Potential of Smart Solutions for Utility Services in the Developing World



Global convergence of increasing mobile network coverage, mobile handset ownership, mobile commerce and smart technologies offer new pathways to achieve reliable energy access and increased water security based on a low-cost, scalable and accessible information architecture.

The flexibility and affordability these systems are introducing for the low income population, could provide local and decentralized solutions in locations where they are needed the most.

As a natural evolution of the Green Power for Mobile and Community from Mobile programmes, the GSMA M4D is researching the Opportunity of using Smart Solutions for a Better Access to Energy and Water in the Developing World

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Green Power for Mobile



Country Data Profiles (2010)

Country	Regions	GDP (in US$)	Population	% Population Without Access to the Electricity Grid	% Population Without Access to Safe Water	% Population Without Access to Improved Sanitation	% Population with Mobile Connection	% Population with Mobile Coverage
Burundi	Africa	1,330,790,160	8,518,862	99%	21%	64%	22%	59%
Chad	Africa	6,838,983,051	11,506,130	98%	58%	91%	30%	24%
Liberia	Africa	879,464,613	4,101,767	95%	39%	73%	44%	47%
Sierra Leone	Africa	1,856,392,962	5,835,664	95%	43%	61%	42%	78%
Rwanda	Africa	5,261,963,315	10,277,212	93%	26%	58%	35%	82%
Papua New Guinea	East Asia and Pacific	7,914,594,203	6,888,387	93%	61%	56%	27%	10%
Niger	Africa	5,259,368,130	15,891,482	93%	54%	87%	25%	86%
Somalia	Africa	-	9,358,602	92%	71%	74%	12%	-
Uganda	Africa	15,803,499,657	33,796,461	91%	40%	57%	42%	97%
Malawi	Africa	4,727,486,011	14,900,841	91%	27%	39%	25%	94%
Mali	Africa	8,964,687,644	15,369,809	90%	50%	54%	58%	19%
Myanmar	East Asia and Pacific	-	50,495,672	87%	22%	23%	1%	11%
Tanzania	Africa	21,368,198,378	45,039,573	86%	38%	53%	48%	76%
Kenya	Africa	29,375,775,194	40,862,900	84%	39%	57%	62%	95%
Ethiopia	Africa	31,962,250,072	84,975,606	83%	78%	87%	12%	10%
Madagascar	Africa	8,487,968,572	20,146,442	81%	54%	68%	30%	55%
East Timor	East Asia and Pacific	598,000,000	1,124,355	78%	42%	64%	48%	15%
Cambodia	East Asia and Pacific	10,401,935,532	14,138,255	76%	59%	83%	77%	86%
Afghanistan	South Asia	14,213,670,485	30,605,401	71%	61%	66%	64%	65%
Sudan	Africa	54,633,362,294	43,551,941	64%	30%	66%	53%	43%
Haiti	Latin America	6,478,628,513	9,958,175	62%	46%	70%	37%	78%
Yemen	MENA	26,365,156,990	24,255,928	60%	33%	57%	49%	98%
Nigeria	Africa	168,567,245,571	158,258,917	49%	52%	56%	56%	72%
PDR Laos	East Asia and Pacific	5,907,115,553	6,436,093	45%	49%	70%	52%	23%
Bangladesh	South Asia	89,359,767,442	164,425,491	45%	26%	61%	50%	89%
Ghana	Africa	26,169,336,384	24,332,755	40%	25%	82%	78%	79%
Pakistan	South Asia	161,819,031,346	173,383,000	38%	9%	41%	63%	36%
India	South Asia	1,727,111,096,363	1,170,938,000	34%	14%	67%	73%	73%
Honduras	Latin America	14,175,394,173	7,615,584	30%	13%	31%	95%	78%
Nicaragua	Latin America	6,213,677,483	5,822,265	28%	21%	53%	65%	75%
South Africa	Africa	282,754,441,020	49,962,243	25%	12%	35%	114%	100%
Bolivia	Latin America	17,339,992,191	10,030,832	23%	15%	54%	73%	48%
Indonesia	East Asia and Pacific	539,355,489,060	232,516,771	22%	23%	45%	97%	65%
Peru	Latin America	126,923,120,549	29,496,120	14%	17%	37%	83%	57%
Iraq	MENA	65,192,699,145	32,297,391	14%	19%	21%	77%	78%
Philippines	East Asia and Pacific	168,333,540,385	93,616,853	10%	15%	28%	98%	99%
Turkmenistan	Europe and Central Asia	18,650,526,316	5,176,502	10%	28%	38%	14%	-
Tajikistan	Europe and Central Asia	4,978,154,344	7,074,845	10%	41%	49%	80%	-
Bhutan	South Asia	1,264,687,048	708,484	8%	38%	30%	60%	11%

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More smart solutions are leveraging the strength of mobile technologies

- The concept of such solutions is based on the integration of a GSM communication module to the renewable solution allowing
  - Data exchange Over The Air with a central server
  - Flexible incremental payments from customers
  - Remote Maintenance and alerts if malfunction

- A new breed of companies has emerged to offer these ‘pay as you go’ solutions for energy access, where customers top up for energy the same way they would top up for mobile airtime:
  - Azuri Technologies
  - Mobisol
  - Shared Solar
  - Simpa Networks
  - mKopa

- As revenue collection is a major challenge for off grid projects sustainability, the integration of mobile banking solutions (such as MPESA in Kenya, GCash in the Philippines,..) with these charging solutions represents a clear disruption in the way BoP consumers access to affordable energy.



Source Mobisol, Simpa Networks



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Shared Solar Case Study – Pay as you go Electricity

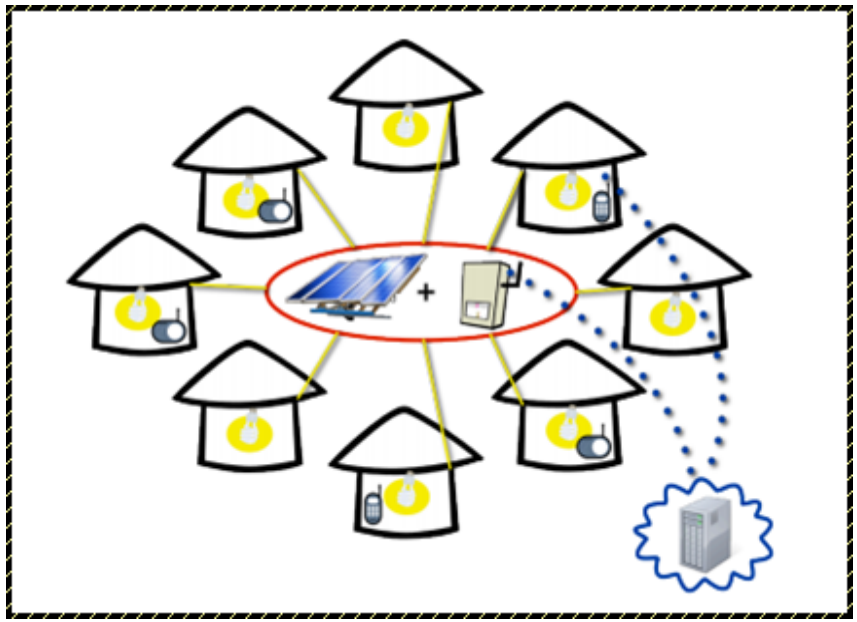
New York based Start Up developed by Vijay Modi, Director of the Modi Research Group and Professor of Mechanical Engineering at Columbia University & Director of the Modi Research Group and Professor of Mechanical Engineering at Columbia University

Product: small scale (1 kW) micro-grids based on renewable energy with prepaid, aggregated metering and semi-automated management

System: Customers have the flexibility to purchase electricity in small incremental amounts, either from local entrepreneurs who can upload credit, or using scratch cards.

SharedSolar has recently signed an agreement with Airtel to explore the use of mobile-money transactions. About a dozen pilot systems, benefiting a population of 1500 are now functioning in Mali and Uganda with some in place as long as one year.

SharedSolar is looking at expanding its project to new countries and develop a similar product for smart water access solutions.



Source: Shared Solar

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Grundfos Lifelink Case Study – Sustainable Smart Water Solutions

Grundfos is a major water products & services provider (18,000 people in 45 countries).

Problem: The main target areas for LIFELINK are the rural communities in arid and semi-arid parts of Kenya, where surface water is scarce

Solution: Grundfos LIFELINK system consists of a submersible pump operated by solar panels. The users tap the water from the automatic water dispenser using a smart card with water credit. Behind the payment system is a partnership between Safaricom and Grundfos LIFELINK. Via an interface using M-PESA, the community members can use a mobile phone to transfer credit to the water key, which they use to draw water by the tapping station.

Two years after the installation of the first LIFELINK system in March 2009, 20 LIFELINK systems have been sold and implemented, providing clean water for approximately 50,000 people.



Source Grundfos Lifelink

Impact assessment surveys reported from both community members and health facilities state that the occurrence of water borne diseases amongst children is reduced by at least 50% with the Grundfos system

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Mobile Money Landscape – 140 live deployments



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