

GREENBAY PILOT: FINAL LEARNINGS REPORT



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ABBREVIATIONS

KES	Kenya Shillings
W	Watts
km/h	Kilometers per Hour

EXECUTIVE SUMMARY

Between March 2024 and April 2025, Delta40 piloted a new venture called GreenBay to scale the sales of certified second-life appliances in Kenya. With support from CLASP, we tested digital procurement, pricing, and sales innovations targeting low- to middle-income households and SME retailers.

Over the 7-month pilot, GreenBay achieved:

- 413 second-life appliances sold
- KES 7.2M Kes (\$57.6K) in total revenue
- Over 11 metric tons of electronic waste diverted from landfills
- Strong proof-of-demand for B2B resale and consumer trade-in procurement models

This pilot lays the groundwork for GreenBay's vision of a trusted, digital-first marketplace for quality-assured, climate-smart second-life appliances in Africa.

OBJECTIVES AND SCOPE OF WORK

CLASP's support enabled GreenBay to implement these key activities:

TASK 1: LANDSCAPE ASSESSMENT & STAKEHOLDER MAPPING

Status: Completed (March–May 2024)

Lead: Delta40

- Conducted extensive mapping of second-life product stakeholders across Nairobi:
- Identified 50+ secondhand sellers, B2B retailers, scrap dealers, and informal repairers.
- Interviewed 30+ low- and middle-income customers to understand appliance access gaps and purchase behavior.
- Segmented the market by product category (fridges, TVs, cookers, solar home systems) and buyer type (retailers vs. end-users).
- Benchmarked gross margins across categories:
- 15–65% for certified B2C appliances.
- <10% for discounted B2B bulk resale.
- Held partnership meetings with OEMs (Opalnet, Hotpoint), platforms (Jumia, Kilimall), and service centers to explore takeback and resale models.
- Mapped key customer pain points: trust, lack of warranties, poor after-sales support, and limited financing options.

TASK 2: PROCUREMENT, EVALUATION & CERTIFICATION

Status: Complete (April–August 2024)

Lead: Delta40 (with CLASP co-development)

- Procured 100+ appliances across test categories from individuals, OEMs, Jumia forfeited stock, and B2B retailers.
- Developed and piloted SOPs for:
 - Product intake, evaluation, and grading (Grade A, B, C).
 - Certification tags (attached to certified products sold).
 - Repair and cleaning protocols.
- Partnered with CLASP to refine condition scoring standards.
- Co-developed internal metrics to track product accessibility, energy efficiency, and affordability improvements.

TASK 3: RESALE ON EXISTING PLATFORMS

Status: Completed (May–September 2024)

Lead: Delta40

- Created a basic 1-page GreenBay microsite to build early trust.
- Listed certified second-life appliances on:
 - Facebook Marketplace
 - Jiji
 - WhatsApp Business with catalogue + video demo integration
 - Instagram (via Green Bay’s official handle)
- Collected buyer feedback through structured interviews (15+).
- Key insights:
 - Video demos and “Certified by GreenBay” tags boosted B2C trust.
 - B2B buyers prioritized discounted “as-is” appliances with light testing.
 - Customers were willing to pay a small premium (10–15%) for appliances with warranty coverage.

TASK 4: RECYCLING STRATEGY & CIRCULARITY PARTNERSHIPS

Status: Completed (June–September 2024)

Lead: Delta40

- Conducted recycling market mapping:
- Engaged e-waste recyclers, scrap dealers, and plastic/metal resellers.
- Identified lack of capacity for large-scale solar panel or battery recycling.
- Held exploratory talks with local recyclers (e.g., WEEE Centre, Ecocycle) on integrating formal takeback pathways.
- Piloted safe disposal of unusable product parts and explored resale of functional components (e.g., compressors, thermostats).

TASK 5: MVP PLATFORM DEVELOPMENT

Status: Completed (August 2024–January 2025)

Lead: GreenBay with Delta40 Support

- Built Shopify-based MVP marketplace with “Certified” and “As-Is” inventory categories.
- Enabled product search, trade-in initiation, video demos, and digital consent flows.
- Integrated with Kilimall for warehousing and delivery-as-a-service.
- In progress: customer cohort tracking and CRM integration.

TASK 6: A/B PRICING & FINANCING EXPERIMENTATION

Status: Completed September 2024–January 2025) | Lead: GreenBay & Delta40

- Designed A/B tests for B2C vs. B2B pricing, warranty pricing, and instalment plans.
- Partner with Koolboks for early PAYGO feasibility on refurbished appliances.
- Tracking the cost of acquisition, conversion rates, and repeat purchase signals.

TASK 7: FINAL LEARNING REPORT & SCALE-UP PROPOSAL

Status: Completed (Due February 2025) | Lead: Delta40 with GreenBay

- Synthesize results from 6 tasks into a final report.
- Include learning on certification SOPs, resale traction, pricing tests, and recycling.
- Outline scale-up proposal with costs, margin improvement strategies, and ecosystem gaps.



Solar panel on top of a household in
Rwanda
Photo credit: CLASP

KEY LEARNINGS ON COMMERCIAL STRATEGY

Over the course of the pilot, the following insights emerged about the potential for the GreenBay model:

A. Consumer vs. B2b demand: During the pilot, B2B sales accounted for approximately 80% of total units sold, primarily driven by secondhand appliance and electronics retailers concentrated in Nairobi's informal markets. These buyers prioritized bulk purchases at discounted rates, often accepting minor defects without requiring full certification. In contrast, consumer demand showed stronger conversion when appliances were cleaned, certified, and bundled with short-term warranties. Trust and purchase intent were notably higher when video demos were shared via WhatsApp or Instagram, with customers responding well to clear visual proof of functionality and transparency on defects. These insights suggest that while B2B offers scale, the D2C opportunity is highly viable—especially when supported by quality assurance, digital engagement, and flexible delivery.

B. Inventory sourcing strategy: The pilot confirmed that major appliance distributors like Hotpoint, Opalnet (LG), and Jumia are dependable sources of returned, scratched, dented, or defective inventory. These partners frequently manage overstocks and customer returns that are unsuitable for retail but ideal for refurbishment and resale. GreenBay also tested a consumer trade-in program, which, while modest in volume during the pilot, demonstrated strong potential when combined with digital submission, technician-led pickup, and store credit incentives. However, the manual nature of current trade-in processing limited scalability and margin capture. The team also identified batch processing as a key operational lever to improve refurbishment efficiency, reduce variability in product condition, and lower average repair costs through consolidated technician workflows.

C. Margin vs. Volume trade-off: Pilot data highlighted a clear tension between margin and volume. In early months like January and February 2025, low sales volumes were offset by high gross margins, driven by premium-priced, certified units sold directly to consumers. These appliances benefited from visual quality grading, warranties, and digital marketing. As the business pivoted to B2B in March and April 2025, unit volumes increased sharply, but gross margins fell due to bulk discounting and minimal value-added services. On average, consumer-certified units delivered gross margins of 15–65%, while B2B sales to retailers yielded margins below 10%. This trade-off indicates that future margin resilience will depend on inventory segmentation, with D2C channels focusing on refurbished certified stock and B2B channels handling lower-grade or unprocessed inventory at scale.

D. Value proposition for household appliance vs. Solar & ev manufacturers and distributors: GreenBay was initially conceptualized as a digital marketplace for energy-efficient household appliances, solar products, and electric two-wheelers. However, during the pilot phase, the platform gained far greater traction in the household appliance segment compared to solar or electric mobility products. This was driven by several structural and market-specific factors. In addition to sourcing inventory from partners like Jumia, Hotpoint, and Opalnet, GreenBay also launched a consumer trade-in program, enabling customers to exchange used appliances for credit toward new or refurbished items. These trade-ins were then refurbished and resold through the platform, creating a steady supply of pre-owned inventory and deepening customer engagement through circular transactions.

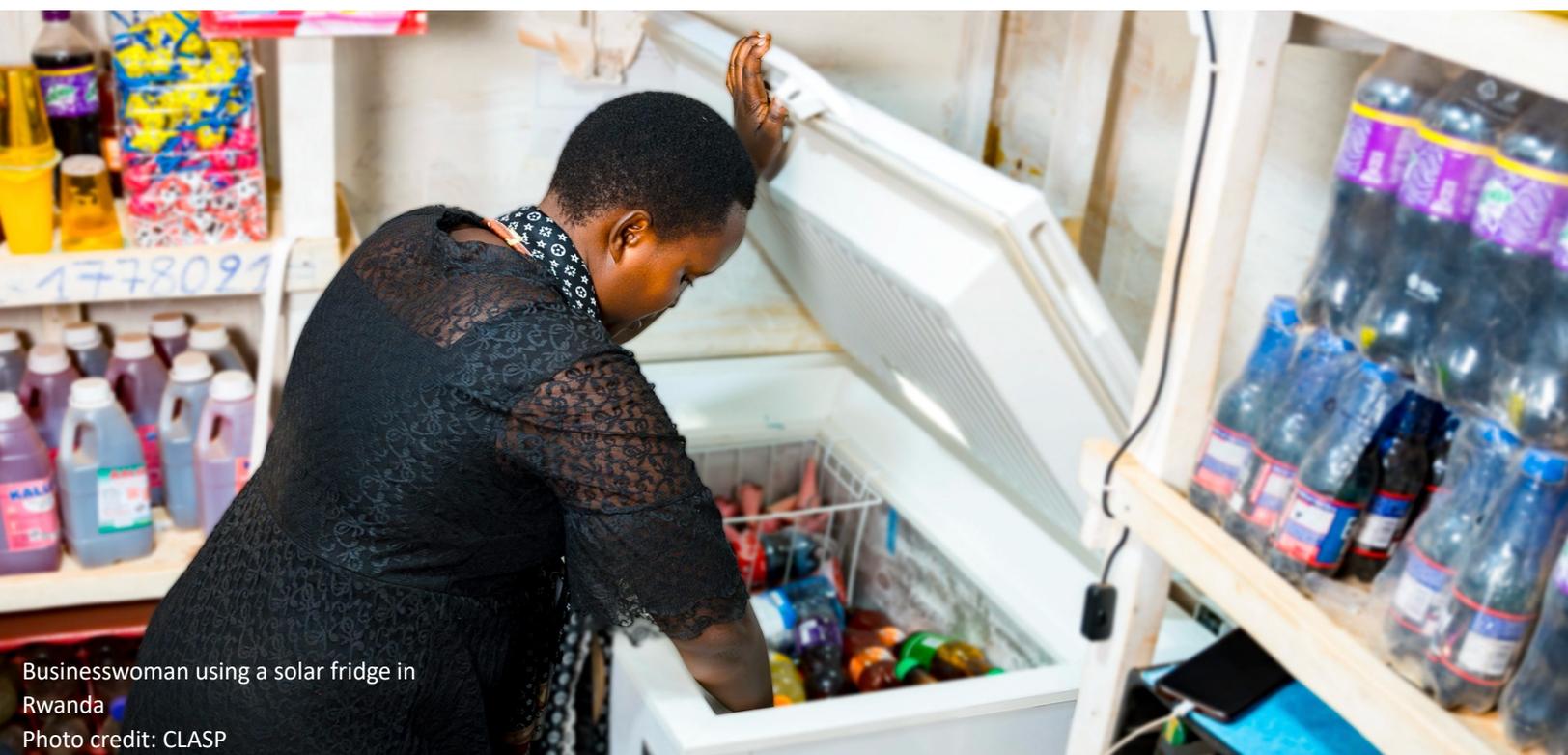
First, the household appliance market in Kenya is relatively mature, with established brands such as Hotpoint, Opalnet (LG), and Jumia frequently managing returns, damaged packaging, repossessed items, or end-of-line inventory. These partners see strong value in offloading non-retailable but functional stock via a certified resale channel like GreenBay, which was previously missing in the market. In contrast, solar and EV categories remain emerging sectors in Kenya, with underdeveloped resale ecosystems and reverse logistics.

Second, solar panels typically have a lifespan of 20–25 years and come with long warranties, which limits the short-term availability of second-hand inventory. The few second-life solar products that do circulate—such as inverters and batteries—are often used for end-of-life and require costly retrofitting to restore performance, often without guarantees of reliability. Additionally, safety concerns and degradation issues in battery storage make resale difficult without proper diagnostic and testing infrastructure.

Third, spare parts for appliances like refrigerators, cookers, microwaves, and washing machines are readily available in local markets such as Eastleigh and River Road. This allows local technicians to refurbish and restore slightly damaged products at relatively low cost. On the other hand, solar and EV companies often rely on proprietary parts sourced from China or India, making repairs costly and slow. As a result, returned units in these sectors are more commonly cannibalized for spare parts, particularly batteries and controllers, rather than refurbished for resale.

CONCLUSION: WHY APPLIANCES WIN (FOR NOW)

GreenBay's early traction in the appliance segment has been driven by more abundant pre-owned inventory, lower refurbishment costs, broader availability of parts, and higher consumer familiarity and trust in the resale of household goods. While the second-life market for solar and EVs may expand in the future, particularly with advancements in battery testing, modular systems, and circular financing, household appliances currently offer stronger unit economics, easier refurbishment pathways, and more immediate impact potential within Kenya's circular economy landscape.



Businesswoman using a solar fridge in Rwanda
Photo credit: CLASP

TRADE-IN MODEL INSIGHTS

A critical component of this pilot was the experimentation and refinement of GreenBay's consumer trade-in model, which emerged as a high-potential supply-side innovation to unlock circularity at scale. While trade-in volumes were modest during the pilot phase, the channel showed strong economic and strategic promise. Specifically:

Supply Generation: Trade-ins created a new, consumer-led procurement channel that could supplement or replace bulk sourcing from retailers and OEMs. Unlike commercial returns, trade-ins often required lighter refurbishment and yielded higher resale margins when condition scoring and verification were tightly managed.

Unit Economics: Refurbished trade-in stock — especially fridges, washing machines, and TVs — consistently outperformed bulk “as-is” stock on gross margin. In some cases, units sold after trade-in and refurbishment generated 20–40% higher margins, especially when sold D2C with warranties.

Trust and Conversion: Consumers were more willing to trade in old appliances in exchange for discounted, certified replacements, particularly when presented as a fair, seamless and verified process. Offering small incentives (e.g., discounts on new purchases) further improved conversion rates.

OPERATIONAL LEARNINGS:

- Technician-led verification at the point of pickup was critical to prevent disputes and ensure accurate condition scoring.
- Standardized pricing grids based on brand, model, age, and condition helped streamline the valuation process and build trust with sellers.
- Inventory turnaround time was significantly faster for trade-in items, since they often required minor repairs and were already in customer-preferred categories.

CHALLENGES:

- Manual coordination of pick-ups, technician schedules, and refurbishment created operational bottlenecks.
- Valuations were initially inconsistent, creating confusion for both sales agents and customers.
- Some trade-ins were unrepairable, reinforcing the need for stricter eligibility filters at the valuation stage.

NEXT STEPS FOR SCALING TRADE-INS

To unlock the full potential of the trade-in model, GreenBay is investing in:

- **Automation through AI and WhatsApp Commerce:** Development of a conversational AI assistant to handle trade-in submissions, image recognition, instant valuation using a pricing database, technician dispatch, and post-sale follow-up. This tool will reduce manual effort and ensure a consistent customer experience.
- **Trade-In API and CRM Integration:** Building backend systems to integrate trade-in flows with inventory, refurbishment workflows, and customer acquisition systems, enabling real-time updates and automated tracking of trade-in lifecycles.
- **Strategic Partnerships:** Collaborating with retailers, SACCOs, and microfinance institutions to promote trade-ins as part of upgrade, replacement, or credit programs.
- **Awareness Campaigns:** Educating consumers about the value of trading in appliances, environmental benefits, and the assurance offered through warranties and testing.

PILOT HIGHLIGHT: FOSSIL FUEL TO ELECTRIC MOTORCYCLE CONVERSION

As part of GreenBay's continued commitment to circular economy innovation, the team successfully piloted the conversion of a used internal combustion motorcycle into a fully electric model. The project involved retrofitting a HAOJIN HJ150 bike in collaboration with Kiri EV Ltd, a Nairobi-based electric mobility solutions provider.

OBJECTIVE

This pilot aimed to evaluate the technical, operational, and financial feasibility of applying GreenBay's circular refurbishment principles to the mobility sector, particularly within the rapidly growing electric two-wheeler market.

CONVERSION OVERVIEW

The donor bike, purchased for KES 65,000, underwent a full electric drivetrain installation and structural restoration. The conversion was executed under Quote Reference KEV2400016.

ELECTRIC CONVERSION KIT SPECIFICATIONS

- 72V 4000W three-speed electric motor (top speed: 90 km/h)
- 72V 45Ah lithium-ion battery
- Digital display, electronic hand switches, full wiring harness
- Keyless ignition and integrated security alarm system
- Installation, road testing, and rider training
- Safety equipment: helmet + high-visibility reflector

MECHANICAL RESTORATION & AUXILIARY SERVICES

To ensure roadworthiness, Kiri EV was replaced and restored:

- Handlebar, seat, lights (head, tail, indicators), ignition switch
- Bearings (cage, swingarm, front wheel), footrest rubbers
- Rear tubeless tyre, tripod, shock absorber bushes
- Frame and subframe welding
- Full body repainting (frame, tank, cowlings, and fairings)

COST BREAKDOWN

- **Pre-owned Motorcycle (HAOJIN HJ150):** KES 65,000
- **Electric Conversion Kit & Installation:** KES 165,000
- **Mechanical Restoration & Auxiliary Services:** KES 21,150

Total Project Cost: KES 251,150

STRATEGIC LEARNING & IMPACT

This pilot demonstrated the technical viability of ICE-to-electric motorcycle conversions using local talent and supply chains. Key insights include:

- Cost is a significant hurdle; scale-up likely depends on financing models such as PAYGO, B2B fleet leasing, or carbon-linked incentives
- Sustaining operations post-conversion requires a reliable supply of spare parts and trained technicians
- The model strongly aligns with GreenBay's mission to extend product life cycles and reduce emissions through circular innovation

STRATEGIC PRICE COMPARISON

To benchmark affordability and viability, the pilot retrofit was compared with new electric motorcycle offerings:

- **Green Bay Pilot Retrofit:** KES 251,150
- **Ampersand (bike + owned battery):** KES 350,000
- **Roam Air (dual battery):** KES 280,000–350,000

The retrofit cost is 20–30% lower than the market price of new electric motorcycles with comparable specifications, highlighting the potential for affordable circular alternatives if supported by standardized supply chains and reliable aftersales infrastructure.



Technicians working on an EPC in Malawi
Photo credit: CLASP

ENERGY ACCESS & CIRCULAR ECONOMY IMPACT

Africa generates over 2.9 million tons of e-waste annually, but <5% is formally recycled. Through this pilot, Green Bay:

- Diverted 11.2 tons of e-waste from landfill or informal disposal
- Enabled over 400 households or businesses to access affordable, energy-efficient appliances, many for the first time, addressing both climate mitigation and energy equity.
- Specifically facilitated access to:
 - Refrigerators: Increasing cold storage capacity for food preservation and small businesses such as kiosks and juice vendors.
 - Microwaves and Kettles: Reducing reliance on charcoal or paraffin stoves, especially for urban households, and improving convenience, hygiene, and energy efficiency.
 - LPG + Electric Cookers: Offering cleaner, safer alternatives to firewood and charcoal, helping mitigate indoor air pollution and deforestation impacts.
- Entry-level electronics like fans and toasters that ease daily burdens for working-class families in low-income estates.
- Over 70% of the distributed appliances were grade A or B, tested for energy efficiency and refurbished for optimal performance. This ensured that energy access did not come at the cost of high electricity bills or compromised safety.
- The pilot also surfaced new insights about expanding energy access:
 - Households transitioning from traditional cooking fuels showed strong interest in LPG/electric combo cookers when paired with flexible payment plans.
 - Women-led households, in particular, preferred microwaves and kettles due to reduced prep time and perceived ease of use, highlighting a gendered dimension to energy access.
 - Some B2B customers resold these appliances in peri-urban and rural areas, extending the last-mile energy access footprint beyond Nairobi.

By focusing on digital acquisition, trade-in recovery, and centralized refurbishment, the GreenBay model proved a scalable approach to extending access to modern energy services while reducing environmental harm, aligning directly with CLASP's mission to expand sustainable, inclusive energy access solutions.

SCALE-UP STRATEGY

Building on pilot success, GreenBay will scale in the following ways:

1. **Consumer Financing:** Introduce embedded BNPL via partnerships
2. **Trade-In Automation:** Launch WhatsApp AI bot for real-time trade-in valuations and order fulfilment
3. **Expansion to other cities** in Kenya and Nigeria
4. **Warehouse Optimization:** Consolidate the Nairobi warehouse and storefront with real-time inventory sync
5. **Consumer Trade-Ins:** Double down on our trade-in model to solve our supply chain gap

Farmer using a solar pump in Malawi
Photo credit: CLASP



RECOMMENDATIONS FOR FUNDERS AND PARTNERS

Funders and strategic partners interested in supporting models like Greenbay to scale can consider the following:

- **Expand investment to circular marketplaces** that enable reuse rather than just clean-tech startups
- **Fund integration pilots** (WhatsApp AI, BNPL, warranty tech) to reduce cost-to-serve consumers
- **Support consumer awareness campaigns** on the reliability and value of certified second-life appliances.



Technician installing a solar home kit
Photo credit: CLASP

CONCLUSION

Green Bay’s CLASP-backed pilot demonstrated that certified second-life appliances — when paired with warranties, digital selling, and strong sourcing — can unlock circular economy value at scale. With continued support, GreenBay is positioned to become East Africa’s leading platform for trusted, affordable, and climate-smart appliances.



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