and machinery can be purchased.

Participants should also be informed about any **planned training sessions**, demonstrations, or other activities for disseminating information to follow under the productive use programme.

Task 5.2.3

Select appropriate communication channels

Awareness raising strategies must be **tailored** to the target audience's preferred ways of receiving information, i.e. appropriate communication media and channels as well as competent and appropriate communicators must be

chosen, and the campaign must be sensitive to the language skills and literacy levels of the intended audience. Productive use opportunities should also be presented in such a way that makes them as **tangible** as possible for the audience. Some proven awareness raising models in rural contexts include:

- ▶ **specific productive use community meetings or workshops** to discuss productive use options, possibly with experienced entrepreneurs as special guests
- ▶ integrating discussions on productive electricity use into **meetings of community-based institutions** (such as women's self-help groups, savings groups and farmers associations)
- ▶ **road-shows** of technical equipment (e.g. lighting devices, sewing machines, etc.), demonstrations of equipment at village markets, e.g. through use of **mobile demonstration units**
- ▶ **productive use information centres** where electrical equipment is demonstrated and experts advise visitors
- ▶ **presentation** of productive use ideas at meetings of cooperatives and business associations
- ▶ **exposure visits** to existing productive use enterprises
- ▶ joint **visits to urban markets** to learn more about electrical equipment and machinery
- ▶ **distribution of pamphlets** (short, single-topic hand-outs) to business owners
- ▶ **posters** displayed on the walls of shops, etc.

At any awareness raising event, contact data from interested participants should be gathered if possible to facilitate organisation of follow-up activities.



TOOLS AND INSTRUMENTS

One very effective technique is to involve established community authorities in awareness raising events as moderators, hosts or speakers, as this raises confidence among community members in the ideas presented on productive use of electricity.

Outcomes of Module 5.2

- ▶ Increased awareness of productive use opportunities throughout the community
- ▶ better knowledge among interested (future) entrepreneurs about the benefits and requirements of productive electricity use
- ▶ increased awareness of productive use among local authorities and potential partners (MFI, providers of business development services, training institutes, etc.).

Box 5 Assign awareness raising activities to a qualified implementing partner

All tasks under *Module 5.2* should be delegated to a single organisation that will progressively develop a good relationship with the target communities and those individuals who are interested in engaging in productive use-based business activities. NGOs, locally rooted consultancies, or government agencies whose core activities are also based on community work are good candidates for implementing partners. In any case, these partners should seek to harness the established structures and networks of existing CBOs and village groups for all awareness raising activities.

Readily usable tools and instruments

CEFE International is a comprehensive set of entrepreneurship training instruments using experiential learning methods; it can be used to enhance the imagination and sensibility of potential business persons to start a new business or enlarge existing businesses with electricity. www.cefe.net

NRECA Guides for Electric Cooperative Development and Rural Electrification. Module 9: Productive Uses of Electricity.

Provides concrete steps for electric cooperatives and companies to design a productive uses of electricity program, as a basic tool to move towards greater sustainability. The guide makes reference to NRECA experience on raising awareness on PU through mobile demonstration units and other methods. www.nrecainternational.coop





Module 5.3 Provide technical assistance to MSMEs

In brief

Technical skills, such as (i) product know-how to make **informed decisions for purchasing** electrical equipment and (ii) **skills to operate and maintain** such equipment, pose major bottlenecks for uptake of productive electricity use in the rural MSME sector. Technical assistance to business owners and start-ups is therefore a key element of any effective productive use promotion strategy. The scope and intensity of technical capacity building obviously depends much on the level of technical sophistication of the community where productive use of electricity is being promoted.

Practical tasks

Task 5.3.1 Assess technical training needs among the target group

The very first step towards designing an effective technical assistance strategy is to assess the knowledge and skills gaps of the target group (building on the analysis of key bottlenecks undertaken in *Module 3*). This can be done in an interactive **workshop** or through discussions or qualitative **interviews** with a representative selection of entrepreneurs, carried out by a technical expert. The assessment should

also be sensitive towards special technical training needs among certain groups, e.g. women with little previous exposure to electrical equipment.

Task 5.3.2 Define a training strategy and identify partner institutions

The training strategy should be determined in a way that maximises outreach to the target group while capitalising on and strengthening existing technical skills and utilising programme resources as efficiently as possible. Broadly defined, there are four different modular options for a technical assistance strategy:

1. **working directly with individual entrepreneurs** through technical training workshops, on-the-job coaching, and visits to trade fairs for electrical equipment guided by a technical expert, etc
2. working through **technical training institutes or vocational schools** by supporting their efforts to offer special courses, integrating teaching content relevant to productive use into the curricula of existing courses and enhancing the technical capacities of teachers
3. working with **equipment vendors** to improve their product portfolio, customer services and operating manuals for electrical equipment
4. improving other **technical advisory services** accessible to productive use entrepreneurs.

All elements of the technical training strategy should ideally be developed and provided through **established training institutes, vocational schools or local technical experts**, including equipment vendors, qualified NGOs and research

institutes. This will ensure that course content and teaching methods are tailored to local contexts and target groups, and also that local technical capacities for productive use are strengthened in the long run. **Business associations, unions and chambers** as well as **government extension agencies** are also potential partners for organising and implementing technical training for productive electricity use.

In many cases it will be prudent to follow up on group training with individual **visits by technical experts** to workshops with the aim of further supporting entrepreneur efforts to put acquired skills into practice. Another option is to divide training participants into **self-help groups** who visit each other mutually and provide peer advice as follow-up to training.

Task 5.3.3 Design technical training courses

The technical training will typically need to cover the following issues:

- ▶ advising on **where** to purchase equipment
- ▶ criteria for **selecting and purchasing electrical equipment** (performance, quality, energy consumption, etc.)
- ▶ information on **warranties, maintenance servicing and provision of spare parts**, etc., that customers should expect to form part of the product package

- ▶ correct **installation** of equipment and associated requirements (protective devices, earthing, ventilation, etc.)
- ▶ **proper use and maintenance** of equipment, including necessary safety precautions and energy-efficient operation.

Outcomes of Module 5.3

- ▶ Enhanced technical skills among MSME business owners and employees relevant to productive electricity use
- ▶ enhanced capacities among training institutes relevant to productive electricity use
- ▶ productive use-specific training curricula and a set of proven training methods.





TOOLS AND INSTRUMENTS

Box 6 Business training and other business development services (BDS)

Successful uptake of productive electricity use often builds on good business management capacities among entrepreneurs. Business start-ups need to develop basic entrepreneurial capacities such as informed risk-taking, and business management skills such as bookkeeping, marketing and supply management, etc. For existing businesses, advanced management capacities are often needed to ensure that uptake of electricity use actually translates into profit gains. This is because significant investment in equipment may be required, **financing institutions** ask for detailed business plans, operations with electrical equipment may be **more complex** and need different **staff management** approaches, and **new marketing strategies** must be developed to sell larger volumes of output or higher quality products.

Various programmes and established institutions offer business management and entrepreneurship training and other BDS, including mentoring programmes and counselling services for MSME. Productive use programmes should seek to collaborate with these undertakings and aim to ensure access to relevant business management training for productive use entrepreneurs. Another option is to adapt the content of business training offered by other programmes and institutions to explicitly address some of the management challenges specific to productive use of electricity.

Established institutions and proven methodologies for business management training tailored to the needs of MSME include:

- ▶ **International Labour Organization (ILO)**, under its Small Enterprise Development Programme, has developed several training tools for business and entrepreneurship training services, with long-standing implementation experience in a large number of partner countries.
- ▶ **e.g. ILO Start and Improve Your Business (SIYB)**, comprising of four sequential training packages: 1. “Generate your Business Idea” (GYBI), 2. “Start Your Business” (SYB), 3. “Improve Your Business” (IYB), 4. “Expand Your Business” (EYB). www.siyb.org.vn/English/whatsnew.htm
- ▶ **CEFE (Competency based Economies through Formation of Enterprise)** is a comprehensive small business training network with more than 20,000 certified trainers in more than 100 countries. In most countries there are private consulting companies or government SME promotion agencies which offer national ToT courses or entrepreneurship courses for micro and small businesses— existing as well as potential. CEFE training instruments are action-oriented and based on experiential learning methods, aiming to enhance the business management competencies of a wide range of target groups (including semi-literate business persons). Typically CEFE trainings last for 5-days. www.cefe.net

- ▶ **EMPRETEC**, an integrated SME capacity-building programme of **UNCTAD** launched in 1988, has developed an Entrepreneurship Training Workshop (ETW), using an experiential learning method aimed at supporting behavioral change; it identifies and reinforces personal opportunities through a process of self-assessment. A typical ENPRETEC training lasts 2 weeks and can be held for various target groups, including semi-literate people. An important element is a careful selection of individuals with entrepreneurial spirit and ambitions. The EMPRETEC programme is implemented in 32 countries with business support centres and local certified trainers. www.unctadxi.org
- ▶ **INSABA Business Planning Manual “Getting it Right”**, comprising the following toolkits: 1. Pre-screening tool; 2. Market study tool; and, 3. Feasibility study Tool. www.insaba.org/images/stories/insaba%20del.2.1.1%20business%20planning%20toolkit.pdf
- ▶ **GIZ Senegal PERACOD** (2010), *Stratégie de développement des usages productifs en milieu rural* (French), provides a detailed outline of the business training *Gerez Mieux votre Entreprise* (GERME) and a business game that helps participants understand typical business management challenges and introduces simple management tools.

Readily usable tools and instruments

NRECA Guides for Electric Cooperative Development and Rural Electrification. Module 9: Productive Uses of Electricity.

Provides concrete steps for electric cooperatives and companies to design a productive uses of electricity program, as a basic tool for to move towards greater sustainability. Provides detailed guidance on developing a technical assistance strategy for MSME who use electricity, including equipment selection, installation and maintenance.

www.nrecainternational.coop



Module 5.4

Facilitate access to financing

In brief

Next to technical skills, access to financial resources for the initial investment in equipment is often a bottleneck for enterprises seeking to take up electricity. MSMEs often lack access to formal financing mechanisms, because financial institutions have insufficient outreach to rural communities and are apprehensive of the high transaction costs associated with working with small clients. Another reason is that rural business owners often have limited legal documentation and collateral, e.g. of business registration and asset ownership, and therefore lack credit worthiness. Hence, productive use promotion should in many cases contain a component for facilitating access to financial services.

Practical tasks

Task 5.4.1

Assess the hurdles to loan applications at the client-level

As a first step, the barriers that impede business owner efforts to obtain loans should be assessed. Typical bottlenecks are:

- ▶ high level of risk aversion that hampers willingness to make investments
- ▶ lack of awareness and knowledge of existing financial services
- ▶ lack of trust in formal financial institutions

- ▶ difficulties in meeting the formal requirements obtaining loans (preparation of a business plan, accounting practices, etc.)
- ▶ lack of collateral.

Task 5.4.2

Take stock of existing regional and national MFIs and micro lending programmes

The next step is to assess the existing MFI landscape, including **commercial and public MFIs, microfinance schemes run by NGOs or government agencies, community-based savings and loan groups and credit cooperatives**, to find out whether they are accessible to the target group, and whether the loan products they offer are appropriate for **productive use investments**. Notably, repayment periods of at least one year, more typically two years, are warranted for productive use investments, as it can take time until the associated changes in production processes translate into profits, and until new or higher quality products have found their ways to the market. If programmes intend to cooperate with small MFIs, e.g. for the purpose of establishing new loan products, they should carefully select their cooperation partners based on assessment of their management and financial situation.¹¹

Qualitative expert interviews with senior MFI staff are here the most effective assessment approach.

¹¹ The GIZ Financial System Development (FSD) Programme in Uganda has established a *light due diligence tool for assessing savings and credit cooperatives (SACCOs)*.



Task 5.4.3

Define measures for improving access to loans for productive use investments

The most appropriate entry points for productive use programmes to facilitate access to financing will emerge as outcomes of *Tasks 5.4.1* and *5.4.2*. Possible activities for improving access to financing for productive electricity use can include:

- ▶ Integrate **awareness raising about formal credit options** into technical and business management training and productive use workshops for entrepreneurs.
- ▶ Strengthen business owners' **collateral** by facilitating the formalisation and registration of business activities and capital assets.
- ▶ Raise **awareness among MFI managers** on the profit potential of productive electricity use, e.g. using sample business plans, and **focus** on the specific needs of productive use entrepreneurs.
- ▶ Invite **MFI staff to participate in business plan preparation workshops** with potential borrowers, and facilitate meetings between MFI staff and business associations.
- ▶ Assist MFIs in developing **new credit lines** that are particularly suitable for productive use investments, e.g. with repayment periods of 12 months and more, and eligibility of purchased electrical equipment as collateral.
- ▶ If no professional financial institution is interested in lending for productive use investments, other potential partners and options should be investigated for setting up a fund for productive use of electricity (such as a **community-based or NGO-managed revolving fund for productive use undertakings**).

- ▶ Provide **partial risk guarantees for productive use investment loans** (covered by donor funds or qualified entities).
- ▶ Advocate within the scope of national and regional level policy dialogue for action to create a more enabling regulatory environment and enhance government support for productive use loans.

Box 7 Loans for productive use investment provided through Zimbabwe's Rural Electrification Agency (REA)

The post-independence Zimbabwean Government has given high priority to rural infrastructure development programmes, which included the rural electrification programme. However, achievement of expected returns on rural electrification was being threatened by low uptake rates. In response to this, a Rural Electrification Agency (REA) was established in 2002 to support income-generating activities for small and medium-sized enterprises (SME) in order to increase electricity demand in rural areas and stimulate small-scale commercial and industrial development. One key service provided by REA is to offer loans for electrical equipment and machinery, such as grinding mills, irrigation equipment and welding machines, which are ordered by SMEs and delivered to the production site by REA. REA is funded by a levy on all electricity bills starting at 1% in 2002 and rising to 6% in 2007, which is supplemented through government fiscal allocations.

Find more information on these efforts at:
www.rea.co.zw



Task 5.4.4

Monitor and evaluate productive use loan performance

Productive use programmes should carefully monitor and evaluate the impacts of micro lending facilities that have been established or improved. This is particularly important given that **little experience and few success stories exist to date** on good practices within the scope of financial support for productive use activities.

Outcomes of Module 5.4

- ▶ Improved access to financing for productive support investments for MSMEs
- ▶ improved understanding among MFIs of the potential benefits of productive electricity use
- ▶ enhanced capacities of MFIs to work with micro and small enterprises
- ▶ sound business plans for financially viable business models that may be used as examples in other contexts.

Box 8 Success factors for productive use development beyond the operating range of energy programmes

Experience shows that lack of basic physical infrastructure (such as access roads, ICT facilities and water infrastructure) can in some cases be a key factor inhibiting uptake of productive use. For example, the availability of water resources may be the single most important precondition in the agricultural sector. Similarly, network expansion and local presence of mobile phone providers may constitute the essential requirement for development of mobile phone charging businesses. If new productive use products – i.e. advanced quality products or higher product volumes that cannot be sold locally and must be exported to other regions – do not find their way to markets, or if entrepreneurs have limited access to information on market opportunities and prices, the impact of productive use promotion will be limited. Development of infrastructure and other complementary services provide a more indirect lever for driving productive use development, and go beyond the scope of productive use programmes. Nevertheless, if infrastructural bottlenecks are identified that hinder productive use development, productive use efforts can seek to shape ongoing infrastructure programmes to maximise benefits that favour productive uses.

TOOLS AND INSTRUMENTS

Readily usable tools or instruments

April Allerdice and John H. Rogers (2000), **Renewable Energy for Microenterprise**. This guide is targeted to the many types of microfinance institutions (MFIs) and microenterprise support organizations that are interested in improving the profitability of their members' microenterprises through renewable energy (RE) technologies. In addition, RE suppliers and technical organizations can use this guide to strengthen efforts to incorporate microfinance institutions and practices into rural electrification programmes. www.eldis.org/assets/Docs/28780.html

BRAC (Bangladesh Rural Advance Committee)

www.brac.net

The approach of BRAC differs from that of other microfinance institutions – it utilise a credit-plus approach where loans are accompanied by various forms of assistance for the borrowers, such as skills-training, provision of higher quality inputs and technical assistance as well as marketing for finished goods. BRAC organise members into village organisations of 30- 40 women. The members are encouraged to use credit facilities to start new enterprises or expand existing ones and as they increase their business, they progressively graduate to larger loans.







Module 6

Ensure monitoring and evaluation (M&E)

In brief

Sound monitoring and evaluation (M&E) of productive use promotion activities is an essential element a programme cycle, and is particularly important in light of the **limited well-documented experience** with productive use programmes. Such evidence is needed first and foremost to underpin decision-making on whether and in which cases it makes sense to add productive use components to energy programmes.

Even though M&E is only discussed in detail in this last section of the manual, the process should accompany all steps throughout the productive use promotion project cycle, from the very early planning steps onwards (not least because M&E costs and capacity requirements must be considered in the budget and personnel planning of interventions). The tasks included in this module, although outlined in a separate module, must therefore be implemented **in parallel** to tasks proposed in the previous modules.

If productive use promotion is implemented as a sub-component of an energy access programme, it is recommended that a **separate monitoring framework** be set up for productive use interventions. This is because results from productive use promotion will materialise within distinct

(often longer) time horizons, and because a distinct target population will be subject to the M&E surveys and studies to be undertaken.

Practical tasks

Task 6.1

Set objectives and define a results chain

See [Module 2](#).

Task 6.2

Collect micro-level baseline data

M&E methodologies must be designed, depending on whether productive use promotion efforts aim to transform existing businesses with electricity or to promote start-ups of productive use businesses. In the first case, monitoring can take the form of surveys among a defined sample of businesses, while in the latter case the quantity and types of new businesses must be monitored as well. In order to allow for robust evaluation of programme impacts, baseline data should also be collected among suitable control groups. The data and information collected at this stage will also be useful during the design and implementation of productive use interventions.¹²

¹² For example, under the GIZ PDDC programme in Benin, a productive use baseline study in the programme area has helped to generate a set of business plan schemes for various types of businesses that were used later to support MSMEs in productive use uptake.

Baseline studies at micro level (i.e. at the community or company level) can cover the following elements:

- 1) Assessment of **socioeconomic indicators** (e.g. income, employment, consumption of certain goods, school enrolment, etc.; mainly quantitative) through baseline studies conducted among the target population prior to at the immediate start of interventions.
- 2) MSMEs and **business activity appraisals**, including qualitative and quantitative methods, to assess numbers and types of existing businesses as well as business opportunities. In some cases such data may already have been generated as part of the feasibility study for the electrification project in order to inform decision-makers about the type of electricity infrastructure to be built.

Task 6.3

Monitoring the institutions involved

Monitoring should also take place among institutions involved in productive use interventions in order to **assess capacity development results** of relevant services. Such monitoring may comprise the following elements:

- ▶ regular stocktaking of existing institutions and actors (private and public) that provide services relevant to productive uses, e.g. business counselling services
- ▶ qualitative analysis (such as expert interviews, focus groups, and participatory observation) of staff at technical and vocational training institutes, government agencies, public utility authorities, MFIs and NGOs involved in services relevant to productive use,

etc., to appraise the level of relevant awareness and know-how

- ▶ surveys among representative samples of (potential) clients of these institutions to assess the quality and outreach of their services.

Task 6.4

Monitor at the macro level

If programmes comprise activities aimed at the macro level, i.e. at policy-making and the **regulatory framework** relevant to productive use of electricity, monitoring scopes at this level may cover the following:

- ▶ inclusion of productive use objectives in development policies and strategies at national, regional and sectoral level
- ▶ reform of the regulatory framework as relevant to the evolution of productive electricity use;
- ▶ institutional capacities relevant to productive use among government ministries and national rural energy agencies
- ▶ changes in planning and implementation processes for policies and regulatory requirements relevant to productive electricity use (MSME promotion policies, related regulations, MSME registration & statistics, budgets, etc.).



Task 6.5

Assess impacts

There is still surprisingly little sound evidence on whether, to what degree, and under what circumstances electrification can boost economic growth through productive use of electricity, and what role complementary services designed to promote productive use play in this context. It can therefore be extremely valuable for future programmes to complement productive use intervention with **robust electrification impact assessment**. This would allow to study whether changes in enterprise performance can be attributed to productive use promotion and not to other factors.

The GIZ-ESMAP initiative *PRODUSE* was launched in 2006 to explore the nexus between rural electrification and productive use has produced and tested a sophisticated methodology for robust impact assessment of productive use efforts following rural electrification (see *tools and instruments for Module 6*).

Task 6.6

Feed M&E results and lessons learned into further planning processes within and beyond productive use programmes

Last but not least, it must be ensured that the lessons and good practice experiences emerging from M&E efforts are **communicated effectively** to decision makers involved in the planning and design of similar projects, follow-up productive use efforts in the programme area, and other energy and productive use programmes.

Productive use programme experience and concrete productive use business opportunities that have picked up successfully can also be presented directly to communities and local-level development actors (including NGOs and local government authorities) with similar socioeconomic structures with an eye to sparking further promotion of productive electricity use. Effective instruments of communication to this end include small leaflets with standard business plans or productive use tools & equipment catalogues.

Outcomes of Module 6

- ▶ Results on the effectiveness of productive use promotion measures implemented
- ▶ evidence of outcomes to justify allocation of resources for productive use promotion
- ▶ strengthened M&E capacities among monitoring and evaluation partners
- ▶ lessons learned and good practice experience to be fed into future productive use programme planning

TOOLS AND INSTRUMENTS

Readily usable Tools or Instruments

GIZ (2008) Results-based Monitoring. Guidelines for Technical Cooperation. Eschborn.

The guidelines describe the general concept of results-based monitoring, and summarize the tasks to be performed, from project design to the use of monitoring results.

RWI (2011): Impact Evaluation of Productive Use – An Implementation Guideline for Electrification Projects.

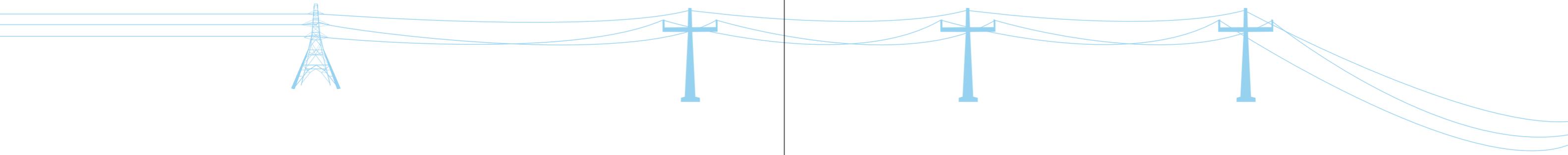
Ruhr Economic Paper No. 279.

This hands-on guide for designing evaluations of the impacts of productive electricity usage was developed by RWI in the framework of the GIZ/ESMAP study *Productive Use of Electricity (PRODUSE) – VOLUME I – Measuring Impacts of Electrification on Small and Micro Businesses in Sub-Saharan Africa*. Complementary to the existing literature on evaluation methods, this guide familiarizes project managers with the concrete steps that have to be undertaken to plan and implement an evaluation. The guide comprises three modules based on enterprise surveys and on anecdotal case studies. For each module, the implementation is described on a step-by-step basis including conceptual issues as well as logistics and methodological questions.

<http://www.rwi-essen.de/publikationen/ruhr-economic-papers/396/>

IFC Advisory Services / GIZ / DFID (2008), The Monitoring and Evaluation Handbook For Business Environment Reform.

A handbook for **Business Enabling Environment (BEE)** practitioners offering guidance on **Monitoring and Evaluation (M&E)** and within this the task of **Impact Assessment (IA)**.



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