



Photo: W Pratt/OEH

We've reduced our diesel consumption by 60%, saving us more than \$46,000 a year.

John Mulligan
Director
DP Ag Pty Ltd

DP Ag: harnessing the sun for greater pumping efficiency

We replaced our old diesel guzzling irrigation system with a much more efficient and reliable solar-diesel hybrid that uses less than half the diesel of our old system.

ABOUT US

DP Ag is a family-run farming business producing fine grade cotton from a 200 hectare site in Moree, NSW. We've been growing cotton since 1978, producing around 400 tonnes of lint a year. We market our cotton to merchants in Australia who then on-sell overseas, to China and other markets.

OUR SITUATION

Cotton, being a desert plant, is more drought and heat tolerant than many other crops. It uses about the same amount of water as most other summer crops, and less water than rice, maize and many vegetable crops.

At our farm, rainfall is supplemented by irrigation. We have a diesel irrigation pump which operates whenever rainfall is low, and around the clock during the hot dry months between October and February.

BY THE NUMBERS

Cost of upgrade:

\$180,589

Estimated cost savings:

\$46,500 a year

Fuel savings:

40,760 litres of diesel
(60% of existing annual consumption)

Simple payback: Less than four years

THE TECHNOLOGIES

Solar-diesel hybrid power plant

Solar power systems that convert sunlight into energy can be integrated with existing diesel-powered systems.

Also known as photovoltaics, these electronically-controlled systems can operate remotely, around the clock in 'hybrid' mode and in 'solar-only' mode during the day.



Solar-diesel hybrid powered irrigation system Photo: W Pratt/OEH

Photovoltaic cells Photo: W Pratt/OEH

The pump uses more than 67,500 litres of diesel fuel per year and because of the high cost of diesel, we had to look at ways to reduce the cost.

WHAT WE DID

With the support of the NSW Government and assistance from our consultant, we upgraded our traditional diesel engine irrigation pumping system to an off-grid solar-diesel hybrid power plant. This means that during the day the pump is powered by solar energy when sunny, and diesel at nights and when it's cloudy.

The system consists of a diesel generator, a pump motor and a 70 kilowatt solar power system. The solar power system is a ground mounted solar array, located in an optimum location on the farm for maximum solar gathering.

The upgrade also included an energy management control system with a variable speed drive to better regulate the pump motor's power needs – particularly outside of peak periods, ensuring that it doesn't run at full speed when the demand is low. The control system manages the diesel generator, solar power system, variable speed drives output and the fuel supply.

THE RESULTS

The new pumping system is saving us on average more than 40,000 litres of diesel annually, representing a 60% saving. That's around \$46,500 in savings per year.

The system gives us energy savings even when we are pumping water 24/7 in the peak use season between October and February. The multiple sensors and computer modem communications lets us monitor and control it remotely, meaning we don't have to go to the site in the middle of cold nights or on wet days.

We also use water more efficiently now. The systems lets us extract water consistently over the course of the year, reducing water level draw down during dry periods when demand for water is at its peak.

THE TECHNOLOGIES

Variable speed drives

When a single pump is required to operate over a range of flow rates and pressures, such as in irrigation, standard procedure is to design the pump to meet the greatest output demand of both flow and pressure. For this reason, pumps are often oversized and they will be operating inefficiently over a range of duties.

This common situation presents an opportunity to reduce energy requirements by using control methods such as a variable speed drive.

By installing a variable speed drive to an irrigation pump motor, the frequency of the electrical power supply can be regulated to match the irrigation volume or pressure requirements.

TAKE ACTION

To find out how you can save on your business' energy costs, contact the Energy Efficient Business team.

NSW Farmers with the Office of Environment and Heritage has developed a **guide** to solar powered irrigation.

EMAIL

energy.saver@environment.nsw.gov.au

CALL

1300 361 967 (ask for the Energy Efficient Business team)

VISIT

environment.nsw.gov.au/business