

THE COMMITMENT OF THE BOLLORÉ GROUP

TO ENERGY STORAGE SOLUTIONS FOR DEVELOPMENT SUPPORT IN AFRICA



Bolloré

BlueSolutions
by Bolloré

ENERGY TO SUPPORT UNPRECEDENTED ECONOMIC GROWTH

With an average annual growth of 4%, Africa experiences an exceptional economic and demographic expansion, requiring major investments in energy production. Moreover 680 millions of Africans have no access to electricity today: according to IRENA, an additional 900 TWh⁽¹⁾ will be required over the next 20 years.

(1) Source: IRENA Africa's renewable future.

RENEWABLE ENERGIES: AN OPPORTUNITY FOR AFRICA

In order to meet this energy challenge, Africa can draw on its extraordinary abundance of renewable energy sources. They are the best economical option in most cases and enhance countries' energy self-sufficiency. In addition to hydroelectric and geothermal energy, already well established, wind and solar energies offer promising possibilities for the continent: AREI (African Renewable Energy Initiative) has set an ambitious target of 300 GW from renewable energies by 2030.



HIGHLY
COMPETITIVE
COSTS



100% CLEAN
ENERGY



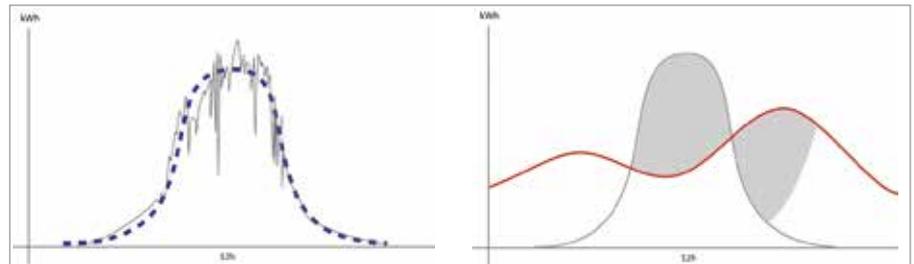
LOCAL AND
ENDLESS SOURCE
OF ENERGY



FAST AND
MODULAR
INSTALLATIONS

ENERGY STORAGE: A RESPONSE TO THE INTERMITTENCY OF RENEWABLES

The variable and decentralised nature of renewable energy deployment presents unique challenges. Storage capabilities can be located at the point of demand or at the grid level to minimise intermittency of the production and better match renewable electricity supply with area demand.



Storage allows energy smoothing and supply shift.

BLUE SOLUTIONS, A TECHNOLOGY TO ADDRESS AFRICA'S ENERGY CHALLENGES

Established in the market of energy storage for 50 years, Bolloré Group designs, produces and markets turnkey solutions for stationary energy storage. Robust, modular and Plug & Play, from 200 kWh to several MWh, these solutions are based on an innovative technology: **Lithium Metal Polymer (LMP)[®]**.



THE LITHIUM METAL POLYMER BATTERY: A BATTERY MADE FOR AFRICA

Unique and safe battery based on a patented technology

- Well-adapted to high external temperature
- No cooling system required
- 100% solid battery, without leak or gas seepage risks
- High thermal stability, no thermal runaway risk

Sustainable, high-performance technology

- Durability exceeding 3000 cycles
- State of Health remains at 100% during full cycle life
- Robust electrical integration, even for fragile grid

Eco-Friendly

- No solvents nor rare minerals
- Highly recyclable and reusable

BLUE SOLUTIONS: ENERGY STORAGE SOLUTIONS FOR AFRICA



INTEGRATING RENEWABLE ENERGIES INTO THE GRID

Solar or wind power plants combined with large storage capacities connected to the grid. The storage system smooths intermittent production and shifts energy to meet peak demand in the evening.

PLANTS FROM 100 KWp/200 KWh TO SEVERAL MWp/MWh



COST EFFECTIVE SOLUTIONS FOR INDUSTRIAL REMOTE SITES

Hybrid power system combining renewable energy production, diesel generator and storage capacity in remote areas.

The hybrid system offers independence from rising diesel prices and reduces operating and maintenance costs.

SOLUTIONS AVAILABLE FOR COMMERCIAL & INDUSTRIAL SITES WITH A MINIMAL 50 KW POWER REQUIREMENT.



DEVELOPPING RURAL ELECTRIFICATION PROJECT

Off-grid networks and mini-grids relying on hybrid power units use renewables with storage capacity to provide energy in hard-to-access locations. Off-grid networks and mini-grids for rural electrification offer a sustainable solution promoting local economic development.

PLANTS FROM 50 KWp TO SEVERAL MWp, FOR VILLAGES WITH OVER 500 HOMES

KEY ADVANTAGES

SUPPORT OF BOLLORE GROUP IN AFRICA

Bolloré Group is the n°1 logistic operator in Africa with a workforce of over 25,000 employees and offices in 52 countries. As a major local player, Bolloré Group assists Blue Solutions in transporting, implementing, operating and maintaining storage systems across the continent.



A COMPREHENSIVE SERVICE



CONSULTING

DESIGN AND SIZING OF THE SOLUTION, BUSINESS PLAN OPTIMIZATION AND LEGAL ASSISTANCE



EPC

TRANSPORT, CONSTRUCTION AND COMMISSIONING



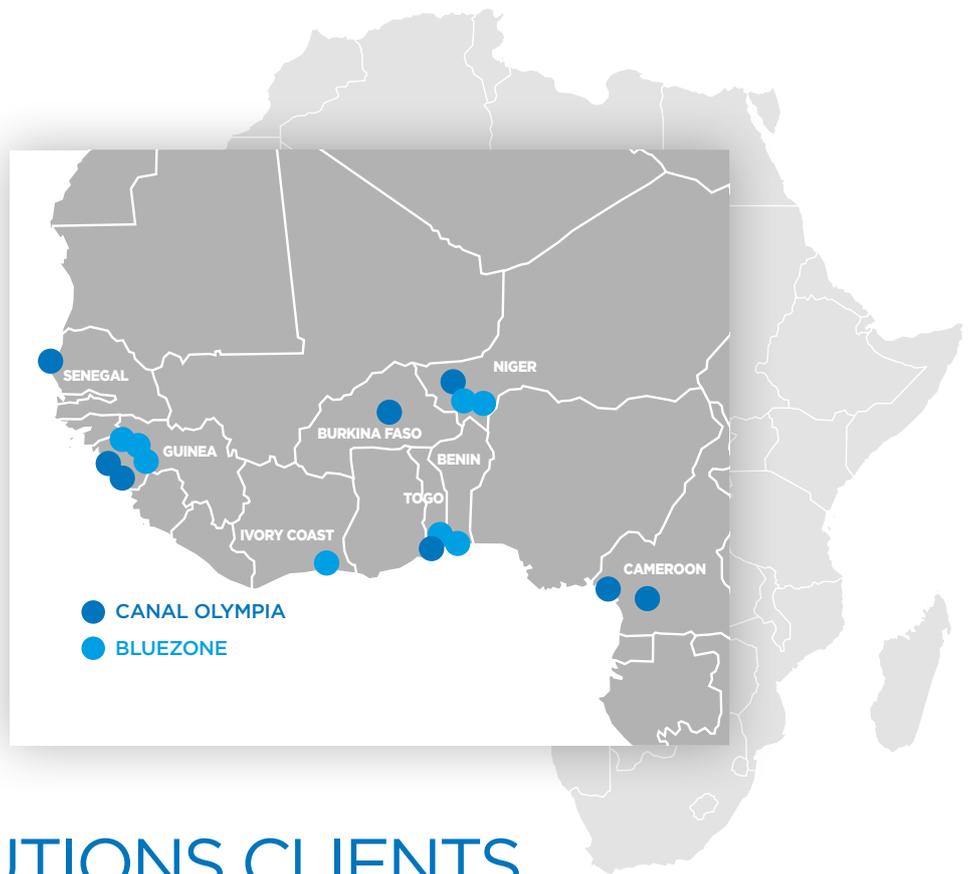
O&M

LOCAL TRAINING, LOCAL OR REMOTE SUPERVISION & MAINTENANCE

CONTROL OF THE WHOLE VALUE CHAIN

Designed and manufactured in Blue Solutions factories in France and Canada, our storage solutions incorporate our LMP® batteries, power conversion components and Smart Energy Management System software. Systems are in compliance with the highest quality standards, adapted and tested to African climatic conditions.

Since 2014, Blue Solutions has deployed solar power plants with storage solutions worldwide. In Africa they are mainly used to power BlueZone and Canal Olympia® sites.



BLUE SOLUTIONS CLIENTS ARE LOCATED AROUND THE WORLD BUT PARTICULARLY IN AFRICA



| CANAL OLYMPIA®

Vivendi Group is building 50 Canal Olympia sites in Africa, the continent's first network of cinema and live performance venues. To compensate for an unreliable grid and reduce air and noise pollution, each Canal Olympia is supplied with renewable energy through a Blue Solutions hybrid power system: 140 kWc of solar energy with 400 kWh of storage capacity.



| BLUEZONE

The BlueZone is an autonomous mini-grid relying on Bolloré's Blue Solutions storage technology (90 - 360 kWh) combined with solar energy production (70 - 140 kWp). Between 2014 and 2015, 9 BlueZones emerged in West Africa. BlueZones have a positive social and economic impact by supporting local businesses and individuals to achieve economic prosperity.

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