Energy Costs

Paying for energy up-front or in the future

The generation and storage of energy is often complex. Grid electricity and diesel have provided stable and reliable power for irrigation in the sugar industry for decades.

With increasing costs for these two sources of energy, many growers are considering other energy sources in the hope that they can reduce their exposure to energy price risk.

These alternative methods usually involve a high capital investment 'up-front' and lower running costs. The suitability of these alternatives will depend on many factors including topography, preferred application method, availability of land, proximity of grid access and so on. Most farms utilise a variety of energy sources for irrigation.

The main sources of energy available to irrigators are:	**Pay-as-you-go energy**	• **Grid electricity** • **Diesel**
	Pay up-front energy	• **Gravity** (on-farm dams and or via scheme) • **Solar electricity** (daytime only) • **Solar electricity plus battery** or storage • **Wind** (lift and store)

Less efficient water application systems with high labour costs and high pumping costs become increasing less viable options when using pay-as-you-go energy.

How to assess the potential effect of capital expenditure to supply energy for irrigation using a 'with and without' change analysis.

	Without change (current system)	With change (proposed system 1)	With change (proposed system 2)
Describe the system	e.g. Grid electricity to irrigate 100 ha sugarcane using high pressure water winch	e.g. Grid electricity to irrigate 100 ha sugarcane using low pressure lateral move	e.g. Solar electricity to pump water to elevation to irrigate 100 ha sugarcane using low pressure lateral move
List components of the system*	Electric pump Water winch Pipes	Electric pump (new or re-use) Lateral move irrigator Relocate hydrant and pipes Alter block layout	Electric pump (new or re-use) Lateral move irrigator Relocate hydrant and pipes Alter block layout Solar panel array Storage dam construction
Calculate capital cost of new components*	Nil	Collect quotes or estimates	Collect quotes or estimates
Calculate annual running costs	Current irrigation costs (water, energy, labour)	Collect quotes or estimates	Collect quotes or estimates
Benefits to cane production	Current productivity e.g t/ha, t/ML	Reduced electricity cost Improved water use efficiency Less labour costs	Reduced electricity cost Improved water use efficiency Less labour costs More reliable and flexible solar energy use (can irrigate at night) Not exposed to electricity price rise
Costs or downsides	High labour cost, disrupted sleep, uneven water distribution, high water use, exposed to energy price rise	High set-up cost (irrigator), exposed to electricity price rise	High set-up cost (irrigator and solar array) Loss of land for water storage

*including pumps, pipes, earthworks, irrigators, field design

Next Steps

Major changes to irrigation infrastructure are often costly and need to be fully analysed to ensure the change is feasible and profitable. Using the Farm Economic Analysis Tool (FEAT) sugarcane growers can compare their current system with a proposed change. Once a proposal has passed the 'FEAT test' it is worth seeking specialist advice from a farm economist or accountant with expertise in farming systems.

Resources

FEAT Online https://featonline.com.au/home

FEAT Online case study : The economic and environmental impacts of innovative practice changes and improved irrigation delivery https://www.publications.qld.gov.au/dataset/sugarcane-economics/resource/7942f1dc-965a-48d3-adc5-c380f616d0f3?truncate=30&inner_span=True