DFID Engineering Knowledge and Research Programme

Contract No R8148

Community Electricity for Sustainable Livelihoods through Public Private Partnerships ("PACE")

Report presented by Energy for Sustainable Development Limited

Internal report: Preparation of final project outputs

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INTRODUCTION

Aims and Objectives

Project Goal: Improved access to clean energy in poorer households through public-private partnerships.

Project Purpose: Define and test models for public-private partnerships to deliver electricity services to rural and under-served urban communities to enable the provision of electricity for communal and domestic access.

Project Outputs:

- Country assessments of the present status of private sector involvement in electricity provision and impact on poorer communities.
- Sustainable Livelihoods evaluation of partnership models for providing electricity to poor communities (electricity for communal lighting, to schools, hospitals and businesses and to households). Action plans for most promising models developed and pilot tested.
- Guidelines detailing recommended operational models for public private partnerships to deliver lower cost energy services to the community.
- "Model Documents" (standard PPP contracts, financial arrangements)

The research has focused on delivery of the above by seeking to:

- Investigate existing examples of public-private partnerships (PPPs) that are delivering electricity to communities. The analysis covered the following aspects: initiation, finance, structure, levels of stakeholder involvement, tariff arrangements, management, maintenance and general sustainability; and
- Understand livelihood aspects of public-private provision in the selected examples, especially in terms of access for the poor. This required an analysis of both direct and indirect access to electricity in the domestic, commercial and institutional sectors

The development of guidelines will inform stakeholders at a national level and international level of the steps that should be taken to maximise benefits to a community from access to electricity.

Methodology

The methodology that was employed in carrying out the PACE project Case Studies is summarised in the table below.

RESEARCH	METHODS/TOOLS/SAMPLE	RATIONALE
1. Community characteristics	Secondary data + interview(s) with key informant(s)	Context setting
2. PPP / electricity supply situation	Interview(s) with key informant(s) involved in the electrification project.	PPP description & identification of stakeholders involved in partnership.
3. Issues, obstacles and success factors	Focus group discussion – with a diverse group of key stakeholders identified in previous stage.	Qualitative insights into success factors/problems re: specific model.
4. Livelihood analysis – households	Short consumer survey (door-to-door surveys to a representative sample of households)	Livelihood analysis to establish positive/negative impacts of PPP model (inc. exclusion, gender impacts, etc.)
5. Institutional/commercial consumer analysis	Short institutional survey (to key local institutions & businesses).	Analysis to evaluate indirect livelihood benefits through community services & local businesses.

RECOMMENDATIONS

Lessons Learned[1]

Although the circumstances in the four different countries are very different, the case studies have highlighted some of the key issues that are important for the successful development of electrification projects in general, and regardless of technology type or location.

The list below is intended to provide practical suggestions for how to ensure the optimal conditions for creating a successfully operating electrification system, with maximum access for the community as a whole. Some of the findings are relatively straight forward and depend to a large extent on institutional capacity.

These findings are based directly on experiences in Ethiopia, Nepal, Sri Lanka and Uganda.

[1] Refer to the nine case studies that have been produced – attached

PLANNING	
Lessons	**Recommendations for PPPs**
• With a poor planning process in place, there is a danger that electrification schemes will not meet the existing and future needs of the community, and will restrict the uses of electricity. • Lack of information at the planning stage can lead to decisions that do not favour wide access.	1) Before a local electrification scheme goes ahead, local authorities should facilitate a planning process that includes: • Research into local needs and priorities • Stakeholder participation • Assessment of existing and future electricity requirements • Identification of potential electrification options • Selection of scheme based on whole community's needs and interests 2) National electricity authorities should make plans for future grid extension publicly available. 3) Access to all in a given distribution area should be considered at the planning stage.
DESIGN	
Lessons	**Recommendations for PPPs**
• Poor system design can result in loss of voltage and lower quality services to consumers located farthest from the source of supply, resulting in unequal access for community members. • Low quality materials may be cheap at the design stage, but in the long-term will require higher maintenance costs.	1) Professional technical design assistance should be obtained. This can be provided by the private sector and may require financial support. 2) Common standards for electrification systems should be developed as a guide to system design. 3) Information on design aspects should be available through an obvious source, for example the national electricity authority.
FINANCE	
Lessons	**Recommendations for PPPs**
• When pro-poor measures have been promoted by donors and other institutions, this has positively influenced the levels of access in those cases. • Private finance will not necessarily consider pro-poor access as a condition for investment. • Communities can be very effective at raising capital. • Business plans that do not cover future maintenance costs and capital replacement costs can lead to the financial un-sustainability of a scheme.	1) Donors should specify pro-poor measures when providing funding for electrification. 2) A proper planning process should ensure that private the private sector is able to respond to the needs of the community as a whole, rather than being opportunistic. 3) Communities require information and guidance on how to utilise their funds wisely for electricity provision, and how to access additional finance. 3) Guidelines need to be developed with advice for business planning and a range of possible financial models that ensure the financial sustainability of a scheme.

TARIFF-SETTING	
Lessons	***Recommendations for PPPs***
• Tariffs that are not transparent and are not based on research of the community's ability to pay can lead to mistrust and payment defaults. • Lack of information on various types and appropriateness of tariffs can lead to the setting of unrealistic or inadequate tariffs. • Affordability is not always the main factor restricting access to poorer members of a community. • When the potential benefits of electricity are clear to them, domestic, commercial and institutional consumers are often prepared to pay higher tariffs for a reliable service.	1) A socio-economic study should be undertaken to assess factors such as local income levels and ability and willingness to pay. 2) Guidelines for tariff preparation need to be prepared that offer a range of models appropriate for different circumstances.
MANAGEMENT	
Lessons	***Recommendations for PPPs***
• Communities can successfully manage small electrification schemes through a committee of community representatives, but require extensive institutional support in establishing a transparent management system. • Local authorities have the institutional capacity to adopt many of the management procedures that are required for electrification schemes, but these should be distinct from other municipal management systems. • The private sector can provide efficient management that can lead to a profitable system. However, this is only likely to be accepted by the community if a high level of service is maintained.	1) Support and guidelines should be made available to communities and local authorities in how to run an effective and transparent management system.
OPERATIONS AND MAINTENANCE	
Lessons	***Recommendations for PPPs***
• Technical training is required to ensure that systems are well-maintained and problems identified before they escalate and incur additional expenditures. • Lack of awareness of the risks and benefits associated with a well-maintained system can lead to neglect when the community is responsible for maintenance.	1) A system of regular maintenance should be established and followed by the party responsible for O&M. 2) Awareness-raising should be carried out in the community to ensure self-maintenance of community-owned equipment. 3) Awareness-raising is needed to make people aware that a high degree of reliability means high operating cost and so they must be willing to pay for high reliability.

USES OF ELECTRICITY	
Lessons	***Recommendations for PPPs***
• Even when 100% of households are connected, if the supply is limited to domestic use only, the livelihood benefits are mainly restricted to those of direct household welfare, e.g. health, education, security and some home-based income generation. • When power is only available in the evenings, it is mainly the household sector that will benefit from the electricity supply. • If electrification is to boost the local economy and provide more significant and longer-term livelihood benefits, electricity needs to be available to the commercial, institutional and domestic sectors. • 24 hour power supplies provide more opportunities for income generation activities when electricity is not being used for lighting and entertainment. However, daytime supplies are often not fully utilized. • For income generating activities to be established, more than an electricity supply is required. Awareness and promotion of the local development opportunities is required. • Electricity has the potential to reduce dependency on biomass resources if it can be used for cooking, as well as lighting and entertainment, etc. However, this must be promoted and encouraged if it is financially viable.	1) A planning process must be carried out with participation from all stakeholders to ensure the widest possible access from the scheme. 2) Generation of electricity for income generation purposes must be carefully planned to ensure that the electricity will be used and paid for. 3) The needs of commercial and institutional consumers should be assessed alongside those of domestic consumers. These will then need to be prioritised on the basis of the needs of the community as a whole. 4) Tariffs should reflect the added value from electricity for businesses and the wider social benefits for institutions. 4) Institutions should be encouraged to maximise the potential of electricity services, for example by holding evening classes in schools to widen access to education. 5) Opportunities for new income generation activities need to be researched, and skills and training needs assessed. 6) Awareness-raising needs to be carried out to promote the benefits of income generation for local development. 7) Information and promotion of new appliances should be available to ensure that people are aware of the costs and benefits of new appliances, and can make informed choices.

Implications for PACE Project Outputs

These recommendations indicate that communities and the private and public sector partners that should be involved in a successful public-private partnership would benefit from a number of practical tools and guidelines.

Although the country situations are so diverse in the four countries assessed, the following practical tools should be considered for inclusion as guideline material in the PACE project outputs:

Tool	**Target Audience**
Country Guides on how to access external expertise on design and implementation of electrification systems (e.g. consultants, suppliers, technical support).	Community members, local authorities or private entrepreneurs with little experience in electrification projects.
Country Guides on potential sources of finance for electrification schemes.	Community members, local authorities or private entrepreneurs who require additional finance to develop an electrification scheme.
Guidelines for business planning, including financial models.	Community members, local authorities or private entrepreneurs with restricted knowledge of business planning.
Standard documentation, e.g. Power Purchase Agreements, Lease Agreements, standards, etc.	Community members, local authorities, private entrepreneurs, regulators.
Tariff models and checklist for socio-economic study.	Community members, local authorities and private entrepreneurs who need to be involved in tariff-setting to ensure an inclusive system.
Guidelines for Electrification System Management	Community members, local authorities or private entrepreneurs who will be responsible for management of a system.
Guidelines on Electric Appliances	Households, institutions, commercial enterprises.
Guide to promotion of income generating activities	Local authorities.

The following themes require a longer term effort by institutions and policy-makers outside the PACE project:

1. Local authorities need to develop skills in planning so that development of local energy resources can take place to ensure social, economic and environmental benefits to the community as a whole.
2. Standards need to be developed by national authorities so that electrification schemes are developed to an acceptable level of quality and safety, for instance to ensure future compatibility with the national grid in the case of future extension plans.
3. Donors should ensure that funding for electrification schemes includes conditions relating to maximum access. Where applicable, these should prioritise access to electricity through institutional and productive uses.
4. Local economic development does not necessarily occur as a direct result of electrification. Electrification programmes must therefore seek integration with other sector programmes to deliver economic progress

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