Accelerating sustainable rural electrification through an enabling legislative, policy and regulatory framework – Lessons learned from the Sub-Saharan African region

Workshop

“Enhancing South – South Cooperation and PPPs in Renewable Energy Projects for Rural Development”

Organised by UN ESCWA & ALMEE

26 November 2012 in Beirut Lebanon
The Alliance for Rural Electrification
Off-grid RETs in developing and emerging countries

The only **industry association** representing

- Technologically neutral
- The **entire off-grid RETs value chain**
- Covering **all continents**
- More than 70 companies

**Business hub for the off-grid RETs industry**

- Networking opportunities
- Market information
- Communications and Marketing
- Advocacy
More than 70 members
Current state of rural electricity markets
RER worldwide, focus on Western Asia

**Worldwide:**
- 1.3 B un-electrified
- 1.1 B living in rural areas
- + 1 B under electrified
- Africa and South East Asia lowest ER

**High electrification rates in WA**
- North Africa (2 M, 1% of pop.)
- Middle East (31 M, 11% of pop.)

**High RER in WA**
- Maghreb and Mashreq
- Lower in Iraq, Yemen and Sudan

**But, under-electrification remains high**

<table>
<thead>
<tr>
<th>Country</th>
<th>ER</th>
<th>Country</th>
<th>ER</th>
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<tbody>
<tr>
<td>Morocco</td>
<td>97.4 (RER)</td>
<td>Syria</td>
<td>99 (Total)</td>
</tr>
<tr>
<td>Tunisia</td>
<td>99 (RER)</td>
<td>Iraq</td>
<td>82 (Total)</td>
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<tr>
<td>Libya</td>
<td>100 (RER)</td>
<td>Saudi Arabia</td>
<td>97 (Total)</td>
</tr>
<tr>
<td>Egypt</td>
<td>99.1 (RER)</td>
<td>Kuwait</td>
<td>~100 (Total)</td>
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<tr>
<td>Sudan</td>
<td>30 (Total)</td>
<td>UAE</td>
<td>92 (Total)</td>
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<tr>
<td>Jordan</td>
<td>99.9 (RER)</td>
<td>Oman</td>
<td>~100 (Total)</td>
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<tr>
<td>Palestine</td>
<td>NA</td>
<td>Yemen</td>
<td>72 (RER)</td>
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<tr>
<td>Lebanon</td>
<td>99 (RER)</td>
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Sources: IEA, 2011, “WEO” & TTA, 2010

Source: REEGLE
Why low ER in rural areas?

**Main Reason:** No Rural Elec. Markets

**3 major constraints impeding**

- High service delivery cost, low pop. density; low income & low demand load
- High risks due to the lack of proper mechanisms to manage risk in the sector;
- And poor access to available credit and equity, needed to enhance market demand

**Vicious cycle impeding development**

- Low income & load demand
- Limited econ. activity & market growth
- High risk & delivery cost
- Limited access to basic services (i.e. power)
- Less private investment & no credit

**Public support** can set conditions for the appearance of the market.

In 2009, 78% of energy access financing came from public sources!!!!

Source: IEA 2011 “World Energy Outlook”

**Universal energy access by 2030**

= 2009 investments * 5

Need for stronger involvement from **banks**

Problem: Energy access perceived as **risky**

Source: IEA 2011 “World Energy Outlook”
Achieving universal power access by 2030

Additional investment 952 TWh

- Mini-grid: 42%
- Isolated off-grid: 20%
- Rural Grid: 42%
- Urban Grid: 18%
- 380 TWh
- 400 TWh
- 172 TWh

Additional Investment $700 Billion (2009 prices)

- Mini-grid: 43%
- Isolated off-grid: 20%
- Grid: 37%
- $259 B
- $301 B
- $140 B

Why the focus on off-grid RETs for RE?

Grid extension:
- Technically and financially risky for RE
- Becomes unviable for remote communities

Off-grid diesel
- Increasing international prices
- Phase out of fossil fuel subsidies
- Increasing prices = increased OPEX

Off-grid RET hybrid systems
- Drop in RETs costs (high CAPEX / low OPEX)
- Ever-increasing public support RETs
- Leapfrogging on diesel systems

Problem: Contrary to grid & fossil fuels, support framework for off-grid RET yet to be developed.
Fostering RE through an enabling framework
Challenges faced by local public authorities in RE

Main: Since RE remains a **decentralised process, no ownership** from authorities.

- No **knowledge** on Rural Electrification
- No **partnerships** amongst key actors to go beyond piloting
- **Legislation & policy**: No processes, dialogue, guidance, coordination
- Lack of **institutions** specifically dedicated to Rural Electrification
- Lack of public and private **financing** structures
- **Regulation**: heavy burden, problem of quality of products and consumer protection, sustainability of the projects, problem of reflectivity of tariffs.
- **Subsidies**: Fossil fuel focussed support schemes which lead to market distortion
Objective: Framework that accelerates development of rural electricity markets

- Pass a **Law** that ensures long term commitment and set the principles
- **Policy** establishing concrete targets
- **Master plan** which establishes a path to achieve targets (with monitoring system)
- Develop **sub-policies**: Off-grid & Grid connected, Generation (RETs and Fossil Fuels), Storage, Trans./Dist., Electricity and thermal energies...
- Launch **energy sector reforms** (basically through regulation)

Ensure establishment of **synergies**:

- **Horizontal** (Rural Development, Agriculture, Water, ICTs...)
- **Vertical** (International, Sub-national, Non-state actor initiatives)
Institutional structure

1. **Parliament**: Committee dealing with RE and legislators with strong ownership

2. **Ministry of Energy** leading process in close consultation with other Ministries Finance, Trade and Industry, Rural Development, Agriculture, Water, ICTs...

3. **Rural Electrification Agency** with Political, Technical and Financial autonomy

4. **Power sector regulator**: Regulation for grid-connected & close dialogue with REA

5. **Power Utilities**, particularly distribution: Key actors for grid-connected RE
Institutional structure (Rural Electrification Agency)

Policy
- Manager of some sort of RE working group gathering all RE key players
- Development of policies and master plan for RE

Regulation: Particularly for off-grid projects (PPPs, tariffs, standards)

Financing
- RE fund manager
- Capacity to refinance itself through emission of bonds and borrow from IOs
- Whole sale banker for local banks and MFIs

Project support (donors and non-state actors)
- Facilitator (capacity building, data collection, development of tools, feasibility studies, best practices and lessons learned...)
- Local content developer through Local Private and Financing Sector Development
De-regulation and Re-Regulation processes: Light, flexible and tailored regulation

✓ Minimize the amount of required information from a project;

✓ Minimize the number of decisions from separate regulatory decisions and actions;

✓ No license required for systems below a given installed capacity (i.e. 1 MW)

✓ Use standardised documents and rely (to the extent possible) on the decisions of other government agencies.

✓ Plan the scope and roles of the private sector (concessions, franchises, services, etc.) and their related contractual frameworks (inc. service obligations, time frame, remuneration structure, etc.)
Sustainability as the main principle:
✓ Quality of products and services (reliability)
✓ Supplier and Consumer (consumer trust) protection

Scope:
✓ Financial, Technical & Technological, Socio-Econ., Env. sustainability
✓ Project lifecycle approach (design, implementation, post-implementation)
✓ Value chain (quality management, hardware certification and accredited training)

Ensuring enforcement:
✓ Well-established processes granting transparency
✓ Auditing of controllers
✓ Sanctions and arbitration mechanisms crucial
Public-Private Partnerships
✓ Clear definition of role of each of the partners
✓ Fair, binding, enforced
✓ As standardised as possible
✓ Be signed over longer period of time (12 to 25 years)
✓ Revisable when it comes to tariff.
✓ Be indexed to foreign exchange rates

Tariffs (must important part of contract)
Tariff must be reflective (LCOE), but affordable
✓ Break-even: Cover CAPEX + OPEX (running and replacement costs)
✓ Financially viable: Include profit to attract private sector
✓ Commercially viable: Balance / commerce & the recipients’ ability to pay.
**Objective:** Complementing the tariff to attract additional private investment

**Risk:** Might contradict basic principles such as neutrality and lead to market distortion

**Channel:** Rural Electrification Fund managed by the REA

**Types:**

- **One-off subsidies** involve capital subsidies aimed at increasing access to services.
- **Transitional subsidies** help to fill the gap between what the user is able or willing to pay and the cost-recovery level of the tariff.
- **Ongoing subsidies** are required where there is a perpetual gap between affordability and cost recovery, including consumption costs.
## Subsidies (2)

<table>
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<tr>
<th>Subsidy</th>
<th>Description</th>
<th>Advantages</th>
<th>Shortcomings</th>
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| Investment based       | Capital subsidies targeting the overall initial investment (or part of it)   | - Supports only economically viable projects  
- Supported by main donor organisations  
- Easy to implement                                                                                                                                  | - Implies cost reflective tariff (at least covering O&M costs)  
- O&M is not guaranteed                                                                                                                                  |
| Connection based       | One-time subsidy granted according to the number of connections achieved    | - Incentive for investment and for maximising connections in very scattered areas  
- Mobilisation of capital & entrepreneurship  
- Can boost PPP                                                                                                                                                                                                 | - Risk of system being overstretched  
- Risk of insufficient resources for O&M  
- Harder to implement, requires stable legal, financial and political environment                                                                 |
| Output based           | - Subsidy supporting the electricity produced  
- Most OBA schemes are transition measures to help bridge the gap between the revenues and the costs | - Strong incentive for mobilisation of private capital and entrepreneurship  
- Can boost PPP  
- Safeguard O&M                                                                                                                                                                                               | - Requires stable refinancing either through cost-splitting, state budget or special fund  
- Has to go in parallel with private sector development objectives  
- Metering indispensable  
- Harder to implement, requires stable legal, financial and political environment                                                                 |
| Lifeline Rates and Cross | - Lifeline rate: subsidising energy use for the poorest consumers  
- Cross-subsidies: tax imposed on richer/bigger/urban consumers to subsidise poorer/smaller/rural ones | - Effective policies for encouraging rural consumers to use electricity  
- Good potential source of revenues for rural electrification and good instrument of social justice                                                                 | - Lifeline can be set too high compromising the financial viability of the rural energy companies  
- Cross subsidy can limit consumption of bigger users                                                                                               |
| Operation              | - Subsidy supports the operation of the system but not the initial investment. - Bridges the gap between affordability and cost recovery | - Helps to secure revenues for the private actor, incentive for mobilisation of private capital and entrepreneurship                                                                                     | - No incentive to achieve economic sustainability  
- Harder to implement, requires stable legal, financial and political environment                                                                 |

Other incentives

Additional incentives for RETs:

✓ Levelise fossil fuel subsidies and RET subsidies
✓ **Feed in tariffs**: Incentivizes the production and targets the quantity of energy. FiT reduces transaction and administrative costs by eliminating the conventional bidding processes and encourages private investors to O&M prudently and efficiently.
✓ **Quotas**: Obligation for electricity suppliers to buy a certain amount of sustainable power, or for customers to share, clean power. Contrary to tariff systems, the government sets the desired level of output, and allows the market to decide the price level and the most competitive technology.

**Additional measures**: tax credits; low import duties for the equipment.

**Granting transparency of the system**: Elimination of non-trade barriers
Support to the private financing sector

Objective: Limit as much as possible the need for subsidies by complementing them with equity, credit and guarantee for risk mitigation.

Targets: Banks (for companies) and Microfinance institutions (for SMEs and consumers)

Type of supports:
✓ Technical support: Quality pre-feasibility and feasibility studies; technical capacity and renewables investments costs/benefits/risks.
✓ Risk mitigation for venture capital partners
✓ Partial risk guarantee and partial credit guarantee schemes are made to encourage the private sector banks and investors to accept higher risk levels, longer term exposures and to lower interest rates.
Concluding remarks

State of rural energy markets:
✓ A big share of the world’s population, particularly rural, remains un-electrified
✓ Main problem: No rural elec. market
✓ Need for public support which eventually boosts private investment
✓ Biggest share of rural areas will be electrified via off-grid hybrid RETs systems
✓ Therefore, need for a RE public support scheme focussed on off-grid RETs

Establishing an enabling framework for RE, with a focus on off-grid RETs
✓ RE Law and Policy key to give guidance and show long-term commitment
✓ Creation of a specifically dedicated autonomous body for RE essential
✓ REA must have policy, regulatory, financial powers (subsidies + project support)
✓ Re-regulation that sets RE tailored framework (PPPs, Tariffs, Standards)
✓ Subsidisation and incentives complemented by equity, credit, guarantee

Expected outcomes
✓ Better performance of RE programmes & faster electrification
✓ Attraction of additional public & private capital used to upscale interventions
✓ Development of Rural Energy Markets that will break vicious cycle in rural areas
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Thank you!