



powerhive



A scalable, sustainable approach to energy access in emerging markets.

Powerhive delivers the world's most bankable and advanced microgrid solution directly to emerging market customers.

Congratulations, you are now the second company in the history of Kenya to be licensed to distribute electricity.

Mr. Buge Wasioya
Chairman of Kenya's ERC Licensing Committee

About POWERHIVE



powerhive

- + Founded in 2011 in Berkeley, California
- + A team of industry experts from the renewable energy, utility, telecom and software industries
- + Patented, proprietary microgrid management platform
- + Years of experience in Kenya & development of 100,000-customer portfolio project
- + Financial backing from Fortune 500 solar company
- + Pursuing aggressive expansion in African and Asian markets

International reach
CORPORATE STRUCTURE



U.S. office

- Data analytics
- Engineering & tech development
- Partnerships
- Finance & strategy

Country office

- New business development
- Project management
- Expert maintenance
- Regulatory affairs

Local office

- Customer service
- O&M
- Asset management

A highly experienced TEAM



Chris Hornor
Chairman & CEO

Chris is an entrepreneur and recognized pioneer of consumer renewable energy product and services. During the last 15 years he has delivered renewable energy to more than two million people. As founder and CEO of Better Energy Systems he launched Solio, a portable solar charger that defined a new category of small-scale consumer energy solutions. In 2008 Chris led the expansion of Better Energy Systems into East Africa where he created the first pay-as-you go renewable energy service for remote, off-grid regions. Chris has held senior posts at technology startups in the US, UK, and Japan.



Rik Wuts
Business Development

During the last decade, Rik has focused on combining cutting-edge technology and innovative business models to deliver market solutions. Before co-founding Powerhive, Rik was the marketing director at Intivation where he introduced solar powered devices in more than 30 countries. He has also consulted several large companies and SMEs on product innovation and business strategy. Rik earned a BS in applied physics and an MS in product design from Delft University of Technology. Originally from Amsterdam, he currently lives in Nairobi and is leading the international expansion of Powerhive.



Greg Rosen
Project Finance

Greg is a 16-year renewable finance veteran with many first-of-its-kind financings under his belt. Prior to Powerhive Greg served as the first Chief Investment Officer at Mosaic where he raised a \$100 million fund from PartnerRE as well as funding from thousands of individual investors. Prior to Mosaic, he spent time at Union Bank and held various other positions in finance and investment banking, including several years at PowerLight and SunPower Corporations where he helped develop and then financed many industry-leading solar projects. Mr. Rosen holds both a Bachelors and Masters Degree from the University of Pennsylvania.



Steve Kraft
Engineering

Steve has nearly 20 years of experience developing hardware and firmware for embedded systems. He has developed solutions for a wide range of hard and soft real-time applications including industrial automation, remote monitoring, and renewable energy. Steve has also served as a visiting professor at the University of California, Berkeley, where he received a MS in Engineering.



Zachary Ayieko
MD, Powerhive EA

Zachary has decades of experience in rural electrification in Kenya, including as CEO, managing director, and manager of the finance department at Kenya Power. At Kenya Power, Zachary was responsible for launching a far-reaching rural electrification initiative. The success of this initiative resulted in his appointment as CEO of Kenya's Rural Electrification Authority, where he helped to expand energy access through grid and renewable microgrid resources. Zachary has also served as chairman of Rural Electrification Club, Africa.

Productive electricity

POWERHIVE MICROGRIDS

+ 100% renewable. 100% scalable.

Powerhive deploys standardized microgrids based on reference designs. We provide renewable, reliable, and productive AC electricity to entire rural communities.

+ Innovative, proprietary grid management platform

Powerhive's technology platform enables automated, remote grid management with advanced features, including mobile money based prepayments, customer communications, and asset management.

+ Data analytics

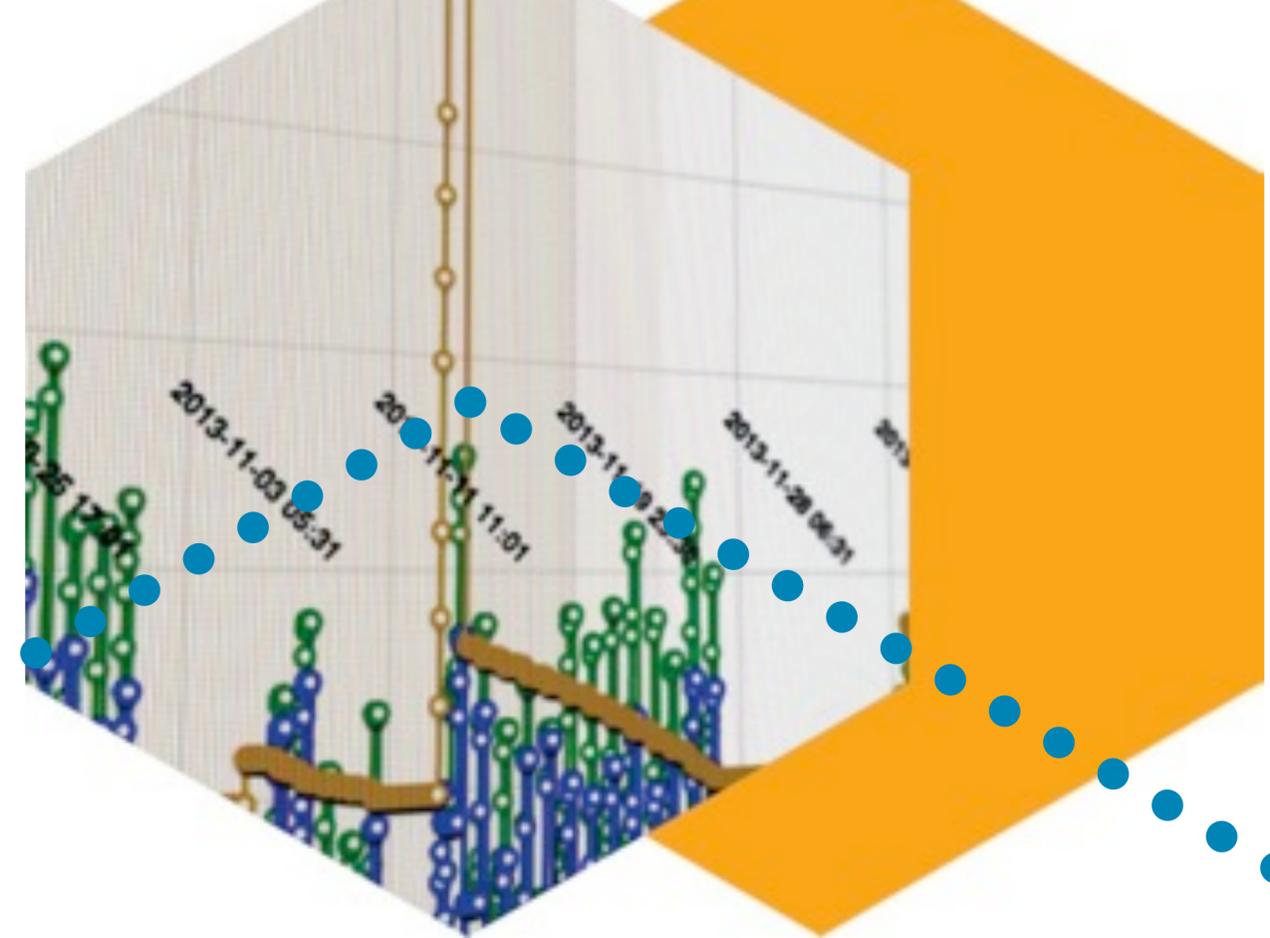
Rich customer data are used to optimize service delivery, predict consumption patterns, and accurately model revenue for new investments and services.



How it works:

1. Users buy energy credit via existing mobile money systems
2. Powerhive automatically activates service and meters consumption upon receipt of payment. Service is automatically disconnected if a zero-balance is reached.
3. Powerhive collects real-time usage and payment data
4. Users access 240V AC productive power for residential and commercial applications.

Productive's smart meter **ASALI**



- +**Electricity metering:** secure, utility-grade, cloud-connected metering
- +**Theft detection:** integrates multiple novel theft detection algorithms
- +**Demand management:** circuit control for load shedding and tariff management
- +**Designed for emerging markets:** multiple circuits per meter minimizes cost per connection

Grid management HONEYCOMB

- +**Mobile money:** integrates with all major providers
- +**Data platform:** 15-minute payment, power and energy data streams
- +**Grid control:** power management; manages loads to ensure maximum quality of service
- +**Tariff engine:** supports an unlimited range of tariff models, including dynamic pricing
- +**Automated support:** proactive and reactive consumer communications
- +**O&M :** algorithms developed from pilot project learnings and best practices from utility scale projects
- +**Security:** AWS, SSL, minimum open port, server access via key only

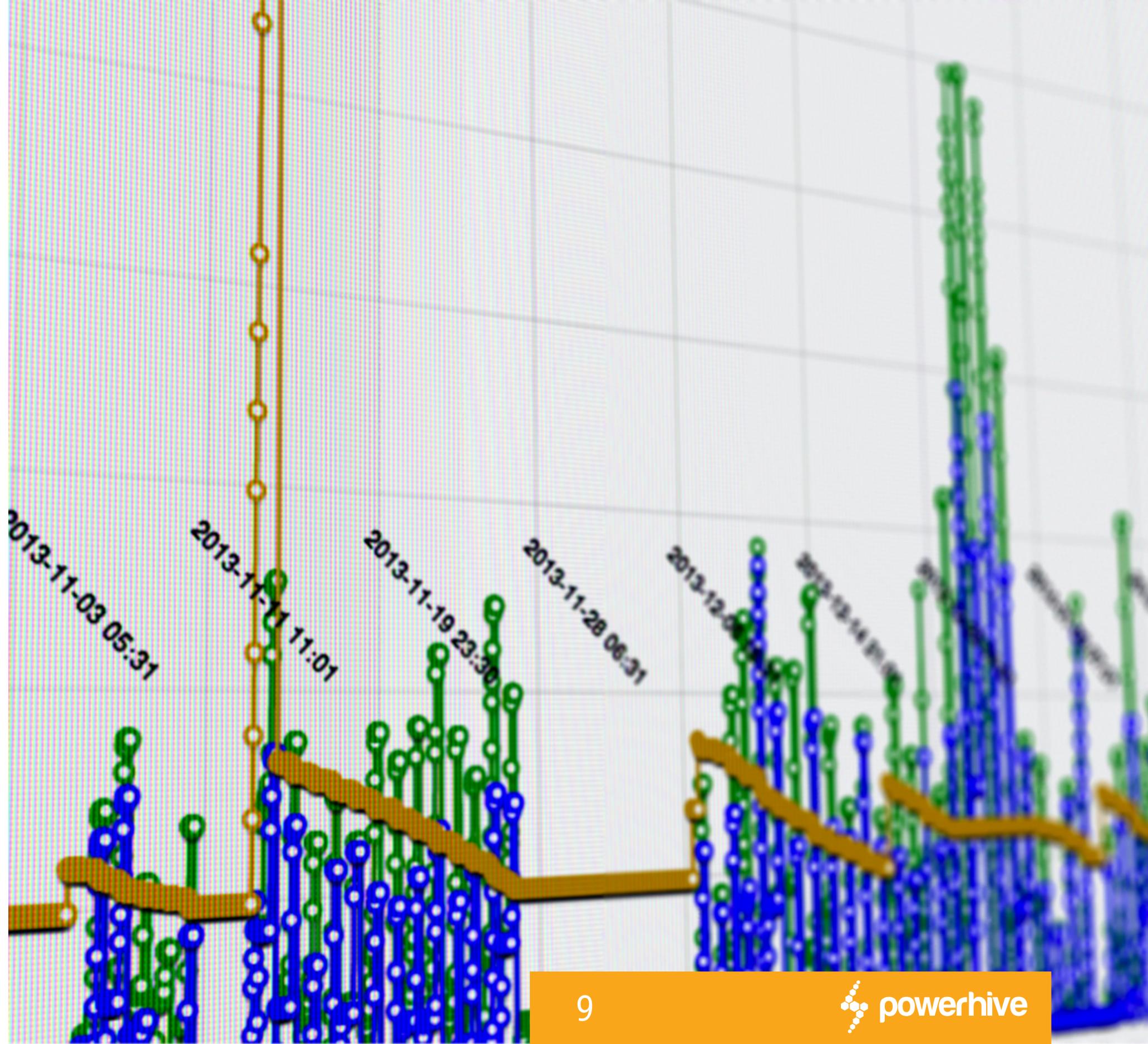


Measuring success

REAL TIME DATA

A key pillar of Powerhive's model is the real-time data stream it collects, which underpins the business model, proves the financial case and aids in devising new services for customers.

- + Highly granular real-time data on energy, usage, power, and payments.
- + 9-10 million customer data points collected and analyzed thus far.



Proving the model

CUSTOMER PROFILE

Name Nahashon O.

Occupation Businessman

Family Wife, 3 kids

Monthly income 25,000 ksh

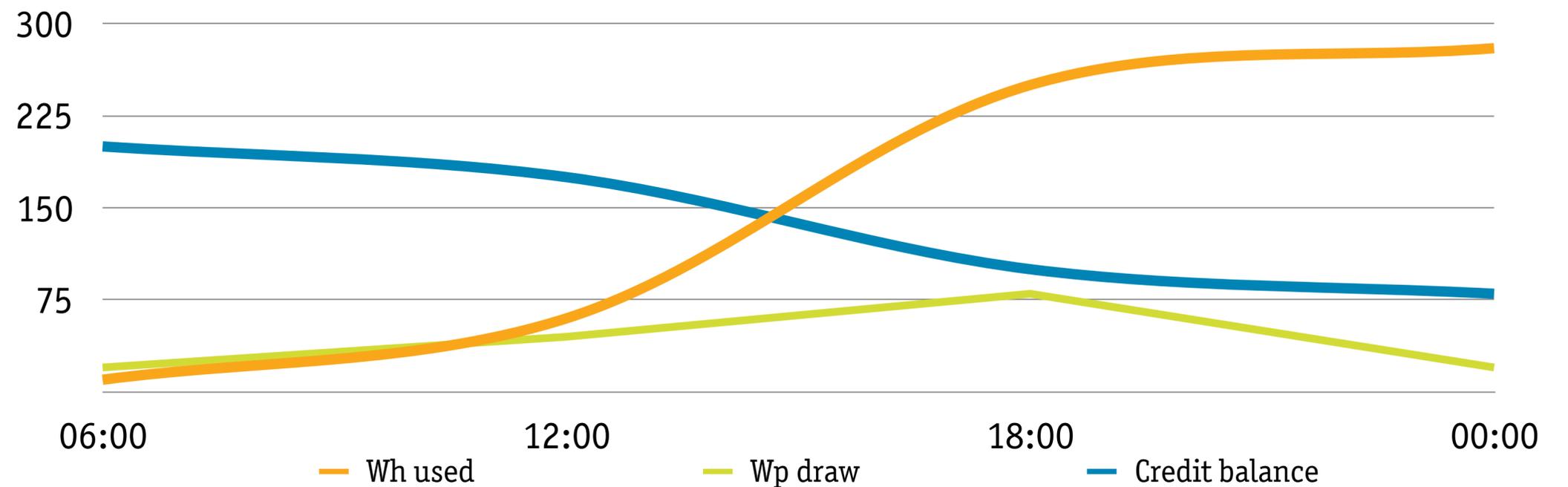
Education level High school

House type Brick house

PH share of income 17%



Typical daily consumption & load profile



Site selection

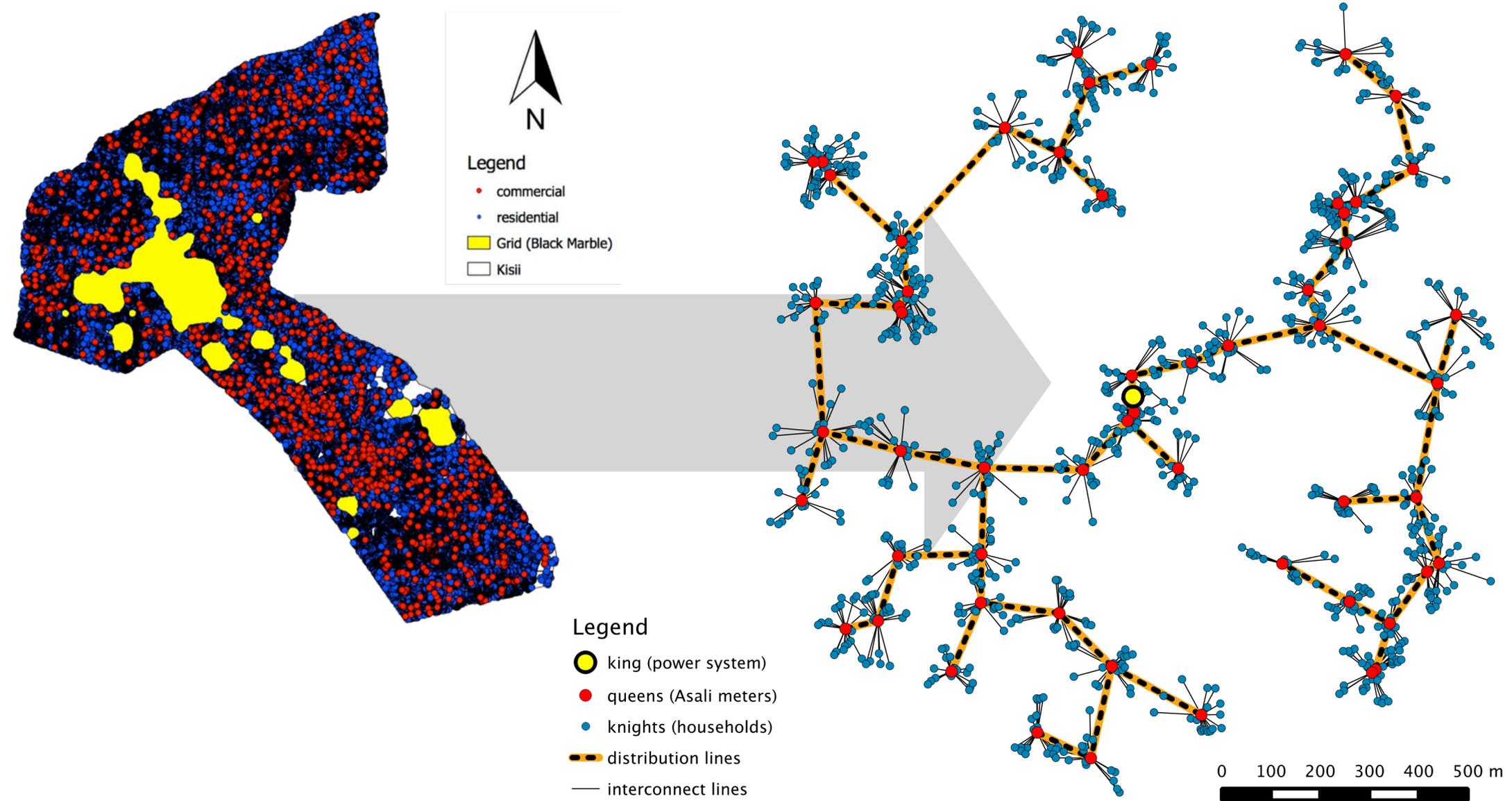
SWARM ANALYSIS

Our proprietary SWARM tool uses satellite imagery to select and design sites for microgrids. It optimizes based on:

- + Population density
- + Technical features
- + Demographic data
- + Financial considerations

This software tool has greatly improved the speed and cost of site identification, as well as the accuracy of site and customer selection.

The SWARM tool uses satellite imagery to identify potential customers and create preliminary microgrid designs for viable sites.



Site selection

GROUND TRUTHING

Powerhive pairs SWARM analysis with a set of tools and processes that optimize site and customer acquisition.

- + **Ground truthing to verify initial analysis and collect in-depth customers insight**
- + Customer qualification based on technical, financial and demographic data
- + Consideration of regulatory and macro-economic issues impacting electrification markets.

Our site and customer acquisition processes are **streamlined and cost-minimizing.**



Productive power **COMMERCIAL USERS**

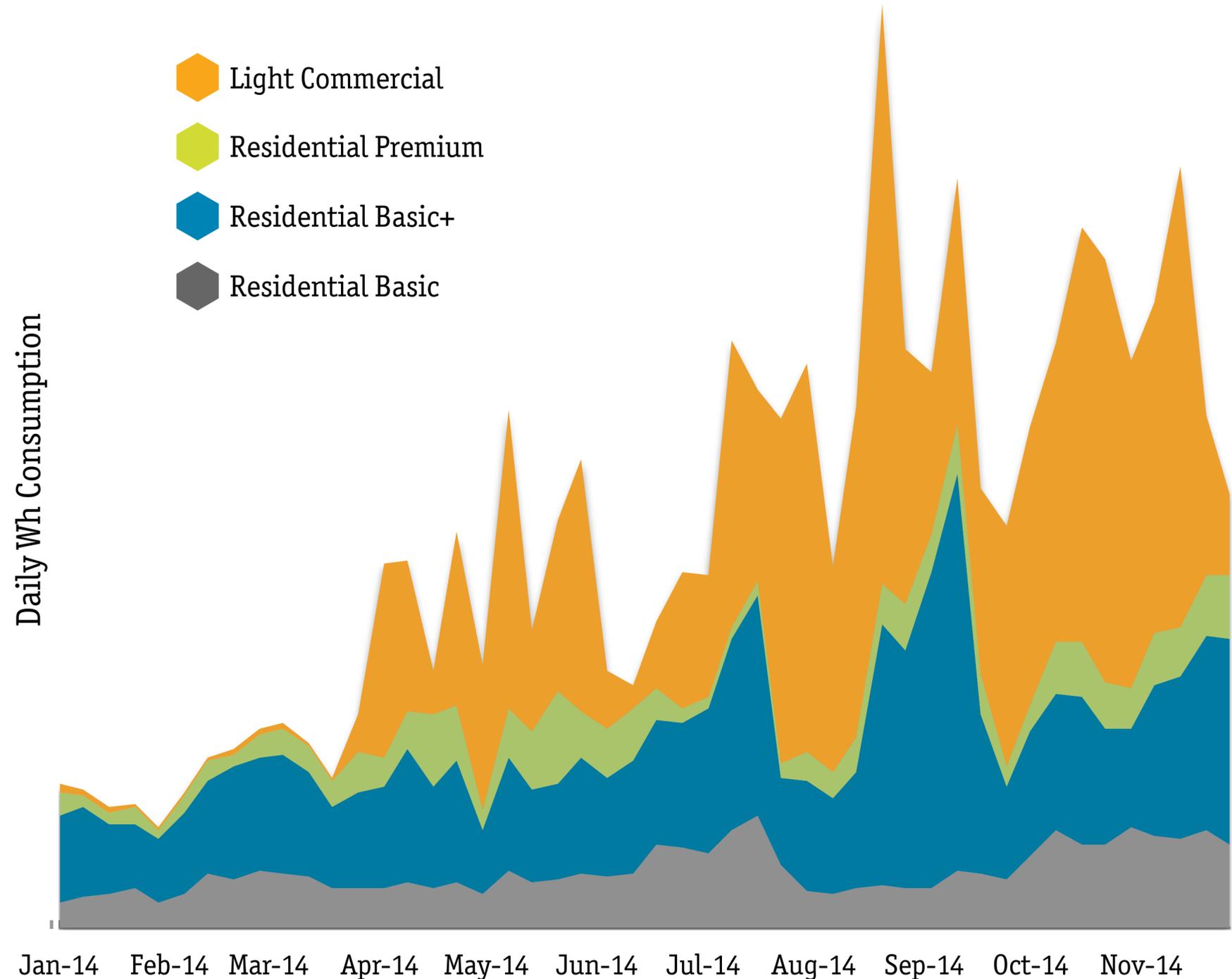
Access to affordable electricity has created opportunities for local entrepreneurs. In our pilots, several businesses that are enabled by electricity have sprung up, such as:

1. Chicken hatchery & nursery
2. Woodworking (lathe, saw, drill)
3. Hair salon
4. Welding



International operations **RAPID GROWTH**

Three years of pilot data prove the energy ladder theory. Energy usage grows over time among our targeted customer classes in addressable villages.



Pilot projects

3+ YEARS EXPERIENCE

For the last three years, we have continuously tested product improvements and experimented with various business and financial services at our pilot sites in western Kenya.

- + We have collected a massive body of data that proves the viability of our model and powers predictive analytics about the entire region.
- + The pilots given us a deep understanding of consumer needs and behavior in rural East Africa.
- + Building on experience in the energy, software, and telecom industries, our team has developed the specialized knowledge and skills required to successfully deploy microgrid solutions in frontier markets.



Milestone achieved Kenya Success

- ✓ 3 years of quantitative and qualitative data from operation of 4 sites
- ✓ Approval by Kenyan regulatory board for 25-year generation and distribution license
- ✓ 100,000 residential and commercial customers identified
- ✓ Environmental license granted for first sites
- ✓ County gov't approved easements including provision for use of public land for infrastructure
- ✓ Registered 30-year land leases for generation sites
- ✓ Shovel-ready 100-village portfolio project
- ✓ Customers' lives & livelihoods improved



“*Since I started using Powerhive I was able to start my own business and increase my income substantially.*”
— FRANCIS N.



“*Before we had this electricity I made very little money. Now I have tripled my income using an electric lathe.*”
— PETER O.

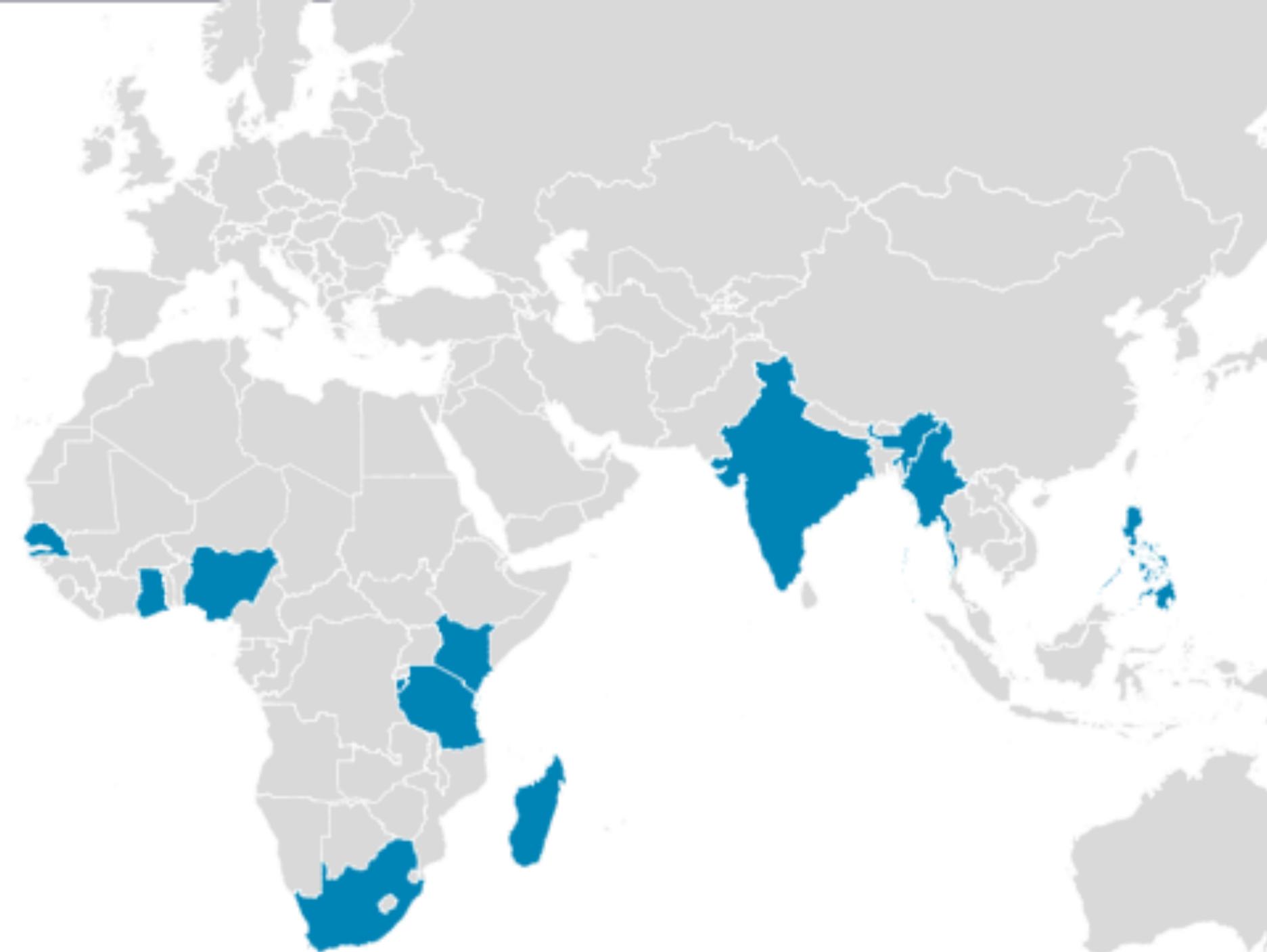
Scaling up
PROJECT CLOVERFIELD

We have developed a **first of its kind** rural microgrid project that will cover **100 villages**, reaching 100,000 customers.

Location	Kisii & Nyamira
Scope	100 villages 20,000 off-takers 100,000 people reached
Project budget	~\$ 12M
Expected return	~14% (after-tax unlevered)
Timeline	Start: Q3 2015 Construction: <9 months

International operations **RAPID GROWTH**

Powerhive currently has operations or projects under development, either independently or in cooperation with local partners, in 11 countries in Africa and Asia.



The Opportunity **FOR INVESTORS**

+ **\$14 million corporate equity raise**

Technology development (\$4 million)

Market expansion & corporate (\$5-6 million)

Project development (\$4-5 million)

+ **Project investment opportunities**

Powerhive projects promise strong, double-digit IRRs. The global opportunity is in excess of \$5 billion over the next 8 years.





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