

Solar panels and more!!

Who are we

[DSE group](#) (Dutch Sustainable Energy group) is founded in 2009 and started with PV solar installations in 2010. We spring from a company called Arends Techniek, who has been active in installing solar in the Netherlands for a long time. We have done many installations ranging from small residential up to large scale industrial systems. Together with our teams, we have commissioned over 2800 solar installations. In 2015-2016, we did an average of 15 solar systems per week.

DSE Group is now active in Ghana. For us, it is very important to involve local people to help us doing the installation. We will make sure that our local team will be thoroughly trained by us, so they will be able to perform installations, maintenance and service. By doing so, we can assure a proper functioning of your system and support the local economy at the same time.

Quality

Good quality starts by selecting the right materials. We only use A-grade products in our systems, to ensure optimal protection for our customers. Panel manufacturers like Trina Solar and Phono Solar have been ranked in the list of Tier One manufacturers for many years, and have all the certificates like TUV, UL and CE. This means the best warranties available.

For our inverters, we are part of Fronius' "Certified Service Partner" program, so we can provide all service and maintenance with full support of Fronius.

What is Solar

Just how does sunshine become electricity? Here's an overview of the solar energy facts, the process, and the equipment that can help you generate your own clean, more affordable energy.

1 Solar Panels

The solar panels are made up of photovoltaic (PV) cells, which convert sunlight into direct current (DC) electricity throughout the day.

2 Inverter

This device converts the DC electricity generated by the solar panels into the alternating current (AC) electricity.

3 Electrical Panel

The AC electricity is sent from the inverter to your electrical distribution board to power your lights and appliances with solar energy. The distribution board is often called a "breaker box."

4 Utility Meter

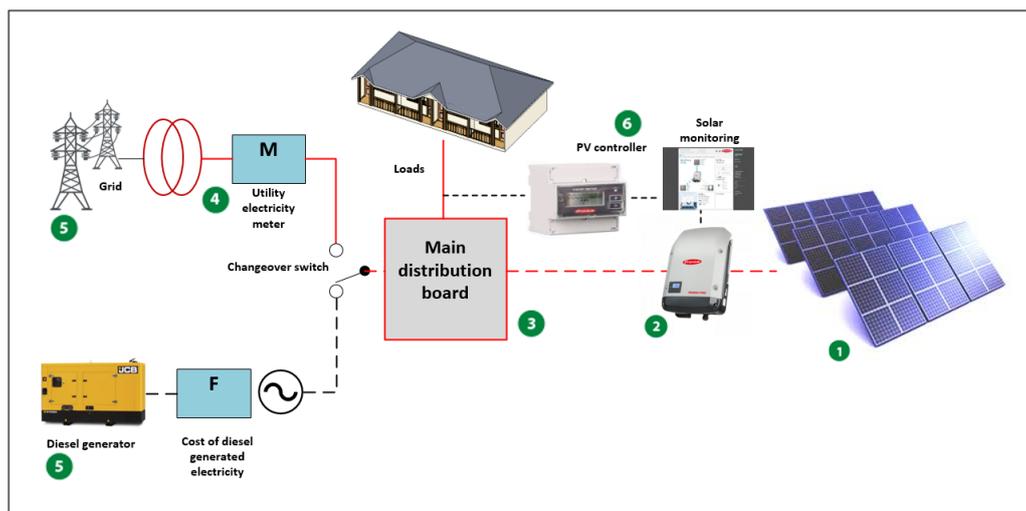
The utility meter measures your energy use. It actually spins backward when your system generates more power than you immediately need. This excess solar energy offsets the energy you use at night.

5 Utility Grid and / or Diesel generator

Your installation will still be connected to the grid. You'll need that power from the utility company at night, or during power cuts from the diesel generator.

6 PV controller and Monitoring System

Our monitoring system continuously tracks your energy production and ensures that your solar power system is running smoothly. During power cuts our PV controller syncs with the diesel generator.



What are the benefits?

With a solar system you create a stable energy supply for any situation.

Our systems are designed in such a way that they can ensure a continuous electricity supply, even during power cuts. The solar system works in perfect harmony with the grid, the genset, and even batteries if needed.

With the high energy cost in Ghana you can realize a considerable saving on your electricity bill.

- ✓ Save monthly cost of electricity payment.
- ✓ A stable power supply.
- ✓ Return of investment within 4 years.



Solar with Back-up.

For small commercial and residential systems, we can also provide inverters with battery storage and emergency power. This means that we can store electricity in the battery to use at night for the most important appliances. Also during power cuts the system can provide energy.



Solar pumps

Clean drinking water is one of the most important ingredients to have a healthy life. With our Solar deep-well and surface pumps we can provide water almost anywhere. Our pumps run completely on solar and hardly need any maintenance or advanced knowledge.

If you are interested in one of our products or you need more information please don't hesitate to contact us.

You can reach us via mail: info@dsegroun.nl or by phone 00233(0)557800170



Example calculation:

For Ghana the solar fraction is ± 1.5 . This Means every 1000Watt produces 1500KWh of power per year. (In our calculation we take extra loss for heat and cleaning intervals). When your load profile is about 50 Kilowatts / hour for 8 hours per day the consumption is approx. 12.000 kWh/ month. Total for the year will be approx.. 144.000 kWh. This means you will need a solar system of ± 100 Kilowatt peak. This is ± 400 solar panels and a roof space of 660m². (based on net metering)

Solar system of 100KW

- 400 solar panels
- DC to AC inverters incl. DC cables
- Mounting structure for steel roof
- Installation of solar system
- Cost price $\pm \text{€ } 110.000,-$ (CIF Ghana, ex VAT and WhT) Supplied DDP is $\pm \text{€ } 128.000$ incl. VAT but ex WhT. Return of investment smaller than 4 years.

The solar system needs to be connected to the AC grid and generator. These costs depends on local situation and system size. When inverters are close to main switchboard, the additional cost will be approx. $\text{€ } 2.000$.

Total cost price of system, including clearing and commissioning, we estimate at approx. $\text{€ } 135.000,-$

Energy prices:

In Ghana the energy price per kWh for larger consumers is approx. $\pm \text{€ } 0.25$ (1.3GHC).

Return on investment:

$$\frac{\text{€ } 128.000 \text{ (total investment)}}{140.000\text{kWh} \times \text{€ } 0.25 = \text{€ } 35.000} = 3.7 \text{ years}$$