Residential market boom — challenges, opportunities and trends

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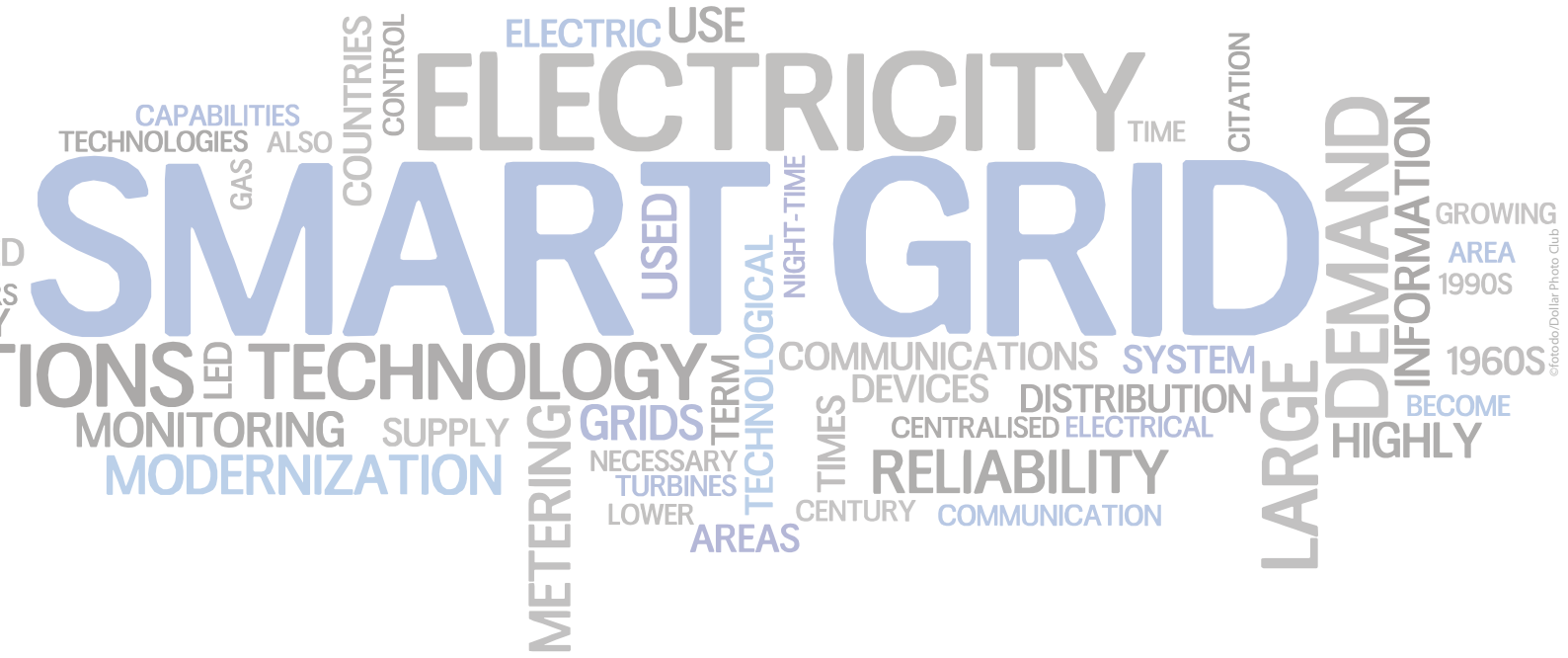


New technologies, legislative amendments, the push to improve energy efficiency and growth in the residential market, particularly multi-dwelling units, is expected to spur the group metering market growth across Australia. According to Australian Bureau of Statistics figures, work commenced on 203,760 new dwellings over 12 months to March 2015. These new residential properties will deliver high levels of energy efficiency using the latest energy management and metering technologies. The latest metering devices can capture information on a range of issues, from transients and surges to harmonics and power interruptions, allowing users to maintain equipment performance and support a facility's power quality improvement efforts. These technological developments and legislative changes will create unprecedented opportunities for electrical contractors.

Mansi Gandhi,

Editor – *ECD Solutions (Electrical+Comms+Data)*

Opportunity from evolution: the future of group metering in an urbanisation era

Dannielle Furness

The Australian electrical services industry has weathered a constant state of change in recent years. Challenging economic conditions, amendments to legislation and licensing (often with significant regional discrepancies) and the emergence of new technologies that require specialist skills and training have significantly shifted the landscape.

While Australia largely deflected the impact of the GFC thanks to a resources boom and a range of government-driven incentives designed to boost consumer spending, the economy still responded to the doom and gloom of international markets. Recession may have been avoided, but a slowing construction industry in the few years post-GFC certainly made its impact felt on contiguous business sectors.

As consumer confidence waned and discretionary spending was curtailed, the housing market defied the trend. Thanks in part to a succession of interest rate cuts culminating in a record low 2% in May this year, property prices continued to escalate in the face of high demand, despite persistent predictions that the bubble had to burst.

Analysts, commentators and, most famously, our federal Treasurer Joe Hockey, consistently blamed a lack of housing stock for spiralling prices. Some state governments, such as New South Wales, subsequently pledged to streamline the approvals process in order to speed up development to meet the seemingly insatiable demand.

Residential opportunity

That's good news for the residential electrical services market, given that around 30% of overall electrical industry revenue comes from residential work. In that sector, electrical services work is fairly even across three main categories:

1. New-build installations
2. Housing renovations and upgrades
3. Maintenance and repairs

The number of new residential builds in the year till March 2015 reached over the 200,000 mark, according to the Australian Bureau of Statistics, significantly up from just over 180,000 in the year prior and just over 160,000 in the year before that — seen by many as a sign of improvement.

However, some economic forecasters, including BIS Shrapnel, now predict that this could lead to an oversupply of housing in 2018. If that does prove to be the case, it is unlikely to be across the board, geographically speaking.

As the resources sector winds down, so too does demand for housing in mining regions, meaning Western Australia and the Northern Territory will do it tougher than most. Given the extreme demand of five to 10 years ago, this is probably more accurately described as a correction than a downturn. Housing demand in the country's north-west has historically never matched the levels of the eastern seaboard. New South Wales and Queensland are predicted for the highest growth as southern capitals Melbourne and Adelaide also threaten to slow.

Sydney, in particular, will enjoy a surge of activity as estimates suggest a shortage of around 50,000 dwellings compared to current demand, which will take around five years to correct. Combined with planned infrastructure projects that aim to reshape the city and open the way for new developments, the current lack of housing spells future opportunity for the electrical trade.

Multi-dwelling development will likely outstrip single-unit housing as buyers forgo the quarter-acre block and seek to remain nearer to urban centres. With multidwelling comes group metering, which can be difficult and time-consuming to implement at a switchboard level.

The changing landscape

The metering market has changed significantly over the last decade, from both a technology and legislative perspective. Increasing environmental awareness and a focus on energy management saw the subsequent development of building rating schemes in commercial environments. Compliance and accreditation require accurate measurement of energy use, so metering technology had to change to meet this challenge.

The metering market has changed significantly over the last decade, from both a technology and legislative perspective.

These changes also influenced the residential sector as consumers began demanding more precise readings from energy suppliers and, in the case of submetering for multi-tenanted spaces, it became a requirement of the on-sell process. Additionally, Victoria, the first (and only) state in Australia to do so, commenced mandatory installation of smart meters for 2.6 million electricity customers in 2009 — a process which took over four years to complete and initially included only limited 'smart' functionality, with consumers unable to easily access their own data.

Legislation brought in under the guidance of the National Measurement Institute (NMI) in 2013 lifted exemptions for electricity meters used for trade. A meter is considered in use for trade if the measurement is used to determine the amount to pay for a transaction, including embedded metering systems where electricity is on-sold, such as multi-dwelling residential developments.

The impact was substantial — from the date of introduction (1 January 2013), all meters used for trade measuring less than 750 MWh per annum were required to be (a) of an approved pattern and (b) verified.

The implication extends beyond the original installation through to maintenance and repairs, whereby a meter installed prior to the introduction date can be repaired or adjusted and the metrological seal can be broken to carry out these works. It cannot, however,

There are proponents for mandated rollout of the technology and others that believe it should be a consumer's choice.

be substantially modified to the point where it effectively becomes a different meter.

For meters installed post 1 January 2013, any works that require breaking the metrological seal, including battery changes, result in a requirement for reverification. The same rules apply for meter relocation. Any non-pattern-approved meter still in service must be replaced by an approved device once it has failed.

When the changes were first introduced, the exemptions had been in place for 11 years, which was designed to give manufacturers enough time to achieve NMI pattern approval. The changeover was not without challenges and, in the early days, there were no DIN rail-mount pattern-approved alternatives, which made swapping new for old on failure a difficult task in some cases, mostly due to space constraints. In addition, communications were often an issue as meters were using disparate protocols.

Things have changed in the intervening years and a range of switchboard alternatives designed specifically for group metering applications have alleviated many of the previous issues. FlexMulti from Schneider is a pre-wired, modular system equipped for plug-and-play installation. The design features current transformer chambers for centralised metering, metering panels that accept any type of supply authority meters and DIN rail modules for various types of control circuitry, making them suitable for 'smart' building installations. Systems such as FlexMulti work equally well for submetering applications and multiple link modules provide simple interconnection.

More metering to come

The federal government's 2015 Energy White Paper places heavy emphasis on cost-reflective tariff arrangements between consumers and suppliers, which is only possible through the use of advanced metering technology. The paper nominates a preference for smart meters specifically or, at a minimum, interval meters.

For consumers to understand current usage, assess its impact on pricing and make informed choices regarding suppliers and plans, they must have access to the data those meters provide. There are proponents for mandated rollout of the technology and others that believe it should be a consumer's choice. Either way, it seems some form of broad implementation is inevitable, as the government seeks to alleviate energy price pressure on the consumer.

This intended change, along with a growing preference for multi-dwelling development, will create increased opportunity for the electrical services industry, particularly in the realm of submetering. Those best placed to capitalise on these trends will have a thorough understanding of the NMI 2013 changes, and the subsequent design and spatial constraints in meter maintenance and replacement, and will be in a position to offer a simple and suitable group metering solution. ■

Power and energy management in a hotel chain

This case study shows how Schneider Electric smart metering increased energy efficiency and a return on investment in an international hotel chain.

The hotel chain in this case study operates over 1000 hotels with about 130,000 rooms in 59 countries. Around 85% of its locations are ISO 9001 certified. They offer their guests a high-quality service commitment, making power and energy management crucial to delivering on their service promises.

"We understood why we regularly had penalties from energy providers," said a hotel director. "The rated power was exceeded every day for some minutes when all rooftops were starting."

The challenge

Schneider Electric was commissioned to provide an energy solution to:

- Ensure and monitor customer comfort across all branches
- Boost confidence regarding customer health and safety, and ensure regulatory compliance
- Optimise energy and fluid consumption to save money and enable green marketing

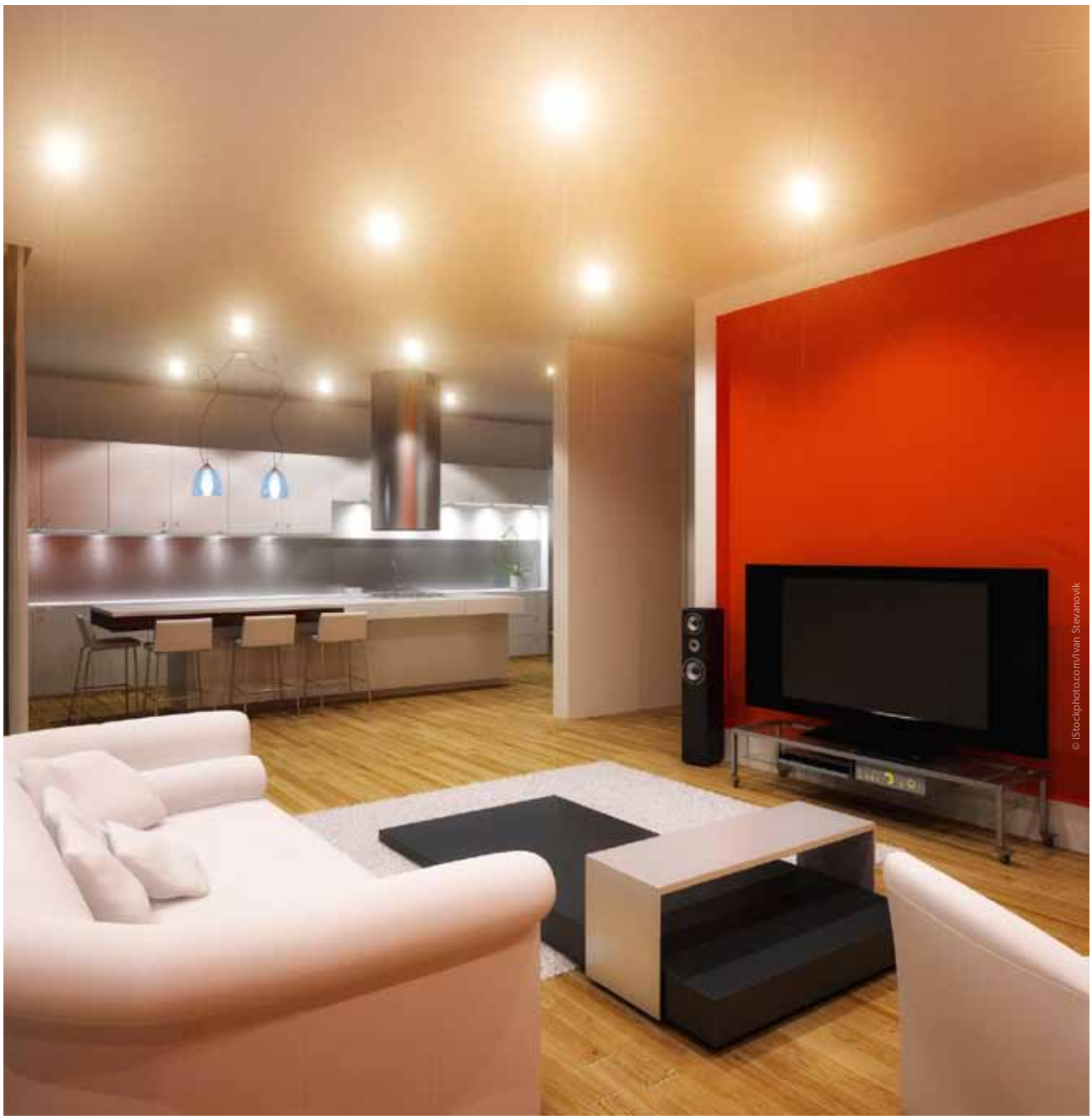
Comfort and safety dashboards are widespread

The energy solution allows hotel staff to be immediately informed by an email sent automatically by Smart Panels when an issue occurs that might impact guest comfort and safety. Additionally, every staff member has permanent access to a real-time comfort and safety dashboard showing:

- Deep freezer temperature
- Key values of heating and air-conditioning systems
- Hot water temperature
- Air temperature and humidity on each floor

"We rescheduled all automatic equipment and we could even lower our rated power subscription," added the hotel director.

The simplicity of the installation across multiple sites was also commented on.



"Most surprising was how each local electrical contractor could replicate and connect the system in each hotel without much technical coordination," said a corporate energy officer.

Best practices shared across the company

Every three months, hotel managers meet together with corporate technical and financial directors to share best practices and compare improvements. One manager said: "We decided to equip a pilot site with solar water heating. By relating its energy consumption to the other sites, we could calculate the savings and payback, and decide upon investing in this equipment for other sites."

Full staff involvement

Each hotel manager and their technical staff have full-time access to details of energy consumption. The entire staff is informed about energy and water savings. The system detects and flags abnormal consumption and breaks electrical consumption down into:

- HVAC
- Food conservation (deep freezers and fridges)
- General lighting and lifts
- Cooking and dishwashing equipment
- Guest rooms

Sustainability information and green marketing

The energy solution offers screens to inform guests of environment-friendly behaviours and display recent resource savings, achieved also due to their support and awareness.

"I was doubtful about the final cost to set up this system. But there was no bad surprise at all. And our facility managers keep it working without any problem," said a financial director.

How today's meters make power quality data easier to understand

Vanya Ignatova, Schneider Electric

Today's power-quality metering devices can capture data on issues ranging from transients and surges to harmonics and power interruptions — but that raw data, alone, might not be useful to the personnel charged with maintaining a facility's electrical system. New products address this challenge with embedded intelligence to show trends and alerts, with at-a-glance displays designed to meet the needs of many different staff members.

Continuous power-quality monitoring is the best way to both maintain current equipment performance and support a facility's continuous improvement efforts. The new displays make such programs easier in a number of ways. For example, a trend graph, as illustrated in Figure 1, can provide clear indication of many long-term, steady-state power-quality disturbances over time. Facility staff can easily see if recommended limits on harmonics, power factor or other potential problem areas have been exceeded.

Figure 1: Analysis of continuous power quality disturbances.

Short-term disturbances, such as voltage sags, swells, transients and interruptions, are represented in a more snapshot fashion, using a variety of statistical widgets, charts and counters, as shown in Figure 2.

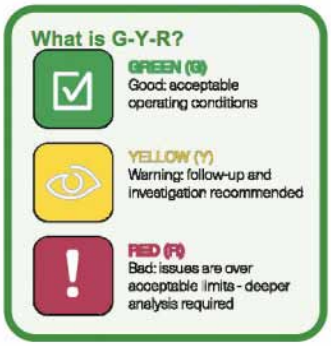
Such a presentation can offer a range of views — from a pie-chart-style breakdown of the kinds of power-quality events a facility might be experiencing to bar charts comparing the impact of events either upstream or downstream of the measured location.

Figure 2: Analysis of power quality events.

Several new-to-market Schneider Electric meters are taking this graphical approach a step further. The systems feature a simplified user interface that uses the green/yellow/red visual metaphor familiar to just about any automobile driver to indicate both short- and long-term power quality issues. In this application, green obviously indicates no critical issues with the characteristic being measured, while yellow and red indicators suggest performance is approaching or exceeding limits outlined in related electrical codes and standards.

The green/yellow/red approach solves a common problem of those whose job it is to monitor and maintain power systems: the wide diversity of potential power-quality problems and their related metrics and applicable standards can be overwhelming. This methodology converts this multitude of taxonomies into meaningful, unified and easy-to-understand indicators for each specific power-quality characteristic.

The new systems also are able to calculate an overall power-quality index that amalgamates the data on individual measured characteristics into a 0–100% rating — kind of like a report card for a single metered connection or an entire facility. ■



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