



# The GSMA Instant Payment Notification (IPN) Hub:

Impact and insights from inception to industry transition



The GSMA represents the interests of mobile operators worldwide, uniting more than 750 operators with over 350 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 the industry-leading MWC events held annually in Barcelona, Los Angeles and Shanghai, as well as the Mobile 360 Series of regional conferences.

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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 and Scaling Off-Grid Energy.

For more information, please contact us:

Web: [www.gsma.com/m4dutilities](http://www.gsma.com/m4dutilities)

Email: [M4DUtilities@gsma.com](mailto:M4DUtilities@gsma.com)

### Authors:

Jisas Lemasagarai

### Contributors:

Ilana Cohen, Henry Bowes

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# Introduction

The GSMA Mobile for Development Foundation set out to address a major barrier to energy access by helping off-grid solar companies to easily integrate with mobile money platforms. To achieve this, the GSMA was supported by the MasterCard Foundation and the UK Department for International Development (DFID) to create the Instant Payment Notification (IPN) Hub. This is a gateway that enables small service providers - primarily pay-as-you-go (PAYG) solar providers, but also other entities, such as water and transport service providers - to serve their customers more efficiently by receiving and validating real-time notifications of payments. The IPN Hub currently connects 14 companies to six mobile money providers in five

countries in Sub-Saharan Africa. The IPN Hub has demonstrated strong value in helping the industry to grow faster, and proving that this kind of solution is still needed for further growth in the PAYG industry, where real-time notifications of payments are essential.

We have always recognised that to scale and sustain this service in the long term, we would need to transition it to an industry player. The GSMA is now in the process of transitioning the IPN Hub to [Beyonic Inc.](#), and is excited about the future growth it can support. As we hand over this asset, we're pleased to share what we have learned while building it, and the value it demonstrated for the industry.



# The need for the IPN Hub

In January 2018, we published a [blog post](#) where we referenced that 1.2 billion people lack access to electricity globally. Notable progress has been made according to the latest report<sup>1</sup>, which shows the number of people living without electricity has dropped to roughly 840 million in 2019. However, the report states that without more sustained and enhanced activity, 650 million people will still be left without access to electricity in 2030 and that 90 per cent will be living in Sub-Saharan Africa.

Over the last decade, a new generation of innovative businesses have taken on the challenge of providing energy to off-grid populations by using a PAYG solar model. The majority of the customers that the PAYG businesses sought to serve did not have access to formal financial services, and making regular payments from a remote location posed a big challenge for them. However, mobile money represents a powerful opportunity to address this problem.

According to the 2019 GSMA State of the Industry Report on Mobile Money, there are now over 1.04 billion registered mobile money accounts globally, of which 45 per cent are in Sub-Saharan Africa<sup>2</sup>, one of the regions where the need for PAYG solar solutions is greatest. The rise of the PAYG solar industry has only been possible through the growth of the mobile money industry. At the same time, the PAYG solar industry has also proven a compelling use case for mobile money by driving its penetration and usage, especially in rural areas.<sup>3</sup> Thus, the two industries are highly synergistic.

However, it is difficult for many PAYG solar providers to effectively leverage mobile money because of the need to undergo a technical integration with each mobile money service in order to receive real-time instant notification of payments made by their customers. Notifications of payments are crucial for any pre-paid utility service that requires customers to pre-pay

before their service is activated. In particular, PAYG solar models allow customers the flexibility to pay for solar home systems in small instalments by mobile money. The solar system is only unlocked for use when the solar provider knows that the customer has pre-paid to use the system, and sends them a code or remotely unlocks the system. Without this functionality, solar providers must manually download customer payment information from mobile money providers' web portals, which means that customers do not have a seamless service with the peace of mind that services will be activated as soon as they pay.

However, mobile money APIs (Application Programme Interfaces) are not usually readily accessible for third parties to easily integrate, and many markets do not have aggregators that could provide these integration services. Mobile money providers therefore have to

invest time and resources to individually integrate each third party, forcing them to prioritise among companies.

Thus, it is essential for scale and efficiency that pre-paid utility service providers and mobile money platforms have access to real-time API connectivity to allow for real-time notification and validation of payments. Moreover, with many active PAYG and mobile money deployments, plus other services that want to use mobile money to receive customer payments, there are a staggering number of technical integrations to be done between mobile money providers and these service providers. Not only is the technical integration required for access to real-time notification and validation of payments, but to also provide a single point of integration to reduce this ecosystem complexity.

1. "More People Have Access to Electricity Than Ever Before, but World Is Falling Short of Sustainable Energy Goals", May 2019, <https://www.worldbank.org/en/news/press-release/2019/05/22/tracking-sdg7-the-energy-progress-report-2019>

2. "State of the Industry Report on Mobile Money", GSMA March 2020, [gsma.com/sotir](https://www.gsma.com/sotir)

3. Snel, "The Value of PAYG Solar for Mobile Operators: The Case of Benin", GSMA February 2020, <https://www.gsma.com/mobilefordevelopment/blog/the-value-of-payg-solar-for-mobile-operators-a-look-at-benin/>



# The architecture of the IPN Hub

The IPN Hub was designed to only process and validate notifications of payments, and does not actually process or handle the transfer of money. Thus, to connect to the IPN Hub, PAYG utility providers are required to forge their own commercial agreements directly with the mobile money providers. This is important to allow the mobile money providers and the PAYG utility providers to control the commercial

relationship, and to limit the legal and regulatory requirements of the service.

The IPN Hub integrates with mobile operators by adapting to their specific APIs. On the other side, it provides a standard API layer that enables all service provider systems to connect with the hub in order to receive and validate payment notifications.

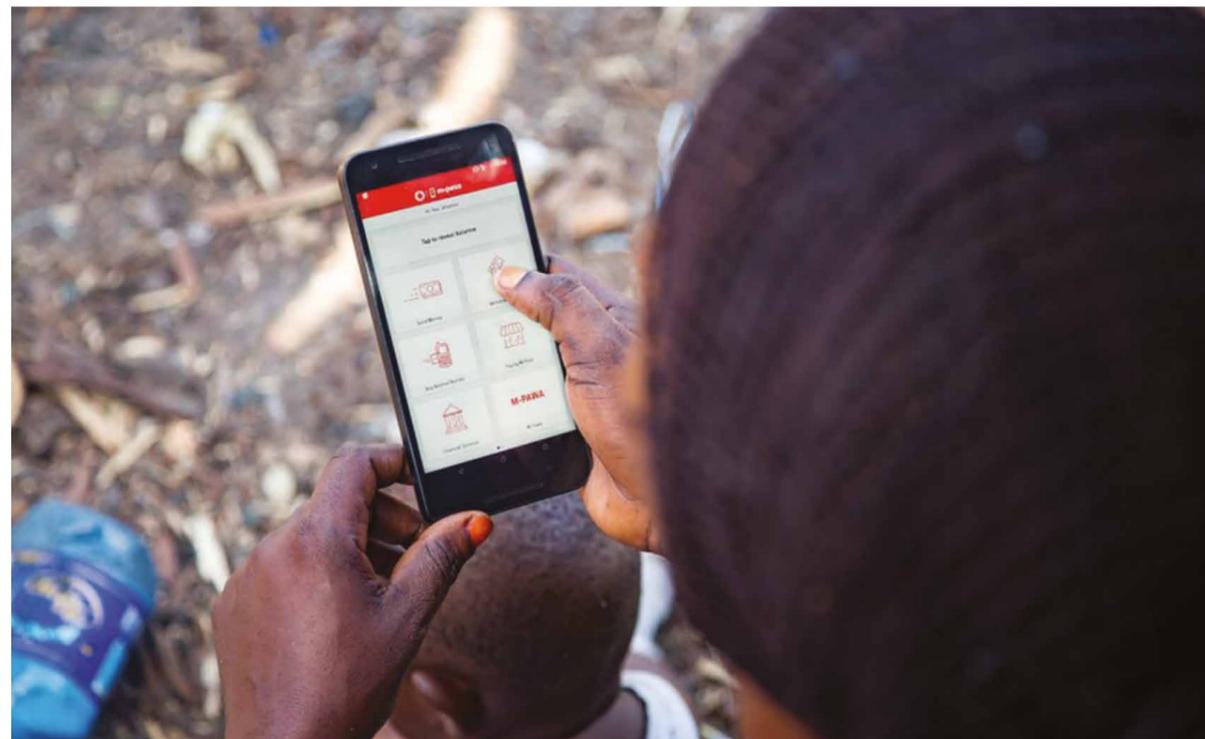
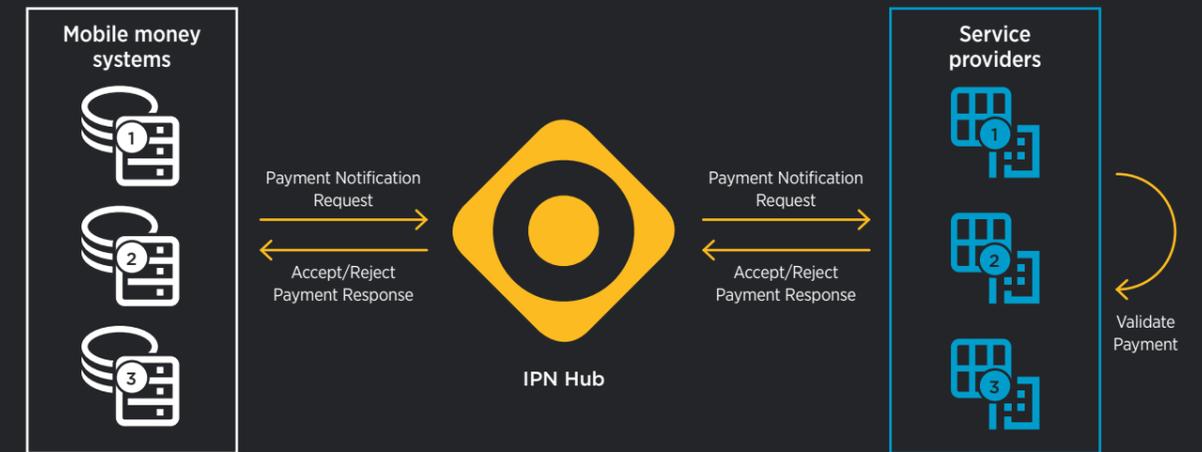


Figure 1

Source: GSMA/Symbol

## IPN Hub Payment Notification Processing Process



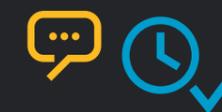
Each mobile money provider has its own API and the IPN Hub integrates with each API, specific to each mobile money provider.



PAYG service providers integrate with the IPN Hub specific API in order to communicate with a mobile money provider.



The IPN Hub internally routes and maps requests from one mobile money provider to a service provider.



The IPN Hub provides payment notification and allows the service provider system to perform real-time validation, but does not process the actual payments.



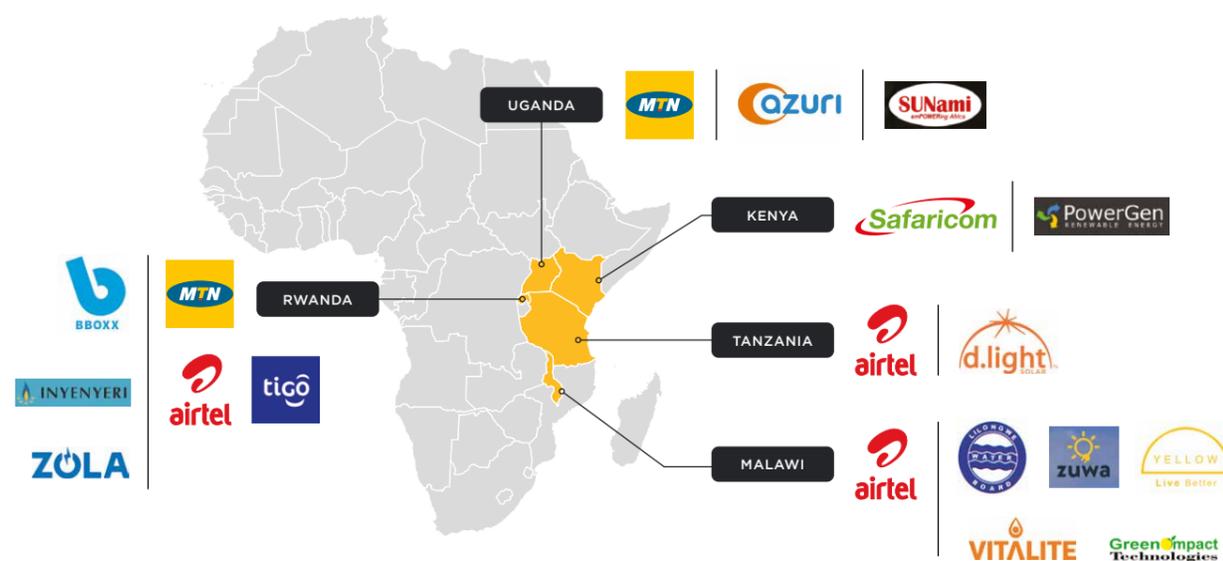
# The expansion of the IPN Hub in Sub-Saharan Africa: Achievements and lessons

The IPN Hub pilot started testing in Rwanda in December 2016. By January 2018, it had connected four entities and had processed notifications for roughly 300,000 unique payment transactions. This led to our decision to scale it across Africa starting in April 2018.

By August 2019, it was available in five markets and had processed notifications for over three million unique payments.

Figure 2

## The footprint of the IPN Hub as of January 2020



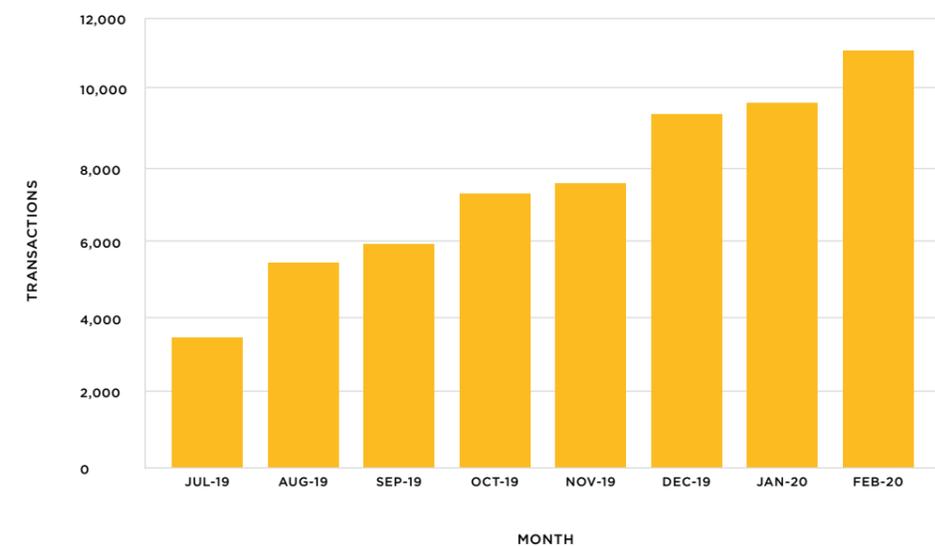
By mid-January 2020, the IPN Hub had connected 14 PAYG utility providers to six mobile money services, processing notifications for over 4.7 million unique payment transactions through over 230,000 unique phone numbers. This indicates that the IPN Hub has played a role in impacting approximately 230,000 households with improved access to energy services.

We were particularly excited to roll out the IPN Hub with Airtel Malawi while teaming up with USAID's Solar Home System (SHS) Kick-Start Program for Malawi, which aims to catalyse and stimulate the SHS

market in the short term. The programme provides results-based financing to SHS providers, operational support, market demand stimulation and development of enabling policies. In just a few months after its roll out, the IPN Hub rapidly connected six new PAYG utility providers to Airtel Money Malawi, including Zuwa Energy, Vitalite Malawi, Yellowsolar, Yellowpay, Lilongwe Water Board's Emadzi and Green Impact. All of these PAYG utility providers were just starting out in Malawi and we have since observed steady growth in the number of transactions they are processing through the IPN Hub.

Figure 3

## Monthly notifications of payments processed by the IPN Hub in Malawi



Throughout the lifecycle of the project, we faced some challenges but also learnt important lessons, as summarised below:

- Getting PAYG and mobile money providers on the same schedule is a challenge.** The business teams of mobile money providers are constantly under pressure to meet revenue targets. As such, their first priority is to optimise their time and resources for high value business drivers. Without a meaningful number of PAYG utilities that the IPN Hub could immediately connect to their business, many of them chose not to prioritise starting the integration. At the same time, a number of PAYG service providers who were ready to start their businesses in a number of markets chose to seek alternative solutions, for example, SMS parsing<sup>4</sup>, because the IPN Hub could not immediately integrate them to the required mobile money provider. A good way to overcome this problem, especially in new markets, is to have a joint industry initiative that brings together mobile money providers, PAYG utility service providers, financiers, and any other market enablers. The collaboration of the IPN Hub, Airtel Malawi, USAID and PAYG solar providers in Malawi is a good example of this.
- The nature of the IPN Hub slowed down contracting.** Mobile money providers found it confusing to sign the IPN Hub Service Agreement with GSMA, as they usually issue their own standard contract to those using their platform. The GSMA adopted a common service agreement for mobile money providers and another for the PAYG service providers. The reason for this, was that for the eventual transition of the IPN Hub to the industry, it would have been difficult for the successor entity to manage agreements which had different terms and conditions from different parties. We didn't face many challenges getting the PAYG service providers to sign their agreements. Yet because of the sensitive nature of mobile money platforms, and the regulations that govern them, we faced delays while attempting to align the GSMA provided common service agreement with the business needs of some mobile money providers. Nonetheless, this approach was essential to our ability to now hand-over the IPN Hub.
- New PAYG companies want to move fast, but may still be setting up their business.** Some PAYG utility service providers were not always fast moving as they faced challenges getting themselves set up in different markets, for example, in getting themselves registered, negotiating appropriate commercial agreements with Mobile Money Providers, and going through KYC and anti-money laundering compliance. Thus, when a service provider would commence the process of engaging the IPN Hub for mobile money integration, the reality of getting themselves set up for business was slow in some cases.
- One connection did not necessarily lead to many.** We thought that once a company connected to the IPN Hub in one market, it would open up new markets for them where other mobile operators had already connected, but this wasn't the case. The reality was that PAYG service providers often employed different strategies in different markets and often operated completely autonomously. It may have been that the footprint of the IPN Hub needed to reach a critical scale before this amplification effect would kick-in.
- The IPN Hub remained focused on its initial use case and did not support alternative payment flows.** Some utility providers, especially in the transport and education sectors required sophisticated payment initiation flows that the IPN Hub wasn't set up to support. The IPN Hub was built to support the processing of notifications for remote payments initiated by customers. Ecosystem players such as those in the transport sector required merchant-initiated payment flows that allowed them to easily manage the payment process for customers. This limited the ability of the IPN Hub to support service providers in these sectors, as explained in the lesson below.
- A 'start-up' built within a foundation can only scale so far.** This type of service needed to be agile and run like a start-up to support working with innovative start-ups. However, the set-up of the IPN Hub within the GSMA Mobile for Development Foundation, which has an essential obligation for caution in spending donor funds that come from taxpayers, was not always able to support

fast and risky business decisions. For example, while PAYG solar providers requested the ability to receive payment notifications at multiple PAYG management platform endpoints, our funding was not set up to quickly make such product changes.

- The concept demonstrated the opportunity, even where we didn't complete integrations.** We struggled in West Africa, where some mobile network operators (MNOs) had not been able to integrate with small PAYG solar companies. Although we did not get the IPN Hub connected to those MNOs, we felt that the concept helped to demonstrate the market opportunity and may have led to some operators proceeding with more direct integrations.

These operational challenges underscore what we knew about the IPN Hub from the very start - that the GSMA was well-placed to create and launch the IPN Hub, but not well-suited to expand it into a financially sustainable, long-term service. The GSMA was uniquely placed to start the IPN Hub because of our strong relationships with our member mobile operators, the support that our [Mobile for Development Utilities programme](#) has provided to the PAYG utilities sector, and our partnerships with donors that seek to catalyse innovation. Similarly, both the mobile money operators and utility service providers viewed the GSMA as a neutral third party and trusted it to support the growth of the industry. In many ways, it was this industry trust that allowed us to pilot this innovative solution, even though we made it clear to all users that the long-term operations and costs would eventually change.



4. The process of extracting useful data from a text message for storage, analysis, display and exporting as needed. In this case, customer account reference and amount can be extracted and validated against the PAYG Management platform.



# Insights about the value of the IPN Hub for the industry

Recognising that GSMA played an important role in developing and piloting the IPN Hub, we set out to measure what kind of value it provided to the industry, in order to inform our selection of an entity that could take it over, and continue to deliver and expand that value. Thus, GSMA engaged an independent consultant to assess this, and support our development of a fair and transparent selection process that took into account the current industry landscape. This consultancy included the following outputs:

- An assessment of how the current IPN Hub users used and valued the service;
- A landscape of the current and future payment ecosystem and market dynamics that influence the transfer of the IPN Hub; and

- An in-depth comparative analysis of the transition options and a recommendation of a way forward that adheres to the founding principles of the IPN Hub.

Through this consultancy, the stakeholders of the IPN Hub expressed its clear value, while at the same time, a number of payment aggregators and PAYG platform providers expressed interest to take over its operations. This information fed into the overall selection process defined for the transition.

Below are some of the insights that the consultancy generated:

## Insights from mobile network operators and payment aggregators

In Sub-Saharan Africa, very few mobile money providers have opened their APIs for easy access by third parties. As such, the IPN Hub and other similar services (e.g. payments aggregators) will continue to

be relevant in the next two to three years to enable easier integrations for third-parties. At the same time, some mobile money providers will continue to focus on their own internal solutions and are unlikely

to utilise the IPN Hub and other similar services. We learned from some mobile money providers that they viewed the IPN Hub as a good proof of concept for the efficacy of harmonised API design. We also confirmed

our understanding that not all PAYG utility providers are an immediate priority for mobile money providers and payment aggregators due to their low transaction volumes when they are just starting out.

## Insights from PAYG service providers

PAYG utility providers said that the IPN Hub sped up their route-to-market, in some cases from six to 12 months to under three months. Similarly, large PAYG utility service providers have been successful at doing direct integrations and have used other payment aggregators when needed. PAYG utility providers stated that the IPN Hub played a critical role in getting them access to mobile money providers; it offered a reliable service and strong technical support to

interface with the mobile money providers. Some service providers engaged with the IPN Hub in order to access multiple markets with just one integration. Although the IPN Hub had yet to achieve the right critical mass of mobile money operators across countries in order to provide this, the need remains relevant. The price point of the IPN Hub (free) was also a key driver for its traction and impact for the PAYG utilities providers.

# The selection of the IPN Hub successor provider

The GSMA commenced the process to select the IPN Hub successor provider in October 2019 by engaging qualified industry stakeholders. We received six proposals from interested entities, which operated in various sectors including payments and communications aggregators, technology solutions providers and PAYG management platforms providers.

The proposals were subjected to a minimum set of selection criteria and were evaluated against a more detailed set of selection criteria, covering the following topics:

- The ability of the entity to retain and/or grow the IPN Hub's value proposition as a low-cost solution;
- The ability of the entity to enable the PAYG utilities market by increasing the number of connections (e.g. continue to on-board new utility service providers and new mobile money providers, thereby expanding the IPN Hub's reach and scale); and

- Business model of operating the IPN Hub (including providing technical and commercial support to PAYG providers).

After a thorough and rigorous selection process, the GSMA selected [Beyonic Inc.](#) as the IPN Hub successor provider, effective 1 May 2020. From the effective date, Beyonic shall be responsible for all the operational aspects of the IPN Hub including future growth. Beyonic was selected to become the IPN Hub successor provider because of its business vision and its commercial and technical proposal strongly aligned with the IPN Hub.

If you are interested to learn more about the IPN Hub, and how it can support your business growth, please contact [doreen.lukandwa@beyonic.com](mailto:doreen.lukandwa@beyonic.com) and you can learn more about the company at their [website](#).





# Looking ahead

As the reach and impact of mobile money platforms increases, the demand for access to the technical platforms that underpin mobile money also increases. Over the last couple of years, the response from mobile money platform providers has been to implement bespoke APIs. While this does open the platforms to service provider integrations, it has increased fragmentation in the ecosystem. In the wider mobile money ecosystem, the challenge being solved by the IPN Hub (processing of real-time notifications and validation of payments), though crucial for the PAYG utilities ecosystem, is only one of the many functionalities that are required in order to make mobile money payments truly open and accessible. And this is essential not only for PAYG utility services providers, but for SMEs in general.

The [GSMA Mobile Money API<sup>5</sup>](https://www.gsma.com/mobilefordevelopment/mobile-money/mobile-money-api/) is an initiative aimed at helping the mobile money industry speak the same technical language by providing a modern harmonised API for mobile money transactions and management that is both easy to use and secure. This allows any third-party to implement a common solution which will work with all mobile money platforms which implement the API. This common technical language, the API specification, enables easy integration between mobile money providers and organisations who want

to interface with these providers. The API is based on RESTful principles, a common easy to use set of principles used in modern APIs, which provide benefits such as flexibility and scalability. The specification also provides best practice security recommendations to ensure a high level of security. The IPN Hub also implements the specification of the GSMA Mobile Money API.

PAYG management platforms are an essential part of further growth in the PAYG utilities sector. By default, many of the PAYG management platforms, or fully integrated PAYG solar companies have had to build the technical integrations with mobile money. The management platforms have always operated independent of each other, where each platform worked with only off-grid solar products from specific manufacturers. For off-grid product distributors, this locked them to products from certain manufacturers, and often to a single PAYG management platform provider. As mentioned earlier, one key product change request we received while implementing the IPN Hub was the ability for it to support multiple PAYG management platform endpoints. This would allow product distributors to experiment with different PAYG products and management platforms while maintaining a flexible customer and payments

experience. Therefore, it is great to see interoperability initiatives that seek to reduce platform fragmentation in the sector, like the one that is being implemented by [PaygOps \(by Solaris Offgrid\)](#), [Paygee](#) and [Angaza](#), the top three leading PAYG management platforms.

The demand for the IPN Hub and other similar services is still very high in Sub-Saharan Africa, particularly in West and Central Africa. The future availability of common and open mobile money API standards will enable it to scale faster and provide a single point of integration for small and medium enterprises seeking mobile money bill-payment functionality across multiple mobile money providers, and multiple countries. Common and open standards will also democratise mobile money connectivity because

companies will have multiple options to connect to mobile money platforms.

The GSMA is proud to have built the IPN Hub to enable its mobile operator members and utility stakeholders to work together toward shared business and development objectives. It was always recognised that the GSMA was well-placed to pilot this novel solution, based on our long and trusted relationships across industries, yet that if the IPN hub proved its intended value, it would be best served by another industry player. We're thrilled to see the IPN Hub live on to support further industry collaboration. We thank our donors, our mobile operator members and utility service providers that supported the delivery of the IPN Hub.

5. "GSMA Mobile Money API", <https://www.gsma.com/mobilefordevelopment/mobile-money/mobile-money-api/>



For more information, please visit the  
GSMA website at [www.gsma.com](http://www.gsma.com)

**GSMA HEAD OFFICE**

Floor 2  
The Walbrook Building  
25 Walbrook  
London EC4N 8AF  
United Kingdom  
Tel: +44 (0)20 7356 0600  
Fax: +44 (0)20 7356 0601