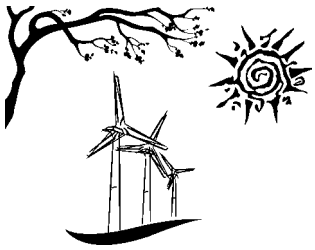

ARIA PROFESSIONAL SERVICES

Barriers to Implementing Demand Side Management in Gold Coast Accommodation Facilities

Preliminary Issues Paper

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Revision (0)

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EXECUTIVE SUMMARY

The project "Barriers to DSM within Gold Coast High Density Accommodation" is funded through the National Consumers Advocacy Panel. Aria Professional Services and Property Council of Australia are joint proponents with support from Energex, Gold Coast City Council (GCCC) and the Australian Institute of Hotel Engineering. The project focuses on Surfers Paradise as it was identified as an area vulnerable to network constraint

The first stage of the project was to conduct an overview of management regimes and decision making processes, gain an understanding of the drivers for consideration of Demand Side Management (DSM), and to identify key initiatives either undertaken or contemplated in the areas of energy efficiency, load switching and distributed generation. This Issues Paper summarises the findings of an initial round of telephone interviews which took place in October 2005.

With the assistance of a GCCC database on tourist accommodation, 60 target participants were identified. These were a mix of hotels, backpackers, and serviced apartments with the latter being the predominant group. Contact was made with 41 of the potential candidates and 31 of these participated in the initial interview. 22 were willing to be interviewed in the future and 8 suggested making a request through the body corporate. Those interviewed included body corporate administrators, engineers, maintenance supervisors, building managers and owners.

The properties themselves were owned either privately, by strata title, or by corporation. The hierarchal structure of private and corporate management was most straight forward and navigable, while strata title run by body corporate committee was found to be varied and complex.

A large majority of the buildings were administered by a body corporate. The committees are typically made up of voting members including owner occupiers, foreign and domestic investors and building managers if directly invested. Decision making can also be influenced by the body corporate administrator, engineering personnel and third parties such as contract energy service providers or advisors. The perceived effectiveness in decision making varied greatly, and many potential hurdles were identified stemming primarily from the number of decision makers.

The majority of management were supportive of DSM initiatives, half of these enthusiastically so. Those that weren't stated the cause as past failures, the age and attitude of owners, or that no one had initiated anything in the past.

DSM initiatives were most advanced where there was some direct ownership of the role, for example within buildings with dedicated engineers or facilities management services offered through the body corporate or contracted out to third parties.

Where DSM had been considered, a range of measures had been investigated; compact fluorescent lights, timers, motion switches, bulk billing, and conversion from electric to gas hot water services, appliance ratings, energy management systems and self generation in order of decreasing frequency. Many had initiatives presently under consideration or in progress. However a considerable shortfall in understanding of energy issues was also

identified, with some participants for example not understanding the difference between bulk billing and DSM.

Initial studies revealed that retailers have not been particularly active in promoting DSM apart from conducting one off audits in order to win business. Bulk billing had also been offered to end users by retailers mainly as an incentive to win business.

The majority of buildings have some form of emergency diesel generator owned and maintained by the Body Corporate however depending on their location, these generators are typically perceived as noisy and polluting and there was concern over regular operation affecting comfort of occupants and guests. Technical, commercial and operational constraints are also serious barriers to the use of such diesel sets to offset mains supply.

Barriers to Implementing Demand Side Management in Gold Coast Accommodation Facilities – Preliminary Issues Paper

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This study "Barriers to DSM within Gold Coast High Density Accommodation" is funded by the National Electricity Market Advocacy Group to identify barriers to implementing Demand Side Management practices in Gold Coast high rise accommodation facilities. Aria Professional Services and the Property Council of Australia are joint proponents, supported by Energex, Gold Coast City Council, and the Australian Institute of Hotel Engineering.

The investigations are to focus on areas within the network where electrical supply is currently vulnerable. By reviewing zone substation forecasts and capacities in conjunction with Energex, Surfers Paradise has been identified as the focal point. Here there are a large number of high density accommodation facilities that overwhelmingly determine the system load.

2 PROJECT APPROACH

The overall approach to the project is summarised below :

Stage	Activity	Time Frame
1	Preliminary Interviews / Prepare Issues Paper	Sep – Nov 2005
2	Develop Survey Materials	Nov – Dec 2005
3	Conduct Detailed Surveys	Jan – Feb 2006
4	Prepare Written Report	Feb - March 2006

Table 1: Project Staging

Preliminary interviews were conducted to obtain an overview of management regimes and decision making processes in target accommodation. In addition an appreciation of attitudes towards DSM was gained, as well as some initial understanding about the drivers for consideration of such initiatives.

This Issues Paper will be used by stakeholders to inform the development of survey materials in Stage 2.

3 INTERVIEW TARGETS

3.1 Overview of Building Types

GCCC databases identify more than 170 registered accommodation facilities in Surfers Paradise alone. These comprise a range of building types including resorts, hotels, backpacker accommodation, and flats and apartments. Capacity ranged from small blocks of apartments with less than ten beds, up to resort accommodation with over 200 beds. Buildings were of a wide range in vintage.

For the purposes of these studies, only buildings with at least 40 beds were targeted leading to a total of 60 potential interview candidates. The overwhelming majority of these were serviced apartments administered by a body corporate and were commonly of mixed use; owner occupied, holiday letting, tenanted, commercial. Some buildings classified as "hotels" were actually administered by a body corporate.

3.2 Personnel Contacted

Meaningful telephone contact was able to be made with 41 of the 60 potential candidates. In these cases those responsible for energy issues could fairly easily be identified. The management organisational structure varied greatly between buildings and those interviewed included building managers, body corporate administrators, building owners, engineering, and maintenance supervisors. The following is a breakdown of the role of those interviewed;

Building Type	# No.
Serviced Apartments(>100 Units)	10
Serviced Apartments	14
Hotel/Motel/Resort	5
Backpackers	2

Table 2: Breakdown of Building Type

Role	# Interviewed
Building Manager	21
Chief Engineer	3
Maintenance Supervisor	4
Body Corporate Administrator	2

Table 3: Personnel Contacted

Once a relevant member of staff was identified and contacted a short interview was conducted (see Appendix1 for sample) using a combination of yes/no and open ended questions to capture the following information;

(i) Type of building, it's function, and occupancy

(ii) Organisational structure and decision making

(iii) Experiences with DSM

(iv) Relationship with retailer

(v) Building generation capacity

(vi) Barriers to implementation of DSM

(vii) Willingness to participate in further interviews.

4 FINDINGS

4.1 Management Structure

Surprisingly there was found to be a great variety of structures responsible for managing the properties contacted. The complexity of these depends primarily on type of ownership, building use, and to a minor degree the size of property.

4.1.1 Influence of Ownership on Management Structure

There are ownership models : individual, company, or strata title.

(i) Individual Ownership - owned and operated by one individual responsible for all decision making, handling and payment of electricity bills. These individuals have an overall knowledge of their business but do not have specific expertise in energy issues or time to focus on it.

(ii) Company ownership - a hierarchy of relationships between superiors and subordinates, forming the familiar pyramid shape. Members of the organization have clearly defined roles and responsibility.

(iii) Strata title ownership - managed by a body corporate committee made up of owner representatives but all owners have a vote in decisions. Committees were also comprised of non-voting members including administrators from body corporate management companies, and building managers. Additional complexities within the structure occur with building management, facilities management, and/or energy management functions being contracted out. Building managers are sometimes voting members of the committee depending on contractual arrangements and/or financial investment in the building.

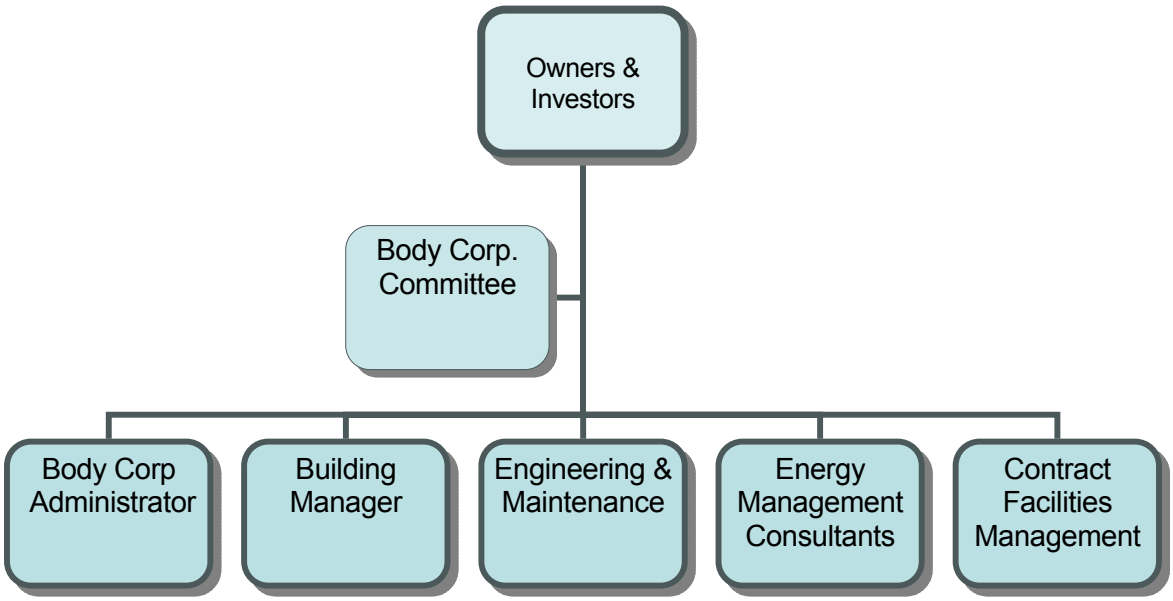

Figure 1: Example of Body Corp. Structure and Relationships

The breakdown across the various ownership models is given in Table 4 below.

Ownership	# No.
Individual	3
Company	3
Strata Title-Body Corporate	25

Table 4: Building Ownership

4.2 Decision Making Processes

Decision making processes are highly influenced by the management structure. Decision making within property owned privately or by corporation was found to be a relatively

straight forward process involving few stakeholders and those responsible are likely to be reasonably well informed and responsive. Decisions make their way up the appropriate chain of command where process and responsibility are clearly defined. Some comments were that initiatives were often considered on their potential for career advancement and alignment with the culture/values of the organisation. This can work for or against DSM initiatives. Usually the decision rests with one person and therefore their views are critical in influencing decisions.

Many respondents indicated that decision making was difficult within strata titled body corporate committees citing potential for many problems including;

- responsibility and ownership often being unclear
- geographically dispersed committee members, difficult communication and scheduling
- conflicting interests between players and trust in their inter-relationships,
- difficulty in reaching consensus between decision makers
- billing details not available to all members
- lack in decision makers' understanding
- conservative and change resistant attitude of older owners

Strata titled decision making is not a barrier in itself but can become so if the decision makers are not clearly identified and ownership is established for investigating, evaluating and tabling initiatives to the committee, or if an outsider is unaware of these dynamics when engaging with the committee.

The sense overall was that unless a DSM investment decision could be considered a "no brainer", body corporates would be reluctant to spend much time evaluating the pros and cons of the initiative and it could get lost or de prioritised along the administration paper trail.

4.3 Attitudes and Drivers for DSM

The large majority of respondents indicated their positive support of DSM. Those who did not support DSM cited the cause as being :

- past failures
- the indifference and old age of owners, or
- because no one had bothered to raise the issue in the past.

Those not sure either had not been working at the facility long enough to really know, or were not involved in the decision making.

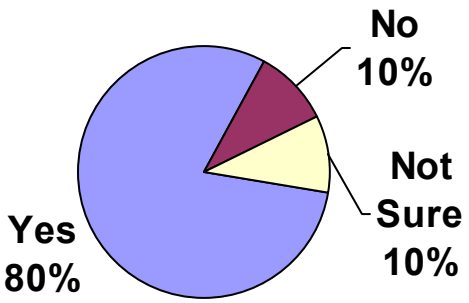

Figure 2: Does Management Support DSM ?

There was no apparent correlation between ownership, management structure, and attitude towards DSM.

Management's primary driver and concern for considering DSM was found to be the internal rate of return on the capital investment and the comfort of occupants and guests. In some cases DSM initiatives were deferred or abandoned due to concern about impact on guest comfort during implementation.

Larger hotels were in cases found to be driven by a desire to keep up with industry and corporate benchmarks. For example quarterly reports on electricity consumption are sometimes generated and compared against a benchmark and if performance falls short a DSM process is initiated.

The environmental aspect of DSM was considered an added bonus, especially within hotels where initiatives could be used to demonstrate good corporate social and environmental responsibility.

The overwhelming support offered by management indicates that attitude of decision makers is rarely a barrier but possibly a good leverage point for change. Having said this, there was plenty of evidence of DSM projects not being implemented despite "in principal support" from management. This perhaps underscores that energy management is not considered "core business" in the accommodation sector, but rather a relatively insignificant incidental expense that must be incurred in order to deliver a productive (eg a bed- night) outcome.

4.4 Initiatives Undertaken

Slightly more than half the respondents were clear that they had investigated some form of DSM. Upon further probing others were able to share some progress in the area, but almost one third had done nothing.

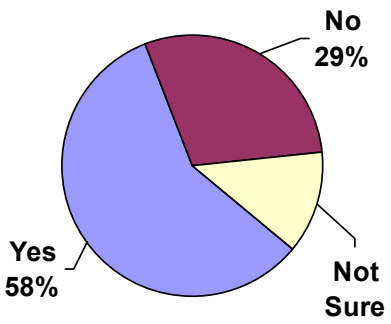

Figure 3: Have DSM Initiatives been actively investigated?

The most advanced and active in DSM were properties with delegated personnel responsible for energy issues. Such personnel could be either

(i) Internal - as in a hotel with a chief engineer on staff, or a block of apartments with the body corporate providing facilities management or

(ii) External - as in the case where facilities management or energy management companies had been contracted.

On-site managers felt a strong sense of personal responsibility, particularly those that were directly invested in property and were voting members on committees.

Some success was reported where energy retailers had performed energy audits and offered to implement the recommendations in parallel with a negotiated bulk billing offering. Some also had audits performed independently. Many participants had initiatives either under way or on the table. Bulk billing was found to be confused with DSM in several cases.

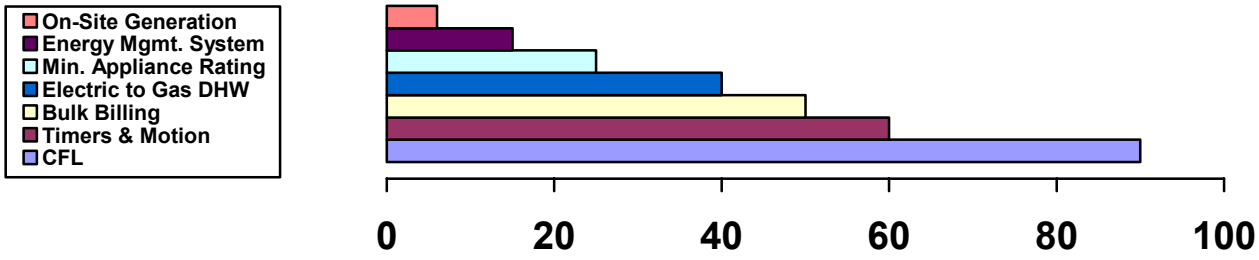

Figure 4: DSM Initiatives Implemented

4.4.1 Energy Efficiency

Most interviewees had implemented energy efficiency initiatives such as; compact fluorescent lighting, motion sensors, and/or timing switches. This was constrained in some cases by the view that it would interfere with the occupants or could be tampered with.

4.4.2 Load Switching

Many had switched domestic and pool water heating from electric element heated storage (calorifier) to gas or instantaneous electrical. For example tankless systems can be adopted

for on demand domestic hot water (can be electric or gas), or alternatively smaller 50 Litre tanks with rapid heating coils (these are more efficient because energy is not wasted keeping stored water hot). It should be noted however that instantaneous electrical hot water has the potential to adversely impact peak demand unless intelligently scheduled.

Some candidates wanted to do more but were limited by building design and behaviour of occupants. Many were considering or had already entered bulk supply agreements which included some discretionary load switching or control in order to reduce peak demand or balance loads. For example some were able to shed air conditioning, pumping, and water heating loads through an energy management control system, although this level of sophistication was generally only found to have been adopted in larger buildings.

4.4.3 Self Generation

Most of the buildings have some form of emergency diesel generator owned and maintained by the Body Corporate. Typically these are perceived as noisy and polluting and there was concern over how regular operation might impact comfort of occupants.

Using the generator during network peak had been evaluated in two cases but both were dismissed; the first for exhaust being blown into the pool area, and the second because it was not found to be cost effective by the retailer. However, there was still ongoing interest in the concept.

A few points are worth noting with regard to on site diesel generation :

- the location of the generators and exhaust gases has a direct bearing on the noise and pollution issues
- acoustic enclosures may be installed to mitigate noise
- air pollution control equipment such as a Selective Catalyst Reduction device may be fitted to mitigate particulate emission problems.
- particulate emissions may be significantly lower when the generator is 100% loaded compared with emergency operation when the generator is only partially loaded.

Technical constraints such as existing DNSP and customer switchgear capacity and network fault levels maybe a barrier depending on the site. Grid export conversion costs of standby generators vary widely between 150 to 1500 $/kVA due to site specific constraints.

Where there is no existing standby (or emergency) generator, an opportunity may exist for the installation of a combined heat and power (CHP or co-ogeneration) system to utilise waste heat and improve energy efficiency.

4.4.4 Power Factor Correction

Although not specifically discussed during the phone interviews, other studies have shown Power Factor Correction to be a cost effective method of reducing demand. Power factor at peak demand has been found to commonly be around 80% in high rise accommodation due to the reactive power demand of air conditioners. Power factor of greater than 95% is desirable and 99% achievable. Therefore a peak demand reduction of 15% to 20% may be

achieved and at costs of around $60/kVAr. Payback period depends on tariff structure but is of the order of 3 years.

4.5 Role of Retailer in Offering DSM Service

In general, retailers were not found to be very active in offering DSM services as shown n the chart below.

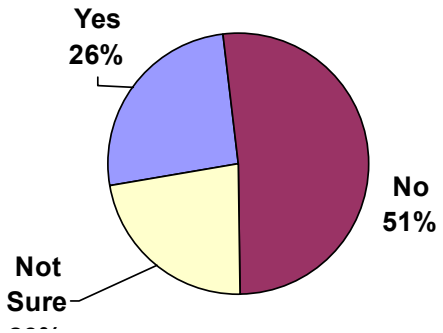

Figure 5: Is your retailer active in offering DSM services?

Those unsure were not directly responsible for or focussed on energy matters within the building and had insufficient information to hand. Some end-users viewed their retailer as uncooperative and even belligerent, whilst others didn't believe it was the responsibility of the retailer to promote DSM.

Where DSM had been offered by the retailers, this commenced with an energy audit. Such audits are critical in that they can provide useful information about the relative benefits on a number of site specific DSM opportunities. In some cases these audits are carried out by independent companies, or they are offered as a way for the retailer to wind business. However some interviewees perceived a conflict of interest in retailer conducting audit and had sought independent advice.

Many commented that they had received promotional material on energy efficiency and green power with their electricity bills but they did not consider this facilitated the steps to take these up. However, some retailers had a reputation for being particularly proactive.

4.6 Presence of On-Site Generation

Most of the buildings discussed had generators for essential mechanicals services like lifts, fire and emergency lighting services. Interviewees could not generally cite generator capacity off hand, but a number felt that generation capability was considerably more than the output during emergencies. The generators usually belong to and are maintained by the owner or the body corporate if strata title, with maintenance being performed by an outside contractor in a few cases.

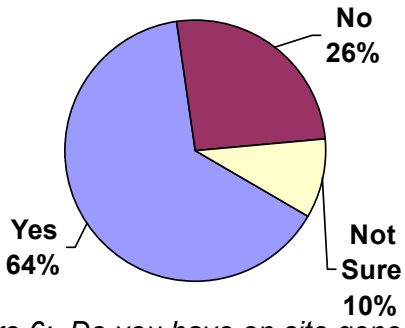

Figure 6: Do you have on site generation?

The on-site generators were generally considered to be a nuisance to operate for prolonged periods on account of being noisy and polluting, and there was a prevailing concern that the operation of generators would impact the comfort of residents and guests.

4.7 Overview of Initially Identified Barriers to DSM

The barriers identified by respondents varied greatly between organisations and a correlation was observed between the barriers identified and the depth into which candidates had investigated DSM opportunities. From this a pattern emerged where some barriers showed up earlier in the process and others later, suggesting a continuum of barriers that occur sequentially. These can be grouped and summarized broadly as follows;

- Lack of clear delegation of responsibility for energy issues – particularly difficult in the body corporate structure where all decisions are made by the committee.
- Inability of decision makers to reach a timely decision that a particular initiative is technically feasible, will not negatively impact comfort of occupants and guests, and that have a sufficient rate of return.
- Lack of awareness around energy issues - often stemming from insufficient information being provided by the retailer via bills
- Lack of a clear price signal - for example peak demand charges are a key driver for DSM initiatives and are not always evident to the customer.
- Lack of support for addressing DSM within organisation – for example values, culture
- Lack of adequate post implementation feedback on effectiveness of the initiative

These and other barriers will be explored in further detail during the face to face surveys comprising Stage 3 of this project.

4.8 Participation in Future Interviews

The majority of respondents were interested in participating further and some were audibly excited at the prospect.

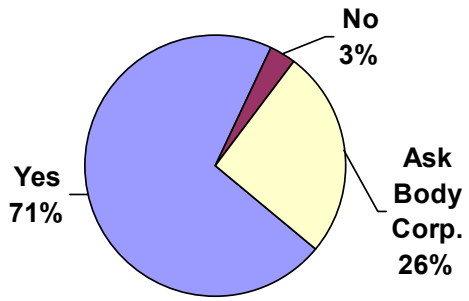

Figure 7: Are you willing to participate in further interviews?

Those who declined did so because they did not believed they were authorised to be involved in a formal interview because of predefined protocols for such requests to go through the body corporate administrator. However, engaging with members of the body corporate committee or decision makers informally did not appear to be a problem.

Some expressed concern over the timing as Christmas is a busy time of the year for the industry, especially during Schoolies Week.

5 Additional Interviews Conducted to Inform Issues Paper

Apart from those directly involved in the accommodation sector, a number of other interviews were conducted to inform the direction of the project and gain a wider perspective. These included :

- Australian Institute of Hotel Engineering
- Energex
- Building service engineers
- Strata and facilities management companies
- DSM product developers
- Energy performance contractors
- Energy management consultants

The findings resulting from these interviews will be incorporated for fully into the Final Report.

6 Appendix 1 – Interview Survey Pro Forma

Gold Coast Demand Side Management (DSM) Survey

DSM initiatives can broadly be classified as one of :

- *energy efficiency*
- *load switching*
- *distributed ("on site" or "self") generation*

Record of Preliminary Phone Interview

Aim :
1. To gain an initial appreciation of the attitudes and typical management approach towards DSM so an Issues Paper can be prepared
2. To invite candidates to participate in a survey to identify barriers to the uptake of DSM initiatives

Organisation :

Interviewer : **Date :**

Person Interviewed : **Position :**

Phone : **Mobile :** **Email :**

Record of Interview :

Introduction

Q1 : Does your employer own the building ? Confirm bed capacity.

Q2 : Have you actively investigated DSM opportunities ? Which ?

Q3 : Is you energy retailer active in offering DSM services ? Who ?

Q4 : Would you say that management supports adoption of DSM ?

Q5 : What on-site generation does your premises have to deal with outages ?

Q6 : Who owns/operates the on site generator ?

Q7 : Once identified, what typically gets in the way of DSM initiatives being implemented ?

Q8 : Would you be willing to participate in face to face interview (approx 30 mins, Jan or Feb 06) ?

Thanks