



**ManoCap
Energy**



**AB Solar
Africa**

Manocap energy &

► Ab Solar Africa, Accra

www.absolar-Africa.com
www.manocapenergy.com

EPC AND FINANCE FOR SOLAR, BASED IN GHANA

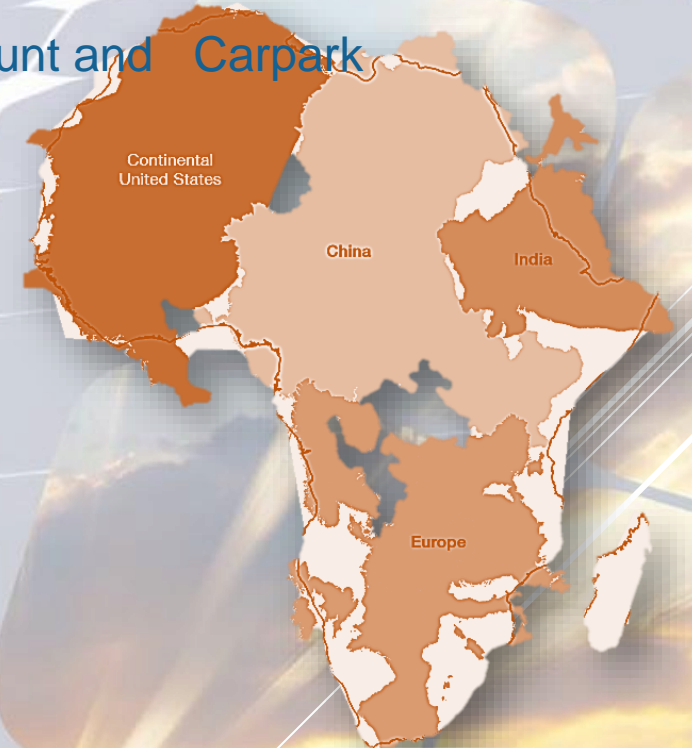
▶ **References of major projects in Africa from 2016 to date :**

- Cargill Ghana, 565kWp Tema Free Zone Enclave ground and carpark
- Labianca Coldstore 385kWp Tema Fishing harbour road, roof mount system
- Danish Embassy, 30kWp Accra roof mount system
- ECPL Pharmacies, 190kWp 2x Accra roof mount systems
- Ecobank. 100kWp Abidjan Cote D'Ivoire roof mount system
- CDDA Coldstore 500kWp, Cotonou Benin roof mount system
- Goldfields GH 95kWp, Accra x 7 new build executive homes with roof mount & battery backup system
- Watchtower Ghana JW.org 150kWp ground mount system for head office ground mount
- Guinness Ghana 1MWp Accra including a "first in Ghana" custom-made roof mount system
- Fair Afric (Choco factory) system 265kWp Suhum including supply of gensets roof mount system



Projects in development

- MSC 420kWp Tema Harbour. Head office with ground mount and Carpark
- MIRO Forestry 2MWp Central region plywood factory.
- NEXANS Kabel metal 480kWp Tema Ground mount
- KCCR 60kWp Kumasi, Hybrid system with battery storage
- Accra Brewery 2.2MWp roof mount in Accra (awaiting PPA)
- Nectar and Jolaks 125 and 409kWp roof top in Freetown Sierra Leone
- Lekki Gardens 1.6MWp with 4MWh storage in Lagos Nigeria
- Invitrolabs 400kWp rooftop in Ghana



So Why AB Solar Africa



- ▶ Solid references and very strong pipeline to be executed when financials are solidified
- ▶ Strong player in niche with significant growth
- ▶ Long standing business relations with key suppliers
- ▶ Technical procurement capability from 10+ years leadership in the EU market
- ▶ Supplementary products within energy saving to complement customers needs

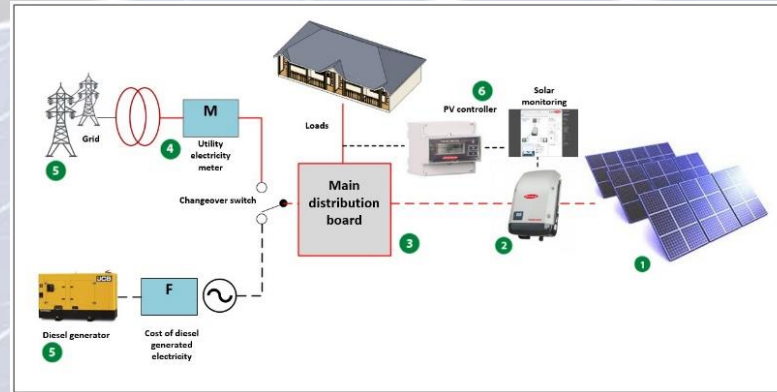




How solar works

With a solar system you create a stable energy supply for your situation. We mostly provide the larger on-grid solar systems with a PV hybrid controller so that we also can control the diesel generator on site. So even with a power cut, and during the day, solar and diesel can run together. With the high energy cost in West Africa there is a huge money saving on your electricity bill.

- 1 Solar Panels
- 2 Inverter
- 3 Electrical Panel
- 4 Utility Meter
- 5 Utility Grid and / or Diesel generator
- 6 PV controller and Monitoring System



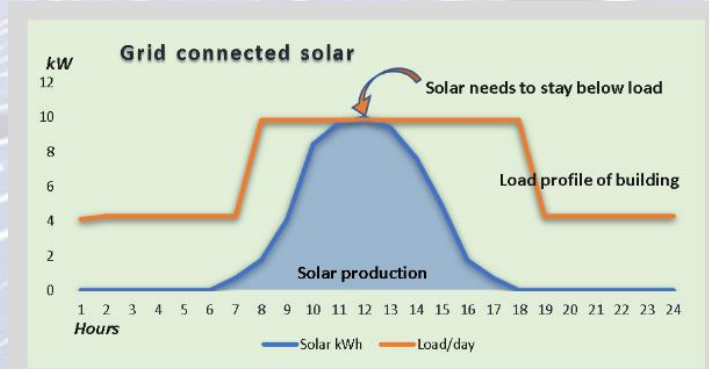
Grid connected system without storage

There are 2 types of solar systems we generally offer.

- Grid connected without battery storage.
- Grid connected hybrid system with battery storage and generator coupling

Grid connected.

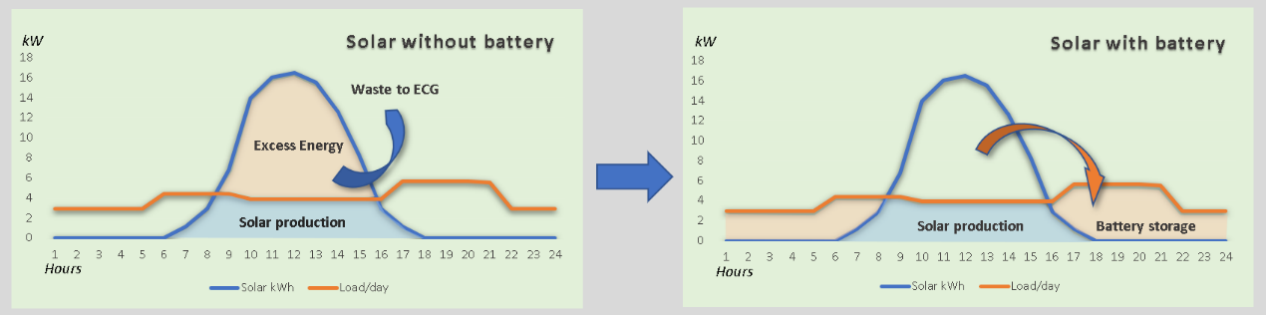
Below an example for an office. As you can see is that the solar (Blue line) stays below the yellow load line. We cannot feed back to the grid and therefore we need to stay below the load curve. On average this will mean we can install around 40-50% of the day need with solar energy. The other 50% you keep buying from ECG (Energy supplier).



Grid connected solar

Hybrid system with batteries

When the consumption during the day is to low but you want to benefit from solar energy in the time that sun is not shining we can install a hybrid system with storage. We then oversize the solar and store the excess energy in a Lithium Ion battery pack. For this we include a smart meter that measures the load. Once the solar is too low the energy from the battery will be used to supply power in the building. Once the battery is drained or power is to low, the grid will add additional power. During power cut we can determine emergency group that will have preferred energy from solar and battery. For larger systems we can add hybrid controller to sync the solar with existing generator.



Difference with or without storage

Used equipment

Solar panels
(only Tier 1 products)



Inverters
(Only A-brands)



Batteries
(Low and high voltage lithium)



Mounting structures



AC and DC equipment
(Only A-brands)

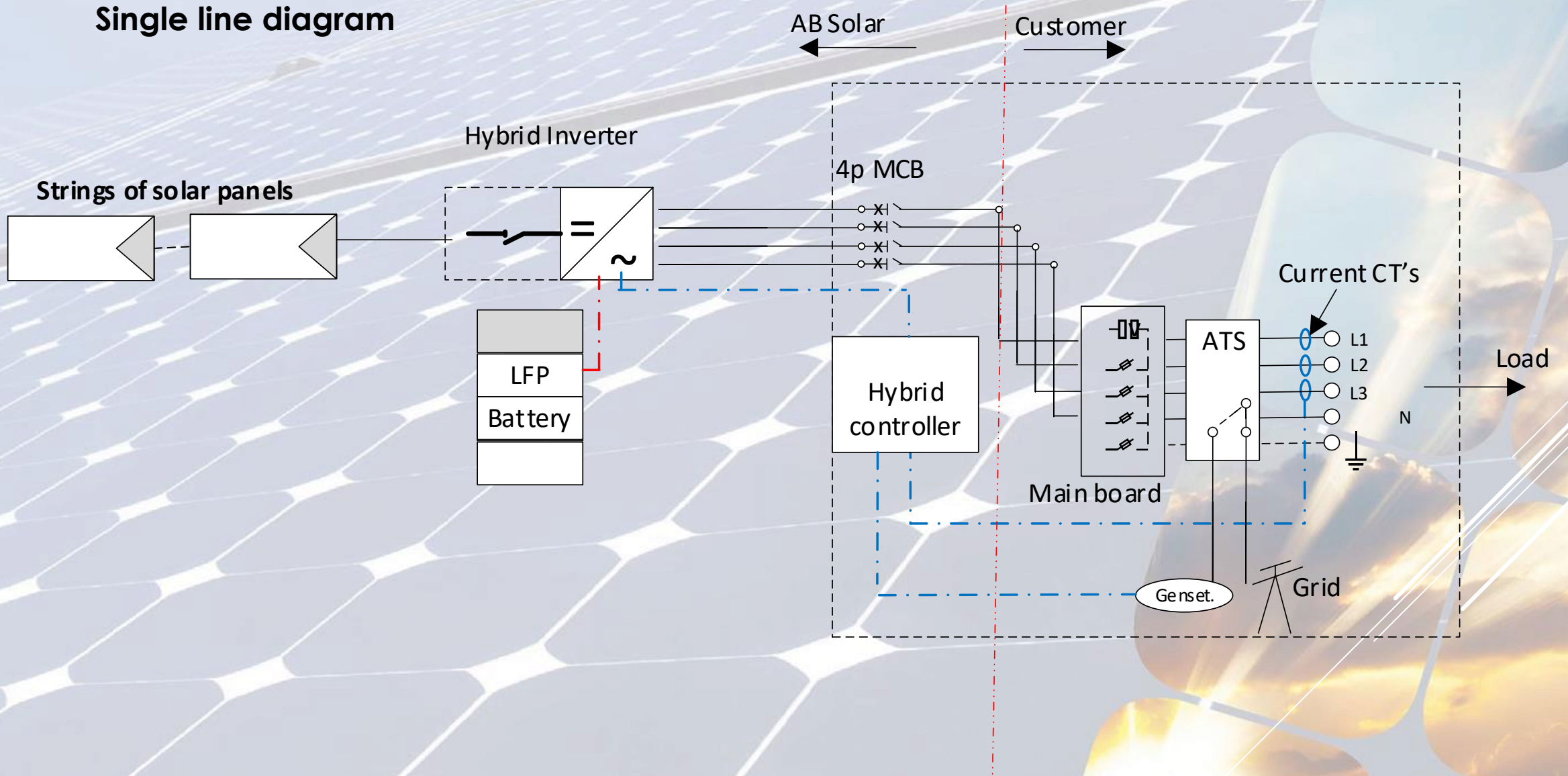


Safety and O&M



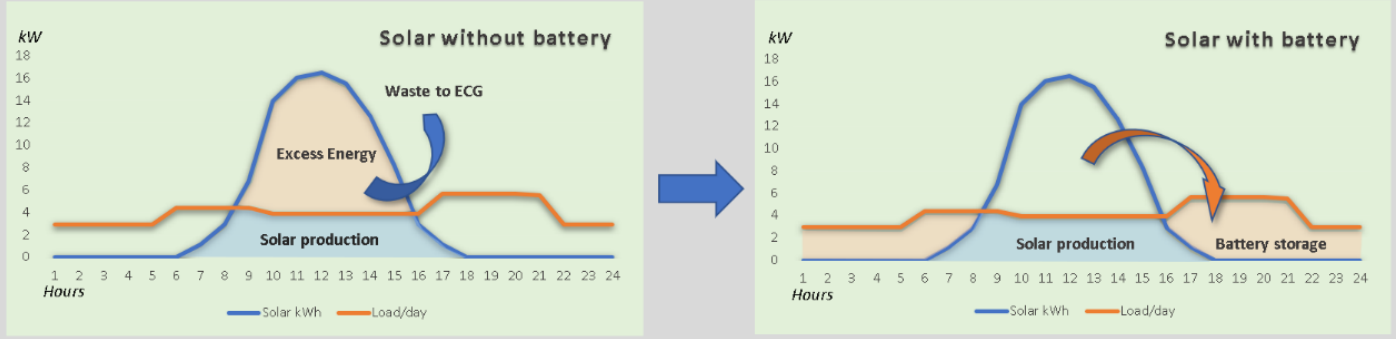
Walkways and safety lines

Single line diagram



Hybrid system with batteries

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Example site based on 10.000kWh Consumption per month

To get a system that fits the customer we need to get some basic information to determine the correct size

- Google location of the project
- Energy bill for the last 6 months that states cost per kWh
- Size and amount of generators
- Running hours of genset per day and Amps that the genset is running on.
- Some site photo's

Load profile for factory / shop / day consumption

Hours	Solar kWh	Load/day	solar extra load.
1	0	2	2
2	0	2	2
3	0	2	2
4	0	2	2
5	0	2	2
6	0	2	2
7	5	23	19
8	12	23	12
9	28	23	-4
10	57	23	-33
11	61	23	-38
12	67	23	-43
13	61	23	-38
14	51	23	-28
15	33	23	-10
16	9	23	14
17	7	23	16
18	5	23	19
19	0	23	23
20	0	23	23
21	0	23	23
22	0	23	23
23	0	2	2
24	0	2	2
394 kWh	385 kWh/day	-2 kWh	

240 extra kWh for battery

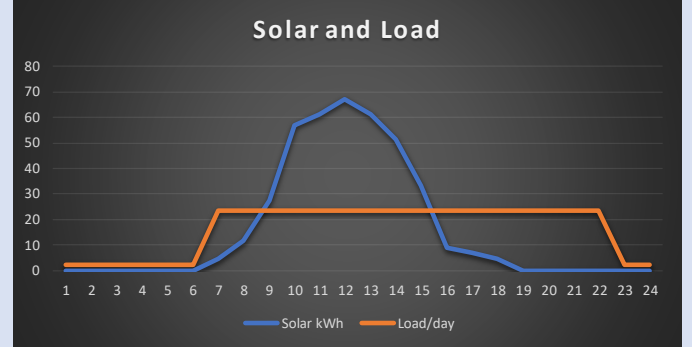
394
-2 kWh
386

from Genset saved with solar
Based on 16 hours 23kWh 6 day operation

Consumption
Total solar production per year.
Advised solar system
Advised Battery system

10,000 kWh/month

143,754 kWh
104,169 Wp
240 kWh



Finance your solar installation and get cheaper energy from day one!

No up-front investment needed.

You pay less per month for your energy than you do now!

Fixed price per month without any surprises!

No escalation on price per year

You pay towards an asset instead of paying to your energy company.

After the lease period you own the system and get 100%

Benefit from your solar production for another 10 years.

Positive environmental impact.



ManoCap Energy

STRAIGHTFORWARD SOLUTIONS TO YOUR ENERGY NEEDS.

We finance and manage commercial and industrial scale energy systems for clients in Africa together with several finance companies. In doing so, we enable our customers to focus on their core business, while we focus on reducing their energy costs and environmental footprint

APPROACH

We believe in providing a straightforward and reliable service to customers. We work with simple legal agreements tailored to the markets in which we operate. We use established industry-leading products and work with experienced partners to save you money from day one.

Minimum project size for finance is 200kWp



Thank you for your attention



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