

Off Grid Charging Project

GPM Working Group 22nd September 2010

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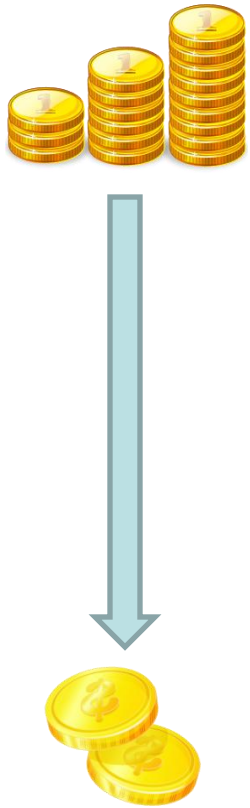
Agenda

- From Solar to Off Grid Charging Project
- Technology Comparisons and Market Sizing
- First Field Study Results
- Next Steps

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Original Solar Handset Competition Objectives

- Stimulate mass-market accessibility to affordable solar charging services through the creation of a new low-cost solar handset segment, **with a guide target of sub US$25 FOB**
- Stimulate uptake of solar phones by the operator community following GSMA promotion
- A bundling option (phone plus solar charger) is under consideration, dependant on feedback from the operator working group





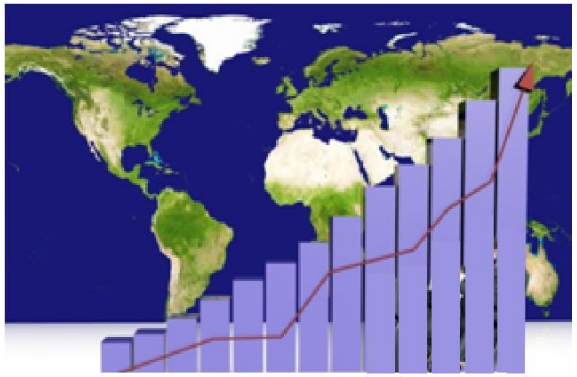
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Original Solar Handset Competition

The Business Case:

- Encourage vendors to catalyse the creation of a new low cost solar handset segment
- Achieving economies of scale across multiple markets and operators





Operator Working Group:

- Align a group of operators to common requirements for a solar handset
- Select and endorse the best overall handset proposition that meets these requirements

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Two key issues have arisen with the Solar Handset Competition



Single technology and vendor winner

- There is rapid innovation in other technologies such as kinetic charging, bicycle charging and external solar chargers
- By selecting just the integrated solar phone and a single winner, the competition will exclude/stifle further innovation



Indicative volumes

- With the current numbers of MNOs engaged it was unlikely that the economy of scale will be achieved through scaled indicative volumes

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* GSMA research
** GSMA report 'Charging Choices': http://gsmworld.com/documents/charging_choices.pdf

GSMA recommends holding on the Solar Handset Competition and adjusting to a two phase approach

- **Phase 1:**
  - **Solar Handset Competition:**
    - Complete functional scope, identify vendors, BUT HOLD on executing full competition
  - **New deliverables:**
    - Knowledge Sharing
      - Research and analysis of the off-grid charging issue, the solutions available and the impact of deploying those solutions via GSMA reports and GSM World website
    - Advisory Services
      - Provision of an on site advisory services for multi-function operator's teams (handset portfolio, strategy, marketing), with focus on specific operator's markets
    - Vendors Bazaar (2nd December 2010)
      - London Event for operators and vendors to meet and showcase latest products

- **Phase 2:**
  - **Solar Handset Competition:**
    - Re-assess viability of Solar Handset Competition with Working Group and execute if valuable to Working Group

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GSMA recommends three additional workstreams

Knowledge Sharing

Description:

Research and analysis of the off-grid charging issue, the solutions available and the impact of deploying those solutions, via GSMA reports and GSM World website

Deliverables:

1. Working Group
2. Market sizing
3. Field studies (of current off-grid charging methods/costs)
4. Technology profiles/comparisons
5. Technical specifications (solar handsets and chargers)

Impact:

Operators will have an improved understanding of the off-grid handset charging issue as well as solutions leading to further deployments of off-grid charging solutions

Advisory Services

Description:

Provision of an on-site advisory services for multi-function operator's teams (handset portfolio, strategy, marketing), with focus on specific operator's markets

Deliverables:

1. Advisory services for operators

Impact:

Multi-functional operator teams will gain improved understanding of off-grid charging issue via interactive advisory sessions with the GSMA team

Vendor Clarification

Description:

Monitoring vendor activity for off-grid charging and presenting operators with vendor solutions

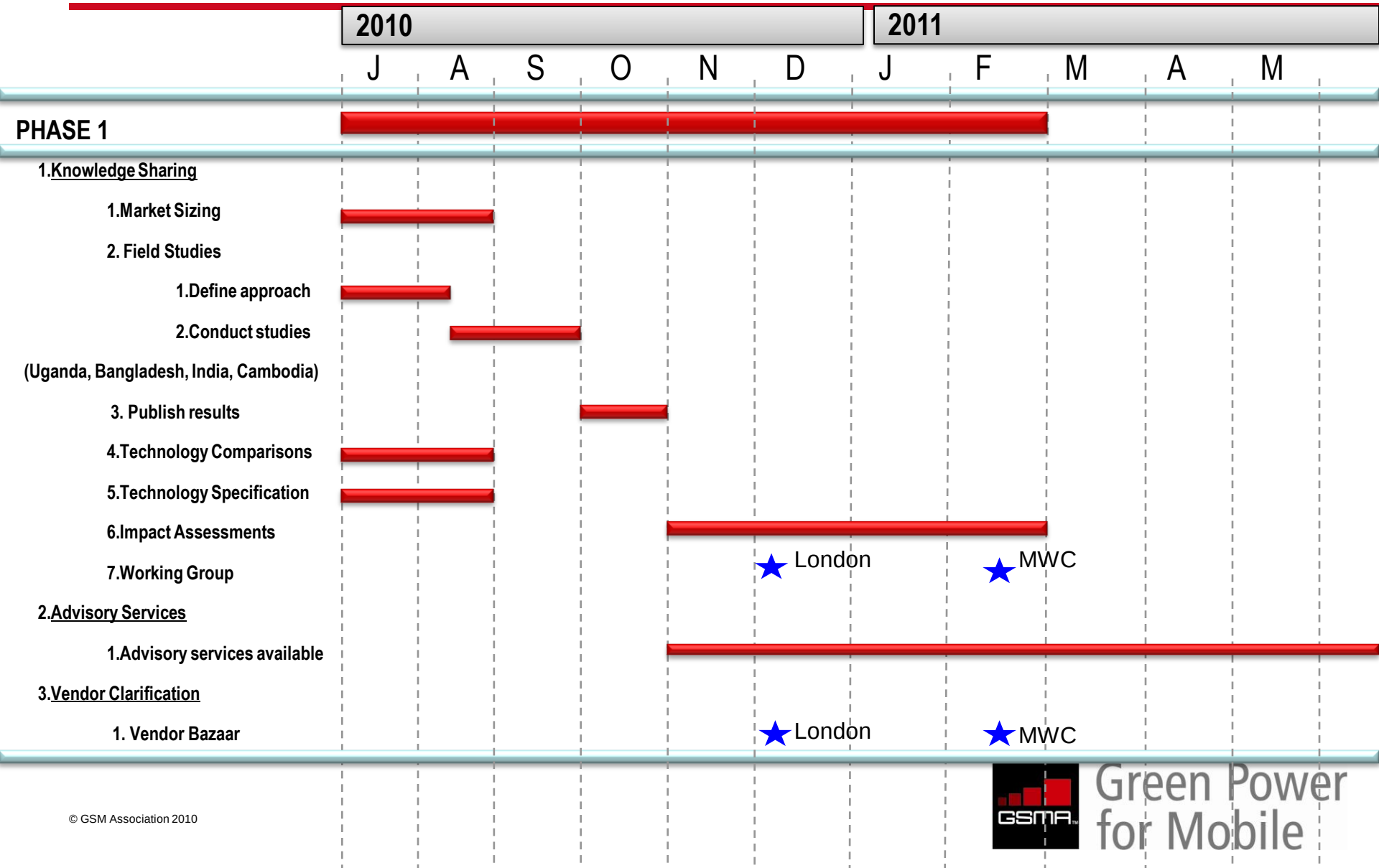
Deliverables:

1. Vendor listing page
2. Vendor bazaar

Impact:

Operators will have visibility of the rapidly evolving vendor solutions

Timeline



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Agenda

From Solar to Off Grid Charging Project

Technology Comparisons and Market Sizing

First Field Study Results

Next Steps

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Technology Comparison - Solar charging

Key Points

• Well designed and efficient in areas with high solar radiation (Sub Saharan region)

• Improved availability with extensive distribution networks in developing countries

• Large investments coming to this solution for start ups and technological innovation around solar charging

• Generally, 60 minutes of sun provide enough power for 10 minutes of talk time

• Price range still expensive for BoP people living below the poverty line, though this is expected to get cheaper

• Problems of theft when phone is left outside to charge



Vodafone presented in July 2010 the VF 247 solar handset to the Indian market – low cost handset (US$32) manufactured by ZTE with Intivation technology for the solar cell



Solio external charger
• 1h of solar charging gives 15 minutes of talk time
• Can provide energy to several low power devices (torches, radio,..)
• High price for developing countries (cheapest models are US$50) – need financing schemes
• Mixed feedback on efficiency from users

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Technology Comparison - Kinetic charging

Key Points

• A simple yet sturdy solution for remote rural areas – resistant to dust and shocks

• Small and easy to use solution to charge low power devices

• Availability remains limited in developing countries with no real distribution networks

• Needs more suppliers and partnerships with players of the mobile value chain to be widespread

• Remains cumbersome and takes a lot of work for a small amount of energy
    • kinetic bike charger: owner of battery used to pay people to pedal on their bicycle to charge the battery



Hand crank charger:

• Small and cheap device (US$10) to charge low power devices
• Able to provide 2 to 8 minutes of talk time for a 3 minutes winding
• Can be seen as cumbersome and tiring to get the phone charged



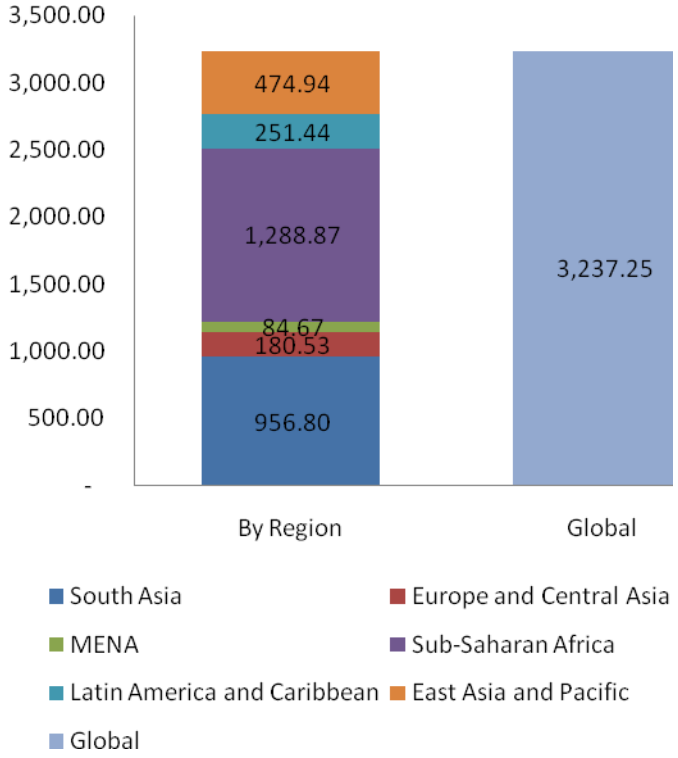
Kinetic charger for bicycle:

• Charging time depend on cycling speed and on phone model
• On average, 20 minutes of cycling at roughly 10 km/h can provide enough charge to a low end phone for about 1 hour of talk time

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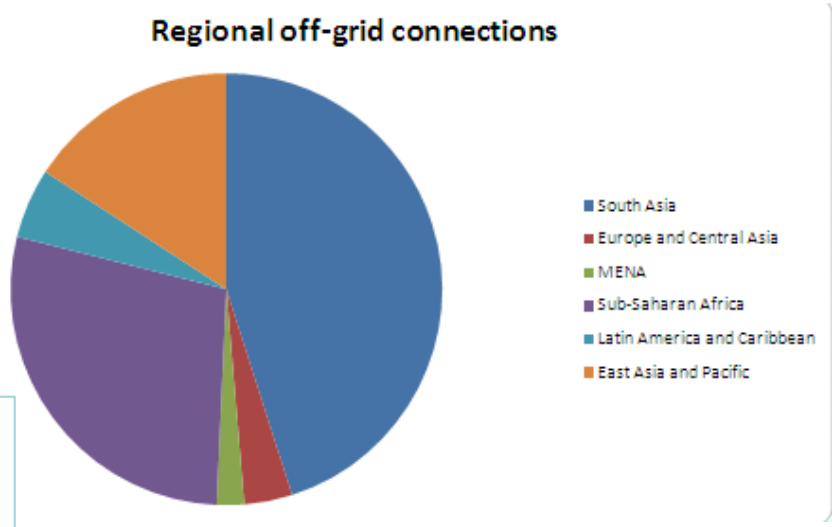
High Market Opportunity for Operators



Potential added revenues from charging solutions (US$ million)

10 % to 14% ARPU increase from charging solutions

US$3.2 Billion per month of potential incremental revenues for operators



Segmentation of off grid connections by regions

South Asia and Sub Saharan regions host the most off grid subscribers (~75% of total)

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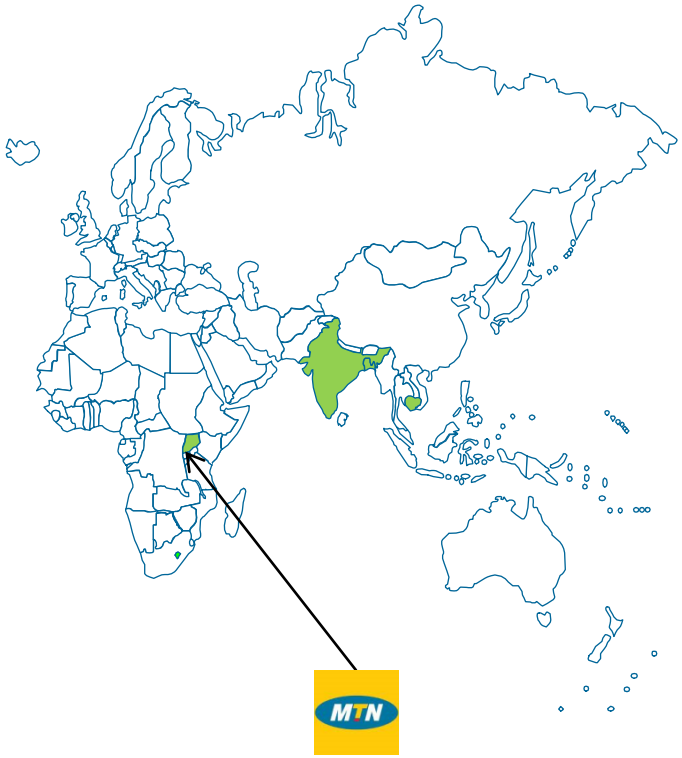
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Economics of Off Grid Charging - Field Studies

Countries to be studied:

- Uganda (with MTN support on the field)
- Bangladesh
- India
- Cambodia





What we would like to know:

- Economics
  - How much do users spend on charging their phone/month?
  - How much do they spend on airtime?
- User Experience
  - How far do they have to travel to charge their phones?
  - What is the impact of this charging process on their everyday lives?

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Field Study Uganda

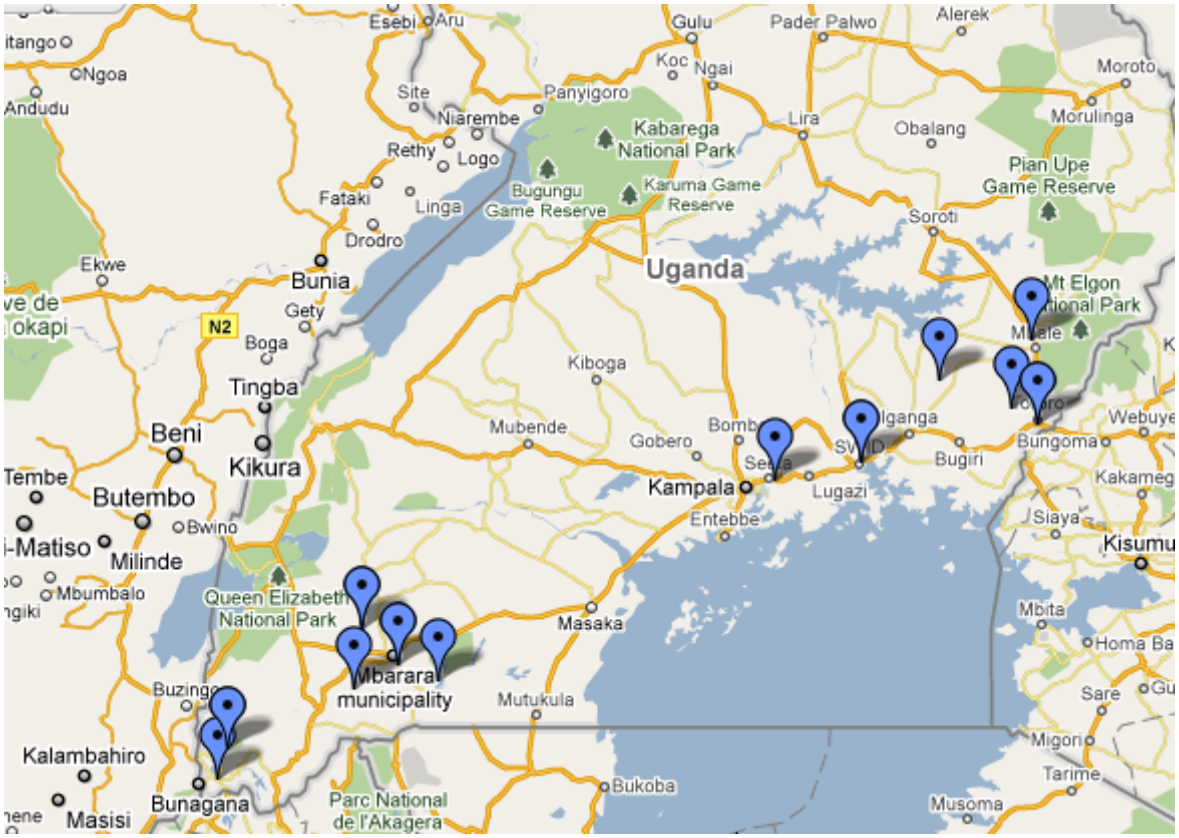
Field Study conducted 22-26 August

Methodology in brief

MTN identified and provided logistic support on the sites, based on mix of rural and rural/urban areas (connected or not to electricity grid) ~ 9% of population is connected to the grid
•12 sites visited in total (from East to West)

2 types of questionnaire for:
• Users coming to charge their phones
• Charging business owners

42 persons interviewed:
• 28 phone users
• 14 charging business owners



12 Sites visited from East to West

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MTN Interview on rural and off grid subscribers

Interview with Dennis Nsubuga and Junior Kwebiiha from MTN

<u>Rural/urban subscribers:</u>
- MTN estimates that everyone owns a phone is urban areas
- Rate is 1 out of 5 people owns a phone in rural
- Mobile users are more business oriented in rural than urban

<u>Handset</u>
- Cheapest Handset from MTN is ~US$14
- People willing to pay more to have a more efficient and longer lasting product

- MTN Uganda doesn't distribute solar phones
- UTL is the only Kasana (solar phone) distributor in Uganda (cost ~US$30)

<u>Off Grid Projects:</u>
- MTN Uganda is involved in several off grid charging projects
- **Major problems of theft** prevents further solar panels deployment (estimated rate of 60% of panels stolen few weeks after installation)





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Off Grid Charging Economics





Charging Shop in Kisoro (South West Uganda)

Price of charge: 200-500 Ugandan Schillings (US$0.10 – US$0.25)

- **Average price is ~US$0.20**
- Price seems to be dependant on site connection to the electricity grid – price is lower when site is connected or close to a large city connected to the grid

Subscriber Charging Expenditures:

US$1 to US$3 per month on charging their phone

- **Average monthly expenditure is ~US$2.25**
- Represents between 5 % to 30 % of subscribers mobile expenditure per month

Cost of Transport:

People living in remote areas travel up to 20 km to charge their phone

- Users spend up to 50.000 Schillings (US$25) per month on transport to the nearest village to charge phone
- Sometimes they give their phone to a driver (truck, car, bike) going to the city to get charged, and then recover it in the evening

- **~ More than ¾ % of people interviewed would spend more money on airtime if they could reduce their charging expenditure**

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Charging Shop in Sunu



Sunu village in Busia County – 100 inhabitants

Not connected to electricity – first city connected to the grid is 15 km away



Charging Shop:
Owner Godfrey– retired officer, now farmer

• Tariffs: 300 Schillings (US$0.15) per phone Charge ~ 6 phones per day

• Only charging shop in the village

• Used to own a kinetic bike charger and a battery provided by MTN and the Grameen Foundation

• However bike charging process is cumbersome, 4h of pedalling needed to fully charge battery, up to 6 phones per day – used to pay someone to pedal to charge the battery!

• Currently charge phones using regular battery charged from the nearest village (cost 800 Schillings – US$0.4)

• Also owns a payphone from MTN





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Charging Shop in Kanoni



Kanoni Trading Center – 600 inhabitants

Not connected to electricity – first city connected to the grid is 10 km away

Rural Area – Low Population density



<u>Charging Shop:</u>
Owner Christine Mugazi

- Solar panel on the rooftop to charge battery
- Investments (Solar panel + battery) estimated to 450.000 Schillings (225 USD)
- Tariffs: 500 Schillings per phone - Charge ~ 5-10 phones per day
- Can Charge up to 4 phones at the same time
- People comes from as far as 1 km to charge phone – same user comes 1 to 2 times a week
- Better business on market days





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Mobile User in Kanoni





Kanoni trading Center – 600 inhabitants

Rural area – low population density

Not connected to electricity – first city connected to the grid is 10 km away

Mobile User:
Linda

Occupation: farmer

Lives 3 km from Kanoni - comes using a boda boda (local motorbike taxi) – cost 10.000 Schillings (5 USD) return trip

Total expenditure charging per month ~ 4500 Schillings (2.5 USD) – charges phone 2 times/week

Total expenditure transport per month (have to come to city to charge phone) ~ 45.000 Schillings (25 USD)

Needs the phone for its farmer business: ask prices, weather info,...

Would spend more on airtime if she could reduce charging expenditure

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Next steps for the off grid charging project

In 2010

- Content is being progressively uploaded on GPM website
  - Technology specifications have been agreed by operators
- Field studies in Bangladesh, India and Cambodia will be finalized by the end of September
  - Publication with results from field studies will be released in November
- Vendor Bazaar
  - 1 day event to be held in London on the 2nd of December
  - Operators and Vendors are welcome to join and are currently being contacted for this event
  - Format:
    - GSMA will present results and updates on the project (market data and field studies)
    - Vendors will have 10 to 15 minutes to pitch their solutions
    - Create bridges between stakeholders and momentum around off grid issues and solutions

In 2011

- MWC event around off grid charging solutions to be determined
- Further investigate with operators energy solutions and services to off grid subscribers

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