Business Models for the NFE Microgrid OS

> [!info] Current working basis — August 2026
> **Tariff:** UEDCL Code 10.2, Q3 2026: Peak 666.5 / Shoulder 562.1 / Off-Peak 429.7 UGX/kWh. The full tariff schedule must remain a configurable model input because ERA/UEDCL rates change periodically. **Sezibwa base case:** zero export value until site eligibility, interconnection terms, and the applicable export credit are confirmed. All commercial offers should be re-run with site-specific load, tariff, capex, financing, and reliability assumptions before commitment.

Purpose

NFE Microgrid OS needs a business model that creates durable recurring revenue while improving the economics and reliability of community energy systems. Two ownership models remain viable, but the current Sezibwa evidence suggests a clear sequencing principle: **scale first through partner-owned deployments, while using NFE-owned projects selectively where the project return and strategic value justify tying up capital.**

The operating system is the common product in both models. Ownership determines who funds the assets, carries performance risk, and receives the energy margin.

Current evidence from Sezibwa

The Sezibwa analysis is not a universal tariff card, but it gives NFE a grounded reference case for product and commercial decisions:

Question	Current finding	Business implication
What should be added to the existing inverter and 8.9 kWh battery?	Solar first. Adding battery at today's price lowers NPV.	The OS should recommend marginal investments based on the assets already installed, not sell a standard hardware bundle.

Question	Current finding	Business implication
How much solar?	**4 kWp is the low-spill efficiency sweet spot; 5 kWp is the maximum-NPV optimum.**	The recommendation depends on the customer's objective: capital efficiency and minimal curtailment versus maximum total value.
What does battery arbitrage contribute?	About 22,000–40,000 UGX/month before fully pricing degradation, depending on backup reserve.	Arbitrage is incremental value from sunk hardware, not the core investment case. Dispatch must exceed marginal degradation cost and preserve the agreed reserve.
When does more storage pay?	At the 5 kWp anchor, the first added unit breaks even around 367,000 UGX/kWh, versus about 626,000 UGX/kWh today.	Treat battery price as a procurement trigger. Additional storage may still be justified separately for outage resilience.
Can surplus solar be sold?	Not assumed in the Sezibwa base case.	Use zero export value until site-specific arrangements are confirmed; show export as a separate upside scenario.

Detailed evidence: Solar Plus Battery Economic Case, Battery Arbitrage Economic Case, Optimal Solar and Battery Allocation, and Battery Price Break-Even.

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1. NFE-owned energy-service model

NFE finances and owns the supported microgrid assets and sells an energy and reliability service to a landlord, estate, community entity, or other contracted counterparty. The exact structure—PPA, lease, energy-service agreement, or another permitted form—must be confirmed against the applicable licensing, tariff, consumer-protection, and metering requirements.

Assets and responsibilities

NFE funds, owns, and operates the contracted system: submeters, solar, batteries where justified, inverters, communications, and the NFE Microgrid OS control and billing layer. NFE carries financing, asset-performance, collections, maintenance, and technology-obsolescence risk.

Revenue and value capture

- **Energy-service revenue:** contracted charges for electricity supplied or bills avoided, subject to the approved commercial structure.
- **Reliability service:** an explicit availability or backup tier rather than an assumed premium hidden inside the energy price.
- **Operating efficiency:** lower losses, better collections, solar self-consumption, reserve-aware dispatch, and tariff-aware control increase project margin.
- **Optional services:** installation, maintenance, reporting, or financing fees where separately contracted.

Optimization is not revenue by itself. It improves the margin or service quality of a contracted energy product. The commercial model should therefore distinguish customer charges from internally generated savings.

Investment test

Approve an NFE-owned project only when the site-specific model shows acceptable NPV, IRR, downside resilience, and debt-service capacity after turnkey capex, losses, degradation, maintenance, collections, taxes, and financing. At Sezibwa, the attractive next investment is solar on hardware already owned; that result should not be generalized to a greenfield site where inverter and battery costs are not sunk.

Best fit

- High-confidence load and collections data.
- A creditworthy counterparty or enforceable payment mechanism.
- Strong solar self-consumption and limited dependence on unconfirmed export revenue.
- A strategically important reference site or a return high enough to justify NFE capital.

Key tradeoff

This model captures the most project economics and operational learning, but it is capital-intensive and concentrates construction, credit, regulatory, and long-term asset risk on NFE.

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2. Partner-owned managed-platform model

A developer, landlord, estate, community entity, or energy-service partner finances and owns the physical assets. NFE supplies the operating platform, supported controls, deployment services, and ongoing technical operations.

Partner role

The partner funds and owns solar, batteries, submeters, inverters, communications hardware, and other site infrastructure. The partner retains asset-financing risk and receives the energy margin, subject to the commercial agreement.

NFE role

- NFE Microgrid OS licensing and supported device integration.
- Metering, customer accounts, billing, collections data, and settlement reporting.
- Monitoring, alerts, remote operations, and performance reporting.
- Tariff-aware, forecast-aware, reserve-aware, and degradation-aware dispatch.
- Site modelling, investment recommendations, commissioning, and lifecycle support.

NFE revenue

- **Deployment fee:** site assessment, modelling, integration, commissioning, and training.
- **Recurring platform fee:** a base site fee plus a usage driver such as connected meters, managed assets, or energy settled.
- **Managed-operations fee:** optional monitoring, dispatch, incident response, reporting, and maintenance coordination.
- **Performance component:** only where savings can be baselined and audited; use a share of verified incremental value rather than gross electricity sales.

A pure revenue share is easy to describe but difficult to govern when tariffs, load, collections, outages, and partner capex all change. A fixed recurring fee provides predictable platform revenue; a narrowly defined performance component can align incentives without making NFE responsible for every movement in the partner's electricity income.

Hardware support and maintenance

NFE should publish a supported-hardware list and define responsibility by asset. Partner-owned equipment remains the partner's financial responsibility. NFE may provide maintenance directly or coordinate approved providers under a separate service level. Unsupported third-party assets, including generators, are excluded unless explicitly integrated and contracted.

Key tradeoff

This model produces less revenue per site than ownership but requires much less NFE capital, limits balance-sheet exposure, and can scale faster across heterogeneous sites.

Common modelling and operating rules

1. **Keep tariffs configurable.** Store the entire time-of-use schedule, effective dates, fixed charges, taxes, and export credit separately from model logic. Re-run forecasts whenever ERA/UEDCL publishes a revision.
2. **Model the actual site.** Use interval load, outages, collections, existing assets, weather, and installed quotations. Do not transfer Sezibwa results unchanged to another microgrid.
3. **Separate sunk and new capital.** Dispatching an owned battery can create incremental value; buying another battery requires a separate investment case.
4. **Separate energy and resilience value.** Energy NPV should stand on its own. Backup reserve, outage avoidance, and service availability should be quantified and priced explicitly where possible.
5. **Use a Sezibwa-specific zero-export-value base case.** Add export value only as a documented scenario with confirmed eligibility, interconnection limits, and credit terms.
6. **Price degradation at the margin.** Arbitrage should run only when avoided tariff cost exceeds conversion losses, marginal battery wear, and the opportunity cost of reducing backup reserve.
7. **Treat second-life storage as a hypothesis.** Recycled batteries may become attractive, but require a second-life-specific techno-economic model covering acquisition, testing and grading, BMS and pack integration, safety, warranty, heterogeneous health, remaining life, and replacement.

Strategic recommendation

Situation	Preferred approach
Partner has capital and wants operating capability	Partner-owned managed platform
Site has strong verified economics, reliable collections, and strategic value	Consider NFE ownership after investment committee review
Demonstration or product-learning site	NFE-owned or co-invested, with an explicit learning budget

Situation	Preferred approach
Economics depend on unconfirmed export revenue or speculative battery pricing	Do not finance on the upside case; validate first

The near-term portfolio should therefore be **partner-led and platform-first**, with a small number of deliberately selected NFE-owned or co-invested sites. This builds recurring software and operations revenue, expands the data set behind the optimizer, and preserves NFE capital for projects where ownership offers exceptional return or strategic learning.

Decisions and evidence still required

1. Define the minimum recurring platform fee and its pricing driver: site, meter, managed asset, or energy settled.
2. Define a measurable baseline and audit method before offering performance-based fees.
3. Set NFE-owned project hurdle rates, concentration limits, credit requirements, and downside tests.
4. Confirm the permitted contracting and electricity-resale structures for each customer segment.
5. Publish supported hardware, warranty boundaries, maintenance responsibility, and service levels.
6. Build the second-life-specific techno-economic model before presenting recycled batteries as a validated strategy.
7. Turn the current optimizer into a repeatable site proposal that reports energy value, resilience value, capex, financing, NPV, IRR, payback, tariff sensitivity, and export sensitivity separately.

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