Ergon Energy Corporation Limited
Ergon Energy Queensland Pty Ltd

Submission on the Power of Choice – Giving Consumers Options in the way they use Electricity

AEMC Issues Paper

Australian Energy Market Commission

August 2011

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1. Introduction

Ergon Energy Corporation Limited, in its capacity as a Distribution Network Service Provider (DNSP) and Ergon Energy Queensland Pty Ltd, as a non-competing retailer in Queensland (together referred to as Ergon Energy), welcome the opportunity to provide comment to the Australian Energy Market Commission (AEMC) on its issues paper outlined in the *Power of Choice – Giving Consumers Options in the way they use Electricity* Consultation Paper (Consultation Paper).

Ergon Energy has structured this submission into the following sections:

- Section 2 provides an overview of Ergon Energy and its approach to demand management;
- Section 3 sets out the key issues Ergon Energy believes the AEMC should consider;
- Section 4 sets out some commentary on consumer protections issues; and
- Section 5 outlines Ergon Energy's detailed responses, in tabular form, to the consultation questions posed by the AEMC.

Ergon Energy is available to discuss this submission or provide further detail regarding the issues raised, or our experience with demand side management should the AEMC require.

2. Overview

Ergon Energy operates in regional Queensland, servicing approximately 700,000 customers in an area covering 1.7 million square kilometres. In seeking to deliver safe, reliable and affordable electricity, Ergon Energy faces a number of challenges centred on meeting customer expectations of service standards, quality and reliability of supply and value for money. Foremost is the need to ensure that electricity and network capacity is available to meet the energy demands driven by the economic and lifestyle aspirations of all customers – residential and business. As a network operator, the management of peak electricity demand through a combination of demand management programs and prudent and effective investment in network assets, and ongoing maintenance, to address regional growth drivers is as critical in operational and strategic plans as network security, quality, reliability, availability and customer service standards. For our retail business, the matters of wholesale risk management, energy pricing, renewable energy targets and ongoing electricity affordability are central to delivering a sustainable and valued product. For Ergon Energy, responding effectively to energy efficiency, energy conservation and peak demand management agendas is considered integral to delivering commercial outcomes and managing risk into the future in an effort to address customer expectations of energy affordability and availability. As such, Ergon Energy supports appropriate changes to market and regulatory arrangements aimed at encouraging customers to minimise their electricity demand, particularly at peak load periods on networks and during times of peak energy prices.

This submission provides a summary of the insights, opinion and learning developed by Ergon Energy (in collaboration with ENERGEX) in driving an energy conservation and demand management agenda, from a Queensland perspective. It should be noted that considerable effort has been contributed to the 'Demand Side Participation' (DSP) discussion by the Queensland electricity DNSPs over recent years. Significant investment in energy conservation and demand management is being progressed by Ergon Energy and ENERGEX with considerable customer and community engagement underway or planned.

The DSP agenda is viewed as a critical part of future energy delivery mechanisms that requires a range of considered interventions to be effective and sustainable, ranging from policy evolution through to responsible customer and community engagement. The combination of tariff reform, market structure, customer, retailer and network incentives, technology application, and more, need to be structured and developed through demonstration of customer and network benefit, better understanding of the economic, environmental and social impacts and effective collation and dissemination of information through knowledge frameworks. The following responses provide insight into current views, trials and strategy but significantly greater consultation with industry is recommended before major change programs are enacted. In particular, exhaustive discussion on the proper market and regulatory requirements to enable and sustain DSP initiatives is a pre-requisite to core decision making.

3. Key Issues

Ergon Energy believes that the key issues that need to be considered as part of any market or regulatory reform include:

- The need for greater sharing of information and data management frameworks to assist customers, networks, retailers, regulators and governments to make effective and sustainable decisions when it comes to energy management action, asset investment, policy development and energy education.

- Ongoing support for, and growth of, load control capability on networks as an avenue to maintain network security, decreasing upward price pressure on network charges, and providing appropriate pricing signals to end customers.

- Understanding that the value chain is not necessarily linear i.e. generator, transmission, distribution, retail, customer. This is increasingly not the case and the implementation of an active DSP market will continue to challenge this assumption. There are a range of participants who can and will offer DSP services, not just the retailer. Further, the assumption of a linear value change devalues the contribution DNSPs can and are making in this space.

- Recognising the differences in regional Queensland and the challenges in providing effective and consistent DSP services to customers. With no regional Australian DSP Market there is a need to consider the operating environment in different parts of the country.

- The importance of delivering value for all market participants in the electricity supply chain. This can be achieved by using DSP programs as an avenue to increase collaboration that benefits end users, shapes load profiles to create optimal asset utilisation outcomes and maintains the competitiveness and viability of the energy market.

- Understanding that disaggregation of the industry into component parts has made it difficult for any one participant in the value chain to deliver the full value chain benefits to customers. Those countries that are making significant in-roads in DSP have vertically integrated utilities that are able to easily capture the full value chain benefits. Any arrangements in the Australian market must endeavour to achieve a similar outcome (with or without vertical integration).

- Understanding and implementation of appropriate risk mitigation, adaptation and premium planning in recognition of the potential for emerging DSP options to carry greater risk in the near term than traditional supply-side solutions. Such risk will relate to electricity reliability, commercial outcomes for participants, emerging technology and customer exposure.

- Regulators and governments should factor DSP risks into current and future legislation considerations, particularly in relation to service standards, to ensure a balance between proven and emerging energy management solutions.

- A need for increasing focus on the value and cost of megawatt (MW) management by customers (and networks) as well as megawatt hours in an effort to extract maximum benefit from the relationship between energy efficiency, energy conservation and peak demand management and to avoid perverse outcomes (e.g. less energy use leading to higher peak demand on networks and reduced network load factors).

- Recognising that DSP options and response to pricing signals should be targeted at both supply and demand side situations with an emphasis on implementing solutions that deliver maximum energy management outcomes for the lowest cost. In establishing a DSP market it is vital that the solutions developed and implemented are as consequence of market-driven response to price signals based on the value of the benefits across the energy supply chain. DSP options should be prioritised based on cost and benefit drivers for industry participants and, ultimately, energy consumers, without bias. That is, if energy conservation delivers the most benefit for the least cost then it should be prioritised in energy policy over less effective, but popular, supply solutions.

- Recognising that the different value drivers of participants in the current market structure, such as 'gentailers', retailers and DNSPs, will require application of a range of DSP options that are beneficial to all participants ultimately. Understanding the impacts of DSP interventions in full is important.

- Network operators (or intermediaries such as energy service companies) are increasingly engaging directly with customers to target DSP initiatives, shape energy load effectively and deliver joint benefits. The role, benefits and impacts on the customer's retailer from these DSP initiatives is a key issue that is increasing in importance. As stated above, the full value chain of benefits from DSP initiatives must be captured so that the benefits can be appropriately shared between participating parties.

- The introduction of appropriate market incentives to encourage technology development by manufacturers and utilisation of emerging smarter technologies by customers.

- Recognition that success of DSP for network businesses is dependent on being able to focus solutions at a granular level on networks to target capacity constraints. As such there can be no 'one size fits all' set of market arrangements, but rather a range of options to be implemented based on opportunities, issues, participants and value propositions.

- The need for cost reflective pricing mechanisms to provide effective price signals to end users in terms of energy costs and delivery costs. Such mechanisms need to address customer diversity in terms of size, financial position and energy awareness, and to be complementary with the DSP options and market incentives developed.

- The importance of conscientious customer advocacy to avoid perverse impacts or split incentives and to enable action by all sectors of the market regardless of industry type, income or cultural differences.

- Continuation and expansion of innovation incentives for network operators to encourage broader research and development of non-network alternatives to energy management, and wider engagement of market participants, manufacturers, research facilities and customers in the testing of emerging DSP options. Continuing evaluation of alternatives and technologies is considered a key factor in successful implementation of DSP programs long term.

- The need to ensure the benefits of DSP programs are passed on to customers through a variety of payment methods, including energy cost reductions, capacity fees and more appropriate energy tariffs.

- A requirement to understand the connection of DSP agendas to potential future carbon price policy and the impact of decisions made in relation to compensation, incentives and regulatory imposts on energy market participants and end customers.

- Managing the transition to broader application of renewable energy on electricity networks through timely and well-measured planning with clear understanding of the linkages to DSP and the role of energy conservation and demand management in 'smoothing' the integration.

4. Consumer Protection Considerations

There are a number of consumer protection issues that need to be addressed in the development of a sustainable DSP framework. While Ergon Energy supports customer protection it recognises the role that government ultimately has in determining appropriate safety nets and customer protection schemes. Consideration must be given to ways to mitigate perverse impacts and hardship for the various customer segments likely to be impacted. Ergon Energy strongly believes there is no 'one size fits all' solution to the demand management agenda and that the range of interventions, information, incentives and innovations likely to be developed will require significant testing for social and business impacts. Social impact assessment will verify and justify financial benefits. Ensuring effective representation of end customer interests, needs and expectations will be a critical part of successful implementation paths for DSP. Factors that need to be considered in evaluating the benefit and practicality of DSP programs include, but are not limited to, the following:

- Achieving equitable participation in DSP to avoid a 'winners and losers' scenario over which certain customer segments have no or little control. This premise is heavily underwritten by a need to develop 'protection frameworks.' Protection frameworks are required to address the potential for vulnerable customers to be exposed to situations where they have no or little control over the type of appliances using energy in their household or the energy intensity of the premises itself. This issue applies to small business operators as well. Use of customer advocacy channels such as Customer Councils, with members from key community and business groups, is seen as a critical part of the consultation and program development process in an effort to highlight the potential pitfalls.

- Ensuring effective and timely access to information on energy efficiency, energy conservation and demand management from a trusted and consistent source. Ergon Energy and ENERGEX are currently conducting customer research to determine the needs and expectations of various customer segments in Queensland pertaining to types of information, detail and availability. This research is an integral input to the development of a joint Energy Information Portal to be fully developed in the current regulatory control period by the two Queensland electricity DNSPs.

- The emergence of third party DSP providers to support delivery of sustained DSP action will require the establishment of effective community and service provider engagement models by distribution businesses. These models will seek to understand and manage the impacts of significant intervention at a network level. The effectiveness of third party activity in a DSP environment needs to be continually measured to verify benefits, effectiveness, regulatory compliance and real cost and savings. Network businesses have traditionally had limited need to develop demand management engagement frameworks with service providers. An effective DSP market may require a range of commercially driven performance parameters to be implemented to effectively value DSP interventions on behalf of customers.

- There will be a range of site specific variables that will determine the ability of a householder or business owner to change consumption patterns. From a residential perspective this includes not only the type and size of premise but the number and age of residents. Cultural differences, health conditions and employment circumstances are also likely to be a factor in the ability of electricity customers to permanently alter their consumption patterns. Consideration will also need to be given to a range of customers in remote locations in Queensland on pre-payment arrangements through card operated meters (this is unlikely to be a unique situation).

- Understanding the cost impacts of key regulatory and government decisions on lower socio-economic groups in relation to technology intervention such as meter replacement on a broad scale across customer bases in an effort to enable or verify DSP programs. This factor has broader implications in terms of being able to effectively explain to customers the need and the short, medium and long term benefits of generic technology and/or service delivery mechanisms. This includes defining and justifying what costs are borne ultimately by customers and how it can be demonstrated to be equitable and justifiable.

- Maintaining the privacy of customer information in the course of delivering broad scale DSP programs through a range of providers is a key component of the success of DSP programs. Data sets such as consumption data and load profiles are potentially sensitive information by virtue of the detail they can reveal in terms of business productivity and household behaviours. Any future DSP broad scale programs need to address customer protection and privacy matters in making critical enabling information available.

Ergon Energy considers it appropriate that consumer protection parameters be included in the proposed future consultation process for the DSP discussion. As both a network and retail business, Ergon Energy needs to deal with a range of customer issues that at times can present a complexity created by the variation in retail and network challenges and objectives. Ergon Energy considers the inclusion of appropriate customer protection frameworks to be a critical factor in developing and delivering DSP. This has been identified through Ergon Energy's own demand management programs and efforts to address the emerging energy affordability pressures for an increasing number of customers.

5. Table of Detailed Comments

Question(s)	Ergon Energy Response
1. Chapter 3 outlines our approach to identifying "market and regulatory arrangements that enable the participation of both supply and demand side options in achieving an economically efficient demand/supply balance in the electricity market." Do you agree with our approach?	In general, Ergon Energy considers the approach being adopted by the AEMC is reasonable. However, we make the following observations: • As discussed in Section 3 above, there is a need to recognise that the value chain is not necessarily linear. • Ergon Energy supports the application of the National Electricity Objective as set out in section 3 of the Consultation Paper, and in particular the assertion that "The optimal (efficient) use of resources from a societal viewpoint will occur when the lowest cost combination of DSP and traditional supply solutions is used to meet demand". • The AEMC must acknowledge that in a disaggregated market there are conflicting drivers for managing peak demand. For example, DNSPs needing to manage localised peak demand whereas retailers being concerned with whole of system peak demand. In addition, some DSP approaches used by DNSPs may involve a reduction in total energy consumption which may be a disadvantage to a retailer. • Clarification of what is out of scope of the AEMC objective for this initiative is requested. The synopsis of the first SRG meetings states that 'nodal pricing, spot/dispatch price intervals and capacity markets are out of scope of this review". This was not noted in Section 1.1.4. of the Consultation Paper. • There is a strong argument for a 'user pays' environment that provides clear pricing signals for energy use behaviour that both assists in reducing peak demand growth (reward) and contributes to peak demand growth (penalty). The underlying drivers of improving network asset utilisation by shaping energy demand on networks are strongly dependent on the development of appropriate technologies, tariff reform, greater customer education and communication, and smarter networks. • Ergon Energy's customer research shows that customers require much greater knowledge of their energy use and DSP options available to them to be able to implement DSP programs effectively. The integration of increased DSP optionality into the electricity market requires customers to be educated, supported, informed and engaged. • It should be noted that DSP initiatives cannot be seen as short term investments and that

	the targeted peak demand reduction of DSP programs on electricity networks may take a number of years to achieve, particularly where there are large numbers of small energy users (e.g. households). Diversity, control and size of the individual loads are key factors. In its examination of market and regulatory approaches, the AEMC should consider the impact of government policy on network infrastructure requirements. For example the large scale connection of Inverter Energy Systems (IES) to the network has imposed a significant cost on DNSPs (and therefore all electricity customers) while the benefits have largely gone to the customers who have installed the IES. Ergon Energy expects the capital expenditure required to manage the impact of connecting large numbers of IES to our network to be significant in this current regulatory control period if current penetration levels are maintained.
2. How should benefits of DSP be measured? Can they be accurately quantified?	There are a number of factors to be evaluated in developing effective measurement and verification capability to adequately value and refine DSP options. Ergon Energy offers the following insights: • The value and the costs of DSP should also be considered in the context of the entire electricity value chain including generators, Transmission Network Service Providers (TNSPs), DNSPs, retailers, energy service companies and customers. • For DNSPs the costs and benefits of DSP should be measured in $/MW (in terms of capital investment deferred or avoided) as networks must build capacity to meet peak demand not the amount of electricity required overall. • The distinction between 'firm' versus 'non-firm' demand reductions is important due to network reliability standards. Non-firm measures will need to include generous diversity factors as networks are required to meet demand on successive peak demand days. • Retailers or other Intermediaries (e.g. energy service companies) can assist by optimising DSP for both customers and DNSPs to ensure both parties' requirements are being met whilst also providing valuable wholesale risk management options. • From a customer perspective, the visibility of kWh and kW reductions achieved as well as the costs and savings need to be readily available and easily interpretable on a customer's bills in an effort to shape customer sentiment towards DSP initiatives. • It is also important to understand where the DSP is measured in relation to the benefit

	that is achieved at various points in the value chain. For example, DSP may be measured at the customer's connection point, but the value may be at the substation, bulk supply point or generator. In undertaking a cost benefit analysis, the benefits available from specific DSP activities can be estimated from what has been achieved in pilots or actual operation within Australia or internationally. For example, with respect to dynamic retail pricing the Brattle group has reviewed 15 schemes and found that "time-of-use rates induce a drop in peak demand that ranges from between three to six percent and critical-peak pricing tariffs lead to a drop in peak demand of 13 to 20 percent"[1].
3. What are appropriate discount rates to apply to DSP investments for the various parties across the supply chain?	The discount rate used by Ergon Energy's regulated network business is based on the application of the Regulatory Test. The commercial rate is calculated annually based on revised market conditions on interest, credit rating, equity betas, tax etc. This is considered an appropriate mechanism for DSP investments. In the long run if the certainty, risks and performance associated with undertaking DSP are no greater than those applicable to traditional network supply options then similar discount rates should apply. However, in the short term DSP risk is likely to be higher and, data availability permitting, a higher rate might be advisable. The discount rate for Ergon Energy's retail business is determined on an unregulated commercial discount rate basis. One source of public information on discount rates for retail businesses are the regulated retail tariff determinations undertaken in different jurisdictions.
4. Are there other issues which we should consider in our assessment process criteria?	There are multiple complexities involved in developing customer-focused DSP solutions to peak demand growth and escalating network costs. Evaluation of the plethora of issues to be managed in implementing DSP requires detailed consultation. Ergon Energy offers the following insights in the interim: • If DNSP's undertake the DSP directly, consideration of operational as well as capital costs is necessary. Operational costs for DSP could potentially be higher than infrastructure maintenance (although more cost effective over the long run) and these must be factored into DNSP regulatory submissions.

[1] "A. Faruqui, S. Sergici, Jan 2009 - Household Response to Dynamic Pricing of Electricity – A survey of the Experimental Evidence"

	• DNSPs will also need to invest in or participate jointly (e.g. with retailers or energy service companies) in trials and pilot studies to test different approaches of engaging with customers to achieve effective DSP. These projects have a higher level of uncertainty than traditional network solutions. These costs (which are likely to be higher than the current Demand Management Incentive Allowance (DMIA) when large scale trials are considered) need to be factored into the Distribution Determination process. • DSP will have differing impacts (benefits or costs) on different parts of the electricity supply chain. Since the industry has been disaggregated, these costs and benefits can be passed through to the system without the full rewards or costs experienced by the DNSP. For example, a DNSP investing in DSP to reduce peak demand will potentially benefit TNSPs by deferring the need for transmission network upgrades. However, the TNSP provides none of the funding to achieve that reduction in demand. In addition, without the option of alternative revenue streams, commercial drivers of a retailer may conflict with a DSP solution proposed by a DNSP. For example, initiatives that reduce total electricity consumption could potentially disadvantage a retailer. Therefore, the inclusion of the retailer into the DSP value chain is critical in ensuring broader engagement in DSP initiatives. • If the customer's retailer is not aware of DSP activities which will influence their customer's load profile, this may result in increased wholesale purchasing costs. • Reduced energy use will reduce liabilities as a result of pricing carbon if the proposed Cleaner Energy Future Plan legislation is passed. Understanding of the linkages of DSP action to carbon price policy response is important, particularly in relation to the compensation mechanisms being considered in the debate around pricing carbon. • As noted by the AEMC, there may be linkages to other pieces of work at both the national and state level and these need to be identified. • Currently, retail price regulation and competition policy is administered at the state level, and each jurisdiction is at different stages of retail pricing deregulation. The AEMC may need to be mindful of these jurisdictional differences and any linkages with other work currently underway at the state level when assessing DSP options for the national market (e.g. the Retail Tariff Reform processes currently underway in Queensland). • The review should be forward looking and attempt to cater for possible developments over the next 10 to 20 years. Such developments may include significant penetration of electric vehicles and greater use of distributed generation. Ergon Energy notes that the

	AEMC's definition of distributed generation does not cover non-registered generation (i.e. <5MW) that is installed and connected to the distribution network for the purpose of providing energy and network support. Ergon Energy queries whether the definition should be expanded to include this type of distributed generation. • Further, the review should not lock in the current paradigms in relation to business structures, but be flexible enough to cater for possible future arrangements. • Growing and maintaining customer engagement and desire to make informed and timely decisions is a key success factor. There will be a requirement for step change in education to bring customers closer to a level of knowledge about what options are available, how and when to engage networks and retailers, and how to take action. Standard sales techniques (Awareness, Interest, Decision, Action) need to be evaluated for appropriateness in engaging customer segments.
5. What are considered the drivers behind why consumers may choose to change their electricity consumption patterns? Please provide examples or evidence where appropriate.	AECOM, in its report on Ogfem trials for the Energy Demand Research Project in the UK[2], used a framework of means, motive and opportunity to report on the results of a number of trials seeking to modify customer electricity use and installation[3] behaviour. Opportunity relates to the specific behaviours that affect electricity demand. Motive refers to incentives to act and means refers to ability, or knowledge to inform action. In terms of motive, research has found people will be inspired to act by specific incentives and rebates, education (including home energy audits), feedback on previous use, community engagement (including through schools) and through the influence of social norms.[4] The drivers of behaviour change are not constant across electricity customers. Smart Grid Australia compares levels of disposable income and desire to act as two core drivers of consumer behaviour and have used these indicators to develop 4 customer segments.[5] The segments are: ▪ Frugal – low income, high desire to act;

[2] AECOM June 2011 - Energy Demand Research Project: Final Analysis.
[3] Installation behaviour refers to a customer installing features in their home that reduce or shift their electricity demand
[4] Jessica Noland, Jessica Kenefick and Wesley Schultz, 2011 "Normative messages promoting energy conservation will be underestimated by experts … unless you show them the data" Social Influence, 6 (3), 169-180
[5] Maximising Consumer Benefits. Smart Grid Australia

	▪ Informed – high income, high desire to act; ▪ Hardship – low income, low desire to act; and ▪ Uncommitted – high income, low desire to act. Recent research by Ergon Energy and ENERGEX highlights that customers are concerned about their electricity costs but are unsure how to mitigate this effectively. The energy demand per kWh has only a weak link to actual usage of different appliances. For example, customers were not aware how much energy their air conditioning units used but all were concerned that they were very expensive to run. Linking the value of DSP action to lifestyle impact and business productivity measures is also a key issue to consider. 'set and forget' capability makes it much easier for the customer to participate but the pricing signal needs to be reflective of the value and impact for the customer, retailer and network involved. It should also be noted that return on DSP investments for customers and access to upfront capital are seen as major considerations in enabling significant action. The following are insights from research conducted by Ergon Energy: • Ergon Energy's research program shows that saving money is key and the primary motivator for most customers to make any changes regarding their electricity usage. This is often done as a result of receiving a high bill, along with budgetary reasons and a desire to minimise what is being spent on household expenses rather than discretionary items or leisure. • Residential customers see energy efficiency as being about both minimising the electricity they are currently using in their home (their initial consideration and is more focused on changing behaviours), as well as how they could change their usage in the future (a longer term consideration, e.g. buying more energy efficient appliances or switching to solar). • Helping the environment is more of a 'nice to have' or secondary consideration for the majority of customers. They want to do the right thing and consider this an additional benefit, but often it is not enough on its own to encourage someone to make changes to their behaviour.

	• In general, people believe that their electricity bill is increasing regardless of their efforts to reduce energy use. This makes people cynical about tips to save energy, especially because their real aim is to save money rather than reduce energy use. This also has implications on their perceptions of Ergon Energy's efforts to help them to reduce their energy use.
6. Chapter 4 lists some plausible DSP options that are currently used or could be used by consumers. Are there any other plausible DSP options currently used by consumers that have not been identified? Please provide description of measures and examples, where available.	The Consultation Paper has identified the majority of commonly used DSP options. However, given current activity in the development of energy storage capability, there may be value in identifying energy storage as a separate DSP activity. Ergon Energy is keen to discuss insights from its own programs further with the AEMC in the detailed consultation phase.
7. Are there any DSP options that are currently available to consumers, but are not commonly used? If so, why are they not commonly used (i.e. what are the barriers to their uptake)? Please provide examples and evidence if available.	The primary issues in terms of application of current DSP options are scale, cost, network and customer benefit (residential and business) and the targeting of initiatives for best effect on networks. A number of initiatives are now being considered as part of the Queensland Energy Management Plan to investigate potential, current barriers and enablers. One barrier that has been identified is the Ring-Fencing requirements that exist for DNSPs. Under the Australian Energy Regulator's (AER) Ring-Fencing Guidelines for Queensland, DNSPs are generally not able to own generation assets within the regulated business. This means that embedded generation is not used as much as it could be.
8. Are there other DSP options that are not currently available to consumers, but could be available if currently available technologies processes or information were employed (or employed more effectively) in the electricity (or a related) market?	Ergon Energy (together with ENERGEX and the Queensland Government) is progressing a number of discussions in this space. Options for consideration include: • Load limiting devices (similar to those used in France and Italy) where a household capacity is set (in KW) and customers are either charged a higher energy rate or appliances are switched off (in a pre-agreed order) until the household demand falls below the agreed / purchased capacity. • Home Energy Management Systems (HEMS) & smarter appliances. This is an immature technology but it is starting to gain some entry positions in marketplace. • Ergon Energy acknowledges that there may be limitations in relation to how much a large number of customers can change when they consume energy. Ergon Energy considers

	that there is significant scope for encouraging customer behavioural change outside the scope of electricity market. Social policies, which may positively impact all social infrastructure could also be beneficial. • The Pacific Northwest National Laboratory, as part of their Olympic Peninsular Project[6], successfully tested the use of automated control equipment responding to real time price signals (at 5 minute intervals) for a range of end use customers including residential (water and space heating), water pumping and distributed generation. The current availability of suitable control technology is uncertain, but is expected to increase in the future if electricity markets in the US and Europe provide this type of price signal. While this technology could be used with any form of dynamic retail pricing, it appears to provide the most relevant benefit when used in conjunction with real time prices. While it is possible to provide real time prices (ex post) to wholesale customers, the requirement to provide similar price signals (preferably ex ante) at the retail level does not exist. • Increasing integration of Demand Response Enabled technology in household and business appliances will provide greater scope for customers to participate in DSP as smarter network technologies emerge.
9. What are considered the relevant market conditions to facilitate and promote consumer take up of cost effective DSP?	Ergon Energy considers that: • Market conditions should provide/facilitate the development of a range of pricing and incentives that can deliver positive outcomes for customers where DSP solutions are utilised (i.e. bill reduction; solar hot water rebates etc). • It is important that market conditions enable third parties to facilitate customer decision making and capture the value of flexible peak demand including: ▪ Customer willingness to apply demand management opportunities; ▪ Market participants being motivated to collaborate by the market opportunities created by this willingness. For example, using direct load control for controlling air conditioning peaks require participation by customers (buy and take up product offerings for demand ready air conditioners), air conditioning installers, electrical retailers, DNSPs and manufacturers; and

[6] Pacific Northwest National Laboratory (DoE) – October 2007 – Pacific Northwest Gridwise™ testbed Demonstration Projects – Part 1. Olympic Peninsular Project

	▪ Market participants, in particular retailers and distributors, willingness to invest in the back office systems required to facilitate the large information flows and sharing requirements demanded by DSP. • In order to increase the penetration of embedded generation to provide network support, greater incentives could be available to customers with embedded generation (available at call) through product offerings that combine the value of generation for network support for a DNSP with the value of energy market price support for a retailer. • Where there are no customers with embedded generation to provide network support, DSP could be achieved by a market participant (retailers, generators, DNSPs etc) owning strategically placed generation. • There needs to be flexibility for DNSPs and retailers to use price signals that reflect the cost of delivering electricity to the customers, including rewards or penalties for usage behaviour during peak times. These signals also require platforms (technology and information) to provide customers with feedback and advice to allow them to effectively participate in 'time-of-use' pricing. It is important that there is recognition in developing cost reflective pricing for supporting DSP mechanisms that cost of energy delivery varies by location across Queensland and that load shapes can vary by region and feeder, making aggregated profiles inappropriate for developing effective price signals. There is considerable work needed in this area to understand the best pricing mechanisms. It is recognised that regulated network and retail tariffs can not be priced to this level of granularity and that other mechanisms will be required to send appropriate price signals to encourage the uptake of DSP (e.g. negotiated contracts between the customer, DSP providers, retailers and DNSPs). • In the future, specialised retail and network tariffs may be required for new technology that will incentivise customer behaviour to allow networks to control the potential impacts of those technologies. For example, electric vehicles could potentially contribute to peak demand reduction and trigger increased investment in the network. If early attention is given to these kinds of tariff products it will condition customers and avoid the emergence of problems as the technology gains momentum. • 'set and forget' DSP solutions that are easy to understand and properly valued need to be readily available to customers.

10. Are there any specific market conditions which may need to be in place to enable third parties to facilitate consumer decision making and capture the value of flexible demand? Please provide examples and evidence as appropriate.	Ergon Energy considers that: • Developing a strong support industry including demand aggregators and energy service companies to accelerate DSP uptake will require a detailed set of performance criteria and measurement and verification (M&V) capability as well a diverse range of regulatory incentives to pursue alternatives to traditional energy solutions. This would include greater incentives to pursue innovation and technology integration (e.g. solar air conditioning). • A market environment that encourages and enables effective sharing of critical data sets is essential. This includes incorporating into government programs, the requirement for data sets related to factors that contribute to energy consumption and load shape being made available to DNSPs as standard where it can be shown to benefit the DSP agenda. Better sharing of information between retailers, DNSPs and third parties to enable the development of innovative DSP products and services should be a key platform of the DSP consultation and development phase. • There is scope for appliance retailers, building companies, and other customer facing channels for products that consume energy, to be engaged strongly on the DSP agenda to ensure consistency of message and integration of DSP objectives.
11. What market conditions (technologies, processes, tariff structures, information etc) are needed, that are not currently employed in the electricity market, to make other DSP options available to consumers?	Ergon Energy seeks to discuss this question in greater detail with AEMC as part of the upcoming consultation process. At a high level, potential market conditions to consider include: • Incentives to promote the development and uptake of new technology such as home area networks (HAN), HEMS and smart appliances. • Pricing or incentives that support the application of smart appliance control either through a HAN / HEMS or direct load control for new appliances that can reduce power use instead of being switched off at the meter box. • Support for development of communications which can deliver an appropriate signalling system to the HAN or HEMS if a direct load control process is not applied. • Availability of firm short-term forward market prices to enable better energy management planning and greater certainty for market participants to pursue DSP at large sites by

	managing consumption and price risk more proactively. • Allowing DNSPs greater influence over IES placement and connection conditions. As an alternative, government rebates could go towards energy storage and smarter inverters rather than just solar panels. This may stimulate the development of microgrids which will take pressure off the grid at peak times and reduce future infrastructure investment. • Future energy delivery models may require a customer to be able to get electrical energy via a number of parties for the purposes of a DSP solution. Currently, the market is based on provision of electrical energy through a single retailer. This may need to change in the future with increasing emergence of alternative energy models including electric vehicle charging and battery storage to allow for multiple party arrangements for customers. This is similar to the telecommunications model (e.g. phone, broadband, entertainment). This increases options and value propositions for customers but still allows for bundled services from a single retailer. • Tariff reform in Queensland is expected to result in the introduction of Inclining Block and voluntary time of use tariffs in 2012, the maintenance of load control tariffs, and the removal of Large Customers (>100MWh pa) in South East Queensland from access to regulated retail tariffs. In the future, it could also send more appropriate network signals to customers if there is corresponding metering available and suitable regulated retail tariffs.
12. Do you consider retail tariffs currently reflect the costs to a retailer of supplying consumers with electricity?	The Queensland Government has recently instigated a tariff reform process to improve the 'cost reflectivity' of regulated retail tariffs in Queensland from 1 July 2012. This process is largely as a result of findings from the Queensland Competition Authority 2009 Review of Electricity Pricing and Tariff Structures which identified that the regulated retail tariffs in Queensland were not cost reflective, and that prices should be rebased and more closely aligned with the structure of ENERGEX's network tariffs.

13. Are any changes needed to retail price regulation to facilitate and promote take up of DSP?	Retail price regulation and competition policy is currently administered at the state level. As such, the AEMC will need to be mindful of a difference in retail price regulation across jurisdictions and the potential for the states to be at different stages with respect to retail pricing regulation. In Queensland, there is already significant retail tariff reform work underway on regulated retail prices to try to encourage more DSP. For example, the introduction of new inclining block and voluntary time-of-use tariffs for residential customers from 1 July 2012 is expected to provide non-market residential customers with improved price signals about their impact on the network. Many second-tier retailers in Queensland currently offer market contracts to residential customers at a discount to the regulated retail tariff. Should this continue, the retail reform process should also benefit sending improved price signals to market residential customers. While Ergon Energy agrees that customers should have a choice of how they manage their electricity and costs it cannot be done in isolation of the technical constraints of the distribution network and the matter of equity issues between customers that are neighbours or in the same area or business segment. Customer choice is preferred. However, if allowing an increased range of tariffs or embedded generation results in an increased cost of supply, it may not be the most economically efficient goal to have DSP. There needs to be extensive evaluation of available DSP options to avoid perverse outcomes such as major reconfiguration of networks to accommodate change. A precedent condition is that network tariffs are appropriately priced for the asset value (and also the peak demand removed or avoided) and then passed through by retailers to ensure price signals are not lost.
14. Do the charges to retailers for use of transmission networks reflect the value of that use?	Ergon Energy passes through Transmission Use Of System (TUOS) charges to customers as cost reflectively as possible, and has designed its tariffs in a transparent manner, to ensure customers (and their retailers) are able to see the TUOS component of their total network use of system charge, and the pricing signals inherent within them. Ergon Energy considers that as long as it continues to be the DNSP's responsibility to recover Distribution Use Of System (DUOS) charges from customers, it is the DNSP who is

	best placed to determine an appropriate methodology for how transmission related payments it incurs are then calculated and passed onto customers.
15. Do the charges to retailers for use of distribution networks reflect the value of the use?	Under the current regulatory framework, the DNSP is responsible for designing network tariffs which send appropriate signals as to the cost (and value) of distribution services in accordance with Chapter 6 of the National Electricity Rules (the Rules). Distribution charges make up the largest portion of the cost to supply electricity to a customer. Distribution charges are generally set to reflect the customer's use of the network as a net load consumer and at a price that recovers the efficient cost to run the network. Under current arrangements, a DNSP must demonstrate that its tariff classes, tariffs and charging parameters meet various 'tests' in Chapter 6 of the Rules in its Pricing Proposal to the AER. These 'tests' have been designed to ensure network tariff structures are developed with regard to key economic concepts (such as stand alone cost, avoidable cost and long run marginal cost) as well as acting to constrain the level of distribution price increase to be experienced by end-use customers. It is important to note that these 'tests' predominantly focus on tariff classes, rather than on individual network tariffs. This means that DNSP's have some level of discretion and flexibility in allocating their allowable revenue and designing their network tariffs, provided that requirements of Chapter 6 are still able to be satisfied. It is also important to note that different DNSPs may have different load profiles, cost drivers and therefore demand issues on their network. Therefore, to ensure effective DSP any distribution pricing rules embedded in the regulatory framework must be flexible enough to allow DNSP's to design and send their own price signals to customers (and retailers) to manage demand on the network.
16. Do all consumer groups, including vulnerable consumers, benefit from having cost reflective prices in place? If not, are any special provisions required to protect certain classes of consumers?	Cost reflective pricing will be an important element in implementing demand management programs. However, the opportunity for a customer to benefit from cost reflective pricing is dependent upon their ability to change their usage patterns or moving appliances with a 'heavy' electricity demand to demand controlled tariffs (or similar). There are a number of factors to consider in determining mechanisms to 'protect' vulnerable customer groups. As each jurisdiction is at different stages of retail pricing deregulation and has different levels of competition, there will be a diverse range of customers who may be vulnerable to the introduction of cost reflective prices. In Queensland, there are already a range of public policy initiatives and subsidy arrangements in place, some of which are intertwined with the

	regulated retail prices (e.g. Community Service Obligation payments to Ergon Energy Queensland for regional customers, and other electricity rebate schemes for particular classes of customers). Any special provisions required to protect certain classes of customers are therefore best assessed by those responsible for retail pricing regulation and competition policy in each of the respective jurisdictions. Notwithstanding, Ergon Energy considers any outworking of social policy issues to address vulnerable consumers should be through specifically designed subsidy programs provided by a government rather than through a cross-subsidisation process within the regulated retail tariffs. As an economic principle, it is important that the cost of supply be accurate to drive appropriate investment in the network. This generally requires a trade-off between recovering the customer's fair use of the network (compared to other customers) and also signalling where constraints are emerging in the network. These may be inversely related in that the lowest cost network is one that serves a large number of customers and is fully loaded most of the time. This is also the area that needs investment (either an increase in capacity of the network or a reduction in local loads) to relieve constraints on new customer load connecting. Vice-versa, the most expensive networks to connect are those that serve sparse areas and customers need to have long network extensions, although there may often be capacity available in the network for the additional load. Vulnerable customers and other social and political outcomes should be separate and transparent as any distortion to the market will result in inefficient investment. Vulnerable customer classes will need to be clearly defined through policy. This matter is relevant to residential as well as business customer segments. Protection of vulnerable customer segments can be tested in DSP trials. The Northern Territory Government has incorporated cost reflective trials as part of the Alice Springs Solar City program with specific focus on 'at risk' residential customer groups. As a general economic principle there should not be artificial provisions put in place and embedded in the distribution or retail prices. Any such distortions will reduce the economic efficiency.
17. To what extent do consumers understand the how they can reduce their electricity consumption and hence bills?	As tariffs become more complicated (e.g. time of use, block tariffs) and the dynamic nature of a customer's house load/embedded generation is increasingly factored into decision making, the requirement for information to allow customers to take effective action becomes greater. There is a risk that customers will not know how to manage available information to the best effect.

	Ergon Energy offers the following insights from its residential customer research program:
	
	• Energy efficiency is becoming a higher priority for customers as electricity prices increase and is more top of mind for many. Most residents are trying to cut down all their household expenses (particularly electricity). However, while many say they are willing to consider other ways of being more energy efficient, there are a number of potential barriers that may need overcoming.
	  ▪ Lack of information/knowledge. Customers are not aware of all the ways they can save energy and particularly be more demand conscious;
	  ▪ Lack of time to look for other options. Customers feel they do not have the time to search for this information or don't know where to start;
	  ▪ Customers already feel they are doing all that they can. Customers feel they have already made changes but haven't seen an impact on their bill and/or they don't know what else they could do; and
	  ▪ Upfront costs outweigh the long term savings. Customers believe the cost of things like buying new more energy efficient appliances or solar initiatives are too expensive and not worth the incremental savings.
	• A sizeable proportion of residents are currently in the action/maintenance stage for many energy efficient behaviours (such as using a clothesline, ensuring dishwasher/washing machine is full, setting the air conditioner to the appropriate temperature, installing water efficient shower heads and ceiling insulation). That said, there is still some room for improvement in terms of making these behaviours more regular i.e. shifting from action (do sometimes) to maintenance (do all/most of the time).
	• The behaviours that still remain to be moved through the behaviour change continuum are typically more costly to change (both in terms mental investment and actual financial outlay) and have been considered and rejected by a substantial proportion of Queenslanders. It will therefore likely take time and effort to change these behaviours and slower/more limited progress can be expected for these behaviours particularly if there is no financial incentive/rebate.
	• While some residents need reminding about some of the ongoing behaviours, they are also looking for new ideas and tips of how they can save money on their bill, particularly if they have been making changes to their behaviour but are not seeing their bill reduce.

18. What issues are associated with provision of existing information in the market? Are there arrangements that could improve delivery of such information? If so how and by whom?	• Privacy and the use of normative messages are important considerations for the AEMC and market participants (i.e. comparing customers' bills to highlight exemplary energy use behaviour). • Mechanisms to reach the customer are varied and there is considerable diversity in how we deliver messages to customers. Some will only respond to a minimal amount of communication (too much is overload), while some prefer greater levels of engagement.[7] The regulatory framework needs to recognise the importance of sufficient investment in communicating with customers through a broad program of approaches. • Ongoing community engagement is a critical factor in supporting marketing messages and ensuring the sustainability of behaviour change.[8] This requires a stable and long term funding foundation. • There needs to be greater collaboration on the development of energy messages in relation to energy efficiency, energy conservation and demand management in an effort to create simple and effective messages that help customers understand the relationship between energy cost and how they use energy in their homes and businesses. • Ergon Energy considers there is a large amount of poorly considered energy information in the market place (and in some cases misinformation). Effective collaboration between market participants, regulators, peak bodies and governments can go a long way towards resolving this issue and providing consistent and simple messaging. However, it is important to consider the length of time that DSP communication campaigns need to run to ensure measurable impact. Ergon Energy's research program shows that: • Very few customers indicate they would proactively seek information about energy efficiency without looking to fill an underlying need or specific issue. Residents do not want to spend time searching for such information unless there is a benefit for them. Most customers are motivated to seek information in a reactive sense, often underpinning a desire to reduce the size of their electricity bill (financial reasons), rather than

[7] " A. Faruqui, S. Sergici, Jan 2009 - Household Response to Dynamic Pricing of Electricity – A survey of the Experimental Evidence"

[8] Ibid and John Steen and Tim Kastelle, 2010 'Townsville Queensland Solar City: New Directions for Ergon Energy in Innovation and Business Models'. Technology and Innovation Management Centre, UQ Business School, University of Queensland

	proactively wanting to become more informed in this area. • Home renovators/builders/buyers are more likely to be proactive in their search functions, as this forms part of a wider opportunity to make changes and improve energy efficiency. • A lot of the learning and information taken in by people regarding energy efficiency and savings is subliminal. Many are unable to pinpoint certain sources they received each piece of information from, but it gets soaked up incidentally. Frequently mentioned existing information sources include word of mouth, ingrained learnings, marketing material, media, Climate Smart Home Service, tradespeople and online sources (general Google search, government websites, energy provider websites). • Customers indicate that online sources offer a number of advantages over other information channels, in particular the ability to access a broad range of current information quickly and easily from multiple sources. A downside of online sources is that there is a lot of information out there, and customers find it hard to know or decide which websites and information to trust. Questions that residents ask in this regard are: ▪ How do I find what is relevant to me and my situation? ▪ How can I be confident in the source of information? ▪ How much will I have to trawl through to find the answer? • For any energy efficiency information to offer value and relevance, it's important to keep in mind the following: 1. Be impartial. Information should give the whole picture (showing both the good and bad points of different information areas, programs and tips) and be impartial to a degree. 2. Provide new information beyond the norm. Go beyond the simple tasks and changes that customers already do and know about, and tell them something new (both in terms of information / understanding, and changes they can actually make). 3. Deliver regional relevance. Customers want the ability to split insights and information by region to make the information even more relevant to them. 4. Relate back to why energy companies want customers to reduce consumption. It is important to explain why we are asking customers to reduce consumption i.e. the benefits to both them and Ergon Energy.
19. Could better information be provided to consumers	Many customers are attempting to reduce their energy costs in one way or another. However,

regarding the actual consumption of individual appliances and pieces of equipment? If so, what information could be provided and in what form?	their general knowledge about where to make cuts (and for residents, how much energy each appliance uses) is limited overall. For business customers, the issues are just as relevant but vary dependent on the type of business and the energy intensity of their processes. As previously mentioned, people are tending to take on the higher profile, largely well known actions and generally those with no or a low upfront cost (e.g. turning off lights when not in a room or switching to energy efficient light bulbs). Presenting new, interesting and relevant energy efficiency advice, as well as providing information on approximate dollar savings (rather than specific appliance wattage, kilowatt savings or greenhouse gas emission savings), considerably aids in increasing the likelihood of behaviour adoption. Over the last few years, Ergon Energy has extensively and regularly communicated to customers regarding the large energy consuming household appliances and how to reduce the costs of these (i.e. pool filter, air conditioner, hot water systems, and refrigeration). The major source for this information has been via the newsletter sent along with the bill (the Wire), and via the additional bill page containing benchmarking information. In addition, Ergon Energy frequently provides information through making comparisons i.e. contrasting the electricity costs of a non energy efficient house with an energy efficient one. An energy information website providing a single reference point for demand management and energy efficiency information for Queenslanders would also be of benefit. The main draw card is the 'one stop shop' positioning and having a single, central source of quality information that is credible, accurate and trusted, with a Queensland focus (relevant). Ergon Energy and ENERGEX are currently working jointly on the development of an energy information portal for Queenslanders, to provide a definitive source of reliable information about the relationship between energy conservation, energy efficiency and demand management. The portal will give consumers Queensland-centric information about the actions they can take to reduce their energy costs and energy infrastructure costs both now and into the future.
20. Are retailer and distributor business models supportive of DSP?	Current retailer and distribution business models have mixed messages for customers. For example, consumption (kWh) is a clear issue for customers but peak demand (kW) is the main issue for distributors. An improved business model would align consumption/energy savings for customers with peak demand reduction for distributors and improved price hedging controls for retailers.

	Distribution business models are not currently designed to be particularly supportive of DSP due to the jurisdictional and legislative requirements on the DNSP in relation to reliability of supply and the inherent risk associated with the use of some DSP options. Ergon Energy considers that there needs to be a greater understanding of the DSP issues associated with the management of retailer/generator business models and how these parties interact with the DNSP and whether there are any issues with competing objectives. For example, demand management for retail hedging versus network support and the issue of energy conservation versus maximising revenue through selling electricity. There needs to be significantly more research in this area to determine if there are insurmountable clashes of business objectives. In addition, there is the issue of investment in DSP and who benefits. For example, will DNSPs fund DSP while retailers benefit and should retailers, generators and transmission providers contribute to DSP investment where it can be demonstrated that they also benefit? There needs to be a strong focus on avoiding duplication of investment in developing a business model for DSP that addresses the needs and expectations of all stakeholders, including customers. For example, back end systems to manage data and communications systems have the potential to create significant investment requirements for distributors and retailers and would benefit from strong design and development collaboration.
21. What incentives are likely to encourage research and development of other parties to promote efficient DSP?	Ergon Energy has encouraged research and development (R&D) by private enterprise by co-investing (and sharing risk) with those partners and actively trialling their technology. This should be encouraged potentially through an increase in the DMIA. Examples of Ergon Energy's activity are available to the AEMC on request. Providing long term certainty in terms of incentives is important, given the risk profile of R&D activity, in an effort to provide market confidence in the commitment to the development of quality DSP options. There is validity in considering a range of incentives for third parties to develop products and services that address peak demand challenges for networks through removing, reducing, or shifting load either permanently or 'at call'. This could include focusing incentives on: • The development of better network integration technologies that connect third party assets to network assets for the purposes of shaping load. For example, smarter inverter energy systems with integrated storage capability for use on Single Wire Earth Return networks.

	• Manufacturing of more demand response enabled high efficiency appliances for use in commercial and industrial applications as well as residential premises. • R&D tax breaks to complement existing government grants and funding programs. Similarly, tax benefits for companies that apply DSP technologies that are shown to deliver significant cost and performance benefit in terms of reductions in energy consumption and demand should be considered. • Funding universities to provide technical and measurement support to real DSP development streams within private and public enterprise.
22. Are there any regulatory, cultural or organisational barriers that affect take up of DSP opportunities?	Ring-Fencing of information between retailers and networks can make using embedded generation difficult when it comes to understanding the best operational solutions for distributed generation. This is similar to the misalignment of the pricing signals from retail and network perspectives. There may also be some reluctance within distribution businesses to have generators embedded in some parts of the network for DSP due to safety and protection concerns without significant governance and agreement process in place. Ongoing testing of solutions and measurement of results to address these and other concerns will be required in the near term. Internal systems need to be fully developed to ensure DSP initiatives are considered equally with traditional network solutions. There will be issues with certainty of performance delivery in the short to medium team making measurement and verification practices a critical function of a broad DSP program. All interventions will need to be demonstrated not to create potential safety issues or increase future network capital and operating costs. Many DSP options carry a greater risk than traditional supply side solutions in relation to reliability, commercial and technology risk. The higher level of uncertainty of a demand reduction result needs to be taken into account. Customer behaviours represent both enablers and disablers in the development of a successful DSP program. Expectations of energy availability impact the ability of networks to shape load in key periods of a day unless the act of load shaping is 'invisible' to many customers and the solution is 'set and forget'. Load control on hot water represents a successful application of load shaping without impacting customer expectations (for hot water) in Queensland. The DNSPs are now trying to replicate this success with cycling

	compressors in household air conditioning and pool pumps in trial situations. In a disaggregated market, the ability of retailers, distributors and customers to be fully aligned on the energy agenda can be significantly impacted. There will need to be significant attention given to aligning the cultural differences of organisations and addressing disparity in business drivers. How customers perceive value will also impact the equation (i.e. lower energy costs, free or reduced cost product, availability). Regulatory treatment of small (<5MW) distributed generation systems that could be used for network support in order to delay network augmentation in the future needs to be evaluated. This is particularly in relation to DNSP ownership of the generation and allowing these installations to access the full value available via the value chain. The treatment of energy storage technology also needs to be considered in determining the DSP options available to network businesses into the future. Pricing signals and cost recovery mechanisms in tariffs will need to reflect true costs and benefits in the energy supply chain. Arbitrary setting of tariffs to provide discounts to customers without corresponding value in cost reductions for energy generation and delivery should be avoided. Current legislative requirements on DNSPs need to be reviewed to provide greater incentive to deploy DSP whilst recognising the risk associated with implementing non-network alternatives to avoid network augmentation. The success of DSP intervention will hinge strongly on the ability to maintain customer comfort and energy availability expectations in households and productivity of the business sector whilst reducing peak energy demand and overall consumption. DSP options which require significant variation in customer practices are likely to meet with resistance as will DSP solutions that require customers to significantly invest in the upfront capital for a long term return. Commercial imperatives to produce or generate DSP opportunities for customers (e.g. product development by manufacturers and other third parties) will require significant market offers to encourage customer take-up across the residential and business sectors. Without commercial drivers with clear market signals, manufacturers in particular are not keen on increasing R&D costs. Importantly, the vast majority of appliances are manufactured

	overseas, making changes to product design and energy management capability difficult just for the Australian market. The use of regulation is considered an important vehicle in managing the development of DSP enabled, 'energy smart' appliances (e.g. the mandating of AS4755.3.1 compliant air conditioners).
23. What forms of commercial contracts/clauses are required for facilitating and promoting efficient DSP?	There will be a range of risk parameters and performance criteria to factor into the necessary contracts with customers and third party DSP providers to ensure value and risk are properly allocated. Considerations include: • Benefit sharing – defining how DNSPs share the benefits of DSP with customers and other third parties involved (including retailer, energy service companies etc). • Ensuring DSP providers guarantee certainty of demand reduction when required through the contractual arrangements to avoid payments for DSP solutions which do not deliver on network performance and energy pricing drivers. This requires detailed measurement and verification clauses in contracts with customers and DSP providers. • Defining the relationship between networks, retailers, customers and DSP providers, and ensuring contracts accommodate action for variation from the respective responsibilities. • Being able to structure contracts in such a way as to allow network operators to easily compare DSP deliverables and risks with traditional infrastructure solutions, and to structure compensation appropriately. It is important that contracts do not see all DSP options as equal.
24. Are there specific issues associated with investment in infrastructure that is needed for consumers to take up DSP opportunities?	Ergon Energy considers there are a number of factors to be considered in terms of developing and targeting DSP incentives. These include: • Reviewing the cost structures for network connection of customer owned embedded generation to be used for network support under contract. • Understanding and valuing investment in 'smart-grid' technology by network businesses to enable effective integration of non-network alternatives (supply and demand side) to deliver sustainable peak demand management solutions. This understanding is necessary to inform regulators and governments as to the impacts, benefits and costs of DSP interventions and the necessary changes to legislation and regulation to accommodate effective implementation. This includes allowance for an appropriate level of return for DSP options.

	• Improving knowledge of how energy is being used by customers and the appliances installed at premises in an effort to better understand the influences on total energy requirements and the ability to shift loads outside of peak periods. This can be achieved through a combination of metering and information gathering from customers when applying for electricity connection. Information on other energy sources and potential for energy exports (e.g. distributed generation) is also important. • All participants in the energy supply chain, as well as customers, will be keen to avoid long lead times on DSP projects and excessive pay back periods on investments. • Understanding, and addressing the challenges for customers of 'up front' capital costs and the price differentiation between energy inefficient appliances and more sophisticated, higher efficiency, DSP-enabled products that deliver significant energy cost savings and network cost benefits over their lifetime of utilisation at the customer premises. Focusing on the return on investment equation for customers in making DSP investments is paramount.
25. Do you consider that the issue of split or misaligned incentives has prevented efficient investment in DSP from taking place?	Ergon Energy considers that split or misaligned incentives have prevented broader application of DSP solutions in the electricity market to date, with limited focus on reducing peak demand on electricity networks. Energy efficiency programs have focused on energy cost and emissions reductions in terms of total energy consumed and provide little incentive for customers to avoid energy use in peak periods on the network. Importantly, the gap between network and retail pricing drivers creates a situation where energy demand on constrained network feeders may not align with the peak energy pricing and hedging challenges of the retailer. Further, customers have limited real pricing signals and behavioural incentives to influence how they use energy other than the size of their bill. Examples of misaligned incentives include: • Owners of rental properties being driven by the capital cost of building development and maintenance, giving renters limited influence over their ability to shape their energy profile other than energy conservation and energy efficiency of small appliances. This issue is just as relevant for businesses renting premises with inefficient cooling, heating and lighting installations. • Networks needing to deal with peak demand at feeder and transformer level while retailers focus on aggregated off-peak, peak and shoulder pricing frameworks set by periods in the day. Consequently, the incentives for both to pursue DSP do not always align due to variation in the pricing signals and the available solutions.

	• High network connection costs for small distributed generation (<5MW) limiting availability of customer embedded generation for network support. Similarly, the benefits of heat recovery as a by-product from industrial operations is not promoted as a viable alternative to using electricity from the grid for heating purposes due to cost and lack of incentives. • Appliance manufacturers (residential and industrial) having little incentive to invest in improving the efficiency and energy management capability of their appliances over cost reductions and product features. • Appliance retailers promoting product price over energy efficiency and long term cost benefits. • Renewable energy generation feed-in tariffs encouraging the shifting of customer loads into afternoon and night time network peaks in an effort to realise maximum income from incentives that exceed the current delivered costs of electricity to homes and businesses. • Doubling of incentives to particular solutions as a consequence of separate state and federal programs to the detriment of other DSP options or leading to short term programs because of cost. • As discussed above, the disaggregation of the industry has resulted in no one entity being able to identify and capture the full value chain benefits of DSP.
26. What are potential measures for addressing any issues associated with split or misaligned incentives?	Ergon Energy supports consideration of: • Measures that place a higher value on pursuing peak demand management to the benefit of all participants in the supply chain, in an effort to deliver DSP initiatives that reduce energy consumption and peak energy demand at feeder level congruently through incentivising the right behaviours and interventions. • Encouragement of energy management solutions targeting the best utilisation of electricity assets, rather than simply focusing on electricity sales and energy market price risk. This would focus on developing a range of incentives for market participants (including new parties) to deliver DSP solutions that maximise the cost/benefit equation for customers and networks without negatively impacting performance and comfort. • Development of a value that can be used in business cases to reflect the economic value within the entire value chain in providing benefits to customers yet allows DNSPs to recover their appropriate costs.

	• Regulatory arrangements that incentivise network businesses and retailers to adopt a different perspective to energy risk and development of customer products and services. • Acceleration of smart grid technologies, such as energy storage and information sharing capability, through regulatory support as network trials progress and prove a value proposition for customers (either in terms of greater capability to respond to pricing signals or improve the efficiency of network and DSP solutions).
27. Are there specific issues concerning ease of access to capital for consumers and other parties?	Cost of capital funding is a major factor in achieving sustained implementation of effective DSP solutions. Adoption of DSP options will depend to a large extent on the risk profile attached to the investment. Consequently, there is potential for capital providers to require more of DSP solutions than traditional investments in relation to returns and warranty in the near term. The introduction of complementary funding streams, regulatory support and risk mitigators (e.g. energy management reward and recognition schemes) to increase the attractiveness of DSP to investors should be evaluated. Other factors to consider include: • In terms of businesses investing in technology, generally electricity usage is a small proportion of their overall costs and funding other business improvement initiatives often receives a higher priority. Access to lower cost funding for implementing DSP features may improve their adoption by the commercial and industrial sector. • Payback periods for investing in DSP can be longer than the time generally specified for other investments by end energy users. To counter this, governments may need to consider the introduction of additional incentives such as tax breaks for DSP investment. • The energy services market is relatively immature in terms of the number of DSP providers. Consequently, customers and networks are limited as to the number of third party providers and the qualifications of those providers, to deliver sustainable and low risk DSP options in the near term. The AEMC will need to consider the introduction of appropriate investment protection mechanisms, including pre-qualification of service providers, in an effort to give greater investment confidence. • Leveraging existing DSP capability such as the Audio Frequency Load Control systems utilised traditionally in Queensland for electric hot water (primarily) and ensuring that investment in DSP technologies encourages optimal utilisation and development of capability and is not driven by incentives to invest in technologies on an adhoc basis.

28. What are the significant energy market challenges in optimising the value of technology and system capability to facilitate an efficient level of DSP?	Ergon Energy considers that an efficient level of DSP requires price signals that accurately reflect the customer's consumption of both energy (MWh) and network service (MW). The energy price signal should reflect the availability of energy at any point in time and the network price signal should reflect the availability of network service over the longer term, particularly investment in peak demand capacity. The challenges in optimising the value of technology and the system capability needed to facilitate broad efficiency of DSP intervention include: • Maintaining energy affordability for customers as a central driver for DSP activity. • Addressing the relative immaturity of 'energy smart' technologies and the limitations of current understanding of how best to integrate these technologies into energy networks and customer installations to deliver the most cost effective outcomes. • Lack of investor certainty in technology capability and application of DSP business models in the near term. Concerns over stranded asset due to uncertainty as to the evolution paths for DSP and associated technologies is a real factor that needs to be addressed. • The need to understand the various customer drivers for participating and paying for DSP options. It is considered there is no generic solution and that, outside load control of specific appliances such as hot water systems and pool pumps, the required DSP implementation model will require significant diversity and flexibility across technology, pricing and application based on the targeted customer segments. Ergon Energy and ENERGEX are conducting significant trials in this space for the residential and business sectors currently. • Being able to demonstrate that DSP intervention (and investment in associated technologies) is a better investment than traditional energy delivery methods and that the associated costs, particularly with providing information infrastructure to manage increased data requirements, are warranted and defensible. • Understanding and optimising the collective capability and diversity of DSP solutions and technologies to deliver a broad range of benefits, in multiple customer segments, is seen as a key challenge. In implementing DSP programs it is important to be able to achieve maximum benefit from investments in terms of customer acceptance, return on asset, application and impact, and to avoid perverse impacts created by disaggregated planning and investment frameworks.

	• Effective integration of DSP solutions into network planning, design and operational frameworks to ensure continuing energy security, quality and reliability, and achievement of customer expectations in terms of energy delivery.
29. Do current technology, metering and control devices support DSP? If not, why not, and what are considered some of the issues?	The primary technology employed by Ergon Energy to assist consumers in DSP is a dynamic load management system utilising ripple control. In addition, we have a small number of locations with a static control device such as a time clock. Both technologies switch a selected or entire load circuit on or off in response to the needs of the DNSP, without intervention by the customer. These technologies work well within the existing regulated retail prices. Queensland customers have embraced the opportunity to participate in demand management activities. Apart from receiving an economic incentive, many customers would be unaware of this service delivery as the impact of control activities is largely invisible. The greatest example of this is storage hot water. Ergon Energy note that a key assumption behind this review is that customers will always make the best decision to actively participate based on the prices they face and the available technology. Current technology goes some way to supporting this need. However, as new appliance technology becomes available the requirement for more complex control solutions is becoming evident. Current DNSP metering and load control systems are very simple and do not provide real-time feedback to the customer. To effectively participate, a customer must know the retail price and their immediate capacity to curtail or defer energy consumption. First generation customer DSP technology is beginning to emerge under the collective name of HANs. While smart meter load limiting capability exists (i.e. setting demand limits on energy consumption) it has not been priced into energy tariffs or implemented in an Australian jurisdiction to date. This capability can assist in helping customers better understand the financial impacts of energy demand on networks and the delivered cost of electricity. Many customers with appliances utilising current technology have been unable to participate in traditional on/off control. For example, who wants their washing machine to be switched off immediately after the bleach has been added to the wash? Customer appliances are starting to be manufactured with the capability to respond to curtailment requests. However, this technology is still in its infancy and there is a long way to go before there is a suitable domestic control system with a user friendly interface. Current technology does enable DSP to some extent, but smart grid technologies should have the capability to send a control signal

	to each Internet Protocol (IP) enabled device and this provide an opportunity to improve the timing, location and granularity of the DSP solution.
30. How can issues relating to weak and/or split incentives be addressed to ensure that the benefits of smart grid technologies are aligned and felt across the electricity supply chain, including by consumers?	Ergon Energy considers that there is a need to ensure that there is a supply chain approach to the introduction of DSP market frameworks. Further, the costs and benefits of DSP intervention need to be well understood, particularly in terms of who extracts the value and who adopts the risk associated with implementing non-network alternatives. This includes making investments in smart grid technologies that lead to better energy management and more cost reflective pricing signals for customers, and avoiding poor investment decisions driven by inadequate industry and customer consultation, or over reaction to the technology agenda. Investment in smart grid technologies needs to be preceded by intensive trialling of technology and associated solutions in network and customer environments. Network involvement in the shaping of a 'smart grid' future is considered critical in an effort to properly define costs and benefits, develop clear pricing signals and maintain reliability, quality, safety and availability of electricity.
31. How can pricing signals/tariff arrangements be made complementary with smart grid technologies to facilitate efficient DSP in the NEM?	Effective education of energy cost structures, broadening of tariff or contract options and deployment of 'set and forget' DSP solutions for customers form a key part of establishing sustainable DSP options. Smart grid technologies provide the ability to give customers greater control of their energy consumption choices and networks greater capability to respond to energy demand events on the electricity grid, but will also contribute to significantly increasing the amount of information available to all parties in the supply chain. Structuring incentives based on the impacts and timeliness of the DSP options to network and retail costs and response requirements should increase the value of the interventions and reduce payback terms for all parties. Utilising smart grid investment to increase the flexibility and responsiveness of customer energy demand and deliver feeder/site specific functionality will enhance direct action opportunity by customers and market participants. This makes the provision of customer specific incentives for DSP action more achievable at the same time as providing better information as to how energy is being used in any period. The connectivity of smart grid solutions to smarter demand response enabled appliances into the future further broadens potential for DSP by the customer that is reflective of the cost and performance drivers of market participants. Allowing flexibility in energy pricing models and customer DSP contracts will allow for more targeted action by networks. This could include arrangements directly with customers through

	contract arrangements outside of the National Electricity Market. Provided appropriate technology exists or a viable work-around can be found for the existing technology, customers need to see both MW price signals (for peak demand management purposes) and MWh price signals (for energy management purposes).
32. In maximising the value of technologies, such as smart grids for DSP, what are the issues relating to consumer protection and privacy?	As reported in "Privacy Matters" Volume 4 Issue 3 Autumn 2010, November 2009, the Australian Government commissioned the House of Representatives Standing Committee on Infrastructure, Transport, Regional Development and Local Government to undertake an inquiry into smart infrastructure. The term 'smart infrastructure' broadly refers to amongst other things, smart grids and smart meters. These devices are used to deliver detailed information about energy usage in individual's homes. In March 2010, the Committee held a conference to open the discussion of the key issues that arise in relation to smart infrastructure. At that conference, Privacy Commissioner Karen Curtis gave a keynote address in "Speech to Thinkfuture Smart Infrastructure Conference 2010 on *Smart infrastructure and privacy* at Parliament House, Canberra 12 March 2010 in relation to some of the privacy issues that arise in relation to smart infrastructure. The Privacy Commissioner highlighted that smart systems have the potential to impact on privacy because they generate information about the behaviour of individuals. As Ms Curtis outlined in her speech, smart grid information, particularly when used in conjunction with the rich data created by smart appliances, could reveal anything from how often the washing machine is used to unusual hours when the lights are on. This seemingly innocuous information may sound harmless, but when combined and collected over time it can paint a detailed picture of an individual's comings, goings and day-to-day activities. The Commissioner's main message to the Smart Infrastructure conference was that privacy should be built in early to smart systems to ensure that individuals feel comfortable with how information is collected and used. The recommendations by the Privacy Commissioner include: • Privacy Impact Assessments (PIA) - PIA will allow the agencies leading smart infrastructure projects in Australia to identify all personal information collected by smart infrastructure. A PIA allows the agency to address any privacy risks with a new project and mitigate those risks.

	• Minimising data collected - a common mistake is to collect more personal information than is actually needed. • Anonymisation - the related issue of de-identifying information can allow organisations to ensure that personal information is not subsequently used for unauthorised purposes. De-identified data can also be useful for research – generally the data is just as useful and comes without the hassle of seeking the consent of thousands of customers. • Data separation - Systems can also be designed to store data in such a way that usage information is held separately to identifying information where possible. A way of achieving this might be to only link smart infrastructure data with a location or customer account when needed for billing, service restoration, or other operational needs. • Internal access controls - access controls around personal information. Access controls should be supported by audit trails so personal information is accessed appropriately. • Security of data from unauthorised access or interception – a smart infrastructure system will also need security measures to protect data from unauthorised access, modification, misuse and disclosure. Some academics have pointed out that smart meters are extremely attractive targets for malicious hackers. • User education - roll out of smart infrastructure should be accompanied by community awareness initiatives and notices to individuals about the types of information collected using smart infrastructure and how that information will be used.
33. To what extent do parties have appropriate incentives to put in place the systems, technologies, information flows etc that facilitate efficient DSP?	DNSPs, as part of normal business, will progressively adopt DSP and smart grid technology subject to detailed business cases and compliance with regulatory requirements. Such investments require adequate return on investment and confidence in the solution. Ergon Energy believes that there is scope to broaden the range of incentives available, particularly in addressing the implementation risk of DSP solutions in the short term and access to energy information critical for effective decision making. Consideration as to how to accelerate uptake outside of the Distribution Determination process through incentives is a matter for the relevant governments. Further insight on Ergon Energy experiences with DSP, through its programs, customer research and broader stakeholder engagements can be provided to the AEMC if required.
34. Are there aspects of the NEL or the Rules which	Ergon Energy considers that both the National Electricity Law and the Rules will need to

prevent parties taking actions that would otherwise allow for more efficient levels of DSP?	accommodate greater flexibility to allow diversity in the relationship with electricity customers in terms of multiple party engagement, pricing and technology application. Ring-Fencing of information between retailers and networks can make using embedded generation difficult when it comes to understanding the best operational solutions for distributed generation. This is similar to the misalignment of the pricing signals from retail and network perspectives.
35. Are there market failures which mean regulation is needed in some areas to ensure appropriate market conditions are in place?	Nil comment.
36. What energy efficiency policies and schemes should be considered as part of this Review, i.e. as impacting on, or seeking to integrate with the NEM?	With around fifty per cent of the average electricity bill comprising network charges (driven by building network capacity), there is a strong argument that the energy affordability agenda would be significantly enhanced by increasing the focus on peak demand management in energy efficiency activity. Implementing energy efficiency policy and schemes that leave peak demand reduction to chance fail to deliver on the full potential of the energy management agenda and do not recognise the cost structure of energy pricing. It makes sense to incentivise and enable customers not only to use less energy but to contribute to and control reduction of their energy use at critical peak electricity demand periods in the day through DSP options, as part of energy efficiency schemes, building and appliance standards, and a myriad of other policy regimes. Failing to consider the peak demand impacts of any energy efficiency policy and scheme development can lead to perverse cost impacts in the long term where there is potential for increased peak demand pressures on networks. This is particularly the case where the solutions are reliant on increasing electricity use when circumstances change or the solutions are not always available (e.g. electric boosted solar hot water systems, customer behaviours).
37. To what extent can energy efficiency policies and schemes be adopted as options for enhancing the efficiency of DSP in the NEM? What are the strengths and limitations of energy efficiency policies as a DSP option compared to other options?	As discussed above, energy efficiency policy and schemes can play a significant role in enhancing the efficiency of DSP provided they consider peak demand management as a key component of their structure and not an occasional side benefit. Policy and schemes can provide a range of incentives to target specific outcomes at a scale but may not allow enough flexibility in targeting customer segments with high energy intensity. The objectives and reach of policy and schemes will need to be considered on their merits. Consideration of DSP benefits from policy and schemes should also include renewable energy policy, particularly as

	energy storage technologies evolve. Energy efficiency policy provides a vehicle for customer education on the energy management agenda and development of targeted messaging for the purposes of reducing energy consumption, emissions and peak demand on networks. It is important for there to be clarity for customers in the messaging around schemes and policies to clearly define impacts of their action on all these factors and the short and long term impacts to energy costs. Network businesses need to play a much larger role in the development of energy efficiency policy and schemes into the future. Details as to the activities being pursued in this space by Ergon Energy can be made available to the AEMC if required.
38. To what extent do existing retailer obligation schemes facilitate efficient choices by consumers in their electricity use? Are there aspects of those schemes that facilitate efficient consumption choices more than others? If so please explain.	Increasing promotion of energy efficiency and associated appliances by retailers has the potential to provide a good outcome for customers if the messaging is aligned with that of critical DSP deliverables (i.e. use less energy at key periods in the day to deliver greater value). Promotion of renewable energy products such as solar photovoltaic systems currently contributes to the ability for retailers to secure Renewable Energy Certificates but provides no 'firm' peak demand management solution for network businesses. This has the potential to change in the future if energy storage capability is linked to the retail offer. Similarly, programs that replace light bulbs and provide stand-by power boards rely heavily on the premise that the intervention reduces energy use and must be linked to sustained behavioural change programs. However, DSP objectives might be best served by promoting and introducing programs that allow 'set and forget' capability that delivers energy efficiency, energy conservation and peak demand management capability for end customers, and connect key contributors to peak energy demand to load control capability on the network (e.g. thermal load). This matter is a relevant for the business sector as it is for the residential sector. Ergon Energy considers there is considerable scope for greater collaboration on the energy efficiency, energy conservation and demand management agendas between retail and network businesses and governments, in terms of common messaging, DSP solution development and design of policy and schemes. This applies also to new residential and industrial developments where much of the energy intensity potential controlled by the customer ultimately is enabled in the design phases (e.g. insulation, ventilation, electrical design, appliance installation, distributed generation). Consideration of future schemes must accommodate progress of network driven programs

	aimed at a combination of energy conservation and demand management objectives with incentives reflective of the value delivered.