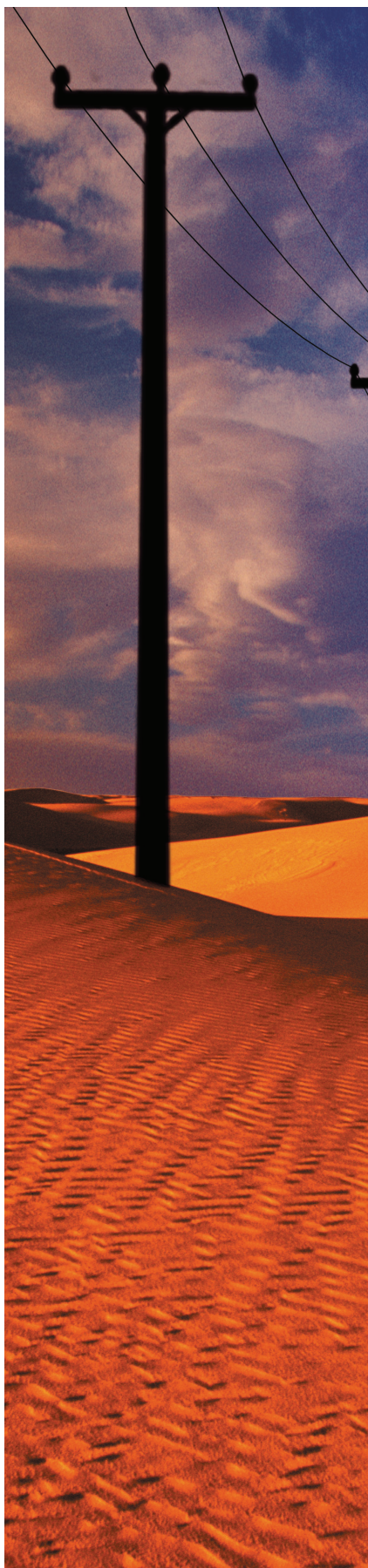


## Residential Energy Management Forum



### **INDUSTRY REPORT**

A report of the REMforum on planning requirements for a successful residential energy management (REM) market in Australia.



## Executive summary

A key consideration for a viable national energy policy is residential energy management (REM). The priority need for successful REM arises due to the high cost of providing electrical infrastructure, energy security, commitment to reducing carbon and population increase. The implications of this major change need to be fully considered in all its dimensions including that part of industry that already provides, in addition to lighting and power, the services of information and communications, entertainment, security and safety, home health, age and assisted living.

The REMforum ([www.remforum.com.au](http://www.remforum.com.au)) was formed by business, industry and government stakeholders to help frame the future developments and requirements of a successful rollout of residential energy management solutions in Australia. The REMforum is sponsored by industry, hosted by The University of Sydney's Warren Centre for Advanced Engineering and facilitated by the Australian Centre for Innovation. In the past year, over 200 representatives from a wide range of organisations have participated in REMforum activities including a series of facilitated workshops.

The purpose of this report is to provide a preliminary sense of the major issues that confront and shape REM from a residential perspective. It is intended to inform industry leaders and all levels of governments and their departments of the need for broad industry and consumer participation as well as the need for proactive management of REM.

### **The REMforum stakeholders propose that deeper consideration be given to:**

- Market structures
- Standards
- Benefits and business case

To facilitate the development of an efficient and viable Australian REM industry the body of this report presents nine key points related to these specific propositions. To ensure that comprehensive benefits are available the following four overarching key recommendations are proposed:

#### **KEY RECOMMENDATION 1**

- *REM planning should be broadly-based, holistic and take into account existing and new contributions from those that provide the services of lighting and power, information and communications, entertainment, safety and security, home health, and age and assisted living.*

#### **KEY RECOMMENDATION 2**

- *There should be oversight of REM by a national body with consumer and broad industry representation, perhaps by an industry alliance.*

#### **KEY RECOMMENDATION 3**

- *Standards, codes of practices, handbooks and consumer guides for the provision of individual and integrated residential services, including REM, should be developed.*

#### **KEY RECOMMENDATION 4**

- *The societal, business and consumer benefits (direct and indirect) of REM should be clearly communicated to all stakeholders, supported by appropriate education programs for consumer and consumer-facing stakeholders.*

## 1. Introduction

Transformation of the energy market, including residential energy management (REM), will impact all Australians. It involves extremely large investments and therefore should be well planned. While there have been many highly publicised initiatives in REM, surprisingly there have been no attempts to take a largely residential centric view which takes into account the substantial industry that presently provides and maintains the services of light and power, information and communications, entertainment, security and safety, home health, age and assisted living.

In response to this situation, the REMforum ([www.remforum.com.au](http://www.remforum.com.au)) was formed by business, industry and government stakeholders to discuss the future developments and requirements of the rollout of REM solutions in Australia. The REMforum is sponsored by industry, hosted by The University of Sydney's Warren Centre for Advanced Engineering and facilitated by the Australian Centre for Innovation. In the past year, over 200 representatives from a wide range of companies have participated in REMforum activities including a series of facilitated workshops. Future deliberations will need to include consideration of the soon to be released ENA paper on energy management and involve collaboration with the NBN, Smart Networks and Smart Metering working groups.

### The objectives of the REM Forum are:

- To foster a REM network to share ideas and experience, provide a mechanism to foster and conduct debate, and plan for the development of a REM industry.
- To pursue 'agreement' between the various players and stakeholders in a potential REM industry over a mutually beneficial pathway to development.
- To raise public awareness of the needs and opportunities for energy management and conservation.

This report contributes to the key objectives of the REMforum by providing a preliminary sense of the major issues confronting and shaping this space. It is intended to inform industry leaders and all levels of governments and their departments of the need for broad industry and consumer participation as well as the need for proactive management of REM. In response to this need, stakeholders have participated in a series of facilitated workshops to provide a preliminary sense of the major issues confronting this market. The findings of this paper are the result of bringing people from across the REM space together to participate in a series of workshops conducted by the REMforum. This report has been compiled from the contributions of governments, academics, researchers, industry and consumer groups. This report is intended to inform industry leaders and all levels of governments and their departments.

This report identifies nine key points directly related to market structures, standards and the benefits and business case. The report also makes four overarching key recommendations with respect to the successful development of the overall market space and these are presented in the executive

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### These objectives are based upon consideration of the following key questions during 5 workshops:

- How quickly is the Residential Energy Management Industry developing in Australia and what is its likely future structure?
- There are a number of alternative technologies available and evolving. How will they co-exist in the market in the future?
- What are the drivers and barriers to sustainable economic Energy Management Solutions?
- Is there a need for a standardised industry approach to this?
- Does the industry perceive a rollout of this Energy Management to the existing 8 million homes in Australia and over what period?

## 2. Scope

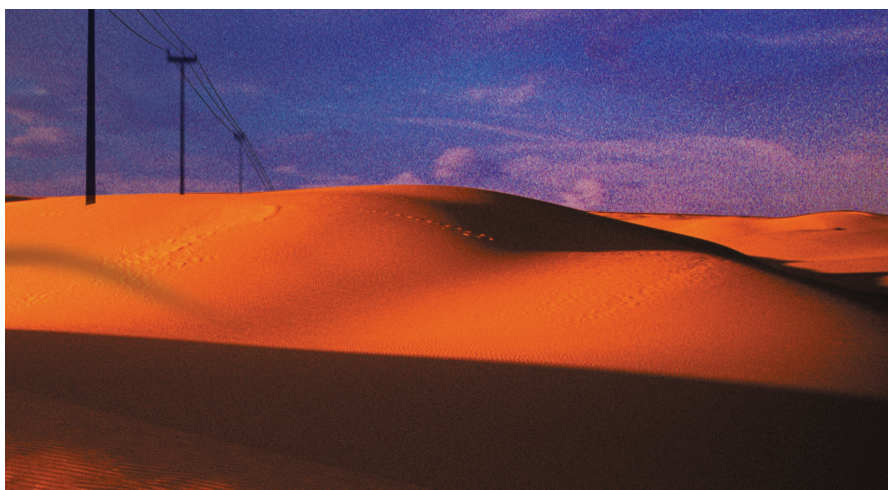
A key challenge in projecting the nature of the future REM industry is the wide range of possible pathways forward. The REMforum has developed its recommendations on an analysis of the key factors driving the REM transformation and their likely consequences:

1. Australia has committed to reducing greenhouse gases and maintaining its current population growth trajectory.
2. Australia has initially responded with energy efficiency, renewables, interval meters<sup>(1)</sup>, market reform, increased prices and a carbon tax is a future strong possibility.
3. The impact of these overarching decisions and responses will include very significant additional transformation of the electricity supply and electricity demand space.
4. Additionally, growth in peak demand is significantly higher than base load growth and is driving Distribution Network Service Providers to implement strategies to mitigate peak load.
5. For the consumer this will mean changes to electricity prices, electricity control/use and electricity availability.
6. For the supply side this will mean greater revenue, different market structure with greater complexity in generation, delivery, customer relations, competition and market operations.
7. This transformation will enable: new and greater opportunities for suppliers; vendors and service providers; and new and greater direct and indirect benefits to the consumer.

A successful REM industry is essential to meet both industry and consumer objectives in the above environment. We recognise that a successful transformation requires careful planning and management. This paper is designed to indicate to all stakeholders what should be done to optimise the outcomes for the consumer and consumer facing side of this market and identify the pitfalls to be avoided.

<sup>(1)</sup>Most meters deployed today are interval meters often called "Time of Use" meters (ToU).

*“This paper is designed to indicate to all stakeholders what should be done to optimise the outcomes for the consumer and consumer facing side of this market and identify the pitfalls to be avoided.”*



### 3. Market Structures

An effective REM industry will require the design of market structures, supported by appropriate technologies and delivery systems enabling consumers to make effective choices and investment decisions in their homes. Market structures typically should include forms of energy efficiency obligations including White Certificates, taxation incentives, subsidies and rebates. A market approach should be adopted with a focus on making the market work to deliver effective services and solutions.

#### This requires consideration of:

1. A holistic approach to energy management, including:
  - a. *The development of REM policy for the building of, and options for, the installation of REM in all homes: Greenfield sites and Multi Dwelling sites (including medium to high-density accommodation) and for retrofitting existing homes in Brownfield sites.*
  - b. *The identification of key players/drivers of the REM industry and how the roles of current players will vary.*
  - c. *If a new sector should evolve - service aggregator or similar - what will it look like and how/should it be regulated?*
  - d. *The creation of commercial/technical spaces that markets can fill via standards, smart meter programs, and others.*
  - e. *The nature and requirements of a domestic market for product development.*
  - f. *Requirements for research and development investment.*
  - g. *Consistency of government policies that are required to enhance investment certainty.*
  - h. *Integration of load control with building fabric (insulation, shading, use of thermal mass etc) and establish genuine benchmarks for energy savings.*
2. Mechanisms that influence residential consumer behaviour, including:
  - a. *The impact of rising energy prices on affordability for residential consumers, the important role of percentage based concession arrangements and the potential national harmonisation of these.*
  - b. *Differentiated pricing and taxing signals – with consumer visibility; i.e. exempt some classes of inelastic energy use (cooking) from time of day tariff penalties.*
  - c. *Targeted education provided by government and industry.*
  - d. *Rewards for customers for connecting appliances in their home to load control solutions; i.e. retailer “pass through” of network charges.*
  - e. *Development of solutions for customer to manage their own energy use by means of setting their own energy use policies.*
  - f. *Development of a better understanding of consumer behaviour categories.*
3. A “war chest” for grants/loans/venture capital to fund/subsidise manufacturer development of appropriate solutions for load reduction, including:
  - a. *Subsidies to industry for energy efficient or demand ready products and services.*
  - b. *Formation or access to a National Distributor group to deliver industry agreed outcomes to promote industry certainty for future appliance manufactures.*

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#### KEY POINT 1:

- *A national holistic REM approach to energy management must be developed.*

#### KEY POINT 2:

- *Meaningful mechanisms to influence residential consumer behaviour need to be developed.*

#### KEY POINT 3:

- *A REM “war chest” of grants/loans/venture capital should be developed to fund and subsidise fund/subsidise manufacturers to develop appropriate solutions for load reduction.*

## 4. National Frameworks

Establishing a national framework of standards, legal/regulatory systems and consumer education is important for the success of the REM industry. The REM space is very complex with many attributes. Home services are provisioned by multiple platforms and systems, capabilities and functionalities supported by a broad range of technologies. The successful convergence of these involves architects, builders, building consultants, wiring contactors, electrical and communications contractors, electronics systems professionals and engineers.

### This requires consideration of:

1. The formation of national bodies responsible for the successful rollout of REM, including:
  - a. *Establishing a body with consumer and broad industry representation to deliver outcomes and promote activities and to ensure international harmonisation.*
  - b. *Establishing a service provider network; e.g. for maintenance contracts on equipment.*
  - c. *Allowing markets to develop specific solutions with guidance and not direct intervention by encouraging best practice before mandatory options are considered. This should include mechanisms to balance leaving developments to the market on the one hand and over-specification and 'picking winners' on the other hand (e.g. through technical standards).*
  - d. *The need for legal/regulatory systems to be continually developed in conjunction with the market as various issues arise; however, some issues such as consumer education should be driven by the market.*
  - e. *Harmonisation across all elements of energy management including structural, noise etc and across jurisdictions; e.g. for air conditioning and roof mounted solar.*
  - f. *Up-skilling of trades-people and/or development of new support networks.*
2. A national framework of standards for REM, including:
  - a. *The role of a national framework of standards in developing an overtly financially beneficial business case for REM based solutions.*
  - b. *Incorporating existing overseas standards into an Australian standard in consultation with national frameworks (such as AS4755 and the Smart Wired Code of Practice for Home Wiring) would contribute to effectiveness of societal outcomes, avoid "rail gauge" issues, enhance business efficiencies, reduce barriers to mobility of solutions, improve customer experience and benefits.*
  - c. *Developing pathways for energy management of priority appliances (e.g. AS4755).*
  - d. *When developing standards, codes of practice and handbooks for residential energy management, all services and supporting systems both in the home and surrounding the home, should be considered and synergies developed.*
  - e. *Clearly differentiating between the requirements of Brownfield, Greenfield and Multi Dwelling sites.*
  - f. *Developing definitions - including what makes products or services 'smart'.*
3. Options to encourage open, flexible and interoperable systems, including:
  - a. *Interoperability across the entire range of infrastructure as a key feature of the future REM space. (For the consumer to have flexibility of DNSP/ Energy Service provider or retailer the platform for communications connection between appliances, Smart Meters, and NBN must be technology independent, reliable, affordable and based on codes and standards. Mandated commonalities must exist between all aspects of the REM network e.g. for electric car chargers, uniform connection standards for "floating" cables to grid, and coordination of charging in a given area.)*
  - b. *Demand response capacity (AS4755 enabled) that respond reliably to simple commands ('turn off', 'turn on', 'operate at half load').*
  - c. *Determining where the intelligence of smart appliances should reside (given the many possible energy delivery and communications pathways into the home).*

#### KEY POINT 4:

- *A national body that is responsible for a successful rollout of REM should be formed*

#### KEY POINT 5:

- *A national framework of standards for REM must be developed.*

#### KEY POINT 6:

- *Open and flexible REM systems must be encouraged.*

#### KEY POINT 7:

- *A range of measures to support the behavioural and attitudinal change necessary to underpin effective residential energy management must be designed.*

4. Provide a range of measures designed to support the behavioural and attitudinal change necessary to underpin effective residential energy management; including:
  - a. Consumer motivation programs that are based upon providing quality information (rather than more information), providing financial incentives and shaping positive attitudes towards change.
  - b. Mechanisms for in-depth consumer engagement (one-on-one education and support).
  - c. Improving engagement in areas where changes are meeting strong resistance (such as the lack of consumer understanding and 'buy-in' with time-of-use pricing)
  - d. Products and services "user guides" for informing consumers of features, benefits, installation and maintenance.
  - e. Building on and extend existing informational schemes that work such as the appliance star rating scheme and the Heart Foundation "Tick" for food. The branding should indicate that products have been tested, certified and branded as 'Smart grid ready' or 'REM ready'. Detailed consideration should be given to the management of such a scheme.

## 5. Benefits and Business Case

Making a clear and compelling business case of the savings to be achieved (at the national and residential level) is important for the REM industry. What would a clear and compelling business case contribute to the REM industry and how would we recommend governments or industry go about achieving it?

### This requires consideration of:

1. Developing a complete holistic set of strategies, including:
  - a. The strategic deployment of public infrastructure – e.g. infrastructure required for electric vehicles.
  - b. Leveraging synergies between different parts of this market – e.g. an energy efficient product benefits both customer and utility.
  - c. Leveraging synergies from infrastructure requirements for different services.
  - d. An integrated approach to energy management – e.g. in multi-unit dwellings using common equipment and services.
  - e. Decoupling schemes that enable utilities to benefit from customer energy efficiency – utility compensation for meeting energy efficiency goals and rewards for exceeding them.
  - f. Modelling over appropriate periods – ten years is the minimum recommended.
  - g. Identifying the role of the grid in the future – including advantages due to economies of scale and the important role of the grid as a means to exchange energy.
  - h. Identifying new commercial opportunities.
  - i. Coordination of all findings from trials etc.
  - j. Research and development capacity requirements.
2. The benefits and long term costs to society, industry and consumers need to be clearly and distinctly made and effectively communicated, including:
  - a. Multiple benefits – e.g. demand limiting is good for both utilities (effective use of assets) and consumers (maintenance of supply in critical times).
  - b. Increased consumer access to benefits realised by the supply side – identify consumer facing benefits.
  - c. Identifying consumer expectations of the market in 10 years.
  - d. The business case that is expressed in terms of national GDP growth, deferred investment in electricity infrastructure (generation and distribution), service provider business, and consumers / households. (An analysis of the national business case for load management is currently being conducted by the Government, and will be available in 2011.)

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*“What would a clear and compelling business case contribute to the REM industry and how would we recommend governments or industry go about achieving it?”*

#### KEY POINT 8:

- There is a need to develop a complete and holistic set of national REM strategies.

#### KEY POINT 9:

- The benefits and long-term costs to society, industry and consumers need to be clearly and distinctly made and effectively communicated.

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## Forum Facilitator:



## Project Facilitator



## Forum Sponsors



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## REM Forum Contacts

John Fennell  
Phone: 02 9380 2000  
Email: jjfennell@copperdev.com.au

Peter Seebacher  
Phone: 02 9484 6434  
Email: pjs@auseng.com.au

## REMforum and report participating companies

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