Energy Efficiency

#6 HYDROPONICS

This grower is located in the Lockyer Valley, growing a variety of vegetables, both in-field and hydroponic. The operations also include packing and processing facilities, not only for their own vegetables but also for produce from nearby farms.

The intensive nature of hydroponic production results in heavy energy use. In combination with the processing, packing and storage facilities, the business is a big consumer of electricity. With monthly electricity consumption varying between about 90 000 and 107 000 kWh, there is a great incentive to increase energy efficiency. Indeed, the farm owners have already taken a number of steps to reduce energy consumption across the business.

Lighting

Lighting is often a major energy user in packing facilities, described in case studies one and five. There are a number of cost-effective methods to increase efficiency in lighting, including increasing use of natural light and the use of timers or motion sensors. This business is also going through a process of replacing the existing lighting fixtures and fittings throughout its facilities with low energy T5 Fluorescents and LED Lighting, which will result in significant energy savings over the long term.

Refrigeration

Refrigeration represents a significant portion of the annual electricity usage for this farm business. There are many design, maintenance and management options that can increase energy efficiency in refrigeration (covered in more detail in case studies two and four). For example, regular maintenance can save about 5 per cent of energy costs, while also ensuring a longer service life and greater reliability. Up to 30 per cent of the heat load in cold rooms can result from air exchange through poorly sealed doors; plastic strip doors or automatic doors can greatly reduce this loss while maintaining easy access. The placement and orientation of cold rooms within a facility can also affect their efficiency.

This farm is seeking further improvements in refrigeration energy efficiency through upgrading the refrigeration equipment. These include changing to more environmentally-friendly refrigerants, more efficient condenser units and retrofitting variable speed drives to condensor fans to drive down electricity usage.

Computers

The energy consumption of computers and other office equipment can be a significant contributor to total energy use. Electricity consumption can be managed by turning off computers when not in use and by taking advantage of the power management options built in to the operating systems (e.g. sleep and standby settings). This business has gone even further by replacing desktop computers with thin clients which have much lower energy needs. This strategy saves about 27 000kWh per year. Thin clients offer other advantages, such as easier deployment, management and reduced total cost of ownership.

The business has also replaced multiple computer servers with a single physical server with multiple virtual servers. This solution has reduced server power consumption by 75 per cent. In addition to reducing energy needs, this system also provides easier server creation, configuration, backups and restore capabilities.

These solutions may not be appropriate for all farm businesses, particularly small operations, but they illustrate what is possible. Of course, this kind of restructuring of computer infrastructure will probably require the assistance of IT professionals.

More information

More information is contained in other case studies within this series and the Growcom Energy Efficiency factsheets, available from the Growcom website www.growcom.com.au.

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