Mobile Money
Instant Payment Notification Hub

Accelerating the Pay-As-You-Go (PAYG) Utilities
sector through mobile money

JANUARY 2018

GSMA Mobile Money

The GSMA represents the interests of mobile operators worldwide, uniting nearly 800 operators with almost 300 companies in the broader mobile ecosystem, including handset and device makers, software companies, equipment providers and internet companies, as well as organisations in adjacent industry sectors. The GSMA also produces industry-leading events such as Mobile World Congress, Mobile World Congress Shanghai, Mobile World Congress Americas and the Mobile 360 Series of conferences.

For more information, please visit the GSMA corporate website at www.gsma.com

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The GSMA's Mobile Money programme works to accelerate the development of the mobile money ecosystem for the underserved.

For more information, please contact us:
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GSMA Mobile for Development Utilities

The Mobile for Development Utilities Programme improves access to basic energy, water and sanitation services in underserved communities using mobile technology and infrastructure.

Our work encompasses any energy, water and sanitation service provided to a community, which includes a mobile component, whether it is voice, SMS, USSD, Machine-to-Machine, NFC, a mobile operator's agent network or tower infrastructure. We aim to seize the opportunity, leveraging mobile technology and infrastructure to enhance access to affordable and reliable energy, clean and safe water and sanitation services in underserved communities. The GSMA Mobile for Development Utilities Programme receives support from the UK Government.

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PAYG solar and mobile money – a powerful combination

Globally, **1.2 billion people lack access to electricity**. Current trends suggest Africa will not achieve universal access to electricity until 2080.[1] Energy access is critical for inclusive economic growth and is supported by UN Sustainable Development Goal (SDG) 7 to ensure access to affordable, reliable, sustainable and modern energy for all.

In order to address this need, a new generation of entrepreneurial businesses have taken on the challenge of providing critical utility services (such as electricity, water and sanitation) to off-grid populations, by using a **pay-as-you-go (PAYG) model** whereby customers in remote locations use their solutions but pay for them incrementally over a period of time. The pay-as-you-go (PAYG) sector has huge potential; over 1.6 million PAYG solar units have been sold globally to date and future sales are estimated to reach seven million units by 2020. These businesses, the vast majority of which are based in Africa and Asia, have a critical need to accept ongoing incremental payments from their customers. However, many (indeed most) of the customers that these PAYG

businesses seek to serve **do not have access to formal financial services**, and making regular payments from a remote location poses a big challenge for them.

Mobile money represents a powerful opportunity to address this problem. **As an industry with more than half a billion accounts** and presence in two-thirds of the world's low- and middle-income countries (with Sub-Saharan Africa and South Asia accounting for the bulk of accounts), mobile money is strong in the very regions where the need for PAYG solutions is greatest. Mobile money can unlock new models of energy services such as affordable bill payments and machine-to-machine (M2M) connectivity to remotely control services. It also offers strategic gains for mobile operators. By providing a compelling use case for mobile money, PAYG providers are **driving mobile money penetration and usage, increasing brand loyalty, and contributing to revenues**. The PAYG solar sector and mobile money therefore offer strong synergies and can strengthen and accelerate one another's growth.

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1. Africa Progress Panel, "Power People Plant: Seizing Africa's Energy and Climate Opportunities - Africa Progress Report 2015" (2015). Available at: http://www.africaprogresspanel.org/wp-content/uploads/2015/06/APP_REPORT_2015_FINAL_low1.pdf

FIGURE 1

Mobile money global spread

**EUROPE &
CENTRAL ASIA**
◆ 10.4M
★ 1.4M

SOUTH ASIA
◆ 164.2M
★ 40.4M

**MIDDLE EAST &
NORTH AFRICA**
◆ 44.1M
★ 13.9M

**LATIN AMERICAN &
THE CARIBBEAN**
◆ 23.0M
★ 10.8M

**SUB-SAHARAN
AFRICA**
◆ 277.4M
★ 100.1M

**EAST ASIA &
SOUTH PACIFIC**
◆ 36.6M
★ 7.1M

◆
Registered accounts

★
Active accounts
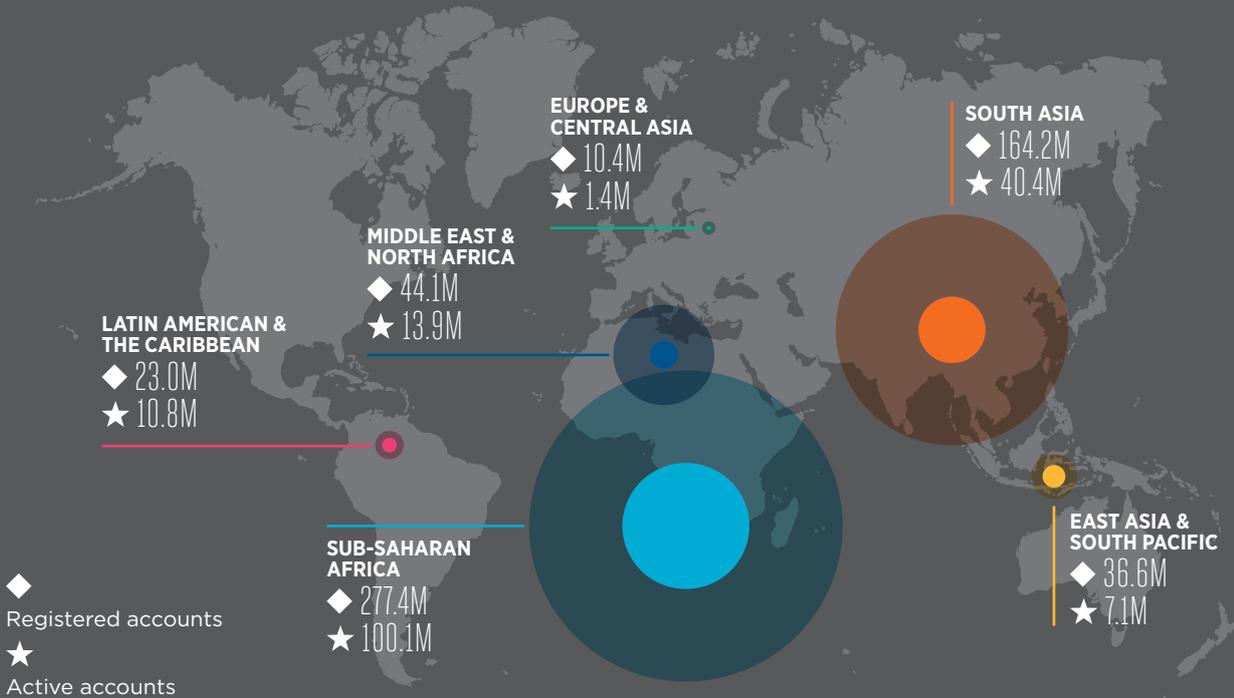
FIGURE 2

PAYG utilities industry potential

1,6 Million
cumulative
sales of PAYG
solar units

1,200
daily
sales

FORECAST OF

7 Million
annual unit
sales in 2020
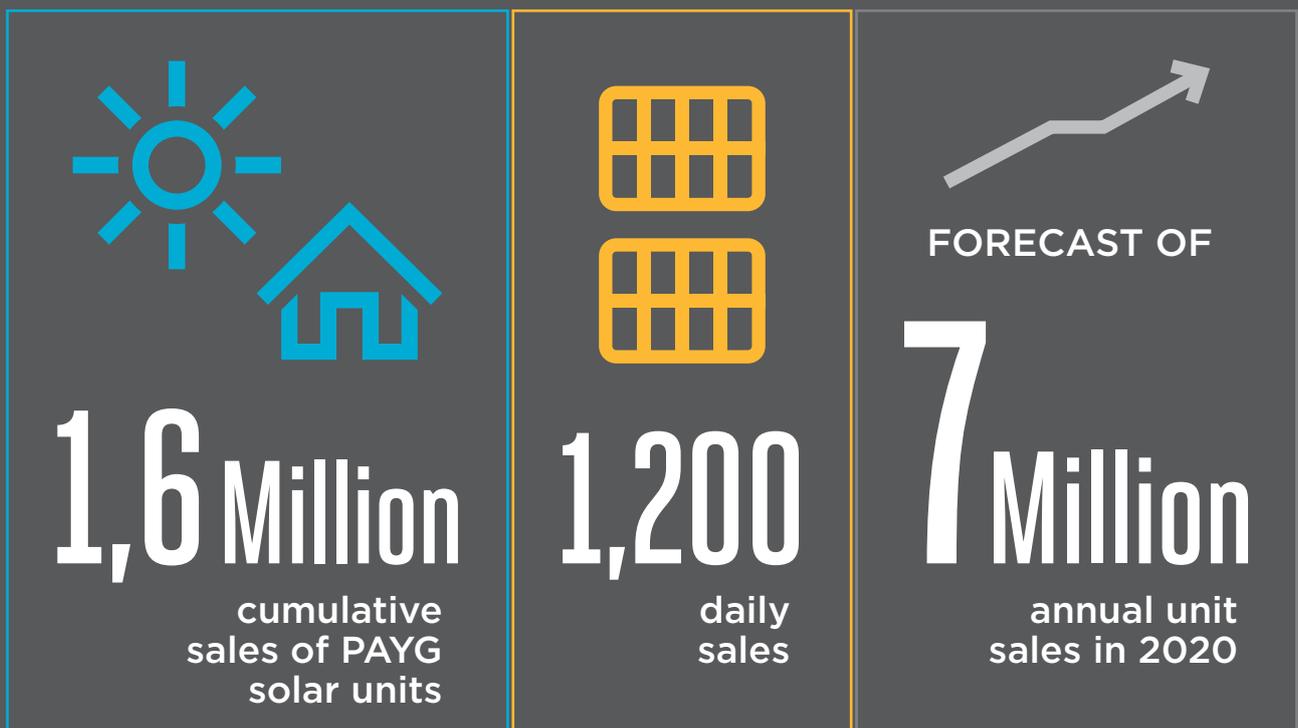
Source – GSMA estimate

Source – BNEF & Lighting Global

Integration challenges

Despite this obvious synergy, PAYG players and mobile money providers have not yet realised the full potential of collaboration. One of the biggest reasons for this is the need for service providers to undergo a **technical integration** with each mobile operator to accept payments from their customers. The current landscape for PAYG companies to connect with mobile money is overly complex. With **71 active and planned PAYG deployments and 151 mobile money providers** (and counting), there is a staggering number of integrations to be performed in Africa alone. This presents a major bottleneck for the entire PAYG industry to flourish. Small companies in particular stand little chance of attracting the attention of large mobile operators that are often tied to legacy systems, making it difficult to connect to new players painlessly and inexpensively. It is not uncommon for an integration between a PAYG provider and an operator to take months to complete and the cost of time and resources dedicated to the process is high.

FIGURE 3

Multiple integrations as PAYG industry grows

PAYG PROVIDERS

MOBILE MONEY PROVIDERS

71 DEPLOYMENTS, 28 COUNTRIES

500M+ SUBSCRIBERS
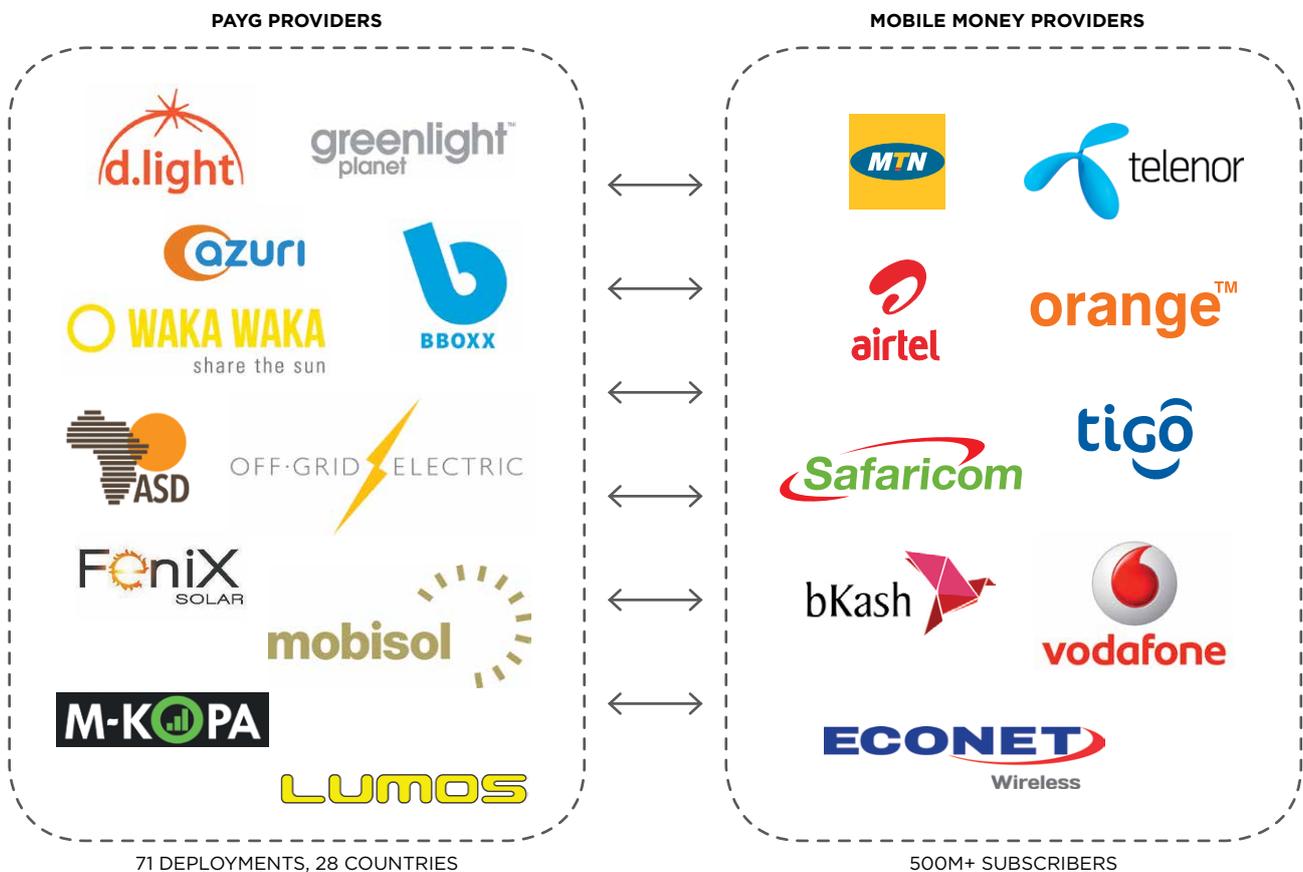
Instant Payment Notification Hub

Prompted by this context, the GSMA's Mobile Money and Mobile for Development Utilities teams (with support from the MasterCard Foundation) came together to create a service that can connect PAYG service providers to multiple mobile operators with **just one integration**. The hub not only aims to enable small PAYG utility service providers to integrate easily with mobile operators, but also to help them to serve their customers more efficiently by sending **instant notifications of their payments** made using mobile money. This is a critical requirement for billers to automatically **track payments in real time** and to, for example, turn on a light as a result of the payment made. It is therefore appropriately titled the **Instant Payment Notification (IPN) Hub.**
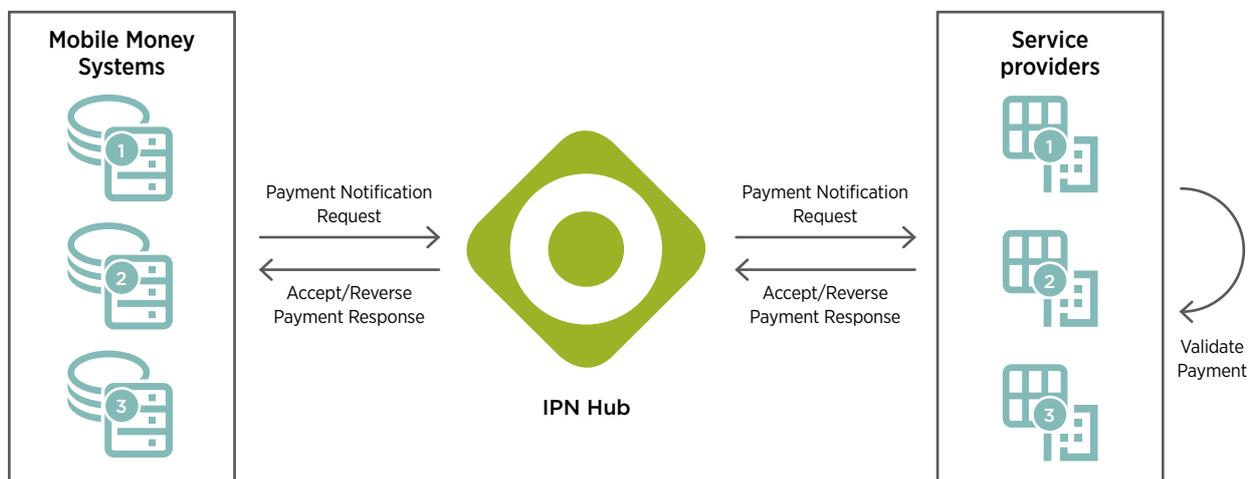
It is important to point out that while the IPN Hub connects different PAYG providers and mobile operators, it does not actually process payments. PAYG providers must still forge contracts and **settle funds directly** with operators outside of the IPN Hub.

The PAYG sector has the potential to deliver a huge developmental dividend and transform lives, but it does not yet present a large commercial opportunity. **Philanthropic capital** can thus play a significant role in accelerating its early growth and getting it to a stable state. In line with this vision, the IPN Hub is meant to act as an **industry utility** and to enable small but life-enhancing PAYG energy transactions in a margin-sensitive business.

The current scope of the hub is simple insofar as it focuses solely on the PAYG solar sector and only processes notifications, and this **simplicity and agility** adds to its strength and versatility. Furthermore, although the IPN Hub was developed primarily to support the PAYG solar sector, the IPN functionality can also be helpful as part of **solutions beyond PAYG providers,** such as water, sanitation and school fees, which may be explored in the future.

FIGURE 4

IPN Hub technical architecture

Mobile Money Systems

Payment Notification Request

Accept/Reverse Payment Response

IPN Hub

Payment Notification Request

Accept/Reverse Payment Response

Service providers

Validate Payment

Pilot in Rwanda and initial results

The IPN Hub was initially rolled out for testing in Rwanda because there is a promising and growing PAYG service provider sector there, yet integrations between PAYG providers and mobile operators can be a long and costly process. Through market visits and active engagement with key stakeholders, we observed a willingness among both PAYG service providers and mobile operators to connect to the IPN Hub.

The hub went live in Rwanda on 1 December 2016. At the time of writing this report, it has been operational for **12 months**, connects **four entities** (MTN Rwanda, Tigo Rwanda, BBoxx and Off Grid Electric) and has processed notifications for hundreds and thousands of payment transactions so far. Since going live, there have been **no instances of downtime** experienced by the hub.

While transactions data has been promising, we also conducted a rapid evaluation of the IPN Hub in Rwanda in April 2017 to better understand its impact on the ground. Testimonies collected from a range of stakeholders (including mobile operators, service providers and also end users of PAYG solar services) indicated that the hub has had positive impact, mainly through: **smoother integrations** for service providers; **instant payments** and service provision for customers; and **reduced manual work** for both operators and service providers.
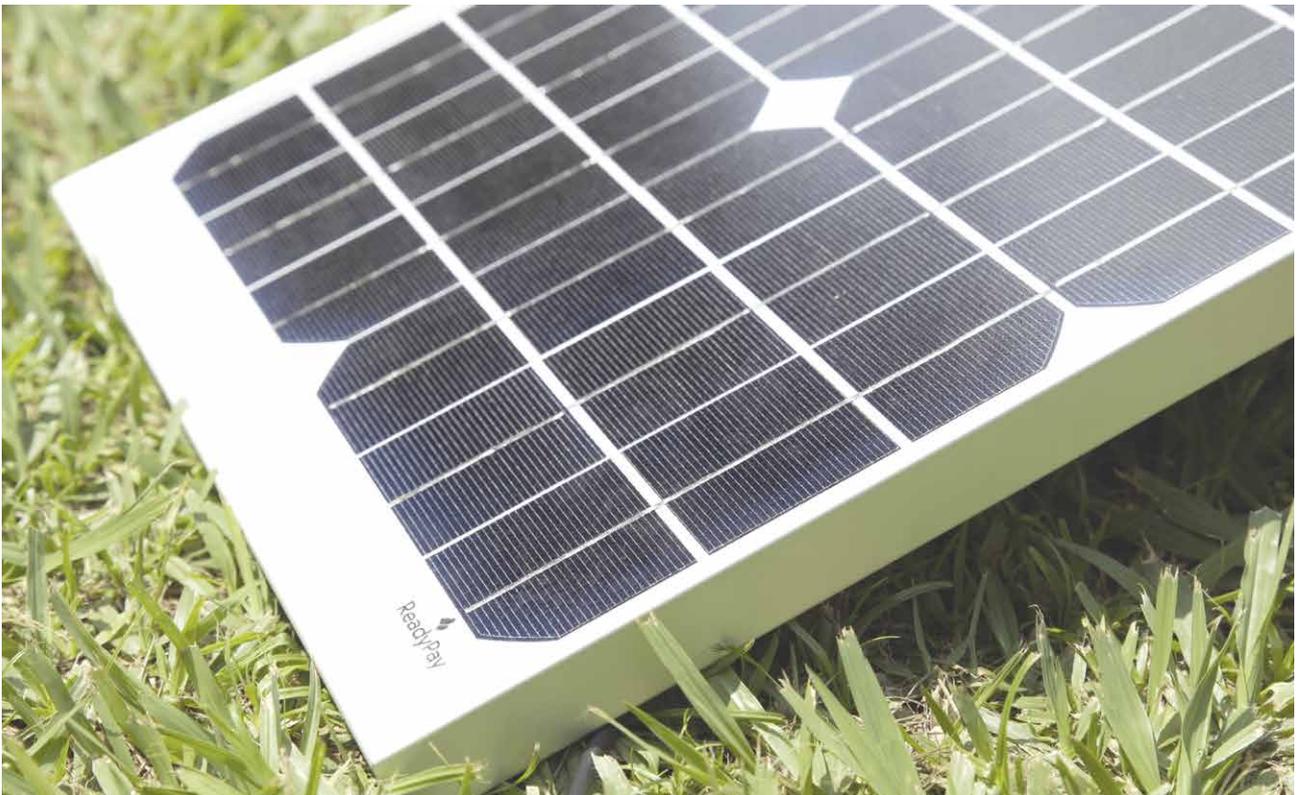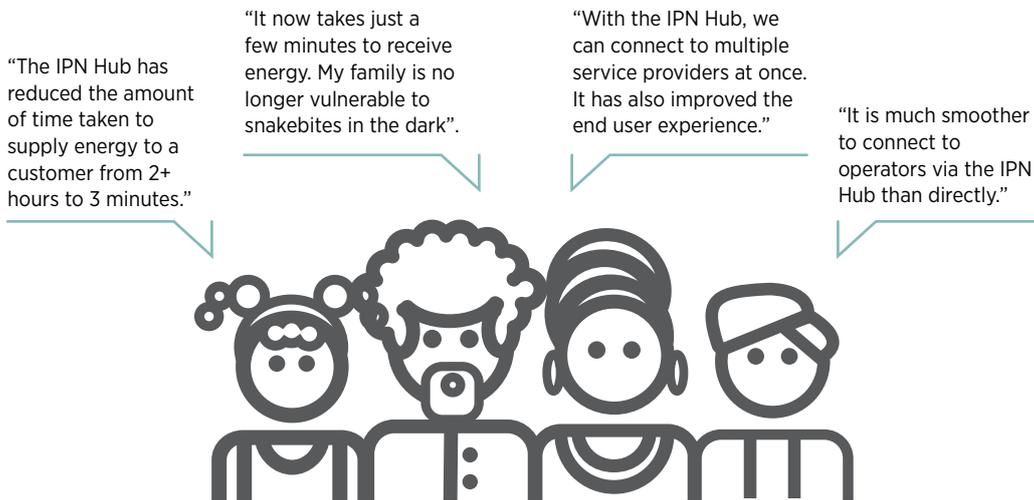
Lessons learned

1. PAYG utility services have the ability to transform lives

While working on this project, one of our most striking observations was just how valuable PAYG utility services are to those who live off the grid in remote areas. For these customers, having a PAYG solar kit in their house is not just a matter of convenience. It goes much deeper than that – as we saw from the example of a customer who felt that the greatest benefit of his PAYG solar kit was that his family could sleep soundly at night without the risk of snakebites. The value of such impact is difficult to quantify or convey in words. We learned through this project that the IPN Hub is not just helping the PAYG industry to scale or the mobile payments ecosystem to expand. Its reach goes far beyond that – to fundamentally transforming the quality of people's lives.

FIGURE 5

Key stakeholder feedback

"The IPN Hub has reduced the amount of time taken to supply energy to a customer from 2+ hours to 3 minutes."

"It now takes just a few minutes to receive energy. My family is no longer vulnerable to snakebites in the dark".

"With the IPN Hub, we can connect to multiple service providers at once. It has also improved the end user experience."

"It is much smoother to connect to operators via the IPN Hub than directly."

2. The sector is currently held back by administrative constraints

As part of this project, we spent a significant amount of time on the ground with PAYG solar providers' management and technical teams. We were struck by just how basic many of the sector's processes remain. PAYG staff spend hours manually downloading information about payments transactions from the portals of mobile operators and then manually re-uploading them onto their own systems, in order to match payments made against their customer records and to work out how much energy to supply to which customer. Inevitably there are mistakes, and costly call centres need to be set up and maintained by PAYG providers to handle customer complaints and queries. On the management side, PAYG staff spend a significant amount of their time liaising with mobile operators, often simply trying to get integrations in place. All these tasks place a huge administrative burden on PAYG providers, distracting them from the more important task of improving their service levels and expanding their business. Ultimately, this burden acts as a constraint on the growth of the sector.

3. Integrations can be challenging

One of the key lessons from this project was that the PAYG sector faces a considerable challenge in trying to integrate with mobile operators. Although both mobile operators and PAYG service providers agreed that the IPN Hub would be useful for them, we found that it still took a significant degree of stakeholder management to bring all relevant parties together for an integration. Part of the reason for this is that many decision makers are required in order to enable an integration. Conference calls with eight to ten participants, extensive technical conversations, and trial and error steps to remove bugs from the system are all typical of the integration process. It takes strong stakeholder management skills and a lot of relationship capital to get an integration over the line.

4. Subsequent integrations take much less time

Despite the points outlined above, we found that once integration had been achieved with an operator, the time taken to connect other operators and service providers to the hub was significantly reduced. We realised that the work on the IPN Hub is frontloaded, and as the footprint of the hub increases, it becomes easier to connect more entities. Every subsequent integration is quicker than the last (thanks to our vendor's increasing familiarity and expertise in addressing the platform complexities faced in each new integration), and more players are willing to connect to the hub if there are already existing members. In essence, we expect the IPN Hub to follow an accelerated growth curve building on its own momentum.

5. Even in markets well served by aggregators, PAYG service providers can struggle

At the start of this project, we had assumed that the IPN Hub would only be useful in markets that were not well connected by aggregators, as they tend to provide the middle layer of connectivity between mobile operators and ecosystem players. However, we have found that even in large markets that are well served by aggregators, the ability and willingness of aggregators to provide regular and bespoke support to small PAYG service providers is limited. While the biggest PAYG players have the ability and resources to command the attention of mobile operators and aggregators in these markets, smaller players still struggle to integrate with them and fall below the required threshold to attract their interest. Eventually, this leads to a less diverse PAYG industry and limited choices for the end user, as well as additional charges placed on the nascent PAYG industry as a result of having an aggregator.

6. The IPN Hub could also be employed for other use cases

We have learned through this project that there are currently a number of services with strong developmental links that are unable to effectively leverage mobile money. In addition to PAYG solar energy providers, IPN functionality can be helpful as part of other mobile money use cases such as water, sanitation and school fee payments. Mobile money providers have shown interest in adapting the IPN functionality to their specific market needs and tapping into some of these opportunities.
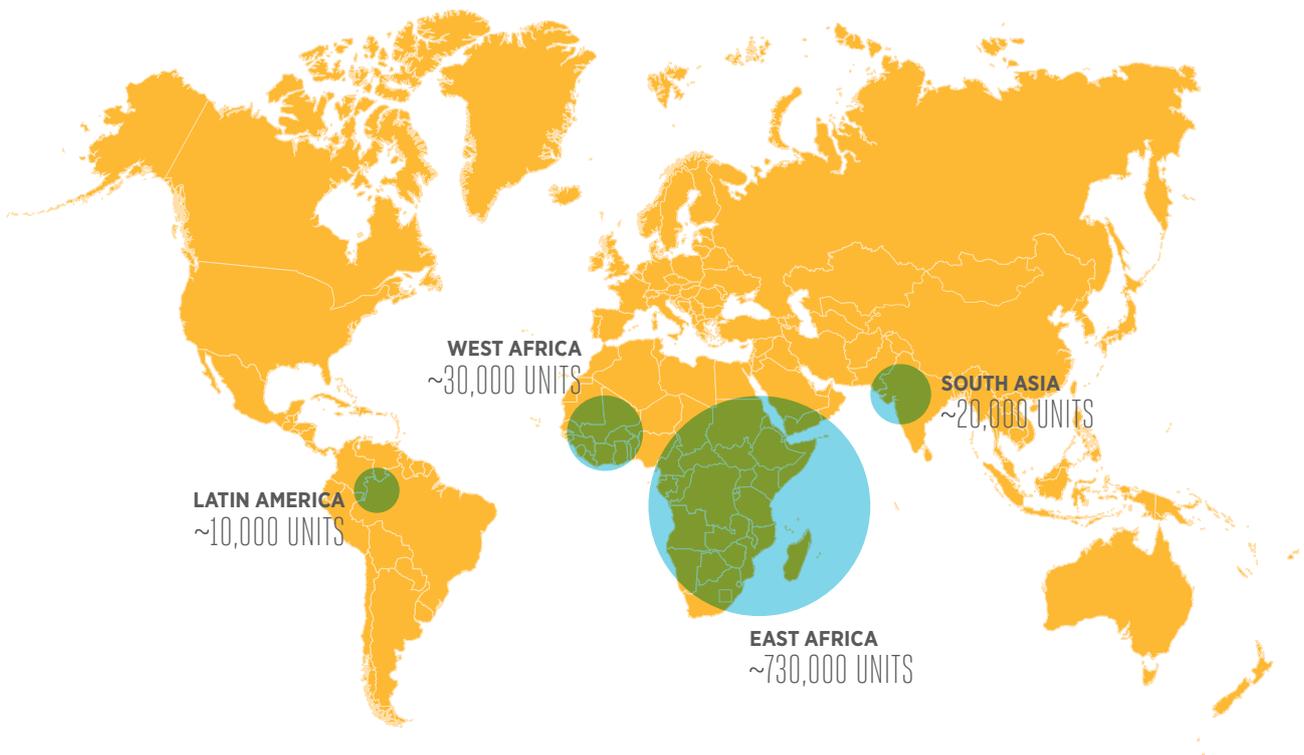
Next steps: expansion and sustainability

The strong results posted by the IPN Hub in Rwanda and positive testimonies received from all project stakeholders provide powerful justification for **scaling the hub to other markets** where the PAYG solar industry's growth is similarly constrained. As a result, the GSMA and the UK's DFID have come together to jointly support the connection of the IPN Hub to many more PAYG service providers and mobile operators, primarily in Sub-Saharan Africa but also in South and South-east Asia. Initial markets for potential expansion include **Cote d'Ivoire, Benin, Ghana, Madagascar and Tanzania**, although the IPN Hub will be a demand-driven initiative; the final selection will depend on demand for the IPN Hub by PAYG providers.

Beyond the initial development and scale-up period, the hub will be run on a cost-recovery (i.e. not-for-profit) basis in order to ensure its long-term sustainability. As part of this, PAYG service providers connected to the hub will pay a **small monthly subscription fee** to support the ongoing costs. As the number of transactions increases, the unit cost per transaction will further decrease for each service provider.

FIGURE 6

IPN Hub expansion plan

WEST AFRICA
~30,000 UNITS

SOUTH ASIA
~20,000 UNITS

LATIN AMERICA
~10,000 UNITS

EAST AFRICA
~730,000 UNITS

Conclusion

The Instant Payment Notification (IPN) Hub has provided a successful proof-of-concept in Rwanda. In addition to enabling a promising growth in transactions, testimonies collected from a range of stakeholders indicate that the hub has also had tremendous positive impact through: smoother integrations for service providers; instant payments and service provision for customers; and reduced manual work for both operators and service providers.

While the IPN Hub in Rwanda has seen positive impact and growth, there have also been several lessons learned from the experience so far. For instance, while pay-as-you-go utility service providers have the ability to transform lives (particularly with home solar kits), they are currently constrained by significant administrative burdens preventing them from achieving the more important task of improving their service levels and expanding their business. Ultimately this burden acts as a constraint on the growth of the sector. Similarly, initial integrations with the IPN Hub were slow, but subsequent integrations took much less time and we expect the IPN Hub to follow an accelerated growth curve building on its own momentum.

The IPN Hub has clearly demonstrated its value in Rwanda. The next few months will see this industry asset rolled out in new markets and potentially for new use cases, fostering the growth of an ecosystem of PAYG providers that depends critically on mobile money.

For more information please visit the GSMA
website at www.gsma.com