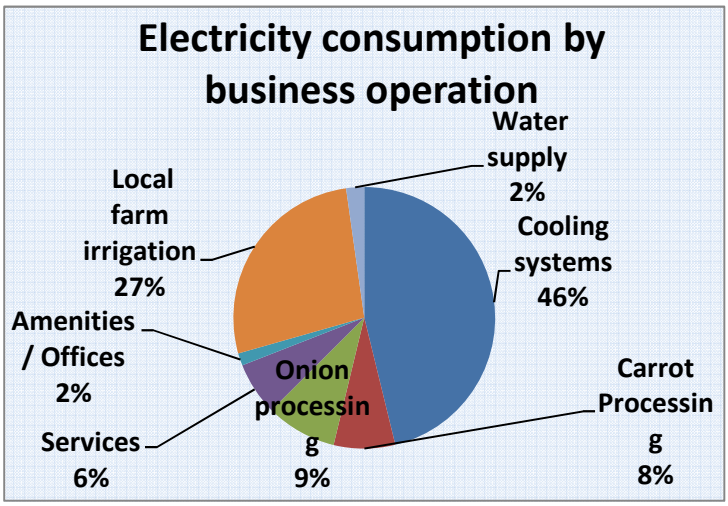
Ivankovich Farms saving energy - father and son partnership

Ivankovich Farms is situated in the sandy coastal plains south of Perth at Myalup. Peter and his son Anthony have been busy recently upgrading their carrot processing operations to meet expanding export markets. Growing vegetables in this environment uses a lot of energy as the sand drains water through it almost instantly and the WA climate can be hot and harsh over the Summer months.

Energy efficiency is a key target according to Anthony as it is a high cost to the business. Electrical energy in particular is responsible for about 50% of the energy costs and this in turn is dominated by the cooling systems and irrigation at Myalup.



Their plan for energy saving is by making the processes as efficient as possible, to waste as little as possible, and use technology to meet their requirements. Starting with carrot delivery and washing, Peter and Anthony have applied process efficiency considerations throughout the new carrot processing line. This utilises a combination of conveyors and flumes to move the carrots.

The flume channel shown below takes carrots from polishing to the hydro-cooler. VSDs are used on all electric motors, the polisher and the hydro-cooler to control flow rates while saving energy. The entire plant is remotely controlled allowing the hydro-cooler to do the bulk of its work during off-peak times. So it is ready and down to temperature by 6.00am.

(Note the LED high bays in place – they are very satisfied with the light output of these luminaires.)

Chillers and cool rooms have not been neglected with the installation of a large new finished goods cool store fitted with a rapid closing roller door. This is serviced by a Neosys air cooled liquid chiller with a scroll type compressor. This unit claims a coefficient of performance[1] (COP) of 1.77 (2.5 times the efficiency of the industry average chiller). Condenser fans are mounted horizontally to maximize the cooling by directing air vertically away from the unit. An air tight loading dock (as shown) minimises cooling loss when loading out going goods.

Ivankovich Farms use fixed sprinkler systems serviced from a main excavation ditch by a series of 55 kW pumps. A diesel pump is also in service as a backup. Pump efficiency[2] was measured by the WA Department of Agriculture at 74% compared with an industry standard of 65%.

The ditch is fed by three bore pumps positioned across the farm. These are each 7.5 kW pumps running at about 60% of their maximum. This provides a good opportunity for Ivankovich Farms to switch over to solar bore pumps, or to add VSD drives to reduce the power draw of these pumps and save energy.

Perhaps the highlight of Ivankovich Farms energy management initiatives is their purchase of 100 kW of solar photovoltaic panels. This bank of PV panels will handle a significant percentage of their power demand, estimated to be a maximum of 400 kW. Return on investment for the PV panels is expected to be less than five years and the panels themselves have a life expectancy of over twenty years.

Attention to energy efficiency and reducing process wastes are reasons why Ivankovich Farms was found to be one of the best performing vegetable growers in a 2014 energy study of 22 vegetable growers. Details of the energy benchmarking results and a costed list of energy saving opportunities can be sought from Infotech Research who performed this work as a part of a Horticulture Innovation Australia project investigating key energy efficiencies for vegetable growers.

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The project has been funded by HIA using the national vegetable levy and funds from the Australian Government.

Horticulture Innovation Australia

[1] Coefficient of performance is the ratio of sensible cooling achieved in energy and the electrical energy input. The industry average is believed to be about COP=0.7.

[2] Pump efficiency is the percentage of energy input to the pump that is transferred to water flow.