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Member for Agricultural Region

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Dear Friends,

I never cease to be amazed by the ingenuity of industry in Western Australia in finding new and innovative ways to improve quality and efficiency; two Western Australian businesses I had the opportunity to meet this week, Phase Change Products Australia (PCP Australia) and Centre West Exports (CWE) did not disappoint.

The Managing Director of PCP Australia, Keith Coakley, invited me to visit CWE's

Sun City Carrot Farm to view the impressive operation and observe the benefits the use of phase change material has brought to CWE's processing and export potential.



An aerial view of Centre West Export's impressive 1,000 acre Sun City Carrot Farm, with carrot yields of 40 ton per acre



The first stage of the carrot packaging process where the picked carrots are washed

CWE's 1,000 acre Sun City Carrot Farm is located at Woodridge about 90km north of Perth. In 2003, the farm became the first in Western Australia to grow and pack on the same site and have been expanding their production, processing and exporting capacity ever since; when it reached production capacity due to power supply issues, CWE approached PCP Australia to help them in this regard.

The carrot packing process for overseas export requires the carrots to be washed in a hydrocooler

to chill the carrot to the core; this process ensures the quality of the carrot is retained during transportation. CWE used chillers to cool glycol, which was then used to cool water in the hydrocooler. The problem encountered by CWE was that the water temperature in the hydrocooler was increasing during the day slowing production and sometimes shutting down production completely in the hot summer months. CWE believed they would need additional chillers to maintain the water temperature and increase production but did not have the power capacity to do so.



Carrots are washed and graded before being processed through the hydrocooler where they are chilled to the core

PCP retrofitted a 1600 kW/hr PCM thermal storage system to use the existing cooling infrastructure at night to increase overall cooling capacity.

Phase change material (PCM) is a mix of non-hazardous inorganic hydrated salts encapsulated in plastic panels. The PCM panels are stacked together in rows within large insulated thermal storage tanks that are connected to the existing chiller system by a plate heat exchanger. The PCM

draws energy from the chilled glycol via the heat exchanger at night and this energy is then released as needed during the day through the heat exchanger, into the glycol tank and into the hydrocooler used to wash and rapid cool the carrots.



Learning the finer points of carrot farming from Peter Wauchope, Manager Sales & Marketing at Centre West Exports



Gavin Colbourne, Production Manager at Phase Change Products Australia, explains the PCM thermal storage system to Jim

The retrofitting of the PCM thermal storage system has had a massive impact upon the efficiency and capacity of CWE's carrot processing, putting it in better stead to deliver to its export markets of Malaysia, Singapore, the Middle East and the Maldives. The production capacity has been increased from around 90 tonnes per day to 150 tonnes per day.

The system has also meant energy costs have been reduced; as the PCM thermal storage system is "charged" overnight,

CWE's power costs are at the off-peak rate of 8 cents/kW versus the peak daytime rate of 32 cents/kW, equating to energy cost savings of around \$80,000 per year

PCP Australia advises me that this is the only system of its kind in Western Australia; however, with such impressive, tangible results I imagine that PCM thermal storage, both in its current and adapted forms, will be of great benefit in serving the energy needs of Western Australia.

Jim



Gavin Colbourne, Production Manager, and Keith Coakley, Managing Director, Phase Change Products Australia