Eskom
AIS Farming Case Study
Fact Sheet

Eskom

Farmers reap rewards from energy investments in irrigation

Before any farmer spends money on improving operations, there's one crucial question they ask: How long before I make my money back?

Agricultural sector

Jacobsdal crop farmers Andrew Conroy, Ian Conroy and Steven Squires from AIS Farming undertook a wide-ranging assessment of where they could make their business more efficient and where they could save money. An economist, Squires understood the importance of any investment to pay for itself – and that the bottom line of their business should reap the benefits as soon as possible.

Irrigation at AIS Farming is fully mechanised and irrigates maize and wheat on 500 hectares of land near the Riet River in the western Free State. Production is in the order of 13,5 tons per hectare of maize, 7 tons per hectare of wheat and 3,5 tons per hectare of ground nuts.

In 2013, acutely aware that energy was a key cost to their business; AIS farming considered an energy efficiency upgrade. Before deciding what to invest in, they obviously needed to know where AIS Farming was spending money and how much. Assisting them to determine their energy-cost baseline was an Eskom Energy Advisor who met with the AIS farming team onsite and assisted them with the number crunching, and gave them detailed practical advice on what the numbers meant.

Working with the advisor's guidance, AIS farming decided on a number of interventions that would help them cut their energy bills. Pumps and motors were replaced with newer more efficient models. The suction pipes of the pumps were enlarged to lower the water speed at the pump inlets, effectively eliminating cavitation (which impacts performance and reduces equipment life expectancy while adding to maintenance costs). Moreover, variable speed drives (VSDs) were installed to ensure that the motors were running at their optimal speeds and not wasting electricity.

AIS Farming also invested in soil moisture probes, which ensure that the crops were getting the right amount of water, while also providing them the data to reinforce their decision to implement a no-till operational policy - this improves water absorption while reducing the need for irrigation.

The Eskom Energy Advisor was extremely helpful in making AIS Farming aware of what equipment was available from whom, at what cost and what likely energy savings could be achieved.

Payback on the investment

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Two years since making the energy-efficiency switch, AIS Farming is as automated as it is ever likely to be within the agreed budget. Thanks to the VSDs, the business can automatically start and stop its pumps using timer switches to irrigate outside of Eskom's peak periods. "During the week, irrigation is done at night when evaporation, wind speeds and electricity costs are lower. Additional irrigation is also done over weekends when electricity costs are lower," they say, adding: "One of the benefits of the new set-up is that our eight employees are more productive; instead of being involved in the detail of irrigation, they can be used elsewhere on the farm."

But back to that all-important payback question. How much did AIS invest and what has been the experience of AIS Farming? "In total, we spent R1.5 million on the upgrade," they explain. "That includes upgrading the pump station structures, equipment and increasing the size of the main pipeline to one of our centre pivots. "They had savings on all their centre pivots with payback periods of less than a year, except where the main pipeline was replaced. This payback period was in line with what we were expecting and even better than what we were promised.

"We took detailed readings of electricity consumption per centre pivot. While there were some variances between the planting seasons we compared, the results were remarkable – as much as four times lower than what we were expecting. In one case, for instance, energy consumption went down from 162 835 kilowatt hours (kWh) to 89 311 kWh – we saved 45% over a period of a year. On the centre pivot where the main pipeline was replaced, the payback will be less than five years. Overall, yes, a great investment and very acceptable payback periods."

So would they recommend that other crop farmers take a leaf out of AIS Farming's book? "Definitely," they say. "The whole process of deciding what to do, what changes to make and what investments to make was challenging but definitely not difficult. They would certainly advise every crop farmer using irrigation not to hesitate; investigate the possibilities, the potential up and down side. You've got nothing to lose. And you get great advice and help from Eskom's Energy Advisors".

Eskom's national Advisory Service advises businesses on:

- Conducting walk-through energy assessments to identify areas of energy wastage and pinpoint energy saving opportunities.
- Improving the energy efficiency of their operations.
- Optimising their maintenance programmes.

They can also support businesses with recommendations and information on:

- Tariffs.
- Energy efficient technologies.
- Appropriate energy sources – whether electrical, fossil fuelled or renewable.

E-mail an enquiry to **advisoryservice@eskom.co.za** or call **08600 37566** and ask that an Energy Advisor contacts you. For more information go to **www.eskom.co.za/advisoryservice**.

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