

**CLEAN ENERGY COUNCIL  
FUTURE-PROOFING IN  
AUSTRALIA'S ELECTRICITY  
DISTRIBUTION INDUSTRY PROJECT**



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# **ANALYSIS OF DEMAND-SIDE MANAGEMENT OPPORTUNITIES**

## **TASK 1C**

REPORT BY: ENTURA  
EXECUTIVE SUMMARY

## Executive Summary

The Clean Energy Council (CEC), through the *Future Proofing in Australia's Electricity Distribution Industry (FPDI)* program, is exploring the changes from the continued integration of renewable energy into Australian distribution networks. This report is a key input to the wider CEC FPDI program and is intended to build an understanding of the opportunities for the uptake of Demand Side Management (DSM) options for Small-Medium Enterprises (SMEs). The outcome of the analysis from this technical report and further business engagement is compiled in the companion report "*Guide to demand side management solutions for businesses*" compiled by Moreland Energy Foundation Limited. In particular, this companion report highlights some broader considerations for uptake of DSM in SMEs.

The CEC hopes that the publication of this report will inform technically-minded stakeholders and enhance engagement such distribution network service providers and DSM equipment suppliers. Combined, the two reports are intended to highlight the business case for various DSM options, assist SME business owners in understanding the opportunities and risks of implementing these options and increase the ability of distribution networks to engage with SME customers.

The analysis conducted here was driven by consideration of three key factors affecting DSM opportunities for SMEs:

- load profile – a business specific characteristic representing how that business uses electricity
- technology – the physical mechanism via which the SME can impact on their load profile
- tariffs – the charging regime for electricity use, which, in conjunction with the load profile, can determine the impact of the technology.

Inputs from a range of sources were used to represent each of these three factors, to cover a wide range of SMEs.

To ascertain where opportunities exist, a detailed half hourly model was used with the inputs to estimate the cost of electricity for each business type (represented by a particular load profile), technology, and tariff. Financial metrics (net present value and payback period) were compiled for each to provide a measure of the viability of each DSM option.

A key limitation of this report is that it cannot cover the specific circumstances of all businesses, nor can it cover all the potential ways of combining and implementing technologies (including their future variants), or the ways in which this and other factors will impact on tariffs. However, in the context of the key business drivers for SMEs (short payback, simple to implement technology that does not distract or impact on core business), such complexities and niche scenarios are unlikely to be a high priority for most SMEs, and as such, the focus on simple and reliable opportunities is considered justified<sup>1</sup>.

This report considers both current and future opportunities for DSM. The key considerations in looking at future opportunities are likely changes in technology pricing and tariff structures. New entrant technologies (i.e. those that are not already in the marketplace) that may initiate a 'game changing' scenario were not considered as these could not be reliably modelled. A watching brief on

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<sup>1</sup> While disconnecting completely from the grid is not commercially feasible in the immediate to short term, consideration of this opportunity for individual SMEs both now and in the future is beyond the scope of this report. The context of this report is DSM opportunities for SMEs *within the grid*.

new technology entrants needs to be kept as any 'technology transition' or 'pricing transition' may occur in the short or medium term.

Tariff structures were also considered to be in a state of transition, and a source of significant uncertainty. This is partly driven by the impact of DSM on revenues for network service providers, and hence on tariffs (which in turn affects DSM viability). To attempt to capture this uncertainty, possible future tariffs were constructed to represent different scenarios, on the basis of cost reflective pricing. These tariffs included capacity charges, which is increasingly common in smaller customers, facilitated by time of use and smart metering. The essential difference between the future tariff scenarios was differing portions of variable cost (i.e. cost per kWh). As the variable cost component is the strongest driver of DSM viability, there was considerable difference in the outcomes for DSM under the different tariff structures, representing a high level of investment uncertainty.

### **Outcomes and Recommendations**

Across most business types, there were two DSM technologies that performed well. These were energy efficiency and solar PV embedded generation. Solar PV had somewhat better outcomes in general, however, was more exposed to the uncertainty described above. In particular, it was noted that whereas under existing tariffs, these opportunities could be said to be viable for most businesses, the uncertainty of future tariffs could degrade the value of investments in many instances, particularly for solar PV. While strong opportunities still exist, these are not as universal and require consideration of specific business circumstances.

More advanced technologies, including battery energy storage systems, fuel cells, and automatic load shifting technology, were also examined and found to be currently uneconomic. There were some specific scenarios for a small number of SMEs where these technologies would work, typically associated with offsetting large network investment or maintenance. While downward capital cost trends for these technologies indicate a point of broad scale future adoption, this is unlikely to occur in the short term and may be further delayed by changes to tariff structures.

In general, it is recommended that businesses considering DSM should focus on simple, proven solutions in energy efficiency, and should consider solar PV with an understanding of the risks and guidance of a reputable installer, who can take into account their particular circumstances. Other opportunities using alternate technologies may be presented to SMEs, and businesses may wish to consider these if they are justified for their particular circumstances.

Though outside the scope of this study, it is also advisable that SMEs regularly review their tariff structure options against their load profile and select a structure that minimises their costs.

For some businesses, DSM, through energy efficiency and solar PV, presents good opportunities now. Looking forward, new opportunities are likely to involve more integrated DSM options. We will see increasing opportunities for businesses to embrace a range of technologies including automated load shifting, solar PV generation, and potentially energy storage to deliver more services to the electricity network, and this will be supported by technology improvements, cost reductions, new tariff structures, and methods to capture the additional value to the network.

Broadly speaking, there are likely to be fundamental changes in the dynamic within the grid that will need to be understood by all stakeholders.

## **SME specific barriers to DSM**

In undertaking this study and developing the above findings, a number of barriers for SMEs were identified.

- SME consumers are largely disengaged from energy usage and cost of supply other than the final cost of electricity.
- Electricity is not a primary cost driver. Small /medium business electricity costs often account for less than 2- 5% of total business costs. While many DSM options may provide a positive NPV, the absolute magnitude of the savings may be a barrier to adoption.
- Technology barriers – smaller load sizes, particularly for load shifting, though often less standardised than residential loads have a larger relative cost to control.
- Business portfolio planning – where business is part of a larger corporation often does not have the flexibility to enact DSM options outside of the capital allocation and planning schedules that occur at a consolidated level.
- SMEs generally have less capacity to be directly involved in managing their own DSM than larger businesses, who can potentially devote a role to this function. Similarly, management systems designed for larger businesses may not be cost effective for SMEs. Domestic technology / approaches may be more useful for many SMEs, as these technologies develop commercially.
- Ownership structures – access to site infrastructure such as individual site metering and access to physical roof space in circumstances where SMEs are in leased or shared buildings.
- Tariff, policy understanding – limited understanding of tariff arrangements, especially likely future tariffs and impacts on DSM options.

## **Policy options to support SME adoption of DSM**

In consideration of these barriers, and the outcomes of the study, several key policy opportunities were identified, which would substantially improve DSM opportunities for SMEs. While these measures are likely to be beneficial, it is important to understand that they are not the core factor driving uptake of DSM, and are not the main outcome of this study.

- provide certainty and consistency for investment (environmental and renewable energy policies, schemes, technology, standardisation for load control, communications, metering)
- increase retail tariff certainty (persistence of tariff structures and rates) over a medium term (~5 years) to support investments in DSM solutions – this may best be achieved by policy to encourage cost reflective pricing at a distribution, and possibly also retail level (note that this may not make DSM more attractive in the short term, but is intended to provide support in the longer term)
- provide clear and consistent (across jurisdictions) rules for tenant access to building infrastructure, or standardised tenant – landlord agreements to provide the same effect
- coordinated national approach to support efficient adoption for businesses with multiple sites
- support technology aggregators to assist SMEs with implementation of DSM – aggregators are likely to be able to reduce administrative and knowledge burden on SMEs, manage risk over a portfolio of projects, capture multiple disparate revenue streams, and manage network support opportunities.