



## **GLOBAL ENERGY NETWORK FOR URBAN SETTLEMENTS (GENUS)**

Promoting Energy Access for the Urban Poor in Africa

*Slum Electrification: Approaches and Challenges*

**Convened by UN-Habitat**

**26 – 28 October 2009**

**Nairobi, Kenya**

**Electrification for Slum/Low-income Settlements in  
Liberia: Opportunities and Challenges**

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# Presentation Outline

1.0 Background

2.0 Electrification of Slum/low-income settlements in Liberia

2.1 Opportunities

2.2 Challenges

3.0 Lessons Learned

4.0 Conclusion



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### 1.0 BACKGROUND

- ❖ Total geographic area of Liberia is 111,370 squared km of which 96,320 squared km is consist of the land area
- ❖ The population of Liberia is 3.476 million
- ❖ Total number of households is 670,295
- ❖ The population of Monrovia is a little over 1 million (30% of total pop), doubling pre-war Monrovia population of almost half a million
- ❖ Population density of Monrovia now exceeds 1500 persons/square mile
- ❖ Increase can be largely attributed to high rural-urban migration, displaced population and returnees who may be unwilling to resettle to their respective rural homes
- ❖ This may be increasing the number of slums/informal settlements in Monrovia



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- ❖ There has been no special national electrification plan or program whether pre or post-war targeted at slums/informal or low-income settlements in the country
- ❖ Pre-war electricity generation capacity was 412MW of which 191MW was from the national utility, the Liberia Electricity Corporation (LEC)
- ❖ Out of the 191MW, the hydropower plant generated 64MW
- ❖ The 14 year armed conflict devastated all these facilities which included power plants, transmission lines, fuel storage tanks and depots
- ❖ Upon the inauguration of the first post-war democratically elected government in 2006, the Emergency Power Program (EPP) was launched



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- ❖ International partners such as the USAID, the EU, Ghana, Norway, the World Bank, etc. provided over \$40 million towards this program to revive the electricity sector of Liberia
- ❖ Presently, the LEC's generation capacity is 9.6MW
- ❖ Nationally, only less than 5% of households have access to electricity
- ❖ Only 8% of urban households have access to electricity
- ❖ Access to electricity in Monrovia, the nation's capital, is about 10% of households



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## Relevant Indicators

Indicator	Value
Total Population	3.48 million
Urban Population	47%
Rural Population	53%
Population Growth Rate	2.1%
Average Household Size	5.1
National Poverty Rate	68%
Urban Poverty	55
Rural Poverty	68

Source: LISGIS, 2008



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### Relevant Indicators Cont.

Indicator	Value
GDP Per Capita (US\$ and PPP\$)	US\$190
Current Power Generation (diesel and fuel)	9.6 MW
Percentage of Population with Access to Grid Electricity	<10%
Total Number of Customers feeding from National Grid	1,899
Total Number of Customers on Prepaid Electricity Meters	127
Current Electricity Tariff (National Grid)	US\$0.45 Per kWh

*Source: Center for Sustainable Energy Technology*



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### 2.0 ELECTRIFICATION OF SLUMS/LOW-INCOME SETTLEMENTS IN LIBERIA

- The Liberia Energy Assistance Program (LEAP), a USAID-funded supplement to the EPP was implemented between 2006 and 2007.
- Under this program, an Urban Community Development Pilot project was implemented. This was aimed at providing electricity access to two low-income urban communities in Monrovia.
- 200 low-income residences were to be electrified as well as schools, health facilities and other institutions in the selected communities
- Only 127 were electrified, and these include residences, institutions and small businesses. Street lights were also installed in the pilot community.
- The remaining 73 structures are expected to be energized soon.
- The delay, according to the LEC has been low capacity of its sub-station in one of the pilot areas





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### Approach/Technology Used

- ☐ USAID-funded LEAP Urban Pilot Project implementation involved the Government/Ministry of Energy; the national utility, LEC; the main contractor, International Resources Group (IRG); sub-contractors included Smyser Associates and CSET (a local energy NGO); the pilot community leadership as well as the beneficiaries themselves.
- ☐ This approach was unique/unprecedented in Liberia as it involved donor, government, utility ,NGO and beneficiary community partnership
- ☐ Prepayment electricity meters were used to connect the pilot beneficiaries
- ☐ Each stakeholder had its own role to play based on their institutional relevance and expertise



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### CSET (Energy NGO)

- Engaged the community through focus groups discussions and surveys: socioeconomic survey to determine ability and willingness to pay; and technical survey to determine suitability of structures and right of way.
- CSET also conducted awareness/sensitization/education campaign on energy efficiency and conservation in the pilot communities
- With connection fee subsidized and financial assistance from the donor, CSET coordinated the wiring upgrade of structures . Each pilot beneficiary agreed to pay labor cost for wiring/re-wiring

### LEC (Utility)

- The LEC , with technical support from the main contractor/management (IRG) did the pilot design and built the distribution system, trained the pilot communities' electricity vendors, and installed the entire



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prepayment system including the meters at both the main station and the structures/homes of the beneficiaries

### **GOL/MLME**

- The government through the Ministry of Energy gave their acquiescence

### **Beneficiary Community**

- ✓ Pilot community organization provided their cooperation and support, while direct beneficiaries paid the labor cost for structure wiring

### **2.1 Opportunities**

- ❖ Improvement in economic and social conditions (quality of life)
- ❖ Poverty reduction/alleviation (helps in meeting target)
- ❖ Improvement in security



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- ❖ Increase in commercial activities
- ❖ Budgetary/fiscal discipline (beneficiaries staying within their means)
- ❖ Beneficiaries paying less \$ for legal connection as opposed to illegal services and inefficient traditional energy service alternatives including own generators
- ❖ Increase in number of customers and hence increase in revenue
- ❖ Reducing rate of power theft
- ❖ Arrears accrual negligible or eliminated
- ❖ Promoting universal access to electricity as per the NEP's goal/objective
- ❖ Signaling opportunity for improving the lives of the poor
- ❖ Buttressing Liberia's Poverty Reduction Strategy (PRS), ECOWAS regional policy on energy access by urban and peri-urban populations, and the



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### Millennium Development Goals (MDGs)

#### 2.2 Challenges

- Official recognition of the existence of slums/informal settlements and incorporating or integrating their electrification in national plans/programs
- Solving issues of tenure in slums/informal settlements
- Risks/safety issues involved with electrifying such communities with makeshift structures
- Such communities are also characterized by social deviants (criminals, drug abusers, etc.)
- Power theft
- Financial viability - Cost of providing service in such areas vis a vis revenue expectations(ability to pay)



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To include electricity in the provision of basic social services by Government to such areas (electricity supply- not part of package)

- Utility's Policy (eg. third party connection)
- Other challenges/constraints specifically faced with the current prepayment system include vendor's kWh sales period within the community, Vendor's contact with the main station at the utility and down-time issue (no control)

### 3.0 Lessons Learned

- Various stakeholders collaboration proved to be a worthwhile approach aimed at electrifying slums/low-income settlements in Liberia
- Some collaborative efforts or the role of some partners may not continue indefinitely, and so an appropriate exit strategy will be required



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- Depending on the type of prepayment meter system used, it could largely help in combating/minimizing power theft
- Payment process was simple and easy for customers, and so connection process must also be the same
- Electrification program design for slums surely varies from the normal as the condition of the area is different from formal settlements
- National utilities must endeavor to study best practices used in other countries with the aim of adopting innovative approaches to improve effectiveness and efficiency and hence attract more customers (eg. urban poor) for sales and revenue maximization
- Subsidies and other forms of financing by government and donors could also help increase electricity access to the urban poor
- Government support to have a dedicated electrification program for the





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urban poor will be essential

### 4.0 Conclusion

- Electrification of low-income urban communities improves the social and economic conditions of the urban poor (buttresses the goal of the energy policy, PRS, ECOWAS White Paper on energy access, MDG);
- Government support through policy, strategy/action plan is indispensable to any electrification program for low-income urban areas;
- Utility's flexibility by studying and applying best/innovative practices suitable to local community conditions is necessary;
- Collaborative effort (Gov't, Utility, NGO, Community, etc.) as earlier described proves relevant to the process





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