Synergies between mobile phone and energy access

April 2014

GSMA

Mobile Enabled Community Services

The GSMA represents the interests of mobile operators worldwide. Spanning 219 countries, the GSMA unites nearly 800 of the world's mobile operators, as well as more than 200 companies in the broader mobile ecosystem, including handset makers, software companies, equipment providers, Internet companies, and media and entertainment organisations.

GSMA Mobile for Development brings together our mobile operator members, the wider mobile industry and the development community to drive commercial mobile services for underserved people in emerging markets. We identify opportunities for social, economic and environmental impact and stimulate the development of scalable, life-enhancing mobile services.

GSMA MECS Program Overview

Mobile Enabled Community Services

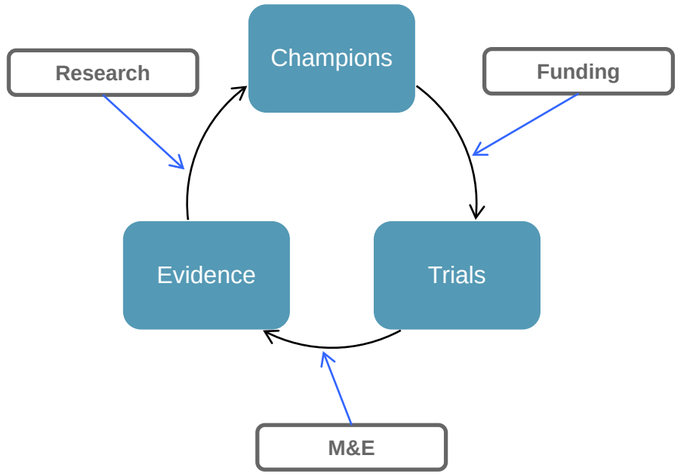
The GSMA Mobile Enabled Community Services (MECS) programme leverages mobile technology & infrastructure to improve access to basic energy and water services

Funding & Timeframe:

- £4.1M in funding from DFID's Climate & Environment Team to be deployed in 2013-2014

Programme Activities:

- Innovation Fund (£2.4M to support innovation and trials)
- Research & Knowledge Sharing/Convening
- Technical Assistance
- Advisory Services to Mobile Operators
- Market Building

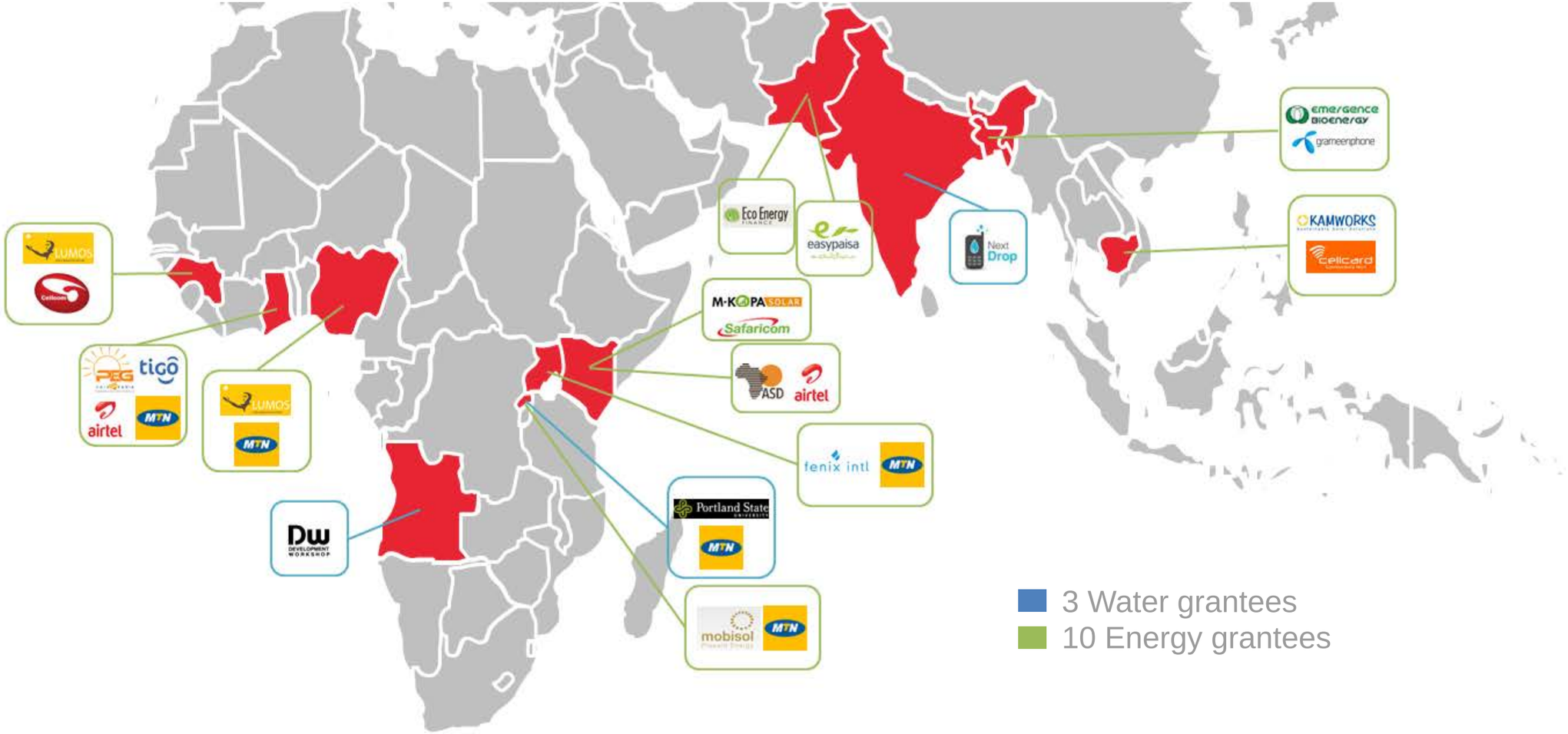


The programme seeks to address the following questions:

- What types of mobile technologies can support community services?
- For a solution to be adopted at scale, what building blocks would be needed?
- What is the social and commercial impact of delivering community services to underserved mobile subscribers?

GSMA MECS Innovation Grantees

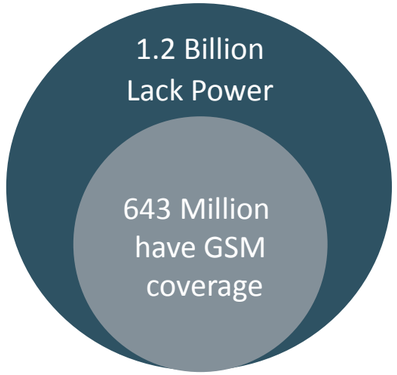
Mobile Enabled Community Services

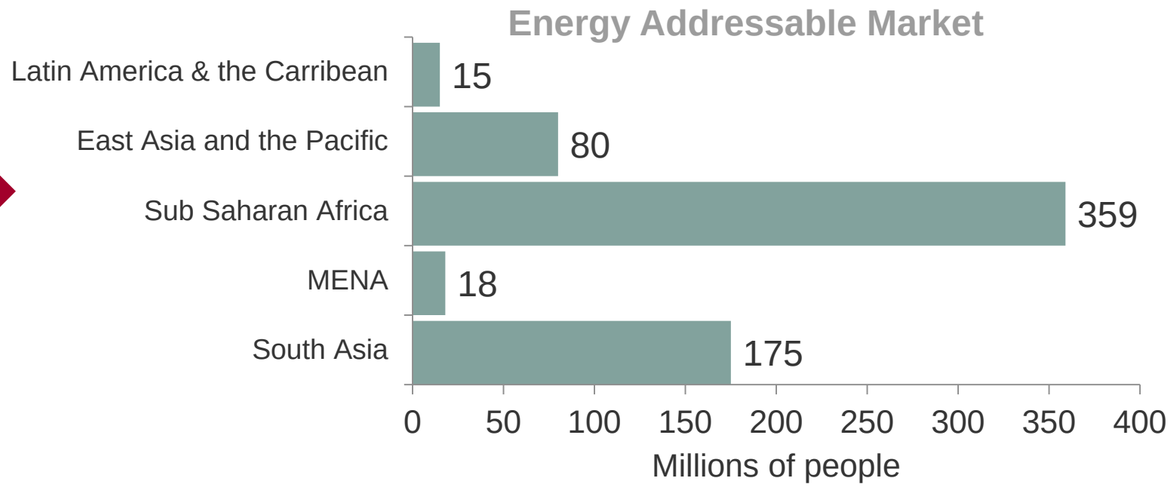


The Size of the Opportunity

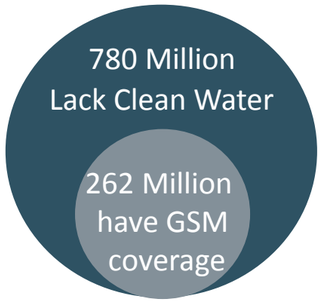
Mobile Enabled Community Services

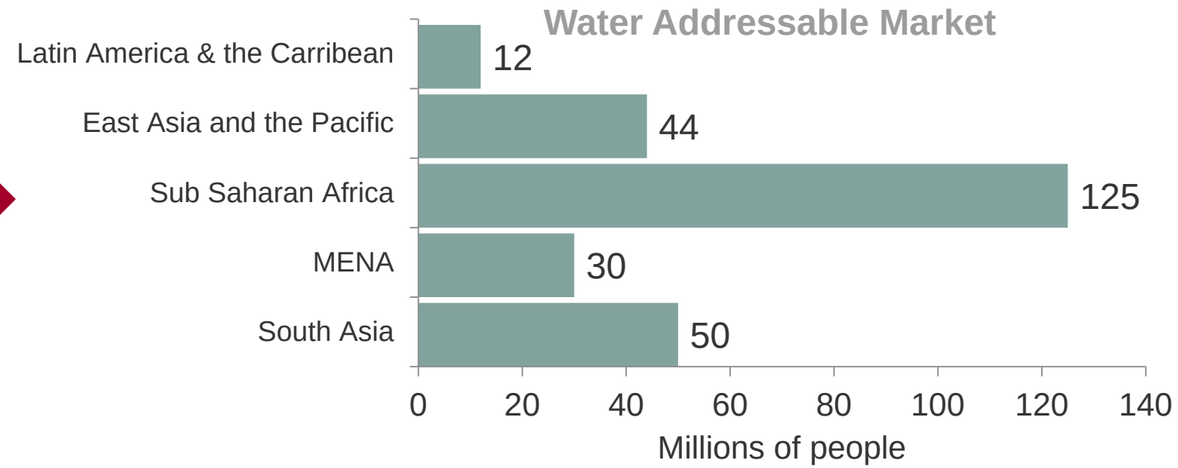
Energy





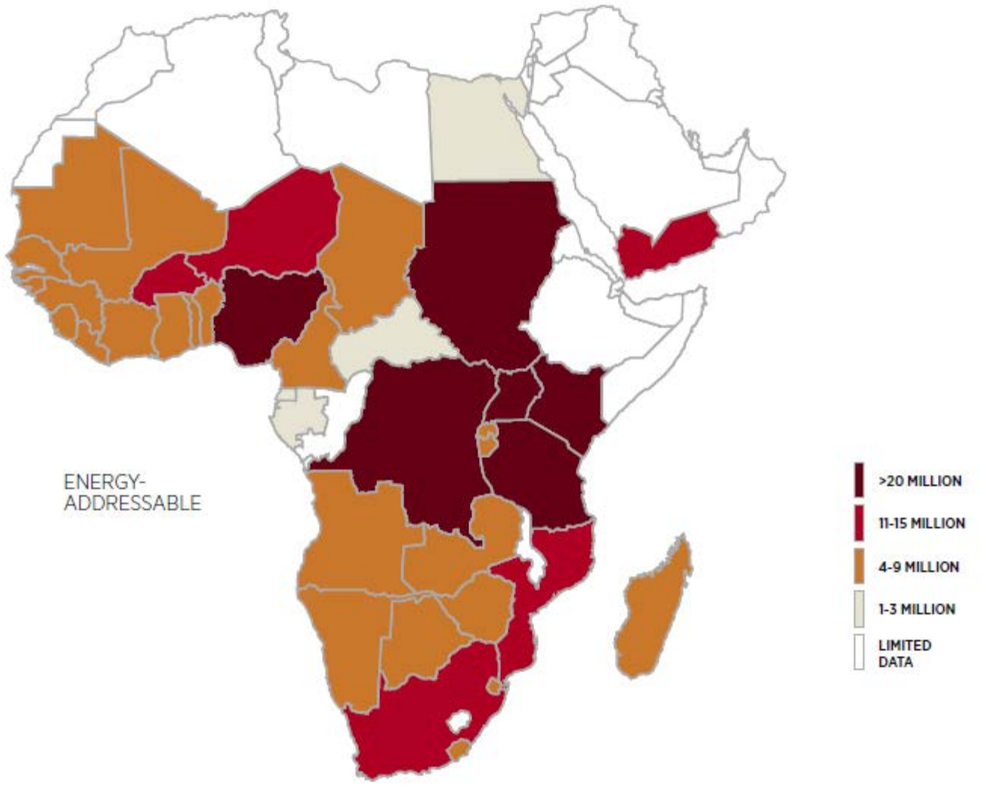
Water

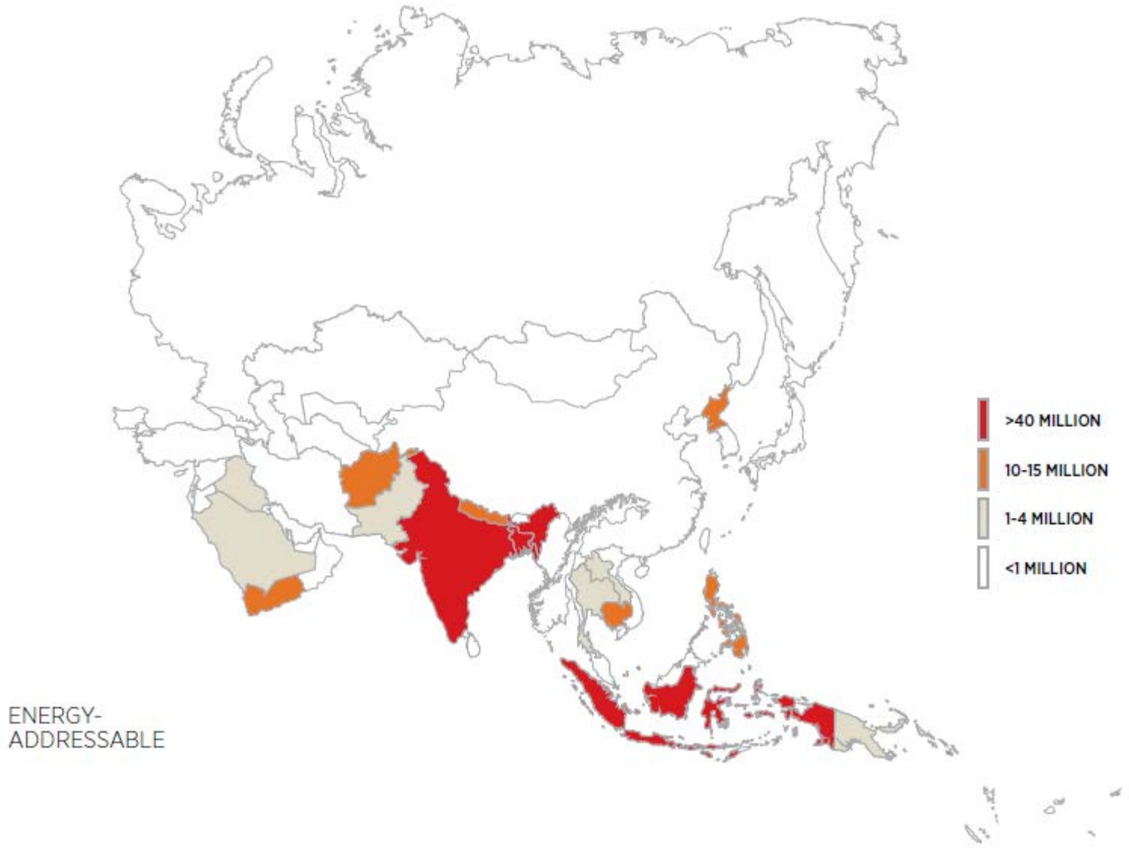




The Energy Opportunity by Geography

Mobile Enabled Community Services

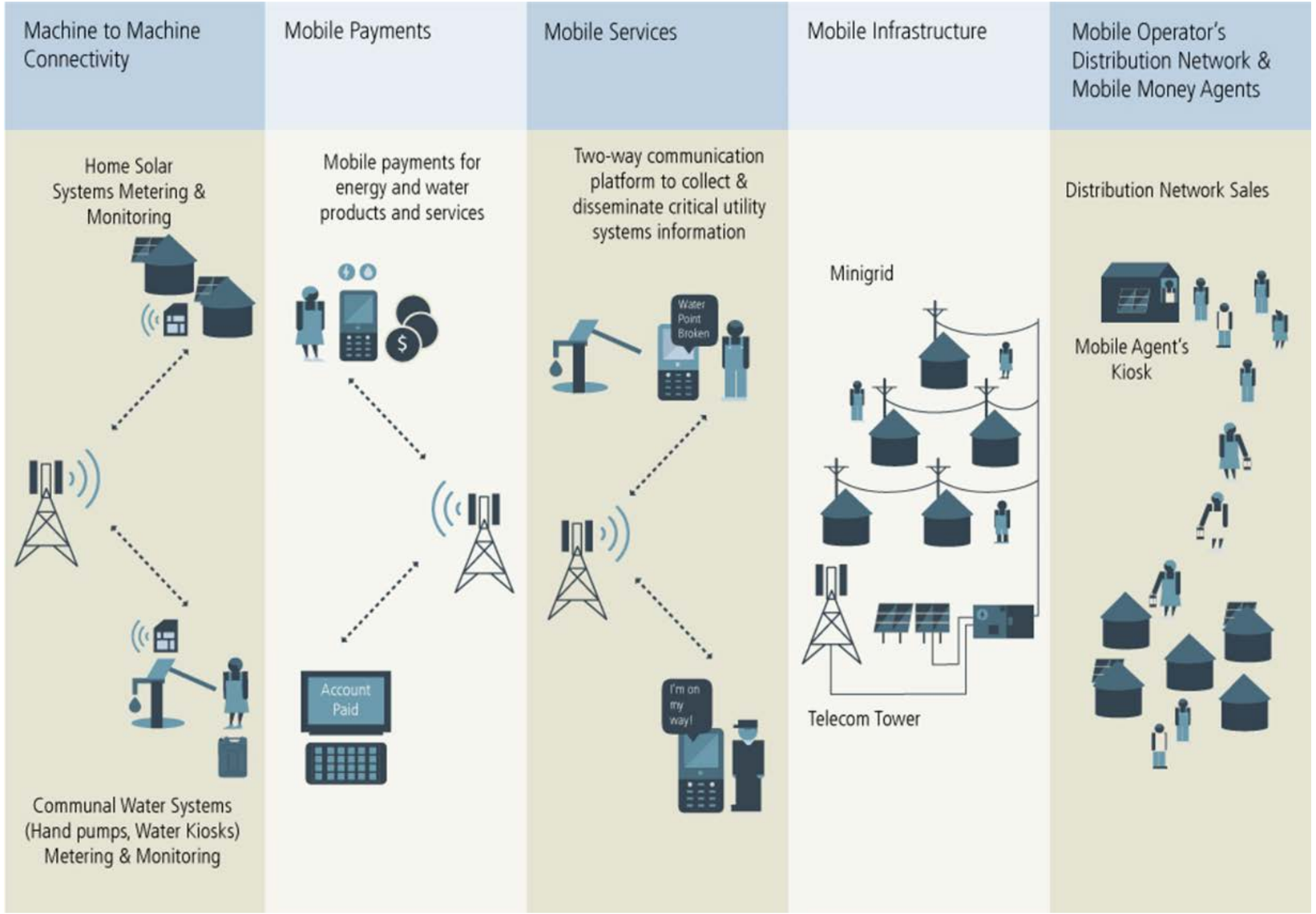




The energy-addressable market is an estimate of the number of people covered by mobile networks without access to electricity

5 Mobile Channels to Support Energy Access

Mobile Enabled Community Services



Machine-to-Machine Connectivity

Mobile Enabled Community Services

- M2M **enables remote monitoring and the Pay-As-You Go capacity of decentralised energy**
- Several communication networks can be used to transfer data
- Can improve operations, control and maintenance in several decentralised configurations:
  - Mini-grid – smart meters at the power plant, block or household level
  - Home Solar Systems – smart meter at the household level

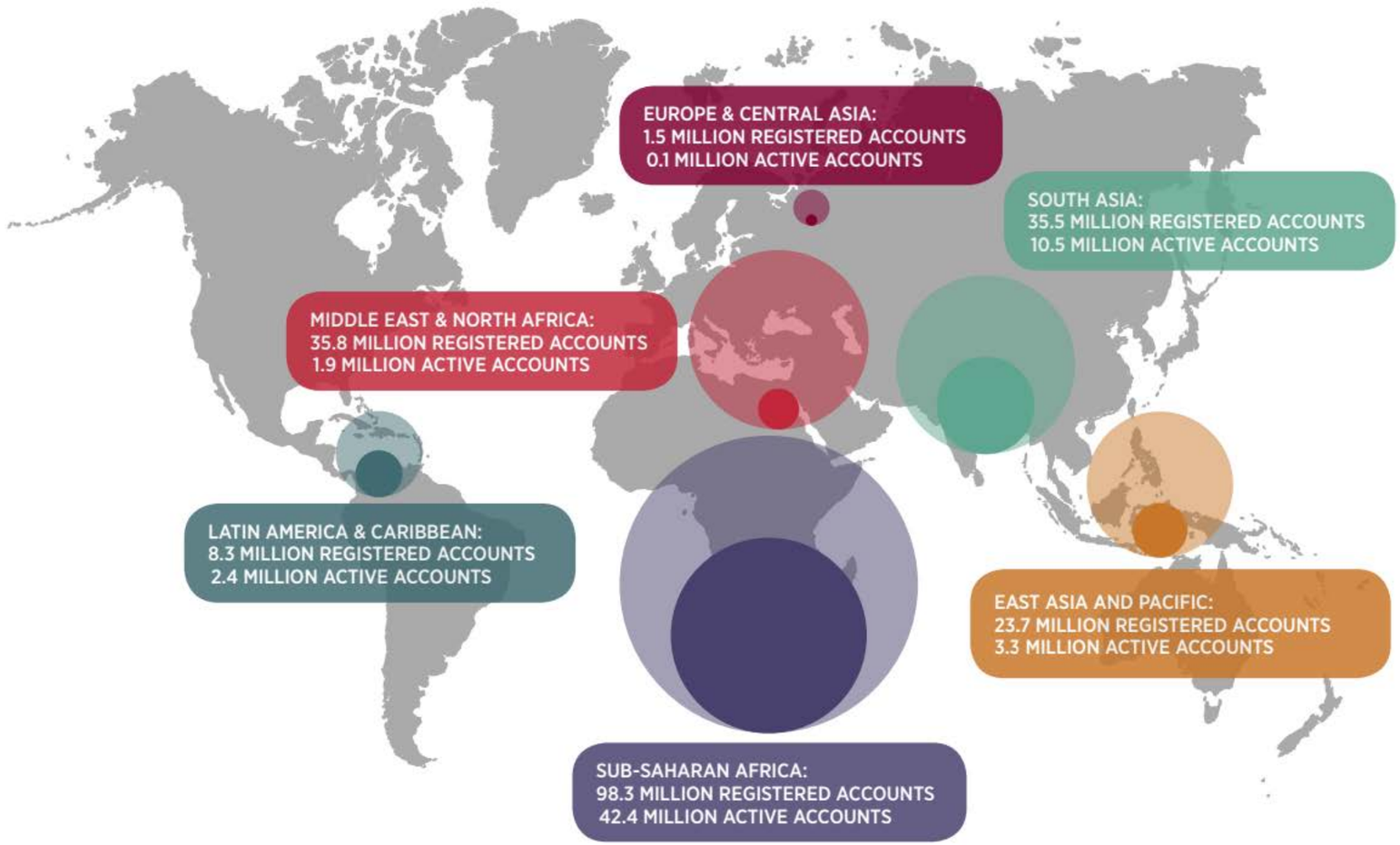
TECHNOLOGY		PROS	CONS
LONG RANGE	GSM - Data	Automatic control and remote monitoring of units Building database on customers' behaviours Ability to improve product performance through data collected	Cost of the GSM connectivity (chipset and monthly data plan) Needs GSM coverage
	GSM - Audio Channel	Low cost of inclusion to enable the PAYG capacity Ability to collect data on unit remotely through mobile phones	Reliance of user's phone to transfer data Needs GSM coverage
SHORT RANGE	Ex. Zigbee, Bluetooth, Infrared	Average cost of inclusion to enable the PAYG capacity Ability to create mesh networks at the village level	Still needs to be connected to a GSM gateway to transfer data over long haul Might need agents presence to transfer credit to unit or collect information from units
INTERNAL	No Radio Frequency Capacity	Low cost to enable the PAYG capacity	No or limited data collected on unit performance Reliance on user's phone Need agents to unlock the device after contract/ service period (when available)

Communication Technologies enabling remote monitoring and the Pay-As-You Go capacity

Mobile Payments

Mobile Enabled Community Services

- **Providing financing solutions and payment flexibility to cash constrained populations**
- Mobile Money continues to grow and expand across more regions
  - 219 live mobile money deployments worldwide
  - More than 203 Million registered accounts (34% in East Africa) – 61 million active accounts
  - More mobile money accounts than bank accounts in 9 African countries*
- Airtime payment as another opportunity for mobile payments (Econet Solar, Nova Lumos (in development))



Number of Registered Customer Accounts and Active Customer Accounts (June 2013)

*Kenya, Uganda, Tanzania, Madagascar, Cameroon, DRC, Gabon, Zambia and Zimbabwe

Mobile Tower Infrastructure

Mobile Enabled Community Services

- **Leveraging the presence of telecom towers in off-grid environments to support rural electrification under a commercial model**
- More than ~100,000 off grid towers in Asia and ~ 45,000 in Africa
- This model is more advanced in South Asia, where more than 20 sites have been implemented

OMC Power in India

- Provides power to telecom towers and energy hubs (11 sites built in Uttar Pradesh as of 2013)
- Purchase Power Agreement (5 year) with Tower Operators – aim is to reduce tower operational expenditures
- Last mile energy distribution is provided by OMC agents delivering charged lanterns and charged batteries to the surrounding community (~3,000 homes per site) - customers don’t have to pay anything upfront and are charged by the day (~US$0.1)

Mobile Operators Distribution Network

Mobile Enabled Community Services

- **Leveraging the footprint (logistics, warehousing and distribution) and brand of mobile operators agents to reach underserved customers**

- Commercial partnerships in East Africa:
  - M-KOPA with Safaricom in Kenya
  - Fenix International with MTN in Uganda/Rwanda and Vodacom in Tanzania
  - Econet Solar with Econet Wireless in Zimbabwe

- Limited number of deals but interest from operators

Fenix International marketing campaign with MTN in Uganda

Mobile-Enabled Pay-As-You-Go Providers

Mobile Enabled Community Services

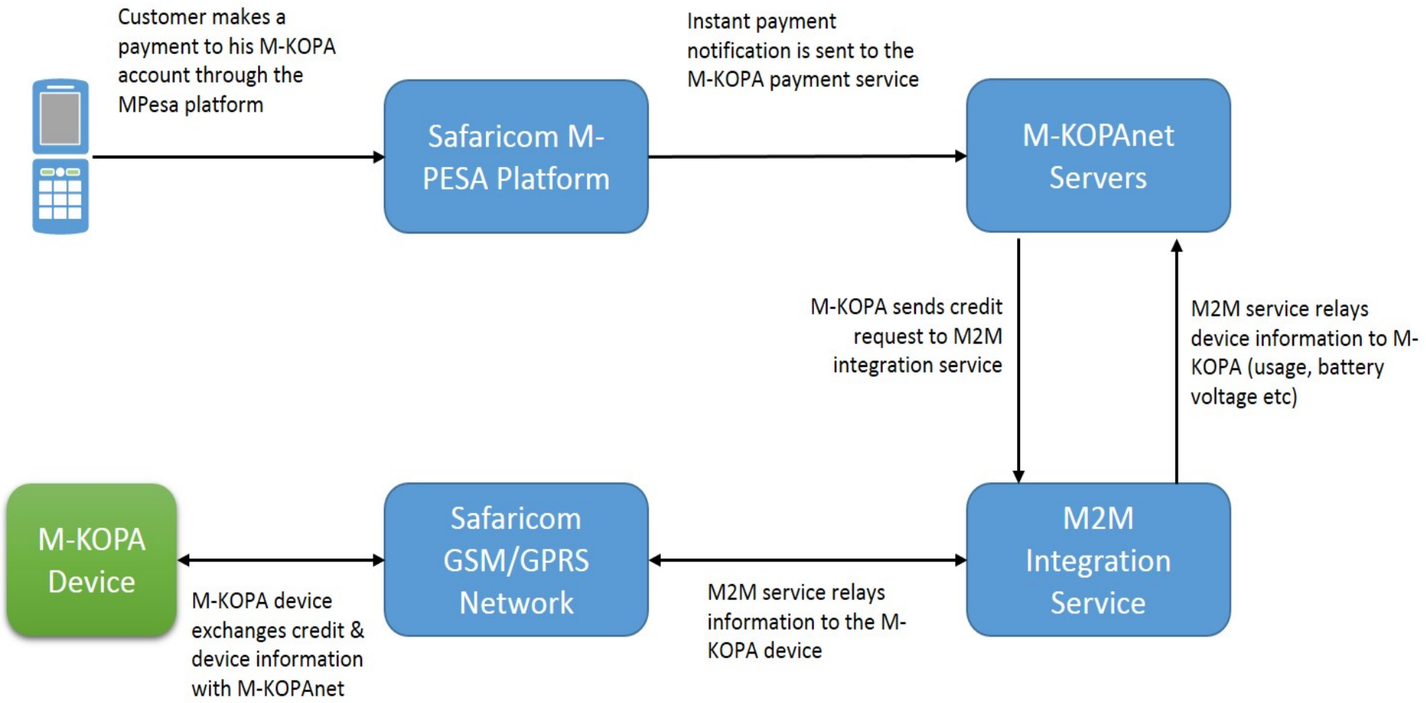
COMPANIES	COUNTRY OPERATIONS	DISTRIBUTION MODEL	SERVICE MODEL	PAYMENT TYPE	TECHNOLOGY	CONTRACT LENGTH
M-KOPA	Kenya, Uganda	Partnership with Safaricom	Lease to own	Mobile money – daily fee	Long Range - GSM data	12 months
MOBISOL	Tanzania, Rwanda	Own distribution	Lease to own	Mobile money - Monthly fees (rates starting at US$12 per month)	Long Range - GSM data	36 months
OFF GRID ELECTRIC (OGE)	Tanzania, Ghana	Own distribution	Solar as a service	Mobile money – Daily fee	Embedded – non wireless	-
AZURI TECHNOLOGIES	Kenya, Uganda, Tanzania, Ethiopia, Rwanda, Ghana and South Sudan ...	Partnership with SolarAid Sunny Money in Kenya	Lease to own	Scratch cards or e-payment – weekly fee (~US$1.5)	Internal – non wireless	18 months
ANGAZA DESIGN	Kenya, Tanzania	Own distribution and partnership with SolarAid Sunny Money	Lease to own	Scratch cards or mobile payments – Daily fee	Long Range - GSM Voice Channel	-
ECONET SOLAR	Zimbabwe, Lesotho, Burundi	Partnership with Econet Wireless	Solar as a service	Airtime billing – Daily fee (~US$0.25 per day)	Long Range - GSM data	-
FENIX INTERNATIONAL	Uganda	Partnership with MTN Uganda	Lease to own	Mobile money – Daily fee	Short Range Wireless	-
NOVA LUMOS*	Guinea, Nigeria	MTN Nigeria and Cellcom Guinee	Lease to own	Airtime billing	Long Range - GSM data	-

*In planning phase

Example of a Financed Purchase Model – M-KOPA in Kenya

Mobile Enabled Community Services

- M-KOPA provides 4 and 5 W home solar solutions (including lights, phone charger and a portable lamp) - currently planning the trial of larger units thanks to GSMA MECS funding
- Key model features:
  - Distribution and revenue-sharing partnership with Safaricom
  - GSM-enabled solar systems
  - Relying on M-PESA for customer daily payments
- More than 50,000 units sold as of January 2014 (commercial launch in October 2012) & recently received a US$10Million syndicated debt facility from the Commercial Bank of Africa

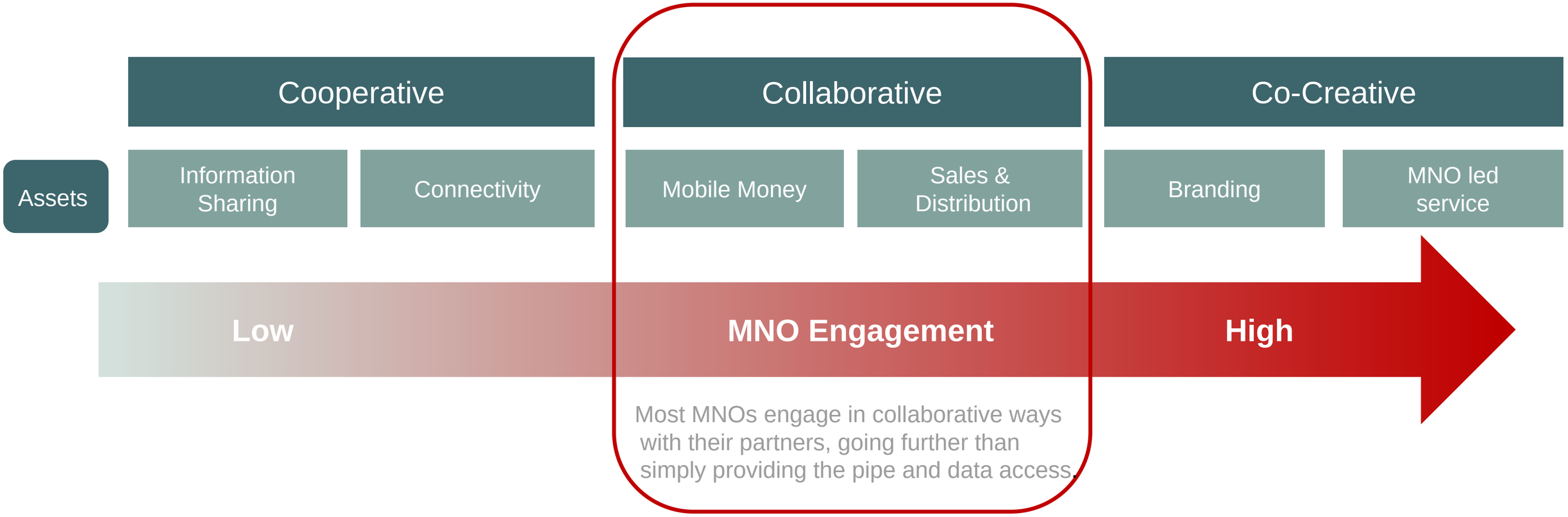


M-KOPA schematic model

The Role of Mobile Network Operators to Support Energy Access

Mobile Enabled Community Services

The analysis of the MECS Innovation Fund applications which included Mobile Network Operators (MNO) as partners or as lead applicants, allowed us to build a spectrum of MNO engagement when partnering with third party providers.



Upcoming GSMA MECS Activities

Mobile Enabled Community Services

Key documents to be published in 2014

- Publication of new research on the Financed Purchase and Energy as a Service model for off grid solutions
- Final results and key learnings from the MECS grantees will be made public in 2015

Key events

- Working Groups in East Africa (Rwanda, June 10th) and Asia (Indonesia, June 23rd)
- Seminar at the World Water Week in Stockholm (theme this year is access to energy and water)

Currently planning Phase 2 for the Programme (2015-2017)