HOW DOES SOLAR WATER PUMPING WORK?

Solar water pumps have been in production since the 1980's. The concept is rather straight forward, even though a lot of cutting edge design, engineering and manufacturing has gone into the process of manufacturing these pumps; A solar panel array (1) converts sunlight into High voltage DC electrical current (power), the array is connected to a controller box (2) (linear current booster / MPPT / Maximum Point Power Tracker) that converts the high voltage DC to low voltage and then drives a special low voltage submersible Solar Water Pump (3)(Helical or Centrifugal type depending on delivery and depth requirements). The motor and wet end then pumps the water out of the borehole, river, dam or pit into a tank, reservoir or dam. The pump continues to deliver water for most of the daylight hours. Batteries can also be used to drive the pump, but in most cases this is not necassary. There are also dry run protection prods (for the pump) as well as over-flow/tank prods available that prevents the motor from running dry and/or the tank/reservoir from running over.

These solar water pumps (e.g. Oil/water based etc) are suitable to provide waters for: domestic use (pottable water), drinking water supply, irrigation, lifestock watering (suiping), pressurising, pond management, etc. (GPS monitoring/related @ e.g. switchup etc can be installed on SEG pumps, same applies to other power products!)

WHAT ARE THE MAIN REASONS FOR CONSIDERING A SOLAR WATER PUMPING SYSTEM?

**Cost effectiveness and long life:** Once the pump has been bought and installed there are no running costs. With generators there are fuel and maintenance costs and the effort of keeping the tank full. With 220/360 Volt electrical pumps (dompel pompe) there is the cost of power and monthly Escom pole fees. With wind mills there is maintenance costs and well as the fact that the least amount of wind is available when water is needed the most. Sun is also more reliable than wind. We can build a pumping system for a deep well at a modest cost.

**Low to no maintenance:** The pumps are brushless, permanent magnet, oil filled units that are build to last many years in the field and since they are located a number of meters below ground they usually cannot be physically damaged. The solar panels typically have a 25 year warranty on their efficiency, if the rain does not wash the dust off the panels, then dust needs to be cleaned off every so often. The control boxes as also very reliable and water proof. So all in all it is a straight forward sytem with little room for error. The pumps can also be installed by hand and pulled up easily if need be.

**Ideal for remote and rural areas:** These pumps can work in areas where it would be very expensive to have grid power (Escom power) installed and can operate independently. Once installed and setup the pumps work on their own and do not need to be switched on or off. The pumps start pumping when the irridation from the sun reaches a certain level (in the morning) and stops when it falls below a certain level (late afternoon). Due to dry run protection prods and overflow protection prods that are installed with the pumps, they do not have to be manually monitored and swithched off.

**Water when you need it:** Solar pumps pump the most water during dry and sunny weather/days when it is needed most. Also works well on low yield boreholes (syfer boor gate) which only allows for drawing off small amouts of water over a longer period. Other pumps tend to pump these holes dry.

**Pumping from multiple sources to multiple storage units:** Solar water pumps can pump water from boreholes, dams, rivers, deep wells, shallow wells, ponds, streams, aquifers, etc. One can pump water to tanks, dams, aquaducts, cripps, animal watering ponds & holes, etc.

**Suitable for various uses:** Domestic (home use) water, off-grid homes, farms & cabins, aquaculture, livestock watering (suiping), etc.

**Access to good quality, abundant water resources:** Water may well be abundantly present on the Earth, but the salt water of seas and oceans accounts for 96.4% of the total water volume. Fresh water only accounts for 3.4% of the total volume of water on our planet. This supply of fresh water is broken down as can be seen below:

2.15%    is contained in glaciers or permanent snow (this makes up about 70% of the total fresh water)

0.019%  constitutes the surface waters : lakes, rivers of all sizes (about 0.6% only of the total fresh water)

(Please note only pumps made to work on this method (to be discussed) is cost effective, to put ANY 220 volt pumps especially to work from alternatives are not cost effective EVEN IF QUOTATION WAS/IS BASED ON PREPLANNING/NOT, there are e.g. Battery sustainability issues ETC; concerning all/any companies; Please be vigilent concerning " too good too be true quotations"; applied to this phenomenon especially, within industry). This prinsiple applies in general to all appliances (bought anywhere) not made to run of renewables (called non ecofriendly appliances etc), even if used for shorter periods of time. ALL Dc appliances must not work straight from batteries (any type), controllers are recommended, please see solar book section/consultation sessions for more! Savings are clean & easy with SEG!