

EVI-SICEE-RESEARCH BRIEF-12

Financing Energy Access

What drives PAYGo adoption among small clean-energy enterprises in Malawi?

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CORE MESSAGE

Pay As You Go (PAYGo) adoption is associated more strongly with continuing access to liquidity and organisational capacity than with starting capital or formal human capital.

Key findings

70.40%	of enterprises relied primarily on cash sales; only 22.4% used PAYGo or instalments.
+17.2 pp	Access to external finance was associated with a 17.2 percentage-point higher probability of using PAYGo.
+9.3 pp	Membership in a group or cooperative was associated with greater PAYGo adoption.
-29.1 pp	Clean-cooking enterprises were markedly less likely to use PAYGo than enterprises in the omitted sector category.

Evidence from the Informing Optimization and Scaling of Youth and Women-Led Clean Energy Enterprises (EVI-SICEE) project supports the findings presented in this brief. The project is a multi-country initiative implemented by the African Centre for Technology Studies (ACTS) in partnership with Mzuzu University and other partners and supported by the International Development Research Centre (IDRC). The project seeks to understand and address systemic barriers facing women and youth entrepreneurs in the clean energy sector across Malawi among other countries. The evidence from Malawi points to a practical financing chain: low-income customers need flexible payment arrangements, but the small enterprises offering those arrangements also need reliable working capital to carry customer receivables.

Why this research matters

Many low-income customers cannot pay the full upfront cost of solar and clean-cooking technologies. PAYGo and instalment sales can ease this affordability barrier by spreading payments over time. For the enterprise, however, flexible payment creates a working-capital commitment because the seller releases the product before receiving the full purchase price and must carry a customer receivable. Most PAYGo research has focused on households or large distributors. This study shifts attention to micro and small enterprises and asks whether consumer-financing adoption is associated primarily with liquidity, human capital, organisational capacity, technology or location.

Study design

Data source	Clean Energy Enterprises Survey under the Women's and Youth Entrepreneurship for Clean Energy Ecosystems in Malawi project
Coverage	17 districts across Malawi's Northern, Central and Southern regions
Analytic sample	860 enterprises
Payment regimes	Cash sale; PAYGo/instalment; deferred payment
Method	Multinomial logit regression
Reporting	Average marginal effects expressed as percentage-point changes in predicted probability

Note: The estimation sample was formed after excluding payment arrangements that were too rare or conceptually distinct for the three-category model and observations without starting-capital information. The final sample contained 605 cash-sale enterprises, 193 PAYGo/instalment enterprises and 62 deferred-payment enterprises.

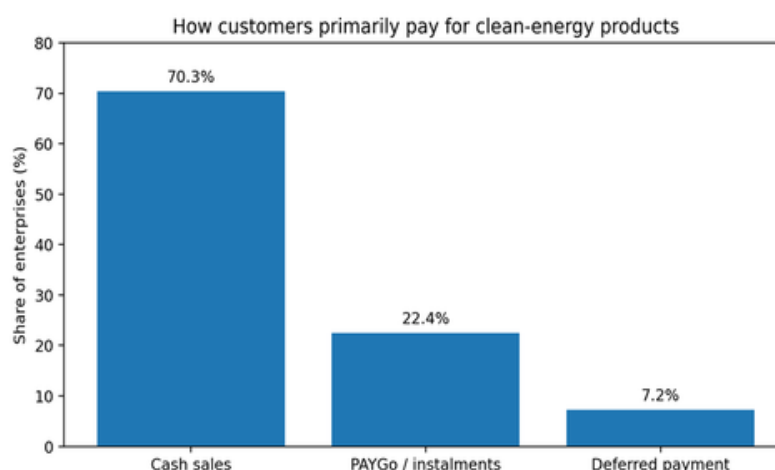


Figure 1. Primary customer payment regime among the 860 enterprises.
Source: authors' calculations from the Clean Energy Enterprises Survey.

What the evidence shows

The clearest result concerns external finance. Enterprises using external capital were 17.7 percentage points less likely to depend on cash sales and 17.2 points more likely to use PAYGo. The association with deferred payment was small and not statistically significant, while starting capital was insignificant across all three regimes. This suggests that the ability to finance an ongoing portfolio of customer receivables is more relevant to PAYGo adoption than the amount of capital available when the enterprise was established.

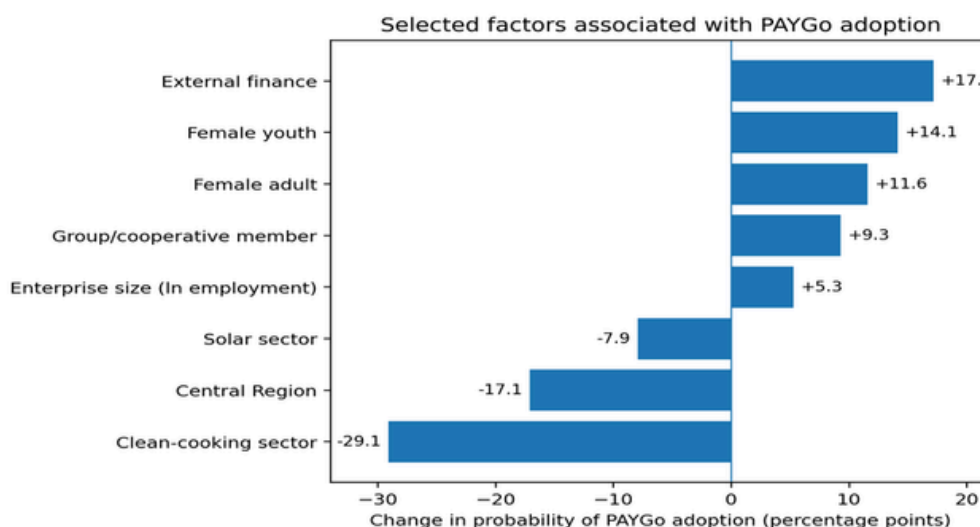


Figure 2. Selected statistically significant average marginal effects on the probability of using PAYGo/instalments. "Enterprise size" is measured as log employment. Sector and regional effects are relative to the model's omitted categories.

Organisational capacity also matters

- Group or cooperative membership was associated with a 9.3 percentage-point increase in PAYGo adoption and an 11.5-point reduction in cash sales.
- Larger enterprises were more likely to use PAYGo: a one-unit increase in logged employment was associated with a 5.3 percentage-point increase in PAYGo probability.
- Older enterprises were more cash-oriented and less likely to use PAYGo, although the study does not establish a causal explanation for this pattern.

Formal human capital was not the main dividing line

Academic attainment and technical or vocational training were not significantly associated with PAYGo. This does not imply that skills are unimportant for enterprise performance; rather, formal human-capital measures did not distinguish PAYGo adopters from cash-sale enterprises once other characteristics were taken into account.

Technology, gender and geography shape adoption

Technology differences are substantial

Clean-cooking enterprises were 34.2 percentage points more likely to rely on cash sales and 29.1 points less likely to use PAYGo than enterprises in the omitted sector category. Solar enterprises were also more cash-oriented, although the corresponding PAYGo reduction was smaller at 7.9 points. These patterns indicate that consumer-financing models cannot be assumed to transfer uniformly across technologies.

The paper interprets these differences in light of product value, repayment duration, collection costs and enforcement technology. Solar systems may benefit from digital payment tracking and remote-locking capabilities, whereas many clean-cooking products have lower unit values and weaker technological enforcement. The dataset does not directly measure product prices, collection costs or enforcement mechanisms, so these channels remain plausible interpretations rather than tested causal mechanisms.

Women-led enterprises show greater PAYGo adoption

Compared with male-adult-led enterprises, female-youth-led enterprises were 14.1 percentage points more likely to use PAYGo, while female-adult-led enterprises were 11.6 points more likely. These results challenge a purely deficit-based view of women entrepreneurs as passive recipients of support. In this sample, women-led enterprises were comparatively active adopters of structured affordability mechanisms, even though women entrepreneurs are widely recognised as facing financing constraints.

Location strongly conditions payment models

Regional differences were among the largest effects in the model. Relative to Northern Malawi, enterprises in the Central Region were 17.1 percentage points less likely to use PAYGo and 30.1 points less likely to use deferred payment. Southern enterprises were 37.2 points less likely to use deferred payment, while their PAYGo difference was not statistically significant.

The model cannot identify the source of these regional gaps. The paper therefore treats possible explanations such as mobile-money penetration, distributor networks, purchasing power, market maturity and local financial infrastructure as hypotheses for further investigation, not established mechanisms.

PAYGo and deferred payment are not the same

PAYGo was associated with external finance, networks, enterprise scale and entrepreneur characteristics. Deferred payment, in contrast, was differentiated more by technology, licensing, premises and geography. Combining both into a single “consumer credit” category would therefore conceal meaningful differences in the financing, monitoring and enforcement requirements of the two models.

What this study contributes

The study extends Trade Credit Theory to decentralised clean-energy markets by showing how small non-financial enterprises can act as liquidity intermediaries. Enterprises obtain finance upstream and, through PAYGo or instalment sales, effectively pass liquidity downstream to customers who cannot afford full upfront payment.

- It distinguishes initial resource endowment from continuing financing capacity: starting capital was not associated with payment-regime choice, whereas current access to external finance strongly differentiated PAYGo adopters.
- It shows that seller-provided credit is heterogeneous. PAYGo and deferred payment have different empirical correlates and should not be treated as interchangeable.
- It highlights technology and place as central features of the economics of consumer financing, rather than treating payment models as universally transferable business practices.

Implications for programmes and practice

- Working-capital support should be treated as a core component of PAYGo expansion among micro and small clean-energy enterprises. Credit guarantees, revolving facilities and receivables financing are more closely aligned with the observed liquidity constraint than one-off start-up support alone.
- Enterprise associations and cooperatives may be useful delivery channels because network membership is positively associated with PAYGo adoption and can potentially support finance, supplier linkages, information and payment management.
- Training should complement rather than substitute for finance. Credit management, bookkeeping and repayment-monitoring skills are likely to be more effective when enterprises also have the liquidity required to carry customer receivables.
- Technology-specific approaches are needed. The strong negative PAYGo association for clean-cooking enterprises suggests that financing models developed for off-grid solar may require adaptation before they are transferred to clean-cooking markets.
- Women-led enterprises should be supported as active innovators in consumer financing, not framed only as financially constrained beneficiaries.

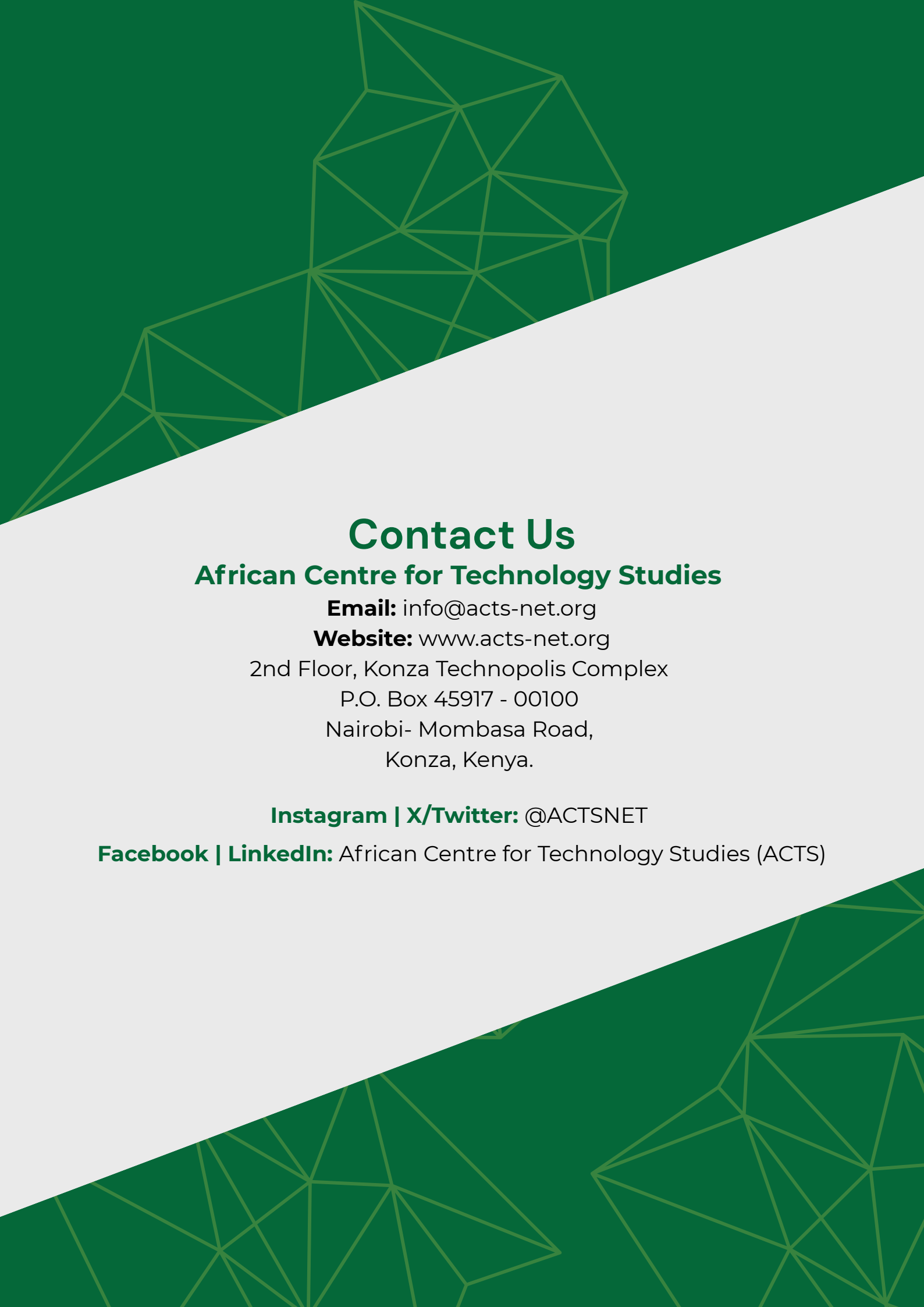
Limits and next research questions

The results are associational rather than causal. Longitudinal or quasi-experimental research is needed to determine whether finance enables PAYGo adoption or whether PAYGo enterprises are more likely to attract finance. Future work should also disaggregate external finance by source, directly measure product prices and repayment costs, and investigate why gender and regional differences are so pronounced.

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Interpretation note: Average marginal effects describe associations in predicted probabilities after controlling for the other variables in the multinomial logit model. They should not be interpreted as causal effects.



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