

ADEX SOLAR ENERGYGROUP PV DIVISION

Solar PV and your business/homes/communities etc

This presentation is aimed to provide you with information on Solar Photovoltaic (PV) technology and what it means to you and your business/homes/communities. In particular, we will like to look at what Solar PV is and how it works, why PV can help to mitigate climate change, as well as the investment required; the potential to generate electricity and to make power cut a thing of the past.

Solar Photovoltaic (PV) technology is a smart building material which converts light directly into electricity.

It is highly adaptable and integrates easily into any new or existing building design as roofing or cladding material or mounted as a framed energy station. Once installed in allocation with good access to light, it increases a building's energy efficiency rating and generates green electricity without the carbon dioxide emissions that contributes to climate change. On-site electricity generation avoids most transmission losses', ensuring the full benefit is delivered directly to the building. With little or no maintenance costs, a solar PV system will reliably contribute electricity to a building's overall energy requirements.

What is a Solar PV system?

A Solar PV system is an energy system which directly converts energy harnessed from the sun into electricity. This electricity is used throughout a building in the same way as conventional electricity imported from the grid.

How does it work?

Silicon material is at the core of most solar PV technology. Once light hits the silicon, electricity is generated and fed through a cable to be collected at an inverter. The inverter converts the Direct Current (DC) to Alternating Current (AC) before feeding it into the building's main electrical circuit. The electricity generated by the system works hand in hand with the existing electrical supply sharing the same circuitry and wiring.

Why go Solar?

Electrical power-cuts, Cost effective alternative to fuel powered generators, Global climate change and the need to reduce carbon dioxide emissions play an increasingly important role in the management of a building's energy use. With energy efficiency high on the list of achievable improvements, the inclusion of a solar PV system goes further and can help transform a building/project from being an energy consumer to being an energy generator. Solar is suitable for use in both urban and rural locations and is adaptable to almost any building/project which has sufficient exposure to light, including Mobile phone receivers.

Avoided Cost

As the electricity is generated where it is consumed, transmission and distribution costs are avoided. Solar electricity is particularly advantageous in situations where peak loads are required during the day when solar electricity generation is at its highest level.

With the functional lifetime of a PV system being 27-30 years, the avoided cost of electricity and/or fuel used to power generators not to mention servicing and maintenance; that would otherwise be purchased from the grid during this time is considerable non-existence.



Solar Water Heater



Solar Panels



Assembled Solar Panels

Work Time: 3 7 days if it is continuous cloudy and rain

Scope of application: park grassland, travel scenic spot, residential district, square etc illumination, original electric illumination can also be changed into solar energy illumination system in accordance with customer's needs.

ADEX SOLAR ENERGY GROUP PV DIVISION

ADEX is the trading name for Ade Adeshina Nigeria & UK Limited. A private company, registered with the Corporate Affairs Commission Federal Republic of Nigeria and also with the Registry of Companies for England and Wales. The Organisation overall business concept is based on theory and ideology known as Fluid innovative Concepts, to facilitate and provide innovative skills, services and products, in satisfying our identified market needs.

Our Firm has being strategically involved in the implementation of "PAN 45" renewable technology in the UK in-line with the EU Directives on Energy Performance in Buildings for both domestic and industrial consumptions. We have being involved in Micro-generation strategy in the UK directly and indirectly. We are able to introduce this equipment and its services to the Nigerian domestic and industrial market, to revolutionise the use of the product "Solar panels", Especially for commercial use where the market potentials are great. To provide effective and efficient power supply at highly affordable prices that will generate attractive annual turnover for your company. We would eradicate your over dependence on generator, reduce and save you huge sums of money no more Power Holding Company of Nigeria PLC (PHCN) and fuel bills for your organisation receiver's operation etc.

Why should I install a photovoltaic system?

Installing your own solar photovoltaic (PV) system means that you can generate your own electricity from the free and inexhaustible energy from the sun. A photovoltaic system never needs refueling, emits no pollution, and can be expected to operate for over 30 years while requiring

minimal maintenance. A typical PV system on a house roof could prevent over 34 tones of greenhouse gas emissions during its lifetime. Today photovoltaic systems are recognized by governments, environmental organizations and commercial organizations as a technology with the potential to supply a significant part of the worlds energy needs in a sustainable and renewable manner.

The UK government has recently committed £20 million towards encouraging the installation of photovoltaic systems on buildings in the UK. Organizations such as Shell and BP have set up large photovoltaic manufacturing plants and environmental organizations such as Green peace strongly support the use of solar energy.

Installing a photovoltaic system is one of the ways householders and other building owners can contribute towards a sustainable future for everyone.

TECHNOLOGY DESCRIPTION

Photovoltaic systems use daylight to power ordinary electrical equipment, for example, household appliances, computers and lighting. The photovoltaic (PV) process converts free solar energy - the most abundant energy source on the planet - directly into electricity.

A PV system is made up of PV array, an array mounting structure, an inverter and various cables and switches. The PV array consists of a number of photovoltaic modules connected to give the required power. Note that this is not the familiar solar thermal technology used for heating hot water.

A typical domestic system of 1.5-2kWp may comprise 12-24 modules covering an area of between 12-40m², depending on the type of semi-conductor used. PV modules deliver direct current (DC) electricity, normally at 12 volts (V), whereas most household appliances need alternating current (AC) at 230 V. The inverter converts the low voltage DC to higher voltage AC. A meter measures the amount of electricity exported to the local electricity network.



156×156 cell 190Wp-200Wp solar panel

BENEFITS OF PHOTOVOLTAIC SYSTEM INSTALLATION

- Your own clean power source that helps reduce global warming.
- Reduces your electricity bills, since daylight is free
- Increases the value of your property
- Extremely low maintenance, with a long functional lifetime of 30 years or more
- Silent in operation
- Increases your awareness of electricity use and encourages more energy efficient behaviors
- Cost effectiveness and stops the reliance on public power supply.
- Increases your awareness of electricity use and encourages more energy efficient behaviors with global climate change threatening all our futures; we need to switch to clean, renewable forms of energy and electricity production.

Installing solar photovoltaic (PV) system means; generation of personal electricity/power supply from free and inexhaustible energy from the sun. A photovoltaic system never needs refueling, emits no pollution, and can be expected to operate for over 30 years while requiring minimal maintenance. A typical PV system on a house roof could prevent over 34 tones of greenhouse gas emissions during its lifetime.

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PROFITABILITY UNDERSTANDING

The cost benefits and effect this would have on the bottom line of an organization is quite significant.

For your organizations' fair understanding, it would be rather appropriate to explain that you need to itemize your cost on power supply, as well as cost of alternative power supply in this regard;

Cost of regular power supply	XX
ADD:	
Alternative power supply (generator).....	XX
Cost of generator fueling (monthly).....	XX
Cost of periodic maintenance.....	XX
Other power generating expenses.....	XX
Total cost of power and alternative source.....	XXX

The profitability index would have to be obtained, calculating the present total cost of power generation with the total cost of the capital expended on the technology acquisition and the short term and long term benefit of this on the bottom-line of the company. With specific concern to cost.

Solar electric panels can generate electricity that is free from pollution, fuelled by the natural resource of the sun, which is free, abundant and inexhaustible. Green peace strongly supports solar energy.

A photovoltaic cell generates electricity when exposed to light. Thin layers of semi-conducting material, most commonly silicon, generate the electricity. The electrical output from a single cell is small; so multiple cells are connected together and encapsulated (usually behind glass) to form a module (sometimes referred to as a "panel"). The PV module is the principle building block of a PV system and any number of modules can be connected together to give the desired electrical output. PV equipment has no moving parts and as a result requires minimal maintenance. It generates electricity without producing emissions of greenhouse or any other gases, and its operation is virtually silent. PV systems supply electricity to many applications in the UK, ranging from systems supplying power to buildings, which are also connected to the normal local electricity network to systems supplying power to garden lights or to remote telecom relay stations. The main area of interest in the UK today is grid connect PV systems.



These systems are connected to the local electricity network. This means that during the day, the electricity generated by the PV system can either be used immediately, or can be sold to one of the electricity supply companies. In the evening, when the solar system is unable to provide the electricity required, power can be bought back from the network. In effect, the grid is acting as an energy storage system, which means the PV system does not need to include battery storage.

Grid connect PV systems are often integrated into buildings. PV technology is ideally suited to use on buildings, providing pollution and noise-free electricity without using extra space. The use of photovoltaic on buildings has grown substantially in the UK over the last few years, with many impressive examples already in operation.

PV systems can be incorporated into buildings in various ways. Sloping rooftops are an ideal site, where

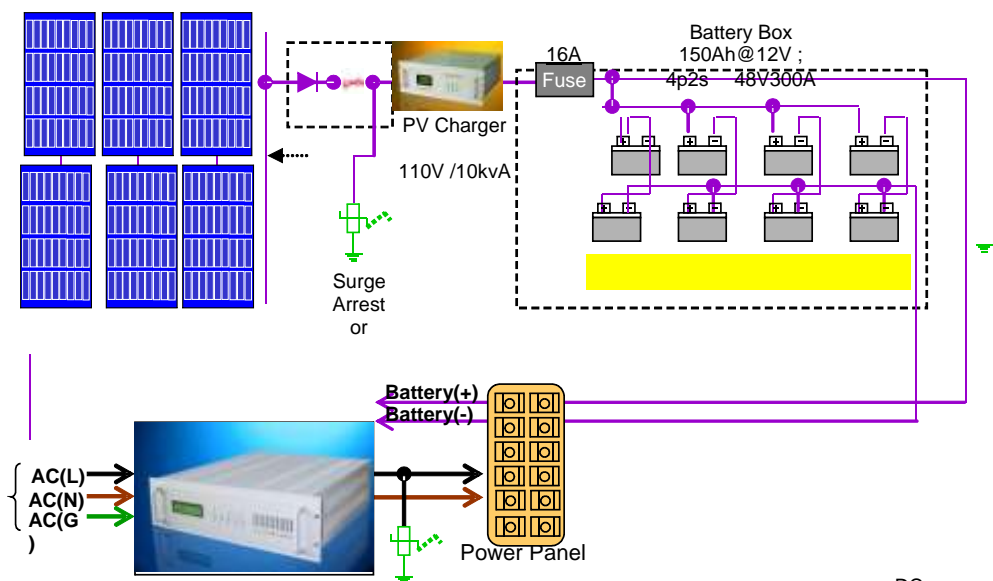
Modules can simply be mounted using frames. Photovoltaic systems can also be incorporated into the actual building fabric, for example PV roof tiles are now available which can be fitted as standard roof tiles. In addition, PV can also be incorporated as building facades, canopies, in conservatory roofs and skylights or mounted on other structures such as pergolas or car parking bays.

A system with a PV array tilted towards the south would generate approximately 750kWh/year per kWp installed. So a typical 2kWp system (around 20 m² of multicrystalline Modules) would generate around 1500 kWh per year. Output will/may be reduced by shade or non-optimal orientations or lack of tilt angles in its design.

Adex Solar offer a complete, installed solar home energy system designed to work seamlessly with your utility power supply systems or as stand alone, clean and cost-effective energy solution. As a homeowner, you now have a choice as to how your electricity is generated. By choosing a solar system to generate a portion or all of your electrical needs, you will always have reliable electricity and equally ensuring future generations have clean air to breathe.

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Explain :

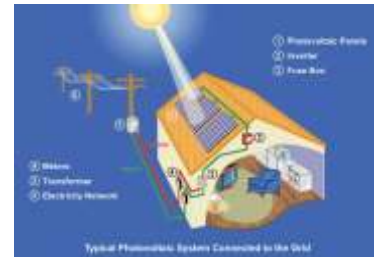
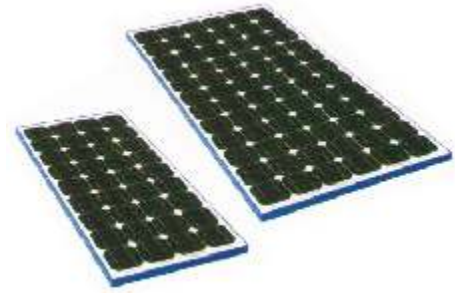
- Estimate: ESH=6h
- Generating 1.2KW x 6h 7.2KWh 7.2KWh x 0.7 5.04KWh per day
- Storage 300Ah x 48V 14,400Wh 14.4KWh
- Cost 3,914Wh; backup 3.7 days

— : DC
 — : AC Line
 — : AC Neutral
 — : AC Ground

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The portability and simplicity of solar electricity supply make it a natural choice for rural electrification and telecommunications in remote areas



As a solar energy company we can help communities develop by providing power. Energy is a vital element in development, providing electrical power to light schools or refrigerate medicines and vaccines. For remote rural communities in the developing world, which have little chance of being connected to an electricity grid, but are, exposed to a lot of sunshine, solar power can offer a lifeline. Increasingly, the world's major telecommunications companies are turning to solar (photovoltaic) electricity as the most practical and accepted technology for remote applications. Solar Firms has been working with the International Telecommunications Industry since 1981.

In response to the rapidly growing telecom business, Solar firm took on the challenge to upgrade eight solar power sites in the remote Nullarbor Plain of Australia to ensure regular power supplies for area communication needs: -

Device layout:



Solar battery module: 1200W (150W×8)

Maintenance-free battery: 8units 12V 150Ah , 4P2S

Inverter &: 48V,3000W

Charge controller: 48V,30Ah

Form of installation : install simply.can work in three continuous wet days

Can work in three continuous wet days

Total Value Without the battery :

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We are associate member of The British Photovoltaic Association (PV-UK), which ensure product reliability for costumer satisfaction. All solar panel bought and sold by the members have Manufactorial's guarantee for both parts and panels.

Launched in June 2004 the project is helping the area recover from recent war by providing energy to community buildings, homes, water pumping systems and street lighting: -



This strategy is dedicated to providing good standard of integrity, quality, service and cost that are required in the company. This will give your firm significant innovative technology advancement and advantage over other competitors.

The concept is aimed at providing an alternative form of power supply that is expedient, cost effective for powering BASE STATIONS nationwide, which is practically maintenance free once it is installed except quarterly servicing review and evaluation.

In order to fully justify your firm's investments/purchase and installation of our innovative product, your company will have to calculate how much spent on a daily basis, weekly and yearly on fuel consumption in running BASED STATIONS in Lagos-state alone compare it to the situation whereby this expenses are eradicated completely for the real alternative "solar energy".

? Diesel per day between 600ltrs = N48, 000 x 30 days = N1, 440.000 per month x 12 month a year = N17, 280.000 per year. Or 1000ltrs = N80, 000 X 30 days = 30,000ltrs per month = N2, 400.000 x 12 month per annual = N28, 800.000 Per Branch. Plus Power Holding Company of Nigeria PLC (PHCN) Bills of minimum of N100, 000 x 12 month per annual = N1, 200.000

- ? Servicing of generating set four times a year N35, 000 x 4 = N140, 000.
- ? Installation of generating set costs N150, 000
- ? Fitting & change over switch, gear switch costs N350, 000
- ? Cost of replacing a 100 KV Generator every Five Years N12, 000.000

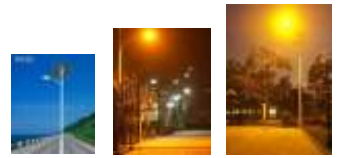
Ade Adeshina UK & Nigeria Limited, has a professionally qualified engineers, experienced staff all committed and focused on costumer satisfaction, due to our knowledge in our trade with sound business acumen gained from practical experiences of the market environment reinforced with credible and well thought-out strategy, has placed us well ahead of the market competition through the finest quality of products and services. To this end we will appreciate a meeting with your board or the individual responsible for the procurement to further illustrate and demonstrate the essence of this opportunity to the team.



Street Lights

- ✚ Self powered (standalone renewable)
- ✚ limited cable trenching
- ✚ No power bills
- ✚ Reduced pollution
- ✚ Reduced CO₂ emission
- ✚ Range of luminaries: DC, PLT, SOX, LED
- ✚ Single or twin lamps
- ✚ Solar PV panels
- ✚ Sealed lead acid batteries
- ✚ Low maintenance
- ✚ Timer control option
- ✚ PIR control option
- ✚ Vandal resistant
- ✚ Can be customized to location
- ✚ Height from 5m, 10m or 12m
- ✚ Custom color finishes
- ✚ Rural or urban use





Street Lights

Height: 6.9m or 12m

Solar energy cell plate: 120-240WP

Light source: 12V, 15W energy saving lamp
LED high brightness: 3W, 15W
Nonpolar Lamp: 23W, 40W, 80W

Accumulator: Lead-acid maintenance free battery
12V
65AH-200AH

Controller: optically controlled, time controlled (1-12) hours on-off, over charge and over discharge, short circuit waterproof protection, and high reliable design.

Work Time: 5-7 days if sunshine; 3-5 days if continuous cloudy and rain

Scope of application: highway, bridge, square, estate etc illumination, original electric illumination can also be changed into solar energy illumination system in accordance with customer's needs.



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Maintenance

The PV panels do require regular quarterly panel cleaning once installed in a dusty environment throughout the product lifespan.

The PV panels typically have a manufacturer's guarantee of 25 years.

The batteries typically have a manufacturer's guarantee of 5 years.

The battery and electronics need to be checked every 2 years by a qualified electrician.

CO2 Saving During Operation:

Assuming optimum sitting conditions the predicted annual CO₂ savings (relative to equivalent UK grid delivered electricity) are as follows:

Annual CO₂ saving for 1 Hydrolyte unit = 176 kg CO₂/ year

COST IDENTIFICATION

1) Cost of 1 unit ranging from: \$_____ to \$_____ (including installation and sundries) excluding VAT

2) Recommended installation procedures for the Pole Erection is 30metres apart, therefore 1 kilometers = 1000metres = (33 poles within a kilometer).

3) Ongoing costs (assuming a 20+ year lifecycle):

<u>Part/service:</u>	<u>Replacement Cost:</u>	<u>Lifespan (predicted)</u>
Bulb	£..... + Labour	5 years
Batteries	£..... + Labour	10 years
Charge Controller	£.....+ Labour	5 years
Panel cleaners	Ongoing staff recruitment cost	Quarterly

The PV panels typically carry a manufacturer's guarantee of 25 years and should not require replacement during the lifespan of the product.

Custom :

In addition to the standard product we offer a full custom design service. System components and aesthetics (PV, lamps and column) to client specification.

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Courtyard Lamps

Height: 2.8 – 4.2 m

Solar energy cell plate: 10 – 60WP

Light source: 12 V, 3 - 15 W energy saving lamp (three basic colors energy saving lamp used for solar energy specially)

LED high brightness: 0.5W - 15W, white, red, blue

High brightness, single granule LED 3W, 15W

Seven-color LED 5W – 15W

Life: /5000 hours

Battery: Lead-acid maintenance free battery 12 V 7AH-65AH

Controller: optically controlled, over charge and over discharge, short circuit waterproof protection, and high reliable design. Can also be designed to customer's requirements.

Lamp pole: 2.8 – 4.2 m; stainless steel, galvanized pipe, cast aluminum metallic paint or plastics spraying, model and color can also be changed.

Wind proofing grade: 33m/S (12 grades)

Work Time: 5 – 12 hours daily, adjustable, continuous 3 – 5 days

Scope of application: park, travel scenic spot, urban roads, residential district, square etc illumination, original electric illumination can also be changed into solar energy illumination system in accordance with customer's needs.





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Lawn Lamps



Height: 50cm 85cm

Solar energy cell plate: 0.8 4WP

Light source: 6 V, 0.6W; 3 18 granules LED
12 v, 0.06 0.2W; 3 8 granules LED

Battery: Lead-acid maintenance free battery 6 V 4 AH 6 V 10 AH
12 V nickel-hydrogen battery 600 -4600m AH

Controller: optically controlled, over charge and over discharge, short circuit waterproof protection, and high reliable design.



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Lawn Lamps





Hot Water Heater

Sample projects

Residential building

Office Block (With open plain, minimum 20 PC, 4 Air-conditions Café, Main lobby and main offices Bulb sockets)

Solar Generators (portable/moveable) further more consider a stand alone Solar energy generator with output energy of 5KW, 10KW, 20KW, 25KW as the third sample projects and give me your findings as soon as you can..

The specification for the same project 'A' above is a two storey building (two floors) Country home. With 4 bedrooms (all self contained)

2 sitting room

1 dining room

1 kitchen

1 family sitting

Appliances for the sample profit A

1. All bedrooms to have standard air condition

2. Toilet and bath with water heater

3. T.V.

4. 3 2way sockets

5. 1 fan each

6. 3 lights

The above / under 1 (i-v) to be multiplied by 4 bedroom

2. Sitting rooms: -

1. standard ac (air condition)

2. T.V. Point

3. 4 2way sockets

4. 6 light

5. 1no comparts

6. plus 2 sitting rooms

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	<p>Device layout?</p> <p>Solar battery module? Wp?</p> <p>Maintenance-free battery? Inverter? ?</p> <p>Charge controller? ? Form of installation? We can install or supply blueprint can work in three continuous wet days.</p> <p>Total cost plus installation : US Dollar. ?</p>
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3000Wp Housing/Work solar power supply system					
Design load name	Specification	Load power	Amount	Operating time	Daily consumption
Lighting	Energy saving lamp	11 W	6	4	264 Wh
Computer	Liquid crystal display	100 W	3	5	1500 Wh
Printer	Ink jet	30 W	1	1	30 Wh
Fridge	150 L	100 W	1	24	800 Wh
Colour TV	21 inch	70 W	1	6	420 Wh
Water pump machine		200 W	1	0.5	100 Wh
Micro-wave oven		1000 W	1	0.5	500 Wh
Fax machine	Ink jet	150 W	1	1	150 Wh
Washer		300 W	1	0.5	150 Wh

Device layout:

Solar battery module: ?Wp; How many batteries are required?

Maintenance-free battery: ?AH/58V:

Inverter & Charge controller: ?:

Form of installation; We will stall and maintain maintenance services

Can work in three continuous wet days

- Parts – US \$.....? + VAT + Installation + local logistic ?

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2000 Wp Housing/Work solar power supply system					
Design load name	Specification	Load power	Amount	Operating time	Daily consumption
Lighting	Energy saving lamp	11 W	6	4	264 Wh
Computer	Liquid crystal display	100 W	1	5	500 Wh
Printer	Ink jet	30 W	1	1	30 Wh
Fridge	150 L	100 W	1	24	800 Wh
Colour TV	21 inch	70 W	1	6	420 Wh
Water pump machine		200 W	1	0.5	100 Wh
Micro-wave oven		1000 W	1	0.5	500 Wh
Fax machine	Ink jet	150 W	1	1	150 Wh
Washer		300 W	1	0.5	150 Wh
Total					2014 Wh
<p>Device layout: Solar battery module: 640Wp; Maintenance-free battery: 150AH/48V: Inverter & Charge controller: 2000 W: Form of installation; We will stall and maintain maintenance services; Can work in three continuous wet days : Parts – US + VAT + Installation + local logistic</p>					

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3000Wp Housing/Work solar power supply system					
Design load name	Specification	Load power	Amount	Operating time	Daily consumption
Lighting	Energy saving lamp	11 W	6	4	264 Wh
Computer	Liquid crystal display	100 W	3	5	1500 Wh
Printer	Ink jet	30 W	1	1	30 Wh
Fridge	150 L	100 W	1	24	800 Wh
Colour TV	21 inch	70 W	1	6	420 Wh
Water pump machine		200 W	1	0.5	100 Wh
Micro-wave oven		1000 W	1	0.5	500 Wh
Fax machine	Ink jet	150 W	1	1	150 Wh
Washer		300 W	1	0.5	150 Wh
Total					3014 Wh
<p>Device layout:</p> <p>Solar battery module: 940Wp; Maintenance-free battery: 250AH/58V: Inverter & Charge controller: 3014 W: Form of installation; We will stall and maintain maintenance services Can work in three continuous wet days</p> <ul style="list-style-type: none"> • Parts – US \$ + VAT + Installation + local logistic 					