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Powering Productivity in African Grids Workshop

UGANDA'S e-COOKING TARIFF

Design Choices, Trade-offs and Regulatory Lessons

Presentation Roadmap

A regulatory story: policy rationale → tariff architecture → practical lessons

1 Context & rationale
Uganda's starting point and clean cooking challenge

2 Design choices
Thresholds, blocks, cross-subsidy and affordability

3 Operational constraints
Targeting without load-level visibility

4 Institutional cooking
Why schools and facilities may scale faster

5 Practice reflections
Who benefits, behavioural issues and awareness

6 Transferable lessons
Future directions for African regulators

Status Quo (as at Dec 2022)

3%
e-Cooking Penetration

42.5
Avg. kWh per Household

Charcoal (biomass) found to be the most prevalent source of cooking fuel for urban households, necessitating a pricing signal to encourage transition.

Over 120,000 customers fail to exhaust lifeline benefits. Socio-economic barriers hinder the lowest-consumption households from reaching the subsidized e-cooking block.

Rationale For Intervention

Demand Growth

Addressing surplus generation by stimulating domestic productive use. Shift from biomass to grid-based energy to improve utility sustainability.

Social Impact

Reducing household energy poverty and improving health outcomes by making electricity cost-competitive with traditional charcoal.

Key Design Principles

Cost Equivalence
Targeted 412 UGX/kWh to match charcoal costs based on hot-plate technology efficiencies.

Cross-Subsidy
Revenue shortfall recovered from units sold within the same domestic customer class.

Revenue Protection
Subsidies capped at 70 kWh to prevent incentive capture by non-cooking high users.

Design Philosophy

Signaling
Create a strong signal that electricity can be used for cooking.

Cost competitiveness
Benchmark against charcoal economics using hot-plate eCooking equivalence.

Revenue neutrality
Recover shortfalls from the same domestic customer class.

Behavioural targeting
Use consumption thresholds as proxy for probable cooking activity.

Subsidy discipline
Limit the number of kWh that can receive the lower tariff.

Operational practicality
Avoid dependence on advanced smart metering at launch.

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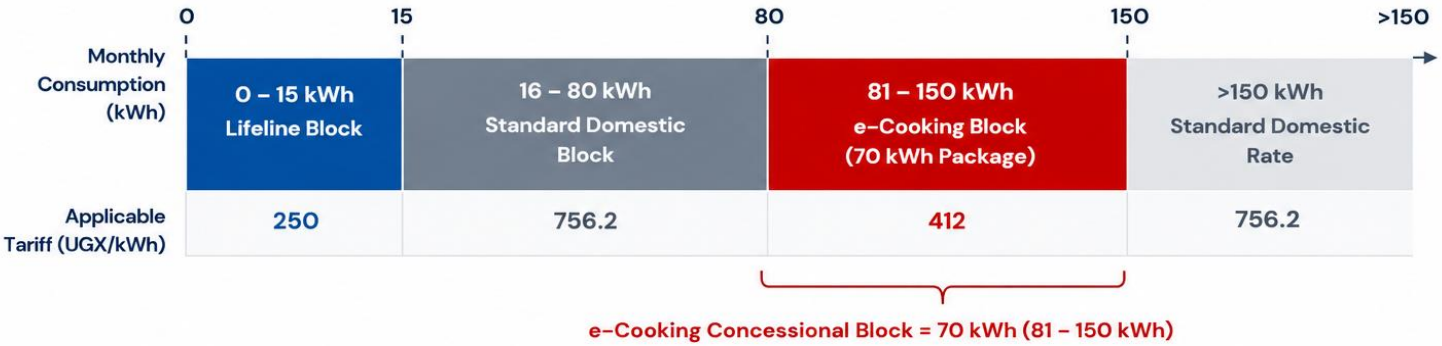
STRUCTURE OF THE DOMESTIC e-COOKING TARIFF

Three-tier structure with lifeline support, 80 kWh threshold and 150 kWh cap

LIFELINE SUPPORT
First 15 kWh at subsidized rate to support basic needs.

80 kWh THRESHOLD
Households typically meet basic non-cooking needs below this level.

COOKING PACKAGE
81–150 kWh block at concessional rate (70 kWh package by implication).



Key Takeaway

The tariff is designed to protect basic consumption (0–15 kWh), recognize typical non-cooking use up to 80 kWh, and provide a targeted concession for cooking between 81–150 kWh (≈70 kWh package), limiting subsidy exposure while encouraging productive electric use.

Why the 80 kWh Threshold?

A behavioural proxy for separating basic household electricity from likely cooking demand and ensure revenue recovery

Assumption: a household cooking with electricity would usually first consume electricity for more basic applications before adding cooking demand.

- lighting
- refrigeration
- television
- phone charging and small devices
- ironing of garments
- other basic applications

Why not subsidize from 0 kWh?

Many customers did not fully utilize even lifeline benefits, showing that low consumption reflected broader socio-economic barriers — not merely tariff levels.

Regulatory interpretation

The 80 kWh threshold became a targeting proxy, behavioural filter and revenue-protection mechanism.

Lesson: without smart metering, consumption thresholds can provide practical, probabilistic targeting.

Why Limit Subsidized Units to 70 kWh?

The cap protects revenue and reduces incentive capture

- control subsidy exposure
- avoid incentive capture by high-consuming households
- reduce use of subsidized units for non-cooking purposes
- anchor the allowance to practical estimates of household cooking needs: HH Cooking needs are not indefinite

Methodological logic

Assume meals per household per day, days in a month and average cooking energy per meal — then derive a reasonable monthly cooking allowance.

Result

70 kWh/month

Discounted block between 81 and 150 kWh/month

Even imperfect engineering approximations can support practical tariff design.

Interaction with the Lifeline Tariff

The lifeline and eCooking tariffs solve different affordability problems

Lifeline tariff

First 15 kWh/month at UGX 250/kWh (~USD 0.066) supports basic energy access.

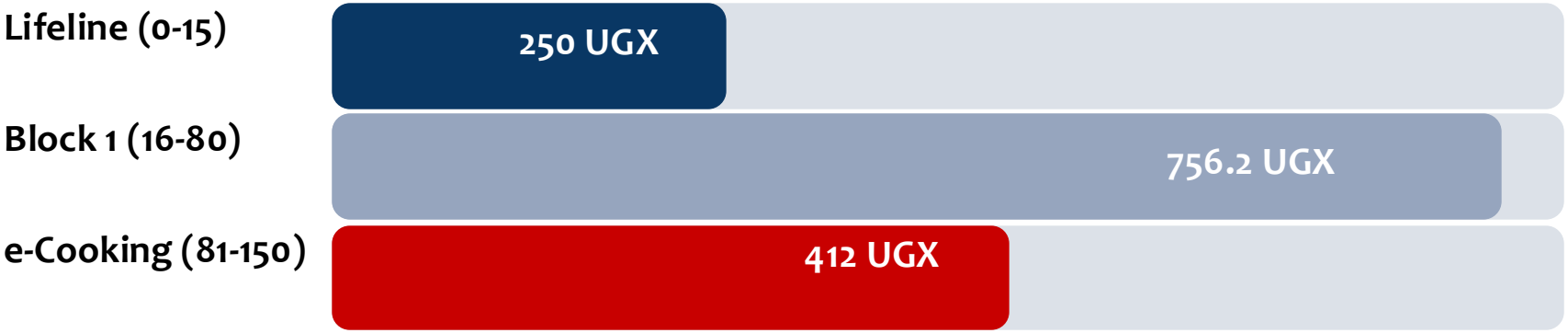
eCooking tariff

Units 81–150 kWh/month at UGX 412/kWh (~USD 0.109) support productive consumption growth.

Important observation: some low-consumption households do not exhaust even the lifeline allocation.

Lesson: tariff reduction is necessary, but not sufficient, for household clean cooking transition.

Lifeline Vs Affordability



The Gap: Over 120,000 customers fail to exhaust lifeline benefits. Socio-economic barriers hinder the lowest-consumption households from reaching the subsidized e-cooking block.

Current Domestic e-Cooking Tariff Structure

A discounted middle block, framed as incremental cooking consumption

0–15 kWh	>15–80 kWh	81–150 kWh	>150 kWh
Lifeline UGX 250/kWh USD 0.066	Normal UGX 756.2/kWh USD 0.201	eCooking UGX 412/kWh USD 0.109	Normal UGX 756.2/kWh USD 0.201

Discounted eCooking block

70 kWh per month: units 81–150 kWh inclusive.

Exchange rate

All USD equivalents use UGX 3,770 per USD.

NOTE: Normal tariff applies to units above 15–80 kWh and above 150 kWh per month.

Revenue Recovery Mechanics

The discount was designed around additional demand and same-class recovery

Ideal regulatory goal

Maintain existing consumption at normal tariff levels while subsidizing incremental cooking-related units.

Cross-subsidy logic

Recover shortfalls from the same domestic customer class, not from an open-ended sector-wide subsidy.

Practical reality

Not every customer would cook using electricity, increase consumption or fully utilize the subsidized block.

Design trade-off

Perfect targeting was traded for operational simplicity and scalability.

The tariff attempted to stimulate new kWh sales while limiting the revenue risk created by discounted units.

Institutional eCooking Tariff

Cleaner targeting is possible when cooking loads can be separately metered

Institutional tariff

UGX 360/kWh (~USD 0.095) for eligible institutional cooking loads.

- schools
- hospitals
- public amenities
- institutional kitchens
- large cooking facilities

Metering condition

Institutions must separate cooking loads and meter kitchens separately from other applications.

Institutional cooking may scale faster because all separately metered kitchen units can be treated as cooking units, enabling larger, cleaner and more measurable biomass displacement.

Transferable insight: institutional tariffs can be an easier entry point for large-scale eCooking adoption.

What Has the Tariff Achieved?

A foundation for eCooking market development rather than a perfect targeting mechanism

eCooking signal	Electricity positioned as a viable cooking fuel.
Bill reduction	Participating households above the threshold see lower marginal cooking costs.
Efficient appliances	Supports EPCs and other cost-saving eCooking technologies.
Future targeting	Creates a pathway for smart meters and appliance sub-metering.
Institutional complement	Works alongside separately metered institutional cooking tariffs.

The tariff created an enabling framework before advanced targeting infrastructure existed.

Challenges Encountered in Practice

Implementation exposed behavioural, economic and metering constraints

- Load ambiguity: cooking vs non-cooking use
- Low-consumption households may not benefit
- Price signals alone may not change habits
- Awareness of tariff structure can be limited
- Appliance affordability remains a barrier
- Household size and cooking patterns vary
- Smart metering coverage is limited

Regulatory implication

The design was defensible as a transitional instrument, but future refinements require better data on customer behaviour, cooking loads and appliance adoption.

Equity implication

The tariff benefits customers able to cross the threshold, so complementary support is needed for low-consumption households.

Transferable Lessons for African Regulators

What other countries can learn from Uganda's experience

- Tariff design can shape energy transition behavior.
- Achievement of Cost competitiveness is a fundamental starting point for just transition especially targeting essential applications like e-cooking
- Perfect targeting is not always necessary to begin market transformation.
- Avoid "Uuniversal inclusion fallacy": Focus on low hanging fruits to create momentum. Avoid the idealist assumption that the assumption that every household can feasibly benefit from a targeted intervention, even where universal inclusion may be desirable in principle but unattainable in practice due to operational, behavioral, and socio-economic constraints.
- Thresholds can serve as practical behavioural proxies where smart metering is limited.
- Revenue sustainability must be designed into the subsidy mechanism.
- eCooking needs tariffs plus appliance finance, awareness and reliability.
- Institutional cooking may offer faster and cleaner targeting.
- Tariff reform should anticipate future smart-grid evolution.

Main lesson: start with a workable design, then improve targeting as data and metering capability mature.

Future Directions

Moving from block-based proxy targeting to data-driven eCooking support

Smart metering	Improve visibility of load profiles and consumption response.
Sub-metered appliances	Bill verified cooking loads directly at eCooking rates.
Customer analytics	Segment households by usage, affordability and adoption potential.
Tariff refinement	Explore time-of-use, appliance-linked and dynamic designs.
Clean cooking ecosystem	Combine tariffs with appliance finance, awareness and reliability.

Future design should reward verified cooking demand while protecting affordability and utility financial health.

Final Reflection

Uganda's eCooking tariff is a pragmatic regulatory innovation under real-world constraints

It is not a perfect targeting mechanism. It is a practical market-building instrument that balanced demand growth, clean cooking transition and utility sustainability.

Demand growth

Encourages additional domestic electricity consumption for productive use.

Clean cooking transition

Improves the economics of moving away from charcoal and biomass.

Utility sustainability

Limits subsidy exposure and keeps revenue recovery central.

"Energy transition policies in emerging systems often evolve before perfect infrastructure exists."

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THANK YOU

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