

Solar Magnetic Plunger Pump – SMPP

A game changer in rural water supply



Introduction

Access to water is one of the most acute issues facing impoverished off-grid rural communities. Over 50% of the world's food is produced by some 500 million smallholder farmers in the developing world, yet only a fraction of these benefit from irrigation. This constitutes a major barrier to economic development and food security, and at the same time a huge business opportunity for good solutions. According to the [2019 outlook by Efficiency for Access](#), the market is expected to grow to ca. 5 million units in 2030, to a ~\$15 billion market, which is still far from reaching the full potential. Scaling the use of solar water pumps will contribute to many of the development goals in these regions: greater energy access (SDG 7&13), improved productivity and access to water for households (SDG 7), poverty and hunger reduction (SDG 1&2), gender equality (SDG 5), and clean water and sanitation (SDG 6).

Our Solution

Among all components of a solar irrigation system, the pump has the greatest impact on the cost per m³ of water pumped and on the Cost of Ownership (CoO). These are the most important considerations for the farmer in the long run. **To date there is not a single solar pump on the market specifically tailored for smallholder farmers.**

Comet-ME has developed the Solar Magnetic Plunger Pump (SMPP) – a clean-sheet design, 1st in-kind, solar-powered borehole water pump (patent allowance), with the lowest CoO and cost per m³ and the highest flow-rate and efficiency in the market, tailored in every respect for off-grid smallholder farmers and communities in the Global South - setting the ground for faster ROI, thus increasing the pace of solar pumps adoption:

- 20-30 m³ per day at 15-45 head range, for irrigating 1 hectare or for daily domestic use of a small community
- Low cost and high reliability, beginning with the plunger-based design, which is dramatically slower than in high RPM motor pumps and therefore practically immune to sand in the water, whereas the high rotational speed results in premature wear. We allow X5 sand in the water @ 1/2 the price of the best in the market!
- A simple design with a single moving part enables field servicing without the need for accurate jigs and tools.
- The controller allows operation under low solar conditions, while rotor pumps need high RPM for operating.
- Includes a remote monitoring unit for PAYG, real-time irrigation system control, fast identification of problems for timely maintenance, as well as various statistical cross sections that will serve governments, international organization and agribusinesses for long-term planning in support of the farmers.

Status

We are currently in the final development stage of the SMPP. Engineering models have been tested for the past 18 months, exhibiting the highest performance, exceeding that of the leading manufacturers in the field. A short video can be seen [here](#). We plan is to establish a for-profit company that will produce and market the SMPP along with a family of pumps derived from the same core technology. **We are currently seeking funds for pilots and mass production preps, followed by market penetration and sales.**