

Battery energy storage in Africa

Procuring flexibility and financing reliable power

Dispatch rights, service contracts and lifetime performance across grid-scale and distributed systems

Africa's battery-storage opportunity is becoming more concrete, but installed capacity is an incomplete measure of progress. South Africa's October procurement announcement prioritises storage services; Egypt's Obelisk solar-and-storage complex reached full commercial operation in August; Senegal's Walo project provides a distinct grid-support model. StoneComms examines the institutional machinery that converts stored electricity into reliable service: a defined system need, a suitable location, enforceable dispatch rights, durable payments and funded lifetime performance.



FLAGSHIP RESEARCH

12 OCTOBER 2026

DESK RESEARCH · NO PROPRIETARY
DATA

RELEVANT SDGs

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Classification by direct relevance; no UN affiliation or endorsement.

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EXECUTIVE THESIS

A battery can be commissioned before the service it is meant to provide has been properly commissioned. The equipment may pass its tests, the developer may secure finance and the minister may announce a capacity figure. None of those events establishes that electricity can be charged, held and discharged at the right place and time, or that the institution receiving the benefit can pay for it.

The distinction has become timely. On 7 October 2026, South Africa announced a proposed 4,600 MW battery-storage allocation. Government's explanation explicitly connected location, charging and discharge requirements to enforceable performance obligations.[1] The substantive change is the attention to the service being purchased, rather than the number of containers ordered.

In Egypt, Scatec reported full commercial operation of Obelisk on 12 August 2026: approximately 1.1 GW of solar with 100 MW/200 MWh of storage, supplying the Egyptian Electricity Transmission Company under a 25-year, US-dollar-denominated power purchase agreement.[2] Senegal's Walo combines 16 MW of solar with 10 MW/20 MWh of batteries and a 20-year take-or-pay partnership with Senelec.[3] These are different contractual and operational propositions. Neither is a template that can be transferred unchanged across the continent.

The research question is therefore practical: under what conditions can African electricity institutions procure battery flexibility that is technically useful, financially durable and beneficial to customers?

StoneComms original synthesis: the core asset is a contracted operating capability. Its value depends on a chain running from measured system need through connection and dispatch to verified service, payment and renewal. Equipment cost matters, but it cannot compensate for a missing link in that chain. A battery whose economic benefit has no contractual recipient may be useful in a model and unfinanceable in a transaction.

This paper proposes a Storage Service Readiness Test. Before procurement, the buyer should be able to identify the constraint, define the service, compare alternatives, allocate control, specify lifetime performance, establish payment responsibility and verify customer benefit. The test is a decision framework developed from the sources, not an empirical ranking or a claim of proprietary research.

The recommendation is to procure the required electricity service first and allow technology competition within credible performance boundaries. For some systems that will favour batteries. Elsewhere, demand response, transmission investment, regional exchange, pumped storage or changes in operating practice may be more valuable. For many systems, a portfolio will be necessary. The objective is reliable, affordable power over time, not the largest storage announcement.

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WHY THIS MATTERS NOW

Falling hardware costs create an institutional deadline

IRENA reports that global installed utility-scale battery-storage costs declined by 93 per cent between 2010 and 2024, reaching US\$192 per kWh in its 2024 dataset.[4] That is evidence of a technology trend, not a delivered quotation for an African project. Financing, freight, civil works, connection, duties, insurance and maintenance arrangements remain local.

The opportunity is nonetheless changing. Lower equipment cost makes more use cases worth evaluating, while renewable growth increases the importance of timing and flexibility. IRENA's 2026 analysis of firm solar and wind finds improving economics for co-located renewables and storage, but its findings depend on resource quality, configuration and financing assumptions.[5] A global cost benchmark cannot establish the least-cost solution at a particular substation.

StoneComms original synthesis: as equipment becomes more affordable, weak procurement becomes more consequential. An institution can now buy a technically credible asset that solves the wrong problem at a competitive price. Good competition reduces the price of a defined service; it does not define the service on the buyer's behalf.

The timing also matters for institutional learning. Early contracts establish precedents for dispatch, charging charges, data access, warranty claims and environmental responsibility. If those precedents are copied without evaluation, a growing market can reproduce contractual weaknesses as efficiently as it reproduces engineering designs.

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KEY FINDINGS

1. Megawatts and megawatt-hours answer different questions

Power describes the rate of delivery; energy describes the quantity stored. Dividing rated MWh by rated MW gives a nominal duration, not a guarantee of usable output under every condition. The reported ratings imply approximately two hours for Obelisk and Walo and five hours for Hex in South Africa.[2][3][6] Those ratios do not make the projects substitutes: their purposes, operating boundaries and contractual obligations differ.

2. System value and project revenue must be reconciled

World Bank guidance distinguishes regulated cost recovery, single-buyer procurement and competitive market arrangements.[7] A project must earn through an arrangement the relevant market actually supports. Avoided curtailment, reserve requirements or diesel expenditure can be real benefits without automatically becoming a payment to the battery owner.

3. Dispatch control is part of the financial structure

The World Bank's solar-plus-storage guidance distinguishes two-part, capacity and blended-energy contracts.[8] Their allocation of operational control and payment risk differs. A buyer seeking broad dispatch flexibility must also possess the communications, scheduling and settlement capability needed to use it responsibly.

4. Lifetime service requires funded renewal

Battery capacity changes with age and use. NREL's System Advisor Model explicitly represents voltage, temperature and degradation when assessing performance and replacement.[9] Tender comparisons should therefore include the obligation and funding to sustain contracted output, not only the opening-day rating.

5. Smaller systems require the same disciplines

IRENA's August 2026 West African mini-grid study evaluates storage within electrification scenarios for Burkina Faso, Mali, Nigeria and Senegal.[10] Its results are conditional modelling, not a financed project pipeline. The principle transfers: compare complete service systems, including demand, backup, fuel, maintenance and replacement.

6. Reliability benefit must survive the network downstream

A storage plant can improve a grid service without repairing the feeder, transformer or connection serving a household. StoneComms original synthesis: public reporting should connect project performance to the intended customer outcome and identify where the remaining delivery constraint sits.

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EVIDENCE AND METHOD

This comparative desk study was completed on 12 October 2026. It examines battery storage as an electricity-service and financing proposition. South Africa provides current procurement evidence and a utility-owned installation; Egypt and Senegal provide contrasting solar-plus-storage contracts; Malawi provides a smaller grid-connected hybrid; West African modelling provides a distributed-access comparison.

The source base comprises government announcements, utility and developer disclosures, development-finance records, World Bank procurement and regulatory guidance, IRENA research and national-laboratory modelling documentation. Current project status is distinguished from historical financing commitments and from projections. Developer descriptions are treated as attributable disclosures, not independent operating audits.

The paper does not aggregate these projects into an African market forecast. AC and DC solar ratings, battery power and energy, procurement allocations, nameplate capacity and delivered performance are different measures. No proprietary dispatch records, contracts, bids, battery-health data or household interviews were available. The analysis consequently identifies decision requirements rather than calculating project returns or proving causal effects on customer reliability.

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1. DEFINE THE SERVICE BEFORE SELECTING THE BATTERY

A technology category is not a procurement specification

Storage can shift energy from one period to another, respond rapidly to a disturbance, support local voltage or reduce dependence on a generator. These functions have different duty cycles and different opportunity costs. World Bank regulatory guidance warns that choosing technology requires a concrete use case and a view of system value.[7]

StoneComms original synthesis: a procurement brief should begin with a service statement. It should name the location, operating period, required response, minimum usable energy, frequency of activation and consequence of non-delivery. It should distinguish routine shifting from emergency reserve and define which requirement takes priority if both occur together.

Consider a hypothetical evening-supply contract. Reserving energy for the evening can conflict with selling it earlier. If the buyer also requires emergency reserve, some capacity cannot be committed to predictable daily discharge. The same stored energy cannot be counted twice. A financial model

that adds every potential revenue source without representing these conflicts overstates the service the asset can sell.

A second distinction concerns the counterfactual. Avoided curtailment is valuable only relative to what would otherwise happen. If generation could be exported through a reinforced line or consumed by flexible industrial demand, the battery must be compared with those alternatives. If reserve could be provided through a different operating arrangement, purchasing storage is not automatically the cheapest option.

The procurement should therefore publish its service logic while protecting legitimately confidential system data. Competition can then reveal the cost of delivery. Without this step, bidders compete on assumptions, and the buyer receives apparently comparable prices for materially different products.

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2. LOCATION AND CHARGING DETERMINE WHETHER CAPACITY IS USABLE

Connection rights must cover both directions

South Africa's October announcement states that storage must be located where it can absorb surplus electricity and discharge without recreating a network constraint.[1] That principle is important beyond South Africa: a connection approved for export alone does not answer every question about charging access.

StoneComms original synthesis: the connection study and service specification should be treated as one analytical exercise. A project needs an answer to four questions: where can charging energy originate; when can it enter; where can discharge reach; and what happens when the network is unavailable? These questions should be tested against the expected duty cycle rather than an isolated maximum-output event.

Co-location can simplify some interfaces, but it does not abolish them. The battery, renewable plant and grid connection may share a bottleneck. Charging may compete with export. The contractual treatment of curtailed renewable output may differ from the treatment of energy deliberately stored. Ownership and metering boundaries can alter which party bears losses and which party receives payment.

The least visible cost may be operating energy. Conversion losses, cooling and other auxiliary loads mean that a stored MWh is not a newly generated MWh. Charging energy should be priced consistently, including any network charges. Otherwise a project can appear cheap because an essential input has been excluded or shifted onto the utility without disclosure.

There is also a timing risk. Storage capacity promised before associated transmission, communication or generation is ready can be idle or unable to deliver its intended service. Procurement schedules should link these interfaces and allocate delay risk to the party best able to manage it. Completion of civil works is an inadequate proxy for service readiness.

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3. MATCH THE CONTRACT TO THE BUYER'S OPERATING CAPABILITY

More control creates more responsibility

The World Bank's planning framework sets out three broad solar-plus-storage models: separate remuneration for energy and storage, payment for combined capacity, and a blended-energy arrangement.[8] These are useful starting categories. They are not recommendations to use an identical contract in every jurisdiction.

StoneComms original synthesis: the contract should align three things: the buyer's required service, the developer's controllable obligations and the buyer's ability to dispatch and settle. A mismatch among them can survive financial close and emerge only during operations.

An availability-oriented arrangement can make sense when the system operator values readiness and directs utilisation. The payment buys access to a capability rather than continuous throughput. But the buyer then needs a clear method for demonstrating availability and distinguishing equipment failure from an instruction it could not issue or a network it could not provide.

A defined-energy product may place more responsibility on the seller for delivering within agreed time windows. That can reduce operational complexity for the buyer. It may also limit the buyer's access to other services the battery could provide. The price comparison must recognise this difference in rights rather than treating a capacity payment and an energy tariff as interchangeable.

A multi-service arrangement needs a priority rule. Who may call the asset, when, and with what notice? Which obligation overrides another? Who pays for additional cycling outside the base duty? What happens to warranty eligibility? A contract that grants overlapping rights to two buyers without resolving these questions creates a dispute, not diversified revenue.

Payment security remains essential. A well-defined technical product does not solve an insolvent buyer or foreign-exchange mismatch. Conversely, a strong guarantee cannot create system value for an unnecessary service. Technical diligence and financial diligence should be connected while retaining their distinct purposes.

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4. PURCHASE LIFETIME PERFORMANCE, NOT OPENING-DAY CAPACITY

Degradation is a delivery obligation

Laboratory and modelling guidance treats battery performance as dependent on operating conditions, including temperature and use.[9] Procurement should specify the service that must remain available during the contract, rather than leaving renewal to a vague future maintenance plan.

StoneComms original synthesis: a lifetime specification should define the measurement boundary, minimum usable energy, permitted operating range, efficiency test, availability definition and verification schedule. It should allocate responsibility for cooling, control systems, replacement modules, software support and safe decommissioning. A supplier warranty is part of that structure; it is not the whole structure.

The procurement comparison should make augmentation assumptions explicit. One bidder may install spare capacity initially. Another may add modules later. A third may permit output to decline. Those offers cannot be compared on upfront cost alone unless the required service is held constant and later expenditure is accounted for.

Control of utilisation is especially important. If the buyer changes the duty cycle, it may change degradation and replacement cost. If the owner restricts operation to protect warranty terms, it may

reduce the service available to the grid. Neither party should discover this trade-off after commissioning. The contract needs an agreed baseline duty and a mechanism for changes.

Safety and local operating capability also belong in the economic case. Site access, emergency procedures, trained technicians, spare parts and an enforceable route for end-of-life equipment are service conditions. A cheap system requiring a long overseas intervention for routine faults may provide expensive reliability. This paper proposes evaluating recovery time and support capability alongside nominal availability.

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STONECOMMS ORIGINAL SYNTHESIS

The Storage Service Readiness Test

The evidence base combines current South African procurement, disclosed African hybrid projects, World Bank contract guidance and IRENA system modelling.[1][2][3][7][8][10] The analytical bridge is that each source describes a different part of the conversion from physical flexibility to an operating and financed service. The proposed test makes those interfaces explicit.

1. Need: identify a measured constraint and the institution responsible for resolving it. Specify whether the problem is timing, reserve, local network performance, fuel dependence or another requirement.
2. Alternative: compare the battery with feasible competing interventions over the same service boundary and period. Include demand management, network investment and other flexibility where relevant.
3. Location: demonstrate access to charging energy and a deliverable discharge route. Test network availability and interface schedules rather than relying on nameplate connection capacity.
4. Control: allocate dispatch rights, operating limits, data access and service priorities. Ensure the buyer can exercise the rights it purchases.
5. Performance: define usable output, response, availability, efficiency and renewal obligations across the contract. Align the duty cycle with warranties and replacement funding.
6. Payment: identify the revenue mechanism, settlement process, payment security and currency exposure. Distinguish public-system benefits from cash actually available to the owner.
7. Proof: establish independent measurement of delivery and the intended customer benefit. Publish exceptions, failures and corrective actions alongside success metrics.

This is a readiness test, not a weighted score. A project with excellent equipment cannot average away an undefined buyer or an unusable connection. Some gaps can be resolved during preparation; others invalidate the proposed service. The framework should therefore record evidence, unresolved dependencies and the accountable party for each gate.

Confidence is strongest in the need to define service, control and payment coherently. Confidence is lower in predicting how much this discipline changes financing cost or customer reliability, because public sources do not supply comparable transaction and dispatch data. That causal question is a proposed research programme, not a finding of this paper.

PAN-AFRICAN COMPARISON AND SCALABILITY TEST

South Africa: procure the system operator's required capability

The proposed 4,600 MW allocation is a procurement intention, not installed capacity.[1] Eskom's Hex project provides an operating reference with 100 MWh of energy storage; AfDB reports its power rating at 20 MW.[6][11] The policy issue is how a broader programme selects sites, service duration and enforceable dispatch requirements. Replication should follow the constraint being relieved, not the visual similarity of battery installations.

Egypt: integrate storage into a long-term hybrid contract

Obelisk's reported commercial operation and long-term PPA demonstrate delivery of a large hybrid proposition.[2] The financing announcement involved development institutions and a blended capital structure.[12] The transferability question is which contract and financing conditions are necessary in another market. An operating project is evidence of execution under its own conditions, not proof that every country can support the same currency or risk allocation.

Senegal: a smaller asset can provide a distinct system service

Africa REN describes Walo's purpose as grid stabilisation, with frequency control and other capabilities alongside solar generation.[3] The relevant lesson is the alignment of a defined operational need with a long-term buyer. Public material does not provide an independently audited series of delivered services, revenues or savings, so this paper does not claim demonstrated cost reductions for Senegalese customers.

Malawi: financing and system interfaces matter at smaller scale

DFC's September 2022 disclosure records Golomoti's 20 MW solar plant and 5 MW/10 MWh storage system, its substation connection and commencement of operations earlier that year.[13] MIGA separately disclosed political-risk support for the project.[14] Together these sources show that modest storage can form part of a broader project-financing structure. The development claim still needs to be tested through actual delivery and customer experience.

West African mini-grids: demand and fuel assumptions change the answer

IRENA's 2026 modelling identifies a minimum addressable mini-grid opportunity of about 568 MW across approximately 42,700 settlements in Burkina Faso, Mali, Nigeria and Senegal, serving around 21 million people under the report's scenario framing.[10] These are mini-grid figures, not battery installations or secured investments. Battery value changes with demand, grid expansion, capital cost and diesel assumptions. A national opportunity map should therefore lead to local validation, not bulk equipment orders.

Across these cases, the transferable disciplines are service definition, interface management, payment design and lifetime accountability. Market structure, buyer credit, geography, demand and operating capability remain local. A continental storage strategy should standardise evidence requirements while allowing different commercial models.

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IMPLICATIONS FOR POLICY, CAPITAL AND IMPLEMENTATION

Governments and regulators

Require storage proposals to identify their service and payment boundary. Clarify how charging and discharge are treated, who may own and operate the asset, and how its cost is recovered. World Bank regulatory guidance identifies ambiguous classification and double charging as potential barriers.[7] Reform should remove unjustified obstacles without granting blanket subsidies to every storage project.

Utilities and system operators

Prepare a service pipeline rather than only a capacity pipeline. Link candidate sites to system studies, procurement schedules and dispatch capability. Budget for communications, metering, staff and settlement. Publish performance criteria that distinguish equipment availability from successful service delivery.

Development finance institutions

Fund preparation and verification as part of the asset. A concessional facility can help establish a first transaction, but it should disclose which barrier it addresses and how later projects will learn from it. Use guarantees for defined risks rather than treating them as substitutes for a coherent service case.

Developers, lenders and suppliers

Test rights as carefully as ratings. Review charging access, dispatch priority, network outage treatment, additional cycling, replacement funding and currency exposure. A project should be able to explain what it sells, to whom, under which measurable obligation and with which remedy for non-delivery.

Communities and industrial customers

Seek a clear account of intended benefit. Greater grid stability, fewer interruptions, lower fuel dependence and lower bills are distinct outcomes. Require the project or utility to state which it intends to deliver and how progress will be observed. Construction employment and community programmes should be reported separately from electricity-service performance.

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RISKS, COUNTERARGUMENTS AND LIMITATIONS

Storage can become an expensive substitute for network reform

A battery may reduce a local problem while a broader transmission or distribution constraint remains. The response is an alternatives assessment and a defined service period. Storage can be a bridge or a complement; it should not become a reason to defer a superior structural intervention indefinitely.

Detailed preparation can delay urgently needed capacity

There is a real trade-off between preparation and speed. The proposed response is standardised evidence and contract modules, not an elaborate new bureaucracy. Reusable requirements can accelerate later tenders, while site-specific network and demand questions remain compulsory.

Long-term contracts can protect developers while burdening buyers

Revenue certainty has a cost. If service needs change, a buyer may continue paying for capability it uses less often. Contracts should address credible adaptation, performance review and residual-value questions. They should not transfer every uncertainty to consumers merely to achieve financial close.

Battery deployment does not automatically deliver decarbonisation

The emissions outcome depends on charging electricity and the generation or fuel displaced. Storage can absorb clean surplus, but it can also shift fossil electricity. This paper does not calculate emissions benefits for the case projects. Any future claim should use an explicit dispatch counterfactual and account for relevant lifecycle boundaries.

Public evidence is incomplete

Project announcements establish reported ratings, financing and milestones; they rarely reveal full contracts, degradation trajectories or settlement disputes. Institutional models demonstrate potential, not realised household outcomes. The paper cannot rank technologies, estimate an African storage market or recommend an individual investment. Its conclusions concern preparation and governance disciplines.

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COMMISSIONABLE RESEARCH AGENDA

A comparative Storage Service Observatory

A useful institutional commission would examine operating projects and planned procurements across at least six African markets, using a common evidence protocol. The aim would be to discover which contractual and operating conditions predict sustained delivery, rather than to count announcements.

The first workstream would build a project register separating rated power, rated energy, usable contractual energy, commercial operation and verified availability. It would reconcile AC/DC generation ratings and record the actual service purchased.

The second would compare contracts and dispatch records. With confidentiality safeguards, researchers would examine charging rights, service priority, activation frequency, payment delays, non-delivery events and utilisation outside warranty assumptions.

The third would evaluate lifetime costs: initial expenditure, operating energy, cooling, spare parts, augmentation, insurance and decommissioning. Scenario analysis would show how results change with demand, currency, charging cost and battery health.

The fourth would test customer outcomes. Industrial-load interviews, feeder data and household evidence would distinguish system support from service improvements reaching users. The analysis should include people beyond the project boundary who may pay for it without receiving equivalent

benefits.

The fifth would compare alternatives using a common counterfactual. A battery that appears effective alone may be less valuable when network reinforcement or flexible demand is considered. Conversely, storage may avoid a more costly intervention. Both possibilities require evidence.

Deliverables would include procurement-ready service definitions, a comparable operating dataset, case-specific financing lessons and a public performance report. The resulting work could help institutions distinguish projects ready for competitive procurement from those requiring further system planning or buyer reform.

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CONCLUSION

Africa's storage opportunity is substantial in scope but heterogeneous in form. The evidence now extends from national procurement announcements to operating hybrid projects and distributed-system modelling. Its next stage should be judged by the quality of the electricity service purchased and sustained.

StoneComms' central conclusion is that storage finance begins with service clarity. The battery must solve a measured problem, operate through a usable connection, follow coherent dispatch rights, receive dependable payment and maintain performance over its contract. Public benefit then requires verification beyond the plant fence.

The most useful next step for an institution is a readiness review of its proposed service pipeline. Identify the missing interface before choosing a supplier. That discipline can turn lower equipment costs into better infrastructure decisions, and better decisions into reliable power.

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KEY METRICS

4,600 MW — proposed South African battery-storage procurement allocation announced on 7 October 2026; not installed capacity.[1]

100 MW / 200 MWh — reported Obelisk battery ratings alongside approximately 1.1 GW solar; full hybrid operation reported on 12 August 2026.[2]

10 MW / 20 MWh — Walo storage ratings, paired with 16 MW solar in Senegal.[3]

US\$192/kWh — IRENA's global installed utility-scale battery-cost figure for 2024; not an African project quotation.[4]

5 MW / 10 MWh — Golomoti storage ratings in Malawi, disclosed by DFC.[13]

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METHODOLOGY

Comparative public-source desk research completed on 12 October 2026. Cases were selected for variation in scale, service and contractual setting rather than statistical representativeness. Reported ratings and milestones were retained in source units. Nominal durations were calculated as rated MWh divided by rated MW and are not performance guarantees. Guidance was used to frame decision requirements; project disclosures were used to establish attributable status and architecture. StoneComms did not conduct fieldwork or obtain proprietary contract or dispatch data.

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LIMITATIONS

No independently audited, comparable operating dataset was available across the projects. Announced procurement is not installed capacity; modelling is not a financed pipeline; commercial operation is not proof of customer-level benefit. Global cost evidence is not a local tender price. Findings support a preparation framework, not causal estimates, a market forecast or project-specific investment advice.

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SOURCE NOTE

Prepared by StoneComms Research & Intelligence from public evidence available on 12 October 2026. The Storage Service Readiness Test and associated recommendations are StoneComms original synthesis. Relevant SDGs are 7, 9 and 13, with SDG 7 primary. This classification indicates substantive relevance and does not imply measured SDG impact, UN affiliation or endorsement.

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SOURCES

1. South African Government News Agency (SAnews). South Africa prioritises gas and battery storage. 7 October 2026. <https://www.sanews.gov.za/south-africa/south-africa-prioritises-gas-and-battery-storage>
2. Scatec. Commercial operations reached for the final phase of the Obelisk project in Egypt. 12 August 2026. <https://www.scatec.com/en/commercial-operations-reached-for-the-final-phase-of-the-obelisk-project-in-egypt/>
3. Africa REN. Walo Storage: project characteristics. Undated project page, accessed 12 October 2026. <https://www.africa-ren.com/en/investments-and-projects/walo-storage/>
4. IRENA. Battery Energy Storage Systems: Key to Renewable Power Supply-Demand Gaps. August 2025; reports 2024 cost data. <https://www.irena.org/News/articles/2025/Aug/Battery-energy-storage-systems-key-to-renewable-power-supply-demand-gaps>
5. IRENA. 24/7 Renewables Outcompete Fossil Fuels on Costs. 6 May 2026. <https://www.irena.org/News/pressreleases/2026/May/24-7-Renewables-Outcompete-Fossil-Fuels-on-Firm-Costs>
6. Eskom. Eskom unveils a first of its kind largest battery storage project in the African continent. 10 November 2023. <https://www.eskom.co.za/eskom-unveils-a-first-of-its-kind-largest-battery-storage-project-in-the-african-continent/>
7. World Bank/ESMAP. Deploying Storage for Power Systems in Developing Countries: Policy and Regulatory Considerations. 2020. <https://documents1.worldbank.org/curated/en/738961598380536870/pdf/Deploying-Storage-for-Power-Systems-in-Developing-Countries-Policy-and-Regulatory-Considerations.pdf>
8. World Bank/ESMAP. Unlocking the Energy Transition: Guidelines for Planning Solar-Plus-Storage Projects. 2023. <https://documents1.worldbank.org/curated/en/099112223104540303/pdf/P1790740c740f800c0a7960bac2a93b3f8c.pdf>
9. NREL. System Advisor Model: Battery Storage. Undated documentation, accessed 12 October 2026. https://sam.nrel.gov/index.php?Itemid=360&id=94&option=com_content&view=article
10. IRENA. Unlocking battery storage potential for sustainable mini-grid electrification in West Africa. August 2026. https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2026/Aug/IRENA_TEC_Battery_storage_minigrids_W_Africa_2026.pdf
11. African Development Bank. South Africa's HEX Battery Energy Storage System is delivering energy solutions Africa can scale. 2026. <https://www.afdb.org/en/success-stories/south-africa-hex-battery-energy-storage-system-delivering-energy-solutions-africa-can-scale-91251>
12. British International Investment. BII, AfDB and EBRD support pioneering solar and battery storage project in Egypt with US\$479 million loan to Obelisk Solar Power. June 2025. <https://www.bii.co.uk/en/news-insight/news/bii-afdb-and-ebrd-support-pioneering-solar-and-battery-storage-project-in-egypt-with-us-479-million-loan-to-obelisk-solar-power/>
13. US International Development Finance Corporation. DFC Commits \$25 Million Loan for Golomoti Solar, Expanding Renewable Energy Generation and Storage in Malawi. 21 September 2022. <https://www.dfc.gov/media/press-releases/dfc-commits-25-million-loan-golomoti-solar-expanding-renewable-energy>
14. MIGA. Golomoti Solar: guarantee disclosure. 4 March 2022. <https://www.miga.org/project/golomoti-solar-1>