



- *Small footprint*
- *Real-time processing of massive amounts of data*
- *Open interfaces using secure Web Services*

Breakthrough Application Leverages the High Performance and Small Footprint of InterSystems Caché to Help Communities Save Energy

The efficient management of energy and water resources is one of the key challenges facing society today. With water resources already under pressure and demand for energy in Australia projected to increase by 50 per cent by 2020, Queensland-based EcoVision™ provides integrated resource management solutions to reduce costs to the consumer and the environment.

“The Caché database is exceptionally powerful and able to handle very large volumes of data rapidly and reliably.”

*– Steve Miller
Co-founder, EcoVision*

The EcoVision system features an innovative touchscreen interface for the home which helps raise consumer awareness around resource consumption and empowers building occupants to reduce their environmental footprint. By graphically displaying energy and water usage and automatically turning connected devices on and off, EcoVision helps home owners save on

electricity, gas and water bills in times of increasing energy prices and limited water availability.

Feedback provided by EcoVision empowers and encourages users to set their own targets and then adjust their consumption habits according to their lifestyle choices. Benefits of any energy-saving initiatives – such as changing light fittings or appliances – can be verified instantaneously.

Founded in 2005 by Gold Coast engineers Rick Maddox and Steve Miller, EcoVision strives to deliver products that are relevant today, but also flexible enough to be able to be modified for various future interfacing systems and evolving market needs.

In 2006, the company won its first major contract with Landmatters, the developers of The Ecovillage at Currumbin, to provide real-time energy and water monitoring systems in 144 new homes. Residents of the Ecovillage now interact with EcoVision on a day-to-day basis to check their total energy and water

consumption, and monitor progress against their targets. Some residents have demonstrated the feasibility of being net energy exporters to the grid.

EcoVision was acquired in August 2008 by Pacific Environment Limited, a company listed on the Australian Stock Exchange. Since then, it has secured a number of contracts to supply both residential and commercial systems.

The company chose the InterSystems Caché database and rapid development environment because of its advanced technologies that aggregate large volumes of data, fast processing speed, easy connectivity, small footprint and robust operation.

EcoVision makes extensive use of Caché's ability to support both object and SQL database access. Objects are accessed natively for real-time pattern recognition and SQL access is used to display data or connect to remote data sources via Web services.

"The architecture of the Caché storage mechanisms and the ability to access the same data directly as an object or via SQL made this application viable," said Miller. "EcoVision uses Web services to communicate between different modules and under that there is usually a SQL viewer or query supporting the service. Caché's SQL capabilities allowed us to modularise the components so we could decide to migrate the user interface to .NET instead of Flash, for example, without having to rebuild the rest of the application."

Caché's small footprint was essential in keeping the cost of the EcoVision touchscreen units as low as possible. Its legendary robustness was equally important in minimising support costs.

"Essentially we have taken industrial strength technology and put it in the home," said Miller. "The only time we have ever had to make a support call is when there has been some corruption due to power failure and, even then, they were hardware corruptions not software."

Capturing Consumption Data for Whole Communities

Caché's ability to rapidly process large volumes of information and perform real-time analytics allows EcoVision to connect to and manage a virtually unlimited number of meters, sensors and controllers in the home. Individual EcoVision systems can also be interlinked through broadband networks to aggregate detailed consumption data for whole communities.

"Through our innovative and highly flexible architecture EcoVision can contribute to smart grid initiatives which aim to increase supply and demand side cooperation," said Miller.

Caché's object database capabilities mean that EcoVision can perform real-time pattern recognition on the very large sets of aggregated data generated by a virtual or a real community.

"The Caché database is exceptionally powerful and able to handle very large volumes of data rapidly and reliably," said Miller. "We are aggregating data from thousands of homes and from multiple sources within each home. Object database access is fundamental to being able to process the massive numbers of data points generated in real time."

The company's demand side management capability is currently being trialled in the South Australia Government's Lochiel Park project where residents can subscribe to keep their peak electricity consumption below one of three self-selectable limits in return for rebates off their household electricity bills.

Once they have subscribed, EcoVision tracks peak demand trends and sheds non-essential loads such as pool pumps, air conditioners, dishwashers and washing machines in a priority determined by the householder in order to keep consumption below the selected limit. The system does not affect essential loads such as lighting and general power.

By facilitating demand side cooperation in the future, EcoVision aims to help minimise demand spikes and allow energy suppliers to meet increasing power demand with renewable energy sources rather than building new fossil-fuel burning power stations.

“In Queensland you have massive population growth and it is difficult to support these new communities without new power sources,” said Miller. “EcoVision is a breakthrough application that works very well with new renewable sources like wind farms by accommodating their natural variance. If the provision of service is not coordinated with demand management, however, then the ability to meet new demand with renewables cannot be met.”

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