

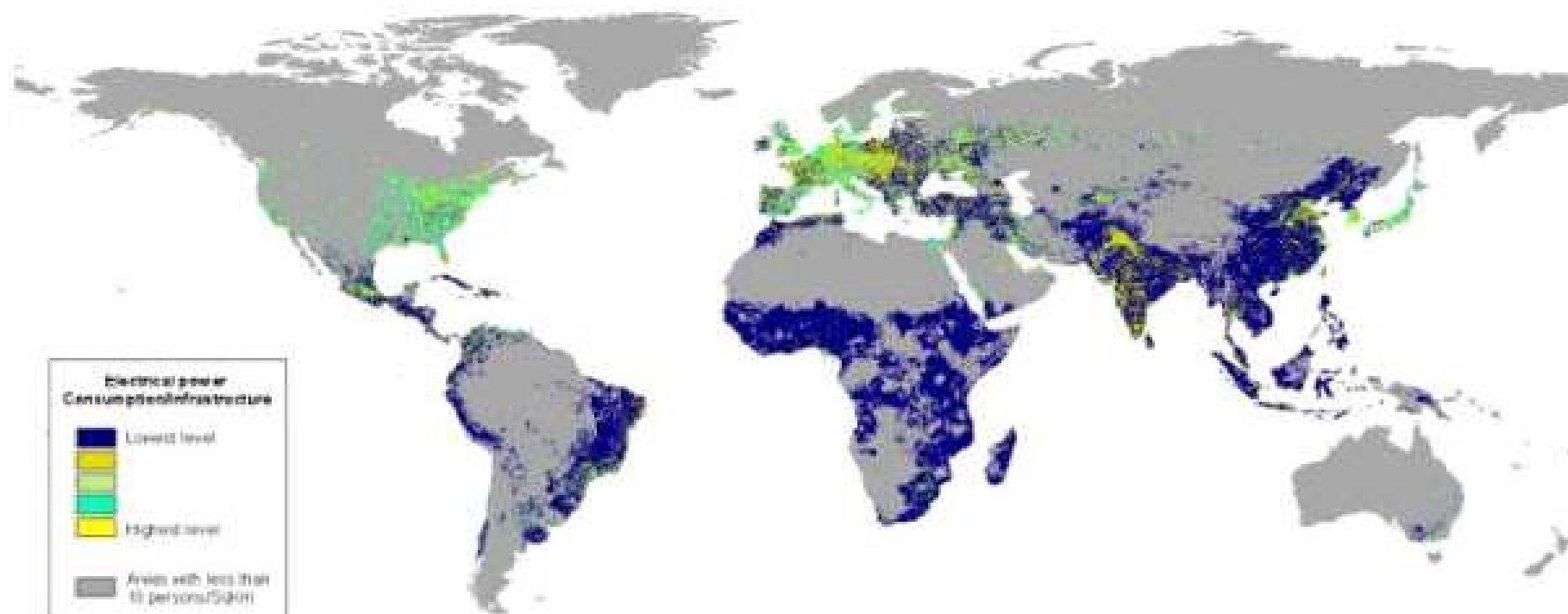


Weza Rural Energy Enterprises

**Business with Four Billion Conference, University of Michigan
September 2007**

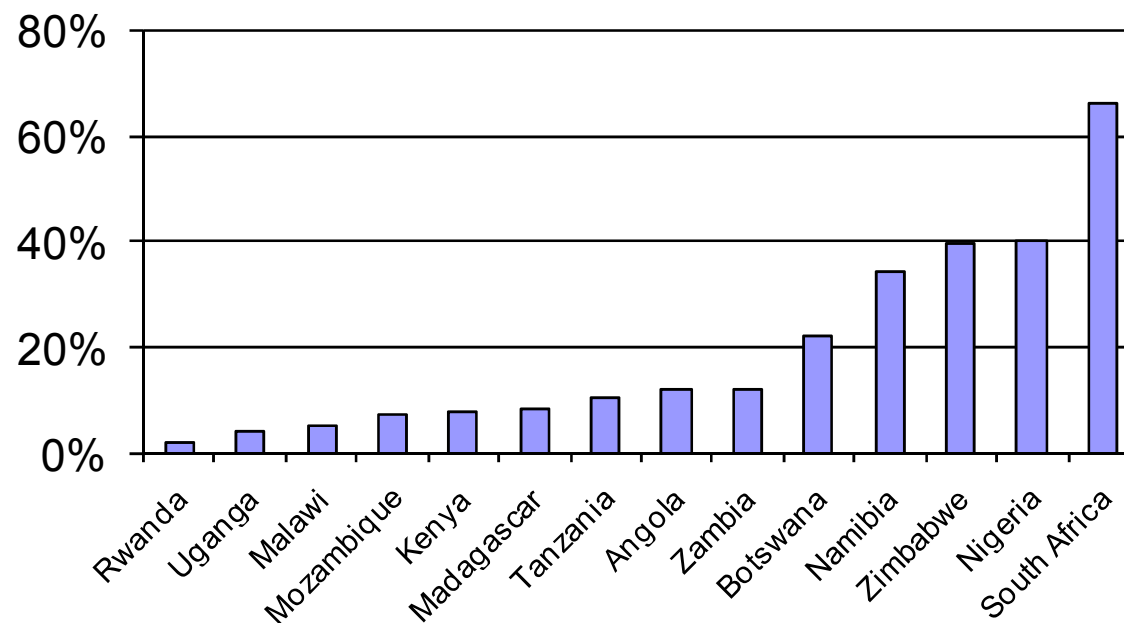
Nearly 2 billion people in the world, approximately 35% of the global population, still do not have electricity. A further 2 billion people have infrequent access.

Electrical Power Consumption/Infrastructure Prorated by Population Density



On average, 9 of out 10 people in Sub-Saharan Africa have NO access to electricity.

Access to Electricity for Selected African Countries



Source: International Energy Agency (IEA). 2002. *World Energy Outlook: Energy and Poverty*

Energy and poverty are linked.

- The areas in the world that have the high levels of poverty also have the lowest levels of modern energy consumption.
- The vast majority of the poor dependent on the traditional fuels of wood, dung and crop residue, often using primitive and inefficient technologies.
- Energy is a means to an end.

Energy and the UN Millennium Development Goals (MDGs)

MDG Target	Energy Linkage
1. Eradicate extreme poverty and hunger	<ul style="list-style-type: none"> - Electricity, fuel needed for incoming generating activities : industrial, micro-enterprise, agriculture, etc. - Need for batteries reduces disposable income
2. Achieve universal primary education	<ul style="list-style-type: none"> - Need for illumination after dark to be able to study - Many girls do not attend school as they are collecting wood and water
3. Promote gender equality and empower women	Adult women spend a large part of their day cooking and collecting fuelwood
4. Reduce child mortality	Disease caused by effects of indoor air pollution from traditional fuels
5. Improve maternal health	Poor illumination for night-time deliveries, daily drudgery and physical burden of fuel collection and transport
6. Combat HIV/AIDS, malaria and other diseases	Electricity needed for radio, which can spread important public health information
7. Ensure environmental sustainability	Cleaner energy systems needed in lieu of dirty alternatives.

In SSA, development agency and government initiatives have not had a huge impact.

	Population	Rural Electricity Access in SSA
1970	222m	4%
2006	350m	10%

- Increase in access is instep with increase in population.

Poor Focus

- Focus on extending national electricity grid to dispersed, rural areas, which in SSA is overwhelming costly and slow
- Focus on increasing supply of traditional fuel sources – e.g. addressing the woodfuel gap through afforestation.

The development community has recently realized that decentralized energy solutions are more sustainable, but still face challenges.

Support of short-term projects, not long-term programmes

Most decentralized energy technologies are still expensive

- Solar, wind, micro-hydro installations are costly and in most cases, require a high level of skill to install and maintain.

Problem of energy poverty is solved by providing inexpensive, portable solutions that provide low-power energy, which support most communication and lighting needs.



Rugged, portable, reliable, easy-to-use and maintain decentralized energy sources that will charge portable devices anytime, anywhere

Rugged, portable, reliable, easy-to-use and maintain radios that will work anytime, anywhere



Reliable, bright illumination wherever and whenever you need it

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The Freeplay Weza

Freeplay has developed a portable off-grid generator, Weza, that can power low-power devices (i.e. up to 7 mobile phones at a time and up to 20 portable LED ball lights). The generator can be powered by foot-power, solar or wind.



Objectives of Rwanda pilot

Project Goal: To create in rural Rwanda a network of sustainable energy micro-enterprises that use Freeplay Energy's foot-powered generator to sell energy services to local communities.

Development Goals:

- Impact on day to day lives of beneficiaries (both entrepreneurs and their potential customers)
- Reduction in polluting environmental practices
- Improved business capacity in rural areas
- Improvement in perceived creditworthiness of entrepreneurs
- Get feedback to create appropriate products for use in rural settings in the future.
- Establishment of effective product delivery practices/processes (for easier scale up and replication)

Entrepreneur Profile in Rwanda

Gender: Males 61%, Females 39%

Ages: 21-77, average is 39 yo.

Education Level: no school (12.3%), primary school (54.3%), lower secondary (28.4%)

Number of dependent children: average 4.3

Main source of income before pilot: Farming (12%), Farming and Livestock (55%), Farming, Livestock and more (22%), Non-farming (11%)

Income level before pilot (545 RWF/1 USD): 100% are earning <2.76 USD/day – extreme poverty line in Rwanda with 50% earning below <0.60 USD/day.

Access to electricity: 0%

Main sources of energy before pilot: Wood (34.6%), kerosene (75.3%), candles (3.7%)

Development Impact in Rwanda

	Indicators	Start of project (Jan 07)	Mid-project (Aug 07)	End of project (Jan 08)
Economic	Income	<2.64 USD/day	Up to 5 USD/day	?
			Used for more livestock, clothes and food, luxury foods (meat, bananas), commercially produced beer)	
Social	No specific indicators could be determined Will use testimonials to ascertain impact on health, education and social life.		Increased social status and cohesiveness in community, feeling that health is improving without kerosene	?
Environmental	% reduction in use of kerosene for lighting	11 USD/month/household spent on kerosene, batteries and candles	Kerosene displaced completely by LED ball lights - 5.20 USD upfront and 0.80 USD/month for charging	?

Lessons learned so far in Rwanda

Project Level

- need for committed partners whose success depends on success of project
- need for all project partners to have same level of product understanding
- need for dedicated staff
- need for well-defined maintenance and repair structure up-front
- allocate enough time for technology transfer

Enterprise Level

- Strong ability for rural enterprises to analyze their own markets and come up with appropriate services and prices
 - 100 RFr (0.20USD) for 1 mobile phone charge
 - 100 RFr (0.20USD) for 1 6 hour ball light charge
- There is tremendous income generating potential of rural energy businesses
 - earnings of up to 2500 RFr/day (up to 5 USD/day)
 - average of 10 mobile phone charges and 4 light charges a day

Lessons learned so far in Rwanda

Enterprise Level (cont'd)

- need to consider other viable businesses besides mobile phone and lights charging
 - feedback from entrepreneurs is that adding haircutting to their list of services will double income (i.e. up to 5000 RFr/day)
 - Others: television, sound equipment, ironing.
- assumption that cost of Weza is prohibitive is invalid
 - Given working product, enterprises do not believe they will have difficult to pay loan payments within 1 year
- Level of promotion is relatively low - word of mouth advertising generates more demand than can be supplied

Unintended consequences

Tarnished brand image

- Due to some product failures

Increased consumption

- Need to ensure that increased incomes do not result in unnecessary spending – women believe that men not know how to handle money!

Creation of power differentials

- Gender imbalance among Weza entrepreneurs - 39% women
- Some women operators are being threatened by husbands as they are earning too much income

Shocks to social system

- Social popularity has increased in most cases by becoming a Weza enterprise operator. On the flip side, entrepreneurs who have experienced a product failure and whose businesses are inoperative while the Weza is being repaired become isolated in their communities and are being called cheaters or liars.