



All Energy Pty Ltd
www.allenergypl.com.au

Fact Sheet: Solar Pumping

Microgrid for 100% renewable water pumping

Water pumping has traditionally used diesel fuel due to low capital expenditure (CAPEX) or grid power for ease of maintenance and operability for large applications such as water movement for irrigation and pumping water bores.

Low cost solar arrays coupled with pump drives specifically for solar power means that using 100% solar is a viable option.

To achieve the same amount of pumping per day, a solar pump will need to be approximately four (4) times larger than a diesel pump running 24 / 7.

PV panels, ground mounting & installation are the main cost (~85%) with the pump motor & drive being the balance. An optimised system can deliver a payback towards 3 years compared to a diesel pump. A key assumption is that the dam / tank receiving the water has sufficient capacity to receive & store water pumped via the 12 hours that the solar system is operating.

Pumping Tech	Pumping Cost: cost per unit over life of plant.	Info	Payback	Emissions
Diesel pumping	\$0.68 / kWh	Lowest set-up cost; high operating cost; highest emissions	Base case	No reduction. Base case
100% PV solar pumping	\$0.091 / kWh	Best overall economics; available ~ 6 hours per day	~ 3 to 5 years (budget pricing still being received for 450 kW system)	100% reduction
Hybrid diesel + battery + solar pumping.	\$0.42 / kWh	Highest CAPEX; majority of emissions still remain	~ 4 to 5 year payback	36.7% reduction
Grid Power	\$0.27723 / kWh for 10 hours off-peak per day + supply charges	Ergon Tariff 62A off peak only 9pm to 7am. Emissions are Scope 2 (rather than Scope 1 for diesel)	Can be very expensive to set up if grid is not available on-site	~22% the emissions of diesel

Over the life of plant, PV solar provides the best economics. Electrified systems also provide the least maintenance as fuel deliveries are not required and servicing / maintenance is less than an internal combustion engine system.

The kilo-watt per hour and demand charges for grid power means that solar pumping has better long term economics (less than half the long term cost).

Key Parts of a Solar Pumping System



Regional and Remote Communities Reliability Fund

Microgrids for Balonne Shire

Collaborative project with Balonne Shire Council that received grant funding from the Australian Government



All Energy Pty Ltd
www.allenergypl.com.au



More information:

W: www.allenergypl.com.au

E: Max Barnes

(max@allenergypl.com.au)

Gareth Forde

(gareth@allenergypl.com.au)