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# **VRT Citect Solutions**

## **Overview**



The logo for Citect features the word 'Citect' in a bold, blue, sans-serif font. The 'C' is stylized with a small orange square above it.

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## Overview

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## 1. **Business Imperatives**

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The global business environment is becoming increasingly complex and competitive. At the same time, organisations are required to accept that the multitude of environments in which they operate are sustainable in the long term. Triple Bottom Line Reporting is a tool which is rapidly gaining in popularity among socially responsible organisations for measuring and reporting their degree of conformance with these goals.

### ***What is the Triple Bottom Line?***

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The triple bottom line (TBL) focuses corporations not just on the economic value they add, but also on the environmental and social value they add – and destroy. At its narrowest, the term ‘triple bottom line’ is used as a framework for measuring and reporting corporate performance against **economic**, **social** and **environmental** parameters.

VRT Citect Solutions can assist you in meeting your goals in two of these three areas, with a single set of solutions. Our facilities management solutions, with a focus on energy reduction, has a direct and immediate benefit on both the **economic** and **environmental** lines.

## **2. VRT Citect Solutions**

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Both VRT Systems and Citect have successfully implemented a number of facilities and energy related projects over several years. Both companies recently teamed with electrical meter provider, EDMI, to provide an energy/environmental solution to the Australian Department of Defence through the Facilities Manager, Resolve FM.

Based on the success of this project, and a fruitful working relationship spanning several years, VRT and Citect have joined forces to partner with facility owners and managers to help them meet their business imperatives in the areas of costs and the environment, via facilities management.

### ***About VRT Systems***

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VRT Systems is an Australian systems integrator which has partnering relationships with a number of suppliers of industrial software packages in the SCADA (Supervisory Control and Data Acquisition) and IIM (Industrial Information Management) areas, including Citect. One of VRT's specialties is the provision of systems that deliver data in real time to both industrial operations and business management levels of users. VRT has developed an enviable record for innovation over the last 15 years. Highlights include real time plant operations remotely through an Oracle "business" application, and the world's first monitoring of a process plant from the other side of the country via a web browser. VRT delivers IT solutions built on engineering skills and experience.

### ***About Citect***

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Citect is a worldwide leader in industrial automation and information management solutions and is the largest independent vendor in its field, in the world. In terms of both revenue and market share, Citect is one of the top 5 multinational technology companies in Australia and works with over 85% of leading Australian Manufacturers. Its CitectHMI/SCADA and Plant2Business software are complemented by professional services, customer support and training. These solutions are enhanced by strong partner programs and are sold in numerous industries, including water and waste water, facilities monitoring, gas pipelines, mining, dairy, food processing, pharmaceuticals and power distribution. Citect is headquartered in Sydney Australia, has offices in Australia, USA, Europe, China and Africa, and its products are distributed in more than 40 countries worldwide.

### 3. Overview of the Energy Management Processes

It is of vital importance for any modern organisation, whether it is a mine, factory, hotel, hospital, or commercial building, to carefully consider operational costs. One of the least considered and often the largest of these operational costs is energy.

With the changes taking place in the Power Utilities world-wide there are many opportunities arising for the utilities and consumers to make better use of their resources.

Without the necessary equipment in place, it is impossible to make intelligent decisions on how to efficiently manage energy. There are definite steps that can be followed by energy managers in order to have a successful energy management process put in place. VRT's RUMS Model comprises:

1	Auditing
2	Metering
3	Monitoring
4	Data Storage
5	Reporting
6	Data Analysis
7	System Integration
8	Corrective Action
9	Continuous Improvement

#### 3.1. Energy Auditing

This “front end” process is often necessary to determine the general potential to reduce energy consumption and greenhouse gas emissions. It may also include a record of the existing infrastructure, along with budget costing of additional facilities that would be necessary to determine the feasibility of installing a permanent monitoring (and control) system to help ensure sustained achievement of benefits.

#### 3.2. Metering

The older types of inductive disk meters are no longer adequate. Although this is a proven, low cost method of metering it has a limited functionality. In today’s deregulated market it is not only important to know what the consumption was, but when the peak consumption occurred and which part of the plant or process was responsible for its occurrence. The latest electronic technology is being employed in modern metering. Load profile data and power quality data storage are standard on most modern power meters or smart transducers.

### **3.3. Monitoring**

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Once the meters have been installed, it is far more cost effective to automate the data capture than to rely on a manual system. Most modern meters have the facility to communicate via a network to a central point. Real time energy data acquisition and graphical display are as important in the management of a plant/facility as the production/operational parameters. This graphical display of the energy flow in the plant enables early detection of possible system or plant failure. This information allows the energy costs to be minimised by implementing short-term decision making.

### **3.4. Data Storage**

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It would be impossible to conduct 'post event' analysis and energy cost allocation unless the instantaneous data is stored in a well-managed database. This database should be of the open type to allow access to the data from other business management and production applications.

### **3.5. Reporting**

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A user friendly, easy to understand reporting format is crucial to the success of the energy management process. It should be concise and accurate giving only the necessary information for the application. Reporting can be categorised into billing, production, tenant sub metering, inter-departmental sub metering and quality of supply. It can then be broken down into profile data and revenue based data. Reporting can be in the context of energy (kWhrs, peak demand in kW) or environmental (tonnes of CO<sub>2</sub>).

### **3.6. Data Analysis**

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Individual load profiles and cost calculation can be carried out by accessing the database. Trends of daily, weekly, monthly and annual profiles can be calculated. Alarming of set-point violations can be used to prevent equipment damage or recover costs when equipment has been damaged. Extrapolation of the trend data can be used to predict periods of high demand and preventative action can be taken. Analysis of the historical data is a valuable tool for planning and production scheduling against power or cost constraints. This data will provide you with the facility to check whether the profiles fit the nature of the business. It can be used to check if the supply authority is providing you with the correct billing data and establish whether you are on the most cost-effective tariff.

### **3.7. System Integration**

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As mentioned earlier it is important from a management perspective that other parties can access the energy database. The production management can use this data for production related cost allocation. It can be integrated into preventative maintenance program. It can also be combined with climatic data to predict and budget for high-energy costs related to changing weather patterns. The energy consumption of individual business units can be monitored and managed on a national scale.

Related business functions where integration with the energy management system can produce considerable added value include:

- Building Management Systems
- Plant and equipment maintenance
- Relational database applications
- Administrative management
- Process Modelling and Optimisation tools

### **3.8. Corrective Action**

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Only when sufficient data has been accumulated can cost saving measures be implemented. These could involve any combination of the following:

Automatic demand control by load shedding or scheduling.  
Automatic demand control by peak lopping with stand-by generators.  
Power factor correction.  
Production scheduling.  
Tariff analysis.  
Resource management.  
Entering into the electricity trading market.

### **3.9. Continuous Improvement**

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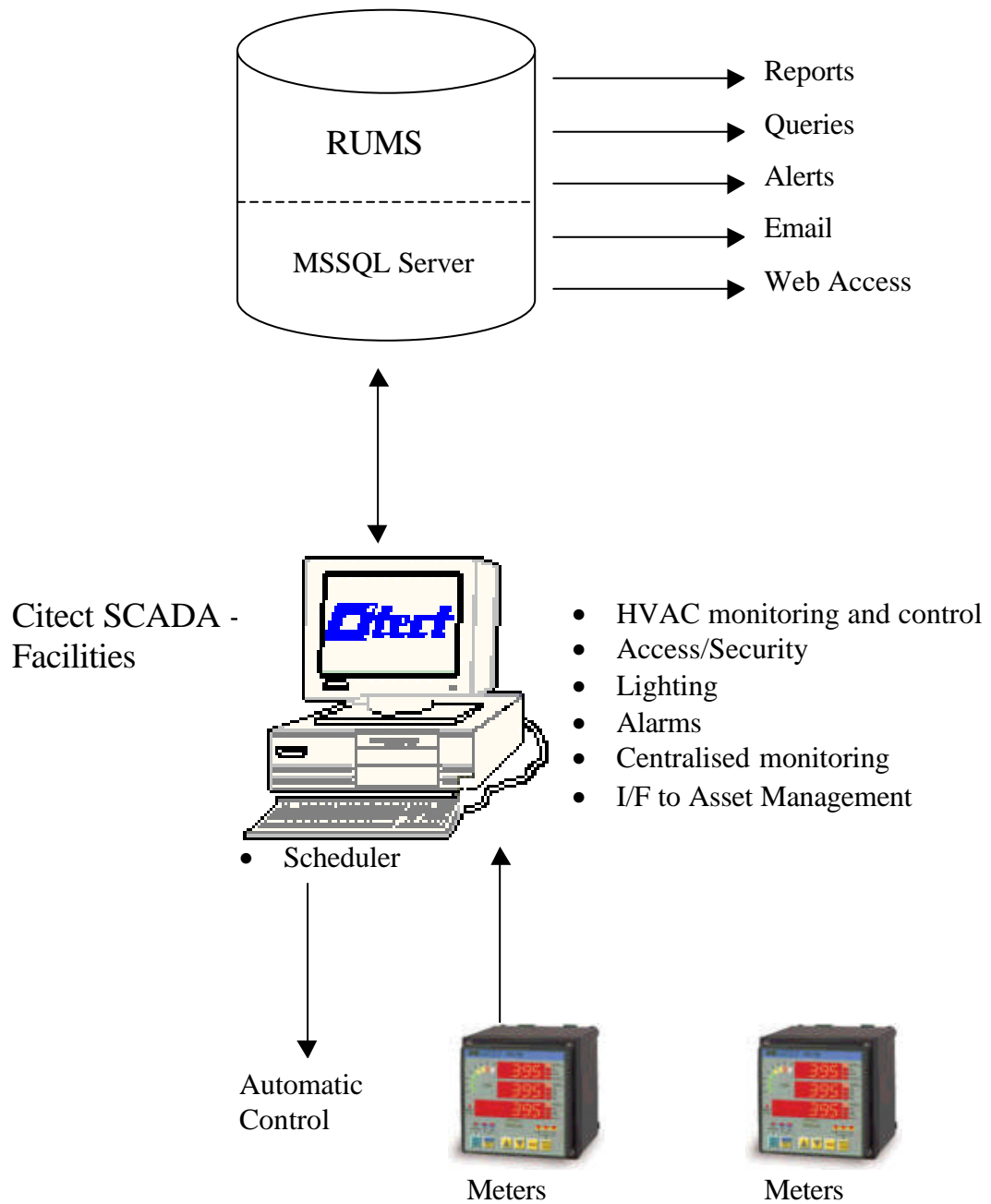
This is the final and one of the most important stages in the implementation of an energy management process. Once the monitoring and data acquisition systems are in place and the corrective action has been taken, then the changes in the energy consumption patterns need to be continuously monitored. This will provide the energy manager with the necessary information to refine the system and benefit from additional savings.

***Energy monitoring and management is not a one-off exercise but is the implementation of a continuous process, which needs to be modified, refined and perfected.***

## 4. Solutions

VCS cover all of the above processes via a combination of services and tools developed for previous projects.

Figure 1 Architecture of a Typical RUMS Solution



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## 5. Outline of Tools Available

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Tools are available at several levels, the most productive being at the SCADA and information management levels.

### 5.1. SCADA

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#### 5.1.1. Introduction

The RUMS SCADA toolkit provides a host of additional templates, symbols, genies and supergenies for the **Citect SCADA** system. Although primarily catering for the Utility Management Systems market, the RUMS SCADA toolkit also provides useful tools and templates for all types of SCADA applications. It combines the latest generation look-and-feel navigator with a structured page and tag management system. The tool kit is designed to provide a developer with higher-powered SCADA functionality with the minimum of development cost. The page navigation, power summary displays, power meter, and Power Carrier Control (PCC) links are all dynamically configurable. This means the simple act of creating a new page from a template will automatically link the page to the navigation tree, or adding a new meter to the tag database will automatically display a new meter summary and link to the relevant display page. All this is achieved without the need for any further development work.

#### 5.1.2. Features

- *Toolkit package, with templates, symbols, genies and supergenies.* The page templates include button bars, menus, alarm indications as well as user and prompt displays. Besides alarms and trend templates there are also overview and schematic templates with side panels for additional controls and displays. There are genies for power summary displays and pop-up meter displays with kWh trend profiles.
- *Latest generation look-and-feel navigator.* A common navigator bar on every page with colourful, clearly distinguishable buttons and drop down menus. As well as the common *back* and *forward* navigation buttons and lists, there is also a logical *up level* button and hierarchy list, which gives the operator direct access to higher level overview pages. The navigation system is based on page titles rather than file names giving a clearer comprehension to the operator.
- *Unique Naming Classification.* The RUMS SCADA toolkit utilises a unique and practical naming classification that comprises system, location, object and function identifier codes. This naming convention is used for the naming of pages, tags and devices. Advantages of this type of naming convention include the ability to logically associate tags to display pages based on any of the classification categories i.e. localised display of meters for a particular location.
- *Local trends and alarms features.* The standard navigation templates include links to display only alarms or trends local to the current scope of the page or location. This provides instant access to localised alarms and trends without development costs.

- *Dynamic templates.* The drop down navigation system menus on each of the templates dynamically update with the addition of each new page to the system. These pages are categorised into their system category within the menu. There are also dynamic templates for metering and PCC control pages that will automatically add displays and links for each new entity found in the tag database.
- *Easy development.* Even the development of large scale systems is made easy with the combination of dynamic templates and a structured naming convention. Development times are dramatically reduced as each new schematic page is already customised with specific details such as local navigation links, local alarms and trends display links, local meter summary displays and links to their pop-up meter details, as well as any local PCC controls.
- *Low maintenance and upgrade costs.* Ongoing maintenance and upgrade costs are kept low due to the relative ease of development.
- *Productivity gains.* Productivity gains of the order of 10:1 are achievable compared with conventional configuration practices.
- *Automated Load Survey export function.* The RUMS SCADA toolkit contains an export facility to transfer load surveys from power meters in a pre-defined CSV format to other machines on the network.
- *Spreadsheet based tag database generation utility.* This utility helps generate the tags required for power meters and PCC devices in an Excel spreadsheet form based on a given meter or PCC template. To setup all of the database tags associated with a particular meter, the developer only needs to enter the details about the meters location codes, ID, and description once, and the rest is automatically generated. This data is then saved to file and copied to the relevant project.
- *Scheduler for Automatic Control.* The Facilities version of Citect contains a powerful Scheduler which is used to automatically initiate load control. It uses time clock, calendar and events, as well as logical combinations of all of these, to trigger control actions. Once energy minimisation or optimisation strategies have been developed, these “business rules” can be configured into the Scheduler to lock in the ongoing achievement of the resultant benefits.

**5.2. RUMS Reporter**

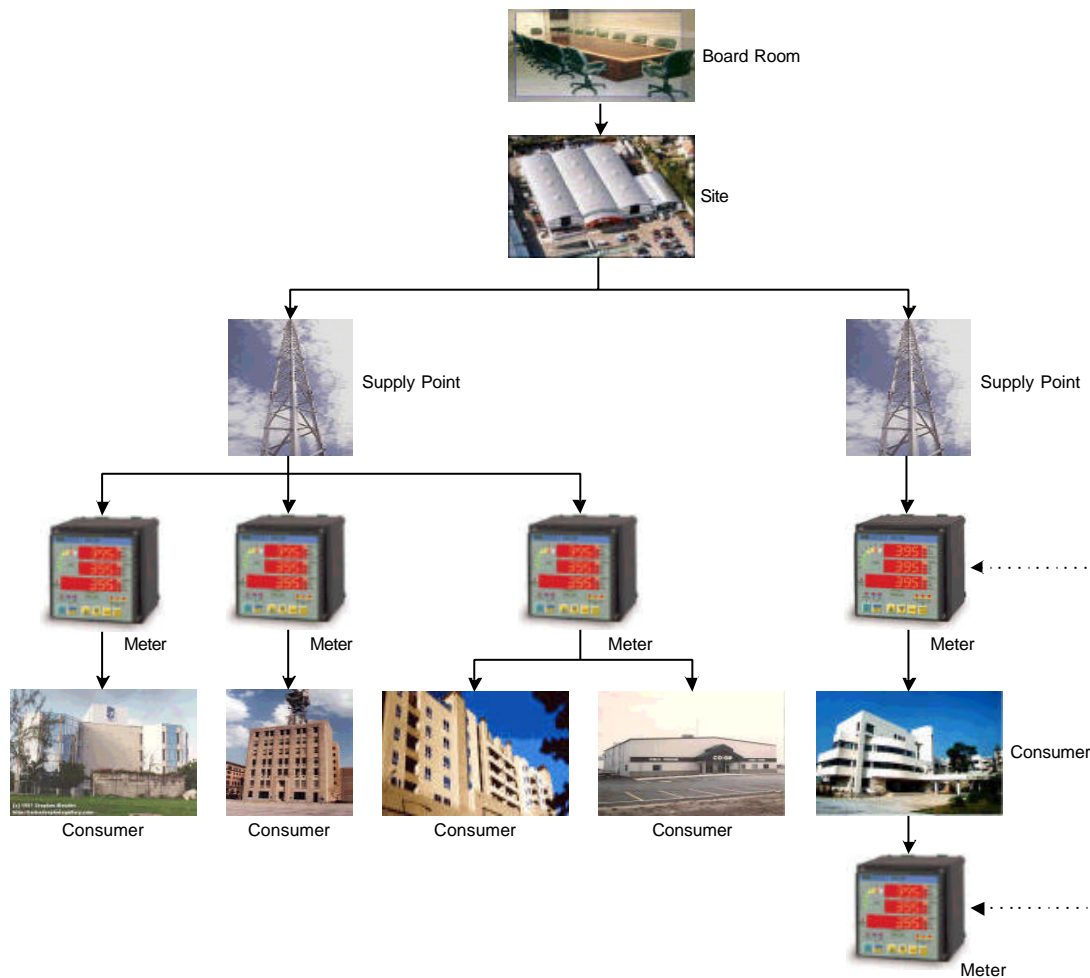
**5.2.1. Overview**

RUMS Reporter is a powerful, multi-site utility monitoring and management application. RUMS Reporter will provide your energy management team with an essential tool to minimise energy consumption and reduce your organisations greenhouse gas emissions. It is able to integrate seamlessly into your existing metering infrastructure.

This system has been developed to provide an enterprise wide solution. It is highly scalable, supporting multiple sites and organisations.

A simplified schematic illustrating some of the basic functionality for a single site is presented below.

**Figure 2 Overview of RUMS Reporter Data Model**



## Features

### *Harness the power of RUMS Reporter, turn your data into information*

Provide for any number of Organisations, Supply Points, Metering Points and Consumers. Invoice your Consumers using multiple rates, configurable rate times and configurable invoicing periods.

Allow Consumers to restore invoices from archive, retrieve a complete history of usage so they can compare their current usage.

Run ad-hoc queries, find out how individual or groups of Consumers are performing by applying configurable filters and criteria.

Create usage benchmarks for Consumers. Retrieve exception reports when a Consumer exceeds a configurable threshold.

### *Use built-in tools to create a scalable configuration for your enterprise*

Setup and maintain the configuration for your site. Use the simple and intuitive interface to establish your Organisation details, Supply Points, Metered Points and Consumer details.

Consumers of energy can be supplied any number of descriptive categories which are used to group data for reporting and querying. For example, extract a report detailing the total kWh's used at a site, grouped by a building category, and the shift types used in that building.

Configure Greenhouse Gas Emission Coefficients. Any report detailing energy consumption will also detail associated the associated Greenhouse Gas Emissions. If your organisation is a part of the Australian Governments Greenhouse Challenge, this information will be invaluable.

Assign a single physical stream of metered energy into any number of logical streams that can be apportioned to consumers.

Maintain local and organisational defaults to be used by the local application or organisation wide by all application instances. For example, a local default could be the default site; an organisation wide default may be the amount charged per kWh.

Leverage existing infrastructure, easily stream your data into RUMS

- Accept data from any SCADA system, third party application or hardware that supports the creation of CSV files.
- Provides automated data file output facilities in a CSV and XML formats.
- Facility to incorporate standalone meters for short term or temporary data acquisition.

Security

- System level security for sensitive application data provided through MSSQL SQL Server.
- Application based user security and role definition. A user can be given one or more roles, allowing them access to different functionality in the system.
- Site security - allow users to access information relevant to their site only.

What's ahead for the RUMS Reporter Platform

- Automated uploading of configuration data to RUMS Reporter.
- XML streaming of data into RUMS.
- Multiple greenhouse gas or percentage based rates for highlighting usage costs.
- Setup wizards to streamline system configuration and maintenance.

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## 6. Benefits of a VRT Citect Solution

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- *Profit through Savings*

RUMS Reporter will increase corporate profits by saving significant amounts of operating expenditure whilst increasing the organisations production potential. A comprehensive, multi-site energy management system, RUMS Reporter will show your energy management team where the inefficiencies are and where the savings can be made. If automatic load control systems are installed, then guaranteed ongoing benefits will be achieved.

“Successful facilities management entails taking a holistic, performance-based approach to facilities monitoring and tracking key performance... CitectSCADA Facilities is a solution that provides Facilities Managers with the necessary tools to integrate and track systems performance, increase ROA and reduce operating costs” - Craig Resnick, Director of Research, ARC Advisory Group

- *Risk Management*

Organisations on demand based tariffs can incur large and disproportionate costs from small increases in energy consumption. Real time monitoring and alarming, along with modelling and forecasting, will significantly reduce these risks.

- *Increased Asset Life*

Reduced operating costs are an immediate return of utilising RUMS Reporter in an energy management solution. Long term, RUMS Reporter can help to increase the effective life of plant and equipment through the introduction of energy usage efficiencies. RUMS Reporter will help your energy management team identify inefficient asset utilisation signalled by the overconsumption of energy.

- *Protection of the Environment*

There are few environmental issues more significant than Greenhouse Gas Emissions. Addressed specifically by the United Nations Kyoto Protocol of 1997, the levels of carbon dioxide, sulphur oxides and nitrous oxides in the atmosphere is something we as individuals, and our governments should be aware of and informed about.

If your organisation is concerned about its levels of Greenhouse Gas Emissions, or perhaps it is already a part of Australia's Greenhouse Challenge, then RUMS Reporter will provide your energy management team with the necessary information to reduce outputs. As part of its original design brief, Greenhouse Gas monitoring and reporting is centric to all reporting functions within the RUMS Reporter system.

- *Independence from Retailers*

Several Retailers are now offering monitoring systems on a lease basis as an element of their energy supply contract. If you subscribe to the “Don Chipp Principle”, then you may not be too comfortable with this “Judge and Jury” scenario. An independently supplied monitoring system with superior storage and analysis capabilities, that will support you through many contract renegotiations, will provide the level of independence you need.

- *Corporate Image (Triple Bottom Line Reporting)*

Today's corporate environment is one of tight budgets, rising profit targets and an obsessive need to tightly quantify each and every item of expenditure. Whilst the quantifiable benefits of RUMS Reporter have been documented, one of its main benefits can't easily be measured in dollars and cents, corporate image. RUMS Reporter will help your organisation foster a positive image as an organisation that has a holistic vision of the future, one that encourages profits through savings, encourages sustainability and one that respects its place within the environment.

VRT Citect Solutions can help you improve the results in your Triple Bottom Line reporting.

Other benefits include:

- ◆ Consistency through automatic control.
- ◆ Improved comfort.
- ◆ Reliability/validity/integrity of data.
- ◆ Lower costs for tenants.
- ◆ Improved tenant retention rate.
- ◆ Integration of disparate systems within buildings.
- ◆ Enterprise integration.
- ◆ In-house system or use an ASP model through an external service provider.
- ◆ Reduced manning levels (and costs) for Facilities Managers, e.g. remote, instantaneous alerts.

## **7. Contact**

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If you feel that VCS may be able to help you, please don't hesitate to contact us as below:

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