

# IRENA Practitioners Meeting

## BACKGROUND NOTE

**How can different stakeholders work together to promote business driven solutions for energy access?**

***30 November – 1 December 2011, Indian Institute of Management, Bangalore***

IRENA is hosting a two-day practitioners' meeting on November 30<sup>th</sup> and December 1<sup>st</sup>, 2011 to explore how different stakeholders can work together to enable renewable energy (RE) entrepreneurship to grow and support the creation of rural RE markets. IRENA's Policy Advice and Capacity Building Department (PACB) is convening over 50 participants, including entrepreneurs, policy-makers, financiers, and development organisations to discuss the factors hindering the dissemination of RE technologies in rural areas, including aspects related to financing, capacity and skills, policies and regulations, as well as public awareness and demand for new technologies. The meeting will also allow identifying coherent and practical recommendations for governments and other stakeholders on how to overcome barriers through suitable legal, regulatory and institutional framework conditions.

This background note serves as an input to the workshop. It briefly introduces the different sessions on policy and institutional frameworks, business models and financing, market development, and capacity building and provides a number of questions to be discussed over the two days.

### **Background**

The global market potential for providing energy services for consumers at the bottom of the global income pyramid (or "BoP") has been estimated at approximately USD 433 billion<sup>1</sup>. This market potential represents the spending on energy of almost four billion people, living on less than USD 3,000 per year in local purchasing power. An increasing number of businesses are now targeting this market and many have been successful in providing access to renewable energy solutions. Nevertheless, the challenges for entrepreneurs remain numerous and include the lack of skilled human resources, the difficulties in accessing financing and developing sustainable supply chains, poor customer and maintenance services, as well as the inability and unwillingness to pay by the low-income rural population.

Governments in many countries have been establishing favourable policies for improving energy access, often supported by technical and financial assistance from various multilateral agencies. Micro-finance institutions have been introducing innovative business models to provide energy services to the poor and new technologies, more adapted to the specific needs of low-income consumers, are increasingly penetrating the market. While grid extension especially in rural areas is often not cost-effective, off- or mini-grid renewable energy technologies can satisfy the energy needs of rural communities less expensively and more environmentally-friendly.

Despite some progress, more than 1.3 billion people are still without access to electricity and over 2.7 billion people rely on traditional use of biomass for cooking.<sup>2</sup> There is an urgent need to identify the good practices that have successfully managed to overcome those barriers and replicate them elsewhere on a larger scale.

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<sup>1</sup> World Resources Institute (2007): The next four billion – Market Size and Business Strategy at the Base of the Pyramid.

<sup>2</sup> International Energy Agency (2011): World Energy Outlook 2011.

## Public policy and institutional frameworks

Experience has shown that government action to support private investment in energy provision is crucial in various ways: Governments need to open up energy markets to private investors, they have to provide political stability and reliable long-term regulation to reduce the risk perception of investors, and they need to offer direct incentives for investment in the form of grants, interest-free loans or tax holidays to help renewable energy entrepreneurs in the start-up phase. Financial incentives at the seed, start-up and growth stages of enterprises are significant to develop the small-scale niche of the renewable energy market in developing countries.<sup>3</sup>

There is no single policy or institutional model which can be suitable to all countries. Policies formulated need to be moulded and strategized as per local conditions, the targeted technology and its market. In some countries, rural electrification agencies and funds have proven successful to support private developers, in others private and decentralised electrification companies have been able to successfully serve rural areas, while in a number of other countries local cooperatives owned by consumers were the main driver for energy access.

Moreover, tariff setting is a central question for the sustainability of mini-grid projects. For the promotion of off-grid RE systems different types of subsidy schemes, ranging from purely investment-based incentives to output-based subsidies, have been used.

Since governments have only limited resources for rural electrification, it is important that subsidies are not only provided to support poor rural areas in accessing modern energy services, but also to increase the commercial potential of rural projects and therefore leverage private investments.<sup>4</sup> According to the World Bank's experience, subsidies must be transparent; target people in most need of support; easy to administer; be linked to results (i.e., focus on expanding access); provide for strong cost minimization incentives; and ensure good governance.<sup>5</sup>

### Questions for Discussion:

- 1) Apart from grants/subsidies, which other incentives can be used by governments to improve off-grid rural electrification markets?
- 2) Are there successful examples of policy interventions, other than direct monetary support? If yes, should government intervention be monetary or non-monetary, for maximum value and impact?
- 3) What are the other successful policies in the renewable energy sector, which can be replicated in off-grid rural electrification markets?
- 4) Which institutional models have proven successful in rural electrification (e.g. community based, utility-based, etc.) and why?

## Business models and financing

Most renewable energy products have relatively high initial costs. Low-income households have a very limited budget to spend on energy, and face difficulties making such high up-front investments, further impeded by limited access to credits. The cost of an improved cookstove, for example, ranges from a few dollars to more

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<sup>3</sup> Endeava (2001): Energize the BoP! Energy Business Model Generator for Low-Income Markets.

<sup>4</sup> Alliance for Rural Electrification (2011): Rural Electrification with Renewable Energy – Technologies, quality standards and business models.

<sup>5</sup> World Bank (2008): Designing Sustainable Off-Grid Rural Electrification Projects: Principles and Practices.

than USD45.<sup>6</sup> A standard 50 Wp Solar PV System, the most popular system to provide basic light to rural families, typically costs between USD400 and 600, which is well beyond the financial means of the billions of people living in dire poverty.<sup>7</sup> Besides the economic barriers of renewable energy technology, entrepreneurs face a number of country-specific challenges. For example, information on the local energy markets is usually scarce. Moreover, a poor physical infrastructure and unreliable and underdeveloped legal frameworks and enforcement mechanisms further increase the risks for entrepreneurs and hence, the cost of doing business.<sup>8</sup>

This is where business innovation is needed to make energy more affordable to end users. Besides public support to overcome these financial barriers, a sustainable business model – that thoroughly considers the required resources and capacities along the whole value chain, the peculiarities of the market that it is acting in, as well as the opportunities local governments and financial institutions provide – is of utmost importance.

A business model describes how a business creates value and how it interacts with its stakeholders, including its customers, suppliers and business partners. There are a number of different business models that have been tested in the rural electrification context, including dealer models, fee-for-service models and hybrid versions of the first two (see Annex) with each of these models having its advantages and shortages. The ownership, financing, and after-sales service structures can be very different in each model. For instance, while in the dealer models the system is usually owned by the consumer, in the fee for service models, the system belongs to the utility or an Energy Service Company (ESCO). In some models, community funds or local banks play a decisive role in lowering the investment barrier and reaching low-income customers; in other models, the dealer or concessionaire would provide the loans to end-users.

#### **Questions for discussion:**

- 1) What are the factors influencing the type and success of a business model (e.g. technology, policy, community)?
- 2) What are the concrete financial barriers that RE entrepreneurs are facing?
- 3) What are the pros and cons of both the dealer and fee for service models?
- 4) Is the hybrid model more compatible with the off-grid market development than the dealer and fee for service model?
- 5) What are the lessons learned from the different models?

#### **Market development**

The market potential for providing energy access globally is vast and expected to grow in the decades to come. Markets for rural household lighting with solar home systems, biogas, and small hydro power have expanded through rural entrepreneurship, government programs, and donor assistance, serving millions of households. Applications for productive use of renewable energy in agriculture, small industry, and social services are also emerging. This comes after significant changes in investment patterns: In the 70s and 80s, the promotion of small-scale renewable energy technologies primarily took place through official development assistance (ODA), which focused on technical demonstrations or on projects that were narrowly self-sustaining but not replicable. Of late, though donor programs continue, investment has taken more market-oriented approaches that promote enterprise development for sustained service, rather than simply focus on the technologies themselves and their economic characteristics. In essence, it is evident that the

<sup>6</sup> IEA (2010) Energy Poverty - How to make modern energy access universal? OECD/IEA, September 2010.

<sup>7</sup> Intelligent Energy – Europe (IEE) COOPENER (2009): Reinforcing provision of sustainable Energy services in Bangladesh and Indonesia for Poverty alleviation and sustainable Development (RENDEV). D11 Toolkits for Policy makers. April 2009.

<sup>8</sup> Endeava (2001): Energize the BoP! Energy Business Model Generator for Low-Income Markets.

efficient delivery of renewable energy services can only occur when energy is recognized as a public good as well as an economic commodity.

Experience suggests that for rural renewable energy-based electrification markets to develop, solutions must address the need for public policy and regulatory frameworks, replicable business and financing models, as well as capacity-building initiatives. The underlying demand and supply side dynamics should also be specifically targeted for the successful market development of off-grid renewable energy-based access models.

The starting point for any demand- and supply side measure should be a comprehensive assessment of the local energy markets, including an analysis of the different existing suppliers and their profiles as well as the consumers' current energy expenses, their purchasing power and preferences. In developing countries, such market information is usually scarce. Access to information about renewable energy technologies and means of financing could also be made more readily available to the public in order to improve the knowledge and perception about the opportunities of these technologies.

Other suggestions for demand side measures include the strengthening of consumers' purchasing power for energy services through the promotion of productive uses of energy. Promoting "productive uses" is an attempt to make the energy input work directly and effectively for rural economic development. The experience of several countries suggests that promotion of and capacity building for productive uses of energy in rural areas can increase the productivity of rural businesses, enable a more efficient use of the supply infrastructure, and improve the revenues of distribution companies, thereby enhancing the economics of electrification.<sup>9</sup> Demand of potential end-users can be further stimulated by fostering partnerships with local institutions that end-users are familiar with and trust. Moreover, governments can facilitate loans and discount schemes, or establish a relationship with the company offering the energy service in order to enable consumers' access to modern technology products and services at affordable costs.

The supply side of the off-grid based energy access model usually addresses the entrepreneur, the equipment dealer, and the project financiers. Some successful supply-side measures taken in off-grid contexts include establishing a partnership between local government and entrepreneurs to drive and develop a credible and affordable delivery model during the initial stages; building a strong collaboration among service delivery channel partners and stakeholders (including local communities); fostering entrepreneurs who would offer the energy services and businesses that manufacture the corresponding equipment both sufficiently supported by appropriate technology transfer; as well as provision of market knowledge to entrepreneurs to correctly assess competitors, as well as the target group's energy expenses and preferences.

**Questions for discussion:**

- 1) What are the key drivers for the growth of off-grid rural electrification markets?
- 2) What are the most important bottlenecks hampering growth of these markets?
- 3) How can consistent performance across the supply chain be ensured – Challenges and Solutions?
- 4) What is the role of the public and private actors in promoting the creation of a consumer market for renewable energy in rural areas?
- 5) What are the lessons learned from public-private partnerships?

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<sup>9</sup> World Bank (2010): Addressing the Electricity Access Gap - Background Paper for the World Bank Group Energy Sector Strategy.

## Capacity building

In order to promote the scaling up of renewable energy systems in rural areas, the capacities and skills of both, market enablers and players must be developed and reinforced. Policy makers need capacities to design and implement effective and sustainable support schemes that would create the market environment for scaling up renewable energy technologies. Often, people in administrations are unaware of the socio-economic and environmental benefits that renewable energy can provide and many local governments lack knowledge on how to best incentivise renewable energy systems. Market players like project developers, financiers, equipment manufacturers, etc., will need technical, managerial and commercial skills. One reason for the scarce availability of renewable energy systems in rural areas is the lack of technical skills and capacity of entrepreneurs to start or expand a renewable energy business. Insufficient technical and commercial skills also account for poor operation and maintenance of systems and lack of provision of adequate after-sales service. In low-income markets in developing countries, however, skills are in short supply and educational institutions and training centres are usually located in urban areas.<sup>10</sup>

Therefore, there is a need for capacity building at various levels, the individual, organisational and institutional and for various stakeholders, including both renewable energy market enablers and players. Their interests, interactions and interdependencies need to be properly taken into account. Policies to foster the transfer of knowledge and technology cooperation among countries will be as important as policies that develop the required skills and capacities in the country in question.

Capacity building must be addressed by the private and public sector. The public sector in developing countries, however, does generally not have the resources for local capacity building and is not sufficiently embedded at the local level to provide appropriate support to these initiatives. Often the responsibility falls to NGOs or social enterprises that advocate market mechanisms to invest in capacity building. Initial investment in business-oriented capacity building and marketing training to raise awareness of the products and develop a client base is therefore necessary.<sup>11</sup>

### Questions for discussion:

- 1) How can countries/communities assess their capacity needs and were such assessments conducted in your country? If yes, by whom and how were the findings considered?
- 2) What is the role of governments and the private sector in developing the required skills and how are governments and private sector currently involved in your country?
- 3) Which have been good practices in developing the skills of local renewable energy entrepreneurs?
- 4) Which are the capacity related barriers to set up small and medium renewable energy enterprises in your country and how could those be addressed effectively?
- 5) How can the technical and commercial skills needed by manufacturers, sales-staff and technicians be created?

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<sup>10</sup> United Nations Industrial Development Organization (2009): Scaling up Renewable Energy in Africa - 12th Ordinary Session of Heads of State and Governments of the AFRICAN UNION.

<sup>11</sup> Practical Action (2010): Poor people's energy outlook 2010.

Model	Ownership	Financing	After Sales Service	Payment Method (By Consumer)
<b>Dealer Models</b>				
<b>Small Scale Lending</b>	Owned by Consumer	Funded by Local bank which is funded by International organisation (IFC/GEF)	Provided by local entrepreneur on a fee for service basis – Service contracts	Monthly Repayment to bank by Consumer
<b>Retail Provision of Credit</b>	Owned by Consumer	Loan provided by dealer	Provided by dealer on a fee for service basis – Service contracts	Monthly Repayment to Dealer by Consumer
<b>Revolving Loan Funds</b>	Owned by Consumer	Formation of Community fund which gives low interest loans to consumers	Provided by dealer on a fee for service basis – Service contracts	Monthly Repayment to Community Fund by Consumer
<b>Capital Subsidy by governmental/International organisations and funding arrangements</b>	Owned by Consumer	-Loans by local banks to Local entrepreneur - Grant by International organisation to technical partner	Provided by local entrepreneur and technical partner on a fee for service basis – Service contracts	Monthly Repayment to Local Entrepreneur by Consumer
<b>Fee for Service Models</b>				
<b>Concession Model – Prepaid electricity</b> - Can be in Public private partnership form (Concession given after bidding process)	Systems owned by Electricity Utility company	-Provided by Concessionaire -In Public private partnership, government subsidizes the investment costs	Provided by Electric utility company/ concessionaire as service contract	- Monthly consumer payments to concessionaire - Concessionaire pays to equipment suppliers, service and admin staff, and bank loans
<b>ESCO Model</b>	- Main system owned	Provided by ESCO	Provided by ESCO as service agreement	- Monthly consumer payments to ESCO

	<p>by ESCO</p> <p>-Other components may be owned by customer or ESCO</p>			<p>- Concessionaire pays to equipment suppliers, service and admin staff, and bank loans</p>
<b>Hybrid Model – Dealer &amp; Fee for Service</b>				
<p><b>Medium Term Service Contract Model</b></p> <ul style="list-style-type: none"> <li>- <b>Modified concession model</b></li> <li>- <b>Reduced exclusivity period</b></li> <li>- <b>Medium term O&amp;M services</b></li> </ul>	<p>Owned by concessionaire</p>	<p>Provided by Concessionaire</p>	<p>Provided by concessionaire as service contract</p>	<ul style="list-style-type: none"> <li>- Monthly consumer payments to concessionaire</li> <li>- Concessionaire pays to equipment suppliers, service and admin staff, and bank loans</li> </ul>
<p><b>Lease / Hire Purchase Model</b></p>	<ul style="list-style-type: none"> <li>- Main system owned by leasing company; other components customer</li> </ul>	<p>Provided by leasing company through lease agreement</p>	<p>Provided by dealer</p>	<p>Monthly consumer payments to the leasing company</p>