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## Kingo: Growth Opportunities in Off-Grid Renewable Energy

BY BRUCE USHER\*

### Introduction

On a late Friday in March 2017 Juan Fermín Rodríguez sat in an Atlanta airport, waiting for his coffee to cool.<sup>1</sup> He had just landed after a 16-hour flight from Johannesburg, South Africa, en route to his home country, Guatemala. He didn't mind the stopover, however. The lengthy trip between the two continents gave him the chance to contemplate just how far Kingo had come and, more pressingly, what lay ahead for them.

Kingo, the company Rodríguez cofounded as CEO in 2013, had just finished an incredible three-year run. Based in Guatemala, Kingo provided off-grid renewable energy to people living without electric power. The company's primary product was an innovative solar panel unit, called a solar home system (SHS), installed on the roof of each customer's house (see Exhibits 1 and 2).

A standard SHS included one 15-watt solar panel linked directly to a power box in the home. The power box contained a lithium battery that was charged by the solar panel. The battery powered three light sockets and one USB port for mobile phone charging. The power box also contained a keypad on which customers entered a code that could be purchased from local shopkeepers. After the code was entered, the unit was unlocked for a set period of time, during which the customer had access to the power generated by the SHS. Kingo retained ownership of the unit.

As of 2017 the prepaid code cost approximately \$14 monthly, which represented \$4 in savings per month, compared to common alternative sources of lighting such as candles or kerosene lamps. Although \$4 seems modest, it was significant to Kingo's customers, many of whom lived on less than \$5 per day.<sup>2</sup>

#### Author affiliation

*\*Co-Director of the Tamer Center for Social Enterprise; Elizabeth B. Strickler '86 and Mark T. Gallogly '86 Faculty Director; Professor of Professional Practice, The Tamer Center for Social Enterprise*

#### Acknowledgments

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Kingo was about to enter into a hypergrowth mode, and Rodríguez's trip to South Africa was one step in exploring opportunities for expansion. As he finished his coffee and began to head toward the gate to return home, Rodríguez couldn't help being excited about the year to come. It had been seven long years since he had left his promising position at Procter & Gamble (P&G) to take on a new role in order to create value and make an impact. Although there were tough decisions ahead, Kingo was finally poised to do just that.

## Life by Candlelight

The number of people living without electricity in 2016 was nearly 1.1 billion worldwide, split across sub-Saharan Africa (588 million), Asia (439 million), Central and South America (17 million), and the Middle East (17 million)<sup>3</sup> (see Exhibit 3). In total, they represented 14% of the world's population. Lack of access to electricity resulted in long-term health issues, lower productivity, and a relatively high cost of living.

People without electricity were forced to resort to other sources of power, such as candles or kerosene lamps for light and firewood for cooking. Breathing their toxic fumes could be devastating; 2.8 million premature deaths annually were attributed to household air pollution from those sources. The effect on those who spent most of their time in homes where kerosene lamps were the primary source of lighting—primarily women and young children—was estimated to be the equivalent of smoking two packs of cigarettes a day.<sup>4</sup> Kerosene lamp accidents were extremely dangerous as well. Millions of people suffered from severe burns annually due to overturned lamps.<sup>5</sup>

Using sources other than electricity for lighting and cooking also led to significant productivity gaps. Lack of sufficient lighting after dark resulted in the loss of vital hours that could be spent working or studying, and it took an average of 1.4 hours per day to collect wood to fuel a traditional wood-burning stove. Finally, the relatively high prices of candles and kerosene lamps, as well as the cost of remote charging for cellular devices, often meant that families without electricity in their homes had higher fuel costs than families who were on the grid. In short, access to an affordable and clean energy source had become a prerequisite for escaping the cycle of poverty.

The critical nature of energy access made it one of the 17 stand-alone UN Sustainable Development Goals (SDGs) announced in 2015. The aim of SDG 7, Affordable and Clean Energy, included making energy access universal and increasing the share of renewable energy worldwide by 2030. In addition, creating energy access was considered critical to accomplishing eight other SDGs, foremost among which were ending poverty, delivering quality education, and driving economic growth and employment.<sup>6</sup>

The political response to the SDGs and the increase in energy access in the early 21st century painted a promising picture. The number of people without energy access decreased from 1.7 billion in 2000 to 1.1 billion in 2016. The trend had also been accelerating; more than 100 million people gained access per year between 2012 and 2017, up from 62 million people per year from 2000 to 2012. However, due to population growth among those in the deepest poverty, an

increase in the number of people with energy access did not necessarily mean that there was a decrease in the number of people without access. For example, sub-Saharan Africa's increased energy availability only outpaced population growth for the first time in 2014.

Despite the seemingly inevitable march toward universal access to electricity, the high numbers partially masked the increasing difficulty of expanding that access. The key to understanding the complexity underlying the challenge of providing power to specific regions lay in how electricity was delivered (see Exhibit 4). Delivery methods included:

- **On-Grid:** The primary source for traditional energy consumption. Power plants generated large quantities of energy and delivered it in bulk to centrally located electrical substations. The substations converted the energy into a lower voltage suitable for consumer use and delivered it to customers through power lines. On-grid access was best suited for dense population centers that could absorb the high upfront capital requirements across a large customer base.
- **Mini-Grids:** Localized power sources, such as solar farms, wind turbines, small-scale hydroelectric plants, or diesel generators that generated substantially less energy than on-grid power plants. Compared to on-grid infrastructure, mini-grids could become economically viable across a much smaller consumer base, but still required substantial demand and were more feasible with some form of anchor industrial facility.
- **Off-Grid:** Individual power-generating technologies such as diesel generators or Kingo's SHS units, typically used to meet the energy needs of single households. In remote areas with low population concentration and low consumption levels, off-grid units achieved an economic advantage over on-grid delivery and mini-grids.

The remarkable improvement in energy access since 2000 came predominantly from on-grid expansion. The nature of the remaining electricity gaps made similar progress much more difficult. As of 2016, 96% of the world's urban population had access to electricity, compared to only 73% of rural inhabitants. Although grid expansion remained a large part of the solution, there were fewer and fewer areas where it could be easily achieved.

*Energy Access Outlook 2017*, a report by the International Energy Agency, provided a pair of useful simulations. These forecast (1) the availability of energy under current conditions by 2030 and (2) what would be needed to create universal energy access by 2030. The report projected that under current conditions, by 2030 the number of people without electricity would fall to 674 million people, or 8% of the global population. On-grid expansion would account for 50% of the increase, and mini-grids and off-grid sources would each provide 25%. To create universal energy access by 2030, an additional 195 million people would need to be covered by off-grid solutions (see Exhibits 5 and 6). In both cases, a massive increase in off-grid sources would be required, as compared to the growth of energy access through on-grid and mini-grid expansion between 2000 and 2017. SHS businesses were often looked to as the best available option for providing off-grid electricity.

## Quetsol (Kingo Version 1.0)\*

As 2009 was winding down, Rodríguez couldn't shake the sense of something not being right. He was managing P&G's brand portfolio for its largest customer in Central America, Wal-Mart. It was a challenging and highly visible position, yet he couldn't help feeling that he was years or decades away from making a true impact. One of the most important lessons he had learned growing up was the significance of doing meaningful work. Every day, however, he felt more and more that his daily activities were not as aligned with his personal values as they could be.

Rodríguez began having second thoughts about his work after talking one night with a former schoolmate from his childhood, Antonio Aguilar, about the idea for a solar company that could bring power to the three million people in Guatemala who were living without basic energy services. Aguilar had left Guatemala after high school to study astrophysics at Harvard University and had spent the last few years working in finance. He had a tremendous depth of knowledge about the technology underlying the solar power movement and was ready for a new challenge.

Rodríguez decided to leave P&G in early 2010 and, together with Aguilar, founded Quetsol. The company's name was a play on the name of the national bird and symbol of Guatemala, the quetzal, combined with the Spanish word for sun, *sol*. The predecessor to Kingo, Quetsol used similar technology but employed a direct sales model backed by microfinance institutions. Although they managed to reach 4,000 homes in two years, Rodríguez and Aguilar realized that Quetsol's operating model would not scale as they had originally hoped.

By early 2013, Aguilar had decided to move on to a new venture while Rodríguez was just getting started. Rodríguez was convinced that the future of off-grid energy distribution was in SHS units and that a scalable operating model could be developed. Quetsol thus ultimately gave way to Kingo.

## Launching Kingo

Rodríguez had an ambitious vision for Kingo, but he needed to assemble a much stronger foundation for the company. He first turned to Guatemalan serial entrepreneur Matías de Tezanos, who had successfully founded and then exited various Internet start-ups during the early 2000s. He had since become an investor in early stage businesses. He was familiar with Quetsol and excited about the potential for SHS technology, but he needed to know what Kingo would do differently to turn that potential into a successful enterprise.

Although developing a scalable operating model was the major concern, it was also what made Rodríguez most excited about making a fresh start. He explained to de Tezanos that the major

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\* Unless otherwise noted, the remaining sections of this case are primarily sourced from Nico Johnson, "031: Financing Off-Grid Solar, Juan Fermin Rodriguez of Kingo Energy," *SunCast* [podcast audio], May 13, 2017, <https://www.mysuncast.com/suncast-episodes/031>.

difference between Kingo and Quetsol would be asset ownership. Quetsol had employed a loan-to-own model, where the customer purchased the SHS unit through a traditional loan provided by a microfinance institution. The loan required customers to pay Kingo a deposit and to make monthly payments to the lender. That created a high level of friction for those living in extreme poverty.

The primary difficulties with Quetsol's model included the upfront investment required of the customers and the financial risk to them, as well as the challenges of customer screening. The \$30 deposit was out of reach for many consumers, who often lived from paycheck to paycheck. Even for those who could afford it, the deposit represented a major financial commitment for a piece of unfamiliar technology from an unknown company, requiring Quetsol to spend a significant amount of time building trust.

Customer screening and registration by the microfinance institution was another considerable road block to scalable deployment. During the life years that Kingo was operating, 50% of applicants were not even processed due to their remote location and the small size of their loan. Finally, the loan program placed repayment risk on the customer. Although the monthly payments were cheaper than the cost of alternative energy sources, unexpected events could lead to a customer's inability to repay the loan and therefore potentially incur additional debt.

The Kingo operating model was built to alleviate these issues by providing Energy-as-a-Service.<sup>†</sup> The SHS units were owned by Kingo, which installed them free of charge. The customer paid daily, weekly, or monthly for a code to unlock the unit. Kingo was responsible for maintaining the unit and replacing it with a new version every four years at no cost to the customer.

As of 2017 the cost of the unit to Kingo was \$75. As the company increased its scale, the cost of installation, also borne by Kingo, continued to decrease rapidly, from \$94 per unit in Q4 2016 to a projected \$35 per unit by June 2017. The code for access to the unit retailed for \$14 per month, while the shopkeepers who sold the code earned a 6% commission.

The new model allowed Kingo to acquire customers without requiring them to make an upfront capital commitment or obtain third-party approval, while the customer gained access to electricity without assuming any financial or technological risk. As an ongoing service provider, Kingo was also able to maintain a closer relationship with the customer, which was an important advantage for increasing share of wallet in the future.

Sufficiently convinced by the new model, de Tezanos agreed to be the first investor in Kingo and join the company's board as executive director. Rodríguez knew that having him on the team was a big win. De Tezanos gave the nascent company immediate credibility, and he had the experience to guide Rodríguez in building the business appropriately. Over the next two

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<sup>†</sup> The model is alternatively referred to as Pay-as-You-Go (PAYG).



years, de Tezanos helped him raise \$2.5 million, giving Kingo significant runway to develop in a responsible manner (see Exhibit 7).

## Ramping Up

Kingo first focused on improving the SHS technology, which required innovation on both the hardware and software ends of the business. Stealing units for parts was a risk to exposed assets, as was energy theft. In response, Kingo systems were purpose built so that each component could interact only with other Kingo parts. Kingo also developed a full suite of custom software products, including algorithms that unlocked the solar panel embedded in each Kingo SHS unit; code generators; and applications providing the ability to gather data from all stages of the SHS process. The capability to function outside of cell range was an additional hurdle that the company overcame since cell phone coverage in Guatemala was unreliable in some rural areas.

After securing the technology and ironing out the operating model, in 2014 Kingo launched a 500-unit pilot program to study how easily customers adapted to the product and what improvements could be made to it. The pilot, which demonstrated that customers loved the SHS unit and were able to seamlessly adopt it, with immediate financial and social benefits, also served as a tool to attract new investors.

The year spent operating the pilot program also gave Rodríguez an opportunity to focus on building the company's management team and perfecting distribution of the product. Finding the right people, who had talent and also fit with the company culture, was of utmost importance. In particular, Rodríguez focused on both the financial and operational scalability of the business. He brought in Juan José "JJ" Estrada as CFO and Luis del Cid as COO. Estrada had previously been a managing director at E10, a boutique venture capital fund based in Guatemala focused on addressing emerging markets energy challenges. He brought deep experience structuring and raising capital, along with a history of growing businesses in Central America. Del Cid, meanwhile, had developed extensive operational expertise working for Claro, the leading subsidiary of the dominant Latin American telecom company América Móvil. At Claro, del Cid served as country manager for Honduras and Costa Rica, where he successfully implemented Claro Home, a cable/Internet/telephone package, to over 300,000 homes in a two-year period (see Exhibit 8).

If Kingo was to scale at the rate Rodríguez envisioned, it also needed a replicable distribution model that would be able to penetrate the most remote areas of the developing world. The team eventually landed on a four-phase process:

- **Phase 1 – Validating the Market:** Market validators visited a new community to establish that the appropriate demand level existed and that the potential new customers had the capacity to keep a unit active for 70% of a given time period (utilization rate).
- **Phase 2 – Promotion and Installation:** The company formed a relationship with community leaders, and the sales team presented the products to the community

through mass demonstrations. Adoption was very smooth since Kingo installed the unit and provided a free trial period that enabled community members to see that the technology worked and that they saved money by using it.

- **Phase 3 – Installing shopkeeper networks:** Kingo went to all the stores in the community, called *tiendas*, and gave the shopkeepers an app through which they could sell prepaid credits. The app was essentially a digital numeric randomizer that could work outside of cell coverage. The shopkeepers were highly incentivized to sell Kingo credit since it was the highest margin item in their store. As of 2017, Kingo had a network of 1,800 shopkeepers in Guatemala.
- **Phase 4 – Ongoing Customer Service:** Kingo viewed itself as a service company building long-term relationships, so positive customer interactions were key. The products had a perpetual warranty and there was a 24/7 toll-free call center providing immediate assistance. The company promised a 72-hour turnaround time for resolving technical issues. Field service providers were also hired directly from the community to manage a specific portfolio of customers. The role represented a rare opportunity for people previously making \$100–\$150 per month to make \$400–\$500 per month working for Kingo while remaining in their own community.

The process was designed to keep Kingo close to the customer and to distribution partners, allowing the company to continue making improvements to benefit the portfolio. As a service model, Kingo strove to provide more than customers thought they were paying for and to use the best technology available, which created trust, loyalty, and a very strong customer relationship.

## Commercial Launch

Coming off a highly successful pilot program and confident in the significant organizational improvements it had made, Kingo launched commercially in 2015. The company sought to establish itself first in Petén, Guatemala's largest region. Petén represented a strong candidate for Kingo due to its large rural expanses, which made investment in traditional on-grid infrastructure prohibitive. Providing the careful education and instruction Kingo had found to be critical during the pilot period contributed to the tremendous demand for electricity in the power-starved communities of northern Guatemala.

Kingo finished 2015 with units in 8,400 homes and a fresh \$3.0 million Series A round of funding. By March of 2017, Kingo products were in 36,000 homes, and the company was installing 4,200 new units every month (see Exhibit 9). Equally important, the company's success left no doubt that Kingo products made an immediate financial and social impact.

According to a joint Kingo-IADB survey, 92% of homes with a Kingo unit reported average monthly savings that represented a 21% decrease in energy-related expenses.<sup>7</sup> The survey also indicated a 250% increase in study time for children, a reduction from 56% to 0% in the number of homes in which fuel-related accidents and burns occurred, growth in productivity in 96%

of homes, and an increase of mobile phone use in 100% of households.<sup>8</sup> However, the survey was unable to capture the significant health benefits from removing toxic gases from the home.

## **Opportunities for Growth**

The remarkable progress experienced by the company set the stage for the exponential growth that would be rewarded for unlocking the potential of a \$38 billion global market<sup>9</sup> (see Exhibit 10). Now it was Rodríguez's responsibility to decide how to capitalize on that early success. He believed that at this stage of industry development, with all global participants involved owning less than 1% of the market combined, being present in any particular market was not what mattered. The key would be to establish an expansion strategy that was replicable and financially viable. Kingo knew it needed to act fast, while working to maintain both the company's values and operational excellence. In that vein, the company explored various opportunities and developed three options for how to move forward:

### **Option 1 – Organic Growth in Central America**

Kingo would continue to raise additional capital for expanding solely in Central America. The company had become a viable business and had received significant interest in follow-on equity rounds as a result. The asset-ownership model, coupled with a recurring revenue stream, would make substantial debt funding in the coming years an option as well.

In 2017 there were 1,000,000 homes without power in Central America, primarily in Guatemala, Honduras, and Nicaragua. The region is contiguous, and most of the countries there that lacked electricity were culturally similar. Kingo was also able to leverage operational investments made in Guatemala across Central America. Many of Kingo's current investors had businesses that operated throughout the region and understood the environment in individual countries.

Kingo's main operational focus would continue to be Guatemala, with subsequent expansion across Central America.

### **Option 2 – Franchise in South Africa**

Rodríguez had recently been contacted by a businessman in South Africa, Seth Davis, who had heard Kingo's story and was intrigued by the technology. Davis was a South African native who had executive experience in the aviation industry in Europe and had launched a few successful entrepreneurial projects in his home country. He saw partnering with Kingo as an excellent opportunity to help millions of people in Africa gain access to electricity, and he viewed the market potential for SHS units as astronomical.

In 2017 sub-Saharan Africa had 588 million people living without electricity, or approximately 118 million homes—the largest number in the world by far. In fact, many believed that the potential for developing off-grid electricity in that region was similar to the opportunity that the mobile industry had had there just 10 years earlier. Cell phone usage in sub-Saharan African exploded from 5% in 2005 to 46% by 2015, representing an addition of 500 million



people. The unprecedented growth had created a market of over \$53 billion per year that directly employed over 1.3 million people. It had also changed the reality on the ground for many services beyond communications, most notably for payments.<sup>10</sup> That said, the region was already home to two well-established SHS companies, namely M-Kopa in Kenya and Off-Grid Electric in Tanzania.

The contemplated deal would be to set up a Kingo franchise owned by Davis. He would license all of the IP from Kingo, including its software, hardware, brand, and commercial experience to date. In exchange, Kingo would receive a 15% fee on all revenue generated by Davis's business. Davis agreed to invest a minimum of \$500,000 to set up the South African franchise. Kingo would receive data from the business but would have no operational control or responsibility.

### **Option 3 – Joint Venture in Colombia**

A member of Rodríguez's network believed that there were strong synergies between Kingo and a major telecom company that offered a prepaid product in Colombia, so she arranged a meeting between the two parties. The telecom company, with approximately \$750 million in annual revenue, viewed Kingo's services as a strong strategic complement to their existing business. The telecom was interested in supplying capital and providing local market knowledge in the form of a joint venture with Kingo, although not in running the operations of the business.

Colombia was another large market; according to official government estimates, in 2017 there were 450,000 homes without power in the country. However, very reliable local sources indicated to Kingo that the true number was closer to 1,000,000. At that size, the Colombian market was similar in magnitude to that of all of Central America. Kingo also had had the opportunity to raise capital at the parent company level from the private equity arm of EPM, Colombia's largest utility company, a move that provided added knowledge in the region.

The joint venture arrangement would be a \$5 million deal, with the telecom company contributing \$4.25 million and Kingo providing \$750,000. The \$5 million of equity would be seed capital for a new subsidiary; Kingo would own 55% of it, and the telecom would own 45%. The subsidiary would have a five-member board, three appointed by Kingo and two by the telecom company. Kingo would maintain operational control of the entity and hire a country manager who would have full profit and loss responsibility and report to the board of the subsidiary. As a 55% shareholder, Kingo would be required to consolidate the subsidiary's financials under IFRS rules, and any future buyer of the parent company would automatically gain majority control of the subsidiary.

## **Beyond SHS Units**

Supplying off-grid electricity provided by SHS units was the heart of Kingo. Rodríguez realized, however, that the company was uniquely positioned to take advantage of other related opportunities. Access to energy led to development and, consequently, to the

consumption of more resources. Purchases of consumer products such as cooking tools, refrigerators, and televisions were highly correlated with development. Productive tools including water pumps to irrigate fields and motors to mill crops would eventually become within consumers' reach as well. If there was demand for those items, larger SHS systems or even mini-grids would be required. Rodríguez believed firmly that Kingo's future would lie not only in reaching millions without power, but also in riding the wave of development with its clients. Now he just had to figure out the optimal growth strategy for the company, for his investors, and, most importantly, for his potential customers.

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## Exhibits

### Exhibit 1

#### Kingo SHS Unit



Source: Internal Kingo document.

### Exhibit 2

#### Energy Usage Examples

	Appliance providing energy service	Power need [Wp]	Usage amount [hrs / day]	Energy need appliance per day [Wh / day]	Cumulative energy need per day* [Wh / day]	Example product
Unit						
Tier 4 < 1,600Wh per day	Grain Mill	750	4	3000	3744	
	Water Pump	150	2	300	744	Sunpump SDS 128
	Fridge	150	2	300	444	Steca PF 166, no battery
	TV / Tablet Comp	12	6	72	144	MacBook pro (65Wh), iPad (34Wh)
	Lighting	10	6	60	72	Fosera Lamp 200 (1.6W)
	Phone	5	2	10	12	iPhone (10Wh)
	Task Light	0.5	4	2	2	d.light s1/s2

Source: Pepukaye Bardouille and Dirk Muench, *How a New Breed of Distributed Energy Services Companies Can Reach 500mm Energy-Poor Customers within a Decade*, Canopus Foundation, June 1, 2014, [http://www.canopusfund.org/fileadmin/redaktion/Documents/DESCO\\_-\\_Google\\_Search.pdf](http://www.canopusfund.org/fileadmin/redaktion/Documents/DESCO_-_Google_Search.pdf).

## Exhibit 3

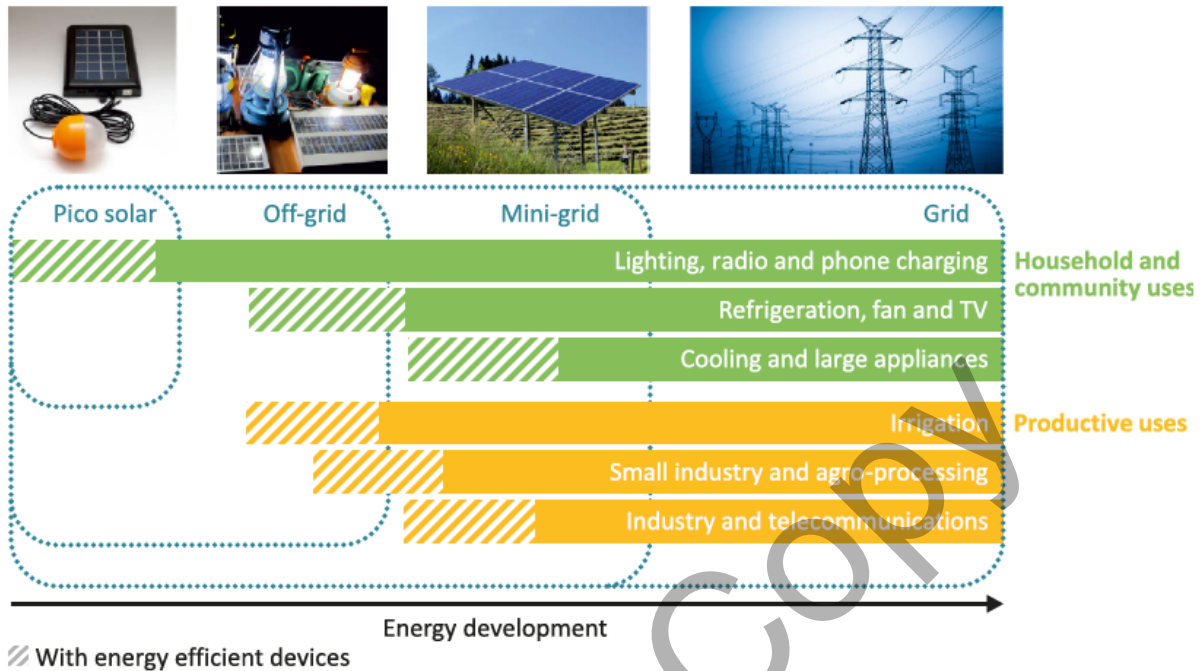
### Population without Access to Electricity

	2000		2016		New Policies Scenario 2030	
	million	%	million	%	million	%
<b>Africa</b>	<b>532</b>	<b>66%</b>	<b>588</b>	<b>48%</b>	<b>602</b>	<b>36%</b>
North Africa	14	10%	0	0%	0	0%
Central Africa	73	90%	98	75%	122	63%
East Africa	164	90%	172	61%	135	34%
South Africa	15	34%	8	14%	1	1%
Other Southern Africa	108	86%	135	69%	156	55%
West Africa	158	67%	175	48%	188	36%
<b>Developing Asia</b>	<b>1 059</b>	<b>33%</b>	<b>439</b>	<b>11%</b>	<b>54</b>	<b>1%</b>
China	18	1%	0	0%	0	0%
India	600	57%	239	18%	0	0%
Indonesia	99	47%	23	9%	0	0%
Other Southeast Asia	100	33%	42	11%	2	<1%
Other developing Asia	242	68%	135	27%	52	9%
Central and South America	56	13%	17	3%	4	1%
Middle East	15	9%	17	7%	14	5%
<b>World</b>	<b>1 672</b>	<b>27%</b>	<b>1 060</b>	<b>14%</b>	<b>674</b>	<b>8%</b>

Source: International Energy Agency, *Energy Access Outlook 2017: From Poverty to Prosperity* (Paris, France: IEA Publications, 2017), 49,  
[https://www.iea.org/publications/freepublications/publication/WEO2017SpecialReport\\_EnergyAccessOutlook.pdf](https://www.iea.org/publications/freepublications/publication/WEO2017SpecialReport_EnergyAccessOutlook.pdf).

## Exhibit 4

### Electricity Provided by Delivery Method, 2017

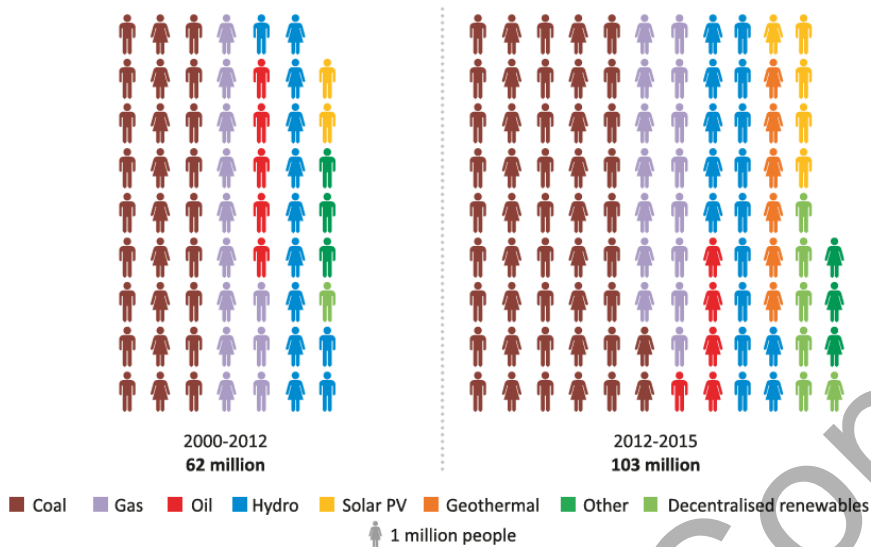


Source: International Energy Agency, *Energy Access Outlook 2017: From Poverty to Prosperity* (Paris, France: IEA Publications, 2017), 35, [https://www.iea.org/publications/freepublications/publication/WE02017SpecialReport\\_EnergyAccessOutlook.pdf](https://www.iea.org/publications/freepublications/publication/WE02017SpecialReport_EnergyAccessOutlook.pdf).



## Exhibit 5

### Number of People Gaining Access to Electricity by Fuel Type, 2000–2012 and 2012–2015

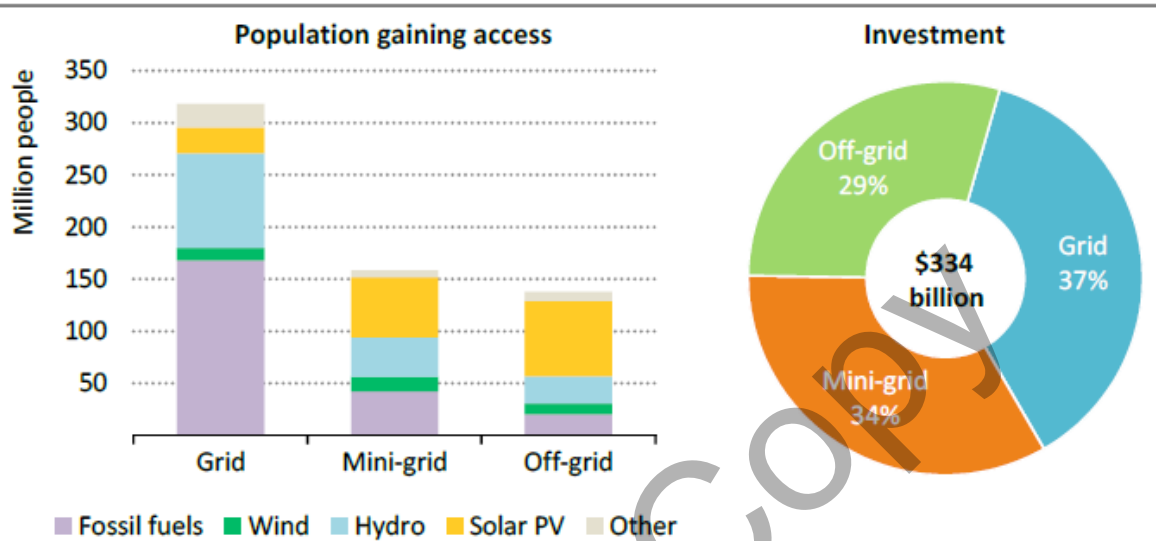


Source: International Energy Agency, *Energy Access Outlook 2017: From Poverty to Prosperity* (Paris, France: IEA Publications, 2017), 45, [https://www.iea.org/publications/freepublications/publication/WE02017SpecialReport\\_EnergyAccessOutlook.pdf](https://www.iea.org/publications/freepublications/publication/WE02017SpecialReport_EnergyAccessOutlook.pdf).

## Exhibit 6

### Energy Access Projections

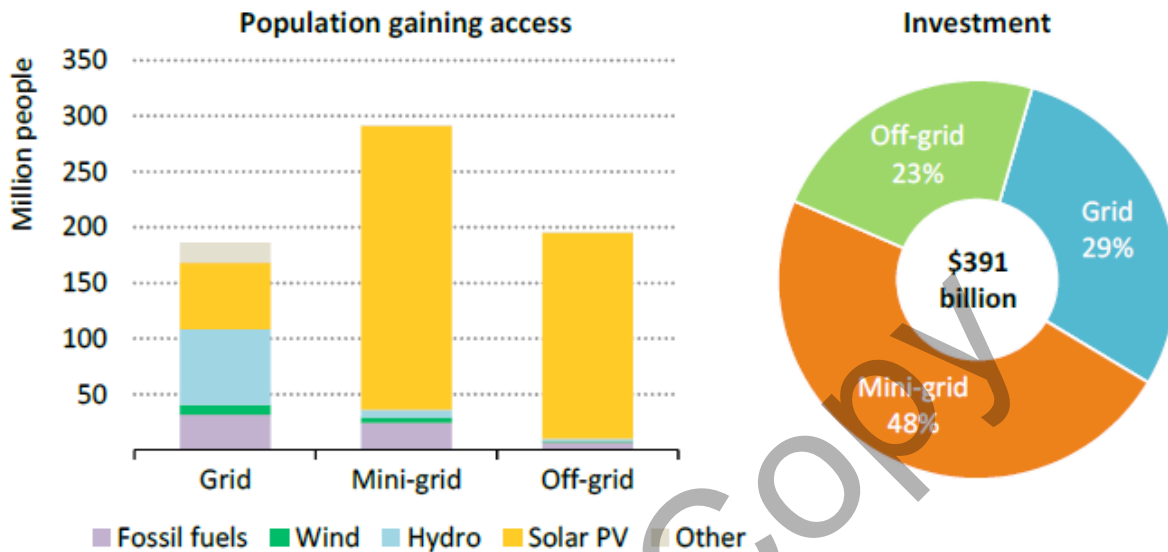
Path to Increased Access by 2030 under Current Conditions



Source: International Energy Agency, *Energy Access Outlook 2017: From Poverty to Prosperity* (Paris, France: IEA Publications, 2017), 50, [https://www.iea.org/publications/freepublications/publication/WE02017SpecialReport\\_EnergyAccessOutlook.pdf](https://www.iea.org/publications/freepublications/publication/WE02017SpecialReport_EnergyAccessOutlook.pdf).

## Exhibit 6 (continued)

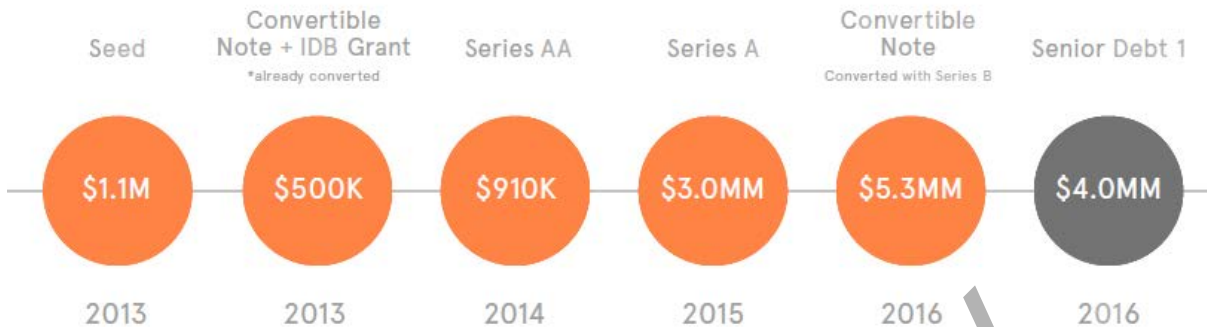
### Additional Requirements for Universal Access by 2030



Source: International Energy Agency, *Energy Access Outlook 2017: From Poverty to Prosperity* (Paris, France: IEA Publications, 2017), 53, [https://www.iea.org/publications/freepublications/publication/WEO2017SpecialReport\\_EnergyAccessOutlook.pdf](https://www.iea.org/publications/freepublications/publication/WEO2017SpecialReport_EnergyAccessOutlook.pdf).

## Exhibit 7

### Kingo's Funding through FYE 2016



Source: Internal Kingo document.

## Exhibit 8

### Kingo's Management Team



**Juan Fermin Rodríguez**

CHIEF EXECUTIVE OFFICER


- 5 years in mass consumer markets at Procter & Gamble
- 6 years experience in Off Grid Solar Energy
- 2015 MIT Top Innovators under 35 Central America.
- Forbes 30 under 30 Social Entrepreneur Nominee.
- Unreasonable Institute Fellow.
- Agora Partnerships Fellow



**Juan José "JJ" Estrada**

CHIEF FINANCIAL OFFICER

- 7 years as Managing Director of Grupo OEG private equity firm focused on energy and telecom.
- Oversaw strategies and capital raising for over 10 companies. Wide Network of connections in Central America



**Luis del Cid**

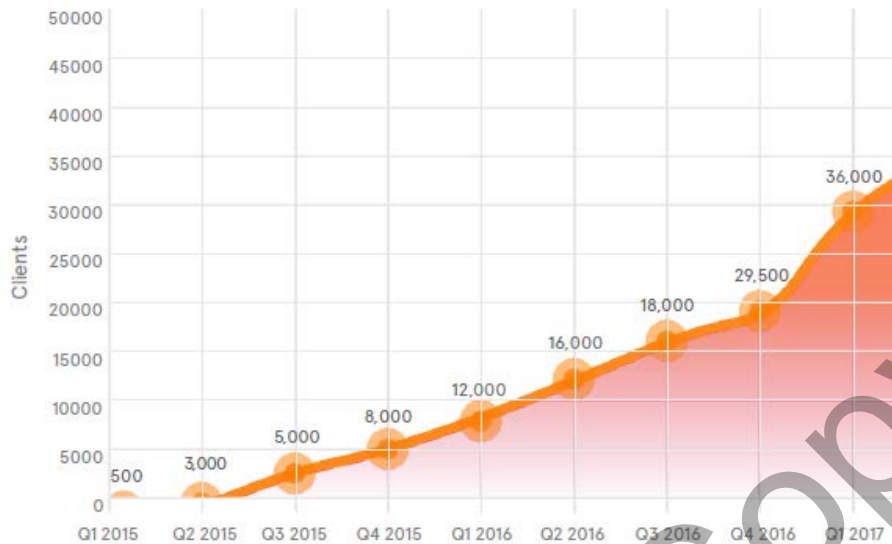
CHIEF OPERATING OFFICER

- 10 years in marketing and sales for L'Oreal.
- Headed Honduras and Costa Rica for largest telecom in LATAM, managing over 7,250 employees.
- Deployed cable service to 300,000 homes in 2 years.

Source: Internal Kingo document.

## Exhibit 9

### Kingo's Unit Growth through Q1 2017



Source: Internal Kingo document.

## Exhibit 10

### Kingo's Financial Projections (Illustrative for Profitability Measurement Purposes)

	2017	2018	2019	2020	2021	2030
Installed Units	46K	100K	191K	294K	360K	543K
% Penetration of Target Market	2%	7%	10%	16%	21%	45%
Revenue	\$2.4MM	\$5.2MM	\$16MM	\$29MM	\$40MM	\$70MM
EBITDA % of Revenue	(\$1.3MM) -48%	\$10K -1%	\$5.2MM 33%	\$12MM 42%	\$18MM 44%	\$36MM 52%
Net Income % of Revenue	(\$3.3MM) -141%	(\$4.3MM) -81%	(\$3MM) -19%	(\$376K) -1.3%	\$2.4MM 6%	\$16.4MM 24%

Source: Internal Kingo document.



## Endnotes

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<sup>1</sup> This description and the following descriptions and quotes attributed to Juan Fermín Rodríguez come from Kyle Van Decker's interview with Juan Fermín Rodríguez in Guatemala City, on March 14, 2018 unless another source is cited.

<sup>2</sup> World Bank, *Country Poverty Brief: Guatemala* (Washington, DC: World Bank, October 2017), [http://databank.worldbank.org/data/download/poverty/33EF03BB-9722-4AE2-ABC7-AA2972D68AFE/Archives-2017/Global\\_POV\\_SP\\_CPB\\_GTM.pdf](http://databank.worldbank.org/data/download/poverty/33EF03BB-9722-4AE2-ABC7-AA2972D68AFE/Archives-2017/Global_POV_SP_CPB_GTM.pdf).

<sup>3</sup> Unless otherwise noted, all data points in this section were sourced from International Energy Agency, *Energy Access Outlook 2017: From Poverty to Prosperity* (Paris, France: IEA Publications, 2017), [https://www.iea.org/publications/freepublications/publication/WEO2017SpecialReport\\_EnergyAccessOutlook.pdf](https://www.iea.org/publications/freepublications/publication/WEO2017SpecialReport_EnergyAccessOutlook.pdf).

<sup>4</sup> World Health Organization, *Fuel for Life: Household Energy and Health* (Geneva, Switzerland: World Health Organization, 2016).

<sup>5</sup> Lighting Africa, *Solar Lighting for the Base of the Pyramid: Overview of an Emerging Market* (Washington, DC: Lighting Africa, June 2010), <https://www.ifc.org/wps/wcm/connect/a68a120048fd175eb8dbc849537832d/SolarLightingBasePyramid.pdf?MOD=AJPERES>.

<sup>6</sup> United Nations, *Affordable and Clean Energy: Why It Matters* (New York, NY: United Nations, August 2016), [https://www.un.org/sustainabledevelopment/wp-content/uploads/2016/08/7\\_Why-it-Matters\\_Goal-7\\_CleanEnergy\\_2p.pdf](https://www.un.org/sustainabledevelopment/wp-content/uploads/2016/08/7_Why-it-Matters_Goal-7_CleanEnergy_2p.pdf).

<sup>7</sup> Elías Miguel Ahuat; Kingo/Inter-American Development Bank Joint Study." Estudio de Impacto Social Kingo Energy," August 23, 2017.

<sup>8</sup> Increased mobile phone use was noted primarily noted for listening to news and music.

<sup>9</sup> According to the International Energy Agency, there were 1.06 billion people living without electricity in 2016. (Source: International Energy Agency, *Energy Access Outlook 2017: From Poverty to Prosperity* (Paris, France: IEA Publications, 2017), [https://www.iea.org/publications/freepublications/publication/WEO2017SpecialReport\\_EnergyAccessOutlook.pdf](https://www.iea.org/publications/freepublications/publication/WEO2017SpecialReport_EnergyAccessOutlook.pdf).) Kingo estimated that there were five people per home and that the company would receive a monthly revenue of \$15 per SHS unit.

<sup>10</sup> GSMA, *The Mobile Economy: Africa 2016* (London, United Kingdom: GSMA, 2016), <https://www.gsmaintelligence.com/research/?file=3bc21ea879a5b217b64d62fa24c55bdf&download>.