SOLARWELL

SOLAR PRODUCTS

Solar Street Light

Solar Search Light

Solar Garden Light

Solar Lantern

Solar Power System

Solar Water Pump

Subsidiary of Rockwell Group

9-T Gulberg-2 (Annexe), Lahore-Pakistan Tel: +92-42-35756301, 35764481 Fax: +92-42-35756303
E-mail: solarwell@rockwellgrp.com WEB: www.rockwellgrp.com

SOLARWELL

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INTRODUCTION

SOLARWELL

INTRODUCTION

Rockwell Group, the Pakistani-based identity, having five sister concerns working separately under the umbrella of this group, namely:

- Rockwell Corp. (Pvt.) Limited-specialists in geo-technical and foundation engineering, established in 1966, and also rendering its services in civil foundation works. Our piling fleet own 17nos. drilling rigs of different methodologies.

- AQUA~Rock International-specialist in providing and installation of drinking water treatment plants.

- **Solarwell-specialists in solar power systems (domestic/industrial), solar submersible/Boost pumps, solar potable lightings, Solar Lantern, Solar Road/Street Lights, Solar Garden Lights, Solar AC's, Solar Geyser, etc.**

- Scale-specialists in architectural and interior designing works, OEM in custom-made furniture.

- Rockwell Sourcing-textile buying house and exporter of branded knitwear.

We "SOLARWELL" is the subsidiary of Rockwell Group (established since **1966**) registered as an Exclusive Entity for Alternate Renewable Energy / Solar Energy products and projects in Pakistan.

We are pre-qualified and registered company by AEDB (Alternative Energy Development Board Islamabad). Please visit www.rockwellgrp.com for more information.

Solarwell, offers professional services in provision and installation of imported solar products as well as designing of custom-made systems. Solarwell with a foreign collaboration is backed-up by highly experienced and technical staff for after sale services.

By the grace of GOD, our R&D division is capable to design custom-made solar systems and have designed and produced solar road lights, garden lights, flood lights, solar stills, converter/inverter, charge controller and power systems etc.

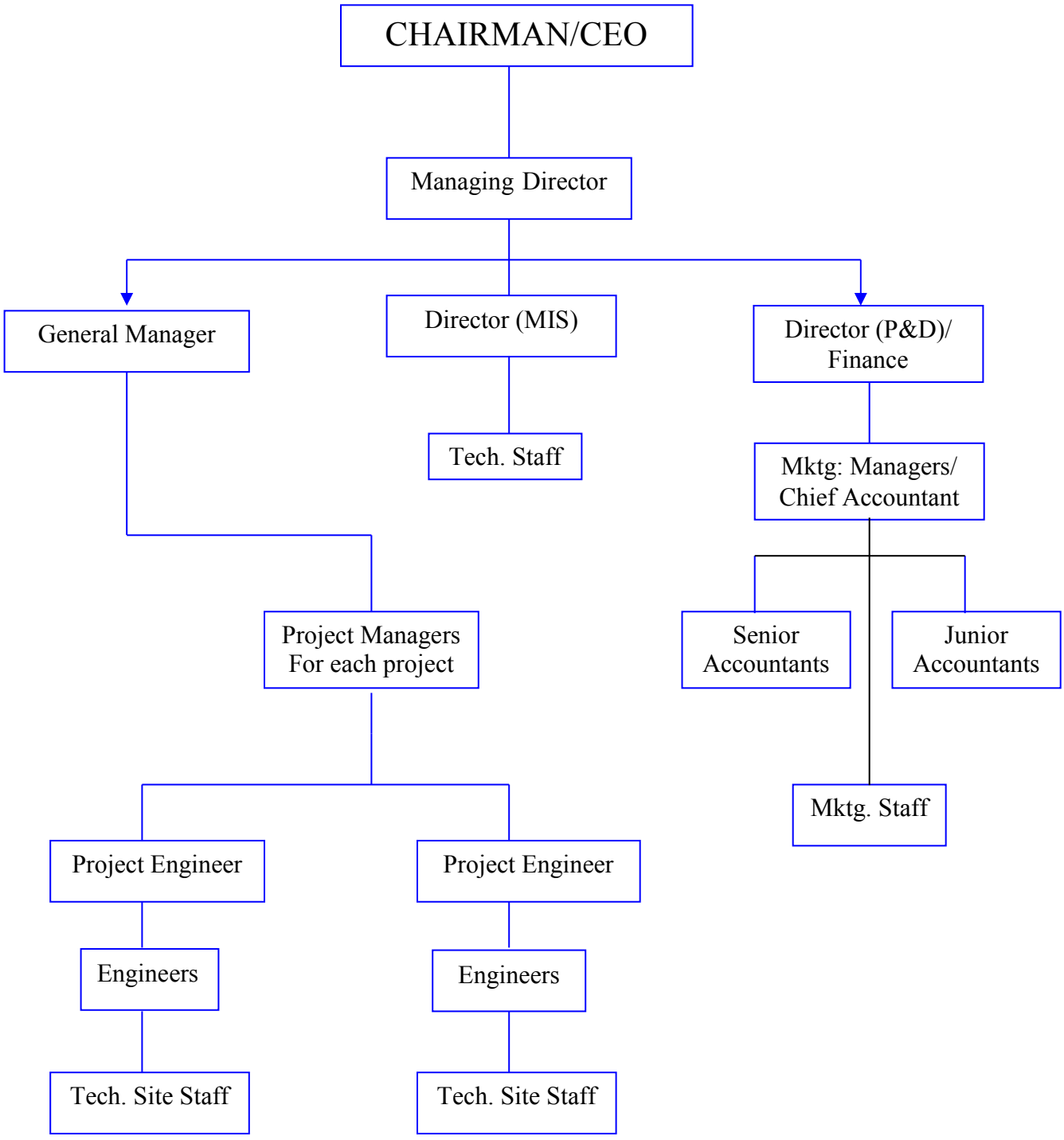
We have attached herewith our documents containing all the desired information for your kind perusal. We are Official Representative and Distributors in Pakistan for M/S LORENTZ, M/S EPSOLAR TECHNOLOGY, M/S ZHEJIANG SINGBEE LIGHTING TECHNOLOGY, M/S SOLARLAND, M/S CHIDEPOT, and M/S GENERTEC INTERNATIONAL CORPORATION, with their brand name as "RAISING TECH". The Certificate of Official Sole Distributor in Pakistan and Authorization Letter are also enclosed herewith.

Our objective is to accomplish our goals, to deliver our services as per our Quality Policy, and execute the jobs in a professional manner. We are attracted to procure challenging/short notice jobs having exposure to the international standards.

ORGANIZATIONAL CHART

SOLARWELL

ORGANIZATIONAL CHART



LIST OF KEY PERSONNEL

SOLARWELL

LIST OF KEY PERSONNEL

S.No.	NAME & DESIGNATION	QUALIFICATION & EXPERIENCE
1	SAEED IQBAL Chairman	Geology & Geotech.Eng. Insti. P.M. (London); R.T.C.S. (London); M.A.C.I. (U.S.A.).
2	ATTIQUE SAEED Managing Director	B.Com., M.Sc. (Eng.Geol.), Dip. Material Eng. C.R.B.C.
3	ASIF SAEED Director (P&D).	B.Com.(Pb); M.B.A. (USA).
4	SHAHZAD SAEED Director (MIS).	B.C.S., M.C.S. Diploma in Solar Energy
5	RIAZ A. MALIK General Manager	Dip. (Civil Engg); C.S.I. (London); Inst. P.M. (London); R.T.C.S. (London); M.A.C.I. (USA).
6	KHURSHID MUHAMMAD Marketing Manager	MBA 10-Years experience.
7	ADNAN RAO Office Manager	B.A, MBA 8 Years experience in Administration.
8	RAO SAJJAD Chief Accountant	B.com, M.com 15-Years experience in Accounts.
9	ADNAN KHAN Sr. Accountant	B.com 8-Years experience in Accounts.
10	IJAZ ALI SHEIKH Project Manager	I.C.A Training in U.S.A. 40-Years experience in handling of all types of projects.
11	SYED M Ali Senior Electrical Engineer	B.Sc.(Electrical Engineering) 17-Years experience in all type of electrification design and fitting.
12	MUHAMAD ZAFFAR Electrical Engineer	B.Sc. (Electrical Engineering). 5-Years experience in all types of electrification design and fitting.
13	MUHAMAD MUNEEB Electrical Engineer	Diploma (Electrical Engineering). 3-Years experience in all types of electrification design and fitting.
14	WAHEED ULLAH Electrician	6-Years experience.
15	MUHAMAD IRFAN Electrician	4-Years experience.
16	TAJAMMAL HUSSAIN Electrician	2-Years experience.

PROJECTS EXECUTED

SOLARWELL

LIST OF SALIENT WORKS EXECUTED

Name of Project	Description	Name of Client
Solar Water Pumps	Providing and installation of PS-1800 Pump at **Umerkot, Sindh** TDH: 165ft Output: 40M³/day	Pakistan Agricultural Research Institute, Umerkot, Sindh
Solar Water Filtration System	Providing and installation of Solar Water Filtration System 700Lit/hr Capacity Container Based with Bore hole, submersible pump, 5KVA Solar Hybrid System**,** at **6nos locations in Okara** TDH: 180ft Output: 30M³/day	ABWT Ameer Begum Welfare Trust, Lahore
Solar Water Pumps	Providing and installation of PS-1800 Pump at **Umerkot, Sindh** TDH: 165ft Output: 40M³/day	Pakistan Agricultural Research Institute, Umerkot, Sindh
Solar Park Lights	Providing and installation of Solar Search Lights at **Chiniot** 4nos. x 50W Solar Search Lights on 30ft Pole	TMA, Chiniot
Solar Street Lights	Providing and installation of Solar Street Lights at **Chiniot** 120W Street Lights	TMA, Chiniot
Solar Park Lights	Providing and installation of Solar Search Lights at **Chiniot** 6nos. x 50W Solar Search Lights on 30ft Pole	TMA, Chiniot
Solar Traffic Lights	Providing and installation of Solar Power System for Traffic Lights at **Chiniot** 4sided Traffic Lights with Countdown Timer	TMA, Chiniot
Solar Street Lights	Providing and installation of Solar Street Lights at **Chiniot** 60W Street Lights	TMA, Chiniot

Name of Project	Description	Name of Client
Solar Water Heater	Providing and installation of Solar Water Heater 160ltrs 20 tubes 58-1800mm with electric backup	Taj-corporation, Kamonki
Solar Water Pumps	Providing and installation of PS-4000 Pump at **Fateh Jang** TDH: 20ft Output: 200M³/day	Mr. Asim Haroon, Fateh Jang
Solar Water Heater	Providing and installation of Solar Water Heater 160ltrs 20 tubes 58-1800mm with electric backup	Comsat, Sahiwal
Solar Water Heater	Providing and installation of Solar Water Heater 200ltrs 24 tubes 58-1800mm with electric backup	Lake City , Lahore
Solar Water Pumps	Providing and installation of PS-1800 Pump at **Landhi-Malir** TDH: 120ft Output: 50M³/day	Pakistan Agricultural Research Institute, SARC, Karachi
Solar Street Lights	Providing and installation of Solar Street Lights at **Ihsan Group** 50W Street Lights for 12hrs operation.	Raiwand Road, Lahore
Solar Water Heater	Providing and installation of Solar Water Heater 160ltrs 20 tubes 58-1800mm with electric backup	DHA, Lahore
Solar Water Pumps	Providing and installation of PS-4000 Pump at **Fattahjang** TDH: 60ft Output: 250M³/day	Water Resources Research Institute ICARDA
Solar Power System	Providing and installation of Solar Power System at **Fattahjang** for 2nos. Ceilling Fans and 5nos. LED lights	Water Resources Research Institute ICARDA
Solar Water Pumps	Providing and installation of PS-1800 Pump at **Chakwal** TDH: 100ft Output: 40M³/day	Barani Agricultural Research Institute Chakwal
Solar LED Lights	Providing and installation of Solar LED Lights at **Chakwal** for 10nos. LED lights	Barani Agricultural Research Institute Chakwal
Solar Street Lights	Providing and installation of Solar Street	WASA Gujranwala

	Lights at **WASA Gujranwala** 4nos. 60W Street Lights for 12hrs operation.	
Solar Water Pumps	Providing and installation of PS-4000 Pump at Satramile **Islamabad** TDH: 100ft Output: 80M³/day	Pakistan Agriculture Research Council
Solar Water Pumps	Providing and installation of PS-1800 Pump at **NARC Islamabad,** TDH: 80ft Output: 45M³/day	National Agriculture Research Council
Solar Water Pumps	Providing and installation of PS-1800 Pump at **D.I.Khan**. TDH: 120ft Output: 42M³/day	Arid Zone Research Institute, D.I.Khan
Name of Project	**Description**	**Name of Client**
Solar Water Pumps	Providing and installation of PS-1800 Pump at **Bahawalpur**. TDH: 170ft Output: 40M³/day	Arid Zone Research Institute, Bahawalpur
Solar Water Pumps	Providing and installation of PS-1800 Pumps at **Umerkot**. TDH: 165ft Output: 40M³/day	Arid Zone Research Institute, Umerkot (Sindh)
Solar Garden Lights	10nos. Providing and installation of Solar Garden Lights 24Watt each for 6hours / day.	Askari 11, Lahore
Solar Garden Lights	15nos. Providing and installation of Solar Garden Lights 15Watt each for 6hours / day.	Askari 11, Lahore
Solar Garden Lights	15nos. Providing and installation of Solar Garden Lights 9Watt each for 6hours / day.	Askari 11, Lahore
Solar Water Pumps	Providing and installation of PS-4000 Pump will lift water from 500 ft. deep & 2,900 ft horizontal and provides 20,000 liters / day	PD-SPDP, FATTA
Solar Water Pumps	Providing of Solar Panels & PS-4000 Pump for 250 ft. depth and 20,000 liters / day	PD-SPDP, FATTA
Solar Power System	Providing and installation of 5KVA Solar Hybrid Power System	Nicalson Road, Lahore
Solar LED Lights	Providing and installation of Solar LED Street Light 30W for 12hrs.	Gulberg, Lahore

Solar LED Lights	Providing and installation of Solar LED Search Light 20W for 12hrs.	Gulberg, Lahore
Solar Geyser	Providing and installation of Solar Geyser with 200 litter tank.	Cantt, Lahore
Solar Home System	Providing and installation of Solar Home System 2nos. Pedestal Fan and 4nos. Energy Saver for 6hrs backup.	Suigas Colony, near Phase 5, DHA, Lahore
Solar Water Pump	Providing and installation of Solar Water Pump for Irrigation. Pump will lift water from 50 ft. deep well and provides 100,000 liters / day	Ithara Hizari 15Km from Jhang
Name of Project	**Description**	**Name of Client**
Solar LED Lights	Providing and installation of Solar LED Lights for 40ft high poles at Race Course Park, Lahore	EPA-Environment Protection Agency, Lahore
Solar Garden Lights	Providing and installation of Solar Garden Lights for 10ft high poles at Race Course Park, Lahore	EPA-Environment Protection Agency, Lahore
Solar Water Pump	Providing and installation of Solar water pumps, PV. Modules and water storage tanks. lift water from 350 ft. deep well to store on 1000 gallon tank. At Chachroo sindh	Alternative Energy Development Board (AEDB)-Islamabad Tharparkar, Sindh
Solar Water Pump	Providing and installation of Solar water pumps, PV. Modules and water storage tanks. lift water from 300 ft. deep well to store on 1000 gallon tank. At Chachroo sindh	Alternative Energy Development Board (AEDB)-Islamabad Tharparkar, Sindh
Solar Water Pump	Providing and installation of Solar water pumps, PV. Modules and water storage tanks. lift water from 250 ft. deep well to store on 1000 gallon tank. At Chachroo sindh	Alternative Energy Development Board (AEDB)-Islamabad Tharparkar, Sindh
Solar Water Pump	Providing and installation of Solar water pumps, PV. Modules and water storage tanks. lift water from 350 ft. deep well to store on 1000 gallon tank. At Umerkot sindh	Alternative Energy Development Board (AEDB)-Islamabad Tharparkar, Sindh
Solar Water Pump	Providing and installation of Solar water pumps, PV. Modules and water storage tanks. lift water from 300 ft. deep well to store on	Alternative Energy Development Board (AEDB)-Islamabad

	1000 gallon tank. At Umerkot sindh	Tharparkar, Sindh
Solar Water Pump	Providing and installation of Solar water pumps, PV. Modules and water storage tanks. lift water from 250 ft. deep well to store on 1000 gallon tank. At Umerkot sindh	Alternative Energy Development Board (AEDB)-Islamabad Tharparkar, Sindh
Solar Water Pump	Providing and installation of Solar water pumps, PV. Modules and water storage tanks. lift water from 200 ft. deep well to store on 1000 gallon tank. At Umerkot sindh	Alternative Energy Development Board (AEDB)-Islamabad Tharparkar, Sindh
Name of Project	**Description**	**Name of Client**
Solar Billboard Light	10 x 20 Billboard size, Providing and installation of PV. Modules, Battery Bank, Controller and 4nos. Solar LEDs lights	Kashmir Road Islamabad
Solar LED Lights	Providing and installation of Solar LED Lights for 15ft high poles	Sapphire Group, Lahore
LED Lights	Providing and installation of LED Lights 220V	Sapphire Group, Lahore
Solar Home system	Providing and installation of Solar Home system for 10 nos. DC bulb, 2nos. DC Fans	Baidian Road Lahore
Solar Home system	Providing and installation of Solar Home system for 5 nos. DC bulb	Mirpur
Solar Home System	Providing and installation of Solar Home system for 4nos. AC tube lights, 2 nos. AC Ceiling fans	Gulberg, Lahore
Solar Street Light	30Watts solar road light on 5M pole	Gulberg, Lahore
Solar Garden Light	5Watts solar garden light on 1M pole	(OPF), Lahore
Solar Garden Light	5Watts solar garden light on 1M pole	Gulberg, Lahore

PICTURES OF PROJECTS EXECUTED

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SOLAR WATER PUMPING SYSTEM AT UMERKOT SINDH

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SOLAR WATER FILTRATION PLANTS AT OKARA

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SOLAR STREET LIGHTS AT CHINIOT

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SOLAR SEARCH LIGHTS AT CHINIOT

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SOLAR WATER PUMPING SYSTEM AT FATAHJANG

SOLARWELL

SOLAR WATER PUMPING SYSTEM AT SARC-PARC, KARACHI

SOLARWELL

SOLAR LED STREET LIGHTS AT WASA, GUJRANWALA

SOLARWELL

SOLAR WATER PUMPING SYSTEM FATAHJANG

SOLARWELL

SOLAR WATER PUMPING SYSTEM AT, CHAKWAL

SOLARWELL

SOLAR LIGHTS
EPA PROJECT AT RACE COURSE PARK, LAHORE

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PAKISTAN AGRICULTURAL RESEARCH COUNCIL
ARID ZONE RESEARCH INSTITUTE
DERA ISMAIL KHAN
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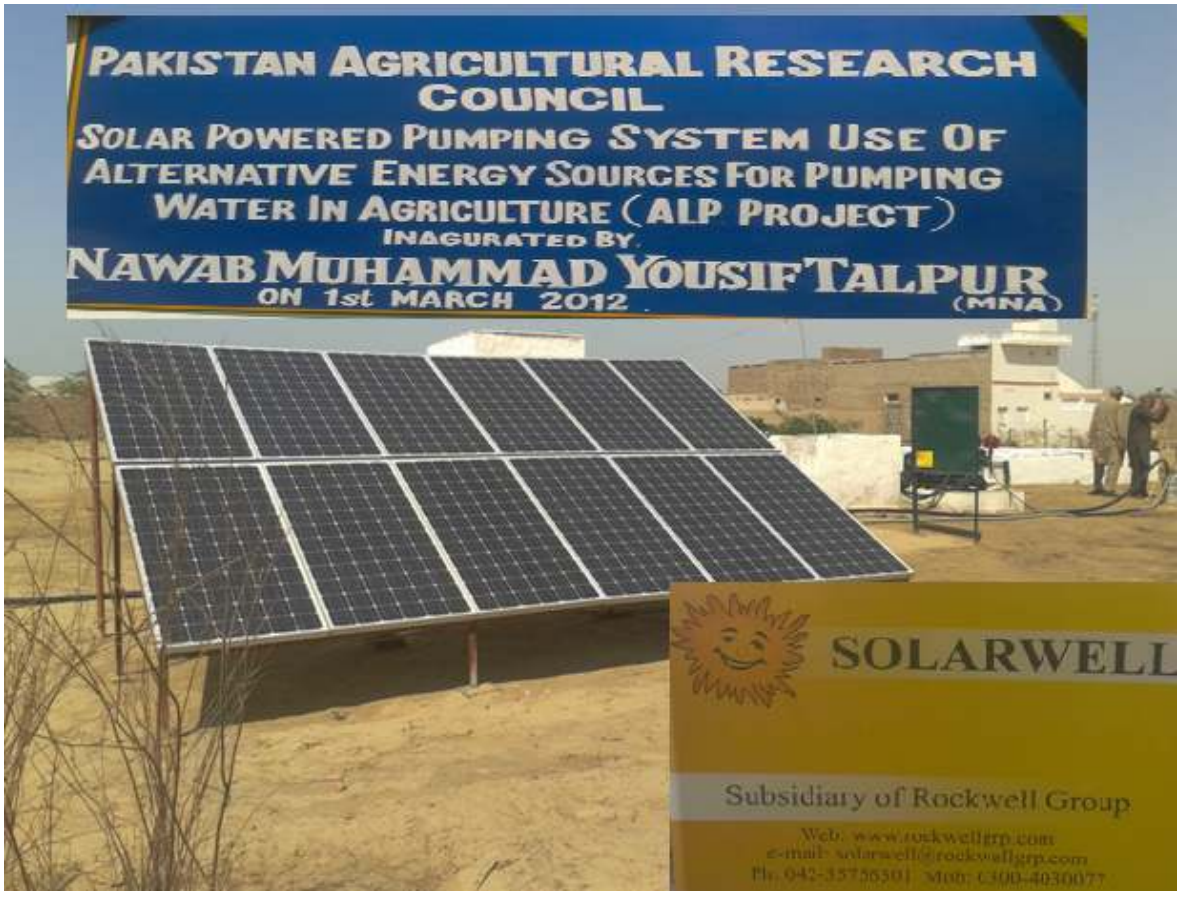
PAKISTAN AGRICULTURAL RESEARCH COUNCIL
SOLAR POWERED PUMPING SYSTEM USE OF ALTERNATIVE ENERGY SOURCES FOR PUMPING WATER IN AGRICULTURE (ALP PROJECT)
INAGURATED BY
NAWAB MUHAMMAD YOUSIF TALPUR (MNA)
ON 1st MARCH 2012
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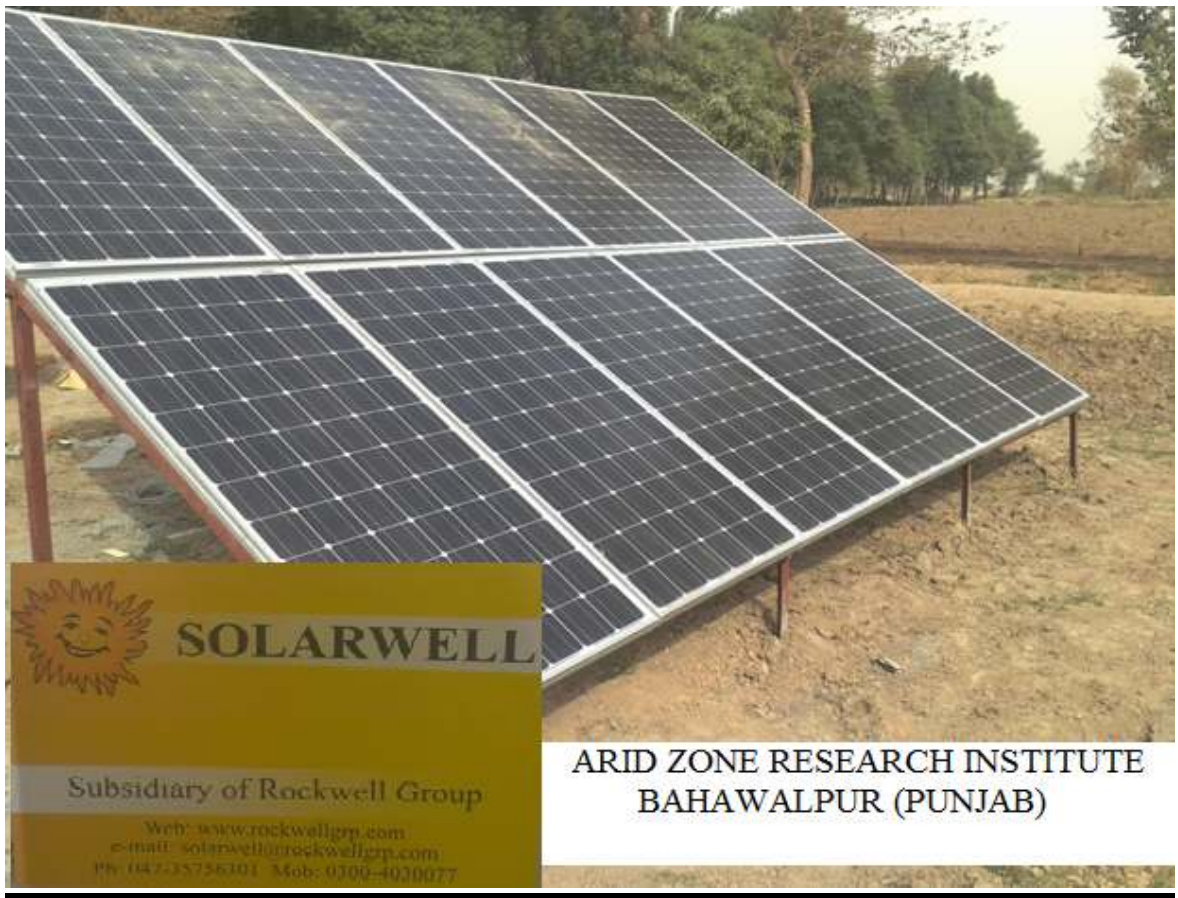
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SOLAR WATER PUMP
AEDB, PROJECT AT THARPARKAR, SINDH

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SOLAR WATER PUMP
AT ITHARA HIZARI DISTRIC JHANG

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SOLAR LIGHTS AT LAHORE

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5KVA SOLAR POWER SYSTEM AT LAHORE

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SOLAR TECHNOLOGY

The solar technology is very much established in the world and there is no question about its technical viability. The increased use of electricity has made it even more viable and a necessity, as the electricity is getting expensive day by day. The importance of developing solar energy as an alternative energy source for sun-friendly country like Pakistan where sun shines for over 300 days a year could hardly be over-emphasized.

Pakistan has an ideal climate to generate solar energy, besides abundance of sunny days the intensity of solar radiation is also much high - roughly 500 watts per square meter at the ground level. This huge solar energy potential is waiting to be exploited.

Solarwell specializes in engineering projects related to alternate and renewable energies. Solarwell has developed Innovative Lighting Solutions powered by Solar Energy. All lights are LED based. Solar lights are generally considered to be dull, less luminous and less sparking. However ultra bright LED's used in Solarwell's products a better design of integration produces, comparable light almost similar to that of conventional lights.

SYSTEM SPECIFICATIONS

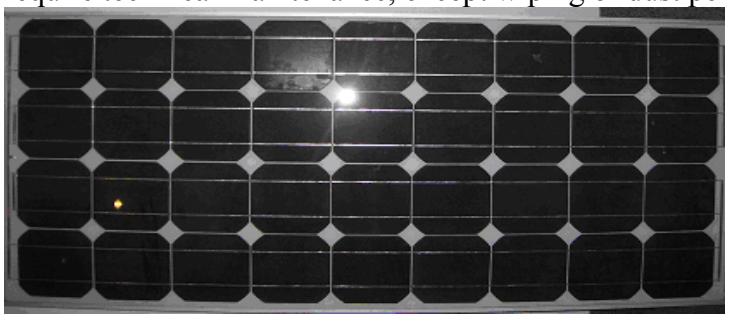
Solar system used for electrification comprises of following components:

a). Solar panel
b). Battery
c). LED Light
d). Timer Circuit
e). Charge Controller
f). Pole (optional)

Solar Panel

Solar Panels used for the energy generation through solar light. Solarwell offers solar panels of numerous capacities generally ranging from 5 watt to 300 watt.

These solar panels are water proof provided with an adjustable stand for panel to face sun at an appropriate angle. The service life of these panels is 20-25 years. These panels do not require technical maintenance, except wiping of dust periodically.



2.2 Battery

Our system comprises of lead acid batteries having a capacity of 5-200 AH. These batteries are encased in a galvanized steel box along with the provision of lock in order to avoid theft lost. These batteries are sealed and have a service life of 05 years.

System has enough backup in battery banks that can be used if sun does not appear for 03 days. Therefore in rainy and cloudy weather this backup performs at optimum level.

2.3 Controllers & Circuit

Charge Controller is provided within the battery box. First purpose is to automatically switch on the light in dark and switch off after desired working hours. The issues of safety and protection of the battery system are also controlled by charge controller, which cuts off the supply to lights if battery voltage drops to 10.5 Volts to avoid ear1y depletion.

The same charge controller cuts-off supply from panel if battery voltage reaches 14.5 volts to avoid overcharging. This effect ultimately increases the total service life of battery. Thirdly the controller also ensures uni-directional flow of the charge from panel to battery and battery to light for overall system protection. Charge controller is a central master device governs all flows intelligently.

LED Based Lights

Solarwell is an engineering based company with specialized focus on environment friendly and energy efficient systems. Our engineers can use individual LED to create their combined effect. Different arrangements of LED’s in different lights with their specific placement schemes, operating voltages and dispersion angles etc. can light any specific place according to requirement.

LED's (Light Emitting Diodes) are very low in charge consumption, thus requiring low power. A low power LED light can produce much more light than equivalent conventional light.

The **search lights** are also LED based and available in different wattage. These lights are categorized on the basis of number of LED's in the light. These lights range to any number of LED's up to 1500 in one fixture.

SOLARWELL

ADVANTAGES OF SOLAR LIGHTS

Keeping generation is an all together different philosophy. Solar Energy Road Lights, specially designed by Solarwell, are stand alone autonomous power generation every system is self contained in all respects and there is absolutely no requirement of infrastructure for common grid connectivity. Collectively save huge financial values and energy. The power produced by such means can off set the deficiency in other sectors like industries and big commercial cities. The advantages of using solar energy street lights are summarized below:

- Solar electricity systems are economically superior to conventional power systems. The operating costs are zero and solar electricity needs very little maintenance.

- If a solar electricity system has been correctly designed, no other system can match its reliability and it gives an un-interrupted power supply. The service life of solar panels and LED lights are internationally understood as 50,000hrs.
- Unlike conventional sources of electricity, solar power produces no harmful emissions that pollute the environment.

- Solar power generation, being a non-depleting energy resource in not directly gauged on financial returns. The world wide trend of power generation through solar energy is because of sustainability of this technology.

- There is a broad objective of creating some share of alternate renewable energy to shift the dependence on conventional resources which have certain political, administrative and strategic concerns. Solar electrification at grass root level will contribute to that share.

- De-centralized power generators with solar systems when multiplied with numbers can collectively take off handsome load from grid.

- Solar lighting solutions with high up front cost are far cheaper than conventional lighting.

- The competition of solar light and conventional light is not only on the basis of quality of light. There are certain other parameters which add to the value of solar light.

It is usually misunderstood that solar lights bring advantages in the form of saving electricity bill. However, it is one of the three (3) main areas where solar powered lights are compared with conventional lights, which are listed below:

Equipment

Solar system has no replacement for 10 years (except Battery and controller) which is not the case for conventional system.

For solar system, the components are:

- Solar Panel
- Battery
- Charge Controller
- LED Light

For conventional light equipment includes:

- Light
- Transformer
- Tariff Meter
- Insulator
- Circuit Breaker

Infrastructure

This is usually not realized by new user and in an expensive part of capital cost required to setup a conventional lighting project. It includes:

- Grid connectivity
- Transmission line from main grid
- Distribution with in vicinity from centralized mini grid
- Underground cable or poles for distribution
- Civil works and Labour

The infrastructure involves cost and time and is a major hurdle in setting up the system in place. The infrastructure varies drastically from site to site and is usually the most expensive component of putting the lights on. There are even situations when this infrastructure can not be made available resulting in no lighting option.

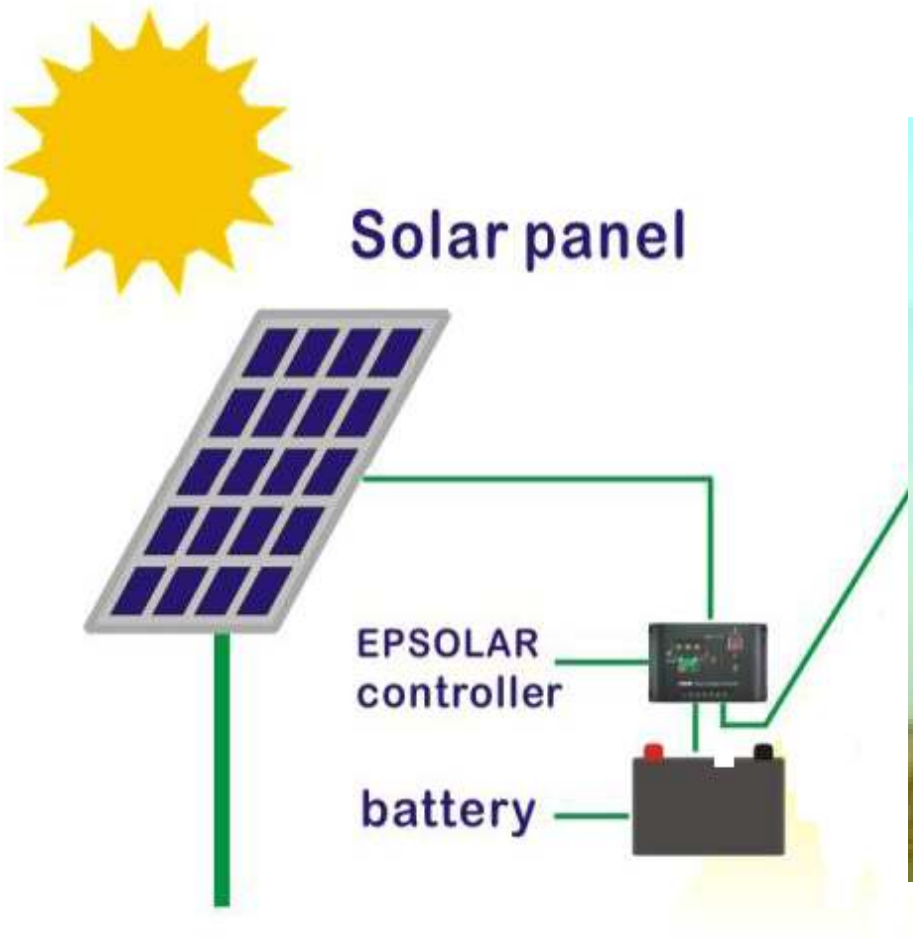
Operation Cost

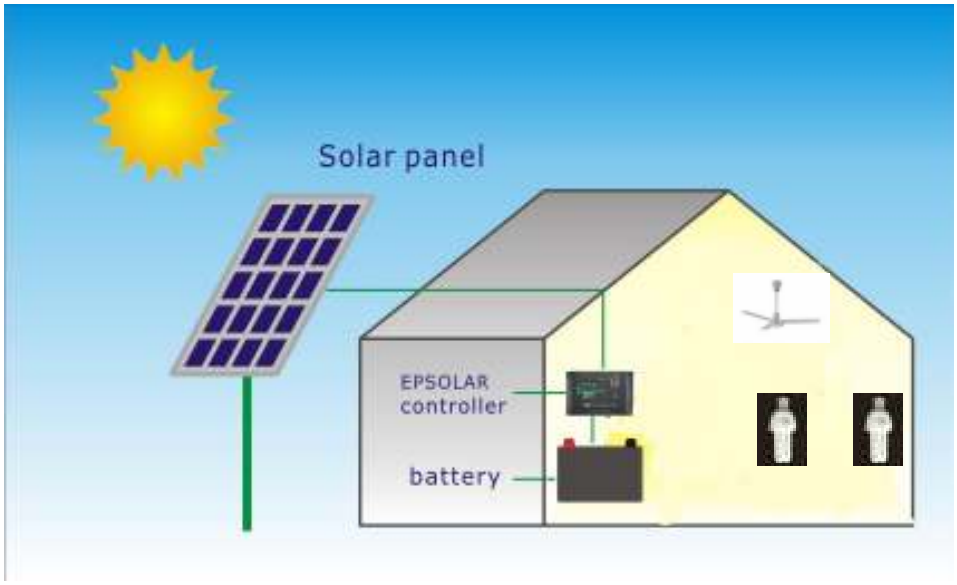
Solar lights have no electricity bill and are thus not affected by the ever increasing tariff. Normally, the financial return is computed on the basis of saving in electricity bills only. However, the equipment and infrastructure are equally important and bring down the payback period.

SYSTEM LAYOUT DRAWING

SOLARWELL

SYSTEM LAYOUT DRAWING





SOLAR LED LIGHTS

SOLARWELL

Solar Lighting

WHY "SOLARWELL" LIGHTS

In many instances lighting at night can be a costly and complicated matter. Issues such as; no available grid power or expensive trenching and cabling requirements can prevent adequate lighting being installed; Damage to the area requiring lighting is also a problem as with conventional lighting systems; footpaths and gardens need to be ripped up to run power cables. Solar streetlights are fully self-contained, so when you choose to install one there are no trenches, no external cabling and no need to connect to the main power grid. With absolutely no power bills and very low maintenance these solar streetlights will pay for themselves.

No Blackout can bring down these lights!

Solar Street Lights are the most cost effective solutions for urban and rural illumination of streets and large compounds/security areas. Even if grid power is available nearby the connection cost it's just much higher than adopting Solar Lights.

Solar Outdoor Area Lighting system is a device that operates using the Light energy available from the sun to provide lighting during nighttime. The Solar PV outdoor lighting is a reliable and an efficient stand-alone system.

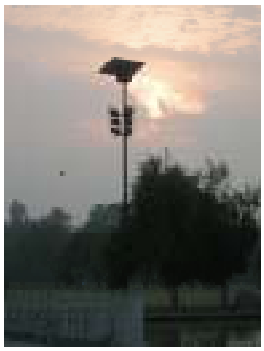
The SOLARWELL outdoor area lighting system can be used for roadways, parking lots & other general lighting applications. It is powered by a Solar Photovoltaic Panel and is completely independent from utility power. There is no need to excavate for underground power lines, because the system is powered by clean solar energy.

The energy is generated & utilized at the same place; there are no long distance cables running and hence less transmission losses. You will enjoy freedom from monthly electricity bills as well as satisfaction that comes with owning and operating an environmental friendly, renewable light source.

This fully integrated system combines the latest and the most innovative solar technologies available providing years of convenient trouble free area lighting. Fully assembled, factory tested kits are available to retrofit the most pole mounting applications.

Not only a cost factor Solar Lights are not affected by power blackouts, they are all independent and switch on and off automatically when required.

Solar Lights come with solar modules, controllers, sealed Batteries, galvanized steel box - arm, lighting fixture with lamp screen, complete with LEDs, Cable kit, clamps and fittings for module fixing etc.



SOLARWELL

SOLAR LED LIGHTS

Solarwell is an engineering based company with specialized focus on environment friendly and energy efficient systems. Our engineers can use individual LED to create their combined effect. Different arrangements of LED's in different lights with their specific placement schemes, operating voltages and dispersion angles etc. can light any specific place according to requirement.

LED's (Light Emitting Diodes) are very low in charge consumption, thus requiring low power. A low power LED light can produce much more light than equivalent conventional light.

An LED driver is a self-contained power supply that has outputs matched to the electrical characteristics of your LED or array of LEDs. LED driver support a wide range of LED topologies and control solution for high power LED lighting applications.

The LED's based Lights are available in different wattage and can be designed and produced for specific customer requirements. These lights are categorized on the basis of number of LED's in the light. These lights range to any number of LED's up to 1200 in one fixture.

- **Highest Efficiency Solar PV Module** – Crystalline Solar Module
- **Field adjustable Solar Panel Mount** – can be rotated around 360° with respect to vertical plane and can be tilted from 0 - 45° with respect to Horizontal Plane to obtain maximum light facing the sun.
- **Lighting Fixture** – Aesthetically designed outdoor weatherproof light fixture body.
- **Electronics** are very high efficiency consisting of a LED driver, charge controller & Temperature Compensation for proper charging of the battery irrespective of ambient conditions. The electronics is also provided with overcharge protection, Deep Discharge protection, open circuit & Short circuit protection.
- **Battery** – Battery used is No Maintenance Dry battery specifically designed for solar applications. The battery provides uninterrupted power for dusk to dawn operation or according to client requirement.
- **Battery Enclosure** – A vented, acid proof, corrosion resistant Galvanized battery box is provided.
- **Operation** – Automatic ON/OFF. It can be designed for 2, 4, 6, 8, 10 & 12 Hours operation by providing timer based circuits.
- **Independent Power**
- **No Electricity Bill**

SOLAR WATER PUMPS

SOLARWELL

Why "SOLARWELL" Water Pumping?

Pioneer in introducing LORENTZ water pumps in Pakistan

PS-150C

- lift up to 70 ft
- flow rate up to 1,330 US-Gal./h
- 12-24 V DC nominal voltage

PS-200 HR/C

- lift up to 160 ft
- flow rate up to 720 US-Gal./h
- 24-48 V DC nominal voltage

PS-600 HR/C

- lift up to 580 ft
- flow rate up to 2,930 US-Gal./h
- 48-72 V DC nominal voltage in solar operation
- 48 V DC in battery operation

PS-1200 HR/C

- lift up to 770 ft
- flow rate up to 5,600 US-Gal./h
- 72-96 V DC nominal voltage in solar operation

PS-1800 C

- lift up to 300 ft
- flow rate up to 5,900 US-Gal./h
- 72-96 VDC nominal voltage

PS-4000 C

- lift up to 550 ft
- flow rate up to 14,000 US-Gal./h
- 230-375 VDC nominal voltage

PS-9K/15K

- lift up to 500 ft
- flow rate up to 16,500 US-Gal./h
- 380-440 VDC nominal voltage

Characteristics

- High reliability and life expectancy
- Helical rotor or centrifugal pump, brushless motor
- High resistance to sand and corrosion
- Fits 4" and larger well casings

Application

- Deep well pumping
- Drinking water supply
- Livestock watering
- Irrigation (pressurized and non-pressurized)
- Pond management
- Irrigation

SOLARWELL

A Practical Introduction

If you need to supply water beyond the reach of power lines, then solar power can solve the problem. Photovoltaic powered pumps provide a welcome alternative to fuel-burning engines, windmills, and hand pumps. Thousands of solar pumps are working throughout the world. They produce best during sunny weather, when the need for water is greatest.

How It Works

Photovoltaic (PV) panels produce electricity from sunlight using silicon cells, with no moving parts. They have been mass-produced since 1979. They are so reliable that most manufacturers give a 10-year warranty, and a life expectancy beyond 20 years. They work well in cold or hot weather.

Solar water pumps are specially designed to utilize DC electric power from photovoltaic panels. They must work during low light conditions at reduced power, without stalling or overheating. Low volume pumps use positive displacement (volumetric) mechanisms which seal water in cavities and force it upward. Lift capacity is maintained even while pumping slowly. These mechanisms include diaphragm, vane and piston pumps. These differ from a conventional centrifugal pump that needs to spin fast to work efficiently. Centrifugal pumps are used where higher volumes are required. A surface pump is one that is mounted at ground level. A submersible pump is one that is lowered into the water. Most deep wells use submersible pumps.

A pump controller (current booster) is an electronic device used with most solar pumps. It acts like an automatic transmission, helping the pump to start and not to stall in weak sunlight.

A solar tracker may be used to tilt the PV array as the sun moves across the sky. This increases daily energy gain by as much as 55%. With more hours of peak sun, a smaller pump and power system may be used, thus reducing overall cost. Tracking works best in clear sunny weather. It is less effective in cloudy climates and on short winter days.

Storage is important. Three to ten days' storage may be required, depending on climate and water usage. Most systems use water storage rather than batteries, for simplicity and economy. A float switch can turn the pump off when the water tank fills, to prevent overflow. Compared with windmills, solar pumps are less expensive, and much easier to install and maintain. They provide a more consistent supply of water. They can be installed in valleys and wooded areas where wind exposure is poor. A PV array may be placed some distance away from the pump itself, even several hundred feet (100 m) away.

SOLARWELL

What is it used for

Livestock Watering: Cattle ranchers in the Americas, Australia and Southern Africa are enthusiastic solar pump users. Their water sources are scattered over vast rangeland where power lines are few, and costs of transport and maintenance are high. Some ranchers use solar pumps to distribute water through several miles (over 5 km) of pipe-lines. Others use portable systems,

moving them from one water source to another. Irrigation: Solar pumps are used on small farms, orchards, vineyards and gardens. It is most economical to pump PV array-direct (without battery), store water in a tank, and distribute it by gravity flow. Where pressurizing is required, storage batteries stabilize the voltage for consistent flow and distribution, and may eliminate the need for a storage tank. Domestic Water: Solar pumps are used for private homes, villages, medical clinics, etc. A water pump can be powered by its own PV array, or by a main system that powers lights and appliances. An elevated storage tank may be used, or a second pump called a booster pump can provide water pressure. Or, the main battery system can provide storage instead of a tank. Rain catchment can supplement solar pumping when sun-shine is scarce. To design a system, it helps to view the whole picture and consider all the resources.

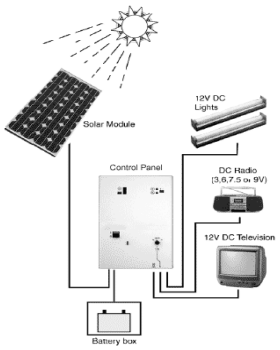
Thinking Small

There are no limits to how large solar pumps can be built. But, they tend to be most competitive in small installations where combustion engines are least economical. The smallest pumps require less than 150 watts, and can lift water from depths exceeding 200 Feet (65 m) at 1.5 gallons (5.7 liters) per minute. You may be surprised by the performance of such a small system. In a 10-hour sunny day it can lift 900 gallons (3400 liters). That's enough to supply several families, or 30 head of cattle, or 40 fruit trees! Slow solar pumping lets us utilize low-yield water sources. It also reduces the cost of long pipelines, since small-sized pipe may be used. The length of piping has little bearing on the energy required to pump, so water can be pushed over great distances as low cost. Small solar pumps may be installed without heavy equipment or special skills. The most effective way to minimize the cost of solar pumping is to minimize water demand through conservation. Drip irrigation, for example, may reduce consumption to less than half that of traditional methods. In homes, low water toilets can reduce total domestic use by half. Water efficiency is a primary consideration in solar pumping economics.

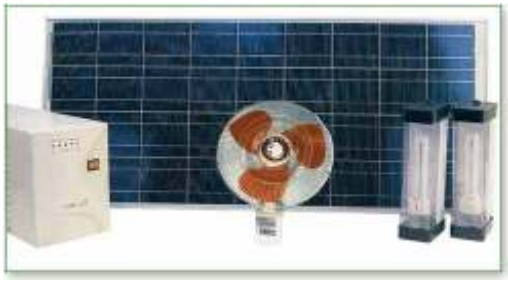
A Careful Design Approach

When a generator or utility mains are present, we use a relatively large pump and turn it on only as needed. With solar pumping, we don't have this luxury. Photovoltaic panels are expensive, so we must size our systems carefully. It is like fitting a suit of clothes; you need all the measurements.

SOLAR HOME SYSTEM



SOLARWELL



SOLAR HOME SYSTEM

PROPOSAL # 01 **Solar Home System to run on DC (Direct Current) for:** 2nos. energy saver bulb 7W 1. 20W Solar Panel. 2. Charge controller. 3. Maintenance Free 12V, 12Amp (Dry) Battery. 4. Installation cables 25ft. 5. Fittings for module fixing. **Charging Time = 1 day** **Running Time = 4-5 hours**	**PROPOSAL # 02** **Solar Home System to run on DC (Direct Current) for:** 2nos. energy saver bulb 7W 1no. DC Table fan 8" blade with emergency inbuilt light. 1. 40W Solar Panel. 2. Charge controller. 3. Maintenance Free 12V, 24Amp (Dry) Battery. 4. Installation cables 25ft. 5. Fittings for module fixing. **Charging Time = 1 day** **Running Time = 4- 5 hours**
PROPOSAL # 03 **Solar Home System to run on DC (Direct Current) for:** 2nos. energy saver bulb 7W 1no. DC Table fan 12" blade. 1. 75W Solar Panel. 2. Charge controller. 3. Maintenance Free 12V, 40Amp (Dry) Battery. 4. Installation cables 25ft. 5. Fittings for module fixing. **Charging Time = 1 day** **Running Time = 4- 5 hours**	**PROPOSAL # 04** **Solar Home System to run on DC (Direct Current) for:** 2nos. DC Energy saving bulb 13W 1no. DC Ceiling Fan (60" blade) 1. 75W Solar Panel. 2. Charge controller. 3. Maintenance Free 12V, 40Amp (Dry) Battery. 4. Installation cables 25ft. 5. Fittings for module fixing. **Charging Time = 1 day** **Running Time = 5-6 hours**
PROPOSAL # 05 **Solar Home System to run on DC (Direct Current) for:** 2nos. DC Table fan 8" blade for **12hrs** 3nos. energy saver bulb 7W for **8hrs** 1no. Mobile phone charger for **2hrs** 1. 150W Solar Panel. 2. Charge controller. 3. Maintenance Free 12V, 150Amp (Dry) Battery. 4. Installation cables 50ft. 5. Fittings for module fixing.	**PROPOSAL # 06** **Solar Home System to run on DC (Direct Current) for:** 2nos. DC Table fan 12" blade for **12hrs** 3nos. energy saver bulb 10W for **8hrs** 1no. Mobile phone charger for **2hrs** 1. 225W Solar Panel. 2. Charge controller. 3. Maintenance Free 12V, 200Amp (Dry) Battery. 4. Installation cables 50ft. 5. Fittings for module fixing.

SOLAR GEYSER

SOLARWELL

Solar Water Heating Systems

Water heating is one of the most cost-effective uses of solar energy, providing hot water for showers, dishwashers and clothes washers. Every year, several thousands of new solar water heaters are installed worldwide.

Solar energy is a clean and abundant energy resource that can be used to supplement many of your energy needs. Solar energy can be utilized as a form of heat, such as solar water heating, room heating and as electricity, such as solar photovoltaic.

Material Description	
Inner tank	Thickness 0.4mm stainless steel SUS304-2B,Tank diameter 360mm
Outer tank	Thickness 0.4mm stainless steel SUS202, Tank diameter 470mm
Insulation	Thickness 55mm imported polyurethane high pressure overall foam
Frame	1.2 mm stainless steel, angle 45 degree
Vacuum tube	Borosilicate Glass 3.3 with AL-N-AL for selective absorption coating.
Inner tank	Thickness 0.4mm stainless steel SUS304-2B,Tank diameter 360mm

Vacuum tube parameter	
Length (nominal)	1800mm
Outer tube diameter	58mm
Inner tube diameter	47mm
Glass thickness	1.6mm
Thermal expansion	3.3x10-6 K
Material	Borosilicate Glass 3.3
Absorptive Coating	Graded Al-N-AL
Absorption	>93% (AM1.5)
Emittance	<8.5%W/ (80oC)
Vacuum	P≤5x10-3 Pa
Heat Loss	≤0.85W/ (m2oC)
Pressure-endure ability	0.6MPa

PROJECT COMPLETION CERTIFICATE

Government of Pakistan
Alternative Energy Development Board (AEDB)
344-B, Prime Minister's Secretariat, Islamabad
Ph: 9223427 / Fax: 051-9205790

B/3/2/2006

21st February 2007

Mr. Asif Saeed
Director (P&D)
SOLARWELL,
9-T, Gulberg-2,
Lahore.

Subject: **INSTALLATION OF SOLAR WATER PUMPS FOR AEDB DEVELOPMENT PROJECT IN SINDH**

As part of AEDB's development project titled "Solar Water Pumping and Desalination Systems", seven (7) Solar Water Pumps (Lorentz, PS 600 HR-03-2) of capacity 2500-3000 litres per day were procured and installed by M/s SOLARWELL, Lahore at various remote villages in District Chachro, Sindh from November 2006 to February 2007. These pumps have so far been working successfully.

2. I commend M/s SOLARWELL on a job well done.

(Air Marshal (R) Shahid Hamid)
Chairman

LETTERS OF ASSOCIATION WITH FORIGN PRINCIPALS

CERTIFICATE
OF
OFFICIAL
EXCLUSIVE AUTHORIZED DISTRIBUTOR

Upon the recommendation of the Management M/s Tenaga Renewable,
Hereby Qualifies and Appoints

SOLARWELL

(subsidiary of Rockwell Group)

9-T, Gulberg-2, Lahore
Pakistan

As a

Official Authorized Sole Distributor for Pakistan with all the Rights, Privileges, Support and Responsibilities there to pertaining for our all range of Renewable Energy Products.

TENAGA RENEWABLE
Blk 463 Jurong West Street 41
#05-379 Singapore 640463
Contact No: [illegible]
Email: [illegible]

LORENTZ

your message	your reference	our reference	☎ direct +49 (0) 4193 7548-0	date 23.03.2006

Alternative Energy Development Board (AEDB),
Government of Pakistan,
Islamabad – Pakistan

Sub: **AUTHORIZED AGENTS FOR PAKISTAN**

This is to certify that M/s Solarwell subsidiary of Rockwell Group having its registered office at 9-T Gulberg 2, Lahore – Pakistan is an Authorized Agent in Pakistan for LORENTZ solar products.

LORENTZ technical expertise are always available to back-up "SOLARWELL".

This authorization needs to be renewed annually.

LORENTZ
BERNT LORENTZ GmbH & Co. KG
Heidekoppel 16, 24558 Henstedt-Ulzburg
Germany Tel. +49 (0) 4193 7548-0 Fax -29

Dipl. Ing. Bernt Lorentz, CEO

BERNT LORENTZ GmbH & Co. KG
Heidekoppel 16
D-24558 Henstedt-Ulzburg, Germany
Tel.: +49 (0) 4193 7548-0
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e-mail: info@lorentz.de
Internet: www.lorentz.de
Bank account: Deutsche Bank AG, Hamburg
Bank code: 20070024, Account-No. 6233210
PHG Verwaltungsgesellschaft Bernt Lorentz mbH, Handelsregister Kiel HRB 7938 KI

General Manager:
Dipl.-Ing. Bernt Lorentz
Tax-Identi-No. DE 159 887 510
HRA Kiel 4454

SOLARLAND
SOLAR POWERED TECHNOLOGY

Facsimile Message

Customer: SOLARWELL" 9-T Gulberg 2, Lahore-Pakistan
Date: 2006-12-04

Attn: Mr.SHAHZAD SAEED
Page:1

Tel: 0092-42-5756301 Fax: 0092-42-5756303

Subject

Letter of Association for "Solar Products" For All Projects

We, M/s SOLARLAND located at Wuxi, China have executed numerous contracts since Year 2004 for solar home system for Government, Semi-Government and Private Sector having International recognition with four departments/agencies.

We, hereby confirm our association with M/s SOLARWELL, a subsidiary of Rockwell Group-Pakistan having its head office at 9-T Gulberg 2, Lahore . M/s SOLARWELL being our " Distributors" for Pakistan region will have our technical expertise and support for all type of Solar products and/or components.

For and or behalf of

Dec. 04. 2006

sign & stamp

B11 Huayou Dong Rd.,Huayou Industrial Area,National High-tech Industrial Area,Wuxi
Tel: +86 510 82261115/85203807 Fax: +86 510 85203812 Web site: www.solarland.com Email: terry@solarland.com

GENERTEC INTERNATIONAL CORPORATION

CERTIFICATE
OF
OFFICIAL
AUTHORIZED DISTRIBUTOR

Upon the recommendation of the Management Genertec International Corporation, Hereby Qualifies and Appoint

SOLARWELL
(of Rockwell Group)
9-T, Gulberg-2, Lahore
Pakistan

As a

Official Authorized Sole Distributor for Pakistan with all the Rights, Privileges and Responsibilities there to pertaining for our all range of products and exclusively for UPS, INVERTER AND CHARGE CONTROLLER.

GENERTEC INTERNATIONAL CORPORATION

(Authorized Signatory)

GENERTEC INTERNATIONAL CORPORATION

TO WHOM IT MAY CONCERN

AUTHORIZATION LETTER

This letter is to certify that either of Mr. Asif Saeed and Mr. Shahzad Saeed of M/S SOLARWELL is hereby authorized to sign and deal with all type of documentation on behalf of our Company for the Tender submissions; As their Firm stand Authorized Distributor for Pakistan under our Official Certificate issued separately.

Regards,

For Genertec International Corporation

CHIDEPOT CO., LIMITED
302, 2unit, No.2 Building, Mingshi Garden, No.1 Haichuan Road, Qingdao, China Zip code: 266071, Tel/Fax: China (532) 85927510, China (532) 85870985 Email: bz@chidepot.com www.chidepot.com

Distributorship Agreement

Agreement entered into between CHIDEPOT CO., LIMITED referred to as Party-A and Solarwell in Pakistan referred to as "the Agent" Party-B.

During the effective period of this Agreement, Party-A hereby grants to Party-B the right to sell Products in Territory Pakistan and Party-B accepts and assumes such appointment for the sale and distribution of Products in Territory Pakistan.

The relationship hereby established between Party-A and Party-B, during the effective period of this agreement, shall be solely that of seller and buyer, and Party-B shall under no circumstances be considered to be the legal representative of Party-A and shall have no right or authority to contact in the name of or to create a liability against the Party-A.

However, M/s. Solarwell (Party-B) is an Authorized Distributor of Party-A.
Under this Agreement, Party-A is responsible for the supply of quality workable products to Party-B and as per mutually decided specifications. Party-A being a supplier of solar products will provide backup services up to the satisfaction of Party-B.

Each individual contact under this Agreement shall be confirmed on each transaction and paid 20% of total value by T/T, 80% of total value by irrevocable letter of credit at sight.
Both Party-A and Party-B shall from time to time and/or on the request of either party furnish each other with information and market reports to promote the sale of Products as much as possible. Party-B shall give Party-A such reports as inventory, market conditions and other activities of Party-B.

This Agreement shall be valid and remain in force for a period of three years and will be extended if not mutually agreed in writing this Agreement commencing from the date when Party-A receives Party-B's first order.
Neither party shall assign, transfer or otherwise dispose of this Agreement in whole or in part or any right hereunder to any person, firm or corporation without the prior written consent of the other party.
Any notice, request, or other document to be given to a Party under this Agreement shall be in writing and (A) sent by registered or certified mail, postage prepaid, (B) hand delivered, (C) sent by express mail or other overnight delivery service which provides documentation of receipt, or (D) sent by telecopy, telex or telegram, addressed as follows:

Party-A: 302, 2unit, No.2 Building, Mingshi Garden, No.1 Haichuan Road, Qingdao, China Zip code: 266071, Tel/Fax: China (532) 85927510, China (532) 85870985 Email: bz@chidepot.com www.chidepot.com

Party-B: 9-T, Gulberg-2, Lahore – Pakistan.
Ph: # 092-42-5756301, 5764481, Fax: 092-42-5756303
E-mail: rockwell@brain.net.pk Mr. Shahzad Saeed

Any party may change its address for receiving notices, requests or other documents by giving written notice of the change to the other party.

PARTY-A: CHIDEPOT CO., LIMITED
(Signature)

PARTY-B: SOLARWELL
Berlin Zhang
(Signature)

CERTIFICATES

Alternative Energy Development Board (AEDB)
344, B Prime Minister's Secretariat, Islamabad
Ph: 051-9223427 Fax: 051-9205790

B/5/9/2006

15th April 2006

Mr. Shahzad Saeed
Solar well subsidiary of Rockwell Group
Lahore

Subject: Registration of Solarwell

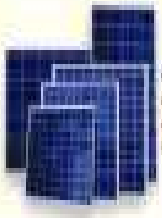
The firm M/s Solarwell subsidiary of Rockwell Group 9-T Gulberg-2 Lahore has been registered with Alternative Energy Development Board on 10th April 2006. Its registration no. is AEDB/Solar/256

The firm is technically qualified for supply and installation of Solar Energy products in Pakistan.

Ahsan Javed
(Technical Coordinator)

BROCHURE

PHOTOVOLTAIC MODULES



Specifications

- Multi / Mono-crystalline 10 Watts to 160Watts
- Mono-crystalline 24Volts 80Watts to 160Watts

Advantages

- Uses high efficiency solar cells
- Multi / Mono / Poly crystalline modules
- 10-20 years warranty

SOLAR STREET LIGHT

Specifications

- PV Module
- Maintenance-free battery
- Bright white LEDs
- Charge controller
- Galvanized steel box
- Lighting fixtures

Advantages

- Automatic on/off (Timer)
- Over current protection
- Available in different models with 6-10hrs/day backup
- Eliminates utility line extensions
- Water proof casing
- Fast and easy installation with portable accessories
- Economical energy-Save heavy electricity bills
- One good year parts defect guarantee with warranty cards

GARDEN LIGHT / GATE LIGHT / CAR PORCH LIGHT

Specifications

- PV Module
- Maintenance-free battery
- Bright white LEDs / Energy saving lamp
- Lighting fixture

Advantages

- Automatic on/off (Timer)
- No external wiring
- Available in different Models with 6-10hrs. Backup
- Water proof casing
- Fast and Easy Installation with portable accessories
- One good year parts defect guarantee with warranty cards

SOLAR BILLBOARD LIGHT / SEARCH LIGHT WITH MOTION DETECTOR

Specification

- PV Module
- Maintenance-free battery
- Spot lights with powered LEDs / Energy saving lamp
- Charge controller
- Galvanized steel box
- Lighting fixtures

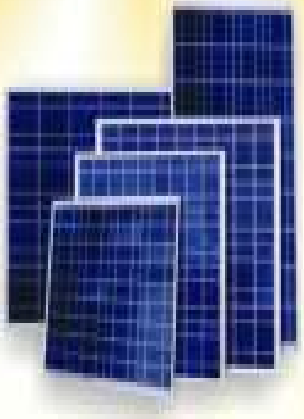
Advantages

- Automatic On/Off timer
- Economical energy-Save heavy electricity bills
- Best solution for advertisement in urban/remote areas
- Customized systems available for any size of billboard
- No running cost
- One good year parts defect guarantee with warranty cards

SOLARWELL

Subsidiary of: ROCKWELL GROUP
9-T Gulberg-II, Lahore-Pakistan
Tel: 92-42-5766301 - 5764481
Fax: 92-42-5756303
E-mail: info@rockwellgrp.com
solarwell@gmail.com
Web site: www.rockwellgrp.com/solarwell

SOLAR ENERGY SOLUTIONS



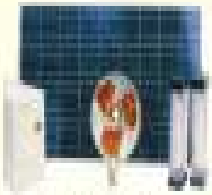
Quality Technology Innovation

SOLARWELL

Let's use it

www.rockwellgrp.com/solarwell

SOLAR HOME SYSTEM



Specifications
- PV Module
- Maintenance-free battery
- Charge Controller

Advantages
- Provides power for AC / DC applications
- Customize designs
- Backup facility as per requirement
- Reliable and fully integrated with safety fuses
- Prepackaged & pre-wired
- One good year parts defect guarantee with warranty seals

SOLAR PORTABLE POWER STATION

Specifications
- Air compressor
- Inverter for AC appliances upto 400W
- Built in Light 10W
- Jumper wires

Advantages
- Easy carrier for frequent travelers
- Dual charging facility AC / DC
- Maintenance free Best to keep in car
- One good year parts defect guarantee with warranty seals

SOLAR TRACKING SYSTEM

Specifications
- No separate sensor, use module as a sensor
- Elevation angle 0-45, manually adjustable
- Supply Energy of tracking drive

Advantages
- High reliability and life expectancy
- Low power consumption ,at 1.32kWh/year
- No unnecessary tracking movement
- Designed to withstand winds up to 120km/hour
- Cost efficient tracking system
- One good year parts defect guarantee with warranty seals

SOLAR TRAFFIC LIGHT / SOLAR WARNING LIGHT

Specifications
- PV Module
- Maintenance free battery
- Powered LEDs
- Charge controller

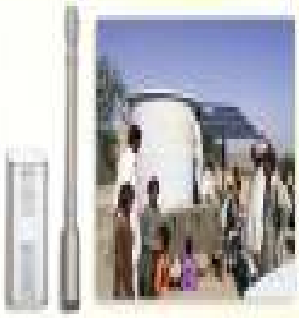
Advantages
- Heightened visibility
- Over Charge prevention
- Auto "ON/OFF"
- Wide range of models
- Easily installed and Maintenance free
- Aluminum alloy housing for weather resistance (Optional)
- One good year parts defect guarantee with warranty seals

SOLAR LANTERN / SOLAR PORTABLE LIGHT

Specifications
- PV Module
- Maintenance-free battery
- Energy saving bulbs/LEDs

Advantages
- Models available with dual recharging (Electricity/Solar)
- Available in different models with 4-8hrs./day backup
- Aesthetically Designed lantern Housing
- High efficiency Electronics
- One good year parts defect guarantee with warranty seals

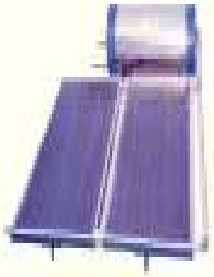
SOLAR SUBMERSIBLE / CENTRIFUGAL WATER PUMP



Specifications
- PV Module
- Micro controller programmed
- Probe sensor
- Float switch
- Pump (HR-Models) having DC brushless motor system

Advantages
- Lift upto 240M
- Max flow rate upto 27M³/hr
- Works efficiently in all water conditions
- Fully integrated system
- Has a perfect safety mode against any damage
- One good year parts defect guarantee with warranty seals

SOLAR WATER HEATER



Specifications
- Tank volume (100-300) liter
- High efficiency collectors
- Absorber area: 2.1 M2
- Can withstand temperature of more than 100 C

Advantages
- Available in different capacities
- Reliable and durable trouble free performance
- Low maintenance
- Environmental friendly renewable energy source
- One good year parts defect guarantee with warranty seals

SOLAR COMMERCIAL SYSTEM

Specifications
- PV Module
- Maintenance-free battery
- Inverter
- Charge controller

Advantages
- Provides power for AC / DC applications
- Customize designs
- Reliable and fully integrated with safety fuses
- Prepackaged & pre-wired
- Hybrid & stand alone system
- Backup facility as per requirement
- One good year parts defect guarantee with warranty seals

www.rockwellgrp.com/solarwell