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SUPPORTING OFF-GRID SOLAR STARTUPS WITH FINANCIAL MODELING

12 LESSONS

CONTENT

ABBREVIATIONS & ACRONYMS

CGAP	Consultative Group to Assist the Poor
COGS	cost of goods sold
EBT	earnings before taxes
EUR	Euro
FX	foreign exchange
IFC	International Finance Corporation
KPI	key performance indicator
PAYGO	pay-as-you-go
P&L	profit and loss
VAT	value-added tax
USAID	United States Agency for International Development
USD	U.S. Dollar

INTRODUCTION

Building a pay-as-you-go (PAYGO) solar-energy business is both exciting and challenging, with each PAYGO business having to navigate complex operating environments and continuous fundraising processes. Applying a robust financial model to manage liquidity, analyze unit economics, and forecast finances makes the journey smoother and helps your business raise funds. Yet, financial models can seem complicated and difficult to create and understand. This is why USAID Power Africa and Persistent, Africa's Climate Venture Builder, developed a **financial-modeling tool** that is freely available to any aspiring or current PAYGO energy access company. The tool provides an industry benchmark model that can help especially early-stage entrepreneurs to better understand their path to profitability and financing needs.

The 12 key lessons we share in this document emerged from Persistent's decade-long experience helping startups in off-grid energy model their finances and its recent involvement in developing the financial-modeling tool with Power Africa. This report details these lessons, together with examples and clear explanations of what actions companies can take based on real-world experience. Although off-grid solar startups stand to benefit greatly from the lessons presented in this report, the insights on profitability are valuable also for more mature companies that want to scale. For example, sound unit economics will help a company of any size avoid scaling the wrong products, which will cause financial losses. This report is also helpful for readers who have invested or are planning to invest in PAYGO solar businesses, or who provide technical assistance and other support to companies operating in the solar-energy sector.

Power Africa aims to help companies make the right operational and funding choices so that they scale sustainably. We hope that the financial-modeling tool, the accompanying user guide, and this report will help demystify best practices in financial modeling for PAYGO businesses and guide you in using financial modeling to make business decisions and raise funds. We welcome feedback and questions on the tool and accompanying materials; please get in touch at a2f@powerafrica-offgrid.org.

MODELING LESSONS

1. Products: Not all products are born equal. Model the essential ones

What we saw

Almost all the startups we have worked with had five or more products they were selling or looking to sell. These products were typically solar home systems of different sizes packaged with different appliances. Most startups tried to build financial models reflecting all their product offerings. This is hard to do and, often, not worth doing. That is because not all products are essential to the financial success of your business.

What this means for you

Although investors may admire your business and the hard work you have done to build it, trying to model too many products can distract investors from your core strengths. You and a would-be investor will struggle to make sense of too many product assumptions. Rather focus on the key products, the ones that drive your financial performance. Investors often have limited time to spend on each company that comes to their attention. A focused financial model will help investors give your business the consideration it deserves.

What you should do

- Focus on your key products when building your financial model. These high-priority items comprise a combination of three to four products that account for much of your company's gross (or contribution) margin. Group the remaining products into one aggregated product. Power Africa's financial-modeling tool allows up to five products to be modeled, which keeps the business focused.
- One way to find out which products matter most is to prioritize them according to each product's unit economics and its intended sales volume. The Unit Economics tab in the Power Africa financial-modeling tool provides you with a way to model each product's unit economics (and you can use the formulas therein to see how to build your own models for each of your products). Once you have determined your unit economics, you can prioritize the products with a simple 2x2 table of the products' cumulative target sales versus their unit economics.

You can learn more about unit economics and its importance from the PAYGO Perform KPIs framework (www.findevgateway.org/paygo-perform-kpis), developed by the Consultative Group to Assist the Poor (CGAP), GOGLA, and International Finance Corporation (IFC) Lighting Global.

Let us illustrate

Figure 1 below shows a unit-economics map for an example company with ten products. Table 1 shows the cumulative U.S. dollar sales and unit contribution for each of its ten products.

The map in the first figure suggests that the key products driving the business' profitability are product numbers 10, 1, 5, and 6. These key products should be modeled individually in the financial model. Together, they account for about 65 percent of the total dollar contribution margins (see Table 1). The remaining products can be aggregated into one product for the purpose of modeling.

Figure 1: Product prioritization:
Cumulative sales per product versus contribution margin per product

Table 1: Example of products' unit contributions, cumulative $ sales, and share of cumulative $ contribution

	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
Unit contribution margin (%)	63%	40%	22%	34%	56%	50%	45%	30%	15%	72%
Targeted, 5 years, cumulative sales ($ '000)	$1,000	$1,100	$900	$1,500	$1,800	$1,700	$1,000	$1,080	$1,250	$2,000
Total contribution margin ($ '000)	$626	$438	$202	$510	$1,003	$843	$449	$321	$186	$1,438
Share of cumulative contribution margin	10%	7%	3%	8%	17%	14%	7%	5%	3%	24%

2. Revenues: Do not ignore collection rates. They are critical to modeling and understanding your cash revenues

What we saw

Almost all the startups we have worked with did not model collection rates in their financial models. The collection rate is the share of the expected customer receivables payments that the company collected. It is never 100 percent: No PAYGO business collects all the customer receivables payments that were due, as some customers will invariably delay payments or cease to pay altogether.

What this means for you

Disregarding collection rates in financial models implies you assume it will be 100 percent. Doing so will result in your model overestimating your business' forecasted cash inflow. This, in turn, can lead you to underestimate your business' funding needs, given you are assuming more cash will be generated from operations than is likely. In practical terms, from an equity perspective, you might understate your funding need by thinking more money will come in than is realistic. Similarly, in terms of debt, having overestimated your cash inflow, you might seek more debt than you actually need. Most investors would want to know that you track collection rates and will assess if your model reflects how collection rates affect your cashflow.

Let us illustrate

In January 2022, MyPayGo Corporation, a fictional solar PAYGO company, sold a solar PAYGO system to Mary. The contract value is $270. Mary paid a $30 deposit upfront in January 2022. Starting in February 2022, she will pay the balance over the next 24 months, i.e., $10 each month. Ignoring collection rates in its financial model, MyPayGo expects and budgets a cash revenue of $140 in 2022 (from the $30 deposit and 11 payments of $10 each). See the table below.

Table 2 : Impact of collection rate on expected cash inflow

	TYPICAL APPROACH	BETTER APPROACH
Contract value	$270	$270
Down payment	$30	$30
Contract balance	$240	$240
Contract length (months)	24	24
# Months payments in 2022	11	11
Expected monthly payment	$10	$10
# Customers	1	1
Collection rate	100%	80%
Expected cash collected in 2022	$140	$118
Expected collection gap (value) in 2022	$22	$0
Expected collection gap (%)	0%	16%

However, during the year, Mary, on average and not uncommonly, paid only 80 percent of the payments she was expected to make. So, MyPayGo Corporation ended up with only $118 in cash (a $30 deposit and 80 percent of the $110 it expected). That is a 16 percent shortfall ($22 as a share of $140).

Although this shortfall may seem insignificant, imagine that what is true for Mary is true for 10,000 customers. For an active customer base of 10,000 customers, it would mean MyPayGo Corporation overestimated its first-year cash inflow by $220,000. If the company had gone on to raise equity for its operations over the next 12 months, it would likely have underestimated its funding request by $220,000. On the other hand, if the company were raising funds for debt, it would assume it could take on more debt than is commensurate with its actual cash inflow.

What you should do

When it comes to building a financial model for your business, modeling the collection rate is especially important. As shown above, it has a significant impact on your cash inflow estimation, and so you should be sure not to ignore it. Estimate your collection based on past performance, then use the collection rate in your model to calibrate the cash you expect to collect in receivables in a certain period.

You can learn more about collection rate and otehr key metrics from the PAYGO Perform KPIs framework (www.findevgateway.org/paygo-perform-kpis). This resource defines collection rate and provides a tool (www.cgap.org/research/data/paygo-perform-data-collection-tool) to calculate several metrics.

3. Costs: Beware, input VAT is not a COGS!

What we saw

Most of the companies we have worked with reported their COGS (cost of goods sold) inclusive of input VAT.

- A product's COGS refers to what it costs your business to buy the product, ship it to the destination country, pay for customs, clear it through customs, and transport it from the clearance point to a local warehouse.
- VAT (value-added tax) is a tax that many governments collect from businesses on the value the business creates by buying and selling a product.
- You should distinguish between input VAT and output VAT. You pay VAT on the product you purchase for your business (called input VAT). You charge VAT on the product you sell to the customer (called output VAT). To find your net VAT, subtract output VAT (VAT you collected from customers on behalf of the government) from input VAT (VAT you paid on the product when you bought it).

What this means for you

The net effect of conflating VAT into your COGS is to understate your earnings before taxes (EBT). This, in turn, understates your tax liabilities, which could get you into trouble with tax authorities as you would have budgeted for a lower level of corporate tax than you should. COGS is tax-deductible, VAT is not. Bundling input VAT into your COGS effectively means that you are making VAT tax-deductible, which is not correct. Consult a tax specialist to ensure that you are correctly accounting for VAT separate from COGS.

Let us illustrate

Suppose MyPayGo Corporation had bought the product sold to Mary at a COGS of $100. Suppose, also, that the input VAT rate is 20 percent. For simplicity, let us assume VAT applies to the whole $100.

Table 3: Impact of including input VAT in COGS

COGS	$100
Input VAT	20%
COGS inclusive of VAT	$120
Decrease EBT	$20
Corporate Tax rate	30%
Decrease in taxes	$6

Reporting COGS as $120 (120 percent*$100) would understate your EBT by $20. Assuming the company's tax rate was 30 percent, MyPayGo Corporation would have paid $6 less in corporate taxes ($20*30%) because of combining input VAT and COGS.

Combining VAT and COGS means that the $20 in input VAT that the company paid was recouped as $14 in direct deductions and $6 in reduced taxes. However, VAT is not tax-deductible.

What you should do

- Do not add input VAT to COGS. Track it separately. The Power Africa financial-modeling tool does that: It clearly separates COGS and the associated input VAT to avoid the kind of conflation we discuss above.

- Note that the lesson above deals with input VAT. For output VAT, you should consult a tax accountant on how properly to calculate, collect, and deduct what needs to go to the tax authorities.

- If your business calculates the value of PAYGO contracts and monthly contractual payments from customers as pre-output VAT, then Power Africa's financial-modeling tool will help you estimate your amount of input VAT. Estimating the cost of input VAT is important especially if PAYGO contract values and monthly contractual payments from customers are pre-output VAT, as is often the case. Whatever the case, you must make sure your financial model reflects the implications of both input and output VAT for your cashflow.

4. Costs: Customer churn is a cost. Really

What we saw

Almost all the companies we have worked with initially ignored customer churn in their financial models. Churn is the share of customers who either default (which may result in a repossessed product) or disappear with your goods (the product is lost). Unfortunately, all PAYGO businesses deal with these kinds of events.

What this means for you

By ignoring churn in your modeling, you are assuming the business faces no repossessions or lost products (refer to the Perform KPI framework for more on churn). Assuming zero churn means your business will lose none of its customers during their contractual repayment period for the product they bought on credit. As with assuming a 100 percent collection rate, assuming zero churn will overestimate your cash inflow. Overestimating your income could lead you to underestimate how much funding your business needs.

Let us illustrate

Assume MyPayGo Corporation started the year 2022 with a cohort of 1,000 customers, each with 24 months of contract payments left. Assuming a churn rate of zero, as almost all the companies we worked with did, will lead MyPayGo Corporation to believe that it will still be earning income from these 1,000 customers at the end of the year.

As the table below shows, even a modest monthly churn rate of one percent will result in 11 percent fewer active customers from that cohort at the end of the year than at the beginning of the year. All else being equal, that translates into 11 percent less revenue than MyPayGo Corporation planned.

Table 4: Impact of churn rate on the number of active customers

MONTHLY CHURN RATE	NUMBER OF CUSTOMERS AT YEAR END	SHARE OF CUSTOMERS LOST BY YEAR END
0.1%	988	1%
0.2%	976	2%
0.3%	965	4%
0.4%	953	5%
0.5%	942	6%
0.6%	930	7%
0.7%	919	8%
0.8%	908	9%
0.9%	897	10%
1.0%	886	11%
1.1%	876	12%
1.2%	865	13%
1.3%	855	15%
1.4%	844	16%
1.5%	834	17%
1.6%	824	18%
1.7%	814	19%
1.8%	804	20%
1.9%	794	21%
2.0%	785	22%

What you should do

Estimate your average monthly churn rate and build it into your model. With Power Africa's financial-modeling tool, you can estimate an average monthly churn rate. This should, ideally, be done for each of the two main types of churns: Repossessed items and lost items. One way to estimate overall churn is to:

- Note the number of new customers you sold to in the first month (or a specific month). Call this C1.
- At the end of the following month, record the number of these customers whose purchases have been either lost or repossessed. Call this number C2.
- Divide C2 by C1 to estimate your monthly churn rate.
- Repeat this process for each of the following 12 months, using the original C1. Then, calculate the average for 12 months. This 12-month average is a good estimate of your average monthly churn rate.
- As much as possible, you should aim to track and reflect each of the main churn types (repossessed items and lost items) correctly. To do this, limit C2 to the specific kind of customer churn. For example, to estimate the churn rate for repossessed items, limit C2 to customers whose purchase was repossessed.
- A final note: Churn due to lost items is a more costly kind of churn because the uncollected value is fully non-recoverable and you will have to write off the associated accounts receivable. In the case of repossession-based churn, you can recover a portion of the accounts receivable's value because the repossessed item is typically refurbished and redeployed to a new paying customer. The cost of the repossession itself is reflected in the Power Africa financial-modeling tool under Direct Cost of Sales.

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5. Financial statements: Cash is still king. So, have a cash-based P&L alongside the accrual P&L

What we saw

Few companies we have worked with had a cash profit and loss (P&L) statement from the outset, with an accrual P&L being more common. As a result, most companies tended to confuse the accrual revenue shown by the accrual P&L with cash that can cover operating expenses.

What this means for you

A cash P&L is an important tool for a PAYGO company to gain insight into its portfolio and cashflow. Moreover, net income in a cash P&L is a more realistic view of profitability than the net-income line in the accrual P&L.

What you should do

We highly recommend that you build and use a cash P&L alongside the accrual P&L. The Power Africa financial-modeling tool can generate both types of P&L statements for you. Use the model or learn how it is done therein and use it to build your own cash P&L.

Let us illustrate

Let us go back to MyPayGo Corporation. Remember that it sold a $270 solar PAYGO product to Mary in January 2022 on the following terms: $30 deposit at sale in January when she bought it, and $10 monthly payments over each of the next 24 months (starting in February 2022).

Assume Mary is MyPayGo Corporation's only sale in 2022 and that it expects her to make all her payments. Then the company's cash P&L will expect $140 in revenue for 2022 ($30 + $10*11). Its accrual P&L, on the other hand, will expect $270 in revenue for 2022.

Table 5: Accrual and cash P&L view of revenue

	ACCRUAL P&L REVENUE	CASH P&L REVENUE
2022 expected	$270	$140
2022 reported	$270	$130

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The cash-management perspective

- In terms of managing your cash, just reading the cash P&L budget and comparing it to the accrual P&L budget will quickly let management realize at least two things:
  - In 2022, revenue will at best contribute $140 in cash to the company's cash inflow. Management can then plan accordingly. For example, if the business' operating cash outflows (e.g., cash operating expenses like salaries and office rent) are more than $140, then it should seek other sources of cash (e.g., debt, equity, or grants) or revise its expected operating cashflow to see what cash expenses can be deferred or cut.
  - Both P&Ls will show that the company expects accounts receivable to increase by $130 (when it looks at the accrual balance sheet).

The portfolio-management perspective

- If Mary makes only ten of her expected 11 payments in 2022, the cash P&L actuals will report $130 in cash revenues for 2022. Comparing this amount to the cash P&L budget will reveal, all else being equal, that the company's collection rate for payments expected in 2022 is not 100 percent.
- It is easier to pick up this discrepancy by comparing the budget and actual cash P&L than doing so with the accrual P&L. Even with a collection rate of less than 100 percent, the budget and actual accrual P&L will still report a revenue of $270, which is not helpful for quickly gauging the company's portfolio health.

The net-income perspective

- The net income reported under the cash P&L is a more realistic view of the cash profitability of the business than the accrual P&L.
- This is because the revenue indicated by the cash P&L model ($140 in our example) is cash the business is likely to receive by the end of 2022. Conversely, the $270 revenue under the accrual P&L is what the company would have received if Mary had paid the full contract value upfront.
- All else equal, and after adjusting for COGS, direct cost of sales, and overheads, the eventual net income reported by the cash P&L is closer to the cash profitability of the business than the net income reported by the accrual P&L.

6. Financial statements: No balance sheet, no loan: The importance of a balance sheet for lending

What we saw

Only a few companies we have worked with had a balance sheet as part of their original financial model, even though they were attempting to raise external funding.

What this means for you

In addition to your P&L and cashflow-statement actuals and forecasts, equity and debt investors will ask to see your company's balance sheet. Without one, your chances of obtaining equity and debt investments are slim.

- Debt investors will often look at your balance sheet to determine if the business has enough equity to meet their leverage requirements (e.g., a minimum debt-to-equity ratio needed to fund the company's assets). Investors also want to get a sense of how much receivables or inventory cushion there is for their would-be debt investment in the event of a bankruptcy. The balance sheet allows investors to set and test debt covenants they might impose.

- For equity investors, especially growth- and late-stage equity investors, the balance sheet is a useful source of valuation information about your company's working capital, capital structure, and accumulated earnings evolution.

What you should do

As explained above, it is imperative to have a company balance sheet. The Power Africa financial-modeling tool generates a balance sheet for your company, based on data that you input. If you want to build your own, study how it is done in the Power Africa tool, then build yours through a similar method.

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7. Financing needs: Let your growth plans drive your financing opportunity, not the other way around

What we saw

Some of the financial models we have seen were driven by financing. This meant that the business owners first estimated how much funding they felt their business could raise, without basing the funding figure on potential sales. Then, the model would calculate the number of units that the business could purchase. This number would be used to represent sales and cascaded in the rest of the model.

What this means for you

A financing-driven model can project fewer sales than are actually possible and delay profitability, thus hampering your business' potential sales and financial performance.

Let us illustrate

- From a sales perspective, suppose MyPayGo Corporation has the realistic opportunity (real demand) to sell 1,000 units in 2022, but its model suggests it can sell only 200 units. The business estimated that it can afford 200 units from the funds it expects to raise. Investors looking at the model will assume that 200 units is all the company plans to or can sell in 2022. This is misleading because the real opportunity is 800 units more (1,000 units in total).

- From a financial-performance perspective, modeling 200 units versus 1,000 units as your expected sales might limit the funding you get and delay profitability.
    - An investor that can fund 1,000 units and is interested in funding MyPayGo Corporation will, based on the sales figure provided, underfund the company by about 80 percent of the funding the company needs to meet the market opportunity.
    - A likely knock-on effect is that the smaller revenue from selling 200 units versus 1,000 units will hamper the company's ability to turn a profit, which means that the company can cover a smaller share of overheads.

What you should do

- Focus on determining and modeling what you can sell, and not what you can buy with the money you think you can raise. Focus on identifying realistic opportunities, then building and communicating a strategy that compellingly demonstrates how you can meet the demand for your product. Your financial model, based on a realistic assessment of your market opportunity, should determine your funding needs. Do not do it the other way around.

- Note that we use the word "realistic" to refer to sales opportunity. A growth-driven model does not mean conjuring up impressive sales numbers as though access to funding is sufficient to enable good sales. No amount of funding will make up for a lack of a clear and executable sales and go-to-market strategy.

PROFITABILITY LESSONS

8. Dashboard: A financing-needs chart is more helpful than you think

What we saw

Most companies did not have a financing-needs chart. A financing-needs chart shows how your cumulative cash flow from operations and investing evolves over time. Power Africa's financial-modeling tool offers such a chart under the Dashboards tab.

What this means for you

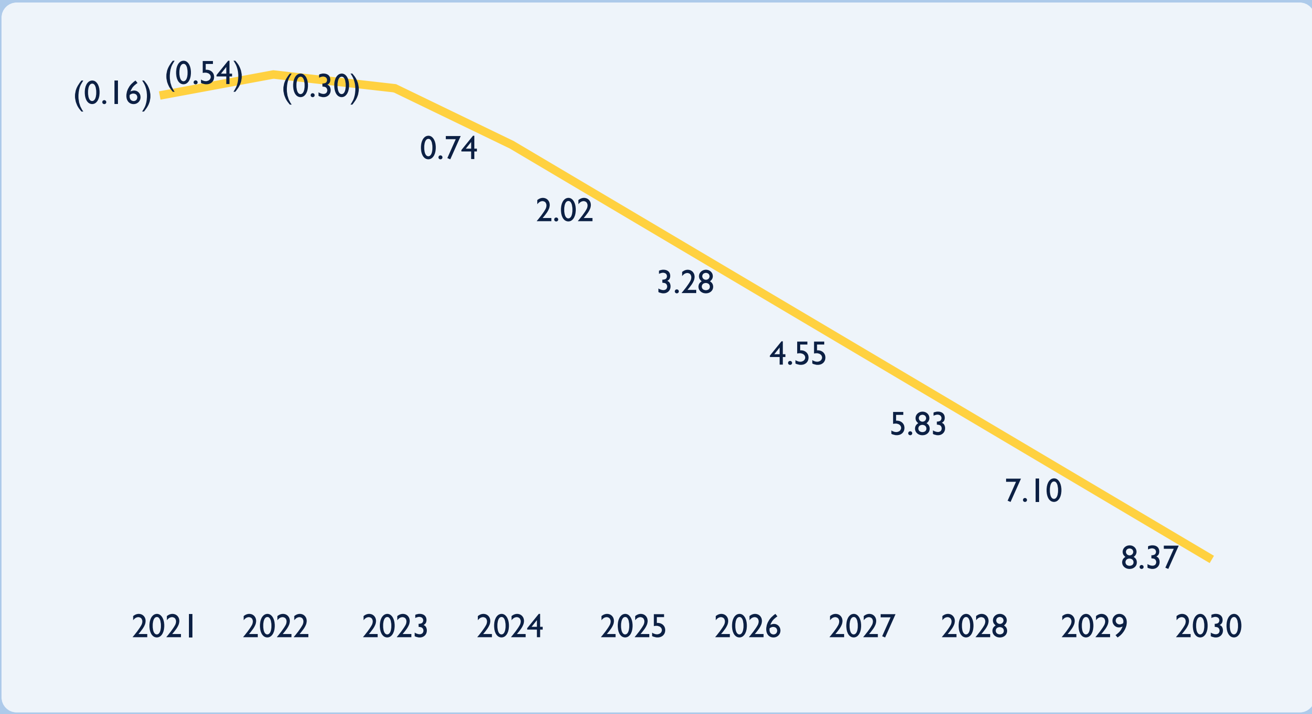
A financing-needs chart provides you with a rough estimate of your company's funding needs over time and a sense of how financially sustainable your business is. In terms of funding needs, a negative number at the end of any given year means:

- Your company will need funding to stay a going concern that year.
- The size of the negative number is roughly equal to the amount of funding your business needs to make it through that year. A positive number is a good thing: You have an end-of-year cash surplus. The year associated with the first positive figure is the year in which your business is forecasted to begin weaning itself off external financing. This is the year from which your business can sustain itself financially with its cash inflow.

Let us illustrate

- See figure 2 for MyPayGo Corporation below. The chart shows the company's cash-need before any external financing has been incorporated in the company's financial model. From the chart we learn:
    - o All else equal, MyPayGo Corporation will need about $600,000 in external funding, likely more if some of that funding is debt.
    - o The company will need the funding no later, and probably much sooner, than the end of 2022 (otherwise the company will not be a going concern).
    - o If the company gets all the funding it needs, starting in 2023, the company will generate enough cash from its sales to cover its operating and investing cash outflows. Put another way, MyPayGo Corporation is a business that has strong potential to become sustainable, meaning it can finance itself primarily (if it so choses) from its cash inflow. The sooner a company can sustain itself with its own cashflow, the better.
    - o If the company never generates a cash surplus, then the business is unlikely ever to generate enough cash from its sales to cover expenses for operations and investments.

Figure 2: Cumulative cash needed to finance growth (operations + investment cash flow, in $ millions)



What you should do

- If you are using the Power Africa financial-modeling tool, after you input your assumptions, check the financing-needs chart in the Dashboard tab. Do this to see if the business is financially sustainable. Financial sustainability occurs when the cumulative cashflow position switches from negative to positive within your projection window. If no such switch happens, revisit your key cost and revenue assumptions to see what needs rethinking. No investor will want to invest in a business that does not have a prospect of becoming sustainable. Hopefully, you can arrive at a set of reasonable sales-growth and associated costs and go-to-market assumptions that make for a sustainable business. If no such set of reasonable assumptions seems possible then, financially speaking, the business might not be attractive to investors.

- If you have your own financial model, study the way the Power Africa financial-modeling tool builds the financing-needs chart, then replicate one for your model.

- The size of the funding needed, and the time the business needs to "turn the corner" to sustainability, often reflect a tradeoff founders must make. This tradeoff is between investing in growth in the first few years (more funding needed) to earn potentially bigger profits much later, versus staying lean in the early years (less funding needed), which can increase the business' chance of becoming profitable sooner.

9. Profitability: Unit economics: Unbundle your costs and revenue to understand your unit profitability. It is painful but worth it

What we saw

For most companies, when it came to assessing their profitability, their focus was on overall corporate gross margins. Companies almost always overlooked their products' unit economics, a key building block of the company's gross margin. Companies neglected unit economics because they had not unbundled the sales and purchase costs associated with each of their products. Even for the few businesses that had done some work on unit economics, unit economics tended to be limited to the units' gross margin. The companies almost never considered the units' product contribution margins.

What this means for you

By focusing only on overall corporate gross margins, you overlook the fact that the gross-margin performance of the individual products drives your company's profit margin. Thus, understanding the gross margins for each product unit gives you insight into what is driving your company's overall gross margin performance.

Let us illustrate

MyPayGo Corporation sells two products. The table below shows the company's overall gross margin. It shows also the unit gross margin for each of its two products. The company has a great overall gross margin of 76 percent.

Table 6: MyPayGo Corporation's unit and corporate economics in 2022

	PRODUCT A	PRODUCT B	MYPAYGO CORPORATION
Unit sold (share of sales)	50 (83%)	10 (17%)	60
Unit price	$270	$4,000	$53,500
COGS	$100	$800	$13,000
Gross margin	$170	$3,200	$40,500
Gross margin %	63%	80%	76%
Direct cost of sales	$50	$2,000	$22,500
Contribution margin	$120	$1,200	$18,000
Contribution margin %	44%	30%	34%

Knowledge of its products' unit economics will help the company see that despite product B accounting for only about 17 percent of its unit sales, the product's high unit gross margin (as a percentage and in dollar value) is a key driver of the company's high gross margin of 76 percent. The relative importance of product B can be inferred from how its 80 percent gross margin (versus product A's 63 percent gross margin) is closer to the company's total margin of 76 percent. Therefore, the company should pay close attention to product B as it is driving the company's profitability.

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- The company should also assess if the gross margins per unit make sense by asking:
    - Is the unit price (contract value) of each product achievable?
    - Will each product's COGS remain stable?
    - How realistic are the projected sales units for each product?
    - Could product prices be optimized?

- Even companies that analyzed their basic unit economics never went to the next level: Looking at unit contribution margin. In the case of MyPayGo Corporation, looking at contribution margins would have revealed product B's strong unit gross margin (as a percentage). However, its unit contribution margin (gross margin minus direct costs of sale like sales commission and installation and maintenance costs) is not as good. Its unit contribution margin is 30 percent (versus 44 percent for product A).

- Companies often miss the insight gained by comparing gross margins against contribution margins because they bundle direct cost of sales into a general sum for operating expenses and so exclude them from unit economic considerations. Calculating the direct cost of sales is often time consuming: It requires tracking costs in more granularity than most companies do.

- Knowing the unit contribution margins of various products can raise important questions about your company's profitability. Businesses often miss the following hard but necessary questions because of a narrow view of profitability and unit economics that companies often take:
    - Why does the direct cost of sales for product B represent a much larger share of revenue than those of product A?
    - Can product B's direct cost of sales be optimized?
    - Should the company invest more effort into product A instead?
    - Or should the company double down on product B, because, despite its low contribution margin percentage, its dollar contribution margin is still significant (67 percent or $12,000 out of the company's $18,000 in contribution)?
    - Could selling a certain mix of the products strengthen the sales of each product?

What you should do

- When assessing your margins, look beyond the company's overall gross margin. Inspect the gross margins per unit of the products your company sells. Unit economics will help you understand what is driving the gross margin, explain to your investors what is driving your financial performance, and identify opportunities to fine-tune your business strategy and pricing.

- Unbundle your products' direct costs of sales from general operating expenses. Doing this will help you expand your analyses of products' unit economics from just gross margin to contribution margin.

- Contribution margin is not the only type of margin to look at when it comes to assessing profitability. Additional ones you analyze are absolute margins and cost-of-capital-discounted present-value margins.

10. Profitability: Foreign exchange matters. Foreign exchange risks can be a hidden cost that can harm your profits

What we saw

Very few of the companies we have worked with modeled the effect of foreign exchange (FX) on their financial performance. Yet, most companies face FX risks. FX risk arises when the business' revenue currency (e.g., Kenyan shillings) differs from the currency it uses to pay for the goods it sold to customers (usually USD), and differs from the currency in which the company's debt was denominated (usually USD or EUR).

What this means for you

Not building FX risk into your company's financial performance amounts to assuming that your business is immune to local currency depreciations. This is never the case.

Let us illustrate

Let us go back to the scenario in Table 6 above. This time, we factor in a five percent depreciation in the local currency of MyPayGo Corporation's operating market. This means that relative to the scenario above, MyPayGo Corporation's unit prices are in effect five percent less in USD (the amount collected stays the same, but converts to a lower value in USD).

Table 7 shows the impact of a five percent depreciation of the local currency. It shows that this FX movement will shave two percent off the company's gross margin (from 76 percent to 74 percent), and two percent off its contribution margin (from 34 percent to 32 percent).

Table 7: MyPayGo Corporation's unit and corporate economics in 2022. This table assumes a five percent local-currency depreciation in 2022

	PRODUCT A	PRODUCT B	MYPAYGO CORPORATION
Unit sold (share of sales)	50 (83%)	10 (17%)	60
Unit price	$257	$3,810	$50,952
COGS	$100	$800	$13,000
Gross margin	$157	$3,010	$37,952
Gross margin %	61%	79%	74%
Direct cost of sales	$48	$1,905	$21,429
Contribution margin	$110	$1,105	$16,524
Contribution margin %	43%	29%	32%

This depreciation might seem small. However, imagine that this depreciation happens every year for the next five years. The second table shows MyPayGo Corporation five years later, all else being equal. The company's gross and contribution margins are down a further five percent. Because most investors expect stable or improving margins, every percentage point matters for your survival.

Table 8: MyPayGo Corporation's unit and corporate economics in 2026. This table assumes a five percent annual currency depreciation starting in 2022

	PRODUCT A	PRODUCT B	MYPAYGO CORPORATION
Unit sold (share of sales)	50 (83%)	10 (17%)	60
Unit price	$212	$3,134	$41,919
COGS	$100	$800	$13,000
Gross margin	$112	$2,334	$28,919
Gross margin %	53%	74%	69%
Direct cost of sales	$39	$1,567	$17,629
Contribution margin	$72	$767	$11,289
Contribution margin %	34%	24%	27%

What you should do

- Calculating your FX risk requires that you keep an eye on the historical exchange rates of the sales currency and your COGS currency to estimate future currency depreciations. Having done this, plan how to stem the anticipated FX-related reduction of your margins.
- Ways to mitigate FX risk are to raise prices (e.g., every two years), optimize COGS (e.g., negotiate price lock-ins with suppliers), and optimize direct cost of sales.

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11. Profitability: PAYGO systems are important. Unless your sales are cash-only, a PAYGO system can help you manage your portfolio profitably

What we saw

Many of the companies we have worked with did not have operational and financial PAYGO technology to track active customers' dues and payments. Yet, most of their sales were made on a PAYGO basis. This seems consistent with the fact, previously discussed, that just as most companies did not track or model their payment collection rates (see Lesson 2), most overlook tracking their finances with PAYGO technology. Most businesses stated that the cost of PAYGO systems prevented them from using one.

What this means for you

Not using a PAYGO system means you have a limited, if any, view into how a key portfolio metric like collection rate is faring over time. The alternative, tracking collection rates manually, can be time consuming and costly.

- Without systems that can easily track and report customer dues and payments, you miss insights into a key lever of cash inflows and portfolio management: Collection rates. Lesson 2 shows that investors care about cash flows. Debt investors want to know whether the business will, now and in the future, generate enough cashflow to service its debt comfortably. Equity investors want to know that the business will eventually generate enough levered cashflow for them to earn dividends or for other investors to buy them out. Furthermore, good PAYGO systems will help you know which customers to follow up with. Not having a good PAYGO system undergirding your business can reduce the credibility of your financial-sustainability narrative that you share with debt and equity investors.

- In the early days of your company (e.g., within the first year), you might be able to manage your portfolio and KPIs manually by using a spreadsheet. However, as your company grows, it will become very laborious to do so. Even with only 500 active customers, a worker spending just five minutes entering each customer's information into a spreadsheet will take more than 40 hours, equivalent to a full-time job. If your business serves 5,000 active customers, you would need ten full-time jobs focused only on data entry.

What you should do

- If you do not already have one, invest in a PAYGO system to track your customers' dues and payments. Analyze the cost of sticking to manual data-entry, building a PAYGO system in-house, or signing up for an off-the-shelf system like Angaza, paygOps, or Upya. What you should not do is assume the status quo is best.

- A good PAYGO system will save your company precious time and money and prepare you to answer investors' questions about your portfolio when you are raising funds. Finally, make sure the figures reflected in your financial model (e.g., collection rates) are consistent with what your electronic systems (PAYGO and otherwise) are telling you. Discrepancies between financial models and PAYGO data are often a sticking point when investors perform due diligence.

12. Profitability: Research and define your market

What we saw

Most of the companies we have worked with did not contextualize their sales figures within the market where they intended to operate.

What this means for you

If you do not research your market, you may overstate or understate your potential sales. If you are looking to raise funds, then you should credibly demonstrate to investors what kinds of sales volumes are possible in the market you serve. Market research can increase your business performance and will strengthen your credibility with investors.

Let us illustrate

MyPayGo Corporation markets product A to individuals living without electricity. MyPayGo Corporation plans to sell 50 units of product A in 2022. Table 9 below is what we often see: With product A, the company aims to reach 0.25 percent of its target market segment.

Table 9: MyPayGo Corporation's market penetration in 2022

Population of MyPayGo Corporation's main market	40,000
Share with access to electricity	50%
Population without access to electricity	20,000
2022 target	50
Implied market penetration	0.25%

- A closer look at MyPayGo Corporation's markets, products, and customers suggests that it is more likely that the purchase is made at a household level than at the individual level. Thus, the appropriate market segment is actually households, not individuals. As a result, MyPayGo Corporation can refine the market opportunity by assuming an average household of four people.

- Table 10 shows the adjusted market size. The sales target of 50 units now represents one percent market penetration, a fourfold increase over the prior assumption. Knowing the realities of your market can help refine your company's go-to-market strategy by, for example, letting you rethink your products' positioning and your sales force's incentives. These refinements will help you tell a more credible story about your business' ambition and potential.

Table 10: MyPayGo Corporation's updated market penetration in 2022

Population of MyPayGo Corporation's main market	40,000
Average household size	4
Implied number of households	10,000
Share with access to electricity	50%
Households without access to electricity	5,000
2022 target	50
Implied market penetration	1%
Increase in market penetration over prior assumption	4x

What you should do

Put your numbers in context, especially sales numbers—a pillar of your business—and adjust your market strategy accordingly. Your investors will always stress-test your numbers. If you have done this yourself, you show investors that you are forward-thinking.

Power Africa aims to achieve 30,000 megawatts of new generated power, create 60 million new electrical connections, and reach 300 million Africans by 2030.

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