

Navigating Consumer Financing

FOR PRODUCTIVE USE: A GUIDE FOR APPLIANCE AND MINI GRID COMPANIES

FALL 2020

Photo Credit: GMG Facility Kenya

For mini grid developers seeking to incorporate effective productive use of energy (PUE) models linked to energy-demanding appliances and other productive inputs, or last-mile product distributors seeking to scale their product's reach among low-income, cash-constrained communities, the question on how to structure an effective model for distribution to customer service and consumer financing is inevitable.

The case provides key considerations in designing, partnering and raising for a consumer financing model that is unique to your business. A range of different consumer financing models are presented that were adopted by off-grid energy and appliances companies, including on-balance sheet, off-balance-sheet financing structures, and how parties such as SunCulture, Fenix, Mkopa, SimuSolar, Pawame and InspiraFarms have looked at building their models so mini-grid developers and partners can also be more sensitized to options they should consider.

Deciding Between In-House and Outsourced Consumer Financing Models

There are benefits and weaknesses to different models, and key considerations from experienced appliance and energy financing actors that the mini grid and PUE sector can learn from. CGAP's Taming of Strange Beasts Report explores the decoupling and separation of these models in greater detail, and should be reviewed in conducting your analysis. The paper emphasizes the complex undertaking of this: "There are no well-developed ecosystems for small-scale consumer asset financing or equipment leasing in the places where people need those assets the most." As such, "the most successful "first generation" PAYGo companies—which still account for about 90 percent of the sales in the sector—create their own

PAYGo hardware, develop software to manage it, build their own distribution networks, and finance their sales on their own balance sheets. The PAYGo firm is both distributor and underwriter, retailer and bank. Each of these two main businesses (three, if you include manufacturing), in turn, conducts many specialized activities." Many believe that in-house management of consumer financing works the best because it streamlines internal systems with payments and financing-related data collection, analysis and feedback loops into other departments of the company that make decisions based on data insights. However, outsourcing credit risk and loan management, as well as data collection and insights, could lower business costs and work well with a strong partner. Several newer players offer viable alternatives.

Expert opinions on In-House vs. External Consumer Financing



In-House

Strengths

Single Point Customer Relationship Ownership. Developer retains full control of customer relationship—in terms of both electricity service and appliance usage.

Financial Upside of Consumer Financing. Managing consumer financing loans and financial upside can be lucrative for the company, often generating higher gross margins than core sales (as has been the case for the home solar sector).

Streamlined Data Insights. Allows for real-time and full data sharing with the appropriate internal teams; whereas often 3rd party providers want to own the data they collect and are unwilling to share full data. Sales & Marketing is constantly testing new promotions, user experience and pricing and requires real-time data and analysis to inform on senior level strategic decisions. Leading companies also use real-time data and insights to motivate their sales and customer service teams.

Risks

High Cost Tech. Maintaining the tech/IT and building the proprietary tech and loan management platform is costly.

High Cost Teams. Typically will require larger teams and robust senior hires that can be costly. These include: 1) Experienced Credit Risk Manager & Supporting Team (centralized team, or by country plus centralized as you grow), 2) Finance Liaison to Coordinate with Credit Risk Team and Corporate Finance, 3) Data Intelligence & Data Scientist Team, 4) Customer Service and/or Loans Recovery Team.

Complexity of Operations. Managing energy services, financing and appliances is operationally complex, with no single software solution that allows side-by-side account management.

Consumer Financing Capital Raise. To take on lending, developers will need to run an additional capital raise process for appliance financing. This alone is why US energy companies created separate legal entities to manage their financing businesses.

Other Factors for Success

Credit Risk and Operations teams and decision making must be aligned, and work in unison:

- Placing a credit management and risk specialist at senior management who can make key decisions on strategy is important to success
- Given site and demographic specifics, no consumer financing requirements or solution is the same so keeping it in-house may allow for faster customization and streamlined intelligence
- Various internal teams will need real-time and frequent access to data on Customer Service Records, Repayment Data, change in Overall Loan Portfolio, Accounts Receivables Data (e.g. Net 30, Net 45), Faulty Product Records, etc.
- Longitudinal studies on each loan's performance over time can be incredibly valuable to gaining greater consumer insights, yet is very hard to obtain because of software integration issues- and high cost of software integration- across partners
- Data and systems integration will always be a challenge, especially entering broader geographies. Even partnership with large telcos or others to share data has proven challenging and cumbersome if looking at different markets, where these companies also use different internal systems by location.



External

Strengths

Separate Financial Accounts. If consumer financing results are poor, it is safer to keep this function independent of core operations and financial reporting so any underperformance (or just early underperformance while perfecting the model) does not cause additional concern to investors.

Cost-Savings with Greater Analytics Potential. A third-party provider with expertise in predictive analytics and business intelligence could be more cost-effective than hiring and building this internal capacity. Data on customer-by-customer insights, other relevant customer performance as a proxy for alternative credit scoring (e.g. GMS plugin to know consumer airtime and repayment behavior), intelligent alerts based on this behavior to signal potential defaults could be very valuable- and result in business efficiencies that justify outsourcing.

Opportunity for Sector-Level Knowledge Sharing of Best Practices. A third-party that monitors many companies according to universal metrics, such as those GOGLA tried to establish, could allow for greater sector-wide business analytics and business model optimization without compromising confidentiality of a single actor.

Keeps Energy Companies Focused on Core Mission. Energy companies who enter consumer financing business lines have sometimes been accused of predatory lending, and a shift in focus from offering a value-added essential service for low-income rural communities to focus on financial returns through lending. Separation of functions through a third party might mitigate this risk and allow the energy providers to focus on providing energy, not financial returns from lending.

Risks

Data Insecurity. Data security/breach and confidentiality concern can be greater if multiple partners are involved and sharing or owning the data.

Data Ownership. 3rd parties, especially data and loan management platforms, have historically required that they own the data collected; this can cause issues in accessing full data needed and in real-time to inform on internal strategic decisions. While this is improving with parties increasingly willing to share data, timing to access data when needed can continue to be an issue and is one currently cited by actors.

Objectives Misalignment May Cause Consumer Conflict. 3rd party lender/appliance partners may have differing interests than mini grid operators. For example, an appliance/financing partner has less incentive to service an appliance after it has been repaid or beyond warranty, whereas the MG developer must still maintain its energy customer relationship.

Other Factors for Success

- In order for full data sharing, tech platforms integration between both partners is critical yet usually not easy to achieve
- It is important that one of these parties have a strong data analytics and business intelligence function. Outsourcing this function that requires highly trained teams that can also be costly, can be very beneficial.
- Increasingly, there are third parties that are offering this function such as Solaris Off-Grid and Odyssey Energy Solutions.

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Even with a partnership model, a dedicated manager at your company or the lending institution will ensure focus and quality control of the loan product.

Concerns related to internal systems, data feedback loops, loan management and pricing models are critical factors. Managing a loan portfolio and the related support services such as credit scoring, following up on delinquent payments, enforcing penalties or recovery of assets from customers in default, and general customer service is a full business in itself. These functions require local staff and physical presence, where potential partners typically are not yet located. As such, there must be an incentive and funds to provide staff and additional capacity to these new locations. Available and locally-present partners near mini grid

sites will often require additional capacity building and careful support and management to ensure quality control and fit. Meanwhile, commercial banks, local MFIs, community savings groups, SACCOs and others with existing local offices will require additional training, development of loan tools and model; a dedicated manager at your company or the lending institution is required to maintain focus and quality control of the loan product. Even with a partnership model, a dedicated manager at your company or the lending institution will ensure focus and quality control of the loan product.

Best Practices

Flexible Repayment Plans To Align with Household Budgets & Payment Cycles.

Offering incentives to customers for repaying sooner can reward faster repayment, while no downside for choosing a longer repayment plan fosters trust and loyalty among customers. Home solar players like MKopa used 12, 14 and 18-month periods, in which payments were tied to # of days repayment was made vs. the overall time frame. There were no costly penalties such as compounding of accrued balances for unpaid days.

Pre-Pay Option. Distributors have found benefits in providing an option to pre-pay or pay more in advance during higher cash flows and liquidity cycles to offset for lower lulls, when regular payments will be challenging. Mkopa created a 30-day grace period without any negative consequence to overall loan terms.

Cash Downpayment. An upfront deposit requirement or initial layaway payment is required to minimize total losses from future defaults. More expensive items typically require a higher upfront payment, for example 20%-60% of total cost. This model has

been applied by RVE.Sol in its local entrepreneurship programs, where applicants must submit a business proposal and budget for a needed appliance such as a TV. RVE. Sol vets the business, requires an initial downpayment, then purchases the asset directly for the local entrepreneur, in this case, to run a small movie theater.

Hiring and Training of Local Community Members Brings Many Benefits.

Hiring and training of women and youth in the community have proven particularly successful for many home solar, appliance and rural enterprise models. The benefits are that it drives up local incomes, empowers women and youth, and creates additional 'stickiness' in the community. Companies perceived as only hiring outside labor have often experienced subsequent community relations and security risks along their value chain in industries from agriculture, aquaculture and beyond. Solar Sister and Village Enterprise, as well as many clean cooking to solar companies, have applied this model, especially focused on women, to ensure success.

Alternative Credit Scoring & Build Up of Credit History.

Mkopa and others built greater trust, loyalty and benefits for their customers by using their repayments and purchasing data to help customers access a larger pool of lenders and loans for additional products, not just energy access. Customers' credit history was shared with the Kenya Credit Reference Bureau for other lenders to reference. Furthermore, consumers can purchase on pay-as-you-go with Mkopa other needed products once they've proven their ability to pay off an initial loan for the home solar or appliance.

Raising a Consumer Financing Facility Can Take Several Years, so Plan a Scale Strategy Accordingly.

Several parties who have recently raised their in-house consumer financing facilities said it took over 2 years to do so. As such, planning a staged and step-up strategy beginning with faster-moving and smaller lenders or funders (e.g. crowdfunding or Kiva), then building up to the impact investors, commercial banks and other larger partners is your best strategy.



Photo courtesy of IDEV. Local retail near mini grid site

Lessons Learned

Priming Grants then Debt. Raising a consumer financing facility always begins with grant funding to ‘prove’ an early model; after this, crowdfunding is often a means of securing smaller pools of working capital, inventory or receivables financing when institutional investors are not yet willing to invest in the newer model/company. Many of the more recent market entrants and earlier stage companies with less than \$3M in gross revenues must rely on this channel. Crowdfunding can also be a means of raising needed working capital faster than that from impact investors and development finance institutions, which may take 9 months to 1 year before disbursing funds.

Commercial Lenders Still Require A Lot of Security. High default rates and uncollateralized loans are key barriers to attracting commercial or even impact investors. This causes commercial lenders to move slowly and lend only in pilot partnerships with the PUE, mini grid and greater appliance sector. Companies seeking partnerships with commercial lenders must look to development finance institutions such as SIDA (via TRINE), UK Aid’s Crowd Power, or the US Development Finance Corporation (DFC) to offer an attractive de-risked model with first loss guarantees or matching funds. Guarantees and

matching funds also typically come with separate due diligence and approval processes that can take many months, so operators should plan well in advance. Meanwhile, those seeking commercial lenders for partners that will offer more than loan processing and consumer loans, should anticipate that large banks are not typically structured to provide this greater support and a multi-year scaling effort should be designed into the model. Seeking a loan from a commercial bank to do in-house consumer lending will be more feasible for many.

Consider the High Costs of R&D, Data Insights, Consumer Lending Fundraising and Facility Management.

For companies entering the market now, they can often benefit by selling appliances and equipment developed by another, thus reducing the high costs of new product development. Many later entrants to the home solar and lantern space adopted this to focus on building last mile competitive strength instead. Cost savings may also be realized in securing a data intelligence and loan management platform or partner because it reduces the cost of hiring a senior credit risk, data scientist and related team, as well as cost of building out a proprietary in-house IT system. Odyssey Energy Solutions, Angaza and Solaris Offgrid

are examples of rising third party lending and consumer financing management partners. Clear and timely sharing of all data and communications between companies will be critical to success.

Accurate Pricing Strategy Paired with Strong Credit Risk Capabilities is Key.

Companies should carefully map key drivers of sales and repayment, building this analysis into site selection and scoping phases. Research by Crossboundary Mini-Grid Innovation Lab shows that effective pricing of the appliance (as well as lower energy tariffs for mini grids) is critical to driving up PUE or appliance purchasing. Also, higher cost equipment such as refrigerators or other PUE products sell in much lower volumes than a radio, tv or cooker—likely due to the total cost and incremental costs that are a greater financial constraint on consumers. Techniques being adopted by many of the larger off-grid cold chain companies should be considered, whereby a portion of the time or use of asset is rented on a monthly basis, or entire unit is rented in perpetuity at a lower cost and longer repayment time horizon.

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Examples of Relevant Consumer Financing Models:

	Mkopa (Home Solar company)	SimuSolar (solar appliance company)
 Financing Model	In-House, Vertically Integrated Cloud-IT System	On Balance Sheet, and via 3rd Party Lender (Kiva)
 Key Strengths	Early pioneer in PAYG, receiving 1st wave of investor support to test, perfect model	Pioneer in crowdfunding and alternative funding sources for growth
 Notable Features	<ul style="list-style-type: none"> Flexible Repayment Plans. Catered to household specific cash flows/liquidity cycles Incentives for repayment faster. No negative consequence for slower repayment Credit History Benefits & Loan Access. PAYG helps establish credit history of unbanked; Shared with Kenya Credit Reference Bureau so other lenders can lend; opportunity to buy other appliances or e-vouchers for agri-inputs based upon MKOPA credit scoring. Vertical integration of IT and lending systems + per customer account tracking allows close risk monitoring 	<ul style="list-style-type: none"> Pioneered in creative financing to offer water pumps to fishing lights Focus on service business with custom design systems to meet the client needs, evaluate well or water source, offer purchasing plans, install equipment, service/secure equipment through remote control and monitoring Strong focus on partnerships with seed sellers, farming associations, capacity builders, mini-grids to reach communities that could benefit from PUE equipment Focus on shift to a data-driven model to analyze and respond to real time indicators of business health via new Operating Dashboard
 Key Challenges	Vertical and customized tech systems are costly to build and manage	Earlier stage player made it challenging to raise
 Systems Used	<ul style="list-style-type: none"> Custom-build MKOPANet, cloud-based monitoring of system performance, synchronization of mobile payments to device, per account tracking of payments. Microsoft- Backend operations management, R&D, customer service. Azure- Facilitate secure, high volume daily payments from customers. Kaizala- Manages sales force and customer communications in real-time 2G. CBA-accounts that interface with Mpesa payments 	Unknown
 Who Funded	<p>Early Grants Bill and Melinda Gates Foundation Shell Foundation, DFID (R&D to diversify product offering)</p> <p>CBA Bank Loan Facility De-risked by collateralized CBA cash account, so bank could monitor Mpesa PAYG payments. Bullet payment with 48-month holiday on principal. Favorable commercial rate of 16%, continued access to automated systems. Bank cap of 20% of \$10M total raise.</p>	<p>\$50,000 raised by Kiva</p> <p>\$25,000 in match funding from Energy 4 Impact as part of the Crowd Power programme, supported by UK Aid</p> <p>Doen Foundation, Debt</p> <p>Various angels- convertible note</p>

	Pawame (home solar and solar appliance company)	SunCulture (solar drip irrigation company)
 Financing Model	On-Balance Sheet	On-Balance Sheet (Kenya); Interested in off-balance sheet in future to SPV or local bank
 Key Strengths	<ul style="list-style-type: none"> — Like SimuSolar, came to market later than the 1st wave solar companies — Focus on competitive advantage via streamlined operations, lean structure, deep local presence in communities across Kenya, reliance on existing products in the market vs. expensive in-house R&D — Focus on perfecting last-distribution, data 	Has been very successful at gaining broad exposure, awards and recognition for its products focused on solar drip irrigation
 Notable Features	<ul style="list-style-type: none"> — Lower cost structure due to narrower geography/deep market penetration vs. constant regional expansion, market entry timing when good products were in the market so focus on selection, distribution vs. R&D — Professional, business-savvy management brought in for financial/operations optimization — Leverage niche inventory lenders with smaller lines of credit, invoice purchasing 	<ul style="list-style-type: none"> — ‘Pay-As-You-Grow’ allows repayments only during harvest cycles to avoid restricting irrigation use that drives income to pay for unit — Pumps are expensive (e.g. USD 480) beyond typical microfinance loans; most lenders will not lend to smallholder farmers due to high transaction cost, lack of collateral — High cost of product means trust and quality with lean customer service is critical. Remote monitoring sensors help to optimize usage and troubleshoot
 Key Challenges	<ul style="list-style-type: none"> — Earlier stage player made it challenging to raise — Less crowdfunding capital during COVID 	<ul style="list-style-type: none"> — Closing funds from impact investors can be a very slow process...”Be prepared to spend 1-2 years to secure full financing needed.” — Accurate pricing and risk management is challenging (and even harder with COVID)
 Systems Used	In-House	<p>In-House Customized System.</p> <p>Began with outsourced data analytics for loan management, but are moving it in-house.</p> <p>“We realized that we have unique operational needs that were not easy to build into existing loan management systems.”</p>
 Who Funded	<ul style="list-style-type: none"> — Venture South Kenya/ Seedrs (receivables purchase) — Benvell — SIMA Funds — KOSAP — Trine — Bettervest 	<p>As with most models, grants were needed 1st to prove model in 1st 1+ year</p> <p>Debt investors include AfDB and NDF-backed FEI-OGEF facility as well as the Triodos and Alphamundi JV, Alphajiri</p>

The Evolution of Consumer Financing and Raising Funds to Support Your Model

High default rates and hard-to-recover assets, combined with weak data analysis and credit risk management have deterred some early investors to lending or investing into consumer or asset financing for last mile appliances. With time, many have improved their data analytics and internal systems to address this issue.



Photo credit: GMG Facility Kenya

Meanwhile, other types of development funders can support a consumer financing model by de-risking it with financial tools and loan guarantees. Examples of loan guarantors include African Guarantee Fund, SIDA, and the U.S. Development Finance Corporation (formerly U.S. Development Credit Authority and OPIC programs). Kiva.org has also acted as a loan guarantor for fair trade and agriculture related schemes, and as such a compelling case might be made to agriculture and rural enterprise-related funders that a consumer financing program housed within an off-grid company is well-aligned with target impact and similar risk profile of other investments. These parties can result in a lower collateral requirement and lower loss potential

for a commercial investor, yet guarantee funds charge a fee for their guarantee, typically do not guarantee more than 50% of the total loan or investment amount, and can often take long to conduct the due diligence process to approve the guarantee. Parties seeking to take advantage of these schemes should plan 9 to 18 months before funds are needed. Regardless, companies should anticipate a 9 to 18 month period before any capital raise funds are secured and disbursed. Select facilities such as Open Road Alliance will offer a bridge loan for nearer term financing once an investor term sheet is secured; however, Open Road Alliance is not only focused on off-grid or appliance sectors and applications will be reviewed alongside a range of other applications.

Today, investors, including impact investors who have been investing for several years, are increasingly cautious to invest in multiple similar business models. As such, in seeking investors, look at their existing portfolio. A sector specific investor, such as off-grid or energy only fund, may be willing to invest in similar models and consumer financing for the sector. However, a generalist investor may only invest in a maximum of 2-3 companies in off-grid or last mile products and consumer financing categories.

Crowdfunding and Alternative Models for Funding Last Mile Distribution and Consumer Financing Models



Energrow appliance and consumer financing. Photo Credit: CLASP.

The amount of money raised through crowdfunding for energy access projects grew from \$3.4 million in 2015 to \$24 million in 2018, and it continues to grow. Crowdfunding and less traditional sources are popular among the second wave of off-grid, appliance and last mile distribution companies that launched after the first wave of paygo and home solar players. Even many early companies such as Greenlight Planet and Bboxx have long relied on Trine to raise. As the sector matured, investors' portfolios and risk tolerance for earlier and second wave companies- even if innovators- slowed down. While crowdfunding has become a popular alternative for debt, funds are still relatively small and insufficient to support long-term or exponential growth of these companies.

To-date, the majority of crowdfunding was from peer-to-peer lending platforms, which represented over 90% of total crowd-funded cash secured in 2018. The largest funds came from UK,

European and Japanese platforms. As of 2018, Energy4Impact's Crowd Power report found that Trine (Sweden) and Energise Africa (UK) represented the largest pool of funds secured. Both platforms are focused on renewable energy fundraising, attracting investors motivated by the prospects of mitigating climate change and reducing energy poverty, while earning a relatively high rate of return. As of 2018, these platforms offered annual returns of 4% to 8% on GBP and EUR denominated investments, and had raised TRINE (\$11M), Energise Africa (6.5M), Lendahand (\$5M), bettervest (\$3.5M), Crowdfunder (\$1M), 2% Kiva DSE (\$430k). Meanwhile, donation based crowdfunding also saw healthy year-over-year growth from platforms such as GlobalGiving, at over 45% growth yet still under \$1M in total funds raised per year. The amount raised for energy access on platforms that offer rewards to campaign-backers, such as Indiegogo and Kickstarter, has struggled with funders to these

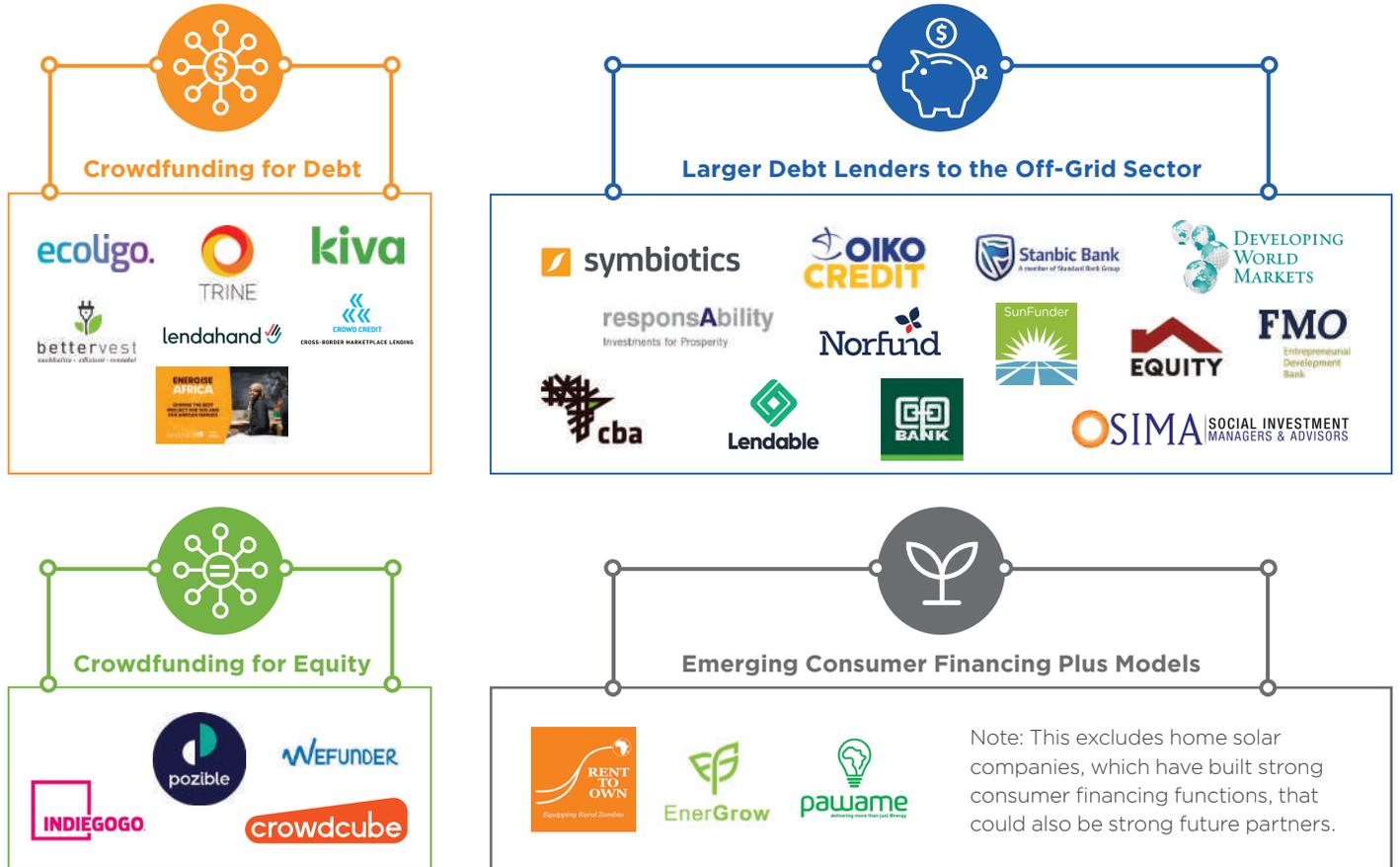
platforms typically focused on products and services that appeal for commercial and consumer use in their home markets. As of 2018, few successful Africa focused equity crowdfunding campaigns had closed, yet solar panel and similar solar product plays such as Buffalo Grid, an UK-based solar mobile charging station company focused on India, and Wakawaka, a portable solar chargers company, raised equity crowdfunding. The initial coin offering (ICO) market and cryptocurrency also poses early opportunity for fundraising for the mini grid and PUE sector with several million USD already raised by a few energy access related ICOs, starting in 2018. The Sun Exchange and a handful of others have begun to prime this market, especially for development country opportunities.

Energy4Impact will soon release its latest Crowd Power report on crowdfunding trends in energy access. They noted a dip in 2019 crowdfunding to an estimated \$55M, still mostly raises from peer-to-peer sites, and anticipate further contraction by as much as 20% for 2020. On the upside, venture debt platforms such as Kiva DSM and Charm Impact are offering new and promising models. While debt continues to be a struggle, Crowd Cube (recently merged with Seedrs), a UK-based platform has recently been successful at attracting crowd-funded equity for the energy access sector, and there are positive signs of growing equity interest.

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Debt & Consumer Financing Lenders Relevant to the Mini Grid & PUE Sector Growth



Meanwhile, the mini grid and appliance sector continues to seek ways to collaborate with traditional commercial and microfinance lenders.

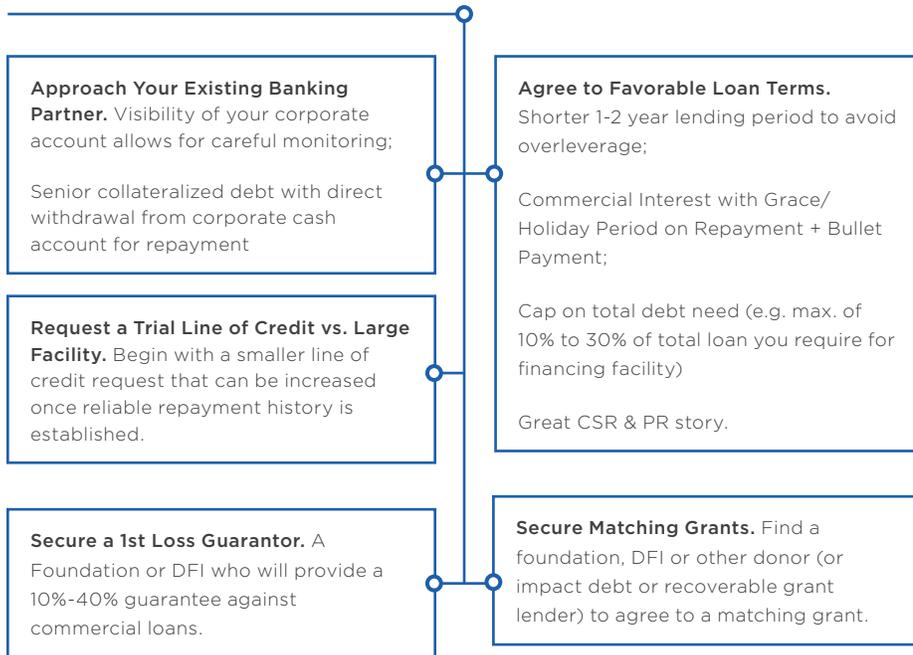
Commercial banks including CBA Bank, Rafiki Bank, Equity Bank and Cooperative Bank are among those showing interest, and most are already in pilot phases of productive use or mini grid debt financing related to appliances and PUE. It is only a matter of time before commercial banks and local MFIs more heavily engage in the sector, as hurdles to effective

partnerships are maneuvered and broken down. Partnerships of this form have much room for improvement with most citing challenges around very different operating models, risk tolerance and expectations. Many believe an optimum partnership model with banks and MFIs would be created if the financing partner had a

dedicated and independent team operating under separate performance metrics and operational structure protected from the core bank model, and tasked with priority focus on promoting and perfecting last mile products. Some ways to navigate these partnerships are proposed.

Navigating Commercial Lender Partnership Barriers

Take to the Bank



Reality Check

Assign an In-House Project Lead. The most feasible partnership with a commercial lender or MFI will require you manage processes, quality control and active loan disbursement.

Take Product, Procurement, Distribution & Customer Service In-House. Commercial banks are structured as lenders, not distributors, product or customer service experts. Identify another partner or build this into your in-house model from the start and explore building capacity for a deeper partnership a few years down the line.

Conclusion

Few models exist for mini grids to incorporate productive use financing and paygo with most examples in early stages and financed by internal capital from the developer. In examples given, additional considerations for mini grid developers are: 1) How to secure pilot funding to confirm the appropriate PUE model and PUE equipment that will require financing, 2) Attract additional debt or equity to scale the PUE model, including the equipment financing, and 3) Who takes on the roles of the diversified PAYGO value chain components, noted in "Taming the Strange Beasts." CGAP notes that the Generation 2.0 model for PAYGO decoupled manufacturing and development of appliances from the PAYGO provider, and that the next

evolution to Generation 3.0 will further separate functions, with decoupling of customer service (allowing for greater focus on this critical function), greater shared data with partners to de-risk and optimize for both parties, while standardizing operating systems and moving toward a centralized and automated underwriting. While many have not done so yet, appliance companies and developers anticipate a shift of consumer financing/customer service functions toward a special purpose vehicle (SPV) or third-party lending partner as the optimal model because it separates finances and operational/financial management into distinct focused businesses. This decoupled structure may also attract a broader pool of investors.

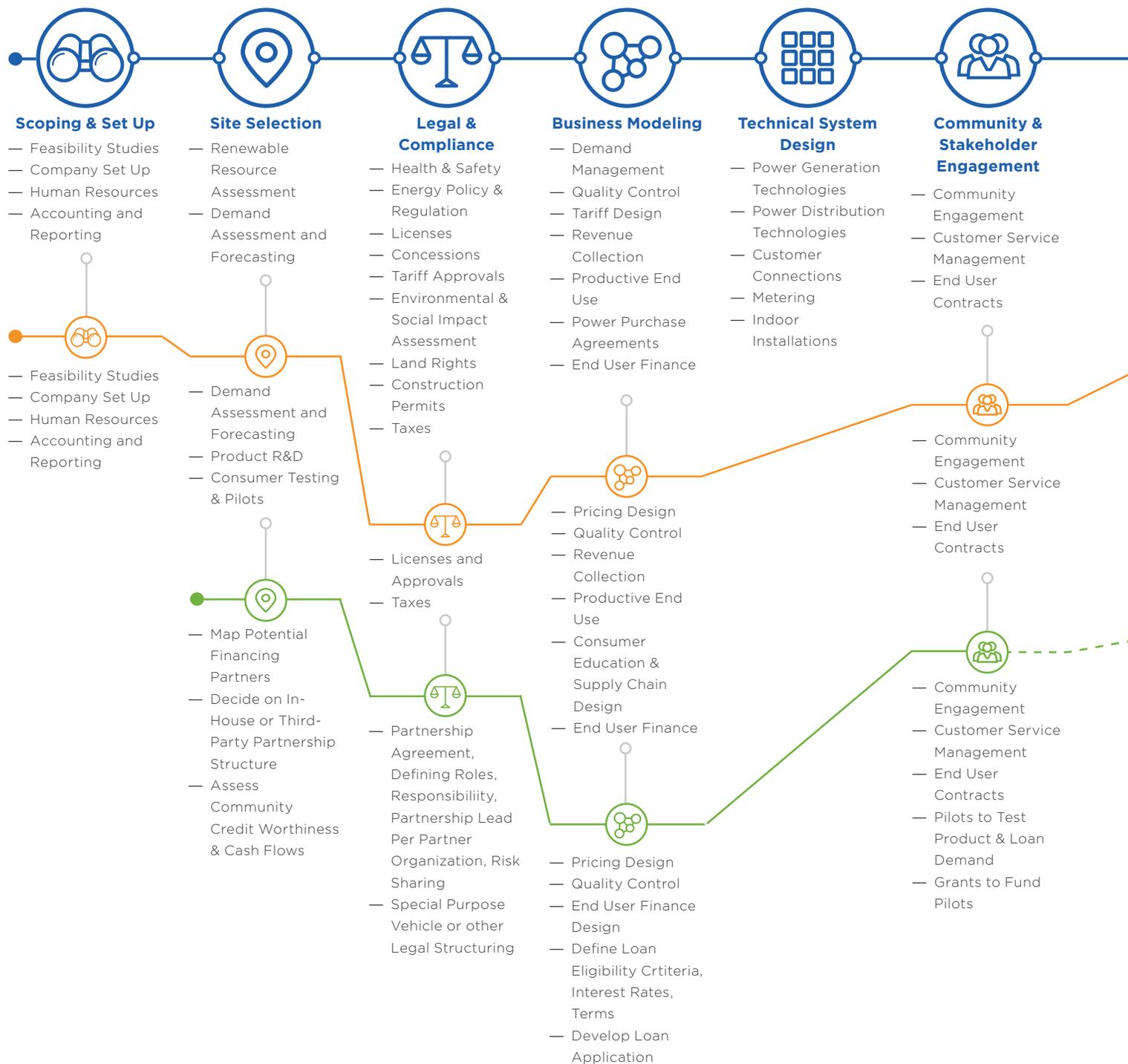
We hope this case provides useful examples and insights into developing a lean decision making and development plan for the provision of PUE consumer finance. An in-house finance model creates the ability to own the client relationship and can improve transparency around different adjacent business lines. However, in-house finance adds complexity and requires specialized expertise. Ultimately, who takes on the consumer financing is a critical question all companies will ask in last mile low-income models. Further pilots that can test new models with clearly defined roles and incentives will advance the sector.

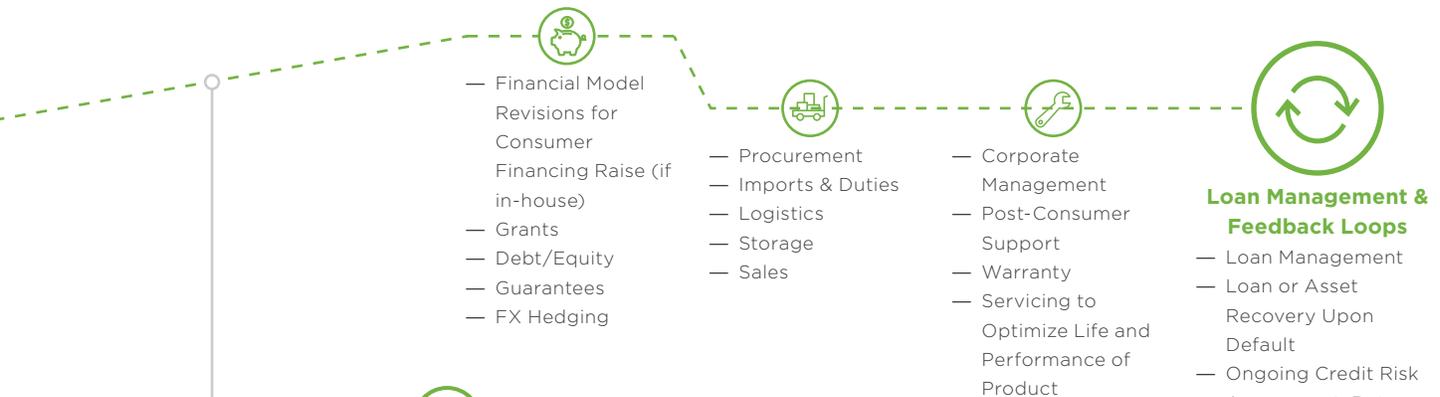
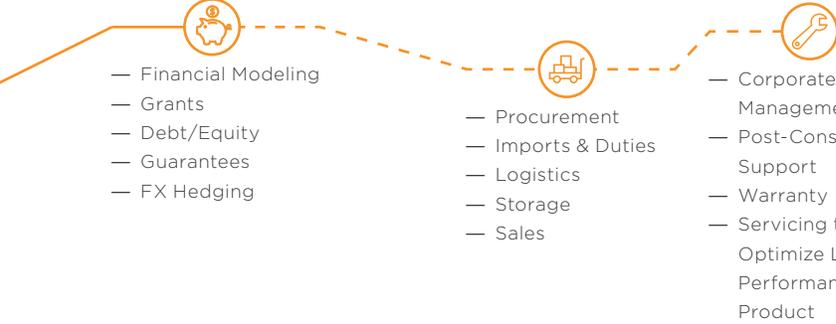
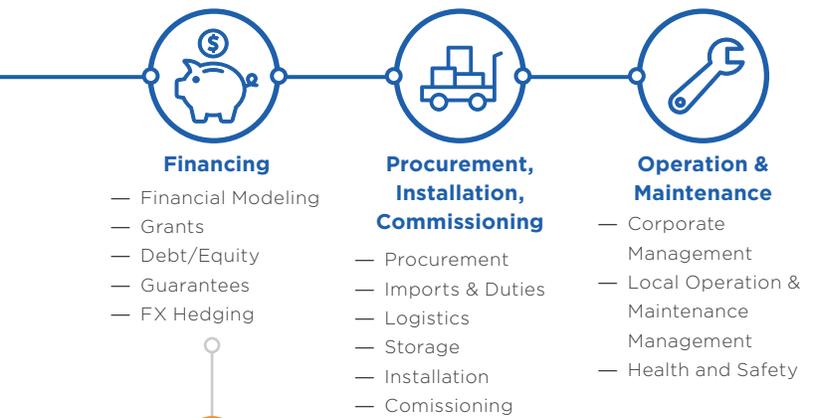
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Finding Process Alignment: Mini Grids, PUE/Appliances and Last Mile Financing/Distribution Business Models

Development Processes: ● Mini Grid ● PUE and Appliance ● Consumer Financing





Note: Often timing can be misaligned at this stage, requiring careful planning and coordination. Also, see 'Taming Strange Beasts' CGAP working paper for further breakdown of paygo models to understand key functions to address.

Appendix: Models for Productive Use of Energy and Appliance Integration

While the case focuses on consumer financing, there are many functions beyond consumer financing that must be considered in designing an optimum operational model. Here, we offer a general roadmap of the various business models that come into play in blending productive use with mini grids. In designing a model that will work and be properly financed and resourced, the relevant functions above must be considered. Which of the above would be included in your company's consumer financing in-house functions?

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