

National Framework for Energy Efficiency

Stakeholder Consultation Report



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This document presents a synthesis of the responses to the *Discussion paper* from the written submissions and information gathered during the various stakeholder consultation activities.

In November 2002, the Ministerial Council on Energy, established in June 2001 by the Council of Australian Governments (COAG), endorsed a proposal for the development of a National Framework for Energy Efficiency (NFEE or National Framework) to define the future direction of energy efficiency policy and programs in Australia. The purpose of the NFEE is to unlock the significant but un-tapped economic potential associated with increased implementation of energy efficient technologies and processes across the Australian economy to achieve a major enhancement of Australia's energy efficiency performance. The Energy Efficiency Working Group (E2WG), established under the Ministerial Council on Energy, has been tasked with the development of the National Framework.

The initial work on the NFEE involved extensive analysis and assessment of the barriers and challenges confronting energy efficiency in Australia, and the potential opportunities for the increased uptake of cost-effective energy efficiency measures. Released for stakeholder comment in November 2003, the *Discussion paper, Towards a National Framework for Energy Efficiency—Issues and challenges*, presented the preliminary findings from this initial work.

A targeted consultation process with individuals and organisations closely involved in energy efficiency was conducted over the period December 2003 to April 2004, with workshops and meetings held in various cities across Australia. Written submissions were also received on the *Discussion paper*. Contributions were received from individuals and organisations from the residential, commercial, industrial, energy services, energy markets and government sectors. Over 160 stakeholders attended the workshops and meetings, and 67 written submissions were received.

This document presents a synthesis of the responses to the *Discussion paper* from the written submissions and information gathered during the various stakeholder consultation activities.

The objective is to unlock the significant but un-tapped economic potential associated with increased implementation of energy efficient technologies and processes across the Australian economy to achieve a major enhancement of Australia's energy efficiency performance.

In commenting on the barriers identified in the *Discussion paper*, consistent themes emerging from stakeholders included the need for:

- > Increased awareness of the economic, social and environmental potential of energy efficiency and of cost-effective options that could be implemented.
- > Government leadership in establishing a national goal or sense of purpose, and greater coordination between policies and programs in different jurisdictions.
- > Financial drivers or availability of capital to invest in energy efficiency measures.
- > Measures to reduce the impact of split incentives between builders and occupants in the residential and commercial sectors.
- > Increased technical capacity to identify and implement energy efficiency measures.
- > Consistent and comprehensive standards and regulations, including equal treatment of supply and demand-side measures within the energy market regulatory structure.

Stakeholders also provided suggestions for key policies that might be implemented to address the various barriers. Policy suggestions can be divided into three general areas — directions, incentives, and building block measures — as outlined below.

Directions

- > Introduce a clear, well articulated and nationally consistent goal for energy efficiency that will provide a focus for action.
- > Expand appropriate information and technical advisory services to provide a nationally consistent approach across all jurisdictions.

Incentives

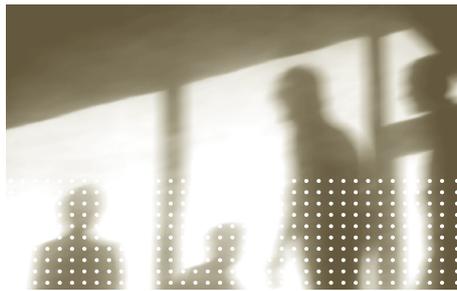
- > Adopt a national energy efficiency target including market-based elements.
- > Provide financial assistance for energy efficiency initiatives via funds or accelerated depreciation (or similar fiscal incentives).
- > Adopt an emissions trading scheme.

Building block measures

- > Strengthen minimum energy performance standards (MEPS) and energy performance disclosure regulations for buildings, equipment and appliances.
- > Build energy efficiency concepts into all levels of education and vocational training.
- > Introduce mandatory energy use reporting by the business sector.
- > Address regulatory barriers that currently favour energy network expansion over demand-side management.
- > Support and invest in energy efficiency research, development, demonstration and commercialisation.

Some of the policies suggested build on existing approaches that are proven to be cost-effective, while others require further detailed analysis.

The outcomes of the consultation process on the *Discussion paper* will inform the process of developing the National Framework for Energy Efficiency that is being undertaken by E2WG.



The objective of this document is to present the findings of the stakeholder consultation activities held over the period December 2003 to April 2004.

1. Introduction

A key task of the Ministerial Council on Energy is to identify policies and programs that will deliver significant improvements in energy efficiency through coordinated action across all jurisdictions. In November 2002, the Ministerial Council on Energy endorsed a proposal for the development of a National Framework for Energy Efficiency (NFEE or National Framework) to define the future direction of energy efficiency policy and programs in Australia. The Energy Efficiency Working Group (E2WG), established under the Ministerial Council on Energy, has been tasked with the development of the National Framework. Initial work undertaken by E2WG in 2003 involved extensive analysis and assessment of the barriers and challenges confronting energy efficiency in Australia, and the potential opportunities for the increased uptake of cost-effective energy efficiency measures. The preliminary findings of the initial work undertaken by E2WG were presented in the *Discussion paper, Towards a National Framework for Energy Efficiency—Issues and challenges*, which was released for stakeholder comment in November 2003.

The purpose of the NFEE is to unlock the significant but un-tapped economic potential associated with increased implementation of energy efficient technologies and processes across the Australian economy to achieve a major enhancement of Australia's energy efficiency performance. The National Framework will be strategic in focus, providing an overarching policy framework, and is being developed cooperatively with the involvement of all jurisdictions and key stakeholders. It will focus on improved end-use energy efficiency outcomes across all sectors of the Australian economy (excluding transport) and includes initiatives that result in improved energy efficiency outcomes.

The objective of this document is to present the findings of the stakeholder consultation activities held over the period December 2003 to April 2004. The principal objective of the consultation process was to seek the views of stakeholders in industry, government and the community on how to address the key energy efficiency barriers, challenges and opportunities confronting individual consumers and sectors, and the Australian economy as a whole.

The National Framework will be strategic in focus, providing an overarching policy framework, and is being developed cooperatively with the involvement of all jurisdictions and key stakeholders.

The outcomes of the consultation process will be fed into the process of developing the National Framework that is being undertaken by E2WG. The E2WG has been working in parallel with the consultation process to further refine modelling and various other energy efficiency assessment tasks, including a review of existing policy frameworks. The combined outputs of these two processes will form the basis of a policy options paper for initial consideration by the Ministerial Council on Energy.

This document is divided into five sections. Section 2 provides an overview of the consultation process. Section 3 presents the key barriers, issues and challenges identified by stakeholders. Section 4 presents the main policy options and solutions put forward by stakeholders to address the identified issues and barriers to achieving enhanced energy efficiency. Section 5 summarises the main findings of the consultation process and draws conclusions in relation to the key barriers and policy options identified by stakeholders.



The distribution of stakeholder submissions was broadly representative of the key sectors of the economy, as was attendance at discussions and workshops.

2. Overview of the consultation process

The purpose of this section is to briefly review the major activities that were undertaken during the consultation phase.

Following the launch of the *Discussion paper* in November 2003 at the National Energy Efficiency Conference held in Melbourne, E2WG commenced a broad-based stakeholder consultation process. The initial phase involved a mail-out of 503 copies of the *Discussion paper* to 415 companies and individuals commencing in December 2003. A list of the companies and individuals who received a copy of the *Discussion paper* is provided in Appendix 1.

Over the period December 2003 to April 2004, eight stakeholder discussion workshops were convened by individual jurisdictions (with the assistance of the NFEF Consultation Secretariat). The workshops were held in Sydney, Canberra, Melbourne (three), Hobart, Launceston and Adelaide. Further face-to-face discussions were also held with individual stakeholders in Tasmania, Victoria and Western Australia over the consultation period.

In addition to the stakeholder discussion workshops, a modelling workshop was held in Canberra on 22 April 2004. The workshop was convened in response to stakeholder requests for more information on how the energy efficiency potential estimates contained in the *Discussion paper* were derived. The workshop presented an overview of the modelling methodology and scenarios used to derive the macroeconomic impact results.

Between the discussions and workshops, approximately 160 stakeholders were directly consulted. A list of the companies and individuals who were directly consulted is given in Appendix 2.

The major feedback from stakeholders came in the form of written submissions—a total of 67 submissions were received. The distribution of stakeholder submissions was broadly representative of the key sectors of the economy, as was attendance at discussions and workshops. Figure 1 shows the sectoral distribution of stakeholders who attended discussions and workshops, put in a written submission, or received a copy of the *Discussion paper*. Figure 2 shows the number of attendees and submittees from each sector. A full list of stakeholders who provided a written submission is provided in Appendix 3.

Figure 1: Stakeholder consultation sector distribution

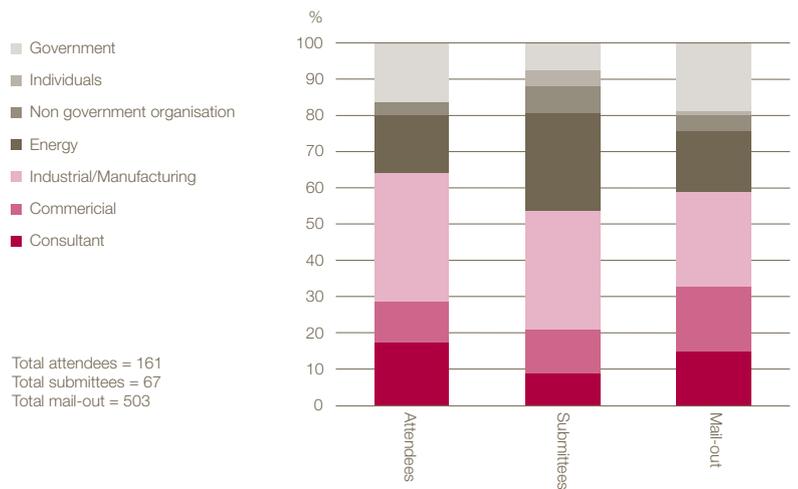
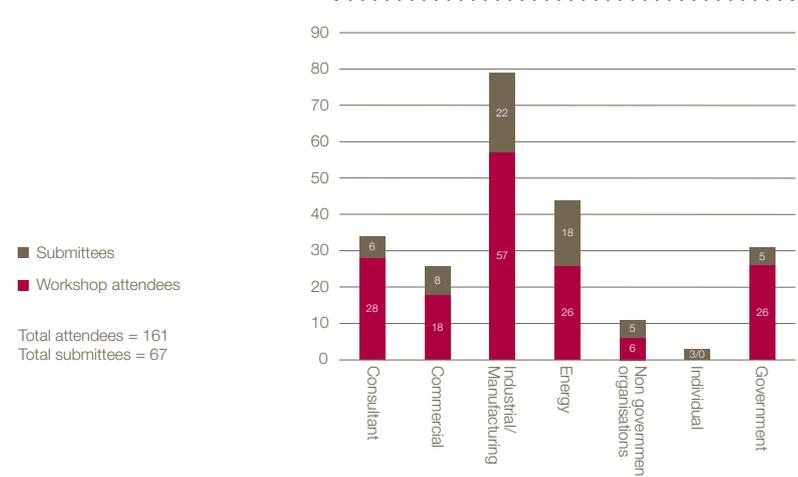


Figure 2: Stakeholder consultation statistics





The barriers and challenges to enhanced energy efficiency were listed in the *Discussion paper*. The main barriers identified are listed in table 1, page 17.

While there was general stakeholder agreement on the main barriers and issues, stakeholders were not unanimous in their agreement with all the identified barriers. Where stakeholders explicitly disagreed with specific barriers, these have been identified in relevant sections.

To protect confidentiality, stakeholder feedback is presented in summary form, and comments are not attributed to individual stakeholders. Stakeholder feedback is, however, grouped according to the specific sector with which the stakeholder is associated. The sector groupings are residential, commercial, industrial, energy markets, energy services and government.

While there was general stakeholder agreement on the main barriers and issues identified in the *Discussion paper*, stakeholders were not unanimous in their agreement with all the identified barriers.

3. Key barriers and challenges

3.1 Residential

The main stakeholder responses relating to the residential sector came from individuals and organisations that have some direct involvement in this sector—for example, local government, housing industry bodies, energy market intermediaries, consumer advisory groups and energy consultants. Although the number of written submissions dealing specifically with the residential sector was limited, the workshops resulted in considerable discussion and stakeholder input on the barriers and issues for this sector. Considerable comment was also provided by energy market intermediaries.

3.1.1 Barriers

There is widespread stakeholder agreement with the barriers and challenges faced by the residential sector, although there was variability in the relative importance attached to specific barriers. It appears that the main issues in the residential sector are the level of awareness and understanding of energy efficiency, the availability and/or accessibility of information on cost-effective energy efficiency measures, as well as government coordination, commitment and regulation in promoting energy efficiency. There appears to be a distinct desire on the part of stakeholders for government to play a more active role in the market to drive energy efficiency in the residential sector (through Minimum Energy Performance Standards [MEPS], enhanced information and awareness-raising activities, and provision of technical expertise). Stakeholders did not identify capital or financial constraints as a significant barrier in the residential sector.

In summary, stakeholders perceptions are that the key barriers in the residential sector are:

- > A general lack of community awareness about the costs and benefits of energy efficiency, particularly in relation to the energy performance and economic benefits of different building design and materials.
- > Difficulties in accessing and sourcing appropriate information on energy efficiency (fragmented sources of information) and jurisdictional variations in the quantity and quality of information available to consumers.
- > Lack of consistent long-term government support and commitment to energy efficiency programs and incentives has contributed to the low level of awareness of energy efficiency in the residential sector.
- > Lack of a nationally coordinated regulatory framework that specifically deals with all building and planning legislation.
- > Individual state variations on the Australian Building Code that undermine the effectiveness of the regulatory framework to deliver energy efficiency outcomes.
- > Split incentives in the residential sector market where developers and builders have little incentive to implement energy efficiency measures and designs (above minimum performance regulations) as they do not reap the economic returns these measures generate.
- > A general public perception that energy efficient homes are more expensive and that investments in energy efficiency have low and delayed returns.
- > Weak energy market price signals and limited energy use information and feedback data to consumers to enable them to make informed decisions on energy use and efficiency.

- > Low level of awareness of energy efficient housing design principles by architects and builders (due to limited tertiary and vocational training in this area).
- > Gaps in the coverage of equipment and appliances by MEPS, which has limited the potential energy efficiency savings in the residential sector.
- > Access to cost-effective technical expertise due to high service and transaction costs (relative to savings) for householders.

3.1.2 Challenges

Stakeholders also generally agreed with the key challenges identified in the *Discussion paper*. Specific additional challenges suggested by stakeholders primarily focussed on raising awareness and increasing information flow, enhancing the role of education and improving coordination across the various levels of government. Challenges raised by stakeholders included:

- > Improving education and targeting of public information to increase the awareness of the general public of the benefits of energy efficiency and provide sufficient incentives for people to implement energy efficiency measures.
- > Identifying and promoting new and cost-effective technologies and appliances that will have a meaningful impact on the level of energy efficiency in that sector.
- > Effectively selling energy efficiency in a world where, in the view of some stakeholders, housing affordability dictates consumer demands and preferences.
- > Encouraging residential housing regulators to participate in a nationally coordinated approach.
- > Establishing well-defined roles for the various levels of government (federal, state and local) to ensure that consumers receive cost-effective and nationally consistent information services, technical assistance and incentives.

3.2 Commercial

The majority of the written submissions relating to the commercial sector were made by representative bodies rather than individual companies. This meant that limited input was directly received from those who actually build or manage commercial buildings.

3.2.1 Barriers

Nearly all of the stakeholder comments relating to the commercial sector were in line with the barriers identified in the *Discussion paper*. Information availability for decision makers also featured as a major barrier in this sector as in the residential sector. Many of the financial and technical barriers centred on the issue of split incentives, while the lack of consistency across jurisdictions of regulations, policies and programs directed at the commercial sector was also a common theme. There was a clear recognition that barriers to achieving improved levels of energy efficiency do exist, and that innovative policies, programs and regulatory frameworks should be implemented by government to overcome these barriers.

Stakeholder feedback on the barriers can be divided into three categories: information, finance and technical support. Stakeholder views of what are the main barriers to energy efficiency under these categories are outlined.

3.2.1.1 Information

- > Lack of awareness of building energy use (partly due to inadequate information provided by meters) and limited information on building energy performance relative to other buildings (rating/disclosure issue).
- > Limited understanding of potential cost-effective energy actions that both landlords and tenants could undertake.
- > The requirement for architects and builders to conform to client specifications, that often do not consider energy efficiency, indicating that energy efficiency information is fed into decision-making process at too late a stage, or not at all.
- > Lack of information on past energy consumption that has inhibited meaningful relative performance assessment of the benefits of implemented energy efficiency measures.
- > Lack of education/vocational programs or training in energy efficiency practices limit the skill levels and awareness of designers and builders, thereby limiting the uptake of energy efficiency in commercial buildings.
- > Jurisdiction specific standards and regulations for the built environment create design and construction complexities resulting in additional costs for organisations.
- > Lack of standard cost-benefit analysis methodologies used by organisations to assess the returns on energy efficiency projects in commercial buildings leads to inaccurate and inconsistent assessment of the overall benefits of energy efficiency.

3.2.1.2 Finance

- > Split incentives where the person funding the energy efficiency improvement does not receive all of the benefits generated was identified as the principal barrier in the commercial sector.
- > Uncertainty within organisations on the success of energy efficiency projects, has often resulted in higher investment return hurdle rates being applicable to these investments relative to others.
 - > Perceptions of greater risk with energy efficiency projects sometimes results in lenders charging a higher premium on capital funds resulting in more costly capital.
- > The existing low cost of energy, and its relatively low contribution to total operating expenditure, tends to reduce the priority and importance of energy efficiency for managers relative to other competing issues.
- > Accounting practices favour revenue streams over cost-reduction strategies.

There was a clear recognition that barriers to achieving improved levels of energy efficiency do exist, and that innovative policies, programs and regulatory frameworks should be implemented by government to overcome these barriers.

3.2.1.3 Technical support

- > Most stakeholders disagreed with the suggestion in the *Discussion paper* that there was a lack of technical energy-efficiency expertise in the market. Rather, stakeholders considered there was more of an issue of organisations not recognising the need for energy efficiency and seeking the appropriate energy services from the market.
- > Mechanical services designers are usually left out of the early decision-making phase of projects (where it can make a difference), thus inhibiting the introduction of energy efficiency concepts in the design process.
- > Insufficient time, at the design and retrofit planning stages, allotted by developers to examine energy efficient options available for buildings.
- > Poor commissioning and maintenance of mechanical services systems results in poor energy performance and low levels of technical efficiency.

3.2.2 Challenges

Stakeholder views appear to support the challenges identified in the *Discussion paper*, with most focussing on improving building energy performance, disclosure and government commitment, coordination and regulation. Some of the challenges raised by stakeholders were:

Most stakeholders disagreed with the suggestion in the *Discussion paper* that there was a lack of technical energy efficiency expertise in the market.

- > Establishing a long-term government commitment towards achieving enhanced energy efficiency outcomes in the commercial buildings sector through implementing appropriate and consistent energy efficiency policy and regulatory measures across Australia.
- > Developing and implementing innovative commercial financing and leasing arrangements to overcome the problem of split incentives in the commercial buildings sector and making it easier and cheaper for tenants/landlords to implement energy efficiency measures.
- > Developing appropriate (and standardised) cost-benefit models and tools to aid decision making by landlords and tenants.
- > Generating sufficient data on energy use in the commercial sector to enable sound technical and policy decisions to be made.
- > Identifying and introducing appropriate courses and mechanisms to raise the energy management skills of building managers.
- > Putting in place mechanisms that will ensure the existence and availability of sufficient technical expertise to deliver the energy efficiency services required in the future.
- > Ensuring that energy efficiency is a core consideration in the decision-making process when designing a building.
- > Ensuring that sufficient expertise is available to organisations, at the right time, to develop a strong business case for energy efficiency in the construction, retrofit and operation of commercial buildings.

3.3 Industrial

Stakeholder input and comment on energy efficiency issues in the industrial sector came from a wide range of sources and interested parties. The sources included individual companies, industry associations, energy consultants and energy market intermediaries. The industrial sector was clearly the sector that attracted the highest level of stakeholder input relative to other sectors.

3.3.1 Barriers

While there was broad stakeholder support for most of the barriers identified in the *Discussion paper*, stakeholder perceptions indicated some disagreement or divergence of opinion regarding particular barriers. The two most notable areas of disagreement were whether organisational and cultural inertia was a barrier in the industrial sector, and whether decision makers applied variable investment thresholds (hurdle rates) to energy efficiency investments. Both of these issues attracted considerable stakeholder comment. There was also debate over whether insufficient government support and financial incentives are a barrier. Some stakeholders suggested that accessing and using appropriate information and technical expertise, rather than government incentives, was the key barrier; while others suggested it was a lack of appropriate financial and fiscal drivers—there was no clear-cut stakeholder position on this issue.

The barriers have been grouped into five main areas: information, financial, technical support services, organisational/behavioural and other.

Some stakeholders suggested that accessing and using appropriate information and technical expertise, rather than government incentives, was the key barrier, while others suggested it was a lack of appropriate financial and fiscal drivers—there was no clear-cut stakeholder position on this issue.

3.3.1.1 Information

Information constraints were identified by stakeholders as a common barrier to enhanced energy efficiency (although this was not unanimous across the sector). In the view of stakeholders, the key information barriers and issues included:

- > Lack of awareness within the business community of the costs and benefits of energy efficiency.
 - > Limited awareness of energy management issues from ‘factory floor’ through to ‘senior managers’ is a common occurrence in small-to-medium scale industry.
- > Information on energy efficiency options was either not available, or not provided, to decision makers when investment decisions were being made.
- > Difficulties in accessing information on potential technology options in specific industry sectors, combined with limited information providing proven examples of the successful application of these technologies (a common constraint recognised by most stakeholders).
- > Public information on energy efficiency technology and management is scattered, ad-hoc and difficult to access—‘there is no single source of currently identified best practice documentation’ for specific industry sectors that is readily available.
- > Poor monitoring of energy use within businesses results in insufficient energy consumption data being available to identify energy efficiency potential, particularly in non-energy intensive industries.
- > Some stakeholders in large-scale and energy intensive industries noted that ‘senior management are very aware of energy efficiency and its benefits’ and that access to, and availability of, information was not considered a major barrier.

3.3.1.2 Financial

Most stakeholders indicated that financial constraints were a major barrier to implementing energy efficiency measures. Key finance-related barriers identified by stakeholders included:

- > Access to, and the cost of, capital was highlighted as a general barrier by most stakeholders, particularly by smaller and medium-scale industry.
 - > However, some stakeholders considered that the importance of capital availability constraints was overrated and that if energy efficiency measures had an attractive rate of return then funds could be accessed—‘good projects attract capital easily’.
- > Large, energy intensive industrial organisations indicated that energy efficiency initiatives often entailed significant process changes and high capital costs to extract increasingly marginal energy savings in their operations and, therefore, the overall rates of return were often not attractive.
 - > Some stakeholders noted that even if cost-effective energy savings could be identified, the issue of asset longevity and investment cycles (often governed by equipment life spans) in large-scale industry often meant that their immediate uptake was unlikely.
- > As energy is often such a small percentage of operating costs, business is likely to focus on areas that are larger expenditure items for their business, even if potential rates of return on investment are attractive (implying that companies may perceive that the transaction costs of implementing energy efficiency measures may outweigh the potential benefits).

- > While industry submissions did not distinguish between external and internal sources of capital, several stakeholders indicated that for subsidiaries of large corporations, capital for energy efficiency investments (cost saving) was often linked to maintenance budgets and not to strategic investment budgets.
- > Stakeholder views on hurdle rates diverged significantly with most large-scale industry stakeholders claiming that there was no hurdle rate differential for energy efficiency compared to other investments, while consultants and intermediaries suggested that in reality these hurdle rates exist.
 - > The apparent divergence of opinion may be associated with different risk premiums being attached to certain types of investment and/or whether investments were viewed as 'strategic' or 'operational'—either way they represent a differential hurdle rate, even if for good reasons.
 - > Some stakeholders suggested that there is a perception within industry that investments in energy efficiency achieve a lower rate of return than investments in core activities.
- > The existence of take-or-pay energy contracts between industry and energy retailers/suppliers often acted as a disincentive towards energy efficiency investments.

3.3.1.3 Technical support services

- > Industry, especially small-to-medium enterprises, believe the availability of internal and/or external expertise is a key barrier to identifying and implementing energy efficiency measures.
 - > The availability of inhouse technical expertise in larger industrial enterprises meant that technical issues were not as important a constraint for larger companies.

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The two most notable areas of disagreement were whether organisational and cultural inertia was a barrier in the industrial sector, and whether decision makers applied variable investment thresholds (hurdle rates) to energy efficiency investments.

- > As plant and factory designers are often not aware of new energy efficient technologies and processes in their industry, some stakeholders noted that new installations often fell short of best practice levels (indicating a potential technical information dissemination issue).
 - > This suggests that there are difficulties in accessing the right financial and technical expertise to quantify savings and develop a clear financial business case for implementing these measures.
 - > One large energy user indicated that the focus for investment was in strategic growth of the market and licence to operate issues rather than operating costs such as energy efficiency. Energy projects were, therefore, given a lower priority and higher hurdle rates. Capital energy projects, for example, would have a 20 year payback whereas smaller energy efficiency projects would need to have a one to two-year payback.
- > Limited availability of consultants with specific knowledge of the industry they are advising, rather than just generic 'energy efficiency' knowledge, was identified as a common constraint, particularly where the consultants needed extensive briefing by plant operators before they could commence activities.
- > The potential benefits of energy service providers in overcoming technical/information barriers does not appear to be well understood in some industry sectors.
 - > Some stakeholders suggested that they had little confidence in the ability of energy service providers (for example, energy service companies) to provide a truly win-win situation for both parties.
- > Several stakeholders noted that the quality and complexity of energy audit reports made it difficult for industry to effectively implement recommended actions from the audits.
 - > Furthermore, these reports often fail to provide sufficient detail on potential technical options, costs and savings, the time required to implement the actions, and whether external technical assistance would be required.

3.3.1.4 Organisational/behavioural

Several industry stakeholders strongly disagreed with the assertion in the *Discussion paper* that cultural or organisational inertia is a barrier to energy efficiency. However, more than half of the stakeholder submissions from the industry sector identified changing behaviour about energy efficiency as a key challenge for their organisation or sector. Key issues and barriers identified by stakeholders included:

- > A general lack of awareness among staff and senior managers of energy efficiency as a potentially important means of enhancing productivity.
- > Some stakeholders identified a tendency for small manufacturing enterprises to stick to what they knew worked rather than accept the risks associated with more innovative and efficient approaches to production.
- > The absence of energy efficiency components in vocational and tertiary education courses, resulting in lower levels of staff and organisational awareness of energy efficiency.
- > Limited resources mean that organisations tend to concentrate on what is the most pressing issue at the time and several stakeholders suggested that energy efficiency would not normally rate as a mainstream issue for most businesses.

3.3.1.5 Other

Other stakeholder perceptions on barriers and issues raised by stakeholders focussed mainly on the policy context in which energy efficiency was placed, particularly in relation to greenhouse policy, and consistency of energy efficiency policies and programs across jurisdictions. Comments included:

- > Several stakeholders suggested that there appears to be a disconnect between current greenhouse objectives and measures, and the approach being adopted to develop a national framework for energy efficiency.
- > The lack of a national goal that encompasses both greenhouse gas reduction and energy efficiency may inhibit the achievement of a least-cost approach to greenhouse.
- > Energy efficiency policy and programs cannot be viewed in isolation from the Mandatory Renewable Energy Target (MRET) and the NSW Greenhouse Gas Abatement Scheme.
- > Some stakeholders considered that action on energy efficiency that results in greenhouse gas abatement should be viewed in the light of the 'no disadvantage' principle.

- > The different priorities, policies and programs of different jurisdictions has resulted in different reporting formats, regulatory compliance requirements and different business operating environments—this also appears to be a frustration to industry and reduces their willingness to participate in these programs.
- > The disconnect and inconsistencies between energy market reform and energy efficiency objectives, sometimes providing conflicting market signals and incentives, is an issue stakeholders indicated should be addressed in the development of the National Framework.
- > Several stakeholders indicated that the *Discussion paper's* assessment of the cost-effective potential for energy efficiency savings in industry seems exaggerated and that insufficient empirical evidence has been provided to support these estimates.

More than half of the stakeholder submissions from the industry sector identified changing behaviour about energy efficiency as a key challenge for their organisation or sector.

- > The lack of coordination of energy efficiency initiatives between jurisdictions (particularly federal/state interaction) has not provided a common message to industrial energy consumers or a common 'single source' location for accessing available information on grants, programs and other incentives—these appear to be ongoing sources of frustration to industry.

3.3.2 Challenges

Stakeholders from the industrial sector generally agreed with the challenges identified in the *Discussion paper* and put forward the following additional specific challenges:

- > Getting the right information to the right people at the right time—which entails identifying who needs what information at what time.
- > Effectively expanding the focus of energy efficiency programs to small manufacturing enterprises.
- > Promoting and developing the energy efficiency services industry, particularly developing specialised skills for specific sub-sectors, rather than generic energy efficiency expertise.
 - > Technical partnerships with industry, government and research institutions has been one method identified by stakeholders to overcome this constraint.
- > Increasing awareness and expertise in energy efficiency across the whole organisation, including production, technical, financial and management skills (involves embedding energy efficiency into business plans and developing inhouse expertise).
- > Attracting and promoting investment in energy efficiency research and development and innovation.

3.4 Intermediaries: Energy markets and energy service providers

A range of barriers, issues and challenges were identified by stakeholders in relation to the energy market and other energy service providers and intermediaries. For the purpose of discussion, these two categories will be dealt with separately although there are similarities in the issues and barriers raised by stakeholders in them.

3.4.1 Energy markets

The energy markets category includes energy generators, distributors and retailers. Stakeholder comments about the energy market and the role of generators and retailers were principally targeted at barriers to the efficient operation of the market, conflicting market signals, market failure, peak demand management and the potential role of government in promoting energy efficiency. The main comments from stakeholders came primarily from energy market participants (mainly energy retailers).

3.4.1.1 Barriers

The main stakeholder views on energy market issues and barriers included:

- > Price information in energy markets does not reflect the full costs of providing energy to consumers and results in inefficient market outcomes.
- > Most stakeholders asserted that market forces will generally lead to efficient outcomes but governments have a duty to intervene in the market place where it is clear that there are unfavourable economic and social outcomes, and where the net benefits of intervention are positive.
- > Demand-side management and the benefits of avoided network costs are not fully captured by the entity that implements the energy efficiency improvements and, therefore, may not provide sufficient incentives for the market to deliver socially and economically optimal levels of energy efficiency.

- > Several energy retailers suggested that organisational and cultural inertia were barriers to achieving higher levels of energy efficiency in the Australian economy and suggested that externally imposed signals (for example, the introduction of an appropriate price signal) are required to elevate energy efficiency as an organisational concern.
- > Network service providers have an asymmetric incentive in favour of investment in network capacity expansion as regulations allow recovery of expenditure associated with network expansion but the same provision does not apply to demand-side management and energy efficiency initiatives by the retailer or the customer.
- > The restricted nature of access to the financial benefits of CO₂ reductions under the NSW Greenhouse Abatement Credit scheme (largely confined to large-scale energy efficiency projects) has inhibited the take-up of smaller energy efficiency actions.
- > Several stakeholders disagreed that there was a lack of real-world case studies showing the benefits of energy efficiency and suggested that the main problem was the lack of interest of organisations in energy efficiency and the fragmented nature of information dissemination.
- > The National Electricity Market regulatory framework does not provide transmission and distribution companies with any incentive to minimise energy losses as these costs are simply passed through to end users.
- > Improving energy efficiency is not a mainstream concern for energy retailers (due to limited financial drivers) or business (due to the low cost of energy and the small percentage of operating costs it represents).

3.4.1.2 Challenges

The main challenges identified by stakeholders in relation to increasing the role of energy market distributors and retail entities in promoting and achieving improved energy efficiency outcomes were:

- > Developing a long-term nationally consistent approach to energy efficiency and effectively communicating this to the Australian community.
- > Ensuring appropriate incentives are available to end-users so that continuous improvement in energy efficiency becomes a mainstream and self-supporting business activity in Australia.
- > Making energy efficiency important enough for decision makers to devote time and resources to identifying and implementing cost-effective energy efficiency actions.
- > Facilitating access to the required capital (internal or external) to fund energy efficiency improvements.
- > Creating sufficient incentives for energy retailers to provide energy efficiency services to customers, and make it profitable to sell energy efficiency as well as energy.
- > Motivating intermediaries to become much more involved in the provision and promotion of energy efficiency to end-users.
- > Ensuring governments act decisively when it is evident that there would be a net welfare benefit to the Australian community through the introduction of a specific policy or action.
- > Ensuring that energy market regulatory structures are neutral and provide the same incentives to both demand and supply-side measures in satisfying the demand for energy services.

3.4.2 Energy service providers

This category includes energy consultants, energy efficiency technicians/engineers, energy service contract companies (ESCOs) and trade associations. Comments on this category came mainly from the industry itself, although there were some comments from other stakeholder sectors.

3.4.2.1 Barriers

Key issues and barriers put forward by stakeholders, in addition to those identified in the *Discussion paper*, that inhibit the development of a self-sustaining energy services industry in Australia include:

- > A perception by business that the potential for energy efficiency within their operations is limited—a ‘we run a tight ship here’ view of the world.
 - > This could indicate a lack of information about what energy efficiency opportunities exist within their organisation, thereby reducing the demand for external energy services.
- > Lack of awareness on the part of end-users of the potential financial and management benefits energy service providers offer.
- > Lack of confidence by potential clients in the certainty of efficiency gains identified by service providers and whether these gains can be achieved without significant interruptions to normal business operations.

- > Energy market structures and regulatory frameworks that act as a direct disincentive to energy efficiency and demand-side measures relative to supply-side options.
- > Taxation treatment of capital versus maintenance expenditure, particularly in commercial buildings, reduces the economic attractiveness of energy efficient retrofits.
- > Lack of certainty on future energy and greenhouse policy settings is acting as a disincentive to the adoption of energy efficient technologies and processes.
- > Non-transparent and non cost-reflective pricing has resulted in artificially low and distorted energy prices that limit the market for energy efficiency services.
- > Lack of industry-wide accreditation, performance benchmarks, measurement and verification procedures has, in the view of some stakeholders, reduced the confidence of end-users in contracting energy service providers.

A range of barriers, issues and challenges were identified by stakeholders in relation to the energy market and other energy service providers and intermediaries.

3.4.2.2 Challenges

The main challenges identified by stakeholders in terms of creating a viable and self-sustaining energy services industry were:

- > Recognising that building a self-sustaining energy service industry in Australia was not an end in itself, but that rather there is a need to create an environment that leads to a self-supporting demand for energy efficiency services—this point was raised by a broad cross-section of stakeholders.
- > Developing a consistent Australia-wide set of policies and programs that leads to a major shift in the community's and industry's approach to energy efficiency, and enables a significant departure from business-as-usual trends.
- > Developing and introducing new energy pricing and tariff structures that increase the level of information to consumers and provide an accurate reflection of the true costs of the energy consumed (specific mention was made about the need for marginal cost pricing).
- > Developing and implementing a regulatory framework that enables cost recovery by energy retailers and utilities for energy efficiency and demand-side management measures.
- > Improving the flow of information and providing case studies to energy users to enable them to understand the benefits of energy efficiency and the merits of engaging energy efficiency experts and service providers to deliver these outcomes.

3.5 Government

Stakeholders raised a range of issues in relation to barriers and issues to increased energy efficiency in government operations and the public sector in general. Stakeholders also identified barriers and issues to energy efficiency in other sectors that emanated from the policies and programs adopted by governments.

3.5.1 Barriers

Stakeholders perceptions of the barriers and issues, by category, are outlined below.

3.5.1.1 Information

- > Lack of sufficient knowledge and information within government operations and public institutions to effectively identify and implement energy efficiency measures.
- > Lack of consistency in energy efficiency policies and programs across jurisdictions, including differences in the content and emphasis of information disseminated to business and the community across jurisdictions.
- > Apparent lack of consistency of policies across different government portfolios, that sends conflicting signals and incentives in relation to energy efficiency.
- > The ad-hoc and discontinuous nature (limited program funding duration) of government sponsored energy efficiency programs.
 - > This inhibits the development of information and technical assistance networks and provides insufficient time for the development of corporate knowledge and awareness.
- > Insufficient public reporting and accountability of government energy consumption and energy efficiency achievements.
- > Inconsistent application of local government planning procedures and requirements across Australia, which leads to differences in energy efficiency performance levels.

- > Low level of public funding and support for research, development and demonstration of energy efficient processes and technologies relative to other activities.
- > Lack of awareness of the importance of high energy-efficiency standards for public housing to reduce the energy services burden on lower income households.
- > Limited government action in relation to increasing public awareness of energy consumption profiles of buildings and equipment (excluding those items already covered by mandatory energy labelling requirements and energy performance disclosure).
 - > This includes the lack of a nationally consistent energy performance disclosure requirement for residential and commercial buildings.

3.5.1.2 Financial

- > Lack of financial incentives for government operations and public entities (housing, schools, hospitals and public buildings) to implement energy efficiency measures due to existing budgetary practices and rules (namely, implementing energy efficiency initiatives that save money can result in a reduction in next year's budget allocation).
- > Inability of some institutions to raise external finance to fund these energy efficiency measures and employ energy efficiency service providers.
- > Split incentives for government in relation to energy efficiency measures in leased commercial premises.
- > Lack of financial incentives (penalty clauses) and best practice energy efficiency specifications in the construction of public buildings (including public housing).
 - > This includes insufficient post-commissioning performance assessment which can result in lower performance and higher costs for occupants (for example, excessive energy bills for public buildings and low-income public-housing tenants).

3.5.1.3 Technical support services

- > Lack of coordination and consistency between different government jurisdictions in relation to technical training and certification activities (e.g. Green Plumbers program).
- > Insufficient technical support in some jurisdictional programs to enable program participants to effectively implement energy efficiency measures (free audits but no follow-up).
- > Under-utilisation of inhouse government energy-efficiency expertise to facilitate the uptake of energy efficiency measures in government operations.

3.5.1.4 Organisational/behavioural

- > Resistance by some departments and portfolios to mandatory energy efficiency reporting, targets and implementation requirements.
- > Perception by some economic policy agencies that the potential for cost-effective energy efficiency measures is limited and that if significant economic opportunities existed the market would ensure that these measures were implemented.

3.5.1.5 Other

- > The lack of government leadership in relation to energy efficiency and the absence of a national goal or target (similar to national efforts on waste recycling and water use).
- > The view of some stakeholders that governments lack the will to seriously tackle the energy efficiency issue and will be reluctant to commit to a new policy agenda in the future.
- > Uncertainty of resources and continuity of programs is a concern for local governments as well: 'Local governments have been unable to feel secure in our activities, and future support from the Federal Government as a result of occasional rumours and uncertainties surrounding the continued support for bodies that assist us (such as the Cities for Climate Protection program).'

3.5.2 Challenges

Some key challenges raised by stakeholders were:

- > Ensuring that government, at all levels, leads by example and implements rigorous energy efficiency targets and ensures that these are effectively reported to the general public.
- > Ensuring consistency and certainty in relation to programs implemented by different jurisdictions.
 - > One stakeholder suggested that this challenge could be met by establishing a dialogue and information exchange mechanism between national, state and local governments in relation to energy efficiency policy and programs.
- > Accelerating the uptake of programs by small-to-medium enterprises through local programs is a challenge at the local government level.
 - > Although targeting small enterprises is not always particularly cost-effective in terms of return on dollar per tonne of greenhouse abatement, or GJ of energy saved, compared to larger companies, stakeholders suggested that broader cultural and social criteria should be given more weight in the allocation of funds that might be available.

An identified barrier was the perceived lack of government leadership in relation to energy efficiency and the absence of a national goal or target (similar to national efforts on waste recycling and water use).

3.6 Barriers summary matrix

The barriers summary matrix (table 1) is a tabulated summary of responses by the stakeholders to the barriers identified in the *Discussion paper*. The main barriers from the *Discussion paper* are listed on the left-hand side (in some cases multiple issues have been combined into one barrier). The response by each sector has been recorded in the columns next to the 'barrier'.

To acknowledge the varying comments made by the stakeholders, the matrix has recorded the responses in three modes. Stakeholders' acknowledgement of the existence of the barrier is recorded as a '•', disagreements are recorded with a '-'. Both signs in a column is an indication of varying opinions of the stakeholders (in that sector), as some agreed to the presence of the barrier while others disagreed. A blank column indicates no response was received from the stakeholders.

The matrix does not identify the relative distribution or weight of stakeholder responses (whether the majority agreed or disagreed with the barrier) but it does indicate the coverage of stakeholder feedback on the barriers.

Table 1: Barriers summary matrix

Barriers

	Residential	Commercial	Industrial	Government	Intermediaries
Lack of available information	•	•	•/-	•	•
Policies don't address behavioural barriers and inertia	•	•	•	•	•
Low returns and resource allocation (energy a small proportion of total costs)	•	•	•	•	•
Access to technical expertise	•	•/-	•	•	•
Access to capital and finance	•	•/-	•/-	•	•
High hurdle rates on energy efficiency projects	•	•	•/-		•
Split incentives	•	•		•	•
Uncertainty of energy efficiency programs' tenure and government support	•	•	•	•	•
Lack of training programs on energy efficiency	•	•	•	•	•
Successful energy efficiency programs not visible	•	•	•/-		•/-
Organisational and cultural inertia	•	•	•/-	•	•
Lack of a nationally consistent and coordinated approach to energy efficiency	•	•	•	•	•



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This section contains a summary of the potential solutions, actions and policy options that stakeholders put forward to increase the level of energy efficiency in the Australian economy.

4. Program and policy suggestions

In summarising stakeholder input on possible solutions and policy options, it is worthwhile noting some of the general conceptual comments that stakeholders made in relation to government intervention in the energy market. Many stakeholders agreed there was a clear case for government intervention to correct apparent market failure in relation to energy efficiency. However, some stakeholders indicated that the *Discussion paper* did not make a compelling case for the introduction of new policy initiatives and programs to increase energy efficiency. Several major industrial stakeholders indicated that government intervention was only warranted where there was a clearly established case of market failure and where it could be demonstrated that any new policy or program provided a net economic and social benefit to the Australian community. Unless these benefits could be demonstrated, government intervention in the marketplace would be unjustified.

Most stakeholders considered that there was clear evidence of market failure in relation to energy efficiency and that governments should intervene to correct this failure. However some stakeholders noted that the existence of perceived market failure may, in fact, be a reflection of rational economic decision making by market participants. Seemingly irrational decisions relating to energy efficiency investments may actually be explained by differing levels of risk and transaction costs associated with the investments.

While there was general support for policy and program initiatives that reduced risks and transaction costs, this did not, in the view of some stakeholders, warrant large-scale government intervention through regulatory and fiscal measures. Some stakeholders indicated that further assessment of the extent and costs of market failure needed to be undertaken prior to the introduction of new energy efficiency policies and measures.

This section contains a summary of the potential solutions, actions and policy options that stakeholders put forward to increase the level of energy efficiency in the Australian economy. The suggestions are divided into the main sectoral categories and also grouped under the general barriers they are intended to address. The key barriers raised by stakeholders can be grouped into three main categories, namely information and awareness constraints, financial and incentive constraints and technical constraints and standards

4.1 Residential

The main suggestions from stakeholders concerning measures to increase the uptake of cost-effective energy-efficiency actions in the residential sector are outlined below.

4.1.1 Information, awareness and coordination

- > Adopt a national energy efficiency goal or strategy, supported by all jurisdictions, to provide a focus for consumer awareness and action.
- > Introduce a nationally consistent, mandatory, energy rating system for all residential buildings (some stakeholders suggested this should only be applied to residences at the point of sale or lease).
- > Establish a national coordinating body, under the Council of Australian Governments (COAG), to facilitate and oversee energy efficiency issues in the housing sector and promote better coordination between building and planning regulators.
- > Expand nationally coordinated consumer awareness programs and information dissemination activities.

- > Expand energy efficiency advisory services and web-based tools to assist consumers in decision making.
- > Expand the role for local government in the delivery of energy efficiency outcomes in the community.
- > Introduce real-time metering and pricing information so that consumers are aware of the costs of their consumption.
 - > This suggestion was opposed by some stakeholders (particularly energy retailers).
- > Introduce energy efficiency components into school curricula to raise awareness of energy efficiency and influence the actions and decisions of future consumers.
- > Introduce programs to enhance knowledge and awareness in the residential sector of energy efficiency in dwellings, through 'renovators workshops' that inform residents on multiple issues relating to home buildings, extensions and energy management in the home, and linked to the development applications process.
- > Educate consumers about the source of their electricity.

4.1.2 Finance and economic incentives

- > Introduce preferential tax treatment and/or subsidies for high-efficiency domestic appliances and equipment.
- > Introduce a nationally consistent appliance rebate program for high-efficiency water and space heating/cooling appliances to increase the share of 'best in class' appliances in the market.
- > Develop green financing options through major finance institutions to facilitate the construction and retrofit of dwellings to achieve higher levels of energy efficiency performance.
- > Introduce a requirement that any organisation submitting a request for government grants or subsidies must demonstrate that the activities the organisation will undertake will not have adverse energy efficiency outcomes.

4.1.3 Technical constraints and standards

- > Expand and strengthen (accelerated introduction of higher minimum standards) MEPS covering all major domestic appliances.
- > Expand training and education activities for tradespeople to enable them to provide advice on energy efficiency equipment and install equipment according to best practice procedures (e.g. Green Plumbers).
- > Introduce a uniform national minimum energy performance building code for all residential buildings taking into account regional variations (some stakeholders suggested this should be at a 5 star minimum).

4.2 Commercial

Stakeholder suggestions in relation to the commercial sector focussed mainly on enhancing the energy efficiency of commercial buildings, particularly in relation to public information disclosure and the introduction of mandatory MEPS for commercial buildings. The key stakeholder suggestions are outlined below.

4.2.1 Information, awareness and coordination

- > Introduce and develop a nationally consistent energy rating system to inform investors, owners and tenants of the energy performance of commercial buildings.
- > Introduce mandatory disclosure of energy performance for all commercial buildings (some stakeholders suggested performance disclosure should be voluntary).
- > Introduce energy efficiency awareness-raising programs for commercial building tenants.
- > Expand mandatory energy efficiency labelling to office appliances and commercial building equipment.

4.2.2 Finance and economic incentives

- > Introduce innovative leasing arrangements to enable costs and benefits of energy efficiency improvements to be split between landlords and tenants (to overcome problems of split incentives).

- > Develop and promote alternative project financing models to enable the construction and/or retrofitting of buildings to achieve high levels of energy efficiency.
- > Introduce a rebate or financial incentive package for retrofitting or installing high-efficiency lighting and heating, ventilation and air conditioning (HVAC) systems in commercial buildings.
- > Introduce changes to the taxation system to ensure equitable taxation treatment between energy efficiency upgrade investments (improvements) and operational maintenance.

4.2.3 Technical constraints and standards

- > Develop and introduce nationally consistent minimum energy performance building standards/codes for all new commercial buildings (several stakeholders suggested that this should be at current world's best practice standards).
- > Establish mandatory MEPS for lighting, heating and cooling for commercial buildings.
- > Promote the development of showcase high energy-efficient commercial buildings for training and demonstration purposes.
- > Introduce MEPS for office appliances and commercial building equipment/machinery.
- > Establish and promote research and development to facilitate innovation and design of energy efficiency in commercial buildings.
- > Promote the development of strategic partnerships (architects, engineers, developers, investors and equipment suppliers) and information networks to accelerate the adoption of best practice energy efficiency measures in the commercial buildings sector.

4.3 Industrial

Key initiatives suggested by stakeholders for the industrial sector focus on increasing the flow of information to decision makers and investors; providing appropriate financial support and incentives to industry for energy efficiency measures; facilitating the development of appropriate technical skills in industry; and increased research development and demonstration activities. Some segments of industry (large energy-intensive industry in particular) suggested that policies and programs should be consistent with greenhouse objectives and that any measures that result in industry increasing their commitment to energy efficiency should receive appropriate recognition under the 'no disadvantage' and 'early action' principles.

The main stakeholder suggestions about options and solutions to overcoming barriers to energy efficiency in the industrial sector are outlined below.

4.3.1 Information, awareness and coordination

- > Promote awareness-raising energy efficiency information programs (supported by relevant case studies) for CEOs and other financial decision makers to demonstrate the direct financial and ancillary productivity benefits of increased energy efficiency.
- > Develop and support local, national and international information networks to ensure that sufficient information on potential energy efficiency measures is available to decision makers.
- > Introduce mandatory public reporting of energy use and management initiatives by large companies to ensure that sufficient market relevant information is available to investors, and to focus senior management attention on energy use within their organisations.
 - > This policy option was not supported by some industry stakeholders.

- > Develop web-based tools for industry to provide better information and appropriate technical assistance guidance (e.g. 'Motor Solutions Online' website).
- > Adopt a common, nationally consistent set of metrics and approaches to measuring and reporting outcomes of energy efficiency initiatives to government.

4.3.2 Finance and economic incentives

- > Introduce a national energy efficiency target, including trading of energy efficiency certificates.
- > Increase support for, and investment in, energy efficiency research, development, demonstration and commercialisation, including tax incentives and write-offs for research and development into energy efficiency.
 - > Some stakeholders called for the introduction of a 150% tax write-off for energy efficiency research and development.
- > Encourage energy efficiency investment through accelerated depreciation of energy efficiency investments.
- > Introduce an emissions trading scheme to provide industry with appropriate financial drivers.
- > Consider negotiating specific agreements with industry to achieve particular energy efficiency outcomes.

- > Sharing of security risk with government for energy efficiency investments (for example, through loan guarantees).
- > Introduce a demand-side management fund for the funding of energy efficiency and demand-side management projects in specific sectors.
- > Introduce an energy efficiency levy on all consumers to fund government energy efficiency programs.
- > Facilitate the increased involvement of financial institutions in encouraging energy efficiency investments in major industrial operations.
- > Provide investment and/or financial support to assist companies overcome or reduce transaction cost impediments (for example, energy audit grants or immediate write-off provisions for the costs of engaging energy efficiency experts, especially for projects that deliver substantial energy savings but do not meet company investment criteria).
 - > Some stakeholders did not support the provision of special financial support to industry to achieve energy efficiency outcomes as they suggest that such measures would increase the cost burden on other sectors of the economy (through increased taxation or reduced revenue flows).
- > Redress the taxation imbalance between upgrade investments (improvements) and operational maintenance.

Key initiatives suggested by stakeholders for the industrial sector focus on increasing the flow of information to decision makers and investors; providing appropriate financial support and incentives to industry for energy efficiency measures; facilitating the development of appropriate technical skills in industry; and increased research development and demonstration activities.

4.3.3 Technical constraints and standards

- > Develop strategic partnerships between governments, industry, research and development networks and industry clusters to facilitate the dissemination of relevant energy efficiency information, develop technical skills and understanding, and promote the adoption of best-practice energy efficiency.
- > Introduce energy efficiency education and training courses for tradespeople, plant operators and professionals (including training for technical professionals to develop energy efficiency business cases to put to senior management).
- > Reintroduce and expand existing programs based on the Energy Efficiency Best Practice program structure but with binding commitments to implement identified cost-effective measures.
 - > Binding commitments did not receive support from some industry stakeholders, particularly energy intensive industry.

- > Expand MEPS to industrial machinery and equipment.
- > Ensure that major energy market players receive the right market signals by making energy efficient issues an integral part of any energy market reform agenda (including load shifting and other peak-load reduction measures).
- > Institute mandatory energy efficiency targets for the industrial and commercial sectors and incorporate the concept of incremental mandatory targets into the relevant licensing conditions.
 - > Some industry stakeholders opposed the introduction of mandatory targets (along the lines adopted by the Victorian Environment Protection Agency [EPA]).
- > Develop specialist (industry specific) skill sets within the energy service provider industry to enable them to effectively participate in activities in particular industry sub-sectors (for example, move from general energy efficiency to industry specific skill sets).

4.4 Intermediaries

4.4.1 Energy services sector

It is recognised that the development of policies and programs that are directed at increasing the uptake of energy efficiency will have a positive impact on the development of a self-sustaining energy services industry. However, during the consultation phase, stakeholders suggested several program and policy options that were specifically targeted at the energy services sector or would have a major impact on the sector. These included:

- > Develop a national accreditation scheme for all energy performance contracting operators, supported by performance monitoring, assessment and verification guidelines and procedures.
- > Ensure governments and the energy services industry work together to develop appropriate case studies and supporting literature on the role and benefits of energy service providers (for example, energy performance contractors) and facilitate the dissemination of this information to end-users.
- > Amend energy market regulatory frameworks to treat supply-side and demand-side measures equally and allow energy retailers and distributors to recover the full cost of implemented energy efficiency and demand-side management measures.
- > Introduce mandatory reporting on energy use and management initiatives by industry as well as public disclosure of commercial building energy performance.
- > Adopt more stringent energy efficiency targets for government operations, schools and hospitals accompanied by an increased ability of government entities to outsource the delivery of these energy efficiency outputs through third parties.
- > Establish an energy services industry development plan to expand the capacity of the energy service sector.

4.4.2 Energy markets and energy industries

The key policy suggestions in relation to energy markets and energy generators and retailers related principally to removing market and regulatory disincentives to energy efficiency and demand-side management activities (including full cost pricing), establishment of a national energy efficiency target, and the continuation of government programs to support energy efficiency.

- > Establish a national energy efficiency target where industry and energy providers could choose between an obligation under the Mandatory Renewable Energy Target (MRET) or an energy efficiency obligation.
- > Create appropriate incentives for transmission and energy retailers to reduce transmission and distribution losses.
- > Move towards full cost pricing for all energy delivered to customers to ensure effective price signals are at work in the market.
- > Establish a national scheme (similar in design to the Energy Smart Program) to fund the up-front costs of energy audits and energy management initiatives.

- > Introduce competitive bidding by generators and retailers for government financial support to enable marginal efficiency investments to proceed—either tied to energy efficiency or greenhouse gas abatement.
- > Ensure that energy efficiency initiatives also contribute to peak demand reductions, by targeting activities on a geographic (locational) basis and prioritising in terms of the relevant contribution to emerging ‘hot spots’ in the distribution system.

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Development of policies and programs that are directed at increasing the uptake of energy efficiency will have a positive impact on the development of a self-sustaining energy services industry.

- > Expand deeming provisions in schemes like the NSW Greenhouse Gas Abatement Scheme to cover a wide range of high energy-efficiency appliances and activities.
- > Adjust the energy market regulatory framework to provide equitable treatment between demand-side and supply-side augmentation measures, thus removing the existing disincentives to implement demand-side measures.
- > Ensure a national energy efficiency framework includes generators and integrate the existing Generator Efficiency Standards scheme into the national approach.

4.5 Government sector

4.5.1 Government operations

Government operations include the direct consumption of energy by government departments and associated operations. The main source of energy consumption for government operations (excluding defence) is in commercial buildings. Policy options raised by stakeholders in relation to government sector operations include:

- > Demonstrate government leadership through establishment of a consistent national goal or target for energy efficiency within its own operations.
 - > Including increased public disclosure and reporting of government energy efficiency targets and achievements.
- > Require governments across all jurisdictions to set MEPS of 4 stars or better (based on the Australian Building Greenhouse Rating Scheme [ABGRS]) for all buildings they lease or buy to provide a driver for improvements in the commercial building stock.
- > Introduce innovative finance and budgetary provisions (including incentives) to enable government operations to implement energy efficiency initiatives (to overcome the current budgetary disincentive faced by some government agencies in reducing energy consumption).
- > Require internal consistency of government policies across different portfolios to ensure that government policies are not providing a direct disincentive to increasing the level of energy efficiency.
- > Consistent application of local government planning procedures pertaining to energy efficiency services and activities across Australia.

4.5.2 Public housing, buildings, schools and hospitals

There were a range of policy suggestions put forward by stakeholders in relation to achieving increased energy efficiency for public buildings, housing, hospitals and schools. These included:

- > Introduce a common standard in all jurisdictions that requires public housing to achieve 5 star or better energy efficiency performance levels and thereby reduce energy cost pressures on lower income groups.
- > Require all public icon buildings to achieve energy-efficiency best-practice performance levels and require the implementation of all cost-effective measures (internal rate of return equivalent to the long-term government bond rate or better).
- > Establish a national hospital energy efficiency benchmark program involving all jurisdictions to ensure all new public hospitals and expansions of existing facilities achieve the highest practicable energy efficiency performance levels, and implement all cost-effective measures in existing facilities within an agreed timeframe.

- > Introduce innovative energy efficiency budgeting provisions to enable schools, hospitals and other public institutions to raise external capital and appoint energy performance contracting groups to implement energy efficiency measures, while allowing institutions to retain budget savings (to overcome the disincentive of budget cuts due to lower energy bills).
- > Develop Australia-wide energy efficiency programs and financing arrangements for schools and educational institutions.

Government operations include the direct consumption of energy by government departments and associated operations.

4.6 Crosscutting

The crosscutting category includes stakeholder suggestions that have implications for energy efficiency across all sectors. The main suggestions from stakeholders that fall into this category include:

- > Introduce a strong, long-term and nationally consistent commitment by governments across all jurisdictions to promote energy efficiency and put in place policies and programs to facilitate the adoption of energy efficiency measures.
 - > Some stakeholders specifically identified the adoption of a mandatory energy efficiency target as the most appropriate means of achieving this.
- > Introduce a market-based national energy efficiency target including tradeable certificates.
- > Build energy efficiency concepts into the curriculum of primary, secondary and tertiary courses to raise public awareness and expand the pool of energy efficiency expertise.
- > Increase public funding and support for research and development of energy efficient processes and technologies in industry, the built environment and appliances.
- > Appropriate energy efficiency accreditation courses for relevant trades and professions (e.g. plumbers, architects, engineers and builders).
- > Integrate energy efficiency into broader government environmental, social and economic policies and ensure cross-portfolio consistency.
- > Improve consistency of energy efficiency policies and programs across jurisdictions to provide common market signals and information to consumers.
- > Develop nationally consistent, broad-based energy efficiency information dissemination mechanisms.
- > Demonstrate consistent and long-lasting government commitment to support and maintain energy efficiency technical and advisory programs.
- > Introduce a national emissions trading scheme to provide an appropriate market signal to stimulate energy efficiency activities.
- > Develop a national, yet locally delivered, telephone advisory service and website that links consumers with local practitioners and trained suppliers in the energy efficiency field.

The crosscutting category includes stakeholder suggestions that have implications for energy efficiency across all sectors.

4.7 Policy dimensions matrix

The policy dimensions matrix (table 2) is a tabulation of the solutions proposed by the stakeholders to address the barriers and issues relating to energy efficiency. The proposed solutions are categorised by sector and by the relevant delivery mechanism or objective. For example, the primary deliverable of mandatory disclosure of energy performance of commercial buildings is to improve information flows and increase the overall level of awareness.

Table 2: Policy dimensions matrix

Disclosure

Introduce mandatory energy use reporting by the business sector

Conduct and provide energy ratings for new and existing houses at the point of sale or change of tenancy
 Disclose energy performance in commercial buildings (mandatory or voluntary)

Introduce a nationally consistent approach to measuring and reporting outcomes of energy efficiency initiatives to government programs across Australia

Awareness

Integrate energy efficiency into broader government environment, social and economic policies

Introduce nationally consistent, broad-based energy efficiency information dissemination packs and programs

Support and develop local, national and international information networks

Develop a consistent and long lasting commitment by government to energy efficiency technical and advisory programs

Government leadership through establishment of a national goal or objective on energy efficiency (similar to waste recycling and water)

	Residential	Commercial	Industry	Intermediaries	Government
Introduce mandatory energy use reporting by the business sector		•	•	•	•
Conduct and provide energy ratings for new and existing houses at the point of sale or change of tenancy Disclose energy performance in commercial buildings (mandatory or voluntary)		•		•	
Introduce a nationally consistent approach to measuring and reporting outcomes of energy efficiency initiatives to government programs across Australia	•		•	•	
Integrate energy efficiency into broader government environment, social and economic policies	•	•	•	•	•
Introduce nationally consistent, broad-based energy efficiency information dissemination packs and programs	•	•	•	•	•
Support and develop local, national and international information networks	•		•		
Develop a consistent and long lasting commitment by government to energy efficiency technical and advisory programs	•	•	•	•	•
Government leadership through establishment of a national goal or objective on energy efficiency (similar to waste recycling and water)	•				•

The proposed solutions are categorised by sector and by the relevant delivery mechanism or objective.

Awareness continued

Facilitate alternative project financing models to enable the construction and/or retrofitting of energy efficient buildings

Integrate energy efficiency issues into the energy market reform agenda (including load shifting and other peak load reduction measures)

Involve financial institutions in energy efficiency investments

Demonstration

Facilitate strategic partnerships between governments, industry, commercial, sectoral associations and research and development bodies

Showcase high energy efficient commercial buildings for training and demonstration purposes

Introduce programs to identify and demonstrate other benefits of energy efficiency—productivity, quality, flexibility

Negotiated agreements with industry to achieve specific energy efficiency outcomes

Accreditation and training

Build energy efficiency concepts into the curriculum of primary, secondary and tertiary courses

Appropriate energy efficiency accreditation courses for relevant trades and professionals (plumbers, architects, engineers and builders)

Introduce a national accreditation scheme for all energy performance contracting operators

Minimum standards

Nationally consistent mandatory energy ratings system for buildings

Nationally consistent minimum energy performance standard for new buildings

Stringent energy efficiency targets for government operations and its associated bodies, target delivery outsourced to third parties

	Residential	Commercial	Industry	Intermediaries	Government
Facilitate alternative project financing models to enable the construction and/or retrofitting of energy efficient buildings		•			
Integrate energy efficiency issues into the energy market reform agenda (including load shifting and other peak load reduction measures)	•		•		
Involve financial institutions in energy efficiency investments	•		•		
Facilitate strategic partnerships between governments, industry, commercial, sectoral associations and research and development bodies		•	•		
Showcase high energy efficient commercial buildings for training and demonstration purposes		•			
Introduce programs to identify and demonstrate other benefits of energy efficiency—productivity, quality, flexibility			•		
Negotiated agreements with industry to achieve specific energy efficiency outcomes			•		
Build energy efficiency concepts into the curriculum of primary, secondary and tertiary courses	•	•	•	•	•
Appropriate energy efficiency accreditation courses for relevant trades and professionals (plumbers, architects, engineers and builders)	•	•	•	•	•
Introduce a national accreditation scheme for all energy performance contracting operators				•	
Nationally consistent mandatory energy ratings system for buildings	•	•			
Nationally consistent minimum energy performance standard for new buildings		•			
Stringent energy efficiency targets for government operations and its associated bodies, target delivery outsourced to third parties			•		•

Minimum standards

Governments should set a minimum energy performance standard of 4 stars or better (based on Australian Building Greenhouse Rating Scheme [ABGRS]) for all buildings they lease or buy

Consistent standards and application of government planning procedures

Expand and strengthen MEPS to cover all major domestic appliances and commercial/industrial appliances, lighting, heating, ventilation and air conditioning (HVAC)

Targeted incentives

National energy efficiency target

Create a fund to support demand management and energy efficiency programs

Preferential tax treatment and/or subsidies for high efficiency appliances and equipment

Redress the taxation imbalance between upgrade investments (improvements) including energy efficiency and operational maintenance

Accelerated depreciation for energy efficient equipment

Emissions trading scheme

Innovative leasing arrangements to overcome split incentives

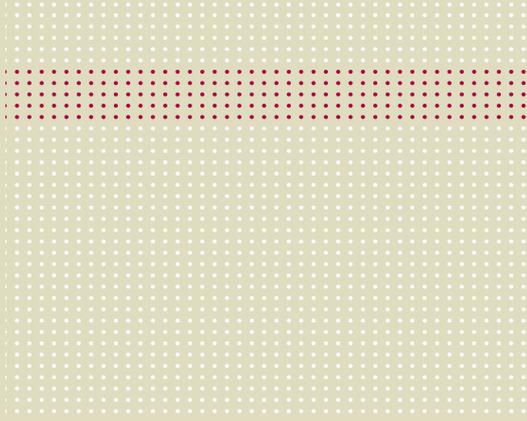
Sharing of energy efficiency investment risk by government

Investment/financial assistance to overcome transaction costs for projects that do not meet company investment criteria

Appropriate incentives to reduce electricity transmission and distribution losses

Innovative finance and budgetary provisions (including incentives) for government operations and public entities

	Residential	Commercial	Industry	Intermediaries	Government
Governments should set a minimum energy performance standard of 4 stars or better (based on Australian Building Greenhouse Rating Scheme [ABGRS]) for all buildings they lease or buy					•
Consistent standards and application of government planning procedures					•
Expand and strengthen MEPS to cover all major domestic appliances and commercial/industrial appliances, lighting, heating, ventilation and air conditioning (HVAC)	•	•	•		
National energy efficiency target	•	•	•	•	•
Create a fund to support demand management and energy efficiency programs	•	•	•	•	•
Preferential tax treatment and/or subsidies for high efficiency appliances and equipment	•	•			
Redress the taxation imbalance between upgrade investments (improvements) including energy efficiency and operational maintenance		•	•		
Accelerated depreciation for energy efficient equipment			•		
Emissions trading scheme	•	•	•	•	•
Innovative leasing arrangements to overcome split incentives		•			
Sharing of energy efficiency investment risk by government			•		
Investment/financial assistance to overcome transaction costs for projects that do not meet company investment criteria			•		
Appropriate incentives to reduce electricity transmission and distribution losses				•	
Innovative finance and budgetary provisions (including incentives) for government operations and public entities					•



	Government	Intermediaries	Industry	Commercial	Residential
Establish and promote research and development to facilitate innovation and design of energy efficiency in commercial buildings			•		
Support and invest in energy efficiency research, development, demonstration and commercialisation	•	•	•	•	•

Technology and innovation

Establish and promote research and development to facilitate innovation and design of energy efficiency in commercial buildings

Support and invest in energy efficiency research, development, demonstration and commercialisation





The level of participation by stakeholders, and their willingness to actively contribute through the stakeholder workshops and written submissions, has enabled the development of a comprehensive picture of the main energy efficiency issues faced by the Australian industry and the broader community.

5. Conclusions

The consultation process has proven to be a valuable method of obtaining information and feedback from stakeholders on key barriers and challenges to the increased uptake of energy efficiency in Australia. The consultation process has also proven to be an excellent means of identifying a range of policy and program options that jurisdictions could consider for inclusion in the National Framework. The level of participation by stakeholders, and their willingness to actively contribute through the stakeholder workshops and written submissions, has enabled the development of a comprehensive picture of the main energy efficiency issues faced by the Australian industry and the broader community.

The objective of this section is to draw out the major conclusions and recommendations from the input received from stakeholders.

5.1 Barriers and issues

Overall, there was a high level of stakeholder recognition of the issues and barriers identified in the *Discussion paper*, although there was not unanimous agreement among stakeholders in all sectors. The key responses can be grouped as outlined below.

5.1.1 Information and awareness

The most common barrier raised by stakeholders was the need for increased awareness of energy efficiency and of potentially cost-effective options that could be implemented, particularly in the residential, commercial and small-to-medium scale industrial sectors. This lack of awareness stems mainly from the lack of availability of, or access to, energy efficiency information, including price signals and data on energy consumption. However, it may also be due to the fact that energy represents a small proportion of total costs for most consumers. A lack of education around energy efficiency, including training courses, was also highlighted as a major barrier.

5.1.2 Government leadership and coordination

A common constraint identified by a wide range of stakeholders was the apparent lack of government leadership in establishing a national goal or sense of purpose to achieve higher levels of energy efficiency. Cross-jurisdictional inconsistency in policies and programs was seen as a significant barrier and stakeholders thought it important that government set an example by implementing cost-effective energy efficiency measures across government operations.

5.1.3 Financial and economic incentives

A major theme of many stakeholder responses was the lack of financial drivers or availability of capital to invest in energy efficiency measures. While the empirical evidence suggests that there are potentially high rates of return on energy efficiency investments, many stakeholders considered that the existence of differential hurdle rates and split incentives (particularly in the residential and commercial sectors) for investors is a major barrier to the uptake of energy efficiency measures. While some industry stakeholders disagreed with the existence of differential hurdle rates, the large number of stakeholder comments on high transaction costs and risks of energy efficiency investments suggest that differential hurdle rates do exist and, in many cases, for good reason. Financial constraints in the residential and commercial sector did not rank as highly as in the industrial sector.

5.1.4 Technical capacity

Stakeholder feedback on technical constraints varied across sectors. Lack of technical capacity appears to be a significant barrier for the residential sector and in industry, particularly for small-to-medium scale enterprises. Technical constraints were not identified as a major hurdle in the commercial sector or in some segments of large industry, particularly energy intensive enterprises. Nevertheless, there appears to be a need to supplement the pool of technical expertise in some areas and to develop training and vocational courses to overcome this constraint. Accreditation issues and standards for energy service providers, and a general lack of awareness of the potential benefits of engaging energy efficiency experts and contractors, were also raised by a number of stakeholders.

5.1.5 Standards and regulations

Stakeholders considered that different standards across jurisdictions, or the lack of minimum standards (for example, for some classes of residential and commercial buildings), was an important barrier that the National Framework should address. In particular, there was a perceived lack of national coordination on minimum building standards and a plethora of different agencies responsible for introducing and enforcing regulatory requirements. There was clear stakeholder recognition that governments should intervene in markets where there was obvious market failure, or where transaction costs and information constraints resulted in less than desirable economic and social outcomes. Some stakeholders, however, suggested the *Discussion paper* had not presented a clear-cut case for government intervention to overcome perceived market failure.

A broad range of stakeholders identified unequal treatment of supply and demand-side measures within the energy market regulatory structure as a significant barrier to be addressed. At present, the view of most stakeholders is that there is a direct disincentive (relative to supply-side augmentation) for retailers and transmission entities to implement energy efficiency measures.

5.2 Suggested policy options and solutions

As outlined in Section 4, there have been a wide range of potential policy options and solutions put forward by stakeholders to overcome the barriers identified and to meet the key challenges to increasing the uptake of cost-effective energy efficiency measures. In summary, the key suggestions by sector are outlined below.

5.2.1 Residential

- > Expand and strengthen MEPS for appliances and buildings.
- > Introduce mandatory and nationally consistent disclosure of residential building energy performance.
- > Expand information and awareness programs for consumers (including through the education system).

5.2.2 Commercial

- > Introduce a mandatory energy performance disclosure requirement (based on a nationally consistent rating system) for all commercial buildings (some stakeholders considered this should be voluntary).
- > Extend MEPS to buildings, commercial office equipment, lighting and heating, ventilation and air conditioning (HVAC) systems.
- > Support and promote demonstration buildings and innovative design to showcase energy efficiency.
- > Introduce innovative financial and leasing arrangements to overcome the split incentive issue.

5.2.3 Industry

- > Introduce a national energy efficiency target to provide a strong market incentive to implement energy efficiency measures.
- > Improve information flows to decision makers through targeted programs, strategic partnerships, web-based links to industry specific information and advisory support services.
- > Introduce mandatory public reporting of energy use or energy management initiatives for large companies to ensure sufficient information flows to investors and the market (this was opposed by some industry stakeholders).
- > Introduce an emissions trading scheme to provide a strong market incentive to implement energy efficiency measures.
- > Enhance levels of government support and partnerships with industry and research institutions to promote appropriate research, development and demonstration activities.
- > Introduce accelerated depreciation or similar fiscal incentives to increase the attractiveness of energy efficiency investments (this was not supported by all stakeholders).
- > Expand MEPS to cover all major industrial machinery and equipment.

Stakeholders considered that different standards across jurisdictions, or the lack of minimum standards (for example, for some classes of residential and commercial buildings), was an important barrier that the National Framework should address.

5.2.4 Energy markets and energy service providers

- > Amend the existing energy market regulatory framework to give equitable treatment to demand and supply-side responses.
- > Introduce a national energy efficiency target scheme to provide sufficient market drivers to increase energy efficiency.
- > Provide an impetus to the development of the energy services industry by adopting stringent energy efficiency targets for government operations and facilitating the outsourcing of the delivery of these targets, as well as working with the industry to develop case studies that highlight the potential benefits of contracting external expertise.
- > Adopt a national accreditation and awareness raising program.

5.2.5 Government

- > Government to lead by example by implementing all cost-effective energy efficiency measures in their operations; adopting nationally consistent targets; providing the community with a national goal or sense of purpose in relation to energy efficiency; and setting a minimum energy performance requirement for new buildings and leased commercial premises.
- > Redress the budgetary disincentive for some public institutions to implement energy efficiency measures.
- > Strive for world's best practice energy-efficiency standards for public housing, hospitals, schools and public buildings (and implement all cost-effective measures for existing facilities).
- > Provide consistency in programs and policies across jurisdictions and a long-term commitment to information and technical advisory services.

5.2.6 Crosscutting

- > Introduce a clear, well articulated and nationally consistent goal for energy efficiency that will provide a focus for action.
- > Adopt a national energy efficiency target.
- > Expand appropriate information and technical advisory services to provide a nationally consistent approach across all jurisdictions.
- > Build energy efficiency concepts into all levels of education and vocational training.
- > Adopt an emissions trading scheme.

A wide range of potential policy options and solutions were put forward by stakeholders to overcome the barriers identified and to meet the key challenges in increasing the uptake of cost-effective energy efficiency measures.

Appendix 1

Discussion paper, Towards a National Framework for Energy Efficiency—Issues and challenges mail-out list

- > ABGR National Steering Committee Members
- > ACIL Tasman
- > ACT Office of Commissioner for the Environment
- > ACT Office of Sustainability
- > ACT Planning and Land Authority
- > ActewAGL
- > Adelaide University Architecture School
- > AGL
- > AGL South Australia Pty Ltd
- > AHA Management
- > Air Con Serve
- > Alcoa World Alumina
- > Alinta Corporation
- > Allen Consulting Group
- > Alternative Technology Association
- > Amcor Australasia
- > AMP Henderson Global Investors
- > AMP Limited
- > ANZ
- > ANZSES—SA Branch
- > Arnotts
- > Arthur Masters
- > Asset Technology Pacific
- > Association of Consulting Architects Australia
- > Association of Consulting Engineers Australia
- > Aurora Energy
- > Australasian Energy Performance Contracting Association
- > Australia Institute
- > Australian Aluminium Council
- > Australian Building Codes Board
- > Australian Bulk Minerals
- > Australian Business Council for Sustainable Energy
- > Australian Chamber of Commerce and Industry
- > Australian Conservation Foundation
- > Australian Consumers' Association
- > Australian Council of Building Design Professions
- > Australian Electrical and Electronic Manufacturers' Association
- > Australian Energy Services Pty Ltd (PowerDirect)
- > Australian Financial Markets Association
- > Australian Gas Association
- > Australian Hotels Association (South Australia)
- > Australian Industry Greenhouse Network
- > Australian Industry Group
- > Australian Inland> Australian Institute Building Surveyors NT Branch
- > Australian Institute of Energy
- > Australian Institute of Petroleum
- > Australian Institute of Refrigeration, Air Conditioning and Heating
- > Australian Liquefied Petroleum Gas Association
- > Australian Local Government Association
- > Australian Paper
- > Australian Paper Industry Council
- > Australian Petroleum Production and Exploration Association
- > Australian Pipeline Industry Association
- > Australian Services Union (Services and Energy Branch)
- > Australian Vinyls
- > Australian Window Association
- > Baking Industry Association of NSW
- > Bankers Association
- > Barrett Burston Malting
- > Betta Milk Co Op Society Ltd
- > Beverage Industry Environment Council
- > Big Switch Projects
- > Blue Circle Southern Cement
- > BlueScope Steel
- > BOMA (NT Division)
- > Bonlac Foods Limited
- > Boral
- > Bovis Lend Lease
- > BP Australia
- > Brenden Meney Architects
- > Brisbane City Council
- > BT Governance Advisory Service
- > Building Designers Association
- > Building Products Innovation Council
- > Business Council of Australia
- > Business SA
- > Cadbury Schweppes
- > Canberra Business Council
- > Caroma Industries Limited
- > Cascade Brewery Company Pty Ltd
- > Catholic Superannuation Fund
- > Cavill Power Products Ltd
- > Cement Australia Pty Ltd
- > Cement Industry Federation
- > Centre for Appropriate Technology Inc.
- > Centre for Energy and Greenhouse Technologies
- > Centre for Sustainable Energy System
- > Ceramic Fuel Cells Limited
- > Chamber of Commerce and Industry
- > Chamber of Commerce and Industry, ACT and Region
- > Chamber of Minerals and Energy
- > Charles Darwin University
- > Chief Minister's Department
- > City of Adelaide
- > City of Burnside
- > City of Campbelltown
- > City of Charles Sturt
- > City of Holdfast Bay
- > City of Marion
- > City of Mitcham
- > City of Norwood, Payneham and St Peters
- > City of Onkaparinga
- > City of Playford
- > City of Port Adelaide Enfield
- > City of Prospect
- > City of Salisbury
- > City of Tea Tree Gully
- > City of Unley
- > City of West Torrens
- > Coca-Cola Amatil
- > Cogen Microsystems Pty Ltd
- > Coles Myer
- > Colonial First State Property
- > Comalco Aluminium (Bell Bay) Ltd
- > Comalco Aluminium Limited
- > Commerce Queensland
- > Commonwealth Bank
- > Commonwealth Department of Industry Tourism and Resources
- > Connell Mott MacDonald
- > Conservation Council of SA
- > Conservation Council of the SE Region & Canberra
- > Coopers Brewery
- > Copper Mines of Tasmania
- > Council on the Ageing
- > Country Energy
- > Cripps Nubake
- > CS Energy
- > CSIRO

- > CSIRO Energy Technology
- > CSS and PSS Boards
- > Cummins

- > Dairy Australia
- > Dairy Process Engineering Centre
- > Delta Electricity
- > Delta Electrics
- > District Council of Mount Barker
- > District Council of Robe
- > Dow Chemical (Australia) Limited

- > Ecka Granules Australia Pty Ltd
- > Eco Energy> Eco-Energy Options
- > Edison Mission Energy
- > Efficient Energy Systems Pty Ltd
- > ElectraNet Pty Ltd
- > Electrical Electronic Industry Training Ltd
- > Electrical Trades Union (ETU)
- > Electricity Industry Ombudsman
- > Energy Supply Association of Australia
- > Electricity Supply Industry Planning Council
- > EMET Consultants
- > Energetics
- > Energex
- > Energy Analysis Consulting
- > Energy and Water Ombudsman of NSW
- > Energy Conservation Systems Pty Ltd
- > Energy Consult Pty Ltd
- > Energy Developments Pty Ltd
- > Energy Doctor Pty Ltd
- > Energy Efficiency and Conservation Authority (NZ)
- > Energy Efficient Strategies
- > Energy Futures Australia
- > Energy Retailers Association
- > Energy Strategies
- > Energy Task Force, Prime Minister and Cabinet
- > Energy Users Association of Australia
- > EnergyAustralia
- > Enertrade
- > Enervision Australia Pty Ltd
- > Engineering Employers Association SA
- > Engineers Australia
- > Environment ACT
- > Environment Business Australia
- > Environment Centre
- > Environmental Protection Agency, QLD
- > Environmentally Sustainable Development

- > Eraring Energy
- > Ergon Energy
- > Essential Services Commission of SA
- > ETSA Utilities
- > Exergy Australia
- > ExxonMobil Australia Pty Ltd

- > Facilities Management Association of Australia
- > Ferrier Consulting
- > Ford Motor Company
- > Foster's Group, Carlton & United Breweries Ltd
- > Frontier Economics

- > General Property Trust
- > Genesis Automation
- > George Wilkenfeld and Associates
- > GHD Pty Ltd
- > Glaxo Smithkline
- > Green Building Council of Australia
- > Greenpeace Australia
- > Grocon
- > Grote Street Business Association

- > Heinz Australia
- > Henley and Grange Residents Association
- > Henley Properties
- > Henty Goldmine Limited
- > Holden
- > House Energy Rating Management Body
- > Housing Industry Association
- > Hydro Tasmania

- > Illuminating Engineering Society of Australia and NZ
- > Impact Fertilisers Pty Ltd
- > Independent Competition and Regulatory Commission
- > Industry Superannuation Property Trust
- > Institute for Sustainable Futures
- > Institute of Chartered Accountants in Australia
- > Insurance Australia Group
- > Integral Energy
- > InterGen
- > International Council for Local Environment Initiatives (ICLEI)
- > International Power Hazelwood
- > Investa Property Trust
- > ITS Communications

- > J.Boag and Son Brewing Ltd

- > Lactos Pty Ltd
- > Lake Bonney Wind Power Pty Ltd
- > Landcom
- > Lofty Ranges Power Pty Ltd
- > Loxton Waikerie Council
- > Loy Yang Power Management P/L

- > Macquarie Generation
- > Macquarie Office Trust
- > Magarey Refrigeration
- > Manildra Group
- > Master Builders Association
- > Master Builders Australia
- > MasterFoods Australia New Zealand—Snackfoods
- > MBA Newcastle
- > McKean and Park, Lawyers and Consultants
- > Merck Sharp and Dohme (Australia) Pty Ltd
- > Minerals Council of Australia
- > Mirvac
- > Mitsubishi Motors Australia Ltd
- > MM Kembla
- > Mobil
- > Monash Property Management
- > Moreland Energy Foundation
- > Mount Pleasant Natural Resource Centre
- > Mr Denise Lehmann
- > Mr John Eastham
- > Mr Richard Lee
- > Ms Jackie Watts
- > Ms Kathryn Davidson
- > Ms Monica Oliphant
- > Multiplex Asset Management
- > Multiplex Developments (Vic.) P/L
- > Murray-Goulburn Cooperative Co Ltd
- > Murraylands Region NPWSA
- > Murraylink Transmission Company Pty Ltd

- > NAB
- > National Competition Council
- > National Electricity Code Administrator Ltd
- > National Electricity Market Management Company Ltd
- > National Farmers Federation
- > Nature Conservation Council of NSW
- > Next Energy
- > NHP Electrical Engineering Products P/L

- > Norske Skog
- > Northern Adelaide Region,
C/- City of Tea Tree Gully
- > Northern Power Services
- > NRG Flinders
- > NSW Chamber of Commerce
- > NSW Department of Commerce
- > NSW Department of Education
and Training
- > NSW Department of Health
- > NSW Department of State and Regional
Development
- > NSW Ministry for Energy and Utilities
- > NSW Sugar Milling Cooperative Ltd
- > NSW Treasury
- > NT Cattlemen's Association Inc
- > NT Centre for Energy Research
- > NT Chamber of Commerce and Industry
- > NT Department of Business, Industry and
Resource Development
- > NT Department of Infrastructure,
Planning and Environment
- > NT Minerals Council

- > Onesteel
- > Optimum Energy Australia Pty Ltd
- > Orica
- > Origin Energy
- > Osborne CoGeneration

- > P&O Australia
- > Pacifica Group Ltd
- > Pasminco Hobart Smelter
- > Pasminco Port Pirie Smelter
- > Pelican Point Power Ltd
- > Perry Brothers
- > Pilkington (Australia) Ltd
- > Pinepanels Bell Bay Pty Ltd
- > Pitjantjatjara Council Inc.
- > Planning Institute of Australia
- > Planning SA
- > Plastics and Chemicals Industries
Association Inc
- > Power and Water Authority
- > Powerco
- > Powercor Australia
- > Powercorp
- > Powerdirect
- > Productivity Commission
- > Property Council of Australia
- > Public Interest Advocacy Centre

- > Qantas
- > Qantec Pty Ltd
- > Qld Department of Housing
- > Qld Department of Industrial Relations
- > Qld Department of Innovation and
Information Economy
- > Qld Department of Local Government
and Planning
- > Qld Department of Premier and Cabinet
- > Qld Department of Public Works
- > Qld Department of State Development
- > Qld Office of Energy
- > Queensland Alumina Limited
- > Queensland Conservation Council
- > Queensland Energy Solutions Industry
Development Centre
- > Queensland Resources Council (former
Queensland Mining Council)
- > Queensland Treasury

- > Rawetech Technologies
- > RCS, Australian National University
- > Renewable and Sustainable Energy
Roundtable
- > Renison Bell Limited
- > Rheem Australia Pty Ltd
- > Rib Loc Australia Pty Ltd
- > RMIT University
- > Royal Australian Institute of Architects
- > Royal Australian Institute of Architects
(SA Chapter)

- > SA Department of Business,
Manufacturing and Trade
- > SA Department of Environment
and Heritage
- > SA Department of the Premier
and Cabinet
- > SA Department of Treasury and Finance
- > SA Parliament
- > SA Water Corporation
- > SA Wine and Brandy Association
- > SAAB Systems Pty Ltd
- > Saturn Corporate Resources
- > School of Electrical Engineering and
Telecommunications, University of NSW
- > SDA Engineering Pty Ltd
- > Shell Australia
- > Simcoa Operation Pty Ltd
- > Simplot Australia Pty Limited
- > SITGas Controls Pty Ltd

- > SKM
- > Solahart
- > Sony Australia
- > South Australian Council of
Social Services
- > South Australian Farmers' Federation
- > Southern Cross Darwin
- > SPC Ardmona
- > SPI Powernet
- > Standards Australia
- > Stanwell Corporation Limited
- > Steve Beletich and Associates
- > Stockland
- > Suntec
- > Sustainable Business
- > Sustainable Energy Development
Authority
- > Sustainable Focus Pty Ltd
- > Sustainable Solutions
- > Synergen Power Pty Ltd
- > System Solutions

- > TAC Pacific Pty Ltd
- > Tarong Energy
- > Tas Department of Infrastructure,
Energy and Resources
- > Tas Department of Treasury and Finance
- > Tasmanian Alkaloids Pty Ltd
- > Tasmanian Chamber of Commerce and
Industry
- > Tasmanian Conservation Trust
- > Tasmanian Council of Social Services
(TASCOSS)
- > Tasmanian Environment Centre
- > Tasmanian Minerals Council Ltd
- > TEMCO
- > TEQMan
- > Terra Gas Trader
- > Territory Construction Association
- > Territory Pastoral Services
- > The Office of Tasmanian Energy
Regulator
- > Total Environment Centre (NSW)
- > Transend Networks
- > Transgrid
- > Troppo Architects Pty Ltd
- > TXU (South Australia) Pty Ltd
- > TXU Australia

- > United Milk Tasmania Ltd
- > UnitingCare Wesley Adelaide
- > Univeristy of SA School of
Geoinformatics Planning and Building
- > Universal Engineering NT
- > University of New South Wales
- > University of SA, School of Engineering
- > University of Tasmania
- > University of Technology Sydney
- > Urban Ecology Australia Inc

- > Visy Industrial Packaging
- > Visy Industries

- > WA Department of Housing and Works
- > WA Department of Industry
and Resources
- > WA Department of Planning and
Infrastructure
- > WA Department of Premier and Cabinet
- > WA Local Government Association
- > WA Office of Energy
- > Wesfarmers Limited
- > Western Australian Conservation Council
- > Western Australian Sustainable
Energy Association
- > Western Australian Sustainable
Industry Group
- > Western Power Corporation
- > Westfield Holdings
- > Westpac
- > Woodside
- > Woolworths Limited
- > World Wide Fund for Nature Australia
- > Wrigley Company

- > Xstrata (MIM Holdings Ltd)

- > Yallourn Energy
- > Yalumba Wines

Appendix 2

..... Consultation workshops and meetings attendees list

- > ABARE
- > ACIL Tasman for the Australian Coal Association
- > ACMV Design Consultants, WA SEA's Energy Efficient Building Design Taskforce
- > AGL
- > Aircon Serve
- > Alcoa
- > Alinta
- > Amcor Australasia
- > Arthur Masters
- > Asset Technologies Pacific
- > Association of Building Sustainability Assessors
- > Association of Building Surveyors
- > Aurora Energy
- > AusPower
- > AusPower (Yallourn Energy)
- > Australian Aluminium Council
- > Australian Building Codes Board
- > Australian Building Energy Council
- > Australian Bureau of Statistics
- > Australian Business Council for Sustainable Energy
- > Australian Conservation Foundation
- > Australian Electrical and Electronic Manufacturers Association
- > Australian Greenhouse Office
- > Australian Industry Greenhouse Network
- > Australian Institute of Energy
- > Australian Institute of Refrigeration, Air Conditioning and Heating
- > Australian Plantation Products and Paper Industry Council
- > Australian Slag Association
- > Ash Development Association

- > Balance Energy
- > Barrett Burston Malting
- > Blue Circle Southern Cement
- > Blue Scope Steel
- > Boags Brewery
- > Bonlac
- > Building Designers Association of Victoria

- > Calidad Industries, Skylighting Industry Association
- > Campbelltown City Council
- > CCP Officer Northern Adelaide Region
- > Cement Industry Federation
- > Centre for Energy and Greenhouse Technologies
- > City of Charles Sturt
- > City of Prospect
- > City of Unley
- > Comalco
- > Commonwealth Bank
- > Connell Mott MacDonald
- > Conservation Council SA
- > CSR Bradford

- > Department of Premier and Cabinet
- > Director, Maxilight Industries

- > Ecogen Energy
- > ECS
- > Edwards Hot Water
- > Electranet
- > Energy Supply Association of Australia
- > Energetics
- > Energy Australia
- > Energy Conservation Systems Pty Ltd
- > Energy Consult Pty Ltd
- > Energy Efficient Strategies
- > Energy Networks Association
- > Energy SA
- > Energy Strategies
- > Enervision Australia (Barton Group Energy)
- > Engineering Employers Association SA
- > Engineers Australia
- > Environment ACT
- > Environment Victoria
- > ESIPC
- > ETSA Utilities
- > Exergy Australia Pty Ltd

- > Ferrier Electrical Consulting
- > Foster's Group, Carlton and United Breweries Ltd

- > Genesis Automation

- > Holden Ltd
- > Housing Industry Association

- > Institute of Sustainable Futures
- > Insulation Solutions
- > Integral Energy
- > International Council for Local Environment Initiatives (ICLEI)
- > International Power Hazelwood
- > Investa Property Trust

- > Loy Yang Power Management P/L

- > Macquarie Office Trust
- > Marrickville Council
- > Master Builders Association of Australia (Victoria)
- > Master Builders Associations
- > Master Builders Australia
- > McKean and Park and Australian Greenhouse Markets Pty Ltd
- > McKean and Park, Lawyers and Consultants
- > Metasource
- > Michael Morton
- > Minerals Council of Australia
- > Mitsubishi Motors
- > Ms Monica Oliphant
- > Murray-Goulburn Cooperative Co Ltd

- > National Electricity Market Management Company Ltd
- > NHP Electrical Engineering Products P/L
- > Norske Skog
- > NRG Flinders
- > NSW Department of Energy, Utilities and Sustainability
- > NSW Minerals Council

- > Orica
- > Origin Energy

- > Pasminco
- > Planning SA
- > Plastics and Chemicals Industry Association
- > Powerco
- > Productivity Commission
- > Property Council of Australia
- > Property Council of Australia Victorian Division

- > Renewable and Sustainable Roundtable
- > Rheem
- > Rib Loc Australia
- > Rinnai Australia
- > Royal Australian Institute of Architects Victorian Chapter

- > SA Premier and Cabinet
- > Saturn Corporate Resources
- > Solahart
- > Sustainable Focus
- > Sustainable Solutions

- > TasCOSS (Tasmanian Council of Social Services)
- > Tasmanian Alkaloids
- > Tasmanian Energy Regulator
- > Tasmanian Environment Centre
- > TCCI/ Property Council of Australia
- > Thomas Clark Australia
- > Total Environment Centre
- > TXU Australia

- > Uni SA
- > UnitingCare Wesley Adelaide
- > Urban Ecology Australia

- > WA Sustainable Energy Association
- > WA Sustainable Industry Group/Centre of Excellence in Cleaner Production
- > Western Power
- > Woodside Energy
- > Wyatt and Associates

Appendix 3

Organisations that submitted written responses to the *Discussion paper, Towards a National Framework for Energy Efficiency—Issues and challenges*

Company name by sector

Commercial

- > Australian Building Codes Board
- > Building Products Innovation Council
- > Confidential
- > Facilities Management Association of Australia
- > Master Builders Australia
- > Royal Australian Institute of Architects

Consultant

- > Australasian Energy Performance Contracting Association
- > Confidential
- > Energetics
- > Energy Doctor Pty Ltd
- > Energy Futures Australia
- > Sustainable Energy Research Group, UNSW

Energy

- > ActewAGL
- > AGL
- > Alinta Corporation
- > Australian Business Council for Sustainable Energy
- > Australian Institute of Energy
- > Confidential
- > Confidential
- > Energy Retailers Association
- > Energy Supply Association of Australia
- > Ergon Energy
- > ETSA Utilities
- > Hydro Tasmania
- > International Power Hazelwood
- > Macquarie Generation
- > Origin Energy
- > Peak Energy Efficiency Consortium
- > Renewable and Sustainable Energy Roundtable
- > TXU Australia

Company name by sector

Government

- > Confidential
- > Confidential
- > International Council for
Local Environment Initiatives (ICLEI)
- > Productivity Commission
- > SA Department of the Premier and Cabinet

Individual

- > Andrew Nance
- > Jonathan Crockett

Industrial/Manufacturing

- > Australian Industry Greenhouse Network
- > Australian Institute of Refrigeration,
Air Conditioning and Heating
- > Australian Vinyls
- > BlueScope Steel
- > Cement Industry Federation
- > Confidential
- > Confidential
- > Confidential
- > Confidential
- > Electrical Trades Union of Australia (ETU)
- > Engineering Employers Association SA
- > Engineers Australia
- > Housing Industry Association
- > Insurance Australia Group
- > J.Boag and Son Brewing Ltd
- > Ken Cheney
- > Mitsubishi Motors Australia Ltd
- > Norske Skog
- > Rib Loc Australia Pty Ltd
- > Rinnai Australia Pty Ltd
- > Skylight Industry Association
- > Western Australian Sustainable Energy
Association
- > Western Australian Sustainable
Industry Group
- > Woodside
- > Zinifex Hobart Smelter (was Pasmenco)

Non-government organisation

- > Confidential
- > Environment Victoria
- > Green Building Council of Australia
- > Moreland Energy Foundation
- > Total Environment Centre (NSW)

