

Energy efficiency in irrigation systems



Improving on-farm operational efficiency is an important part of continually improving productivity and profitability. Due to the recent increases in the cost of electricity and water, finding and acting on opportunities to increase the efficiency of irrigation practices is paramount.

The Queensland Farmers Federation is spear-heading a new project to identify opportunities to improve on-farm energy efficiency for electric irrigation systems, across the entire irrigation sector. CANEGROWERS is supporting these efforts 100%.

► **Irrigators represent a significant amount of energy consumption of Ergon feeders that supply irrigation**

The Queensland Government (through the Department of Agriculture, Fisheries and Forestry) has provided \$722,000 to Ergon Energy to conduct 30 x Level 2 on-farm audits of energy efficiency for irrigation equipment – including pumps, motors, links to winches, pivots and remote sensors.

Not only does this energy audit program identify the opportunities to improve operational efficiencies, it also includes financial analysis of the proposed solution(s) and post-investment analysis to ensure the efficiency opportunities are being captured.

► **There are 11 cane audits covering the following:**

Bundaberg area – pumps and winches, groundwater pumps and new pivot(s), whole of farm investigation for large cane and other produce farms, multiple pump assessments and lateral, flood irrigation pumping and pump to tape.

Mackay area – pump to centre pivot, new pumps and lateral(s), pump supply to new winches and groundwater pumps to lateral.

Burdekin – groundwater pumps replacement.



► **Why group irrigators together?**

Queensland Government:

- Will demonstrate a commitment to irrigators as an important part of the 4-Pillar economy
- **No** Government subsidy requirement
- Will significantly increase utilisation of Ergon's network – an issue identified by the "Costello" Commission of Audit
- Will demonstrate real action to achieve the objectives in the Queensland Agriculture Strategy

Ergon:

- Will remove cross subsidies between irrigators and other customer classes
- Will help reverse the fall in utilisation across the Ergon network
- Will increase off-peak consumption from irrigation in key regional areas
- Will end the adverse retail price spiral

Irrigators:

- Will receive much needed immediate price relief
- Lower prices will allow sugarcane growers to maximise the volume and value of crop production
- A large crop will result in security of cane supply for mills – guaranteeing thousands of "at risk" jobs in regional Queensland, while creating over one thousand more in 2014-15.

The National Electricity Rules do NOT prohibit irrigators being grouped together as a separate customer class!

A five-step approach

While this factsheet focusses on network tariff reform, CANEGROWERS is actively involved in all areas of the electricity pricing reform. The five key components of our strategy to get the best result for irrigators are:

Retail prices 2014/15	Network tariff reform	AER Regulatory Reset 2015–20	Energy market reform	Energy efficiency and demand management
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Factsheets for forthcoming issues will be provided by CANEGROWERS as they are announced.

Preliminary findings of the Irrigation Energy Savers Project have shown major operational efficiencies can be realised.

Energy
efficiency
& demand
management

► **Initial site investigations indicated scope for efficiency gains of the order of 30% by addressing the following issues:**

- Replacing old, inefficient pumps.
- Replacing re-wound motor.
- Optimising new irrigation systems by recalibrating pumps and installing the appropriately sized pump outlet pipes.
- Removing throttling of "gate valves" to control the downstream flow rate.
- Implementing warning systems to inform farmers of system shut down during night irrigation.
- Adjusting of pressure and flow rates of pumps on pivot irrigation systems to cover the extreme boundary of an elevated field AND scaling back pumping parameters when the same equipment is moved to lower elevations.
- Ensuring pumps do not overheat and run at reduced efficiency due to blocked air filters from previous flooding.
- Reducing the number of times water can be pumped on-farm.

► **Future work:**

Case studies will be developed and shared for each cane industry audit.

At least three field days will be held, to demonstrate the opportunities for all irrigators across the state

► **Nature of the connection to the network**

- *When irrigators connected to the network, they made a significant capital contribution to expanding the network in Regional Queensland*
- *The size and value of these investments, along with initial consumption guarantees, is unique to those of any other group of retail customers*

► **Reliability and minimum service standards**

- *In times following a natural disaster, additional costs to immediately restore electricity supply to irrigators is unnecessary and avoidable*
- *In most cases, irrigators are less financially impacted by increased frequency and duration of unplanned outages, compared to all other retail customer groups*

► **Metering services**

- *Irrigators are better placed than any other consumer group to maximise the benefits of advanced metering services*
- *Remotely read interval metering services have the potential to become an innovative farm management tool, in conjunction with the Smartcane Best Management Practice (BMP) program*

Big Industry – Big Impact

- *World's third largest exporter of sugar (80% of Australian sugar is exported).*
- *\$2 billion value to the Queensland economy (to the annual Gross State Product).*
- *Second largest agricultural commodity in Queensland.*
- *15,600 jobs directly, and 70,200 indirectly, accounting for 15% of employees in coastal Queensland.*
- *\$7 billion in land and \$4 billion in infrastructure assets controlled by the industry.*



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