

Solar Powered Reciprocating Water Pump

<https://www.youtube.com/watch?v=dluEA5I1Yxc>

The proposed Solar Powered Reciprocating Mechanism Based Water Pumping System is designed to pump water using solar energy as the primary power source. The system consists of a solar panel, rechargeable battery, DC motor, reciprocating mechanism, piston pump, and water storage arrangement. The solar panel converts sunlight into electrical energy, which is used to charge the battery and operate the DC motor. The rotary motion of the DC motor is converted into reciprocating motion through a mechanical linkage mechanism, which drives the piston of the water pump. This reciprocating action creates suction and delivery pressure to draw water from a source and pump it to the required location.

The proposed system provides an eco-friendly, low-cost, and energy-efficient solution for water pumping, particularly in areas where grid electricity is unavailable or unreliable. The stored battery energy allows the pump to operate when sufficient solar radiation is not available. By utilizing renewable solar energy and a simple reciprocating pumping mechanism, the system reduces dependence on conventional electricity and fuel-powered pumps. It can be effectively used for small-scale irrigation, gardening, agricultural water supply, and domestic water pumping applications.

Features:

- Solar-powered operation using a solar panel.
- Uses a rechargeable battery for energy storage.
- DC motor-driven reciprocating mechanism for water pumping.
- Converts rotary motion into reciprocating motion.
- Provides continuous water suction and delivery.

- Reduces dependence on grid electricity and fuel.
- Uses renewable and clean solar energy.
- Simple and low-cost mechanical construction.
- Suitable for small-scale water pumping.
- Can be used for agriculture, irrigation, gardening, and domestic water supply.
- Requires low maintenance compared with conventional fuel-operated pumps.
- Environment-friendly with no direct fuel emissions.

Major Components:

- ☐ Solar Panel
- ☐ Rechargeable Battery
- ☐ DC Motor
- ☐ Reciprocating Mechanism
- ☐ Piston Pump
- ☐ Connecting Rod
- ☐ Water Tank
- ☐ Water Pipes
- ☐ Check Valve
- ☐ Solar Charge Controller
- ☐ ON/OFF Switch
- ☐ Supporting Frame

Block Diagram:

