Rethinking Results-Based Finance: From Expanding Access to Catalysing Transitions

Executive summary

Replacing fossil fuel generators is not simply an energy access problem, it is a wider market transition challenge. Results-based financing (RBF) is a tool which can contribute, but only where it is designed around customer value, verified fossil fuel displacement, company viability and a credible route to commercial finance. Equally, in some cases, a different financing instrument will be the better answer.

RBF 2.0 in one sentence: A context-first approach that rewards customer success and verified transition outcomes, deliberately shares liquidity and learning risks, adapts as the market changes, and is integrated with the wider financing ecosystem rather than treated as a stand-alone subsidy.

For a Nigeria pilot testing a generator-replacement-tailored RBF, five design moves are proposed:

1. Reward verified displacement and sustained service, not installation alone.
2. Start with customer needs, including reliability, affordability, load requirements, payment preferences and confidence in service.
3. Use staged and liquidity-aware payments so participation is not restricted to firms with the strongest balance sheets.
4. Build proportionate digital measurement and adaptive review into the programme, while recognising the additional cost of doing so.
5. Include an explicit decision gate: test whether RBF is the right instrument before proceeding, and combine it with finance, guarantees, technical assistance or innovation support where required.

Introduction

Results-based financing (RBF) has become one of the most widely used instruments in development and climate finance. From health to education, clean cooking to off-grid solar, it has been deployed as a way to link public or concessional capital more directly to real-world results. In the energy access sector in particular, RBF has played a meaningful role in accelerating market entry, expanding geographic reach, and improving accountability for results.

Yet in recent years, a growing number of practitioners, funders, and implementers have begun to ask an uncomfortable question: **why do so many RBFs struggle to deliver durable market change once the funding stops?** And more pointedly, **why do familiar problems keep re-emerging across very different contexts?**

This article aims to contribute to that conversation, reflecting thinking from ZE-Gen's ongoing work examining how RBF could be utilised for zero-emission generators. It sets out why reforming RBF is now a live issue, diagnoses the structural tensions baked into RBF design, and uses fossil fuel generator replacement in Nigeria as a case for why incremental optimisation is no longer enough. It argues that if RBF is to support the next phase of the energy transition – particularly in markets dominated by incumbent fossil technologies – it must be redesigned, not merely refined.

Results-based finance – the basics

What is results-based finance?

At its core, RBF links the disbursement of funds to the achievement of pre-defined, independently verified results. Rather than paying upfront for inputs or activities, funders pay for outputs, outcomes, or impacts once they have been demonstrated.

In theory, this does three things well. First, it improves accountability by tying payments to evidence rather than intentions. Second, it gives implementers flexibility to decide ***how*** results are achieved. Third, it promises better value for money by reducing the risk of funding activities that fail to deliver.

The difficulty is that the result chosen, the timing of payment and the verification burden all shape the market. RBF is therefore not neutral – it creates incentives, allocates risk and privileges some business models over others.

Why is RBF under pressure?

The short answer is that **RBF has become a victim of its own success**. As it has scaled across sectors and geographies, its limitations have become more visible. High-profile implementation challenges, persistent payment delays, rising administrative costs, and disappointing post-programme outcomes have forced funders and practitioners alike to look beyond surface-level fixes.

The issue is no longer whether RBF can work, but **under what conditions it meaningfully reshapes markets rather than temporarily distorting them**.

Case study – Gender-smart RBF pilot:

Recent experience from a gender-responsive RBF pilot delivered by CrossBoundary Advisory, Shell Foundation and Odyssey Energy Solutions illustrates this risk. Temporary end-user discounts created pricing complexity and customer confusion, with sharp increases in instalments when subsidy support ended contributing to repayment difficulties and customer churn. The experience suggests that enterprise-level incentives that support durable changes in business models may offer a more sustainable route than temporary consumer discounts.

In newer or less mature markets, distortion may also persist beyond the programme itself. Temporary discounts and inconsistent subsidy levels can blur customers' understanding of an appropriate market price, weaken willingness to pay once support ends, and affect trust in a technology or financing model such as PAYGo. Assessing market effects therefore requires attention to customer expectations and behaviour after the incentive has been withdrawn.

This critique is increasingly reflected across the energy-access sector. Recent GOGLA analysis highlights recurring challenges including poorly calibrated subsidies, delayed payments, working-capital pressure, rigid programme structures, over-emphasis on sales rather than sustained access, and the exclusion of emerging business models.[1]

The structural trade-offs inherent to RBFs

[1] GOGLA (2026), 'Revamping Results-Based Financing'.

Many of the problems associated with RBF are not implementation failures in the narrow sense. They are the predictable result of **structural trade-offs that every RBF design must navigate**.

At a high level, RBF designers are always balancing at least five competing objectives:

1. **Integrity** – How confident must the funder be that a result is genuine and additional?
2. **Administrative efficiency** – How much time and cost can be justified for application, due diligence, monitoring and verification?
3. **Market leverage** – How far should commercial incentives and competition drive delivery?
4. **Long-term impact** – Will service, product-use and commercial activity persist once subsidy ends?
5. **Reach and customer welfare** – Who is reached, on what terms, and does the solution create sustained value without avoidable harm?

Pushing hard on any one of these creates pressure elsewhere. For example, maximising integrity often means detailed, multi-stage monitoring and verification, which increases costs and slows payments. Prioritising speed and simplicity can improve cash flow for companies, but raises concerns about misuse or gaming. Designing for long-term outcomes can better reflect durable impact, but typically requires longer time horizons and harder to verify metrics, which create uncertainty for both funders and companies.

More sophisticated outcome metrics likely increase monitoring, verification and logistical costs, even with the use of digital technologies. Adaptive designs also require additional programme-management capacity to track market change, revise parameters and update verification arrangements. These costs need to be budgeted explicitly and justified against the value of the improved outcomes they are intended to secure.

These tensions are not context-specific, but are inherent to the current mechanism paradigm. As a result, RBFs struggle in recognisable ways: easily countable outputs not translating to impactful outcomes, rigidity in the face of market change, implicit bias toward larger firms with stronger balance sheets, and cliff-edge effects when funding ends.

Understanding these trade-offs is essential, because it clarifies the link between design decisions and RBF failures, and **shines a spotlight on where model innovation and new technologies can be most impactfully focused** to "break the link" between certain elements (e.g. integrity and administrative cost).

Battery-as-a-service (BaaS), also known as battery rental, is a growing energy access solution across African markets, that uses solar power to charge batteries, which are then rented to customers for fixed periods. BaaS is most commonly an end-to-end model, where the commercial provider owns the batteries and the solar infrastructure used to charge them.

BaaS models provide customers with flexible and affordable access to energy, allowing customers to pay for the amount of energy they use, typically without requiring a contract, credit check or deposit. BaaS providers rent a variety of solutions, from smaller batteries for essentials such as phone charging and light, to larger batteries capable of replacing generators and powering virtually all home and business appliances.

Most RBFs are technology specific and thus exclude BaaS providers. More technology-agnostic approaches, and perhaps BaaS specific RBF, could accelerate energy access. With many off-grid customers unable to afford a solar home system on PAYGO, BaaS allows them to access electricity quickly and affordably. Modest subsidies can help BaaS providers reach more of those with the greatest affordability barriers, and also help them to scale the energy ladder, moving from entry-level solutions to higher-powered batteries capable of generator replacement.

Why we have been looking at RBFs in Nigeria

Nigeria's generator economy is vast, entrenched, and economically significant

Nigeria remains a priority for first-time and improved energy access, while also being the largest generator market in Africa and one of the largest globally. Millions of grid-connected households, businesses and institutions rely on petrol and diesel generators because supply is unreliable and insufficient. Estimates from ZE-Gen research and market analyses consistently point to **over 60 million small and medium fossil-fuel generators in active use nationwide**, spanning households, SMEs, commercial facilities, telecom towers, health facilities, and public institutions.[2]

This reliance is not marginal or temporary. The national grid typically delivers **3,500-5,000 MW** against estimated demand exceeding **25,000-30,000 MW**, with frequent and prolonged outages. Generators are therefore a defining feature of how households, businesses and institutions secure power, embedded across income levels and use-cases, from small back-up systems to large commercial installations. Even businesses that are technically connected to the grid experience unreliable supply and therefore maintain generators as a parallel power system.[3] Despite being expensive to run, polluting (including both noise and air quality which drive negative health impacts), and inefficient, generators persist because they solve a significant customer problem – unreliable grid supply.

The economic consequences are material:

- Businesses and households in Nigeria spend **tens of billions of dollars annually** on petrol and diesel for self-generation, with ZE-Gen synthesis drawing on World Bank, IFC and SEforALL sources estimating **$28-50 billion per year** across emerging economies, of which Nigeria is among the largest contributors.[4]
- World Bank analysis estimates that unreliable power costs Nigeria **5-7% of GDP annually**, equivalent to roughly **$25 billion** in lost productivity and economic output.[5]
- Manufacturers alone reportedly spent **₦1.11 trillion on generator fuel in 2024**, reflecting how deeply generator costs are embedded in operating expenditure for productive users.[6]

Crucially, this generator market is **mature and resilient**. Fossil generators are cheap to acquire, widely available, familiar to users, trusted for reliability, repairable through informal markets, and supported by established supply chains. For many households and SMEs, the generator is not a last-resort backup but their **primary energy asset**.

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[2] ZE-Gen (2026) 'Understanding Nigeria's Fossil Fuel Generator Challenge'
[3] World Bank (2021) 'Igniting Economic Growth by Reforming Nigeria's Power Sector'
[4] ZE-Gen (2026) 'Understanding Nigeria's Fossil Fuel Generator Challenge'
[5] World Bank (2021) 'Igniting Economic Growth by Reforming Nigeria's Power Sector'
[6] The Heritage Times (2025) 'Rising Energy Costs: In Nigeria, Manufacturers Spent N1.11 Trillion On Generators In 2024'

At the same time, generator displacement should also be situated within Nigeria's wider power-system transition. The objective should not be an immediate elimination of every form of thermal capacity, but to reduce dependence on inefficient, expensive and highly-polluting distributed generators where cleaner alternatives can meet customer needs reliably.

Nigeria is therefore a high-leverage country for generator replacement efforts

This market scale is precisely what makes Nigeria strategically important. Replacing even a small fraction of existing generators would deliver **outsized economic, emissions, and health benefits**, and could create an organic transition dynamic with implications for the global generator space.

ZE-Gen research shows that renewable-based alternatives – most commonly solar-battery-inverter systems, or "Solar generators" – are in the market and already offer **significantly lower lifetime electricity costs** than fossil generators, alongside clear benefits on noise, air quality, and maintenance. The challenge is therefore not technology availability or long-run economics; but the **upfront affordability and risk**.[7]

Ultimately, the customer proposition is not determined by lifetime cost alone. Fossil generators remain attractive because they are familiar, portable, quick to refuel, widely repairable and able to provide high power and energy density on demand. Solar generators may face constraints around upfront cost, but also peak and surge loads, battery replacement, portability, installer quality and confidence in after-sales support. The "risk" to the customer therefore includes performance risk, technology and warranty risk, financing risk and the risk that the system will not meet critical loads when required.

The upfront price gap remains a major barrier to adoption

Despite falling battery and solar costs, there remains a **large and persistent upfront price gap** between fossil and solar generators in Nigeria.

Indicative market prices show:

- Small petrol generators are widely available from **₦50,000-₦500,000**, with larger diesel units scaling upward depending on capacity and soundproofing.[8]
- Solar generators capable of providing equivalent service – particularly for SMEs or productive uses – typically cost **several multiples of this upfront**, often running into **hundreds of thousands to several million naira**, depending on capacity, storage, and installation.[9]

For SMEs operating on thin margins or households without significant disposable income, this price differential is decisive. Even where solar systems are cheaper over their lifetime, the **capital constraint dominates the decision**, locking users into repeated fossil generator and fuel purchases.

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[7] ZE-Gen (2026) 'Understanding Nigeria's Fossil Fuel Generator Challenge'
[8] Naija Tech Guide (2026) 'Generator Price in Nigeria, Petrol and Diesel Gensets 2026'
[9] Nigerian Price 'Solar Generator Prices in Nigeria (February 2026)'

Why RBF is a relevant instrument in this context

In Nigeria, as in many emerging markets, there are a range of concessional finance products and facilities on offer. These interventions are necessary, and build the longer-term market dynamic, but they do **not directly address the generator replacement decision at the point of purchase**.

Nigeria's existing RBF track-record:

Nigeria is not starting from scratch on RBF. Over the past decade, the country has hosted some of the largest energy-access RBF programmes globally, including the Nigeria Electrification Project and more recently the Universal Energy Facility and DARES.

These programmes demonstrate that well-designed, context-specific RBFs – often utilising newer approaches such as competitive tenders, staged payments, PAYGo complementarity and improved verification – can be implemented at scale. In many cases, they have meaningfully expanded access and strengthened private-sector delivery.

The critique in this article is therefore not a rejection of RBF, nor a dismissal of Nigeria's experience. Rather, it reflects a shift in the problem being addressed. Most existing RBFs in Nigeria were designed primarily to expand first-time access. Generator replacement, by contrast, is a market-transition challenge: it requires the active displacement of an entrenched, self-financed fossil-fuel incumbent. The question is not whether RBF works in Nigeria, but whether the dominant RBF templates developed for access expansion are fit for this new challenge.

A generator-replacement pilot should therefore build on their delivery infrastructure and lessons without assuming that existing models can be transferred unchanged.

Credit lines, guarantees, and concessional debt improve the availability of capital upstream, but **they do not reliably translate into lower retail prices at the point of sale**, particularly in fragmented, informal, and risk-averse SME markets. End-user lending, where available, often increases complexity and shifts risk onto distributor firms less able to bear it. Grants, meanwhile, can struggle to scale without careful design, risking market distortion or the subsidisation of non-additional outcomes.

Nor is this gap simply the result of insufficient RBF activity. As summarised in Annex A, the existing landscape of active RBF programmes in energy access and off-grid power is extensive, but remains overwhelmingly focused on access expansion and system deployment rather than the replacement of incumbent fossil-fuel generators.

Generator replacement therefore represents a distinct, but complementary, financing challenge. Nigeria still requires substantial investment to achieve universal electricity access, whilst alongside this sits a different population who customers who already obtain some electricity, but rely on fossil generators to secure adequate or reliable supply. Access expansion and generator displacement should therefore be pursued in parallel, whilst recognising they require different result metrics, subsidy rationales and financing structures due to their differing characteristics (see Figure 1).

The financing challenge for generators is therefore not simply to increase the availability of clean technology, but to make switching away from generators sufficiently attractive to change purchasing decisions.

This is where RBF could play a distinct role. Rather than duplicating supply-side finance, RBF can sit downstream of manufacturing, distribution and project finance and complement credit lines, collateral support and PAYGo models. Properly calibrated, it can reduce end-user prices without distorting market structure or predetermining which firms, technologies, or business models succeed.

The rationale for RBF is therefore not that Nigeria lacks finance altogether. It is that clean alternatives can remain economically unattractive at the point of generator replacement, when buyers weigh upfront cost, immediate cash outlay and perceived risk more heavily than lifetime savings or wider social and environmental benefits. The design challenge for generator-replacement RBF is not simply to subsidise the price gap, but to use temporary, targeted support to **shift purchasing decisions at scale without creating permanent subsidy dependence or distorting the emerging market**.

Table 1. Summary of differing characteristics of energy access versus generator transition

Dimension	First-time access	Generator transition
Starting point	No, or very limited, modern energy service.	Existing service obtained partly or mainly through a fossil generator.
Customer decision	Whether and how to adopt energy service.	Whether a cleaner solution can match incumbent generator performance.
Target result	Connection, system sale or service subscription.	Sustained load served and verified reduction in generator use.
Key additionality risk	Paying for customers who would have connected anyway.	Paying for solar that is stacked alongside, rather than displacing, a generator.

Where standard RBF designs can fall short in solar generator markets

Many of the challenges facing RBF markets are well-documented: delayed payments, high administrative costs, rigidity, and weak post-programme sustainability. But in the context of the energy sector, these are symptoms rather than the root problem. While a minority of recent RBFs have begun to experiment with innovative approaches, the dominant pattern has been the application of out-of-the-box designs to widely differing market contexts, rather than starting from a context-first perspective.

This is further exacerbated by the reality that standard RBF designs were not built for markets dominated by entrenched fossil technologies, where the objective is not first-time access, but active displacement of an incumbent asset that is cheap, familiar, and repeatedly replaced.

Given the different nature of the transition challenge, the first question in considering RBF must be to ask whether RBF is the right tool for the identified constraint.

Table 2. Framework for considering whether RBF is a well-aligned tool for the challenge and context

Diagnostic question	If yes	If no
1. **Is the target result attributable and verifiable at reasonable cost?**	RBF may be suitable.	Use innovation grants, technical assistance or procurement to establish the proposition and evidence base.
2. **Are credible products and service models available?**	Use technology-neutral eligibility with minimum standards.	Prioritise product development, demonstration and patient capital.

3. Is there a defined viability or affordability gap?	Calibrate a targeted, time-bound subsidy.	Address information, regulation, distribution or trust directly rather than subsidising sales.
4. Can companies finance delivery until milestones are reached?	Use conventional or staged ex-post payments.	Integrate advances, working-capital facilities, guarantees or concessional debt.
5. Is there a credible route beyond subsidy?	Use RBF to generate data and accelerate market formation.	Do not launch until the post-programme business model and financing pathway are clearer.

For early-stage or rapidly evolving markets, the appropriate response may be a transition finance platform rather than a single RBF. A platform could combine innovation grants, concessional working capital, partial credit guarantees, outcome payments, technical assistance and common data infrastructure, with each instrument used against the risk it is best suited to carry.

However, even when RBF is an appropriate mechanism to deploy given the circumstances and objectives in question, standard RBF designs struggle when applied to generator replacement in five critical ways:

What is rewarded

They reward deployment, not displacement – Most RBFs are structured around output metrics (units sold, systems installed, connections made, etc.). This works tolerably well for expanding access, but it is poorly suited to generator replacement where the metric of interest is retirement or substitution.

In Nigeria, selling a solar generator does not necessarily mean delivering reliable power or meeting user needs over time, let alone that a fossil generator has been retired, downsized, or materially displaced. In many cases, systems are added in parallel ("stacking"), used intermittently, or under-utilised. An output-focused RBF risks paying for coexistence, not transition.

From the customer's perspective, however, coexistence can be a benefit. Combining grid supply, a generator and a solar-battery system may be a rational way to improve reliability, flexibility and affordability while managing critical loads. Programme design should therefore distinguish between a legitimate staged transition and subsidised deployment that produces little or no generator displacement. This requires customer research on load profiles, service needs, willingness and ability to pay, and acceptable transition pathways before the result metric is fixed.

Nevertheless, this reflects a classic incentive-design problem. When incentives reward volume or speed – such as the number of connections delivered – **providers rationally optimise for fast, low-cost sales**. That pushes behaviour toward minimising unit cost and effort per installation, often at the expense of appropriate system sizing, build quality, after-sales support, and long-term performance. The result is activity that looks successful on paper, but is poorly aligned with durable outcomes or the genuine replacement of incumbent technologies. This is reinforced by monitoring and verification frameworks that confirm installation but do not track usage or reduced generator runtime. As a result, stacked and displaced systems appear identical in verification terms, making genuine transition effectively invisible to the incentive mechanism.

Who can participate

They assume recipient companies can pre-finance – Standard RBFs implicitly assume that recipient companies can finance inventory, installation, and customer acquisition upfront, and wait for reimbursement once results are verified. In generator-scale solar markets, where the cash-flow dynamics are unforgiving, this assumption breaks down.

Solar generator systems are capital-intensive, customers are price-sensitive, and many distributors operate with limited balance sheets. As a result, standard RBF designs (e.g. reimbursement model) that require companies to pre-finance inventory and installations – while waiting months for verification and payment – implicitly **favour larger, better-capitalised players** and exclude the local firms best positioned to serve SMEs and peri-urban or rural customers (harder-to-reach).

These participation effects are often amplified by costly and slow monitoring and verification (MRV). Manual MRV – relying on paperwork, phone calls, and site visits – raises administrative costs and can delay payments, increasing working-capital pressure. This favours firms with more sophisticated systems, human resources and stronger balance sheets.

They clash with, and can implicitly exclude, service-based and rental business models – Many solar generator deployments rely on energy-as-a-service (EaaS) or PAYGo models, where revenues accrue gradually through customer payments over time. Standard RBFs, which trigger payments on upfront sales or installations, are poorly aligned with these cash-flow profiles. Post-hoc verification and lump-sum disbursements can exacerbate working-capital strain, front-load risk onto distributors, and amplify portfolio-at-risk in PAYGo models – undermining the very business models intended to improve affordability and reliability.

Many standard RBFs define eligibility around asset sales or installations, assuming a transfer of ownership to an end-user. Despite the wider challenges mentioned, this fits PAYGo-ownership models, however EaaS and battery-as-a-service (BaaS) – where providers retain ownership and revenue is generated through repeated use over time – often fall outside these definitions. Unless results frameworks are explicitly adapted, such models cannot easily demonstrate eligible “results”, effectively placing them out of scope despite their potential to deliver affordability, flexibility, and genuine displacement of fossil generators. Where rental models have accessed RBF (e.g. BaaS), this has typically required bespoke programme design (e.g. BGFA defining results using service delivery and usage, not asset sales) rather than standard templates.

How it responds to change

They place rigid designs at odds with fast-evolving markets – Battery prices, system configurations, financing models, and customer preferences are all changing rapidly. Fixed targets, system definitions and incentive structures can quickly become misaligned with market reality, locking in sub-optimal outcomes. The result is firms optimising for compliance rather than innovation, with the rewards flowing to “yesterday’s solution”, or offering payments above/below what is required. It is crucial to be continuously adaptable to changes in the market to avoid unintended consequences as context shifts.

Rigid designs are equally ineffective if applied uniformly across diverse geographies and customer segments. In contexts where affordability, logistics, and regulatory conditions vary widely, “one-size-fits-all” designs can struggle to adapt.

Over what timeframe results unfold

They lock in short time horizons that conflict with long-term sustainable market-building – Many standard RBFs are designed around short verification cycles, driven by funder reporting requirements rather than market realities. This encourages front-loaded activity and discourages investment in durability, after-sales support, or system right-sizing – all of which are essential if solar generators are to compete with an incumbent technology as entrenched as fossil-fuel generators.

What happens after the subsidy

They treat market sustainability as a post-programme outcome, rather than something the incentive itself must actively create – Standard RBFs often treat market sustainability as something that emerges *after* the programme ends, rather than being produced by the incentive itself. As such, exit strategies are included but rarely fully embedded into the incentive design.

In this paradigm RBFs optimise for delivery during the programme, not for the target market dynamic following the programme. This is why markets often revert when subsidies are withdrawn.

For generator replacement, this failure is particularly acute. If an RBF merely compresses prices during the programme without strengthening the underlying market – such as distributor creditworthiness, lender confidence, or viable customer financing pathways – it risks creating a temporary sales spike rather than a durable transition. When incentives are withdrawn, activity can fall sharply, firms may fail, and after-sales support can collapse. In a market where trust and reliability are critical, this does not just slow progress; it can actively undermine confidence in solar generators as a credible replacement for fossil systems.

For these reasons, a business-as-usual RBF is not a viable option for generator replacement in Nigeria. Proposing RBF in this context requires proposing **something fundamentally different**.

> **Many of these weaknesses are not unique to generator replacement.** Across energy access, rewarding deployment rather than sustained use or customer value, requiring companies to pre-finance delivery, excluding service-based models and prioritising short verification cycles can also undermine impact. Generator replacement makes these limitations especially visible, but the case for reform is sector-wide.

Rethinking RBF – from optimisation to redesign?

In response to these challenges, much recent RBF innovation – as well as the ZE-Gen programme's initial research and design work – has focused on optimisation: digitising monitoring and verification, automating payments, or streamlining administration. These improvements are crucial – end-to-end digitisation of MRV can **speed payments**, reduce overheads and **improve fraud detection**, significantly improving scheme performance at the margin.

However, optimisation alone cannot resolve the deeper tensions outlined above – particularly regarding successfully calibrating the subsidy level for the given market to minimise distortion, and using an incentive mechanism which encourages the hoped-for market-building behaviour.

Digitisation does not, by itself, solve misaligned incentives. Better data does not automatically translate into better outcomes if the mechanism still rewards the wrong behaviours. Faster payments do not guarantee sustainability if companies remain dependent on subsidies to function.

What is needed instead is a **redesign of the RBF mechanism and model itself**. This means revisiting first principles: what behaviours the RBF is trying to incentivise, over what timeframe, and with what vision of market maturity at the end. It means shifting from a narrow focus on deployment numbers toward a more nuanced understanding of performance, durability, and market learning.

Proposing RBF in solar generator markets particularly requires embracing several structural shifts:

- From **deployment-based results** to **displacement-oriented outcomes** – shift from rewarding installation to rewarding functional replacement; whether defined through sustained load coverage, runtime substitution, or verified reduction in fossil generator use over time.
- From **post-hoc reimbursement** to **liquidity-aware incentive structures** – reduce, rather than amplify, working-capital stress through staged incentives, early partial payments, or complementary liquidity mechanisms that are explicitly integrated into the RBF logic. Without this shift, RBF risks selecting for balance-sheet depth rather than transition impact. Crucially, liquidity-aware design also determines whether RBF can play a catalytic role over time; by generating performance data, repayment histories, and asset familiarity, a well-designed RBF can crowd-in local lenders and shift generator replacement from subsidy-dependence toward routine commercial financing.
- From **short-term outputs** to **time-weighted performance** – longer time horizons and outcome-weighted incentives, even if that increases design complexity. Without this, RBF structurally favours speed over substitution. This includes structuring disbursements to intentionally shape distributor behaviour, rewarding product durability, verified uptime and last-mile reach, not just units sold.
- From **temporary price support** to **durable market conditioning** – use incentives not just to stimulate sales, but to strengthen the market's outlook: encouraging financing models that reduce end-user capital burden, improving firm bankability, and generating data that lowers perceived risk for local lenders. In this sense, RBF must act as a market-conditioning instrument, not just a price subsidy.

We refer to this broader direction of travel as "RBF 2.0"; not a single new template or mechanism, but a context-first, market-building focused approach to RBF design.

Taken together, these structural shifts imply a different understanding of risk in RBF design. Rather than minimising exposure by default, an action which may protect the funder, but also often constrains who can participate and how the market evolves, a transition-oriented RBF asks **which uncertainties the programme should absorb in order to unlock durable market behaviour** – and which can realistically remain with market actors.

The figure below reframes these design shifts through a risk-allocation lens, illustrating how absorbing specific market risks enables specific transition behaviours.

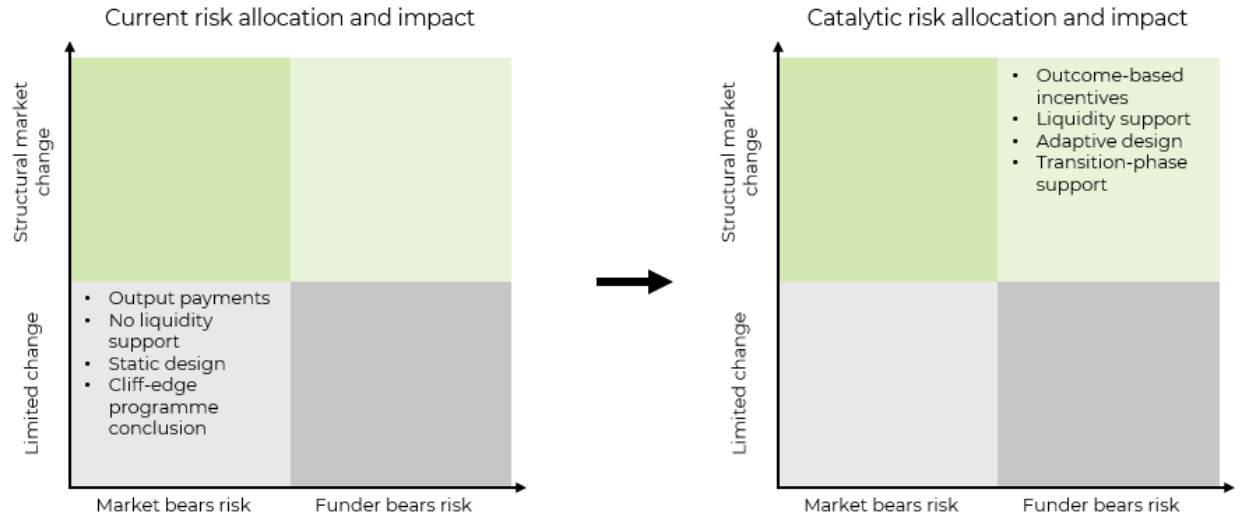

Figure 1. Simplified illustration of how risks can be reallocated to achieve specific goals (see Annex C)

- **Absorbing outcome uncertainty**, to **incentivise long-term performance** – Moving from easily verifiable outputs to higher-order outcomes increases uncertainty for the funder, as outcomes are harder to observe, attribute, and measure with precision. However, by accepting this loss of simplified certainty, the funder enables incentives that pull market actors toward behaviours consistent with long-term sustainability rather than short-term optimisation. In other words, absorbing outcome uncertainty is what allows the programme to reward what ultimately matters, rather than what is easiest to count.
- **Absorbing design uncertainty**, to **enable adaptive market alignment** – Locking in RBF parameters at the outset creates a tightly controlled risk environment for funders, placing emphasis solely on execution, but assumes that markets, technologies, and customer preferences will remain stable over time. By allowing for adaptive design – adjusting parameters over time in response to market signals – funders accept greater uncertainty and open-ended risk. In return, they reduce the risk borne by market actors of being locked into misaligned criteria, and increase the likelihood that the RBF remains relevant as conditions evolve.
- **Absorbing liquidity and balance sheet risk**, to **broaden market participation** – Restricting RBF payments to ex-post reimbursement shifts liquidity and credit risk onto participants, effectively limiting participation to firms with strong balance sheets. This skews incentives toward incumbents and inhibits broad-based market formation. By contrast, mechanisms such as advance payments, working-capital facilities, or forgivable loans deliberately absorb some liquidity and credit risk. While this increases exposure for the funder, it performs a clear function: enabling participation by smaller or newer firms and supporting a more distributed and competitive market structure.
- **Absorbing transition-phase risk**, to **secure post-programme viability** – Treating post-programme market viability as external to the RBF places the full burden of transition-phase risk on market actors, who must achieve sustainability before support ends or face a cliff edge. An alternative approach is for funders to absorb some of this risk – for example by offering temporary risk guarantees to lenders serving the segment. This does not eliminate commercial discipline, but it

buys time for markets to stabilise and for private capital to step in. Absorbing transition-phase risk in this way directly increases the probability that programme-induced activity survives beyond the subsidy period.

Care should be taken to avoid replacing one exclusion mechanism with another.

If funders assume more liquidity or outcome risk (e.g. working-capital support or advance payments) but respond with more extensive due diligence and excessively burdensome applications, warranties or reporting requirements, this risks recreating the same exclusionary barriers for smaller firms that the liquidity support is intended to remove. Due diligence should be proportionate, staged and reusable across related facilities where possible.

A selection of recent programmes below show that useful new approaches are being tested, however no single template resolves every trade-off. In particular, complexity should only be introduced selectively – where it resolves a material constraint.

Table 3. Summary of recent RBF programmes which have included new approaches

Example	Relevant lessons
BRILHO, Mozambique	Reverse auctions and differentiated incentives can support price discovery; a gradual reduction can support exit; customer-centric metrics such as utilisation, satisfaction and after-sales effort can be linked to part of the incentive.
BGFA, Zambia	Technology neutral and business-model-agnostic participation can sit alongside minimum service and consumer protection standards. Market-based subsidy setting, co-financing and verified service over time can support adaptation and leverage.
KOSAP, Kenya	Ex-ante support can fund market entry and supply chain development; differentiated incentives can reflect geographic costs; end-user subsidies require careful targeting and verification; delays can weaken cash flow and trust.
Gender-smart productive-use pilot	Enterprise and end-user incentives can address both supply and affordability barriers, but temporary customer discounts can complicate payment plans, create price confusion and contribute to repayment stress when they end.

Ultimately, a generator-replacement RBF will only create transition if the cleaner proposition works for the customer. A sale is not evidence of success if the system is undersized, rarely used, poorly maintained or accompanied by continued generator operation. Equally, “stacking” is not automatically failure – for some customers, combining grid, fossil fuel generator and solar generator may be a rational route to reliability. The mechanism must distinguish harmful subsidy leakage from a legitimate transitional configuration. In order to ensure direct alignment with customer behaviour and needs, customer discovery analysis should always precede detailed mechanism design of a transition-focused RBF, regardless of the specific asset being targeted.

Implications for a Nigeria pilot – and beyond

Nigeria as a testing ground for reformed RBF design

Nigeria is particularly fertile ground for trying to do RBF differently. The generator problem is large, visible, and economically significant; the solar market is established and commercially active; and there is a dense ecosystem of distributors, financiers, implementers, and funders with deep familiarity with results-based approaches. Policy and delivery institutions already have hands-on experience with RBF, and programmes – such as the Nigeria Electrification Project, Universal Energy Facility – have demonstrated that RBF can be successfully implemented, and evolved, at scale in the Nigerian context, whilst DARES is continuing to scale and extend this experience.

Taken together, this means Nigeria is not a fragile or speculative setting for experimentation, but a credible **stress-test environment**:

- A strong track record of RBF delivery and a supportive ecosystem reduce implementation risk, allowing lessons from a pilot to be attributed to design choices rather than execution failures, regulatory uncertainty, or broader market constraints.
- At the same time, Nigeria's deeply entrenched fossil-fuel generator economy provides a deliberately demanding test case, ensuring that any redesigned RBF is assessed against the real challenge of shifting behaviour and displacing generators – not just accelerating solar deployment in an easier market.

The key implication is therefore not simply to run an RBF in Nigeria, but to **explicitly use a Nigeria pilot as a learning vehicle** – treating it as an opportunity to test different market-building approaches (incentive structures, time horizons, verification approaches, etc.) – rather than defaulting to familiar templates optimised for delivery certainty.

Offering broader relevance beyond Nigeria and beyond generators

While the entry point here is fossil fuel generator replacement, the design questions raised are not generator-specific.

Many other sectors face similar conditions: an incumbent technology that is cheap, familiar, and repeatedly replaced; a cleaner alternative that is cost-effective over time but unaffordable upfront; fragmented demand dominated by SMEs or households; and financial systems that struggle to support. They also experience similar RBF-related challenges: working capital constraints, verification burdens, and subsidy dependence. Clean cooking, productive-use appliances, decentralised cooling, and e-mobility all exhibit versions of these structural issues.

The relevance of a Nigeria pilot, therefore, would lie as much in what it teaches about RBF design as in the assets it deploys.

While the broader RBF reform agenda progresses

The broader RBF reform agenda is already underway. Funders and practitioners are questioning whether existing RBF models are delivering durable outcomes, or whether they have become overly focused on auditability, short-term metrics, and administrative control. Yet there are still relatively few live examples where redesigned mechanisms have been tested in real, competitive markets.

A Nigeria pilot focused on generator replacement can therefore serve a dual purpose. It can address an urgent, high-impact energy transition challenge in its own right, while also contributing concrete evidence to a wider conversation about how RBF needs to evolve.

The implication of this broader agenda is not that Nigeria should wait for the "perfect" RBF model to emerge elsewhere. As one of the key arenas of generator replacement, **Nigeria is one of the places where such models should be forged** – through deliberate experimentation, transparent learning, and engagement with the wider RBF community.

If RBF is to remain a credible instrument for supporting market transitions, it will be because new pilots go beyond deploying capital, and test the mechanism itself.

What this could mean for funders

For funders, the implications of this analysis are less about whether to continue using RBF, or to simply accept more risk indiscriminately, but instead **being more deliberate about where risks sit, and why – what work is this risk doing?**

RBF has not stopped working, but the problems that RBFs are now being asked to solve have changed, while the instrument has largely remained the same. RBF was designed to help new markets start and expand, but it is now being asked to help existing markets change – displacing entrenched incumbents and accomplishing sustained behavioural change over time. Achieving this requires the intentional reallocation of risks to unlock transition, such as rewarding "fuzzier" outcomes, accepting longer time horizons, alleviating working capital stress and having greater tolerance for adaptive design.

RBF remains attractive precisely because it promises accountability and alignment between funding and real-world outcomes. Yet the experience across energy access, clean cooking, and related sectors has made clear that **RBF design choices matter as much as the decision to use RBF at all**.

RBF reform offers a way to retain this trusted instrument whilst renewing and extending its strategic utility:

1. Reformed RBF could align better with transition-type objectives

Standard RBF designs are well suited to delivery problems, such as increasing uptake, accelerating roll-out, or closing short-term affordability gaps. They are less well suited to transition problems, where success depends on behaviour change, asset replacement, and sustained use over time.

A reformed RBF approach could enable funders to target outcomes that matter in these contexts (e.g. displacement of incumbent technologies, durability of use, or post-subsidy viability) rather than relying on deployment metrics as proxies. This would position RBF as a more credible tool for supporting transition goals, an attractive characteristic for funders under increasing pressure to demonstrate that concessional capital is driving real structural change.

2. It offers a more efficient use of scarce concessional capital

From a funder perspective, the central risk with standard RBFs is repetition – the same subsidy logic applied repeatedly to the same problem, without strengthening the market foundations and reducing future dependence on support.

Reforming RBF explicitly seeks to do more than compress prices temporarily. By shaping incentives around durability, firm behaviour, and market conditioning, they could offer a pathway to **spending less over time while achieving more lasting outcomes**.

3. It gives funders greater strategic control over how markets evolve

Standard RBFs are often treated as neutral delivery mechanisms: pay for outputs and let the market decide how to achieve them. In practice, they embed strong – often unintended – signals about who can participate, which business models are favoured, and what kinds of behaviour are rewarded.

Reforming RBF brings these choices to the surface, emphasising its role as a market-shaping instrument. Incentive structures can be aligned with desired trajectories – such as improved firm bankability, better after-sales support, or stronger engagement with local finance – without funders needing to prescribe specific models or technologies. This preserves RBF's flexibility while increasing its strategic utility.

4. Early engagement allows funders to shape the reform agenda, not just adopt it

There is growing, cross-sector recognition that RBF needs to evolve – but relatively little consensus yet on exactly what this reform should look like, owing to the early stage of the discussions. In that context, funders who engage early in RBF reform have the opportunity to help shape:

- Which trade-offs are considered acceptable;
- How integrity, flexibility, and ambition are balanced; and
- What "success" looks like in transition-oriented RBFs.

5. Why Nigeria provides a compelling entry point for interested funders

Nigeria combines a large, entrenched generator market with an established solar ecosystem, capable implementing institutions, active funders, and a positive track-record of RBF implementation at-scale. For funders interested in the future of RBF, a pilot in Nigeria offers a bridge between **why RBF reform matters** and **how funders can actively participate in defining what comes next**.

Looking ahead

The case for reform is not that RBF has failed. It is that the problems RBF is being asked to solve have changed. Generator replacement requires more than deployment: it requires a customer proposition capable of displacing a familiar incumbent, a financing structure that works for companies and customers, and evidence that activity survives post subsidy.

We believe there is a strong case for rethinking how RBF is designed and deployed in these markets where the challenge is no longer access, but transition. The ZE-Gen programme is focused on one such market, fossil fuelled generators.

For Nigeria, the opportunity is to test not only a cleaner generator solution but a mechanism for market transition tailored to this specific challenge. The pilot could therefore produce value well-beyond the assets financed; it could help establish when results-based finance can catalyse transition, when it must be combined with other instruments, and when a different approach is required.

Our goal is to move from diagnosis to demonstration – the work is planned to progress in five stages:

Table 4. Proposed roadmap for moving from customer research to pilot demonstration and scaling

Stage	Core activities	Decision output

1. Diagnose and segment	Customer research; load and generator-use baselines; company unit economics; company, lender and funder interviews; mapping of existing access programmes; mapping hard constraints.	Priority customer segments and a clear statement of the problem RBF is expected to solve.
2. Test the instrument	Compare RBF with grants, guarantees, debt, procurement and hybrid options; model subsidy and verification costs; assess legal and data requirements.	Pilot co-design funding proposal, and information to support a "go / redesign / stop" decision.
3. Co-design the pilot	Define results, payment stages, customer safeguards, due diligence, adaptive review rules and exit logic with customers, distributors, implementers and financiers. *Our key principle will be to design from customer needs not funder preferences, with an additional layer balancing recipient companies' needs, as they must be a sustainable vehicle of change.*	Implementation-ready design and costed monitoring plan.
4. Implement and learn	Run a bounded pilot across selected segments; publish payment speed, customer, displacement and company viability learning.	Evidence for scale, modification or discontinuation.
5. Scale selectively	Expand only where customer value, additionality, cost-effectiveness and post-subsidy viability are demonstrated.	A scalable model or a clear case for alternative instruments.

ZE-Gen welcomes engagement from Nigerian customers and customer representatives, solar-generator and energy-service providers, RBF practitioners, lenders, funders, policymakers and data or verification partners interested in co-designing and testing this approach.

You can connect with us at ZE-Gen.org

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Annex A: Snapshot of active RBF programmes in energy access*

Name	Funder(s)	Geography	Technology scope	Genset focus	Primary result metric	Delivery model
Beyond the Grid Fund for Africa (BGFA)	Multi-donor facility managed by Nefco; funded by Sweden, Denmark, Norway, and Germany	Burkina Faso, DRC, Liberia, Mozambique, Uganda, Zambia	Off-grid electricity via SHS, mini-grids, and other solar solutions incl. battery rentals and appliances	**Partial** – some supported solutions and 'subscription' metric enables service-based models to participate	Energy connections / subscriptions ("energy connections", "energy service subscriptions")	RBF used to incentivise private companies to expand access; explicitly supports "new business models" including battery rentals
Modern Cooking Facility for	Nefco, funded by EU,	DRC, Kenya, Malawi, Mozambiq	Higher-tier clean cooking (electric,	**No** – focused on cooking transitions	Verified clean cooking services delivered	Explicitly supports PAYGo, usage monitoring, and

Africa (MCFA)	Sweden, Norway	ue, Tanzania, Zambia, Zimbabwe	biofuels, biogas)			service-based delivery
Universal Energy Facility (UEF) – Stand-Alone Solar for Productive Use (SSPU)	SEforALL / UEF multi-donor fund	Nigeria (also active in other countries)	Stand-alone solar + batteries (100W-5kW) for SMEs	**Partial** – displacement is an explicit objective, but payments triggered by solar deployment not verified generator retirement	Verified systems deployed / connections; grant paid per unit	Requires pre-financing by companies; assumes asset deployment and post-hoc verification
Nigeria DARES (Distributed Access through Renewable Energy Scale-Up)	World Bank; implemented by Nigeria REA	Nigeria	Solar hybrid mini-grids, SHS, solar business systems, PUE	**Partial** – generator replacement cited in policy narrative; results are measured as access and connections, with genset replacement projected	Performance-based grants tied to connections / systems installed	Developer-led deployment with tranche-based claims and verification
CEI Africa – Green Mini-Grid Results-Based Financing Grants	CEI Africa	Benin, DRC, Kenya (and other SSA countries)	Solar mini-grids	**No** – designed for rural electrification and access expansion	New mini-grid connections unlocked	Asset build-own-operate model; results framed as connections delivered
Uganda Electricity Access Scale-up Project (EASP) – UECCC Results-Based Financing/Price Subsidy Programme	Government of Uganda & World Bank; implemented by UECCC	Uganda	Off-grid solar, clean cooking, productive use tech	**No** – focused on affordability and access, not displacement of incumbent generators	Verifiable outputs; subsidised point-of-sale prices	ESCO-delivered price subsidies; assumes sale of certified products
Mozambique +ENERGIA Facility – RBF Grants (DRE window: PAYGO SHS)	World Bank; managed by Bamboo Capital Partners for FUNAE	Mozambique	PAYGo solar home systems (plus other DRE via facility)	**No** – SHS access expansion	SHS distributed / installed under PAYGo	Explicitly designed around PAYGo cash-flow cycles and consumer financing

* Although not exhaustive, this table provides a snapshot of prominent RBF facilities and programmes across the energy access sector, who likely account for a large share of total energy access RBF capital deployed.

Across this dominant set of programmes, generator replacement is at best a secondary or implicit objective, never the primary metric driving payments. UEF SSPU is the closest; it references generator displacement as an objective, but it does not pay for verified generator displacement as the result. As mentioned above, this lack of verification visibility means SSPU can end up paying for stacking (solar + generator) rather than replacement.

Annex B: Where standard RBF designs fall short

Failure mode	Why it matters	Design response
What is rewarded	Unit sales and installations can reward coexistence rather than displacement.	Link a portion of payment to sustained service and measured reduction in fossil-generator use.
Who participates	Ex-post reimbursement and heavy due diligence favour larger companies.	Use staged advances, working-capital support and proportionate due diligence, with clear recovery rules.
Which models qualify	Sale-based definitions can exclude rental, subscription and EaaS models.	Define results around verified energy service, use and customer outcomes, not ownership transfer.
How the design changes	Fixed rules become misaligned as battery prices, products and customer preferences change.	Set transparent review points and pre-agreed adjustment rules.
What happens at exit	Temporary price compression can create a cliff edge and damage trust.	Condition incentives on a credible post-subsidy proposition and integration with local finance.

Annex C: Linking risk allocation to market transition

Structural shift needed	How funders typically limit risk	What would support transition	Risk the funder could intentionally absorb	How this supports market transition
Move from activity to impact	Pay only for easily verifiable outputs	Link payments to outcomes	Outcome uncertainty and attribution risk	Aligns incentives with long-term performance and sustainability rather than short-term volume
Keep pace with market evolution	Lock parameters at programme outset	Adaptive and flexible design	Design uncertainty resulting from adaptive rules	Prevents misalignment as technology, prices, and preferences change
Broaden participation	Only ex-post reimbursement	Provide advances or working capital	Impact uncertainty (for advances) or credit risk	Enables smaller and newer firms to participate, increasing competition and resilience
Avoid post-programme collapse	End support abruptly at programme close	Supporting lenders to service segment (e.g. guarantees)	Supported-to-unsupported transition risk	Increases likelihood that market activity survives beyond subsidy

Annex D: Summary of redesign logic

Structural shift	Value created	Practical implication / safeguard
Deployment to displacement	Aligns payment with transition rather than sales volume.	Requires baseline data and credible measurement of generator runtime or load substitution; use sampling and remote data where possible.
Ex-post reimbursement to liquidity-aware payments	Broadens participation and reduces working-capital pressure.	Creates credit and recovery risk; keep initial advances limited, milestone-based and subject to proportionate due diligence.
Short-term outputs to time-weighted performance	Rewards uptime, durability and after-sales service.	Extends programme duration and payment uncertainty; define a meaningful but bounded performance window.
Fixed design to adaptive rules	Keeps incentives aligned with technology costs and customer behaviour.	Requires more staff time and governance; pre-agree review dates, data triggers and who can authorise changes.
Temporary subsidy to market conditioning	Builds lender confidence, firm bankability and viable customer finance.	Requires co-design with financiers before launch and a measurable route to declining subsidy dependence.

END