



# ***SOLUTION OVERVIEW***

***VSUITE ENERGY***

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POWERED BY  
**WideSky**

## VRT SYSTEMS

VRT has been pioneering the provision and support of industrial information solutions since the mid 1980s. We focus on creating solutions with minimum platform variation between projects, and maximum through-life supportability. A “deliver and depart” approach is not what we're about – we're looking toward the next 20 years, not just the next three. Our future focus and commitment to ongoing support results in less disruption, increased consistency and reliability, and lower costs over the long term. Some of our existing customer relationships exceed 25 years.

VRT Systems' main business is implementing solutions based on real time information to improve operational efficiency and safety, and to reduce risks related to business continuity.

VRT has provided solutions throughout Australia, South East Asia and Japan. We are proud to have relationships with high profile customers such as Lend Lease, Living Utilities, Leighton, Watpac, University of Queensland, Anglo Coal, Queensland Rail, Xstrata, Coca-Cola Amatil, BHP Billiton, Asahi Chemical, Australian Department of Defence, Rio Tinto, Vale, Queensland DTMR and Power Reactor and Nuclear Fuel Corporation, as well as many small to medium enterprises.

In order to provide our customers with best-practice technology and solutions, we rely on a number of strategic, long term partnerships, some of which also exceed 20 years.

## VSUITE

VSuite is VRT's modular approach to systems integration – in each Vsuite we have a reference architecture that supports a range of different component options, and we select the best fit for your needs. We don't design from scratch for each project, and we don't take a punt on untested technologies.

VRT have rolled out our Vsuite solutions across a range of industries including resources, manufacturing, utilities, transport/logistics and government. Within these industries, we focus on the operational levels of our customers' businesses. The suites delivered span the areas of automatic data collection, automation and supervisory control systems, tracking, energy management and operations management. They are layered with customised integration, on-site and remote support, thorough training and state of the art visualisation.

## VSUITE ENERGY

Vsuite encapsulates VRT's entire portfolio of energy-related technologies and integration know-how. Unlike some of our competitors, we're not just talking about technical gadgets and software, we recognise that a well-rounded solution needs to also consider the “softer” aspects, such as the people who will ultimately consume the energy or operate the systems, and how we can inform and engage them:



- **Metering & Sensing:** Metering for all forms of energy (WAGES – water, air, gas, electricity, steam) as well as weather, environmental sensing and plant instrumentation.
- **Digital Networks:** From pulse meter inputs, through various serial and bus technologies (RS485, Mbus) to wired and wireless IP and mesh networks.
- **Energy Efficiency:** Low energy technologies such as smart LED lighting, solar PV and renewables, to energy management systems, reporting and intelligent analytics solutions to optimise energy use and reduce waste.
- **Demand Response:** Control strategies to manage demand such as peak lopping, adaptive control in response to spot market pricing (NEM gateway), and integration of storage technologies to achieve load shifting.
- **Supply Reliability:** Power network control systems to maintain supply stability and reliability – from load-shedding and emergency generator controls (e.g. hospitals, data centres, defence) to the integration of co-generation, tri-generation and renewable energy systems.
- **Community Engagement:** Tenant and visitor information displays (mobile apps, foyer displays, information kiosks) and residential community portals.

All of these elements have been used together in various combinations in projects we've delivered in the past, so we have hands-on experience in their implementation and integration with your existing business, building and plant management systems.

## Metering

For the last 20 years, VRT have been involved in the import, distribution and integration of meters for almost all the major manufacturers, in water, gas, thermal and electrical meters. These days we leave the import and distribution of product to our partners CETA, so we can focus on integrating meters for our customers.

Our experience with all the major meter manufacturers (CET, Circutor, EDM, SATEC, Schneider, Siemens, SOCOMEC and others) means that we're uniquely placed to understand their various strengths and weaknesses, quirks and shortcomings, and can help you choose the best fit for your requirements. If you have a particular preference, we're willing and able to work with any brand, model, or protocol, whether open or proprietary (though we do like and advocate open standards). Our expertise spans the range right from simple pulse meters, through to advanced power quality analysers with high speed waveform capture and event recording capabilities.

In addition to energy meters, our extensive experience in the industrial automation and instrumentation worlds means that we also bring to bear our experience with adjacent sensing technologies, whether related to power network control systems, weather or environmental monitoring.



## Digital Networks

### Meter Data Acquisition

While many of the transport and protocols used in metering networks share common technological underpinnings with other industries, metering introduces some unique challenges.

There is the high prevalence of direct pulse inputs, the use of local sampling and non-volatile storage (to protect the record of consumption during network interruptions), and the need for communications protocols to handle retrospective transfer of that consumption record after communications has resumed. Add to this the frequent need for remote reading of water and/or gas meters via wireless links, the presence of metering-specific interfaces such as Mbus, and the prevalence of non-standard extensions (e.g. historical data transfer handshaking implemented on top of Modbus) or proprietary protocols (often used by utility meters), and it's a landscape that can get very complex, very quickly.

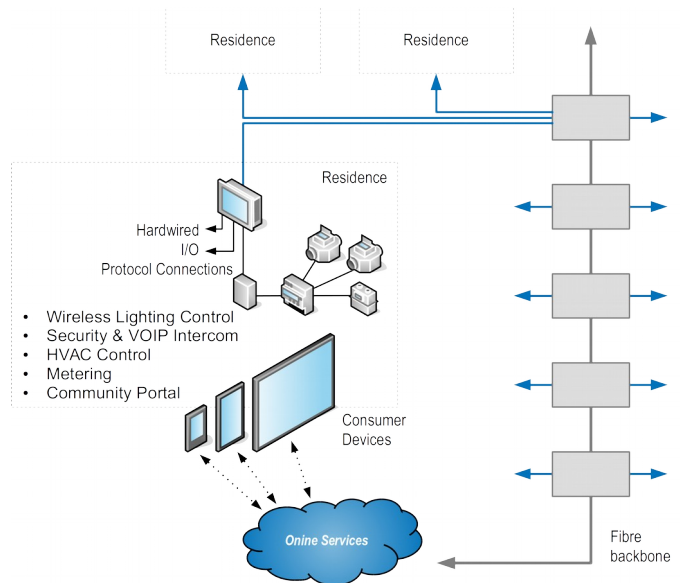
VRT have been involved in complex multi-transport and multi-protocol meter data integration projects since the 1990's, and have unmatched expertise in meter data acquisition systems.



## Systems Integration

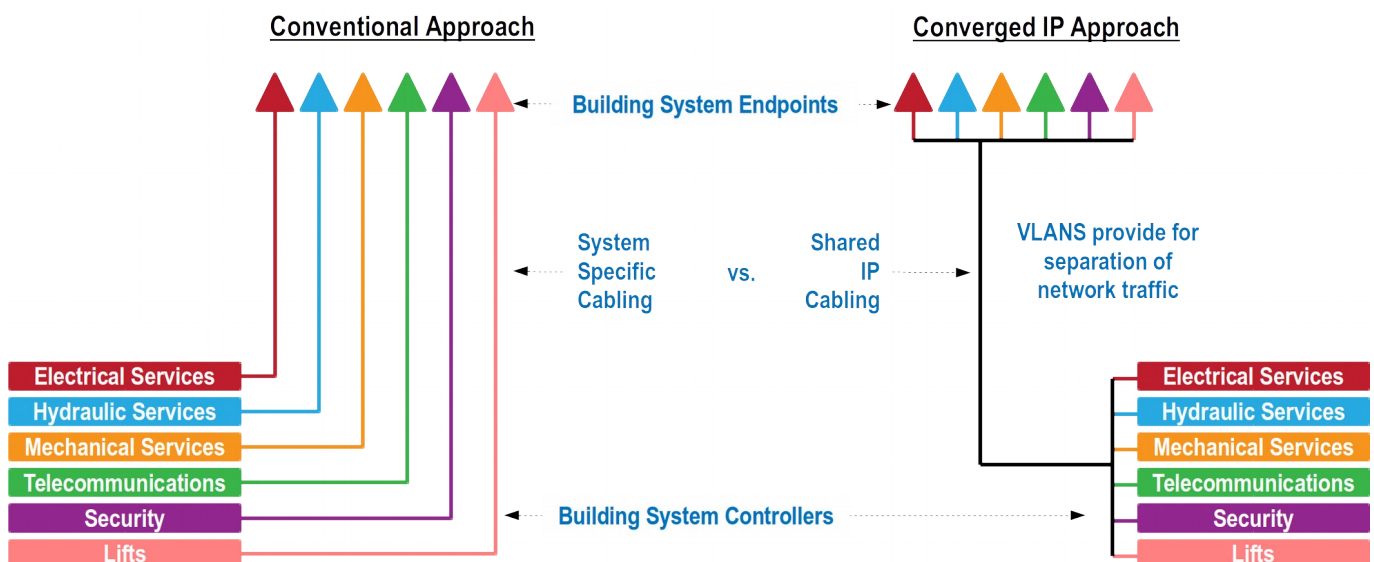
We routinely take on the role of “master systems integrator” (or building systems integrator) and take responsibility for ensuring that all required systems are integrated and work well together (power network control system, building management system, fire, security & access control etc.).

This routinely involves the integration of systems as diverse as BMS, EMS, VOIP (intercom & access control, emergency help stations), CCTV, network monitoring, fire and ventilation systems, paging systems, equipment and personnel tracking systems, lighting and lift control systems. We deal with networking technologies that span utilities, process plants, buildings, data centres, transport systems and defence facilities, all with their own industry-specific protocols and interface standards. This breadth of coverage requires an in-depth technical knowledge, not just of the wire protocols themselves, but IP networking, web services and other principles of technology integration.



**Illustration 1: An example of the extent of MDU tenant metering integrated with smart apartment control functionality and community engagement systems**

## Integrated Communications Networks



Just as we're experts in our field of energy systems integration, we recognise the importance of drawing on the talents of specialist networking expertise – from companies such as Opticomm – when it comes to the design, delivery and support of converged IP networks (GPON, VLAN) that are becoming the norm in modern

development projects. VRT have worked with Opticomm on major construction projects such as the Barangaroo development in Sydney, and value our ability to draw on their expertise in the delivery of integrated communications networks (ICN) in other projects in which we're involved.

## Energy Efficiency

### Meter Data Management

Unless you're banking on (and happy to commit to) a single supplier for all your metering equipment, you're going to need to deal with the task of gathering data from meters of a number of different types, from a number of vendors. Most meter data management systems don't handle this very well, and usually compromise their ability to reliably transfer consumption logs, by supporting a limited subset of the available communication options (e.g. real-time logging only). If you want to transfer interval log data out of multiple meter types and brands, you need a meter data integration product built for interval data transfer, and with native support for a wide variety of network transports and protocols.

In partnership with CETA, VRT Systems is offering a range of "WAGES Hub" devices, that can be used to deliver an enterprise-scale meter data collection system that aggregates large volumes of disparate metering data, stores it in a common format, and then (if required) pushes the data into centralised corporate reporting systems, or even a master energy management system. VRT are able to offer WAGES Hubs integrated with your choice of on-site energy management system (EMS) or as part of a broader architecture that manages meter data collection and distribution to both EMS and billing systems, either on site or as a hosted service (e.g. VRT WideSky).

### Energy Management Software

VRT have been active in the energy management market since the days before packaged solutions were readily available, and in our early projects had to build our own. These days we far prefer to use the packaged solutions on offer, but that early experience gave us an unparalleled understanding of the workings of energy management software, and the design of scalable

systems around them. We've also been exposed to our fair share of systems that simply accumulate, aggregate, and report on the data being collected, and really offer little more in terms of delivering real outcomes in terms of energy efficiency outcomes.



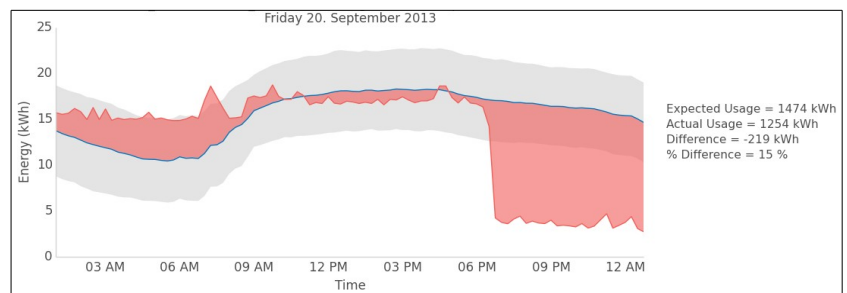


We actively work with our clients to understand the facility they are operating, and strive to implement solutions that report on asset performance (such as chiller plant and HVAC performance, energy intensity) rather than just accumulating energy used. In addition to reporting on what has already occurred, we have also built and delivered Energy Forecasting solutions (e.g. for Glencore Xstrata) to enable capacity planning for supply generation.

## Energy Analytics

If you have an Energy Management System (EMS) it's probably fair to say that you have no shortage of data – the real question is how do you turn that data into actionable information?

At the heart of VRT Analytics is a learning engine purpose-designed for analysing energy data. It analyses for data quality and compensates for missing data. It can analyse operational and non-operational times (or different types of activity days) separately and produces characteristic curves for each of your circuits to illustrate circuit behaviours under these different conditions. It looks for changes in the time of consumption, the magnitude of consumption, and the overall signature of the consumption pattern, and can detect changes in consumption behaviour that would normally be lost in the noise.

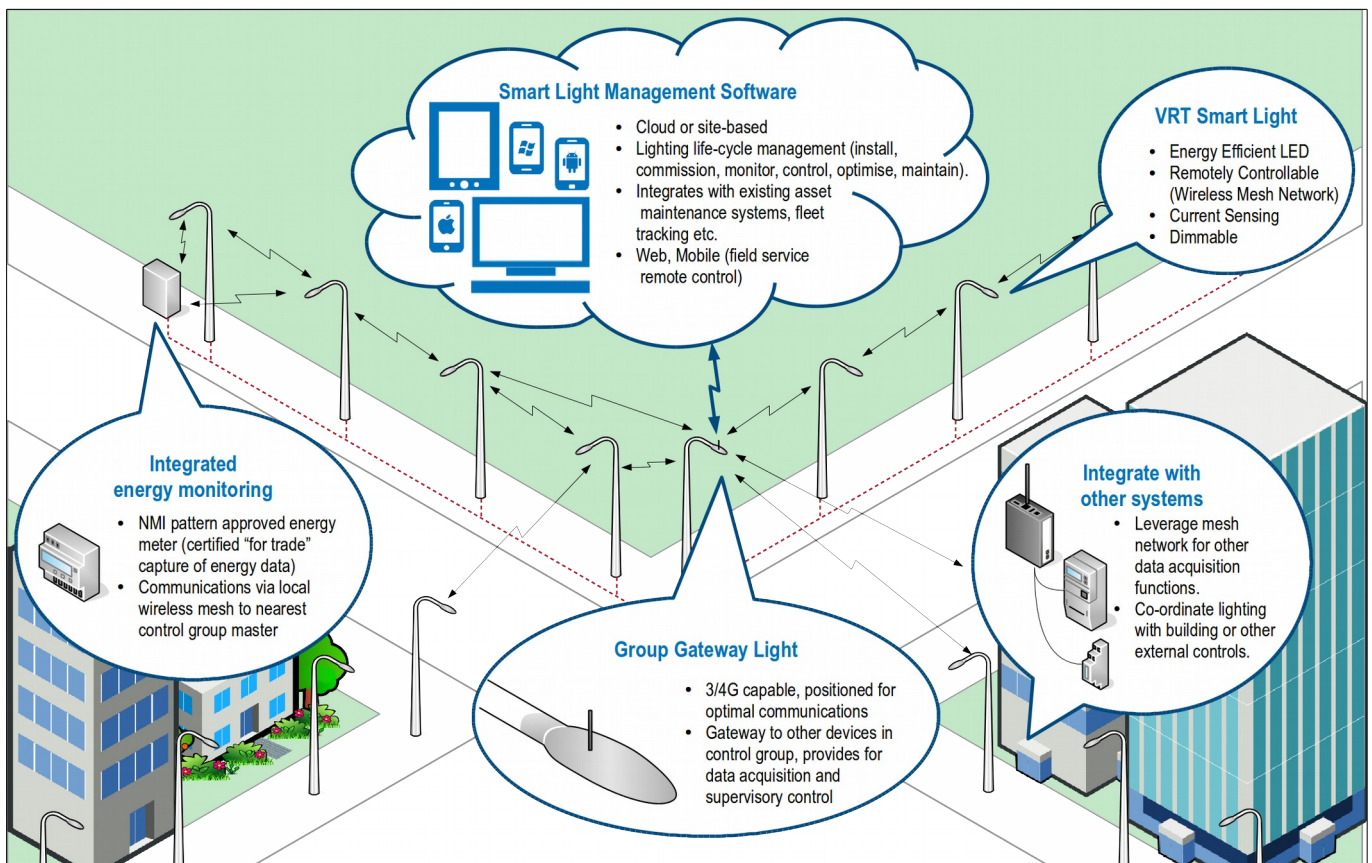


## Smart Lighting Control

LED offers an exciting new option for lighting in public spaces, but deploying LED without considering adaptive control strategies may be wasting much of the technology's potential. Traditional “fixed intensity” public lighting solutions are usually designed around the trade-off between meeting minimum safety requirements and the cost of operation. This can result in lighting systems designed for the middle ground – wasting energy when the light isn't required, and not really as bright as they should be when the light is required.



The VRT Smart Lighting controller is a small dimming controller that can be installed in a wide range of new or existing lights. It doesn't require any additional cabling, or rely on power supply lines for signalling. Instead it uses a secure, self-healing wireless mesh network to enable the lights to communicate with one other, and operate either autonomously in response to local sensors, or by remote control.



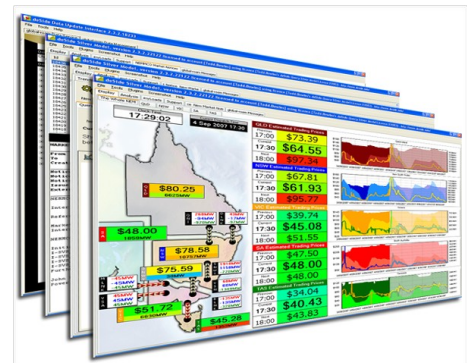
VRT are able to offer autonomously operating lighting systems (which use a combination of PE cells and PIR presence sensors) with manual overrides, or integrate controls with your existing control systems (we have a Modbus interface that most process- and building- control systems can readily interface with).

This wireless based smart lighting solution is applicable to external and internal lighting situations.

## Demand Response

### Load Curtailment

Regardless of whether you are directly exposed to market pricing, if you consume energy at times of peak demand, you will pay a premium for it. Many industrial and commercial consumers with energy-intensive operations may meet the criteria for contestable supply arrangements under the National Energy Market. If your organisation has exposure to the spot market, or is considering moving to spot market pricing, effective load curtailment is crucial.





Global Roam are the leading supplier of market information software and systems for energy traders, market regulators, and energy users on the national energy market. Global Roam's deSide® software facilitates Demand Side Response (or curtail-ability) in the NEM by providing a live feed of market conditions, along with forecast price movements. If your operation has some flexibility in when you consume energy, then VRT can develop an on-line optimisation utilising our NEM Gateway, leveraging the information offered by deSide thereby implementing control strategies to minimise your energy costs.

Even without the sophistication of market-price-driven response mechanisms, some consumers (particularly those operating loads with thermal inertia or cycling loads) can reduce peak demand charges by introducing demand minimisation control strategies, effectively "peak lopping".

## Energy Storage

The expertise VRT has gained through our work with supply reliability (such as the integration of emergency and alternate power sources) makes us well placed to assist with systems that integrated alternative energy sources such as battery and other energy storage technologies that can assist with demand reduction through load-shifting.

As an integrator of these technologies, and with a strong network of organisations with which we have successfully delivered projects, VRT is well placed to provide turn-key solutions in this area.

## Supply Reliability

VRT have extensive experience in the implementation of power network monitoring and control systems (often referred to as PMCS or NCS). The primary role of these systems is the maintenance of a stable supply (emergency generator control, load shedding) in assets with critical supply needs such as hospitals, data centres and defence facilities; in facilities where hybrid generation schemes are in use (co-generation, tri-generation, renewables); and in situations where demand response strategies are employed (energy storage and/or load shifting).

VRT have implemented and supported critical power network control systems for a number of high-profile clients, and we're increasingly involved in the integration of hybrid power systems for customers.

## Community Engagement

So much energy technology is focussed on delivering the hardware, software and systems that often the "soft" requirements (those which address the human occupants) aren't given enough attention. VRT recognise that an important part of any complete energy strategy involves considering how the people living or working in that environment form part of the solution.

## Visitor Information Systems

Modern buildings are increasingly taking advantage of digital signage to inform and engage with visitors to the facility. This can range from fully interactive kiosks, through to passive lift & foyer displays and video walls, providing a range of information to building visitors and occupants:

- Surrounding facilities and attractions
- Route/path finding (locating internal points of interest, emergency egress)
- Public travel information & timetables
- News, weather & social media feeds
- Entertainment, advertising
- Sustainability information – energy consumption, waste, building performance

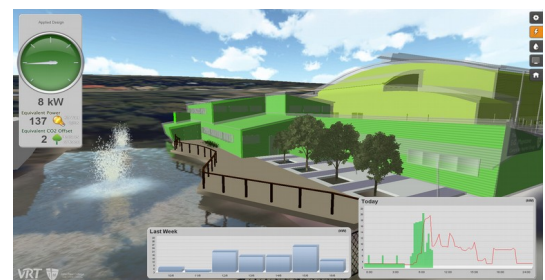
A digital display titled 'Peak Partners' showing a floor directory. The display is divided into five horizontal sections, each representing a floor. Each section lists various departments and their corresponding suite numbers.

Floor	Departments	Suite Numbers
Floor 1	Cafeteria, Mail Room	Suite 100, Suite 105
Floor 2	Finance, Accounting	Suite 200, Suite 205
Floor 3	Operations, Account Management	Suite 300, Suite 305
Floor 4	Sales, Marketing	Suite 400, Suite 405
Floor 5	Engineering, Product Development	Suite 500, Suite 505

While some of this is related to general information, entertainment and corporate image building, the energy and sustainability implications are not insignificant. Provision of pertinent travel information to assist in route planning and journey timing (with public transit information feeds) can encourage increased use of public transport. Some regulatory frameworks actually consider the environmental footprint of a building with travel impacts included, and so in some cases this can lead to the acquisition of additional credits. Studies suggest that people that feel they are being measured or observed actually change their behaviour (the Hawthorne Effect), and this can be taken further with the concept of “gamification” – introducing competitive elements between regions, offices, floors or tenancies to actively minimise inefficiency and waste.

VRT is able to offer a range of visitor engagement solutions, depending on your requirements:

- Clean, simple, elegant web dashboards to communicate building performance. These are the most cost effective to implement, and can be tailored to suit your corporate image. They generally consist of a slideshow type display that includes a mix of images, energy performance dashboards and basic information feeds (weather, travel, news etc.)
- Engaging 3D visualisations that can overlay live building performance and other information on 3D renderings of the building and its environment. These are ideally suited to situations where the owner wants a rich and often interactive display. These are highly customised and suitable for deployment on touch kiosks.
- Engaging with first-time or occasional visitors is one thing. How do you stop people from “switching off” to displays once they realise there's a fixed set of content? Having content that is always changing is



the answer, but maintaining that manually is usually prohibitively expensive. Companies are increasingly recognising the value in social media, not just as a stream of user-driven dynamic content, but a way to engage more meaningfully with their customers. VRT is pleased to be able to deliver rich, dynamic digital signage from [Enplug](#). We are also able to integrate sustainability-related content into the Enplug stream to help drive your sustainability initiatives.

## Tenant Information Displays

An increasing requirement in commercial and residential property developments (particularly multi-dwelling unit complexes where Green Star credits are available) is the delivery of individual tenant information displays. These provide tenants with their own tenancy energy performance information, allowing them to better manage their consumption. These displays can be delivered as fixed (wall-mounted) touch consoles or as “bring your own device” solutions delivered to the tenant's own smart phone, tablet, PC or smart TV:

- **Touch panel displays:** While these may be seen as an additional cost item, if integrated properly with other control and information systems (such as HVAC, lighting, intercom, access control etc.) then the integrated solution may (particularly when viewed with the cost of cabling and termination in mind) may actually better lower cost than simply installing dedicated panels for each system. As well as providing an integration point for a number of systems (particularly in MDU applications), fixed wall panels remain with the facility for life and carry very low ongoing operating costs.
- **Bring your own device (BYOD):** As people increasingly expect to interact with systems on their own terms (from their desk, on the couch, in bed, or remotely: gym, office, car), facility owners are increasingly requesting systems that deliver tenant information onto the tenants own devices (e.g. the Lend Lease Barangaroo R8/R9 project). Just as there are benefits in integrating other systems (e.g. lighting and HVAC control) with energy displays in a fixed context, doing this with a BYOD approach allows tenants to take control while they are out and about. This approach requires an online service with to deliver content via the tenant's Internet or mobile connection, but can be achieved with a lower capital cost than fixed displays.



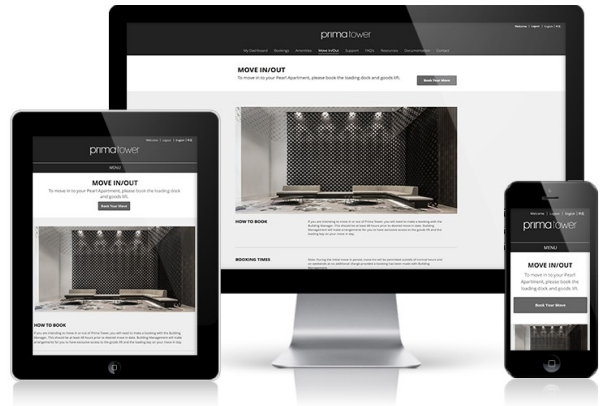
VRT's tenant information display solutions can be delivered in either (or both) fixed panel and BYOD variants. Our fixed panel solution supports a range of hardware options from compact and economical wallplates to high-end multi-touch displays. Our BYOD solution delivers responsive HTML5 content that works equally well on Mac or PC, iPhone or Android, Phone, Tablet or TV.

All of these can be driven from our highly scalable and secure cloud-based platform, WideSky™.

## Community Portals

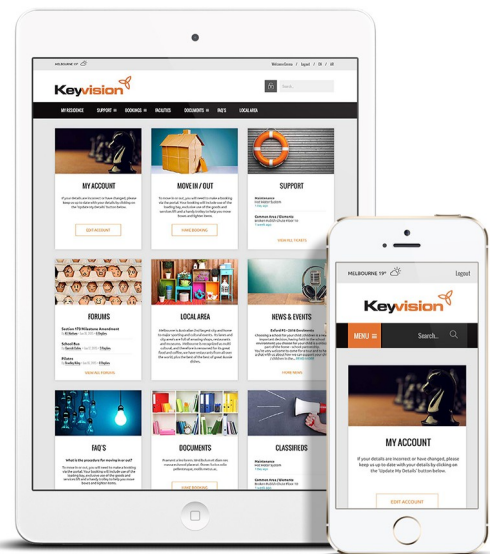
Community portals are increasingly being implemented in planned residential and mixed use (resort, holiday apartments, hotel) projects to provide a primary point of interaction between all community members, including the developer, facility operator, dwelling owners, residents and guests. The experience is tailored for each, and provides a space where members of the community can:

1. **Interact with each other socially:** Interest groups & clubs, newsletters, media gallery, classified ads
2. **Find out the latest information relating to their community:** Local area information, business directory, news, weather, events management
3. **Book communal facilities:** sporting and facilities, work spaces, loading docks etc.
4. **Access important documents:** Dwelling manuals, agreements, body corporate proceedings (all stored electronically)



Portals can present a great opportunity to facilitate efficient operation and sustainability outcomes:

- **Tenant interface:** Integrating energy performance data into private tenant spaces gives tenants access to the energy performance information in a convenient place, secured from access by others (if you are providing energy data via BYOD, this removes the need to separately manage access to meter data by tenants).
- **Support tickets:** Make it easier to report issues to the facility manager – leaking taps, faulty lights or other equipment.
- **Sustainability initiatives:** communicate sustainability initiatives with tenants via newsletters; drive behaviour change through competitions energy and sustainability - “top 10” etc.



VRT is able to integrate energy and sustainability content into a community portal through our relationship with the leading community portal provider, [Keyvision](#). We are also able to integrate and unify the experience across the community portal and tenant information displays, providing access to information, interaction with facility operators, and control functionality in either environment.

## SINGLE SOURCE SUPPLIER

In conjunction with a small network of carefully selected partner organisations, VRT can implement highly cost-effective and reputation-enhancing energy efficiency and information systems for your facility.