



GEM® Green Energy in Motion

CLEAN | MOBILE | SCALABLE ENERGY SOLUTION



The Solar Impulse Efficient Solution Label

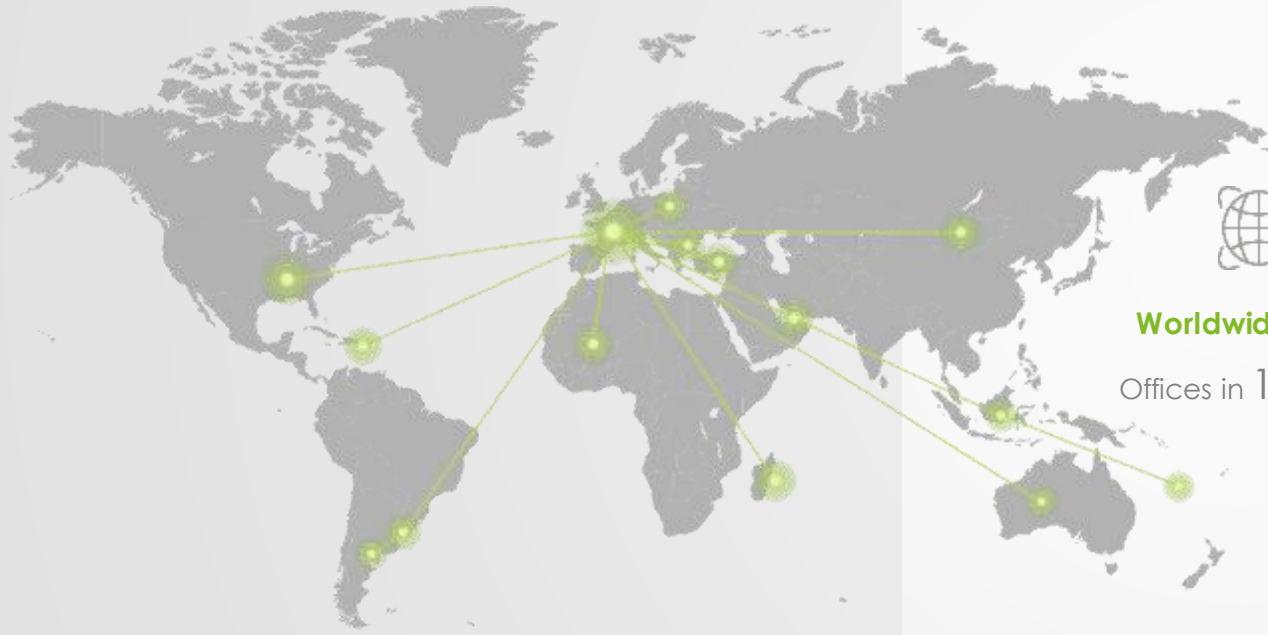
The Solar Impulse Efficient Solution Label is a new and credible symbol: a trademark, that carries the pioneering and innovative spirit of the Solar Impulse adventure. It is granted to solutions who meet high standards of both sustainability and profitability, through a strict assessment of the following criteria:

1. **Technological feasibility**
2. **Environmental and socio-economic benefit**
3. **Profitability**



Akuo

Entrepreneur By Nature



Independent Power Producer (IPP – Paris based)

1 395 MW in operation and under construction and with financing underway

A total pipeline of 3 GW

Two-thirds owned by its cofounders



Multi Renewable Energy Pure Player

Wind, solar, biomass, hydro



Worldwide Player

Offices in 15 countries



Integrated actor

340 employees

Develops, finances, builds and operates



Proven Expertise

€ 205 million * in electricity sales at the end of 2017 and a cumulative investment of € 2.1 billion since inception.



Clear Strategy

Fast Growth,
Geographic and Technological Diversification

Solutions by Akuo

Innovation by Nature

Our vision :

- Renewable energy is a fast-growing market requiring evolutive solutions.
- Akuo Solutions is an Akuo subsidiary, dedicated to tailored and innovative renewable energy generation solutions

Our Solutions :

- Propose cutting-edge technology, such as mobile modules combining solar and storage plants, floating solar structures, solar tiles or Agrinergie® concept
- Universal Power platform with our EMS
- Hybrid energy solution for isolated sites
- Offer Tailor made Engineering Procurement and Construction (EPC) and financing options (PPA, Lease, Vendor Credit)

GEM® : Green Energy in Motion

Akuo Solution developed Solar GEM®, a 74 kW p mobile solar power generation unit, and Storage GEM®, a mobile storage unit.



HYDRELIO® FLOATING SOLAR SOLUTION BY CIEL ET TERRE

Akuo is a manufacturer and exclusive distributor of the world's most advanced modular floating solar solution.



SOLAR TILES

Photovoltaic tiles combined with modern building standards make it possible to convert classical roofs into renewable energy generation, thereby resulting in CO2 emission cuts.



EMS (Energy Management System)

EMS is a digital Energy Management platform allowing Energy and Smart-grid management.

A plug and play solution to manage all hybrid energy configuration.



GEM®

A Solar Plant and Energy Storage Plug and Play Solution



Solar GEM®



Storage GEM®



EMS
Energy Management System

We design, install, operate the system. You enjoy renewable energy



Cyclonic areas and Emergency



Remote community and isolated farms



Remote Industry



Utility companies



Military camps



Mines Sites



Resorts



Urban Development



Powered by renewable energy



Plug & Play solar and storage units



Prefabricated, containerized and easy to install



A 100% Customizable and scalable plant to fit your energy needs



Mobile units that can be deployed, (un)folded and relocated on demand



Cost effective solution that yields significant savings on your energy bill



> 1 MW installed in a week

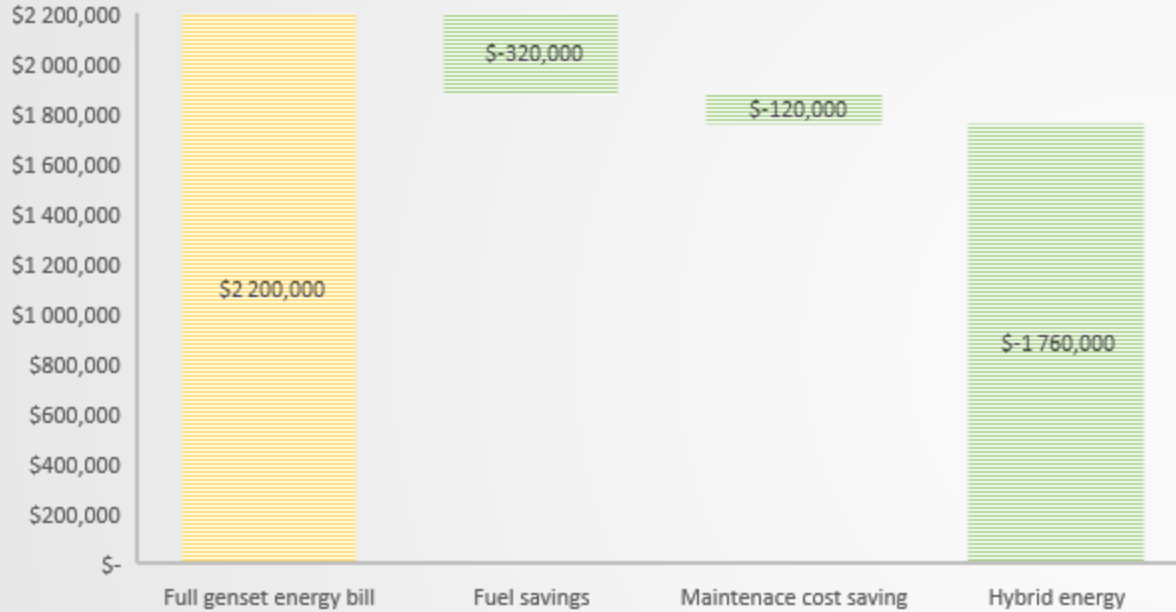


Energy Management System (EMS) universal energy platform



A Solar Plant and Energy Storage Plug and Play Solution

Direct Profits from Day one, 1 MW Load 24/7



20% savings* \$440k per year

**Key assumptions : \$1/L diesel, 1MW load 24/7, no subsidies for solar or storage
60% renewable energy penetration with 2.5MW of solar and 3.6MWh of storage*



Fuel Savings : reduce fuel consumption and CO2 emissions by up to 90%

Business case example : **\$320,000 saved every year**, net of all expenditures



The Smart EMS controls the diesel generators and runs them at optimum load thus **reducing O&M expenses**

Business case example : **\$120,000 saved every year**, net of all expenditures



Quick deployment: thanks to the GEM® technology, the system can be operational **up to 3 months earlier** than with standard ground mounted PV.

Business case example : **\$110,000** in anticipated savings



Highly reliable: solar + storage + gensets combination delivers a **100% availability**, guaranteed

Solar GEM[®]

Innovation at a glance

Solar GEM[®] 20 : > 74kWp in a standard 20ft HC ISO container



- Standard 20ft HC ISO container
- Plug and play solar plant
- Anti-cyclonic by design
- Fully pre-wired strings, inverters and AC cabinet.
- No maximum power limitation
- Easy folding and unfolding of the solar array (30 mins).
- Compatible with energy storage solutions and energy management systems
- Designed for compatibility with most 72 cells PV modules

Features

Solar capacity	> 74 kWp
Solar panels	200
Operating Temp. range	-25 °C to +60 °C (-13 °F to +140 °F)
Container weight	13,2 metric Tons
Deployed footprint	L. 92m x W. 6m x H. 1m (2.9m for the container)
Closed footprint	L. 6.1m x W. 2.4m x H. 2.9m
Installation	No specific installation needed

Storage GEM[®]

Innovation at a glance

Storage GEM[®] 20 : > 1MW in a standard 20ft HC ISO container



- Standard 20ft HC ISO container
- Plug and play Storage plant
- Anti-cyclonic by design
- Fully pre-wired inverters Batteries, EMS and AC cabinet.
- No maximum power limitation, fully scalable.
- Easy and Quick installation.
- Compatible with any LV or MV electrical grid.
- Best in class reliability, thanks to modular and redundant inverter design
- Hot swappable

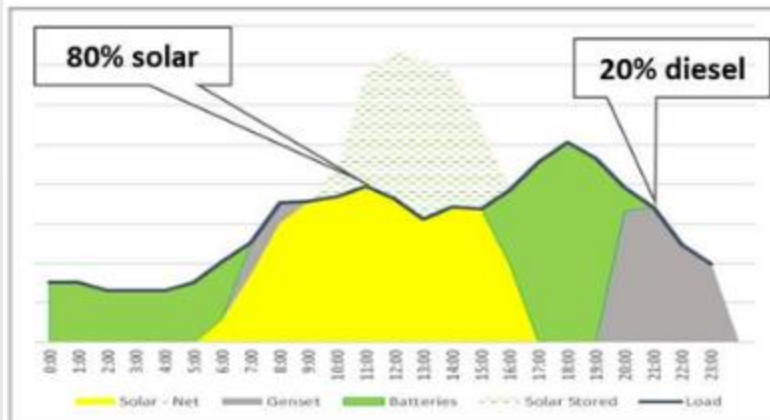


Features

Power capacity	From 200kW to 800kW in one container
Energy capacity	From 100kWh to 1.5MWh in one container
Round trip efficiency	Greater than 85%
Operating Temp. range	-25 °C to +45 °C
Voltage output	LV or MV
Frequency	50-60Hz
Dimensions	6,06 x 2,44 x 2,90m
Lifespan	Up to 20 years
Warranted lifespan	10 years

EMS Smart Energy Management System

Innovation at a glance



- Designed for Hybrid Energy Plant
- An universal energy management Platform
- Management of Solar/ Storage and any other electricity provider (Genset/ Hydro, etc.)
- Local and remote control
- Remote upgrade
- Real time local/remote Alarms

On-grid functionalities :

- PV smoothing and controlled ramp
- Frequency regulation in less than 100ms
- Voltage regulation in less than 100ms
- Peak curtailment
- Capacity firming

Off-grid functionalities :

- Automatic switch to on->off and off->on grid without any blackout
- Maximisation of PV generation
- Optimization of diesel load rate for better lifespan

We offer a Seamless Process From Order to Operations



FOB* 6 Weeks

YOU Customize your need

We Integrate

It into your existing power supply system, thus maximizing your overall savings.

Average 3 months

YOU Start your Solar plant



We support you

A customized support from EPC to full package services and operations

Engineering



Our team create a customized design for your project, including:

- Detailed sizing and layout showing all system components
- Integration with your current power system

Installation & Commissioning



Our installation and commissioning team supervise on-site activities to ensure a smooth set up of the system:

- Installation and commissioning of the GEMs
- Startup and testing of the whole system

Training



We train your technicians on basic O&M activities, including:

- Routine inspections
- Basic corrective maintenance
- Performance control
- All level service Maintenance

O&M Services



We provide all services from light support to full O&M of the system:

- Customized services & maintenance
- 24/7 Remote performance monitoring
- Scheduled preventive maintenance
- Full corrective maintenance coverage
- Spare part management & support

GEM[®]

Easy & Quick installation



> 74 kWp in 2 hours*

> 1 MWp in a week



MCA- Indonesia

1.2MW Solar / 2.1MWh Storage using Solar GEM and Storage GEM technology

Project Name	MCAI Hybrid
Location	Berau province, East Kalimantan, Indonesia
Operator	Local structure managed by villagers
Energy Offtaker	Village owned entity
Project Type	3 Hybrid Minigrids power by solar, micro hydro, gensets, and batteries
Client	Millenium Challenge Account
Role in the Project	Conceptual, Front End & Detailed Engineering Design, EPC
Commercial Operation Date	April 2018
Annual Energy yield	1,260 MWh/year with 90% Renewable energy penetration

Solar powered Community-owned Hybrid Minigrid with battery storage

The project mixes solar and micro-hydro for renewable energy production. This 1.2 MWp hybrid power plant provides 24-hours access to electricity for 400 households in the villages of Merabu, Long Beliu and Teluk Sumbang in Berau Regency of East Kalimantan Province.

The energy produced is sold to villagers at the standard rate of energy in Indonesia. The hybrid power plants are managed by a villagers-owned organization.

Akuo is responsible for the full EPC of the plants and manage the operation and the maintenance training for the plant.



TelukSumv abg



Merabu



Long Beliu

Mining project

Using 3 MW Solar GEM and 9,1MWh Storage GEM technology

Reliable :

Top-tier components
Redundant design
Easy maintenance
O&M services available

Durable :

- proven and mainstream technology
- robust design relying on straightforward mechanical structure
- xx year warranty
- upgrade options available

Cost Competitive :

- more competitive than gensets from a diesel cost of \$0.8/liter
- hedge against fluctuations of diesel price

Benefits to the Community :

- jobs creation for the long-term (local hires for O&M)
- cleaner environment with reduced noise and CO2 emissions
- capacity building programs available

A turn key hybrid energy project for Mining activity

The project mixes solar GEM® plant + storage GEM® and diesel generators. The hybrid power plant will provide up to 80% fuel saving and maximum reliability thanks to the system coupling with EMS Energy Platform

For this project, Akuo is responsible for the full EPC of the plants but also to build operational and maintenance training capacity.



Military camps project



Equivalent or superior operational safety
Reduced risk associated with fuel supply chain
Reduced risk of lack of energy thanks to redundant equipment system



Significant operational cost reductions in the camp
Reduction in diesel consumption
Reduced logistics costs



Easy operation and maintenance
Simple uninstallation, possibility of immediate reversibility from the hybrid solution to the initial 100% thermal solution thanks to the EMS platform.



Positive impact on the environment



AKUO (head office)

140 avenue des Champs Elysées
75008 PARIS
Tél : + 33 1 47 66 09 90
Email : akuoenergy@akuoenergy.com

AKUO MIDDLE EAST

Laurent Longuet
Offices 606 to 610, Jumeirah Bay X2 Tower
Cluster X, Jumeirah Lakes Towers
Dubai, United Arab Emirates
Tél : +971 44 42 79 01
Email : longuet@akuoenergy.com

AKUO AIX EN PROVENCE

Jean-Christophe Paupe
Parc des Valladets
210 chemin des Valladets
13510 Eguilles
Tél : + 33 1 47 66 09 90
Email : arend@akuoenergy.com

AKUO AFRICA

Pierre-Antoine Berthold
140 avenue des Champs Elysées
75008 PARIS
Tél : + 385 12 30 11 04
Email : berthold@akuoenergy.com

AKUO USA

Thomas Coté
645 N Michigan
Suite 980
Chicago, Illinois 60611
Tel. : + 1 31 22 83 34 00
Email : akuoenergy@akuoenergy.com

AKUO ARGENTINA

Martin Bocage
Basavilbaso 1350, Of 805,
Buenos Aires Argentina
Tel: +54 11 4893-1268
Email : bocage@akuoenergy.com

AKUO PACIFIC

Jean Ballandras
Suite 10, 35 Buckingham Street,
Surry Hills NSW 2010
Sydney, Australie
Email : Ballandras@akuoenergy.com

AKUO ENERJI

Gazi Kalkan
Hollanda C. No 4/6
06550 Yildiz Ankara –Turquie
Tèl : + 903 1 24 39 67 55
info@perfectwind.com.tr

AKUO – INDIAN OCEAN

48 chemin Cachalot
97410 Saint Pierre
Tél : + 262 2 62 57 06 25
Email : akuoenergy@akuoenergy.com

AKUO BULGARIA

Stéphane Colin
29a Slavanska street, floor 2,
Office 10
1000 Sofia Bulgaria
Email: colin@akuoenergy.com

AKUO INDONESIA

Christophe Moyon
Galeri Ikat Plaza
Jl. Bypass Ngurah Rai
Unit J & K Pemogan Denpasar 80361, Bali
Tél : +62 36 18 47 32 44
Email : moyon@akuoenergy.com

AKUO CROATIA

Emil Bakic
Pokornoga 15
10000 Zagreb - Croatie
Tél : +385 12 30 11 04
Email : bakic@akuoenergy.com

AKUO POLAND

Marius Nowak
Plac Rodla 8
70-419 Szczecin
Tél : +48 91 48 444 02
Email : nowak@akuoenergy.com

AKUO MONGOLIA

Tuvshin Battsereg
Suite 603, Park Place,
Sukhbaatar District 14241,
Ulaanbaatar, Mongolia
Tèl : +976 9191 9090
Email : tuvshin@akuoenergy.com

AKUO DOMINICAN REPUBLIC

Salvatore Longo
Calle Juan Garcia Bonelly n.9, local 2C
Sector Ensanche Julieta, D.N.
Santo Domingo
Dominican Republic
Tèl : +1 809 7 296 882
Email : longo@akuoenergy.com

AKUO CORSICA

Christian Chiari
1, rue du Docteur Morucci
20200 Bastia
Tél : + 33 4 95 48 18 87
Email : chiari@akuoenergy.com

AKUO WEST INDIES

Olivier Kremer
Immeuble Curaçao
Impasse des Palétuviers _ZI de JARRY
97122 BAIE MAHAULT
Tél : + 596 6 96 83 26 38
Email : kremer@akuoenergy.com

AKUO URUGUAY

Martin Bocage
Rambla Rep de Mexico 6517, Of 104
Montevideo
Uruguay
Tel.: + 598 26 00 91 19
Email : infouruguay@akuoenergy.com

AKUO COLOMBIA

Maria del Pilar
Medellín, Colombia
Tel: +57 3176389165
Email : thernandez@akuoenergy.com

