



# Off-grid Rural Electrification Approaches



**Capacity building workshop  
Beirut 24-25 May 2016**



# OUTLINE

**Policy Framework for Off-grid Rural Electrification**

**Financing Mechanisms and Required Support Policies**

**Socio-economic Aspects And Community Involvement**

**Capacity Building and Training**

**Summary and Conclusion**

## **I- Policy Framework for Off-grid Rural Electrification**

- The policy framework for off-grid rural electrification is a set of principles, long-term goals, and commitments that form the basis of developing rules, procedures and guidelines for the domestic context**
- Key policies for promoting off-grid electrification should, as a minimum, include a development strategy including realistic action plans, transparent electricity pricing policies, as well as policies on financial incentives and financing mobilization.**
- A clear institutional structure for the planning and implementation of rural electrification efforts is also recommended to include all relevant levels of government (central, provincial, local, etc.).**

# Key policies for promoting off-grid rural electrification

Key policies	Main content of the policy
Strategies	<ul style="list-style-type: none"><li>▪ Long-term objectives and strategic goals;</li><li>▪ Transparent overall rules and guidance regarding development plans and financial mechanisms;</li><li>▪ Roles and responsibilities among the relevant institutions and stakeholders.</li></ul>
Development plans	<ul style="list-style-type: none"><li>▪ Review of energy access in the country (i.e. detailed electrification rates in different areas);</li><li>▪ Criteria for the selection of target areas/communities;</li><li>▪ Resource mapping for target areas/communities (i.e. water course, biomass, wind, sunshine);</li><li>▪ Action plans including prioritization of areas/communities to be electrified;</li><li>▪ Data collection on location, socio-economic conditions, electricity demand, etc.</li></ul>
Financial incentives and electricity pricing policies	<ul style="list-style-type: none"><li>▪ Specification on types and amounts of financial incentives for off-grid electrification projects (e.g. investment subsidies, VAT exemption, import duty exemption, etc.);</li><li>▪ Criteria for the entities eligible for financial incentives (e.g. power producers, project owners, end-user, community, etc.);</li><li>▪ General pricing principles for off-grid electrification (i.e. tariff structure for off-grid applications).</li></ul>
Financing mobilization	<ul style="list-style-type: none"><li>▪ Mechanisms for mobilizing funds for off-grid rural electrification (including domestic as well as international sources).</li></ul>

# Recommendation

- ❑ **Set up realistic and achievable targets for off-grid rural electrification.**
- ❑ **Engage all levels of government in the decision making process, and clearly allocate the responsibilities among them.**
- ❑ **Set up clear criteria for selecting the target villages for off-grid rural electrification.**
- ❑ **Establish mechanisms for sharing the costs of off-grid rural electrification among different public actors.**
- ❑ **Create a suitable policy framework to successfully mobilize financing from international partners.**
- ❑ **Create an efficient national institutional structure for planning, coordinating and implementing of all off-grid rural electrification activities.**
- ❑ **Don't use a top-down approach for planning off-grid rural electrification programs.**
- ❑ **Don't allow for overlapping and conflicting roles and responsibilities between institutions involved in off-grid rural electrification.**

## II- Financing Mechanisms and Required Support Policies

The option most commonly applied:

### ❑ **Private financing:**

Used for commercially viable projects. A private company invests in an off-grid rural electrification project using its equity capital and commercial and/or soft loans. Grants and/or government budget are not required,

### ❑ **Public Power Utility Financing**

Used when the public power utilities are investing in off-grid rural electrification projects using their equity capital and (soft) loans from local and/or international financing institutions.

### ❑ **Government financing,**

Used for commercially not viable projects.

Projects are commonly realized by private developers. The off-grid power system is usually hand over the ownership to a local community-based entity.

### ❑ **Public Private Partnerships (PPP).**

Combines the advantages of the private and the government financing mechanisms. It can offer lower tariffs of electricity, reduce the time of project setup and implementation and ensure sustainability through the inclusion of a business case.

# Comparison of Financing Options

Financing Option	Advantage	Disadvantage
<b>Private financing</b>	<ul style="list-style-type: none"> <li>✓ Projects are usually set up faster</li> <li>✓ Effectively implemented due to the business interest of private companies, their financial capacity and technical as well as managerial competences.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Financing require a minimum selling price for electricity</li> </ul>
<b>Public Power Utility Financing</b>	<ul style="list-style-type: none"> <li>✓ Using loans from IFI's</li> <li>✓ Affordable electricity tariffs for rural villagers.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Revenues are not sufficient for reinvesting in expansion of the project or new projects.</li> </ul>
<b>Government financing</b>	<ul style="list-style-type: none"> <li>✓ Using the Government Budget</li> <li>✓ Affordable electricity tariffs for rural villagers</li> </ul>	<ul style="list-style-type: none"> <li>✓ The investment is hardly paid back</li> <li>✓ The project setup and implementation takes long due to the complexity of project arrangements</li> <li>✓ Government financing depends on the availability of budget which is not always predictable.</li> </ul>
<b>Public Private Partnerships</b>	<ul style="list-style-type: none"> <li>✓ Projects are usually set up faster</li> <li>✓ Effectively implemented due to the business interest of private companies, their financial capacity and technical as well as managerial competences.</li> <li>✓ Affordable electricity tariffs for rural villagers</li> </ul>	

# Recommendation on Financing Mechanisms

- A legal framework to encourage the private sector to get involved in off-grid rural electrification should be established.**
- The local banking sector should be involved.**
- The financial incentives for off-grid rural electrification should be carefully designed.**
- Properly set up the electricity tariffs for off-grid rural electrification.**
- Don't allow complex and unclear application procedures for subsidies.**

### III- Socio-economic Aspects And Community Involvement

- ❑ **Community involvement is important at all stages of the project cycle,**
- ❑ **It is crucial to understand the community's needs and potential before starting with the actual planning of a project**

Stage of the project	Main project activities with community involvement
Project O&M and management	<ul style="list-style-type: none"><li>▪ Planning and organizing the operation and maintenance of the facilities (e.g hiring staff);</li><li>▪ Management setup including financial management (fee collection, profit sharing, etc.);</li><li>▪ Technical and business training (for community entity in charge).</li></ul>
Project Monitoring and Evaluation (M&E)	<ul style="list-style-type: none"><li>▪ Monitoring of technical performance of power system;</li><li>▪ Monitoring and evaluating of socio-economic and environmental impacts of the project.</li></ul>

# The main indicators used for monitoring and evaluating

Type	Impacts
Economic	<ul style="list-style-type: none"> <li>▪ <b>Job creation:</b> Increased number of jobs directly or indirectly created by the off-grid rural electrification project (staff to operate, maintain and manage the power facilities, increased economic activity by home businesses and productive users);</li> <li>▪ <b>Household income:</b> Increase in household income after the provision of electricity;</li> <li>▪ <b>Household expenditures:</b> Decreasing expenditures on energy including fuels and/or electricity mainly for lighting and cooking;</li> <li>▪ <b>Business use of electricity:</b> Improved productivity and increased use of electricity in existing home businesses; increased number of newly established home businesses;</li> <li>▪ <b>Productive use of electricity:</b> Improved productivity and increased use of electricity by existing productive users (mills, manufacturers, etc.); Increased number of newly established productive users;</li> <li>▪ <b>Economic development of the community:</b> Improved economic development indicators such as overall income growth, income per capita, poverty alleviation, etc. compared to the situation before electrification.</li> </ul>
Social welfare and	<ul style="list-style-type: none"> <li>▪ <b>Electrical appliance ownership:</b> Increased use of electrical appliances (i.e. electric lamps, radios, televisions, electric fans, refrigerators, or water pumps) in a household after being electrified;</li> <li>▪ <b>Health benefits:</b> Improvements to the community health facilities (cooling, lighting); better health due to cleaner air as households reduce the use of polluting fuels for lighting and cooking (indoor-lighting); improved knowledge through increased access to information on radio/TV;</li> <li>▪ <b>Education benefits:</b> Improved quality of schools through the provision of electricity-dependent equipment (computers, TV, lighting); increased study time for children at home (lighting); improved access to information (radio/TV);</li> <li>▪ <b>Social benefits:</b> Increased time spent on community activities.</li> </ul>
Environmental	<ul style="list-style-type: none"> <li>▪ <b>Global environmental benefits:</b> Decrease of greenhouse gases (GHG) emissions (only to a limited extend due to relatively small system size).</li> </ul>

# **Recommendations on Socio-economic Aspects and Community Involvement**

- ❑ Involve the local community as much as possible in all stages of the project cycle.**
- ❑ Use participatory approaches when working with the local community.**
- ❑ Keep the community organization small and functional during project implementation.**
- ❑ Make sure that women are represented and involved in the project planning.**
- ❑ Don't allow misunderstanding and mistrust among the villagers.**
- ❑ Don't neglect the social safeguards and environmental impacts of an off-grid rural electrification project.**

## **IV- Capacity Building and Training**

- ❑ Capacity Building and Training is fundamental for all involved stakeholders to ensure that they can fulfill their roles and responsibilities in an off-grid rural electrification project;**
  
- ❑ It is crucial to understand the community's needs and potential before starting with the actual planning of a project**
  
- ❑ Typically, the following stakeholders are eligible for targeted Capacity Building and Training measures:**
  - Policy makers and government officials (central and local level);
  - Project developers;
  - Financial institutions and private investors;
  - Equipment manufacturers and construction companies;
  - Power plant operators and managers;
  - Local communities/end-users.

# Types and main topics of the training and capacity building activities

Project stakeholders	Main topics of CB&T	Types of CB&T
Policy makers and government officials	<ul style="list-style-type: none"> <li>▪ General aspects of off-grid rural electrification projects (including policy, financial aspects, technology, impacts/benefits);</li> <li>▪ Policy frameworks for sustainable off-grid rural electrification;</li> <li>▪ Tendering/contracting.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Seminars</li> <li>▪ Workshops</li> <li>▪ Study tours/site visits</li> </ul>
Project developers and consultants	<ul style="list-style-type: none"> <li>▪ Prevalent policy frameworks and legal aspects;</li> <li>▪ Project planning (needs assessment, (pre-) feasibility, project design and business models, etc.);</li> <li>▪ Project implementation (project organization, construction/installation, supervision/monitoring, community involvement).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Seminars</li> <li>▪ Workshops</li> <li>▪ Classroom trainings</li> <li>▪ On-site trainings</li> <li>▪ Site visits</li> </ul>
Financial institutions and private investors	<ul style="list-style-type: none"> <li>▪ General aspects of off-grid rural electrification projects (including policy, financial aspects, technology, impacts/benefits);</li> <li>▪ Prevalent policy frameworks and legal aspects;</li> <li>▪ Project financing;</li> <li>▪ Business models;</li> <li>▪ Risk assessment of RET.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Seminars</li> <li>▪ Workshops</li> <li>▪ Study tours</li> <li>▪ Site visits</li> </ul>
Equipment manufacturers and construction companies	<ul style="list-style-type: none"> <li>▪ General aspects of off-grid rural electrification projects (including policy, financial aspects, technology, impacts/benefits);</li> <li>▪ Prevalent technical standards;</li> <li>▪ Project implementation (construction/installation, tendering/contracting, supervision/monitoring, testing/commissioning and hand-over).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Seminars</li> <li>▪ Workshops</li> <li>▪ Classroom trainings</li> <li>▪ On-site trainings</li> <li>▪ Site visits</li> </ul>
Power plant operators and Managers	<ul style="list-style-type: none"> <li>▪ General aspects of off-grid rural electrification projects (financial aspects, technology, impacts/benefits);</li> <li>▪ Plant operation;</li> <li>▪ Plant maintenance;</li> <li>▪ Business management (Accounting, fee collection, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Seminars</li> <li>▪ Workshops</li> <li>▪ Classroom trainings</li> <li>▪ On-site trainings</li> </ul>
Local communities/ end-users	<ul style="list-style-type: none"> <li>▪ General aspects of off-grid rural electrification projects (financial aspects, technology, impacts/benefits);</li> <li>▪ Project design and business models;</li> <li>▪ Efficient use of electricity;</li> <li>▪ Productive uses of electricity</li> </ul>	<ul style="list-style-type: none"> <li>▪ Community discussions</li> <li>▪ On-site trainings</li> </ul>

# Recommendations

- Conduct an adequate capacity building needs assessment at the beginning of the off-grid electrification activity.**
- Earmark sufficient resources for continuous CB&T measures during the whole project cycle.**
- Carry out a comprehensive training on power plant operation, maintenance and business management as a standard.**
- Utilize, whenever possible, local training institutions.**
- Pay particular attention to capacity building measures for the local community.**
- Evaluate trainings.**

## **V- Summary and Conclusions (1/2)**

- ❑ Policy makers shall develop the key policies for promoting off-grid rural electrification which shall include a development strategy and concrete action plans, a suitable electricity pricing policy, financial incentives and a framework on funding mobilization;**
- ❑ A clear legal framework for private investment in off-grid rural electrification needs to be established in order to mobilize the private sector to become actively involved in this market;**
- ❑ A central institution/agency shall be created to coordinate the planning and implementation of all off-grid rural electrification activities in a country;**
- ❑ The public sector should use its resources to finance off-grid projects in poor rural areas where business models can hardly be established and projects are less or not profitable. Wherever possible and economically viable, priority should be given to the private sector to get engaged for investment and project development;**

## **V- Summary and Conclusions (2/2)**

- Productive and institutional applications of electricity not only help to improve standards of living (e.g. job creation, better health care) but also increase the economic attractiveness of the off-grid power project. The project developers therefore must consider initiating or enhancing productive activities as they significantly increase the sustainability of the project;**
- Maximizing the awareness and involvement of the benefitting community in the early stages of the project cycle, especially during the project assessment phase, is vital to the success of off-grid project implementation. Key activities include public awareness campaign, regular meetings with community leaders and focus-group meetings;**
- Capacity building and training to develop local capacities in design, implementation, management and O&M is essential for the success of off-grid rural electrification projects. Therefore, adequate resources should be devoted to developing local capacities.**



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# Thank you for your attention

