Australian Government

Issues Paper

National Energy Savings Initiative

Department of Climate Change and Energy Efficiency

Department of Resources, Energy and Tourism

DECEMBER 2011

As part of the Clean Energy Future plan, the Australian Government is undertaking further work on a national Energy Savings Initiative.

National Energy Savings Initiative

As part of the Clean Energy Future plan, the Australian Government is undertaking further work on a national Energy Savings Initiative (ESI). The National Energy Savings Initiative Working Group has released this Issues Paper to seek the views of individuals and organisations on aspects of design and implementation of a possible national Energy Savings Initiative.

This Issues Paper was developed with the assistance of the National Energy Savings Initiative Advisory Group, and many other stakeholders who attended workshops in Adelaide and Melbourne in November 2011. The Working Group thanks all involved for their assistance.

About the National Energy Savings Initiative Working Group

The National Savings Initiative Working Group (the Working Group) has been established to prepare a report for the Minister for Climate Change and Energy Efficiency and the Minister for Resources and Energy on possible design options for a national Energy Savings Initiative. Full terms of reference are at Appendix D to this paper. The Working Group comprises senior officials from the Department of Climate Change and Energy Efficiency and the Department of Resources, Energy and Tourism.

The Working Group is assisted by an Advisory Group comprising

Australian Council of Social Service
Australian Council of Trade Unions
Australian Energy Markets Commission
Australian Industry Group
Choice
The Clean Energy Council
The Climate Institute
ClimateWorks Australia
Energy Efficiency Certificate Creators Association
Energy Efficiency Council
Energy Networks' Association
Energy Retailers' Association of Australia
Energy Users Association of Australia
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About the issues paper, and making a submission

This Issues Paper sets out topics the Australian Government will consider as part of further work on a national Energy Savings Initiative. Each chapter of the paper provides context on a set of issues, and raises questions on which the Working Group is seeking stakeholder responses. On pages iii - ix there is a chapter-by-chapter summary of the questions asked, to aid readers who wish to target their attention to particular issues. The box below contains information on how to make a submission in response to the Issues Paper.

The Issues Paper was developed with the assistance of the National Energy Savings Initiative Advisory Group; and many other stakeholders who attended workshops in Adelaide and Melbourne in November 2011. The Working Group thanks all involved for their assistance.

How to make a submission

The National Energy Savings Initiative Working Group invites all interested people and organisations to make a written submission in response to the topics raised in this Issues Paper. Submissions may range from a short letter outlining your views on a particular topic to a larger document covering a range of issues. Where possible, you should provide evidence, such as relevant data and documentation, to support your views.

The Working Group is committed to an open and transparent process, so all submissions should be provided as public documents that can be placed online. Under some circumstances sensitive material can be submitted in confidence, for example, if it was of a personal or commercial nature, and publishing the material would be potentially damaging. Please contact the Secretariat for further information and advice before submitting confidential material.

All submissions, except for any information supplied in confidence, will be published on the Department of Climate Change and Energy Efficiency's website shortly after receipt, and will remain there indefinitely as a public document. Copyright in submissions resides with the author(s), not with the department.

Each submission should be accompanied by a cover sheet (see Appendix A). For submissions received from individuals, all personal details will be removed before publication on the website. Please remove track changes and hidden text from documents before submitting. Submissions by email are preferred, either as a Microsoft Word (.doc) file, or as a PDF.

Send submissions to:

Post:

Attn: Energy Savings Initiative Secretariat
GPO Box 854
CANBERRA ACT 2601

Electronic:

energyefficiency@climatechange.gov.au
subject line: *Issues Paper*

The closing date for submissions is 27 February 2012

Structure of the Issues Paper

Chapter 1 discusses contextual information that may assist readers with the remaining chapters. These include background on a national Energy Savings Initiative, exploring common barriers to energy efficiency improvements; a summary of the factors affecting energy price rises; and a general description of how energy efficiency obligations work.

Chapter 2 sets out high-level principles for a national Energy Savings Initiative. Major design elements (likely to be common to any national Energy Savings Initiative) are discussed in Chapter 3. The scope of a national Energy Savings Initiative to catalyse energy efficiency improvements in different sectors is set out in Chapter 4.

Chapters 5 and 6 cover in depth two specific issues that the Working Group was asked to consider: creating an incentive or requirement to create certificates in low income homes and in ways that reduce peak electricity demand.

Appendix A is a submissions cover sheet template. Appendix B has a quick-reference table of the features of the three state-based schemes and key international schemes. A list of acronyms is provided in Appendix C. The National Energy Savings Initiative Working Group's terms of reference are in Appendix D.

Next steps

Subject to interest, the Working Group will convene a series of public workshops on the Issues Paper in capital cities in early February 2012. For more information on public consultation, visit: www.climatechange.gov.au/government/initiatives/energy-savings-initiative.aspx.

Responses to the Issues Paper will inform a progress report that the Working Group will present to the Australian Government in the first half of 2012. Following the progress report, the Working Group will narrow design options and conduct economic modelling to inform a regulation impact statement, to be released for public consultation in the second half of 2012. The Australian Government's decision on whether to further pursue a national Energy Savings Initiative will be based on the outcomes of this regulation impact statement and consultation processes.

Summary of questions

Chapter 1: Background

1.6 Policy options for a national energy savings initiative

1. What are the costs and benefits associated with introducing a national Energy Savings Initiative, in the context of the introduction of the carbon price from mid 2012; and how are these costs and benefits likely to be distributed.
2. What do you consider to be the potential costs and benefits of moving to a national scheme? Please provide specific examples where possible.
3. What do you consider to be the benefits and costs of harmonisation of existing state schemes? Are these greater or smaller than a single national scheme?
4. What implementation issues are likely to arise in harmonising jurisdictional schemes or seeking to establish a national scheme?
5. What are the governance options and implications of different scheme models?

1.7 Interactions between a national energy savings initiative and other policies and programs

6. Can you provide evidence or examples of potential negative interactions between a national Energy Savings Initiative and existing energy efficiency or broader policies/programs?
7. Can you provide evidence or examples of potential positive interactions between a national Energy Savings Initiative and existing energy efficiency or broader policies/programs?
8. What suggestions do you have to eliminate overlap between a national Energy Savings Initiative and other programs and policies? If a national ESI was to replace some existing policies and programs (other than the state schemes), how should phasing out of these programs or policies be handled?
9. What principles or rules should be applied under a national Energy Savings Initiative to the coverage of activities supported through other policies or programs to avoid unintended impacts?
10. What factors should the Australian Government consider in deciding on the lifespan of any national Energy Savings Initiative?

Chapter 2: Principles and objectives

2.1 Objectives of a national energy savings initiative

11. What could/would be the impact on you and/or your organisation of the different objectives discussed below?
12. How should different (and potentially conflicting) objectives be refined, balanced and prioritised?
13. What are other possible objectives for a national Energy Savings Initiative?
14. It will be important to identify where multiple scheme objectives may compete with each other. For instance, a scheme targeting low income households may not also be a scheme with a ‘least cost’ objective as energy savings in high needs households, while worthwhile addressing, can be harder to reach, more intensive to unlock and therefore more expensive How could a national Energy Savings Initiative balance multiple objectives?
15. Do you think that putting downward pressure on increasing energy expenses should be a primary objective of a national Energy Savings Initiative? If so, for which groups of energy customers?
16. Should a national Energy Savings Initiative have as its priority reducing the amount of energy used by individuals, or reducing the price paid per unit of energy? Do you see a scheme targeting this objective being essentially transitional in nature, or long-lived?
17. Do you think that supporting vulnerable energy users to adapt to higher energy costs should be a primary objective of any national Energy Savings Initiative?
18. Do you consider that such an objective should support a scheme that is transitional in nature, or potentially long-lived?

19. Do you think that helping to reduce greenhouse gas emissions should be the primary objective of a national Energy Savings Initiative?
20. Given the complementarity principles outlined in Appendix D, how could an Energy Savings Initiative with a primary objective of helping to reduce greenhouse gas emissions be considered complementary to a carbon price?
21. Do you see such a scheme being transitional in nature, or long-term? Noting the discussion of timeframes for a national Energy Savings Initiative in Chapter 1, how might an assessment be made of whether a mature carbon price was sufficient to overcome market failures previously addressed by a national Energy Savings Initiative?

2.2 Principles for the design of a national energy savings initiative

22. Are there other principles that should be included? What are these?

Chapter 3: Major design elements

3.1 A baseline and credit system

23. What framework would best suit a national Energy Savings Initiative and why?

3.2 Trading and certificates

24. Should a national Energy Savings Initiative allow trading in eligible activities?
25. What evidence is there from existing schemes that trading improves benefits or imposes costs? For whom?
26. Should a national Energy Savings Initiative issue certificates? What evidence of advantages or disadvantages to a certificate system has emerged from existing state-based and international schemes?

3.3 Sectoral coverage

27. The Australian Government has committed to investigating a broad-based national Energy Savings Initiative, that is, one that allows activities to be undertaken in the residential, commercial and industrial sectors. Are there sectors, or sub-sectors, that should or shouldn't be excluded from undertaking activity in a national Energy Savings Initiative? Why? What costs would inclusion or exclusion of certain sectors impose?
28. What evidence is there from state-based and overseas schemes that including or excluding a sector from creating activity changes the costs and benefits of an energy efficiency obligation? In what way?
29. How might including or excluding a sector or sub-sector from undertaking activity help or prevent a national Energy Savings Initiative from achieving one or other of the objectives outlined in Chapter 2? Is including or excluding a sector or sub-sector consistent with the design principles outlined in Chapter 2?

3.4 Fuel coverage

30. Given the factors above that affect the selection of a fuel base for deciding on an Energy Savings Initiative target, what fuels should be covered in a national scheme?
31. How would the choice of fuel coverage affect a national Energy Savings Initiative's ability to meet one or other of the objectives set out in Chapter 2? How would fuel coverage affect the cost of the scheme?
32. If a national Energy Savings Initiative covered more than one fuel, should it have one target covering all fuels or should it have a separate target for each fuel? How would this affect companies that sell more than one fuel (for example, an energy retailer that sells both electricity and gas)?
33. If a fuel can be used for multiple purposes, should a national Energy Savings Initiative treat these two uses differently when calculating a base for a target and achieving a target?
34. Given the objectives outlined in Chapter 2, how should a national Energy Savings Initiative treat energy use outside the main grids? Are different treatments required for different

fuels?

35. What factors should be taken into account when considering energy use outside the main grids to ensure an appropriate balance of private and public benefits?

3.5 Units of measurement

36. Referencing the objectives set out in Chapter 2, which unit of measurement would be most appropriate for a national Energy Savings Initiative?

3.6 Setting targets

37. The Working Group intends to test the benefits and costs of a range of targets through economic modelling. In selecting targets to test, what factors should the Working Group take into account? How does the choice of objective set out in Chapter 2 affect the level of the target?
38. What factors should be taken into account when determining an appropriate penalty rate for any national ESI?
39. What evidence is there from existing schemes in Australia or overseas that banking and borrowing provisions make it easier or more difficult to meet a target in a given year?
40. Should a national Energy Savings Initiative use sub-targets or incentives to drive activity in a particular sector/s or region/s? Is so, where and to what degree?
41. How does the choice of objective relate to decisions around whether a sub-target is included in a scheme design?
42. Is using a sub-target consistent with the design principles in Chapter 2?
43. What evidence is there that sub-targets increase costs? Who bears this cost? Is this additional cost balanced by increased benefits elsewhere?
44. In what circumstances should a national Energy Savings Initiative consider allowing exclusions from the target base? What evidence is there that such exclusions increase overall costs? Who bears these costs? Are these additional costs balanced by increased benefits elsewhere?
45. Would excluding consumption of eligible fuels from a sector or sectors from the target base help or hinder a national Energy Savings Initiative to meet the objectives set out in Chapter 2? Would excluding a sector be consistent with the design principles in Chapter 2? Why?
46. Which form of target should be preferred for a national Energy Savings Initiative and why?
47. What evidence is there for the effects of different forms of target on business development and planning?

3.7 Obligation points and thresholds for obligations

48. Should a national Energy Savings Initiative use energy retailers as an obligation point? What would be the relative costs and benefits of choosing this obligation point? Should another point be chosen, either alongside or instead of energy retailers?
49. What would be an appropriate threshold for the obligation, and why? Are there alternative approaches to assist small retailers?
50. Given the complexity of finding a practical obligation point in the liquid fuels supply chain, and the incentives provided by changes to fuel tax arrangements, should the Australian Government consider including all liquid fuels or particular liquid fuels in the target base and therefore place an obligation in the supply chain?
51. Would the costs of excluding large users as an obligation point from a national Energy Savings Initiative outweigh benefits? Would specific treatment of large users be consistent with the design principles in Chapter 2?

3.8 Eligible activities

52. What would be the implications of using the above criteria to ensure that an Energy Savings Initiative credited only additional energy efficiency improvements beyond business as usual? Are there other criteria that could be applied? How would using these criteria assist or hinder meeting the objectives outlined in Chapter 2?

53. What evidence is there that existing schemes, both in Australia and overseas, are too stringent or too lenient with respect to crediting business as usual? What has been the impact of this?

54. How could a national Energy Savings Initiative create a pathway for new activities to enter the scheme?

55. What evidence is there from international and state-based schemes that different approaches for new activities are helpful or act as a barrier to entry?

56. What criteria should a national Energy Savings Initiative use to exclude an activity or adjust the credit available for an activity?

3.9 Crediting and verifying savings

57. Which technologies, processes or changes to the way energy is used should be considered candidates for deeming in a national Energy Savings Initiative?

58. What are the advantages and disadvantages of introducing more complexity into deeming methodology (for example, location or time of use) versus using a simple deemed value that may be an underestimate or overestimate of the actual performance of the equipment?

59. Which technologies, processes or changes to the way energy is used are best suited to a calculation approach or to a combination of calculation and deeming?

60. What are some ways to reduce transaction costs associated with calculating and verifying savings?

61. What factors should be taken into account in establishing an appropriate audit and compliance regime?

62. What evidence has emerged from existing schemes that different compliance models have created higher or lower costs for scheme participants? Who bears these costs?

3.10 Ensuring a smooth transition from state-based schemes

63. Generally, what are the advantages or disadvantages to different approaches to managing transition issues?

64. Design features or methodologies differ from state to state. For businesses that participate in more than one state scheme (including obligated parties and certificate creating businesses), which of these would require resolution to enable a smooth transition, and what options are available? What other factors should be taken into account?

65. What evidence is there that starting a new scheme would cause activity flight from one location or jurisdiction to another?

66. What evidence is there to suggest that activity might be evenly or unevenly spread across Australia? What would be the impacts of this?

Chapter 4: Improving energy efficiency in different sectors

4.1 Households

67. What evidence is there for barriers limiting the uptake of cost-effective energy efficiency by Australian households? How could these be reduced by an Energy Savings Initiative?

68. What features of Australian or international energy efficiency schemes have been effective at encouraging the take-up of household-specific energy efficiency options?

69. Considering the energy efficiency improvements that have been achieved through various regulations, programs and existing energy efficiency obligation schemes, what potential exists for energy efficiency improvement across households? Does this opportunity vary across Australia? Which household activities should be eligible to generate credits under a national Energy Savings Initiative?

70. Some international schemes have encouraged energy savings by households through behaviour or cultural change. Could a national Energy Savings Initiative be an effective way of encouraging energy savings achieved through households' behaviour change? How could a national Energy Savings Initiative be designed to do this? What costs would this impose?

4.2 Small and medium enterprises (SMEs)

71. For different SME types, what is the opportunity and scope to improve energy efficiency?
72. What are the barriers that currently prevent SMEs from taking up available energy efficiency opportunities? To what extent could these be addressed by a national Energy Savings Initiative? Is there evidence that other policies or programs would be more effective in achieving this objective?
73. Are there particular Energy Savings Initiative design features that would increase the uptake of energy efficiency opportunities by SMEs? Are there design features that would impede such opportunities from being unlocked?
74. Many small and medium-sized energy efficiency service providers participate in existing state schemes and, therefore, would be expected to find business under any national scheme. What design features of Australian or international energy efficiency obligation schemes are effective at supporting the growth of the energy efficiency service provider sector? How should any barriers or issues be addressed in the context of a national Energy Savings Initiative?

4.3 Commercial, government and community buildings

75. Can you provide evidence or examples where barriers limit uptake of cost-effective energy efficiency in the commercial, government and community sectors? Would these be impacted by an Energy Savings Initiative? If yes, how? Is there evidence that other policies or programs would be more effective in achieving this objective?
76. For companies participating in the NSW or international schemes, what has been your experience of the existing methods for crediting energy efficiency improvements in the commercial sector?
77. Are there other features of the NSW or international schemes that have influenced the take-up of energy efficiency opportunities by commercial sector energy users?

4.4 Industrial and mining operations

78. Can you provide evidence of where barriers limit uptake of cost-effective energy efficiency in the industrial sector? How would these be impacted by an Energy Savings Initiative?
79. How does the availability of specific skills in energy efficiency remain a barrier in the industrial sector?
80. Do you consider that industrial energy efficiency projects should be eligible activity in a national Energy Savings Initiative? How should activities that take place on sites remote from the main grids be treated?
81. For companies experienced with the NSW or international schemes, what has been your experience of the existing methods for calculating the creation of certificates for larger industrial projects?
82. Are there other features of the NSW or international schemes that have influenced the take-up of energy efficiency opportunities by industrial energy users?

4.5 Energy generation and networks sectors

83. Should activities which save primary energy be credited in a national Energy Savings Initiative? If so, what approach or methodology should be used to credit these activities and why?
84. Have barriers that could be addressed by an Energy Savings Initiative been effectively addressed by other policy mechanisms? Can you give specific evidence or examples as to why covering generators under a national Energy Savings Initiative would or would not produce positive outcomes?
85. Given the monopoly nature of energy networks and their unique regulatory environment, can you provide evidence that an Energy Savings Initiative is or is not an appropriate policy tool to encourage greater energy efficiency? Can you provide any evidence to suggest that the incorporation of energy networks will or will not provide a net benefit?
86. Can you provide any examples of methodologies appropriate for an Energy Savings Initiative to measure and monitor the impact of energy efficiency in networks?

4.6 Emissions intensive trade exposed industries

87. Do EITE industries experience barriers to energy efficiency uptake that a national Energy Savings Initiative would address?

Chapter 5: Low income households

5.1 Energy use and efficiency in low income households

88. Are there particular barriers to energy efficiency that confront low income households? To what extent could a national Energy Savings Initiative address these barriers? Are there other policy options better able to address these barriers?

89. Are there particular low income households, dwellings or regions which require specific assistance? Would a national Energy Savings Initiative be an effective policy tool to provide this assistance?

90. Households may experience periods of financial difficulty not directly related to their weekly income, with financial difficulty also linked to periods of mortgage strain, unexpected changes in employment status or health related matters. Could a national Energy Savings Initiative that supports low income households also be designed to support other households experiencing financial hardship? How could such households be defined for coverage under any national Energy Savings Initiative?

91. What costs or benefits could a potential national Energy Savings Initiative impose on low income households?

92. How successful have existing programs been at improving low-income households' energy efficiency and assisting them to manage energy costs? What potential exists/remains to improve energy efficiency across low income households? Does this vary across Australia?

93. Is there evidence to suggest particular kinds of energy efficiency improvements have occurred disproportionately in certain areas? For example, have particular upgrades been biased towards regional or metropolitan areas?

5.2 Design considerations for a national energy savings initiative that explicitly supports low income households

94. If a national Energy Savings Initiative were to support low income households through a sub-target approach, could the approach applied either in South Australia or in the United Kingdom be built upon? Are there particular design features of either scheme that have advantages or disadvantages in supporting low income households to become more energy efficient?

95. Any national Energy Savings Initiative that specifically targets low income households must contain a method by which energy retailers or third parties can easily and reliably identify low income households. What options are there for a low income household to be identified as such?

96. Is there evidence to suggest that any of the above design options would be more or less effective in assisting low income households to improve their energy efficiency and manage their energy costs?

97. Can you provide evidence of additional costs or benefits for incorporating a specific requirement for low income households in a national Energy Savings Initiative?

Chapter 6: Peak demand

6.3 Energy consumers' response to peak demand reduction incentives

98. Do you see risks in implementing incentives designed to reduce peak demand outside of energy market frameworks?

99. Do you have evidence or examples to forward the case that certain activities should or should not be incorporated in a potential Energy Savings Initiative peaking component? In particular:

    a. active demand response mechanism (such as load control)

b. passive mechanisms that change the load profile overtime (such as high efficiency air conditioning)

c. load shifting (where there may be no energy saved and greenhouse gas emissions may increase)

d. distributed generation or fuel switching (and which fuels), or

e. network management activities?

6.4 Design considerations for a national energy savings initiative that explicitly targets peak demand

100. Can you provide evidence, in terms of benefits or risks, that a national Energy Savings Initiative which targeted peak demand should focus upon reducing local network peaks to defer augmentations; or on reducing wholesale market peaks and defer peaking generation?

101. Should such a scheme target peak demand reductions that will maximise downward pressure on electricity prices in the near- to mid-term, or focus more broadly on peak demand reductions wherever they are available?

102. In the case of a scheme focused on network deferral, how should networks be involved to ensure local near-term augmentations are effectively targeted? How should peak demand reductions be valued and integrated with planning and regulatory determinations to ensure that downwards pressure on network prices are captured in the near- to mid-term?

103. Where a scheme has some impact on both network and market peaks, should both be rewarded, and if so, how should these benefits be calculated?

6.5 Examples of peak demand targeting schemes

104. Of the above examples of scheme designs, which, if any, are likely to drive greater benefits and uptake of demand response activities? Which options have higher risks and complexity? Please provide supporting evidence.

105. Could a peak demand Energy Savings Initiative be integrated into a wider Energy Savings Initiative (such as a national energy efficiency obligation scheme), or could it be one or more sub-schemes, with separately targeted obligations or incentives? What implications will this have for complexity, eligible activities and metrics?

106. Could a peak demand-focused Energy Savings Initiative be a mandated obligation with penalties, an obligation with penalties and incentives, an opt-in initiative with targets and incentives, a voluntary code, or something else? Who could be the obligated party in a peak demand focused scheme?

107. Should there be any restrictions on the types of entities that could act as a provider of peak demand reduction services? What certainty over peak energy reduction outcomes is desired as compared to certainty of the costs imposed by the scheme? How might this relate to reducing energy costs?

Table of Contents

1 Background

In late 2009, the Australian Government committed to establish a Prime Minister's Task Group on Energy Efficiency (the Task Group). The Task Group reported to the Minister for Climate Change and Energy Efficiency and the Minister for Resources and Energy on options to deliver a step change in energy efficiency by 2020 and place Australia at the forefront of the Organisation for Economic Co-operation and Development (OECD) energy efficiency improvement. The Task Group report was published in October 2010. Amongst its six foundation recommendations was that:

> 'The Government agree to the introduction of a transitional national energy savings initiative to replace existing and planned state energy efficiency schemes, subject to detailed consultation on its design'.[1]

The Task Group noted that 'significant further design work is necessary before the Government could consider whether to proceed with implementation of an energy savings initiative'. [1]

The Task Group's initial analysis found that a well-designed national Energy Savings Initiative could complement a carbon price, and noted that:

> 'an energy savings initiative would better prepare the economy to respond to a carbon price through energy efficiency and allow the carbon price to play an important role in driving energy efficiency improvements as the carbon price matures... noting that for some sectors, even a mature carbon price will not address specific market barriers.'[2]

In response to the Task Group report, the Australian Government's plan for a Clean Energy Future undertook that the Australian Government would:

> 'expedite the development of a national energy savings initiative and will examine further how such a scheme may assist households and businesses to adjust to rising energy costs. This further work will involve additional detailed design, quantification of costs and benefits, and discussions with state and territory governments.'[3]

and further that:

> 'the ESI would: have broad coverage (that is residential, commercial and industrial sectors); and create an incentive or a requirement to create certificates in both low income homes and in ways that reduce peak electricity demand.'[4]

The Clean Energy Future plan identified a number of issues to be investigated including: the annual targets that could apply; sectoral and fuel coverage issues; energy savings activities to be considered eligible activities; and how a smooth transition from state-based schemes could be managed.

Subject to further analysis, economic modelling and a regulatory impact study, the Australian Government will make a final decision on whether to pursue a national Energy Savings Initiative policy. However, the Clean Energy Future plan also stated that any decision to adopt a national Energy Savings Initiative will be conditional on the endorsement of the Council of Australian Governments (COAG) and agreement that existing state schemes will be folded into any national scheme.[5]

1.1 *Why the Australian Government is investigating ways to improve energy efficiency*

Using energy more efficiently can lower carbon pollution and save money. Australia's energy intensity (an economy-wide proxy for energy efficiency) is higher than the OECD average. The International Energy Agency notes that this is largely due to Australia's relatively low energy prices, long transport distances and energy-intensive industrial sector.[6]

Improving energy efficiency delivers both private and public benefits. For individuals and businesses that invest to improve their energy efficiency, there are considerable savings to be made. Taken in aggregate, individual improvements can deliver a public benefit through low or negative cost carbon pollution reductions; and through lower overall energy demand that can translate to savings in energy generation and network investment.

The Task Group report found that there is considerable scope for Australia to improve the efficiency of energy use in all sectors of the economy. These improvements could have economic, social, and environmental benefits.[7]

Many studies have identified numerous cost-effective opportunities for improvements to energy efficiency in all sectors of the Australian economy.[8] The fact that these opportunities are not being realised, despite rises in energy prices, suggests potential market failures and non-price barriers that stymie action by businesses and individuals.

The Australian Government's investigation of a national Energy Savings Initiative is situated within this context of: potential for energy efficiency improvement identified through Government programs and research; the presence of market failures and non-price barriers to energy efficiency improvements; and recent energy price rises across the Australian economy.

1.2 *Market failures and non-price barriers*

There is a substantial body of evidence in the energy and economic literature establishing that energy and fuel price signals may not trigger changes in some areas unless market failures and non-price barriers to action are overcome,[9] and that these market failures and barriers are common to economies across the world.[10]

Table 1.1 Common market failures and non-price barriers[11]

Barrier	Description
Imperfect and asymmetric information	Energy efficient technologies and services are not taken up because individuals or decision makers do not have access to sufficient or accurate information about their options; appropriate skills are not available; or the transaction costs involved in researching and understanding their options are too high.
Split incentives (principal/agent problems)	Energy efficient technologies and services are not taken up because the person purchasing an energy-using technology is not the same person who benefits from its use. For example, a landlord may purchase the technology used in a rented building, but it is the tenant that pays the energy bills associated with that technology. Or, one part of a company may be responsible for capital expenditure, but another area for operating expenditure.
Bounded rationality, behavioural norms and organisational barriers	Even where people have access to sufficient information, they may be overwhelmed by its size and complexity, or may not have the time to carefully process it. In these circumstances, people may fall back on 'satisfycing' ('near enough is good enough') behaviour or 'rules of thumb' when making decisions about energy use. Organisational barriers occur where structural arrangements or internal incentives impede informed decision making (for example, operational engineers who manage energy use may not be engaged in energy or equipment purchasing).
Materiality barriers	The energy savings of many small-scale activities may yield substantial community benefits if adopted at scale. However, individuals may not consider the private energy savings of such activities to be sufficiently material for them to spend the time and effort acquiring and implementing them.
Access to capital and other financing barriers	Even where cost-effective energy efficient options are identified, take-up can be impeded if upfront capital cannot be acquired (for example, due to competing priorities, credit limitations or lack of financial services).
Regulatory and planning practices	Regulations, programs and taxation rules can affect the take-up of energy efficiency improvements. Regulatory arrangements can impede some activities or can distort their costs and benefits.
Inefficient pricing/externalities.	Where the price of energy does not efficiently reflect the full real costs, rational private decisions may be inefficient in terms of wider public or shared benefits. Energy prices are very rarely perfectly efficient for a range of reasons such as the lack of time-of-use metering; cross subsidies to protect vulnerable consumers; or externalities such as pollution.

Table 1.1 summarises common market failures and non-price barriers that impede the take-up of energy efficiency opportunities.

The market failures and non-price barriers in Table 1.1 have the effect of increasing transaction costs for people or firms that wish to improve the energy efficiency of their homes or businesses, sometimes to the extent that the opportunities are completely blocked. While this may reflect that people make rational private decisions about adoption of an inefficient energy option, the wider community may face greater shared costs, for example, expansion of energy supply infrastructure or increased costs of carbon abatement.

Barriers and market failures may vary by sector, business type and size, geographic region and climate, and household characteristics such as level of household income and tenure type. The Stern Review noted that 'the impact of these barriers can be most clearly seen in the frequent failure to realise the potential for cost-effective energy efficiency measures'.[12]

While a carbon price will provide the incentive for energy users to improve energy efficiency, for some there remain significant barriers to improvement that will not be overcome even as energy costs rise. Well-designed energy efficiency policy can complement a carbon price by tackling market failures and non-price barriers to action.

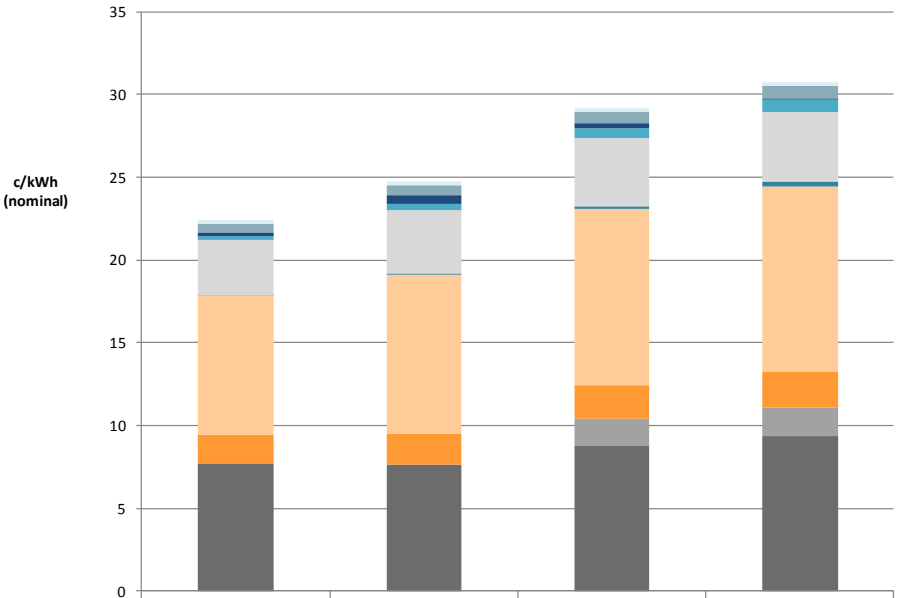
1.3 *Factors affecting electricity and gas price rises*

Energy prices in Australia have been rising recently and are projected to continue to rise in the near future.

Historically, Australia has had stable electricity prices and still enjoys some of the lowest prices in the developed world. However, significant increases in electricity prices started around 2007, with the average increase projected by the Australian Energy Market Commission to be 19 per cent (in real terms) from 2011/12 to 2013/14.[13]

There are three major components of a typical electricity bill: wholesale electricity costs (electricity being bought from generators); network charges (paying for the reliable delivery of electricity from generators to end users); and a retail margin (retailer costs and profits). Schemes such as the Renewable Energy Target (RET) and state-based environmental schemes also make a comparatively small addition to a standard bill for a small customer. Figure 1.1 shows the components of projected future residential electricity prices (national average electricity tariff). [14]

Figure 1.1 Projected composition of future electricity price rises



	2010-11	2011-12	2012-13	2013-14
other state-based schemes	0.22	0.22	0.2	0.21
energy efficiency and demand management state schemes	0.55	0.6	0.68	0.75
Small renewable energy scheme	0.21	0.53	0.29	0.14
Renewable energy target / large-scale renewable energy target	0.22	0.42	0.66	0.7
Retail	3.36	3.8	4.06	4.24
Feed-in tariffs	0.02	0.07	0.19	0.26
Distribution	8.35	9.57	10.61	11.15
Transmission	1.73	1.92	2.08	2.23
Carbon price impact	0	0	1.65	1.74
Wholesale	7.74	7.63	8.74	9.33

Source: Australian Energy Market Commission, '*Possible Future Retail Electricity Price Movements: 1 July 2011 to 30 June 2014*' (2011). These projections relate to regulated electricity tariffs and prices have been weighted by the number of residential customers and the average residential electricity price in each state and territory. The Treasury estimates that the impact of the carbon price mechanism on average household weekly expenditure on electricity would be $3.30 per week in 2012–13.[15]

The key driver behind recent price rises, and of forecast price rises, has been increases in network charges (especially for distribution networks). Higher expenditure on networks, or the 'poles and wires', is being driven by the need to replace aging assets and to meet rapidly growing levels of peak demand.[16]

Natural gas prices have historically been low in Australia by international standards, though prices on the west coast began rising some years ago, and prices on the east coast for long term contracts are expected to head in the same direction in future years.[17] Natural gas prices are expected to continue to increase due to factors on both the demand and supply sides of the market. On the supply side, gas prices are heavily influenced by the cost of production. Over the past decade, increases in capital and labour costs have seen the cost of gas production increase. On the demand side, the price of natural gas is affected by rising demand from both increasing exports of Liquid Natural Gas (LNG) and increased domestic demand (primarily related to electricity generation).[18] Furthermore, as the capacity to export LNG increases, domestic market prices may rise to match the international net-back prices, which are higher than current east coast domestic prices.[19]

1.4 *Policy options for delivering energy efficiency improvements*

There are a range of policy options available to address or reduce market failures and non-price barriers to realising energy efficiency improvements, including:

- *Direct regulation of technical performance*. Examples include Minimum Energy Performance Standards for appliances, and regulation of building energy efficiency performance through the Building Code of Australia.
- *Encouraging action*. Examples include providing grants, rebates or tax incentives to encourage firms and individuals to purchase new, more energy efficiency equipment or appliances.
- *Providing information*. Examples include the Australian Government's LivingGreener website, which provides advice to homeowners and other energy user groups on improving energy efficiency; the Energy Efficiency Opportunities program, which requires large users of energy to identify opportunities to improve energy efficiency; and the Commercial Building Disclosure program, which makes the energy efficiency performance of a building visible to potential purchasers or tenants.
- *Improving efficient market signals.* Examples include moves in the National Energy Market towards time-of-use pricing and ongoing improvement of wider energy market regulation.
- *Market-based regulatory incentives.* Examples include the state-based energy efficiency obligations.

A national Energy Savings Initiative would be an example of market-based regulatory incentives. Different policy approaches may target specific market failures or non-price barriers and some barriers and market failures will respond better to one policy option than to another. To effectively address barriers, a package of approaches needs to be considered as a coherent strategy or policy mix.

1.5 *Energy savings initiatives in Australia and other countries*

An Energy Savings Initiative is a form of energy efficiency obligation scheme. These schemes share three key features:

- a target for energy efficiency improvement
- obligated parties that must meet the target
- a measurement and verification system defining the energy savings activities that can be used to meet the target, their value, and how it is confirmed that these activities took place.

If an obligated party does not meet its allocated portion of the target it must pay a specified penalty. Those who are obliged to meet the target will seek out the cheapest way to do so amongst eligible activities. In this way, least-cost energy efficiency improvements are delivered. Obligated parties will pass through to their customers some or all of the costs of meeting the obligation. In a well-designed scheme, these pass-through costs will be outweighed by private and shared benefits, leading to a net overall benefit to society.

Within these broad parameters, there are myriad ways in which an energy efficiency obligation can be designed to achieve different outcomes and to suit different circumstances. Many schemes allow trading of energy savings credits or certificates; such schemes are commonly known as 'white certificate' schemes.

Box 1.2 Example of an energy savings initiative at work [20]

A target has been set for an energy retailer, who must find 40 000 units of energy savings in a year. For each unit of the target that goes unmet, the energy retailer must pay a penalty of $40.

A householder might install a high efficiency heating system that achieves an energy efficiency saving of 10 units. The householder could sell these 10 units to the energy retailer, and it is assumed that the energy retailer would be willing to pay up to $40 per unit (the value of the penalty). So the householder will receive up to $400 when their new heating system is installed. The householder also continues to enjoy ongoing savings on their energy bill because their new heating system uses less energy than the old one.

Alternatively, an energy service company could replace heating systems at a discount of up to $400 (10 energy saving units at the value of the penalty) in return for the right to sell the energy savings to a retailer. The household would receive a lower-cost heating system as well as ongoing savings on energy bills, and the energy service company’s business would expand.

Forms of energy efficiency obligation schemes are in place in New South Wales, Victoria and South Australia, the United Kingdom, France, Belgium, Denmark, India, Italy, and in 26 states of the United States (see Appendix B for a quick reference comparison). In many of these countries, the schemes operate alongside and complement a carbon price. The European Commission recently issued a directive to all European Union Member States to implement some form of obligation. A scheme is planned for the Australian Capital Territory in 2012.

Studies have found that energy efficiency obligation schemes have proven effective in catalysing activities that have high individual transaction costs.[21] These are activities where the non-capital cost (such as time) of undertaking an activity outweighs the perceived benefit, or where the payback times of a project are short but the overall individual gains are not material.

Independent assessments of schemes in Australia and overseas have found that energy efficiency obligation schemes can deliver energy efficiency improvement at net negative cost to the economy. For example, an evaluation of the first 18 months of the New South Wales Energy Savings Scheme (ESS) found that activities implemented in the first 18 months have a total net present value of $187 million over the life of the Scheme.[22] When costs to all parties were taken into account, it was estimated that the cost to the United Kingdom economy of saving one kilowatt hour of electricity through the first Energy Efficiency Commitment (2002-2005) was 1.3 pence, compared to the cost to the consumer at time of purchasing one kilowatt hour at 6.7 pence.[23] Evaluation of the second United Kingdom Energy Efficiency Commitment (2005-2008) found that the scheme delivered a net present value of £3.1 billion.[24]

1. ***What are the costs and benefits associated with introducing a national Energy Savings Initiative, in the context of the introduction of the carbon price from mid 2012; and how are these costs and benefits likely to be distributed.***

1.6 *Policy options for a national Energy Savings Initiative*

As noted above, energy efficiency obligation schemes operate in New South Wales, Victoria and South Australia; the Australian Capital Territory aims to introduce a scheme in 2012. Schemes have also been canvassed for other Australian states.[25] Each of the existing schemes has been designed to meet different objectives (Box 2.1 in Chapter 2), with the result that each has different rules concerning annual scheme targets, sectoral and fuel coverage, eligible activities and other design elements.

There are potential benefits that could be realised by consolidating and streamlining the existing state-based schemes. A nationally consistent approach may reduce compliance costs for participating businesses (which are typically passed through to consumers) and would recognise that the market for many energy efficient products and services is a national one. A nationally consistent approach may also present advantages to regulators, obligated parties and third parties (for example energy service companies) through the operation of a single set of rules and regulations.

Conversely, introduction of further obligation schemes (including a new national one) without removing or harmonising existing schemes would increase compliance costs for participating businesses. The Australian Government has stated that any decision to adopt a national Energy Savings Initiative will be conditional on the endorsement of COAG and agreement that existing state schemes will be folded into any national scheme.

An alternative to a single national scheme would be to achieve harmonisation between existing state schemes and any future schemes. On 14 December 2011 the Premiers of New South Wales and Victoria announced they would be undertaking further work to seek to harmonise their respective jurisdictional energy efficiency schemes.

Experience with other policy mechanisms demonstrates there are differing degrees of harmonisation that can be achieved, with implications for businesses that operate across state borders. For example, the Greenhouse and Energy Minimum Standards scheme will use Commonwealth legislation to create a single national standard for the performance of common household appliances and other equipment, but some administrative and compliance functions will reside with states and territories.

At the other end of the spectrum, the National Energy Market relies on consensus agreement by all jurisdictions on new legislation, which is then enacted in the South Australian parliament and mirrored in the other east coast states. As a result, each state still controls some related arrangements, including retail price regulation and each jurisdiction negotiated some derogations within the National Electricity Rules. A third example of harmonisation is the COAG principles for feed-in tariffs, which provide for feed-in tariffs for small generators to be consistent with energy market reform but leaves it to individual states and territories to decide whether to have a feed-in tariff and the amount of that tariff.

2. ***What do you consider to be the potential costs and benefits of moving to a national scheme? Please provide specific examples where possible.***

3. ***What do you consider to be the benefits and costs of harmonisation of existing state schemes? Are these greater or smaller than a single national scheme?***

4. ***What implementation issues are likely to arise in harmonising jurisdictional schemes or seeking to establish a national scheme?***

5. ***What are the governance options and implications of different scheme models?***

1.7 *Interactions between a national Energy Savings Initiative and other policies and programs*

Responsibility for energy efficiency policy and delivery is shared between Commonwealth, state and territory governments. The National Strategy for Energy Efficiency was established through COAG to accelerate energy efficiency improvements for households and businesses, by implementing a 10-year, $88-million strategy to deliver measures across four areas of focus.

Given the presence of a range of existing policies seeking to improve energy efficiency and deliver associated policy outcomes (for example climate change mitigation and broader energy market objectives), a fundamental consideration in investigating a national Energy Savings Initiative is the interactions or overlap of these policies with any national scheme. There are estimated to be close to 300 individual energy efficiency measures across different levels of government in Australia.[26] This reflects shared responsibility between the levels of government, and also that (as discussed above) the many and varying barriers to improving energy efficiency respond to different policy options.

Measures that may duplicate

Some current measures are designed to achieve similar objectives, or create similar effects and behaviours as an Energy Savings Initiative. For example, there are a wide range of grants and rebates delivered by different levels of government and different jurisdictions, such as rebates for hot water system upgrades. Generally, these rebates aim to reduce access to capital barriers and/or reduce technology upgrade costs over time by developing the service markets.

An Energy Savings Initiative may provide an alternative, market-based avenue to deliver the same incentives. If these sorts of measures and a national Energy Savings Initiative exist in parallel, there is a risk of over-subsidy or subsidising 'non-additional' activity (discussed in Chapter 3). Any Energy Savings Initiative design needs to consider a range of options to avoid this eventuality, such as explicitly excluding activities where they are supported through other mechanisms.

Measures that may support

Some measures may support the effective operation of a national Energy Savings Initiative. Appliance labelling and energy performance standards could be used to define eligible activities under an Energy Savings Initiative. For example, the use or uptake of appliances that meet a specified level of high energy efficiency performance could be eligible for credits. This approach is used by existing state schemes. Similarly, support for energy efficiency skills development (such as through the Clean Energy Skills Programs), may increase market capacity with respect to the energy services skills and expertise required to meet an Energy Savings Initiative target.

Other measures may be complementary in a less direct manner – for example primary information sources like the Green Vehicle Guide or wider education campaigns. In Victoria the 'Black Balloons' campaign is used to support the Victorian Energy Efficiency Target (VEET) scheme. It is possible that these sorts of measures could strategically support a national Energy Savings Initiative by ensuring advice and services are transparent and coherent between information sources.

Further measures may be fully or partially complementary, but interactions need to be considered carefully. For example, the Energy Efficiency Opportunities program for large energy users encourages companies to overcome organisational barriers to the identification of energy efficiency opportunities in their operations. However a significant proportion of these opportunities remain unimplemented due to remaining barriers.[27] An Energy Savings Initiative may support greater uptake of these activities. However there is also some risk of supporting activities which may have happened in any case, so the estimate of benefits must be measured carefully.

6. ***Can you provide evidence or examples of potential negative interactions between a national Energy Savings Initiative and existing energy efficiency or broader policies/programs?***

7. ***Can you provide evidence or examples of potential positive interactions between a national Energy Savings Initiative and existing energy efficiency or broader policies/programs?***

8. ***What suggestions do you have to eliminate overlap between a national Energy Savings Initiative and other programs and policies? If a national Energy Savings Initiative was to replace some existing policies and programs (other than the state schemes), how should phasing out of these programs or policies be handled?***

9. ***What principles or rules should be applied under a national Energy Savings Initiative to the coverage of activities supported through other policies or programs to avoid unintended impacts?***

Lifespan of a national Energy Savings Initiative

As with all policy options for energy efficiency, any future national Energy Savings Initiative would only remain in place while it meets its objectives and remains the best way to address market failures and non-price barriers.

The Task Group report suggested that, for some sectors, even with a mature carbon price in place, an Energy Savings Initiative could play a role in addressing sector-specific barriers to energy efficiency and those that do not respond to higher energy prices. The Task Group also suggested that any national scheme could be designed from the beginning to include trigger points or mechanisms for phasing down the scheme's targets.[28]

The NSW Energy Savings Scheme is legislated to run until 2020 or until the NSW Minister for Energy is satisfied that an equivalent national scheme has been put in place. The VEET is legislated to run the three year phases, and the South Australian Residential Energy Efficiency Scheme is legislated to run to the end of 2014, with a review in 2013 to consider whether the scheme should continue.

10. What factors should the Australian Government consider in deciding on the lifespan of any national Energy Savings Initiative?

[1] Australian Government, *Report of the Prime Minister's Task Group on Energy Efficiency*, Canberra, July 2010, p. 2.

[2] Australian Government, *Report of the Prime Minister's Task Group on Energy Efficiency*, Canberra, July 2010, p. 52.

[3] Australian Government, *Report of the Prime Minister's Task Group on Energy Efficiency*, Canberra, July 2010, p. 81.

[4] Australian Government, *Securing a Clean Energy Future – The Australian Government's climate change plan*, Canberra, July 2011, p. 126.

[5] Australian Government, *Securing a Clean Energy Future – The Australian Government's climate change plan*, Canberra, July 2011, p. 126.

[6] International Energy Agency, *Implementing energy efficiency policies 2009: are IEA member countries on track?*, OECD/IEA, Paris, 2009, p. 53.

[7] Australian Government, *Report of the Prime Minister's Task Group on Energy Efficiency*, Canberra, July 2010, pp. 17-20.

[8] See for example, ClimateWorks Australia, *Low carbon growth plan for Australia*, 2010; and assessments prepared for the *National Framework on Energy Efficiency*, <http://www.ret.gov.au/documents/mce/energy-eff/nfee/library.html>.

[9] See for example: L Lutzenhiser, 'Social and behavioral aspects of energy use.' *Annual Review of Energy and the Environment*, vol. 18, 1993, pp. 247-289; C F Camerer, G Loewenstein, & M Rabin (eds), *Advances in behavioural economics*, Princeton University Press, 2004; International Energy Agency, *Energy Efficiency Policy and Carbon Pricing*, 2011; and *Gadgets and Gigawatts*,2009; M Croucher, 'Potential problems and limitations of energy conservation and energy efficiency.' *Energy Policy*, vol. 39, 2011, pp. 5795-5799; Productivity Commission, *The Private Cost Effectiveness of Improving Energy Efficiency*, Report No. 36, 2005; M A Brown, 'Market failures and barriers as a basis for clean energy policies.' *Energy Policy*, vol. 29, 2001, pp. 1197-1207; and H Allcott, & S Mullainathan, 'Behavior and Energy Policy.' *Science*, vol. 327, 2010, pp. 1204-1205.

[10] See for example: L Ryan, S Moarif, E Levina, & R Baron, *Energy efficiency policy and carbon pricing*, International Energy Agency, Paris, 2011.

[11] After: Australian Government *Report of the Prime Minister's Task Group on Energy Efficiency*, Canberra, July 2010; R Garnaut, *The Garnaut Climate Change Review: Final Report*, Cambridge University Press, 2008; and Productivity Commission, *The Private Cost-Effectiveness of Improving Energy Efficiency*, Report No. 36, August 2005.

[12] N Stern, *The economics of climate change: The Stern Review*, Cambridge University Press, 2007, p. 20.

[13] Australian Energy Market Commission, '*Possible Future Retail Electricity Price Movements: 1 July 2011 to 30 June 2014*' (2011), pii.

[14] Australian Energy Market Commission, *Final report: future possible retail electricity price movements: 1 July 2010 to 30 June 1013*, Sydney, 2011, p. 14.

[15] Australian Government, *Securing a Clean Energy Future – The Australian Government's climate change plan*, Canberra, July 2011, p. 46.

[16] It should be noted that the Australian Energy Regulator (AER) is currently proposing changes to the electricity rules which are intended to ensure a more effective and robust assessment of network expenditure. See: AER, viewed on 21 November 2011, <www.aemc.gov.au/Electricity/Rule-changes/Open/Economic-Regulation-of-Network-Service-Providers-.html>.

[17] Australian Energy Regulator, *State of the Energy Market 2010*, Melbourne, 2010, p. 78.

[18] Australian Energy Market Operator, *2010 Gas Statement of Opportunities for Eastern and South Eastern Australia*, Melbourne, 2010.

[19] Queensland Department of Employment, Economic Development and Innovation, *2011 Annual Queensland Gas Market Review*, Brisbane, 2011, pp. 22-23.

[20] This box draws heavily on Box 4.1, p. 51, of the Australian Government, *Report of the Prime Minister's Task Group on Energy Efficiency*, Canberra, July 2010.

[21] For example, comparative analysis of five European schemes found that, while the technologies delivered differed on the basis of the rules of those schemes, nevertheless, the three major schemes (UK, France, Italy) tended to deliver measures in the residential sector that had small savings but high transaction costs. See Rezessy S & Bertoldi P, *Energy supplier obligations and white certificate schemes: comparative analysis of results in the European Union*, Proceedings of ACEEE Summer Study on Energy Efficiency in Buildings, 2010.

[22] Databuild Research & Solutions, *Energy Savings Scheme Cost Effectiveness Analysis Report*, 2011, p. 3.

[23] E Lees, *European experience of white certificates*, 'Country Studies', p. 12, World Energy Council project on white certificates, 2007, quoted in Australian Government *Report of the Prime Minister's Task Group on Energy Efficiency*, Canberra, July 2010, p. 57.

[24] Eoin Lees Energy, *Report to DECC: Evaluation of the Energy Efficiency Commitment 2005-08*, 14 Dec 2008, viewed on 25 November 2011, <http://ebasic.easily.co.uk/031047/02105C/EEC2Report18Dec08.pdf>.

[25] Australian Energy Market Commission, *Final report: future possible retail electricity price movements: 1 July 2010 to 30 June 1013*, Sydney, 2011, p. i.

[26] Australian Government, *Report of the Prime Minister's Task Group on Energy Efficiency*, Canberra, July 2010, p. 76, based on the 2008 Wilkins Review and some analysis of more recent measures.

[27] Department of Resources, Energy and Tourism, *Energy Efficiency Opportunities Program Mid-Cycle Review Final Report*, Commonwealth of Australia, Canberra, 2010, p. 49.

[28] Australian Government, *Report of the Prime Minister's Task Group on Energy Efficiency*, Canberra, July 2010, pp. 69-70.

2 Principles and objectives

2.1 *Objectives of a national Energy Savings Initiative*

Clear objectives for any national Energy Savings Initiative will play a crucial role in the Australian Government's assessment of whether such a scheme can be justified on cost-benefit grounds.

Identifying a clear objective for a national Energy Savings Initiative is complicated by several potential benefits from improving energy efficiency, such as lowering customers' total energy bills (which, in turn, could be tackled by lowering overall energy consumption or by lowering energy unit prices), specifically improving energy affordability for vulnerable groups, or reducing domestic greenhouse gas emissions and reducing the cost of achieving any particular emissions reduction target. It is quite possible that some energy efficiency activities promote all of these outcomes at the same time. However, it is important to have a clear concept of which of these outcomes is to be *prioritised*, because it will strongly influence:

- how effectiveness is defined and measured
- identification of alternative policies for achieving the same goal, against which a national Energy Savings Initiative must be assessed
- design choices within any national Energy Savings Initiative, and
- the timeframe over which such a scheme might be relevant (lifespan is discussed in section 1.7 of Chapter 1).

Another possible objective for a *national* Energy Savings Initiative is conceptually quite different: reducing transaction costs associated with having multiple (different) schemes operating in different states and territories. Box 2.1 shows the objectives of existing state-based schemes, and a comparison table is in Appendix B.

Once an objective has been identified, further analysis must be conducted to ensure that there is indeed a role for government in promoting energy efficiency in this way and answer questions such as:

- Are there market failures that would prevent a socially efficient level of energy efficiency from being delivered without intervention?
- Is a national Energy Savings Initiative the most cost-effective way of overcoming these market failures compared with other options?
- Do the overall benefits of the measure outweigh its costs?

Objectives of the existing state schemes are listed in Box 2.1, and some possible objectives for a national Energy Savings Initiative are discussed in more detail on the following pages. There may be connections between these objectives, and one objective may be achieved as a side-effect or co-benefit of another, depending on design. There is further discussion of setting sub-priorities within an objective in Chapter 3 (sub-targets), Chapter 5 (low income households) and Chapter 6 (peak demand).

Box 2.1 Objectives of existing state-based schemes

New South Wales Energy Savings Scheme (ESS)[1]

- Assist households and businesses to reduce electricity consumption and electricity costs.
- Complement any national scheme for carbon pollution reduction by making the reduction of greenhouse gas emissions achievable at a lower cost.
- Reduce the cost of, and the need for, additional energy generation, transmission and distribution infrastructure.

Victorian Energy Efficiency Target (VEET)[2]

- Reducing greenhouse gas emissions.
- Encouraging the efficient use of electricity and gas.
- Encouraging investment, employment and technology development in industries that supply goods and services which reduce the use of electricity and gas by consumers.

South Australian Residential Energy Efficiency Scheme (REES)[3]

- Improve energy efficiency and reduce greenhouse gas emissions within the residential sector.
- Assist households prepare for likely energy price increases from emissions trading.
- Reduce total energy costs for households, particularly low income households.

11. What could/would be the impact on you and/or your organisation of the different objectives discussed below?

12. How should different (and potentially conflicting) objectives be refined, balanced and prioritised?

13. What are other possible objectives for a national Energy Savings Initiative?

14. It will be important to identify where multiple scheme objectives may compete with each other. For instance, a scheme targeting low income households may not also be a scheme with a 'least cost' objective as energy savings in high needs households, while worthwhile addressing, can be harder to reach, more intensive to unlock and therefore more expensive How could a national Energy Savings Initiative balance multiple objectives?

Reducing pressure on households' and businesses' energy bills.

One possible objective of a national Energy Savings Initiative could be to help reduce the pressure on customers' overall energy bills.

Broadly, there are two ways that a national Energy Savings Initiative could be designed to reduce pressure on households' and businesses' energy expenses. One approach is to target *energy prices* (the price charged per unit of energy), while another is to target *energy costs* (the product of the *price* and the *volume* of energy that a consumer uses). It will be important to identify which approach is to be prioritised, because each has different implications for scheme design or alternative policy options.

A national Energy Savings Initiative could target *energy costs* by helping consumers improve the energy efficiency of their appliances, equipment, processes and building fabric, enabling them to reduce their energy consumption and cushioning them from rising energy prices. The existing state-based schemes and most international schemes have adopted such an approach.

In contrast, where the objective of a national Energy Savings Initiative is to tackle *energy prices*, it would be designed to improve energy productivity by targeting the factors that are presently driving energy price increases; particularly costs associated with network infrastructure upgrades (see Section 1.3).

A scheme with such an objective may encourage activities that reduce pressure on distribution networks, particularly activities that reduce energy consumption at peak periods. This may be achieved by targeting efficiency gains through technologies used at peak periods (for instance, household air conditioners) or the shifting of energy use from peak periods to non-peak periods. It may also favour energy savings within the network (contributing to peak demand) rather than 'off-grid' energy use which has a separate supply chain. The opportunities, risks and challenges associated with using a national Energy Savings Initiative to target peak energy demand are discussed further in Chapter 6, and fuel coverage and targets are discussed in Chapter 3.

An objective of helping to reduce energy bills implies that that the scheme would focus on those groups of customers and activity types where there are significant barriers to customers pursuing energy efficiency opportunities without assistance.

15. Do you think that putting downward pressure on increasing energy expenses should be a primary objective of a national Energy Savings Initiative? If so, for which groups of energy customers?

16. Should a national Energy Savings Initiative have as its priority reducing the amount of energy used by individuals, or reducing the price paid per unit of energy? Do you see a scheme targeting this objective being essentially transitional in nature, or long-lived?

To support vulnerable energy users to adapt to higher energy costs

A national Energy Savings Initiative could be designed to support sectors of the community that are particularly vulnerable to price rises, for instance low income households. Even though this could be seen as a subset of the overall energy bill reduction objective discussed above, it is worth considering separately, since such an objective could entail quite different design features and costs and benefits; and be compared against a different set of alternative policies.

A scheme with this more targeted objective might be favoured if low income households generally experience greater barriers to becoming energy efficient than other households, for example through poorer access to information or capital. Low income households on average spend a much greater proportion of their income on electricity, gas and petrol (around 15 per cent, versus five per cent for middle and higher income households)[4] making them particularly vulnerable to energy price increases. A scheme with this objective may support measures that cushion these households from energy-related cost-of-living increases and which provide them with the tools and information to adopt an energy efficiency response.

A national Energy Savings Initiative that seeks to support low income households to become more energy efficient could adopt an approach based on incentives or requirements. For example, incentives could include support for specific activities that are relevant to low income households, while requirements could include requiring that a proportion of the energy savings that obligated parties must achieve comes from activities in these households. These issues are further discussed in Chapter 5.

17. Do you think that supporting vulnerable energy users to adapt to higher energy costs should be a primary objective of any national Energy Savings Initiative?

18. Do you consider that such an objective should support a scheme that is transitional in nature, or potentially long-lived?

Helping to reduce Australia's domestic greenhouse gas emissions

Another potential objective of a national Energy Savings Initiative is to help reduce Australia's domestic greenhouse gas emissions by unlocking low-cost abatement opportunities that would otherwise remain blocked by market failures and non-price barriers.

It is important to place this possible objective in context. From 1 July 2012, Australia's energy industries will be subject to a carbon price. The Australian Government is implementing a carbon price because it is the most cost-effective means of achieving Australia's greenhouse gas emissions reduction targets. The complementarity principles agreed by COAG (see Attachment A in Appendix D) lay out the criteria for assessing whether policies that target greenhouse gas emissions reductions are required when a carbon price is in place.

Without a carbon price in place, one possible rationale for an Energy Savings Initiative could be that the consumption of energy from fossil fuels creates a 'negative externality' (a social cost that is unpriced – carbon pollution), and that because energy users are not facing the full costs of their actions, they would tend to 'overuse' energy created from fossil fuels (judged from a social viewpoint, taking into account the costs of carbon pollution). On this basis, intervention might be justified to correct for this. However, with a carbon price in place, this rationale could not be supported. This is because the carbon pricing mechanism will address the negative externality by factoring carbon pollution into energy prices.

Notwithstanding, other market failures may prevent efficient customer responses to the incentives created by a carbon price. For example, if energy customers face significant barriers to gaining and processing information about energy efficiency opportunities, they might persist in using energy in a way that means Australia's energy consumption and domestic emissions are higher than they need to be. In turn, this would mean that it would be more difficult and expensive for Australia to achieve any particular emissions reduction target.[5]

If, as its primary objective, a national Energy Savings Initiative were to target emissions reductions where barriers exist to them being taken up in any event, then it implies that the scheme design would need to reward activities that result in the greatest emissions reductions from energy efficiency. There are important distinctions between targeting emissions reductions and targeting improvements in energy efficiency. For example, improving the efficiency of a production process that was already fuelled by renewable energy would not be rewarded in a scheme targeting emissions reductions, but it might be in a scheme targeting the size of overall energy bills. Targeting reductions in greenhouse gases also means that geographical differences in the carbon intensity of the electricity supply between different networks or regions would be a relevant factor in scheme design, which it would not be in a scheme targeting overall energy bills.

19. Do you think that helping to reduce greenhouse gas emissions should be the primary objective of a national Energy Savings Initiative?

20. Given the complementarity principles outlined in Appendix D, how could an Energy Savings Initiative with a primary objective of helping to reduce greenhouse gas emissions be considered complementary to a carbon price?

21. Do you see such a scheme being transitional in nature, or long-term? Noting the discussion of timeframes for a national Energy Savings Initiative in Chapter 1, how might an assessment be made of whether a mature carbon price was sufficient to overcome market failures previously addressed by a national Energy Savings Initiative?

Table 2.1 – Principles for a well-designed national Energy Savings Initiative

Principle	Intent
1. An efficient approach which maximises net benefits to society	The final design should represent the most efficient option that meets the scheme objective(s), minimising transaction costs including those associated with compliance with multiple schemes.
2. Effective at delivering additional improvements in energy efficiency	A national Energy Savings Initiative should be designed to realise energy efficiency opportunities beyond business-as-usual levels and in addition to the improvements that will be delivered by the Carbon Price Mechanism and by existing state schemes.
3. Complementary to the Carbon Price Mechanism and energy market arrangements	A national Energy Savings Initiative should overcome non-price barriers and address residual market failures to the uptake of low cost energy efficiency opportunities in accordance with the COAG Complementarity Principles. A national Energy Savings Initiative should also be complementary with existing electricity and gas market arrangements, as well as wider energy market development objectives including: effective retail competition; efficient network regulation; and increasing efficient demand-side participation.
4. Transparency	Governance arrangements such as setting and adjusting targets, and assessing and rewarding activity should be clear, transparent and easily understood to maintain investor confidence. The costs and benefits from a national Energy Savings Initiative should be clearly demonstrated and apparent to all.
5. Simplicity	A national Energy Savings Initiative should minimise administrative and compliance complexity.
6.Fair and equitable	The benefits of a national Energy Savings Initiative should be equitably distributed. Where a national Energy Savings Initiative imposes additional costs on energy end users, these should be borne as equitably as possible. Exclusions and offsets should be considered only where necessary for the scheme to remain fair, equitable and cost effective. Where a national Energy Savings Initiative is the most appropriate way to deliver targeted assistance to disadvantaged and low-income households, it should be designed to do so, while minimising any impact on the wider costs and benefits of the scheme. The design of a national Energy Savings Initiative should provide clear transition arrangements for individuals or organisations that have made investments under existing state-based schemes.
7. Flexibility	Flexibility should be built into the design of a national Energy Savings Initiative to allow effective responses to changing circumstances and the uncertainties associated with the pace of technological development and market penetration; and to maintain the best possible mix of new and additional activities.

2.2 *Principles for the design of a national Energy Savings Initiative*

In its final report, the Task Group presented a set of principles that could be used to guide policy development of any national Energy Savings Initiative. Since the final report was published, the Australian Government released the Clean Energy Future plan and has legislated the Carbon Price Mechanism as the primary means to meet Australia's international obligation to reduce greenhouse gas emissions. To reflect these developments, the design principles presented by the Task Group have been adapted and refined (Table 2.1). Any national Energy Savings Initiative would need to achieve an appropriate balance between these principles.

22. Are there other principles that should be included? What are these?

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[1] For more information, refer to: Independent Pricing and Regulatory Tribunal, *Energy Savings Scheme*, viewed on 21 November 2011, <www.ess.nsw.gov.au/>.

[2] For more information, refer to: Essential Services Commission, *Victorian Energy Efficiency Target (VEET)scheme*, viewed on 21 November 2011, <www.esc.vic.gov.au/public/VEET/>.

[3] Essential Services Commission of South Australia, Residential Energy Efficiency Scheme (REES) Code Proposed Amendments: Final Decision, Adelaide, December 2011, viewed 14 December 2011, <http://www.escosa.sa.gov.au/library/111130-REESCodeFinalDecision.pdf>.

[4] CSIRO, *Energy Affordability, Living Standards and Emissions Trading: Assessing the social impacts of achieving deep cuts in Australian greenhouse emissions*, Report to The Climate Institute, & The National Institute of Economic and Industry Research (NIEIR), 2008.

[5] In practice, Australia's carbon price is likely to mirror international prices. If barriers to energy efficiency result in higher domestic emissions, it would probably not entail a rise in the carbon price, but would be reflected instead in a greater reliance on the purchase of international carbon units to meet our emissions targets. This would result in a reduction in Australia's welfare if it would have been cheaper to undertake more emissions reductions domestically.

3 Major design elements

This chapter discusses the factors involved in setting a target for energy efficiency improvements (sections 3.1 to 3.6), agreeing on an obligation point or obligated parties (section 3.7) and broad aspects of measurement and verification (section 3.9). Section 3.8 discussed eligible activities, and transition issues for existing schemes are discussed in section 3.10.

3.1 *A baseline and credit system*[1]

Market-based policy instruments are often characterised as either cap-and-trade or baseline-and-credit. In a cap-and-trade scheme, a regulator imposes a cap on the commodity it wants to control and issues permits equivalent to units of the cap. Generally, participants that wish to use the commodity must purchase and surrender a permit.

In a baseline-and-credit scheme, a baseline is determined for the focus commodity and credits (or certificates) are issued for activities that represent an improvement against the baseline. Participants that are above their allocated portion of the baseline can acquire credits or certificates to bring themselves back to their required baseline.

In a paper entitled 'Regulation of energy suppliers to save energy – lessons from the UK debate', Professor Nick Eyre of the Environmental Change Institute at Oxford University notes that:

> 'there is a fundamental difference in objectives between 'baseline and credit' and 'cap and trade' options – the former seeks to improve energy efficiency, the latter reduce energy demand through either or both of improved efficiency and reduced demand for energy services.'[2]

The concept of energy efficiency involves comparing actual energy performance to a counterfactual informed by historical experience. This typically leads to selecting baseline-and-credit frameworks as the most practical form for mandatory energy efficiency obligations. There are examples of both cap-and-trade and baseline-and-credit schemes in energy efficiency, though baseline-and-credit approaches are more commonly applied. All three existing Australian state-based schemes use a baseline-and-credit framework, and the Task Group report recommended a baseline-and-credit framework.

The Tokyo Cap-and-Trade program requires buildings and factories in the Tokyo area that consume more than 1,500 kiloliters of crude oil equivalent to monitor and report emissions every year. Liable buildings have two choices: they can reduce their energy consumption and therefore their liability to purchase permits; or they can purchase permits to meet their full liability.[3] Similar schemes have been proposed for Australia in the past.[4]

23. What framework would best suit a national Energy Savings Initiative and why?

3.2 *Trading and certificates*

Not all energy efficiency obligations have trading nor do they all issue certificates for eligible activities.

Trading gives liable parties the option of meeting their obligation by undertaking activities themselves, or contracting someone else (such as an energy services company) to do it for them. Trading can occur without a certificate system. For example, the United Kingdom's CERT allows one liable party to agree to assign part of its obligation to another liable party with the regulator's permission, but there are no certificates issued.

Trading can make it easier for small liable parties to meet their obligation at a lower cost because they have the option of purchasing from the market rather than undertaking activity themselves.[5] However, overseas schemes have also shown that trading behaviour and a viable energy services sector does not tend to emerge where the energy market is dominated by one or two large players.[6]

24. Should a national Energy Savings Initiative allow trading in eligible activities?

25. What evidence is there from existing schemes that trading improves benefits or imposes costs? For whom?

Once a decision has been made to allow trading, there is a second decision to be made about whether to create a 'currency' in which the trading takes place. In existing schemes this has generally been some form of certificate representing a unit of eligible activity. The New South Wales ESS and the VEET both issue certificates which can be traded. The SA REES allows for trading of credit between energy retailers, but does not issue tradeable certificates. Evidence from some overseas schemes shows that tradable certificates tend to lead to the development of an energy services sector, as these certificates provide more certain revenue.[7]

26. Should a national Energy Savings Initiative issue certificates? What evidence of advantages or disadvantages to a certificate system has emerged from existing state-based and international schemes?

As noted in the discussion of objectives in Chapter 2, the carbon price mechanism is Australia's primary instrument for achieving greenhouse gas emissions targets. While a national Energy Savings Initiative could be designed as a complementary measure, any certificates created under the Energy Savings Initiative would not represent a form of offset in the carbon price mechanism and would not be fungible into that scheme. This is because the electricity and gas sectors are covered by the carbon price mechanism cap, so any reductions made in energy use (through a national Energy Savings Initiative or other means) do not represent an *additional* reduction in Australia's national emissions. However, these actions could help to drive down the *cost* of achieving Australia's emissions targets, by unlocking low-cost abatement that would otherwise not occur.

3.3 *Sectoral coverage*

One of the first decisions to make in designing a national Energy Savings Initiative is to determine the sectors where energy efficiency improvements can be undertaken to meet the target. Different sectors will have different opportunities to improve energy efficiency, and can potentially deliver different quanta of activity. This will affect decisions about which sectors will be eligible to have activity undertaken in them, and which sectors are allowed to undertake activity, and what activities can be undertaken. Schemes in Australia and overseas have chosen to allow activities in different sectors to achieve different objectives.

The New South Wales Energy Savings Scheme (NSW ESS) has the broadest sectoral coverage of the Australian schemes, allowing activities to be undertaken in the residential, commercial and industrial sectors. The Victorian Energy Efficiency Target (VEET) currently allows activity to be undertaken in the residential sector, and will shortly expand to allow a range of business activities to be undertaken. The South Australian Residential Energy Efficiency Scheme (REES) only allows activities relating to residential premises.

Amongst the major European schemes, the British Carbon Emissions Reduction Target (UK CERT) only allows activity that improves energy efficiency for residential energy consumers. The Italian scheme allows activity that improves energy efficiency for all stationary energy consumers, while the French scheme allows activity that improves efficiency of stationary and transport energy in all sectors except those that are liable parties in the European Union Emissions Trading Scheme.[8]

Deciding to allow activity to be undertaken in a sector requires consideration of:

- *The scheme objective:* Would including or excluding a sector better allow the scheme to meet its objective.
- *The fuels consumed in that sector*: Different sectors have different fuel consumption patterns. For example, the industrial sector generally uses more gas compared to the commercial sector. There can also be variance within sectors. For example, households in Victoria tend to use more gas than those in Queensland, reflecting the different climates and the availability of reticulated gas in those states.
- *The opportunities to improve energy efficiency in that sector*: Some sectors will have greater opportunities to improve energy efficiency than others because of their fuel mix and because of opportunities for technological and behavioural change.

27. The Australian Government has committed to investigating a broad-based national Energy Savings Initiative, that is, one that allows activities to be undertaken in the residential, commercial and industrial sectors. Are there sectors, or sub-sectors, that should or shouldn't be excluded from undertaking activity in a national Energy Savings Initiative? Why? What costs would inclusion or exclusion of certain sectors impose?

28. What evidence is there from state-based and overseas schemes that including or excluding a sector from creating activity changes the costs and benefits of an energy efficiency obligation? In what way?

29. How might including or excluding a sector or sub-sector from undertaking activity help or prevent a national Energy Savings Initiative from achieving one or other of the objectives outlined in Chapter 2? Is including or excluding a sector or sub-sector consistent with the design principles outlined in Chapter 2?

3.4 *Fuel coverage*

Once a decision has been made on which sectors are allowed to undertake activity, an assessment can be made of the energy sources that would be used as a basis for deciding on a target.

Different schemes operating in Australia and overseas have different fuel coverage. The NSW ESS covers only electricity, while the Victorian VEET and South Australian REES cover electricity and gas. Schemes overseas generally cover electricity, and sometimes gas and/or heating oil as well. The French scheme also covers liquid fuels used for transport.

There are a number of factors that need to be considered in determining fuel coverage design decisions, such as:

- *Location and activity use characteristics*: Fuels such as liquid petroleum gas (LPG) and diesel are used for both stationary energy and transport. Substantial amounts of fuels are used outside the main electricity and gas grids. For example, many regional and remote mining sites use large amounts of diesel both to generate electricity and for transport. Bottled LPG is used both for homes that are not connected to reticulated gas, and for some light vehicles. Some fuel types are only available in particular regions, (for example reticulated gas) which may restrict opportunities for savings in those areas.
- *Opportunity for savings*: Fuels included in a national Energy Savings Initiative should offer a source of potential energy savings (that is, there should be a reasonable number of opportunities to use that fuel more efficiently).
- *Measurement ease*: It must be relatively simple to assess the amount of that fuel that is used. The easiest way to assess the amount of fuel used across the economy is to identify a point in the supply chain where all or most transactions regarding the fuel are transparently recorded.

- *Fuel switching*: Some processes can be made more efficient by switching from one fuel to another. If a national Energy Savings Initiative included more than one fuel in the base for its target, consideration would need to be given to how each fuel consumption changes due to fuel switching. A technological switch from electricity to gas would reduce overall electricity consumption, but increase overall gas consumption, which may or may not result in an *overall* decrease in energy consumption. However, as gas is generally less greenhouse-intensive than electricity, it may result in a decrease in greenhouse gas emissions. Examples of fuel switching activities which may be considered include cogeneration and other forms of distributed energy; or switching from electric to gas hot water or heating. (see also Box 3.1).

Covering a wider range of fuels offers the potential to reduce the overall scheme costs and increase the benefits by opening up a greater array of low-cost energy efficiency opportunities. However, this may also add complexity to a scheme, which may increase administration and participation costs.

30. Given the factors above that affect the selection of a fuel base for deciding on an Energy Savings Initiative target, what fuels should be covered in a national scheme?

31. How would the choice of fuel coverage affect a national Energy Savings Initiative's ability to meet one or other of the objectives set out in Chapter 2? How would fuel coverage affect the cost of the scheme?

32. If a national Energy Savings Initiative covered more than one fuel, should it have one target covering all fuels or should it have a separate target for each fuel? How would this affect companies that sell more than one fuel (for example, an energy retailer that sells both electricity and gas)?

33. If a fuel can be used for multiple purposes, should a national Energy Savings Initiative treat these two uses differently when calculating a base for a target and achieving a target?

Box 3.1: Fuel switching treatment in other schemes

The Victorian VEET establishes greenhouse gas reduction rates that can be applied to gas and electricity, for the purpose of allowing retailers to calculate their liability for each unit of energy that they purchase. A technological switch from electricity to gas would increase gas consumption, therefore impacting on the levels of the VEET target that is met by each fuel source.

The NSW ESS uses only electricity as the base for its target, so a technological switch from electricity to gas would help meet the electricity target, but increase gas consumption outside the scheme. Both electricity and gas retailers are included in the SA REES and both electricity and gas saving activities are included in the list of approved energy saving activities. The UK CERT covers electricity and gas, and includes the relative changes to fuels in its deemed savings calculations for technology switching.

Energy consumed outside the major grids

Some Australian energy consumers are located outside of the eastern states' National Electricity Market (NEM), Western Australia's South West Interconnect System (SWIS), and the major gas networks. There are energy consumers in locations covered by smaller grids, such as the Darwin-Katherine system, Pilbara, Mt Isa, Alice Springs and Broome; and there are large and small energy consumers that are not connected to any network and generate their own electricity.

These energy users often experience higher energy costs due to their remoteness and a lack of competitive forces, and hence, they receive larger private benefits from improving their energy efficiency.[9] However, these energy efficiency improvements may not contribute to wider shared benefits, such as projects undertaken in the NEM and the SWIS where the benefits of reduced demand have potential to flow through to all electricity users through lower energy infrastructure costs. For example, installing a new compressor unit in an off-grid mine site will benefit the mining company. Installing the same compressor on a mine site that is connected to the NEM may benefit other electricity users connected to the NEM, because the need for new poles and wires could be reduced, which could flow through to lower electricity prices for all, as well as benefiting the mining company. In remote areas where governments subsidise the cost of energy for users, an improvement in energy efficiency would have both a private benefits (to the user) and a shared benefit (in terms of reduced public spending on subsidies).

Including off-grid energy efficiency may reduce or increase the overall costs of the scheme and needs close investigation. For example, the cost of energy supply tends to be much higher off-grid, resulting in potentially higher paybacks and lower certificate costs for individual efficiency activities. Conversely, undertaking energy efficiency activities in more remote locations is generally more costly (such as transport and employment costs).[10]

Including off-grid areas and the smaller grids may be beneficial in targeting low-income households. These geographic areas include a higher proportion of lower income communities.[11] As a result, encouraging the uptake of energy efficiency behaviour in off-grid areas may assist these households to manage higher than usual energy costs.

For an Energy Savings Initiative with an objective of unlocking abatement (rather than addressing peak demand to place downward pressure on energy prices), energy use outside the major grids may be a potential source of low-cost abatement. Very large improvements in off-grid projects, for example improvements in a large new LNG plant, may also provide shared benefits if they are able to lower the cost of meeting a national carbon abatement target.

34. Given the objectives outlined in Chapter 2, how should a national Energy Savings Initiative treat energy use outside the main grids? Are different treatments required for different fuels?

35. What factors should be taken into account when considering energy use outside the main grids to ensure an appropriate balance of private and public benefits?

3.5 *Units of measurement*

The target for a national Energy Savings Initiative, and the activities that are credited within it, will need to be measured in a unit of measurement that reflects the objective of the scheme (see chapter 2), and the fuels used as the basis for setting the target (see section 3.2 above). The unit of measurement also needs to reflect the scale of potential activities (for example, household technologies deliver savings orders of magnitude smaller than industrial projects).

It is possible to use conversion factors to convert between different units. For example, the NSW ESS asks project proponents to calculate savings in megawatt hours (MWh), then convert them to tonnes of carbon dioxide equivalent (tCO_2e). As discussed in Chapter 6, choice of unit of measurement has particular implications in a scheme that targets peak electricity demand, because the value of a MWh saved varies with time and location.

All three existing state schemes use tCO_2e as their unit of measurement, as does the UK CERT. The French Energy Efficiency Obligation uses kilowatt hours (kWh). The Italian scheme uses tonnes of oil-equivalent, reflecting that much of Italy's electricity is generated from oil.[12] Table 3.1 sets out some options for units of measurement.

36. Referencing the objectives set out in Chapter 2, which unit of measurement would be most appropriate for a national Energy Savings Initiative?

Table 3.1 Units of measurement for a national Energy Savings Initiative

Unit	Rationale
Megawatt hours (MWh)	Appropriate for a scheme that focuses on improving the overall efficiency of electricity *use*. Does not reflect value of saving energy at different times of day.
Megawatts of demand	Appropriate for measuring electricity *load* (that is, the infrastructure

(MW or MVA)	capacity required to deliver electricity), and therefore may be used for a scheme that targets peak demand. Not appropriate for gas, liquid fuels, solid fuels or electricity *consumption* over time.
Gigajoules (GJ)	Appropriate for all fuels, but not for peak demand. Appropriate for a scheme that focuses on improving the efficiency of overall *energy* use.
Tonnes of carbon dioxide equivalent (tCO_{2e})	Can be derived from all fuels, but not from peak demand. Changes over time as the greenhouse intensity of electricity changes. Appropriate for a scheme where the objective is emissions abatement.
Financial value ($)	Can be used to combine energy demand and energy consumption by assigning a market value to each.

3.6 *Setting targets*

Once the fuel base for a target is decided, and the unit of measurement selected, the target can be set. The ambition of the target is critical to the effectiveness of an energy efficiency scheme.[13] A target specifies the desired level of energy efficiency improvement that goes beyond business-as-usual improvements. If the target is too low, the objectives of the scheme may not be fully met. If the target is too high, the scheme will drive investment in higher-cost energy efficiency improvements that are not cost-effective from a private or social viewpoint; or scheme participants may opt to pay a penalty rather than find savings, leading to a higher cost with no associated benefit. Over time it may be necessary to adjust the target to respond to changing circumstances. A well-designed scheme would have a clear and transparent mechanism for doing so.

A factor in setting the target level for a national Energy Savings Initiative is assessing the market's ability to deliver the required amount of activity. Lack of existing service providers and related skills could create delays in the ability for the market to respond. The capacity of the market may be more developed in states that already have schemes. Conversely, in the early years of a national Energy Savings Initiative, the market may flourish in states that do not currently have schemes because there may be a greater supply of untapped activity in those locations.

The Working Group has been asked to advise on possible design options for a national Energy Savings Initiative that would be capable of delivering energy efficiency improvements at least as great as those being delivered by existing schemes. As part of this process the Working Group will consider the opportunities to improve energy efficiency that exist in other states. This is intended to ensure that any national Energy Savings Initiative does not undermine these schemes and drives improvements that are additional.

37. The Working Group intends to test the benefits and costs of a range of targets through economic modelling. In selecting targets to test, what factors should the Working Group take into account? How does the choice of objective set out in Chapter 2 affect the level of the target?

Penalties

Penalties create the incentive for obligated parties to meet the obligation. They also cap the cost of the scheme, as obligated parties should be willing to spend up to the penalty cost to meet their obligation, but no more. A well-designed scheme would carefully balance penalties against the expected costs of the scheme such that penalties are rarely paid, as paying a penalty imposes a cost on the market without the subsequent benefits (unless it is accompanied by a 'make-good' obligation). Alternatively penalties could be recycled to capture benefits elsewhere.

The NSW ESS penalty is $23.99 per tCO2-e in 2011. The Victorian VEET penalty is $41.23 per certificate for 2011. The UK CERT uses a make-good obligation and a fine that is linked to company profits.

38. What factors should be taken into account when determining an appropriate penalty rate for any national Energy Savings Initiative?

Banking and borrowing

'Banking' allows an obligated party to over-achieve their target in one year and draw on this surplus to meet its target in following years (either formally through an agreement with a regulator, or by holding certificates or credits that they do not surrender in a particular year). 'Borrowing' allows an obligated party to underachieve their target in one year provided it makes up for this in the next year. Both banking and borrowing assist the market to adjust smoothly in response to changes in supply of eligible activity. In general, banking is more likely to occur when the future value of certificates or credit is likely to be higher than the current price. Borrowing is more likely to occur when the current price is higher than the likely future price (which generally reflects a current undersupply of activity).

The NSW ESS allows unlimited banking, and limited borrowing (obligated parties may carry forward to the next year a shortfall of certificates of up to 10 per cent of their liability for a given year). The Victorian VEET allows banking (although any banked certificate cannot be older than six years from the date of installation activity) but does not allow borrowing against future compliance years. The SA REES allows obligated parties to bank eligible activity against a subsequent year's target and also allows them to meet only 90 per cent of their obligation in a year without penalty, though the shortfall must be made up in the subsequent year.

39. What evidence is there from existing schemes in Australia or overseas that banking and borrowing provisions make it easier or more difficult to meet a target in a given year?

Sub-targets

Sub-targets (also called 'ringfences') can be used to reserve part of the target for activities in a particular sector of the economy, or for a particular technology, or in a particular geographical area. This could be done to align with a scheme objective that tries to target one of these; or to address equity issues or industry development needs. For example, a scheme that has the objective of assisting low-income households could set a sub-target for activity that takes place in these households. A scheme that targets peak demand could reserve part of the target for activities that improve the efficiency of energy use at peak times.

Sub-targets may drive up the overall cost of a national Energy Savings Initiative. The more sub-targets that are present, and the larger the part of the overall target that is taken up by sub-targets, the less scope there is for the market to seek out the lowest-cost opportunities across all covered sectors to improve energy efficiency.

Sub-targets could also be used to ensure a geographical spread of activity and associated costs and benefits. Australia has two large electricity grids: the NEM on the east coast, and the SWIS on the west coast. These grids are not linked. If it were cheaper to undertake activity on the west coast than on the east coast, it could be expected that participants would do so, choosing to meet their east coast obligations through activities in the SWIS. This would lead to a concentration of benefits on the west coast and costs on both the east and west coasts, which may not be equitable.

A third use for sub-targets is as a transitional measure. For example, if a national Energy Savings Initiative began with limited coverage, which was later expanded, a sub-target could be used for a transitional period to ensure a minimum level in the sectors first covered.

If the chosen scheme objective was to deliver the lowest cost energy efficiency improvements or carbon emissions reductions across the Australian economy, it follows that it does not matter where activity occurs. If the scheme objective was to assist the full spectrum of Australian households to better manage their energy consumption and adjust to higher energy prices, then where activity takes place, both geographically and between covered sectors, is an active consideration. Therefore the choice of objective is fundamental to the consideration of sub-targets.

An alternative to using sub-targets to drive particular activities would be to use incentives. For example, rules for a national Energy Savings Initiative could be designed to make it easier to undertake activity in one sector or area than in another. Or, the scheme rules could include a multiplier for some activities, making it more attractive to undertake those activities (it should be noted that once a multiplier is present, the actual energy efficiency improvements that take place become detached from the energy efficiency improvements that are credited, making it more difficult to assess whether the policy has been successful). The South Australian REES has a sub-target for priority households. This is similar to the UK CERT. The other two existing state schemes do not use sub-targets. The planned ACT scheme will use a sub-target for low-income households, similar to the SA REES.[14]

The use of sub-targets is discussed further in Chapters 5 and 6 with respect to low-income households and peak demand.

40. Should a national Energy Savings Initiative use sub-targets or incentives to drive activity in a particular sector/s or region/s? Is so, where and to what degree?

41. How does the choice of objective relate to decisions around whether a sub-target is included in a scheme design?

42. Is using a sub-target consistent with the design principles in Chapter 2?

43. What evidence is there that sub-targets increase costs? Who bears this cost? Is this additional cost balanced by increased benefits elsewhere?

Exclusions from the target base

The target base refers to the quantum of energy from fuels chosen for coverage (section 3.3) that is consumed in sectors where eligible activity takes places (section 3.2). For example, in a scheme that only covers electricity use and only allows activity to take place in the residential sector, the target base would be the total quantum of electricity consumed in the residential sector. Generally, eligible activity would be aligned to the target base, though there are sometimes exceptions to this (see below).

There are a number of reasons to make an exclusion from the target base. First, a sectors' energy consumption of an eligible fuel could be excluded from the target base because stronger incentives or more effective policies to improve energy efficiency already exist in that sector, and so therefore activities that are undertaken in that sector are unlikely to represent energy efficiency improvements that go beyond business as usual.

Second, consumption of a covered fuel in a sector or subsector could be excluded on the basis that there is little or no scope for eligible activity in that sub/sector.

Third, a sector's consumption of an eligible fuel could be excluded from the target base in order to protect consumers in that sector from other impacts caused by a national Energy Savings Initiative (such as energy price rises or impacts on competitiveness). For example, all or part of the energy used by low income households could be excluded, which would imply that there would be no case to pass through costs of meeting the target to these households.

Excluding consumption of eligible fuels in a sector from the target base would generally increase the costs of the scheme, particularly if activity in that sector was a potential a source of low-cost improvements.

Excluding a sector from the target base does not always mean that eligible activities cannot be undertaken in that sector. The NSW ESS partially excludes the loads of large users that are eligible for emissions-intensive, trade-exposed industry assistance under the Carbon Price Mechanism. Energy savings from recognised activities in these sectors are still eligible for certificate creation.

44. In what circumstances should a national Energy Savings Initiative consider allowing exclusions from the target base? What evidence is there that such exclusions increase overall costs? Who bears these costs? Are these additional costs balanced by increased benefits elsewhere?

45. Would excluding consumption of eligible fuels from a sector or sectors from the target base help or hinder a national Energy Savings Initiative to meet the objectives set out in Chapter 2? Would excluding a sector be consistent with the design principles in Chapter 2? Why?

Form of the target

Targets can be set in absolute amounts (the target is set at X units in year Y), or in percentage trajectories (the target is set as X per cent of the target base in year Y). These have differing effects on business certainty. Absolute targets provide more short-term certainty, but tend not to be set too far into the future. Percentage trajectories can be set many years into the future, but the exact amount year to year will fluctuate as the target base changes.

The Victorian VEET and South Australian REES set absolute annual targets in three-year cycles. The NSW ESS uses a percentage trajectory, which sets the percentages out to 2020. The REES also sets targets for energy efficiency activity in priority group households, and for energy audits. Targets for the existing state schemes are summarised in Table 3.2.

Table 3.2: Comparison of the state scheme targets

Scheme targets	2009	2010	2011	2012	2013	2014	2015 - 2020
NSW ESS (% liable sales)	0.5%	1.5%	2.5%	3.5%	4.5%	5.0%	5.0%
Victorian VEET (MtCO2e)	2.7	2.7	2.7	5.4	5.4	5.4	-
SA REES energy efficiency activities (ktCO2e)	155	235	255	255	335	410	-
SA REES priority group	35%	35%	35%	35%	35%	35%	
SA REES energy audits	3000	5000	5000	5667	5667	5667	-

46. Which form of target should be preferred for a national Energy Savings Initiative and why?

47. What evidence is there for the effects of different forms of target on business development and planning?

3.7 *Obligation points and thresholds for obligations*[15]

Once a target has been set, an energy efficiency obligation scheme then makes this target mandatory for a party (or parties) somewhere along the energy supply chain (Figure 3.1). The obligation point (or points) would reflect the eligible fuels that comprise the target base (see section 3.2 above). For example, in a scheme that used gas, electricity and liquid fuels as a target base, the obligation points would be placed in the supply chains for gas, electricity and liquid fuels.

Figure 3.1: Participants in the energy supply chain

Energy efficiency improvements can take place and be rewarded at any point in the energy supply chain provided that prices are free to adjust in response to the cost of these activities. Different obligation points could affect the complexity and cost of a scheme.

If an Energy Savings Initiative is to use the power of the market to find and implement the lowest cost energy efficiency improvements, it makes sense to place the point of obligation as close as possible to the people who have the most control over the end-use of energy. However, placing the obligation on end consumers themselves is complex and costly; there are so many individual consumers that sensible operation of an energy savings initiative would be impossible.

Possible obligation points are discussed below. These are not exclusive choices – one or more of the obligation points listed may be better suited to meeting chosen objectives of a national Energy Savings Initiative.

Electricity and gas retailers and distributors

In the electricity and gas supply chains, energy retailers provide a way of collecting small and medium consumers, both households and business, to create a workable obligation point. Most would also be complying with at least one, and possibly more than one, state-based scheme, so a national energy efficiency obligation that replaced the state-based schemes would not change, and may reduce existing regulatory burden. While retail competition is developing across the country, the level of competition varies between regions, and some retailers remain government-owned.

Another option might be to place an obligation on energy distributors. Electricity and gas distributors are regulated monopolies, so the costs that they can pass on are determined by their respective regulators. The costs of compliance with a national Energy Savings Initiative would therefore need to be accounted for in the price regulation process. As there is no competition between energy distributors, there is no scope for competition pressures to ensure the compliance costs that are passed on to consumers are minimised. However, energy distributors could benefit directly from improvements to energy efficiency in their distribution areas that may delay or defer the need to invest in infrastructure upgrades. This may help address peak demand.

All three state schemes use electricity or electricity and gas retailers as the obligation point. The Victorian VEET and the SA REES establish a threshold (measured in customer numbers) for obligation. This means that the smallest retailers need not comply with the state schemes.

48. Should a national Energy Savings Initiative use energy retailers as an obligation point? What would be the relative costs and benefits of choosing this obligation point? Should another point be chosen, either alongside or instead of energy retailers?

49. What would be an appropriate threshold for the obligation, and why? Are there alternative approaches to assist small retailers?

Liquid fuels

Retailers of liquid fuels are many and highly dispersed, and do not have a relationship with liquid fuel customers in the same way that electricity and gas retailers do. Liquid fuel distributors have even less relationship with end-users than liquid fuel retailers. Adjustments to fuel tax arrangements announced as part of the Clean Energy Future plan mean that many business uses of liquid fuels and non-transport uses of CNG, LPG and LNG will be subject to an equivalent carbon price.[16] This should provide these fuel users with an incentive to improve their energy efficiency.

State schemes do not currently include liquid fuels. The French Energy Efficiency Obligation places obligations and targets on suppliers of transport fuel.

50. Given the complexity of finding a practical obligation point in the liquid fuels supply chain, and the incentives provided by changes to fuel tax arrangements, should the Australian Government consider including all liquid fuels or particular liquid fuels in the target base and therefore place an obligation in the supply chain?

Large users

Many large users of energy do not buy energy from an energy retailer, instead sourcing it directly from the relevant electricity or gas market, or generating the energy themselves.

In the NSW Greenhouse Gas Reduction Scheme (GGAS), direct market customers (generally large users of energy) are one of the obligation points. Large users of energy that are not direct market customers may opt to manage their own share of the GGAS target, rather than face a higher energy price passed through by a liable energy retailer. These large users prefer to find opportunities for abatement in their own operations rather than face a passed-through cost for compliance from an energy retailer.

Making large users an obligation point would broaden the target base which could reduce costs and increase benefits across the economy. However, as discussed in section 3.6, there may be other impacts on these users to take into account, such as changes to international competitiveness.

51. Would the costs of excluding large users as an obligation point from a national Energy Savings Initiative outweigh benefits? Would specific treatment of large users be consistent with the design principles in Chapter 2?

3.8 *Eligible activities*

Additionality and business as usual

As outlined in Chapter 1, a national Energy Savings Initiative would seek to unlock improvements to energy efficiency additional to those which would have occurred otherwise.

It is difficult for Energy Savings Initiative participants (whether obligated parties, energy efficiency service companies, or regulators) to know whether an energy efficiency improvement would have happened in the absence of an Energy Savings Initiative. However, there are some useful criteria that could assist in making sure that an Energy Savings Initiative credits energy efficiency improvements that go beyond business as usual:

- *Only award improvements that go beyond regulated standards*. Regulated standards for energy efficiency exist in many areas of the economy. Products such as lighting, home appliances, motors and drives are subject to regulated minimum energy performance standards. In some states, companies that use more than a threshold amount of energy are subject to compulsory implementation of some energy efficiency improvements. New building work is subject to energy efficiency provisions in the Building Code of Australia. Some local governments may place additional energy efficiency requirements on new buildings or developments.

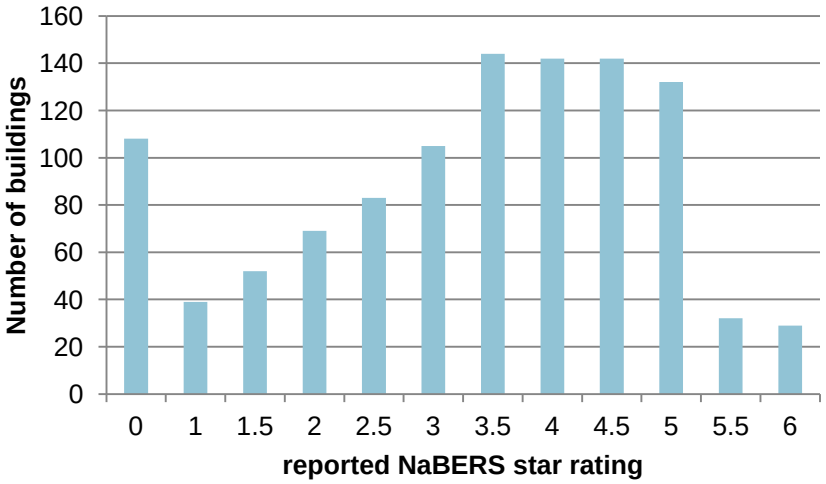
  A national Energy Savings Initiative could ensure additionality by excluding examples such as these from being able to claim credit. For example, no credit would be awarded for installing a low-flow shower head in a new house to meet planning laws.

- *Only award high-efficiency improvements*. High-efficiency products tend to occupy a small percentage of the market. For example, fridges with a star rating of five stars formed only 5.6 per cent of sales in 2009, compared to a 69.5 per cent sales share for three-and-a-half stars and four stars (the market average in 2009 was 3.99 stars).[17] Five-star and above commercial buildings represented only 18 per cent of the market in the past 12 months (see Figure 3.2).[18]

  If an Energy Savings Initiative awarded credit only for the highest efficiency improvements, these would be fairly certain to go beyond business as usual. For example, no credit would be awarded for installing a four star fridge (the market average), but credit could be awarded for a five star fridge; and similarly, no credit would be awarded for upgrading a building from two stars to four stars, but credit could be awarded for upgrading to six stars.

- *Require a baseline*. Projects to improve energy efficiency in industrial operations are often unique to a particular site or facility, meaning it is difficult to use the criteria above to filter out business-as-usual improvements. An Energy Savings Initiative could require such projects to establish a baseline for current performance of a process or facility through measurement and monitoring. It could then award credit for changes in technology that result in efficiency improvements against that baseline. The NSW ESS has a methodology called the Metered Baseline Method that works in this way.[19]

Figure 3.2: Number of commercial buildings in each NABERs star rating category, last 12 months[20]



Source: Data supplied to the Department of Climate Change and Energy Efficiency by the New South Wales Office of Environment and Heritage, for commercial office buildings rated under the NABERS Energy for Offices protocol that are listed as for public availability, or for the CBD program.

52. What would be the implications of using the above criteria to ensure that an Energy Savings Initiative credited only additional energy efficiency improvements beyond business as usual? Are there other criteria that could be applied? How would using these criteria assist or hinder meeting the objectives outlined in Chapter 2?

53. What evidence is there that existing schemes, both in Australia and overseas, are too stringent or too lenient with respect to crediting business as usual? What has been the impact of this?

Pathways for including and excluding activities

In theory, any activity could be eligible for inclusion in a national Energy Savings Initiative if it is additional to business as usual and amenable to crediting savings through eligible methodologies. Over time, however, eligible activities may become more common or subject to separate regulation (and therefore would not meet additionality criteria). At the same time, new technologies would come onto the market, which may be genuinely additional and therefore should be considered eligible for inclusion. To allow markets time to adjust, a pathway to inclusion and transparent criteria for exclusion are desirable design features for a national Energy Savings Initiative.

Different schemes have different ways to manage these. The VEET provides for proponents of new activities to bring forward evidence of savings for use by the regulator in developing a new deemed category. The South Australian REES allows a person to make an application to the regulator seeking a determination that a new energy efficiency activity should be approved. To encourage innovation, the UK CERT allows a guaranteed minimum amount of credit to liable parties that agree to trial from so-called 'market transformation' activities (generally technologies or approaches that are not currently accredited under the scheme), on the proviso that credit above the minimum amount is only awarded for the actual savings achieved in the trial.[21] Governments can also pro-actively develop methodologies for new technologies.

Some of the state schemes have already had to respond to changing market conditions by excluding activities or adjusting the credit available. For example, the NSW Government is consulting on the removal of showerhead replacements from its list of eligible technologies from 22 December 2011. This follows adjustments to the deemed savings for showerheads in late 2010. Under the Demand Side Abatement Rule of the NSW GGAS (forerunner to the NSW ESS), the deemed factors available for household lighting were adjusted downwards after three years, to take account of new data on the persistence of installed products.[22] The Victorian VEET allows discount factors to be applied to deemed savings through a ministerial order.

54. How could a national Energy Savings Initiative create a pathway for new activities to enter the scheme?

55. What evidence is there from international and state-based schemes that different approaches for new activities are helpful or act as a barrier to entry?

56. What criteria should a national Energy Savings Initiative use to exclude an activity or adjust the credit available for an activity?

3.9 *Crediting and verifying savings*

Two methodologies for energy efficiency improvement are commonly used in energy efficiency schemes: deeming and calculation.

Deeming

Deeming establishes a standard amount of credit that is available for a particular technological change. Generally, all of the deemed credit is awarded at the time the technology is installed. Deeming tends to be used for technologies that are standardised and common. For example, many schemes in Australia and overseas use deeming for household lighting.

An advantage of deeming and up-front allocation of credit is that it aligns awarding of credit with the capital expenditure for the item. This can assist in making the item more affordable. Deeming also shifts responsibility for determining savings away from energy service companies and obligated parties, and onto the scheme regulator, which helps reduce transaction costs for these parties (though with an associated increase in responsibility for the regulator).

Depending on scheme rules around deeming, one possible disadvantage of it is that reductions in demand can become decoupled in time from the awarding of credit.[23] This arises in schemes where credit is awarded up-front at the time of installation, for reductions in demand that actually take place over the life of the technology. In such cases, the associated wider benefits of reduced demand occur further away in time than the costs of complying (for example reduced expenditure on energy infrastructure, putting downward pressure on energy prices).

Deeming methodologies can be simple or complex. For example, a simple methodology for a high-efficiency air-conditioner could use Australia-wide estimates of the amount of energy saved by replacing an old air conditioner with a high-efficiency unit, and assign a deemed credit accordingly. This would to some extent create a difference between the actual savings achieved, and the savings awarded, but anyone who bought that air-conditioner would be eligible for the same amount of credit. A more complex methodology could take account of the climate zone where the air-conditioner was installed, the presence or absence of smart controls, and the likelihood of the air-conditioner being used at peak times. In this case, the credit would be closer to the likely savings delivered by the air-conditioner, but different purchasers would receive different amounts of credit depending on where they lived.

Deeming is used in all three state-based schemes. Overseas schemes also use deeming.

57. Which technologies, processes or changes to the way energy is used should be considered candidates for deeming in a national Energy Savings Initiative?

58. What are the advantages and disadvantages of introducing more complexity into deeming methodology (for example, location or time of use) versus using a simple deemed value that may be an underestimate or overestimate of the actual performance of the equipment?

Calculating savings

Calculating savings involves establishing a baseline for a process or facility (through measuring and monitoring), and calculating the savings expected to be achieved through installing new technology or changing energy management practices. Once these changes are made, the process or facility is monitored again, and credit is awarded once savings have been achieved (for example, yearly or quarterly). Calculated savings methodologies are more suited to projects which are bespoke or use non-standardised items, or use items in combination. They are also suited to applications with a high degree of variability where outcomes cannot be predicted with the confidence required to take a deemed approach. They align the timing of savings with the timing of awarding credit. However they are also more complex, with associated increases in transaction costs for all parties.

The NSW ESS has established several methodologies used for calculating non-deemed savings. It also has one methodology that allows savings to be calculated for individual projects, but awarded on a deemed basis. The Victorian VEET does not currently utilise calculation methodologies.

59. Which technologies, processes or changes to the way energy is used are best suited to a calculation approach or to a combination of calculation and deeming?

60. What are some ways to reduce transaction costs associated with calculating and verifying savings?

Accreditation, audit and compliance

Any energy efficiency obligation needs a system of verifying and auditing scheme participants to ensure that savings are being achieved, targets are being met, and integrity in the system is maintained. In a scheme with tradeable certificates, trading is unlikely to emerge if there is doubt over the validity of the certificate or its eligibility to be surrendered to meet a target.

The NSW ESS requires project proponents to apply for accreditation before they can begin creating certificates. Accredited parties (called ACPs in NSW) are subject to a risk-based audit regime which sets out how often they must audit their operations. ACPs pay for the costs of audits themselves, but a deed of agreement makes the auditor responsible to the regulator.[24]

The Victorian VEET also requires pre-accreditation but has stricter criteria around certificate creation and registration that gives the regulator direct oversight of record keeping by certificate creators. For example, in the VEET, every certificate created has a street address associated with it, and inspectors have the power to enter premises to check records and verify activities.

The South Australian REES requires energy retailers to bring forward annual plans outlining how they plan to meet their targets and how they will ensure that the savings achieved are real. Retailers may sub-contract carrying out the activity, but unlike in NSW and Victoria where the liability for meeting the rules for certificate creation rests with a liable party (who may be an energy services company rather than a retailer), in South Australia all the liability rests with the retailer.

These three different models carry different distributions of liability if rules are breached:

- *Seller liability* (as in the NSW ESS and VEET) means that the original creator of activity bears the liability of making sure that it meets the rules for creation (and therefore carries the risk of it not meeting the rules).
- *Buyer liability* (as in the REES) means that the final purchaser of activity carries the liability (and the risk) that the activity does not meet the rules (though in practice the final purchaser may use contractual or other arrangements to manage this risk).

In addition to the compliance costs of obliged parties, regulators also face costs associated with discharging their functions. Regulators may choose to recoup these costs through application fees and fees attached to certificate creation and transaction.

61. What factors should be taken into account in establishing an appropriate audit and compliance regime?

62. What evidence has emerged from existing schemes that different compliance models have created higher or lower costs for scheme participants? Who bears these costs?

3.10 *Ensuring a smooth transition from state-based schemes*

The Terms of Reference for the Working Group nominate that one of its priorities is to:

> 'consider and advise upon possible implementation arrangements for a national Energy Savings Initiative, including arrangements for ensuring a smooth transition from existing State-based schemes.'

Transition issues will be investigated by the Working Group through the process of further work on a national Energy Savings Initiative and clear communication will be made to market participants on the progress of the process.

63. Generally, what are the advantages or disadvantages to different approaches to managing transition issues?

Transition issues for the energy services sector

Energy services companies participating in existing state-based schemes, depending on the respective scheme rules, have created energy savings certificates or credits in the markets in which they operate. The smooth introduction of a national Energy Savings Initiative would require that appropriately skilled and resourced service providers exist at scheme commencement. However, where the income of these businesses relies on certificates or credits for a state-based scheme, they may face financial risks if there is a fall in demand for certificates following from uncertainty around whether, and when, a national Energy Savings Initiative would replace existing state schemes.

Businesses may also be affected by uncertainty concerning the design of any future scheme, including:

- whether energy savings activities that are currently eligible under one or more state schemes will be eligible under any national scheme
- how any national scheme would treat energy savings certificates that have been generated and banked under the existing state schemes, and
- how the target of any national scheme compare with the existing state based targets.

It is the scheme target that is the ultimate driver for demand for certificates or credits. With respect to the target for any national scheme, the Working Group's Terms of Reference, include that the Working Group would consider and advise upon possible design options for a national Energy Savings Initiative that would

> 'be capable of delivering energy efficiency improvements at least as great as those being delivered by the New South Wales Energy Savings Scheme (ESS), the Victorian Energy Efficiency Target (VEET) and the South Australian Residential Energy Efficiency Scheme (REES).'

64. Design features or methodologies differ from state to state. For businesses that participate in more than one state scheme (including obligated parties and certificate creating businesses), which of these would require resolution to enable a smooth transition, and what options are available? What other factors should be taken into account?

Geographic spread of activity

The geographic up-take or spread of energy efficiency activity across Australia under any national scheme will depend on the availability, scope and cost of realising the eligible opportunities in various locations. These opportunities are affected by factors such as demographic and building stock characteristics, climatic conditions and the presence or history of energy efficiency related policies that have been applied in the area. The investigation of a national Energy Savings Initiative needs to analyse these issues as part of determining the overall costs and benefits of various scheme designs.

65. What evidence is there that starting a new scheme would cause activity flight from one location or jurisdiction to another?

66. What evidence is there to suggest that activity might be evenly or unevenly spread across Australia? What would be the impacts of this?

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[1] This section draws strongly on work undertaken by the Prime Minister's Task Group on Energy Efficiency.

[2] E Eyre, 'Regulation of energy suppliers to save energy - lessons from the UK debate', *Proceedings of the British Institute of Energy Economics Conference*, September 2008.

[3] Tokyo Metropolitan Government, *Tokyo Cap-and-Trade Program: Tokyo ETS*, 2009, viewed on 14 November 2011, <http://www.nrw.co.jp/file/fireplace_talk/19.10.2009_miyazawa.pdf>.

[4] See for example the 'Efficient Building Scheme' proposed by Lend Lease: Lend Lease & Lincolne Scott Advanced Environmental, *The summary case for an efficient building scheme*, viewed on 14 November 2011, <http://www.delfinlendlease.com.au/sustainability/pdf/EfficientBuildingScheme.pdf>.

[5] S Rezessy, & P Bertoldi, 'Energy supplier obligations and white certificate schemes: comparative analysis of results in the European Union', *Proceedings of ACEEE Summer Study on Energy Efficiency in Buildings*, 2010.

[6] P Waide, and B Buchner, 'Utility energy efficiency schemes: savings obligations and trading', *Energy Efficiency*, vol 1, 2008, pp. 297-311.

[7] S Rezessy & P Bertoldi, 'Energy supplier obligations and white certificate schemes: comparative analysis of results in the European Union', *Proceedings of ACEEE Summer Study on Energy Efficiency in Buildings*, 2010.

[8] S Rezessy, & P Bertoldi, 'Energy supplier obligations and white certificate schemes: comparative analysis of results in the European Union', *Proceedings of ACEEE Summer Study on Energy Efficiency in Buildings*, 2010.

[9] For a discussion of higher electricity prices for remote communities in South Australia, see: Department of Transport Energy and Infrastructure – Energy Division and KPMG, *Review of the Remote Areas Energy Supply Scheme*, 2011, p. 1, viewed on 15 November 2011, <http://www.sa.gov.au/upload/franchise/Water,%20energy%20and%20environment/energy/energy_supply/Remote%20Areas%20Energy%20Supply%20Scheme%20Final%20Report%20-%20EXCLUDNG%20APPENDIX%20A.pdf>.

[10] For a comparable discussion of higher costs for installing smart meters in remote areas, see: NERA Economic Consulting, *Costs and Benefits of Smart Metering in Off-Grid and Remote Areas*, A Final Report for the Ministerial Council on Energy's Smart Meter Working Group, 10 August 2010, p. 20, viewed on 15 November 2011, <http://www.ret.gov.au/Documents/mce/_documents/2010%20bulletins/no-186-NERA-off-grid-smart-metering-final-report.pdf>.

[11] Australian Bureau of Statistics, *Household Income and Income Distribution, Australia – Detailed Tables, 2009-10*, ABS cat. No. 6523.0, 30 August 2011.

[12] European Commission, *Italy – Energy Mix Fact Sheet*, January 2007, viewed on 25 November 2011, <http://ec.europa.eu/energy/energy_policy/doc/factsheets/mix/mix_it_en.pdf>.

[13] L Mundaca, L Niej, N Labanca, B Duplessis & L Pagliano, 'Market behaviour and the trade-or-not-to-trade dilemma in "Tradeable White Certificate" schemes', *Energy Efficiency*, vol 1, no. 4, 2008, p. 344.

[14] Simon Corbell MLA, ACT Minister for the Environment and Sustainable Development, media release, viewed on 11 November 2011, <http://www.environment.act.gov.au/__data/assets/pdf_file/0004/233149/110928_Sustainable_Energy_Policy_MR.pdf>.

[15] This section draws strongly on work published in the report of the Prime Minister's Task Group on Energy Efficiency.

[16] Emissions from domestic aviation, domestic shipping, rail, and non-transport uses of liquid fuels and LPG, CNG and LNG will be subject to an equivalent carbon price from 1 July 2012 through reductions to fuel tax credits and changes to excise. See: Australian Government *Securing a Clean Energy Future – The Australian Government's climate change plan*, 2011, pp. 105-106.

[17] Energy Efficient Strategies, *Greening Whitegoods – A report into the energy efficiency trends of whitegoods in Australia from 1993 to 2009*, October 2010, viewed on 11 November 2011, < http://www.energyrating.gov.au/wp-content/uploads/Energy_Rating_Documents/Library/Washing_and_Drying/Household_Appliances/201008-greening.pdf>; and Energy Efficient Strategies, *Greening Whitegoods – A report into the energy efficiency trends of whitegoods in Australia from 1993 – 200*, Final Report prepared for E3 – Equipment Energy Efficiency Committee, Detailed output tables, October 2011, viewed on 11 November 2011, < http://www.energyrating.gov.au/wp-content/uploads/Energy_Rating_Documents/Library/Washing_and_Drying/Whitegoods/gfkapp09.pdf>.

[18] Data supplied to DCCEE by the New South Wales Government's Office of Environment and Heritage, for commercial office buildings rated under the NABERS Energy for Offices protocol that are listed as for public availability, or for the CBD program.

[19] Independent Pricing and Regulatory Tribunal, *Metered baseline method (including NABERS)*, viewed on 18 November 2011, <http://www.ess.nsw.gov.au/activities/metered_baseline.asp>.

[20] Data supplied to DCCEE by the New South Wales Government's Office of Environment and Heritage, for commercial office buildings rated under the NABERS Energy for Offices protocol that are listed as for public availability, or for the CBD program.

[21] Ofgem, *Carbon Emissions Reduction Target (CERT) 2008-2011: Supplier Guidance – Version 2*, viewed on 25 November 2011, <http://www.ofgem.gov.uk/Sustainability/Environment/EnergyEff/InfProjMngrs/Documents1/CERT%20supplier%20guidance.pdf>.

[22]Independent Pricing and Regulatory Tribunal, *Greenhouse Gas Benchmark Rule (Demand Side Abatement) No. 3 of 2003*, Effective from 25 August 2006, viewed on 25 November 2011, <http://www.greenhousegas.nsw.gov.au/documents/Rule-DSA-Aug06.pdf>.

[23] Whether deeming results in a 'decoupling' of energy savings in time from awarded credits depends largely on scheme rules around deeming. In many schemes, credit for deemed savings is awarded up-front, when energy efficiency upgrades are installed. However, in the Italian scheme, deemed savings are credited on an 'ex-post' basis, that is only *after* they have occurred, which may prevent decoupling. Here, the lifetime savings of the activity are calculated at the time of installation but the corresponding credits are distributed annually in portions, as the savings occur. See: M Pavan, 'Tradable energy efficiency certificates: the Italian experience', *Energy Efficiency*, vol. 1, 2008, pp. 257 – 266.

[24] Independent Pricing and Regulatory Tribunal, *GGAS Frequently asked questions*, viewed on 25 November 2011, <http://www.greenhousegas.nsw.gov.au/audit/audit_faqs.asp#pay>.

4 Improving energy efficiency in different sectors

4.1 *Households*

In 2009-10, the residential sector was responsible for approximately 11.9 per cent of Australia's total energy end use (across all fuels, including transport).[1] This was a rise of 1.2 per cent over the previous year, and total consumption in the sector is projected to grow steadily towards 2020 as population increases and households acquire more energy-consuming equipment and appliances.[2] In contrast to total energy end use in households, in some circumstances the residential sector has been found to contribute more than 50 per cent of energy use at periods of peak demand (discussed further in Chapter 6).[3] Household energy expenditure has also increased in recent years, with weekly average household expenditure on domestic fuel and power (not including transport fuels) having increased by 38 per cent over the period 2003-04 to 2009-10.[4] Moreover, while electricity prices have traditionally increased by less than household income, the opposite is now the case.[5]

For most households, expenditure on electricity remains a relatively small portion of total household expenditure at around two to three per cent.[6] However for some consumers, particularly low income households and households experiencing other forms of financial stress, energy expenditure as a share of disposable income can be much higher.

Increasing energy prices may encourage some households to improve their energy efficiency. For some others, a range of non-price barriers (including information failures and asymmetry, split incentives and bounded rationality) may mean that, even as energy prices rise, cost-effective energy efficiency opportunities will not be taken up. One issue particularly relevant to households is that many common small-scale energy efficiency opportunities do not provide substantial energy savings, with the result that consumers perceive the benefits of these options to not be worth the time or effort of researching, acquiring and implementing.

67. What evidence is there for barriers limiting the uptake of cost-effective energy efficiency by Australian households? How could these be reduced by an Energy Savings Initiative?

Design features that drive activity in households

Many Australian and international governments have looked towards energy efficiency obligation schemes to overcome non-price barriers and accelerate the deployment of energy efficient technologies.[7] While schemes differ in their design, most have been particularly effective at driving uptake of energy efficient options by households.

Under the Italian scheme, household electricity and heating measures accounted for 71 per cent of scheme credits over the 2005-2007 period.[8] Further, household measures accounted for at least 40 per cent of energy savings activities undertaken within the Belgian, Danish, French, Italian and British schemes in 2008.[9] Locally in 2008, approximately 81 per cent of certificates generated under the NSW Greenhouse Gas Reduction Scheme's (GGAS) Demand Side Abatement rule (precursor to the NSW Energy Savings Scheme (ESS)) were from household activities.[10]

The design features that appear to have been most effective at driving household measures are regulator-derived deemed savings methodologies for small scale activities (such as lighting, insulation and water heating upgrades). Such methodologies reduce transaction costs for third party energy efficiency service providers and allow economies of scale in their deployment.

68. What features of Australian or international energy efficiency schemes have been effective at encouraging the take-up of household-specific energy efficiency options?

Potential activity in households

Chapter 1 highlights the existence of many policies and programs in place to improve energy efficiency in the residential sector. New building work is subject to the energy efficiency provisions of the Building Code of Australia. Common household appliances are subject to Minimum Energy Performance Standards (MEPS). Grants and rebates for household energy efficiency improvements are available to householders in all states and territories.[11]

All three state schemes allow activities to take place in households but each scheme credits different activities. For example, the Victorian Energy Efficiency Target (VEET) and South Australia's Residential Energy Efficiency Scheme (REES) award credit for replacing inefficient incandescent lamps with energy efficient lamps in households. Some 60 per cent of activity in the VEET from its commencement to 29 November 2011 has come from this activity.[12] The NSW ESS does not award credit for replacing incandescent lights with compact fluorescent lightglobes (CFLs), though it does award credit for replacing halogen downlights.

The rules around eligible activities can also have significant impacts on scheme results. For instance, after residential lighting activities were deemed ineligible under the NSW ESS, the percentage of certificates generated in households dropped to around 13.5 per cent when compared to its precursor NSW GGAS.[13]

All states also award credit for other activities in households, such as installing new appliances and removing old ones; changes to window treatment, heating systems and draught sealing (Victoria only), and installing new water heaters. The schemes cover the same types of activities, but typically have different methodologies for awarding credits and designating eligibility for different technologies.

69. ***Considering the energy efficiency improvements that have been achieved through various regulations, programs and existing energy efficiency obligation scheme, what potential exists for energy efficiency improvement across households? Does this opportunity vary across Australia? Which household activities should be eligible to generate credits under a national Energy Savings Initiative?***

70. ***Some international schemes have encouraged energy savings by households through behaviour or cultural change.[14] Could a national Energy Savings Initiative be an effective way of encouraging energy savings achieved through households' behaviour change? How could a national Energy Savings Initiative be designed to do this? What costs would this impose?***

4.2 *Small and medium enterprises (SMEs)*

Small and medium enterprises (SMEs)[15] exist within each sector of the economy and therefore cover a broad range of operations and energy end use technologies and processes. SMEs include home-based businesses (many of which share a similar energy use profile to households[16]), restaurants, retail businesses, construction and small manufacturing operations.

A 2011 survey of businesses (mostly SMEs) by the Australian Industry Group (AiG) found that 66 per cent had not improved their energy efficiency in the past five years and 57 per cent did not expect improvements over the next two years.[17] The AiG survey noted that it was likely that this low uptake could be attributed to energy costs being generally a relatively small proportion of total costs for SMEs, despite energy prices rises. The AiG survey found that electricity costs are two per cent or less of sales revenue for about 65 per cent of respondent companies.[18] Another key barrier to carrying out energy efficiency activities for this sector is the lack of access to (and high cost for) finance for energy efficient projects.[19]

One common characteristic across SMEs is the absence of internal energy management and efficiency skills.[20] Employer groups have identified that, in comparison to larger firms, SMEs have few employees and therefore less scope to develop internal expertise outside of their core business activities, such as energy management and efficiency[21]. For this reason, SMEs may often be required to seek advice and skills from third-party energy efficiency service providers. A national Energy Savings Initiative that encourages the development of a broad-based energy efficiency services sector is therefore likely to help overcome a significant barrier to SMEs becoming more energy efficient.

71. ***For different SME types, what is the opportunity and scope to improve energy efficiency?***

72. ***What are the barriers that currently prevent SMEs from taking up available energy efficiency opportunities? To what extent could these be addressed by a national Energy Savings Initiative? Is there evidence that other policies or programs would be more effective in achieving this objective?***

A range of international and Australian energy efficiency obligation schemes support SMEs to become more energy efficient.[22] Of the three Australian states that have schemes, NSW's ESS is the only scheme which currently covers SMEs. The Victorian Government will extend the VEET to include a range of business activities in the next three-year phase of the scheme (2012 to 2014), with eligible activities initially limited to a range of deemed measurement methodologies.[23] The scheme planned for implementation in 2012 by the ACT Government is expected, subject to a regulatory impact assessment, cover SMEs.[24]

73. ***Are there particular Energy Savings Initiative design features that would increase the uptake of energy efficiency opportunities by SMEs? Are there design features that would impede such opportunities from being unlocked?***

74. ***Many small and medium-sized energy efficiency service providers participate in existing state schemes and, therefore, would be expected to find business under any national scheme. What design features of Australian or international energy efficiency obligation schemes are effective at supporting the growth of the energy efficiency service provider sector? How should any barriers or issues be addressed in the context of a national Energy Savings Initiative?***

4.3 *Commercial, government and community sectors*

These sectors include office buildings, shopping centres and other retail buildings, hotels, restaurants, schools, universities, hospitals and community facilities and services. Buildings presently account for around 7.2 per cent of Australia's total energy consumption. Within the sector, energy use this is expected to grow by 70 per cent over the period to 2029-30.[25]

New commercial buildings are subject to minimum energy efficiency standards, though new buildings represent only around one to two per cent of the building stock.[26] Owners of premium grade commercial buildings have carried out energy efficiency upgrades of their buildings in response to growing demand for energy efficient buildings.[27] Government programs also aim to reduce energy use in the sector. For example, the Australian Government has established Low Carbon Australia Limited to overcome financing barriers that impede the commercial building sector from taking up energy efficiency opportunities.[28] The Low Carbon Communities Program will also provide support to assist local councils and community-use buildings to improve their energy efficiency.[29]

However, there remains substantial potential to increase efficiency by further improving the design of new commercial buildings and by retrofitting existing buildings. ClimateWorks Australia, in a study undertaken for Low Carbon Australia Limited, estimates that commercial buildings have the potential to save 22,922 gigawatt hours (GWh) of energy per year by 2020, and that 51 per cent of potential energy savings in existing commercial building retrofits are available from upgrades to central services equipment.[30] Research commissioned by the Australian Sustainable Built Environment Council also conservatively estimated the potential to reduce energy use in the commercial buildings sector by 15.5 per cent against 2010 projections by 2029-30.[31]

Barriers that affect the commercial, government and community sectors include split incentives (where the building owner pays for energy efficiency upgrades but the tenant accrues the benefits in the form of reduced energy bills); a lack of access to finance; high hurdle rates for energy efficiency investments compared to other investments; lack of perceived materiality of energy efficiency (such as where energy costs are a relatively small proportion of total costs); and information failures.[32] Box 4.1 explores a short example.

75. Can you provide evidence or examples where barriers limit uptake of cost-effective energy efficiency in the commercial, government and community sectors? Would these be impacted by an Energy Savings Initiative? If yes, how? Is there evidence that other policies or programs would be more effective in achieving this objective?

Box 4.1: Street lighting

Many local governments face barriers to moving towards more efficient street lighting. This is due to the split incentive resulting from the division of responsibility between local governments, who are largely responsible for paying for street lighting services, and the Distribution Network Service Providers (DNSPs) who are largely responsible for maintaining and managing street lighting in most areas of Australia.

For local governments, street lighting represents a significant portion of their electricity costs. Change to more efficient street lighting offers significant opportunities for savings. DNSPs typically do not gain from energy reduction achieved through the introduction of efficient street lighting. Street lighting is a minor part of any distribution business and these costs are managed directly or passed through to the customers with a lack of economic incentive for DNSPs to act. In some cases local governments are also faced with significant residual asset values of existing street lighting which must also be addressed if the asset is retired early.

A national Energy Savings Initiative could play a role in overcoming these barriers.

Methodologies for calculating savings in the commercial sector

The NSW ESS currently allows certificates to be created for energy efficiency improvements in the commercial sector. The sector has participated strongly in the NSW ESS, with 23 per cent of 2010 Energy Savings Certificates (ESCs) being created in this sector.[33] Energy service companies from the commercial sector are also implementing projects and creating ESCs from these recognised energy saving activities.

In the NSW ESS, a number of methods are available to calculate allowable energy savings in the commercial sector:

- The Project Impact Assessment Method allows proponents to develop customised certificate calculation approaches using standard engineering methods, with limited deeming of future savings. This method can be used when a relatively standard energy savings projects is implemented either once off or many times.
- The Metered Baseline Method allows savings to be demonstrated and claimed over time for larger more complex projects. It works by establishing a consumption baseline through measurement and consumption which is then re-measured after the activity to determine the energy savings. This method can include the use of a National Australian Built Environment Rating System (NABERS) baseline for relevant buildings.
- The Deemed Energy Savings Method is a generic approach for measuring the lifetime or 'deemed' savings of an activity (the installation of common equipment such as refrigerators) before the actual savings occurs. Specific sub-methods are available for commercial lighting and high efficiency motors.[34]

The Victorian VEET will be extended in its next three-year phase to include a range of deemed business activities and the proposed ACT scheme is expected to cover small to medium-sized businesses.

All three existing schemes have stimulated some activity in public housing, and the NSW ESS has also stimulated activity in hospitals. Many government agencies (state, Commonwealth and local) occupy commercial buildings (either as tenants or owners), so to the extent that any national ESI allows activity to take place in commercial buildings, this may stimulate improvements in government energy efficiency.

76. For companies participating in the NSW or international schemes, what has been your experience of the existing methods for crediting energy efficiency improvements in the commercial sector?

77. Are there other features of the NSW or international schemes that have influenced the take-up of energy efficiency opportunities by commercial sector energy users?

4.4 *Industrial and mining operations*

Australia's industrial sector, including the resource processing, manufacturing and construction industries, is Australia's largest energy using sector, consuming about 37 per cent of Australia's final energy consumption in 2009-10.[35] Energy consumption in the mining sector is also expected to grow at nearly twice the rate of the commercial and residential sectors over the period from 2007-08 to 2029-30[36]; an average annual growth rate of 3.3 per cent versus 1.9 per cent for the combined residential and commercial sectors, and 0.6 per cent for manufacturing.

Importantly in considering the coverage and impact of an Energy Savings Initiative, much of the energy use in the industrial sector is in the form of gas (37 per cent), oil (26 per cent) and other primary fuels (16 per cent), much of which is used to generate electricity.[37] This is particularly true in the mining sector where many sites are located off-grid.[38]

Energy use in this sector is also dominated by a small number of large companies, with the top 207 energy using companies (as covered under the Australian Government's Energy Efficiency Opportunities (EEO) program) being responsible for 78 per cent of total mining sector energy consumption and 93 per cent of that consumed in the metals manufacturing and manufacturing sectors.[39]

The barriers to energy efficiency in this sector can differ greatly from those affecting smaller energy users, for example: organisational barriers between different parts of the business and decision making structures; internal competition for capital; behavioural norms and biases; skills constraints to provide expertise and advice both in-house and through service providers; and technical risk to the business in making large investments in un-tried technologies which could impact other business revenue.[40]

Despite the relatively high capabilities and resources of large organisations, there is strong evidence through existing measures that these barriers remain significant. For example, companies under the EEO program (who undertake and report on mandatory energy assessments) have to date identified 32.0 PJ of energy efficiency opportunities with payback periods between two and four years, of which 6.2 PJ have been implemented.[41] Therefore, while there is evidence that the EEO program may begin to address some of the organisational and skills barriers, further support may be needed to address areas such as low prioritisation, technical risk and the lack of a wide skills and services base.

78. Can you provide evidence of where barriers limit uptake of cost-effective energy efficiency in the industrial sector? How would these be impacted by an Energy Savings Initiative?

79. How does the availability of specific skills in energy efficiency remain a barrier in the industrial sector?

Many large users are also located in areas remote from the NEM and the SWIS and/or the larger gas distribution systems.[42] These users may generate their own energy, for example, from gas or liquid fuels. There may be opportunities to improve energy efficiency in these operations at low cost. If the objective of a national Energy Savings Initiative was to place downwards pressure on energy price risers for *all* users, then energy efficiency improvements made outside the major grids would not contribute to this objective because the savings would not result in the deferral of infrastructure investment. However, if the objective was to unlock low cost abatement or energy efficiency, then improvements outside the major grids could still contribute to this objective.

A key issue in considering coverage of the industrial sector is the approach to reporting, measuring and monitoring activity under the scheme. The industrial sector may have a number of areas which could benefit from technology-based deeming approaches, such as large scale commercial lighting or refrigeration. However many of the large energy efficiency opportunities in this sector may be specific to a particular process or focused on applying new management or operational approaches rather than technology replacement. Accrediting these types of activities may bring in large, low cost energy efficiency opportunities into a scheme, but may also require more administratively costly methods of measurement, monitoring and verification, which can create hurdles to entry.

Of the three existing Australian schemes, only the NSW ESS specifically covers the industrial sector, however, some activities proposed for inclusion in the Victorian VEET scheme may occur in industrial facilities (for example lighting upgrades or motor technology improvements). The NSW ESS has three methods for calculating the certificates to be derived from the implementation of eligible activities (as discussed in Section 3.6), of which the Metered Baseline Measurement and Project Impact Assessment methodologies have been important in unlocking facility-specific industrial energy efficiency opportunities.[43]

80. Do you consider that industrial energy efficiency projects should be eligible activity in a national Energy Savings Initiative? How should activities that take place on sites remote from the main grids be treated?

81. For companies experienced with the NSW or international schemes, what has been your experience of the existing methods for calculating the creation of certificates for larger industrial projects?

82. Are there other features of the NSW or international schemes that have influenced the take-up of energy efficiency opportunities by industrial energy users?

4.5 *Energy generation and networks sectors*

Electricity generators and energy networks are crucial aspects of the energy supply chain, but are also industrial businesses in themselves.

Generators

Electricity generation converts *primary* energy sources,[44] such as coal or natural gas, into electricity. This process can have varying levels of efficiency. Some of the primary energy will always be lost in the conversion process. A generation business is also a consumer of *final* energy in their wider operation and ancillary services (for example transport and processing of input fuels).

Generators could face barriers to energy efficiency like any other business. The Prime Minister's Task Group on Energy Efficiency quoted research estimating that operational improvements to existing fossil fuel thermal efficiency could reduce energy use by three per cent for brown and black coal plants and 3.5 per cent for gas power plants.[45]

A key issue in considering inclusion of generators under a national Energy Savings Initiative is how to reward the saving of primary versus final energy. This could be impacted by the choice of Energy Savings Initiative objective and range of energy sources covered.

Generators have always faced competitive dispatch arrangements which should provide some incentive to improve energy efficiency. The recent pricing of carbon emissions and extension of the Energy Efficiency Opportunities program to cover generators have both increased the likelihood that generators will undertake energy efficiency activities. What barriers remain, if any, needs careful consideration. Incorporating generators in a national Energy Savings Initiative may unlock any residual barriers or may result in these businesses being rewarded for activities they would have undertaken anyway.

83. Should activities which save primary energy be credited in a national Energy Savings Initiative? If so, what approach or methodology should be used to credit these activities and why?

84. Have barriers that could be addressed by an Energy Savings Initiative been effectively addressed by other policy mechanisms? Can you give specific evidence or examples as to why covering generators under a national Energy Savings Initiative would or would not produce positive outcomes?

Networks

Energy networks, which transport electricity and gas from their source to end users, create losses in the order of 8 to 10 per cent for electricity networks and up to 6.5 per cent for gas networks.[46] This is a significant proportion of energy lost, as it applies to most electricity and gas consumed in Australia, so small savings can create large dividends. Losses occur though a range of mechanisms, such as heat loss in wires and transformers, gas leakage and gas used in compression. In operating their business, energy networks are also consumers of energy, through activities such as construction, monitoring and maintenance.

The efficiency of different networks can vary widely and there are a diversity of activities which can improve network efficiency, such as: high efficiency transformers or compressors; installing reactive power sources; rearranging distribution feeders; increased monitoring; and addressing physical deterioration of pipes. An incentive scheme in the United Kingdom demonstrated reductions in distribution network losses of up to 1.45 percentage points.[47] Improvements in gas network infrastructure can also reduce the leakage of natural gas which can have a large greenhouse impact, as methane has a global warming potential 25 times that of carbon dioxide.[48] However, unless a national Energy Savings Initiative had an objective of achieving abatement, this would only be a co-benefit.

At the time of publication, the NSW Government was conducting public consultation on a proposed NSW ESS Rule amendment to expand eligible projects under the ESS to include energy saving activities in electricity networks.[49]

Networks face some unique barriers to consider in the context of a national Energy Savings Initiative. Network businesses are natural monopolies and a complex regulatory framework exists to manage their cost-recovery, prices and incentives. Under the current regulatory regime, network businesses do not pay for losses in the network.[50] Instead, losses which occur in the network are paid for by retailers and passed on to consumers. This situation creates a classic 'split incentive' barrier for energy efficiency in networks. They cannot pay for improvements to reduce losses through the resulting savings in energy costs, as these are passed on to consumers, despite there being opportunities to improve network efficiency and therefore reduce costs to consumers. There has been some attempt to reduce this split-incentive effect through Demand Management Incentive Schemes,[51] however there may still be insufficient incentives for networks to reduce losses. An additional complexity for crediting network activities under an Energy Savings Initiative is that it can be difficult to identify and monitor the direct effects of efficiency improvements. Network losses are dynamic, changing with many factors, including weather, consumer demand behaviour and a range of interactive elements of network design.

An Energy Savings Initiative may be able to create a market for energy efficiency where network businesses are rewarded for efficiency improvements, and benefits would flow to the public at large. However this must be considered in the context of the wider regulatory framework. Adding an Energy Savings Initiative incentive may conflict with existing regulation and it may be more appropriate to place a similar incentive within their regulatory framework. Conversely, the complexity of the existing regulatory framework may make an external incentive, such as an Energy Savings Initiative, more effective.

There are a number of activities underway which may encourage network businesses to improve the energy efficiency of their infrastructure. The Australian Government made a commitment in the Clean Energy Future plan to extend the Energy Efficiencies Opportunities program to cover energy network businesses and the implementation of this commitment will necessarily consider related incentives in regulation. In addition, the energy market reform agenda has a focus upon better regulation of network businesses, particularly in areas which result in the cost-effective management of network infrastructure. This includes the current 'Power of Choice' review being undertaken by the AEMC. Given that the outcomes of these work streams are not yet known, there is a risk that an Energy Savings Initiative may reward activities by energy networks which may have otherwise occurred.

85. Given the monopoly nature of energy networks and their unique regulatory environment, can you provide evidence that an Energy Savings Initiative is or is not an appropriate policy tool to encourage greater energy efficiency? Can you provide any evidence to suggest that the incorporation of energy networks will or will not provide a net benefit?

86. Can you provide any examples of methodologies appropriate for an Energy Savings Initiative to measure and monitor the impact of energy efficiency in networks?

4.6 *Emissions-intensive trade-exposed activities*

A number of companies that have invested in Australia undertake emissions-intensive trade-exposed (EITE) activities, motivated in part by Australia's wealth in resources and historically low energy prices.[52] Examples of these activities include: aluminium production, steel manufacturing, pulp and paper manufacturing, glass making, cement production and petroleum refining.[53]

87. Do EITE industries experience barriers to energy efficiency uptake that a national Energy Savings Initiative would address?

[1] Australian Bureau of Agricultural and Resource Economics and Sciences, *Energy Update 2011*, June 2011, p.5.

[2] Department of Environment, Heritage, Water and the Arts, *Energy Use in the Australian Residential Sector 1986 - 2020*, 2008, p.20.

[3] For example, Essential Services Commission of South Australia, 'Peak Demand on the ETSA Utilities System' (2004), p 8.

[4] Australian Bureau of Statistics, *Household Expenditure Survey, Australia: Summary of Results, 2009-10, Table 1: Household Expenditure, 1984 to 2009-1*, cat. no. 6530.0, 6 September 2011, p. 30.

[5] R Sims, *Energy Market outlook, Presentation to Multi-Party Climate Change Committee*, 10 November 2010.

[6] Australian Bureau of Statistics, *Household Expenditure Survey, Australia: Summary of Results, 2009-10, Table 3: Gross Income Quintile, Household Expenditure*, cat. no. 6530.0, 6 September 2011, p. 32.

[7] See: M Sciortino, S Nowak, P Witte, D York and M Kushler, *Energy Efficiency Resource Standards: A Progress Report on State Experience*, American Council for an Energy Efficient Economy (ACEEE), Report U112, June 2011; and E Vine, and J Hamrin, 'Energy Savings Certificates: A market-based tool for reducing greenhouse gas emissions', *Energy Policy*, vol. 36, 2008, pp. 467-476.

[8] M Pavan, 'Tradable energy efficiency certificates: the Italian experience', *Energy Efficiency*, vol. 1, 2008, pp. 257-266.

[9] E Lees, *Experience of EU Energy Efficiency Obligations – Diverse but Delivering*, presentation to the Joint European Commission and European Council for an Energy Efficient Economy (ECEEE) seminar on Energy Efficiency Obligations, Bucharest, 30 September 2011.

[10] Independent Pricing and Regulatory Tribunal, *Compliance and Operation of the NSW Greenhouse Gas Reduction Scheme during 2009: Report to Minister*, July 2010, p. 55, viewed on 25 November 2011, < http://www.greenhousegas.nsw.gov.au/documents/SchRep09.pdf>.

[11] See www.livinggreener.gov.au for more detail on existing household energy efficiency programs.

[12] Search of VEET registry (https://www.veet.vic.gov.au/Public/PublicRegister/Search.aspx, accessed 30 November 2011) for all registered certificates created from all lighting activities.

[13] Independent Pricing and Regulatory Tribunal, *Compliance and Operation of the NSW Greenhouse Gas Reduction Scheme during 2009: Report to Minister*, July 2010, p. 38, viewed on 25 November 2011, < http://www.greenhousegas.nsw.gov.au/documents/SchRep09.pdf>.

[14] M Sciortino, S Nowak, P Witte, D York and M Kushler, *Energy Efficiency Resource Standards: A Progress Report on State Experience*, American Council for an Energy Efficient Economy (ACEEE), Report U112, June 2011.

[15] Small and Medium Enterprises (SMEs) are businesses that are generally defined on the basis of numbers of employees (where small businesses have 5-19 employees and medium businesses have 20-200 employees), although other definitions (such as on the basis of annual turnover) are sometimes used. See: Department of Innovation, Industry, Science and Research, *Key Statistics – Australian Small Business*, 2011, viewed on 15 November 2011, < http://www.innovation.gov.au/SmallBusiness/KeyFacts/Documents/SmallBusinessPublication.pdf>; and Australian Government Parliamentary Committee on Corporations and Financial Services, *Access for Small and Medium Business to Finance*, April 2011, viewed on 16 November 2011, <http://www.aph.gov.au/senate/committee/corporations_ctte/sme_finance/report/report.pdf>.

[16] Victorian Government Department of Primary Industries, *Regulatory Impact Statement: Victorian Energy Efficiency Target Regulations*, March 2011, viewed on 16 November 2011, < http://www.dpi.vic.gov.au/energy/environment-and-community/energy-efficiency/energy-saver-incentive-scheme/submissions-to-the-regulatory-impact-statement-veet-regulations>.

[17] Australian Industry Group, *Energy shock: confronting higher prices*, February 2011.

[18] Australian Industry Group, *Energy shock: confronting higher prices*, February 2011.

[19] Victorian Government Department of Primary Industries, *Regulatory Impact Statement: Victorian Energy Efficiency Target Regulations*, March 2011, viewed on 16 November 2011, < http://www.dpi.vic.gov.au/energy/environment-and-community/energy-efficiency/energy-saver-incentive-scheme/submissions-to-the-regulatory-impact-statement-veet-regulations>.

[20] Victorian Employers' Chamber of Commerce and Industry, *Submission to the Prime Minister's Task Group on Energy Efficiency – Issues Paper*, 5 May 2010, viewed on 14 November 2011, <http://www.climatechange.gov.au/government/submissions/pm-task-group/~/media/submissions/pm-taskforce/papers/148-victorian-employers-chamber-of-commerce-and-industry.ashx>.

[21] Department of Innovation, Industry, Science and Research, *Key Statistics – Australian Small Business*, 2011, viewed on 15 November 2011, < http://www.innovation.gov.au/SmallBusiness/KeyFacts/Documents/SmallBusinessPublication.pdf>.

[22] See: M Sciortino, S Nowak, P Witte, D York and M Kushler, *Energy Efficiency Resource Standards: A Progress Report on State Experience*, American Council for an Energy Efficient Economy (ACEEE), Report U112, June 2011; and E Vine and J Hamrin, 'Energy Savings Certificates: A market-based tool for reducing greenhouse gas emissions', *Energy Policy*, vol. 36, 2008, pp. 467-476.

[23] Victorian Government Department of Primary Industries, *Regulatory Impact Statement: Victorian Energy Efficiency Target Regulations*, March 2011, viewed on 16 November 2011, < http://www.dpi.vic.gov.au/energy/environment-and-community/energy-efficiency/energy-saver-incentive-scheme/submissions-to-the-regulatory-impact-statement-veet-regulations>.

[24] Simon Corbell MLA, ACT Minister for the Environment and Sustainable Development, media release, viewed on 11 November 2011, <http://www.environment.act.gov.au/__data/assets/pdf_file/0004/233149/110928_Sustainable_Energy_Policy_MR.pdf>.

[25] Allen Consulting Group, *The Second Plank Update: A review of the contribution that energy efficiency in the buildings sector can make to greenhouse gas emissions abatement*, Report for the Australian Sustainable Built Environment Council (ASBEC) Climate Change Task Group, June 2010, pp. 7-8, 35.

[26] Allen Consulting Group, *The Second Plank Update: A review of the contribution that energy efficiency in the buildings sector can make to greenhouse gas emissions abatement*, Report for the Australian Sustainable Built Environment Council (ASBEC) Climate Change Task Group, June 2010.

[27] See, for example: N Kok, P Eichholtz, R Bauer & P Peneda, *Environmental Performance: A Global Perspective on Commercial Real Estate, European Centre for Corporate Engagement*, Maastricht University School of Business and Economics, Netherlands, 2010.

[28] Low Carbon Australia, viewed on 15 November 2011, <http://www.lowcarbonaustralia.com.au/>.

[29] Department of Climate Change and Energy Efficiency, *Low Carbon Communities*, viewed on 18 November 2011, <http://www.climatechange.gov.au/government/initiatives/low-carbon-communities.aspx>.

[30] ClimateWorks Australia, *Australian Carbon Trust Report: Commercial buildings emissions reduction opportunities*, December 2010, p. 16.

[31] Allen Consulting Group, *The Second Plank Update: A review of the contribution that energy efficiency in the buildings sector can make to greenhouse gas emissions abatement*, Report for the Australian Sustainable Built Environment Council (ASBEC) Climate Change Task Group, June 2010, p. 12.

[32] See, for example: ClimateWorks Australia, *Australian Carbon Trust Report: Commercial buildings emissions reduction opportunities*, December 2010; and R Garnaut, *The Garnaut Climate Change Review*, Cambridge University Press, 2008.

[33] Independent Pricing and Regulatory Tribunal, *Compliance and Operation of the NSW Energy Savings Scheme during 2010 – Report to Minister*, July 2011, p. 35.

[34] Independent Pricing and Regulatory Tribunal, NSW Energy Savings Scheme website, viewed on 11 November 2011, <http://www.ess.nsw.gov.au/activities/activities.asp>.

[35] A Schultz, and R Petchey, *Energy update 2011*, Australian Bureau of Agricultural and Resource Economics and Sciences, Canberra, June 2011.

[36] A Syed, J Melanie, S Thorpe, and K Penney, *Australian energy projections to 2029-30*, ABARE research report 10.02, prepared for the Department of Resources, Energy and Tourism, Canberra, March 2010, p. 13.

[37] A Schultz, and R Petchey, *Energy update 2011*, Australian Bureau of Agricultural and Resource Economics and Sciences, Canberra, June 2011.

[38] Australian Bureau of Agriculture and Resource Economics and Sciences, *Energy in Australia 2011*, prepared for the Department of Resources, Energy and Tourism, Canberra, 2011, p. 30.

[39] Department of Resources, Energy and Tourism, *Continuing Opportunities: Energy Efficiency Opportunities program – 2010 Report*, Commonwealth of Australia, Canberra, 2010, p. 7.

[40] Australian Government, *Report of the Prime Minister's Task Group on Energy Efficiency*, Canberra, July 2010, p. 118.

[41] Department of Resources, Energy and Tourism, *Continuing Opportunities: energy efficiency opportunities program – 2010 report*, Commonwealth of Australia, Canberra, 2010, p. 12.

[42] R Petchey, *End Use Intensity in the Australian Economy*, ABARE-BRS Research report 10.08, ABARE-BRS, Canberra, September 2010.

[43] Independent Pricing and Regulatory Tribunal, *Energy Savings Scheme – Calculation Methods*, viewed on 9 November 2011, <www.ess.nsw.gov.au/documents/ESS-Calc-Methods.pdf>.

[44] Primary energy is the initial fuel, such as coal or natural gas, which is converted or transformed into final energy. Logically, final energy is the form of energy which end users consume, generally electricity. Total primary energy equals final energy plus any transportation or conversion losses.

[45] Australian Government, *Report of the Prime Minister's Task Group on Energy Efficiency*, Canberra, July 2010, p. 169.

[46] Australian Energy Regulator, *State of the Market 2009*, Australian Competition and Consumer Commission, 2009.

[47] Office of Gas and Electricity Markets, '*Electricity Distribution Annual Report 2008-09 and 2009-10*', 2011, p. 37, viewed on 9 November 2011, <http://www.ofgem.gov.uk/Networks/ElecDist/PriceCntrls/DPCR5/Documents1/Electricity_Distribution_Annual_Report_for_2008-09_and_2009-10v2%5B1%5D.pdf>.

[48] United Nations Framework Convention on Climate Change, *Global Warming Potentials*, 2011, viewed on 10 November 2011, <http://unfccc.int/ghg_data/items/3825.php>.

[49] See: NSW Government, *Energy Savings Scheme*, viewed on 9 November 2011, <http://www.trade.nsw.gov.au/energy/sustainable/efficiency/scheme>.

[50] See: Australian Energy Market Commission, *National Electricity Rules Version 46*, 10 November 2011, viewed on 15 November 2011, <www.aemc.gov.au/Electricity/National-Electricity-Rules/Current-Rules.html>; and Australian Energy Market Operator, *Treatment of Loss Factors in the National Electricity Market – Draft*, 1 July 2009, viewed on 9 November 2011, <www.aemo.com.au/electricityops/0170-0004.pdf>.

[51] Although there are no nationally consistent incentives in this regard, the Demand Management Incentive Schemes for NSW, ACT, South Australia and Queensland are intended, in part, to address the issue of the split incentive for network losses. See: Australian Energy Regulator, *Guideline on demand management incentive scheme*, viewed on 15 November 2011, <http://www.aer.gov.au/content/index.phtml/itemId/717022 and http://www.aer.gov.au/content/index.phtml/itemId/718843>.

[52] Industry Commission 1998, Micro Reform — Impacts on Firms: Aluminium Case Study, Research Paper, AusInfo, Canberra, March 1998, p. 8, and pp. 68-70.

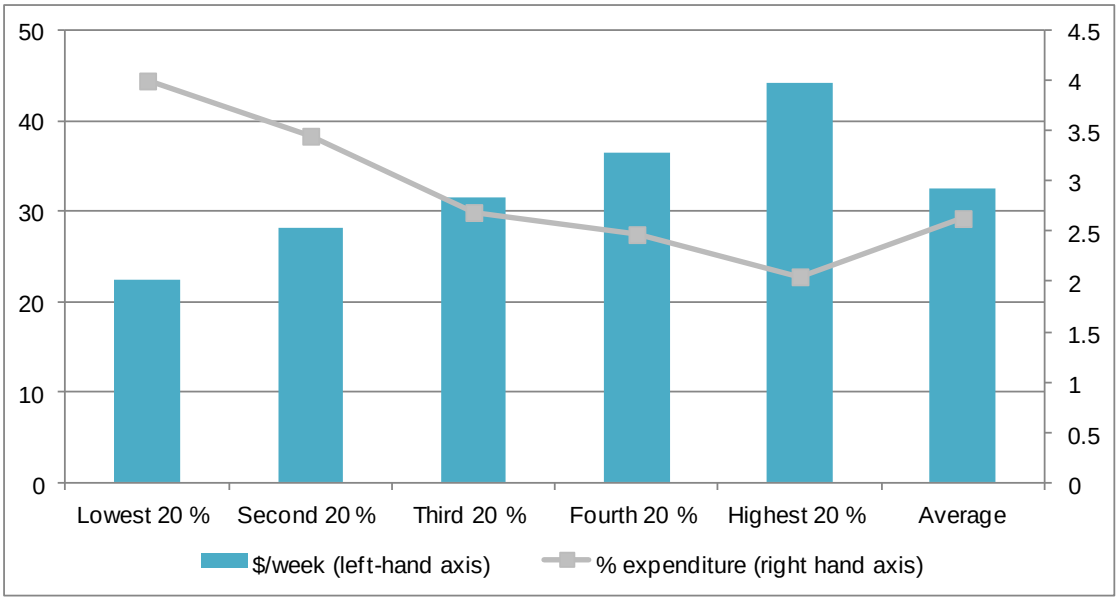
[53] Australian Government, *Securing a Clean Energy Future – The Australian Government's climate change plan*, Canberra, July 2011, p. 54.

5 Low Income Households

5.1 *Energy use and efficiency in low income households*

Low income households are particularly vulnerable to energy price rises because they tend to spend a greater proportion of their weekly income on utilities and fuel. The ABS has noted that the average Australian household spends 2.6 per cent of weekly income on fuel and power, while households in the low to middle income brackets spend between 3.4 and 4 per cent (Figure 5.1).[1]

Figure 5.1: Energy expenditure by household quintile 2009-10 (weekly expenditure, $A2003-04) [2]



Source: Australian Bureau of Statistics (2011) Household Expenditure Survey 2009-10, Category Number 6530.0.

Note: Each column represents average household expenditure by equivilised disposable income quintiles (that is, by household income adjusted for number of adults and children in the household).

Analysis[3] shows that, because these households spend significantly more of their disposable income on energy, many low income households are, in the context of rising energy prices, currently struggling to fund their energy bills. During 2009-10, 18 per cent of households in the lowest quintile group did not pay at least one utility bill on time, compared with 13 per cent for the average household.[3] Evidence also points to some households demonstrating an 'energy conservation' response to higher energy prices (for example, reducing the use of heating during winters) rather than an 'energy efficiency' response (acquiring appropriate insulation or energy efficient heaters)[4] – this response could be due to a range of reasons.

There is a growing body of evidence that demonstrates low income households are more likely to experience both price and non-price barriers to improving household energy efficiency.[5] While price barriers act as a major driver in preventing low-income households accessing more efficient household appliances, a range of other factors may also play a significant role. These may include reduced rates of financial or other literacy, language barriers, recent migrant or refugee status, reluctance to trust or engage with government agencies, illness or other health related concerns and transient employment.

The Garnaut Climate Change Review (and references therein) detailed a range of challenges confronting low income households in the context of energy use:

> While all households are likely to experience at least one of these market failures to some extent, low income households are more susceptible. For example, low-income households have relatively less capacity to pay for energy-saving products, like solar hot water or insulation, which can have significant upfront costs. Low-income households have less energy-consuming appliances in general, but also noticeably fewer energy efficient appliances, and less energy efficient homes (ABS 2010a). In low income households insulation is less common, refrigerators are less efficient, and there is a greater reliance on energy intensive electric heating (ABS 2010a). Similarly, principal-agent problems will be prevalent among low-income households, because the total number of renters are greater in low income brackets (ABS 2008a, IPART 2010b). [6]

Low income households have the highest incidence of full ownership of their home, reflecting the high proportion of elderly owner-occupiers in the low income category.[7] Generally these households are asset-rich, but income-poor. However, a substantial number of low income households live in publicly or privately owned rental accommodation. In 2009-10, 25.5 per cent of low income households lived in private rental properties and 7.2 per cent households lived in state or territory government operated accommodation services. As outlined in Chapter 1, renters often cannot respond to energy price rises by improving the energy efficiency of their dwellings because the ability to do so requires the consent or support of a landlord. Some low-income households (for example, residents of caravan parks and apartment complexes) do not have a direct relationship with an energy retailer or may pay a flat fee for energy rather than an amount associated with their own energy consumption.

Around 24 per cent of households in regional Australia are low income households (compared to around 20 per cent of all households).[8] Many non-metropolitan households already face higher energy prices than metropolitan households and are therefore likely to be more vulnerable to future price rises.[9] Since energy efficiency skills and services are less available in regional and remote Australia[10], non-metropolitan households (both low income households and otherwise) may also be in a weaker position to overcome information and skills barriers that may impede energy efficiency improvements.

88. Are there particular barriers to energy efficiency that confront low income households? To what extent could a national Energy Savings Initiative address these barriers? Are there other policy options better able to address these barriers?

89. Are there particular low income households, dwellings or regions which require specific assistance? Would a national Energy Savings Initiative be an effective policy tool to provide this assistance?

90. Households may experience periods of financial difficulty not directly related to their weekly income, with financial difficulty also linked to periods of mortgage strain, unexpected changes in employment status or health related matters. Could a national Energy Savings Initiative that supports low income households also be designed to support other households experiencing financial hardship? How could such households be defined for coverage under any national Energy Savings Initiative?

91. What costs or benefits could a potential national Energy Savings Initiative impose on low income households?

Because low income households are confronted by both price and non-price barriers, it has been recognised that this section of the community requires particular support to acquire and use new energy efficient appliances and equipment, and personalised assistance to better understand and manage their energy consumption and bills.[11] Some assistance is currently provided through government, energy industry and third sector policies and programs, although the type and accessibility of assistance is inconsistent across the country.

Some energy retailers in the National Energy Market (NEM)[12] and the South West Interconnect System (SWIS)[13] and regional grids offer hardship programs that provide one or more services, including flexible payment plans, information and assistance to access government concessions, information and training to help customers better manage their finances; home energy assessments, and assistance to purchase appliances and equipment.[14]

Alongside retailer hardship programs, governments and the not-for-profit sector operate various rebate, concession, information and support schemes. In many states and territories, eligible low income households can access household utility concessions and/or a basic energy efficiency measures including home audits and energy assessments. [15]

Under the Clean Energy Future plan, the Australian Government committed $130 million (in addition to household assistance payments through the tax and transfer system) to support low income households to adjust to higher energy prices.[16] These include support through the Low Income Energy Efficiency Program (LIEEP), which will support consortia of community organisations, local councils and energy service companies to trial energy efficiency approaches in low income households, and the Household Energy Saver Scheme (HESS), under which low income households will be assisted to find more sustainable ways to manage their energy consumption.

Many community sector organisations, including Kildonan Uniting Care and the Brotherhood of St Laurence, provide support and services to assist low-income households manage their finances and improve household energy efficiency.[17] Some of these programs attract credits from state energy efficiency obligations to meet some of the delivery costs, such as the Brotherhood of St Laurence's 'Brotherhood Green' program that provides advice and support for households to improve energy efficiency in Melbourne.[18] In some programs, like that run by Kildonan Uniting Care in partnership with Origin energy, assistance is tailored to the individual household and support is provided for financial counselling; advocacy to assist in credit matters and payment plans; appliance upgrades; and assistance in accessing further services or concessions.[19] In NSW, Victoria and South Australia, activities by third sector organisations in low income households may be eligible for support under existing energy efficiency obligation schemes.

92. How successful have existing programs been at improving low-income households' energy efficiency and assisting them to manage energy costs? What potential exists/remains to improve energy efficiency across low income households? Does this vary across Australia?

93. Is there evidence to suggest particular kinds of energy efficiency improvements have occurred disproportionately in certain areas? For example, have particular upgrades been biased towards regional or metropolitan areas?

5.2 *Design considerations for a national Energy Savings Initiative that explicitly supports low income households*

There are three broad design options for a national Energy Savings Initiative that could explicitly support low income households:

- A 'requirements-based' scheme with sub-targets, requiring a certain amount of savings to be achieved in the low-income sector through regulation
- An 'incentive-based' scheme that provides for specific incentives to encourage savings in the low-income household sector, such as a certificate 'multiplier', or
- A scheme without any specific targets or incentives in place for low-income households, but which focuses on addressing peak demand or other factors that are presently driving energy price rises. Such a scheme would reduce pressure on *energy prices*, rather than trying to cushion against *energy costs* (the distinction between *energy costs* and *energy prices* is discussed in Chapter 1), but these benefits may take time to flow through .

Sub-targets requiring savings to take place in low income households

Regulatory requirements could mandate that a certain proportion of energy savings occur in a particular sector, such as low-income households. This approach has been adopted in a number of existing schemes. For example:

- The South Australian Residential Energy Efficiency Scheme (REES) specifically targets low-income homes as a 'priority group' within the scheme[20] and requires obligated energy retailers to meet 35 per cent of their obligations by delivering activities to priority group households. They must also meet targets for delivering energy audits to these households. [21] The 'priority group' is defined as those households where a resident currently holds a specified type of Commonwealth or state government concession or pension card, or participates in energy retailer hardship programs.[22] In the first three-year phase of the REES, the scheme has been effective in driving the uptake of low cost appliance upgrades including compact-fluorescent lighting and water efficient shower heads. Uptake of these items has exceeded the 35 per cent target across 2009-2010 with upgrades to hot water heaters and ceiling insulation also strong across the priority and non-priority household group.[23]
- The United Kingdom's Carbon Emissions Reduction Target (CERT) scheme includes a sub-target for suppliers to achieve 'at least 40 per cent' of total energy savings in a 'priority group' of vulnerable and low-income households. A further requirement is that 15 per cent of savings within the priority group must occur within a 'super priority group' of homes deemed to be 'lowest income households more at risk of fuel poverty.'[24]

Chapter 3 discusses further a sub-target approach.

94. If a national Energy Savings Initiative were to support low income households through a sub-target approach, could the approach applied either in South Australia or in the United Kingdom be built upon? Are there particular design features of either scheme that have advantages or disadvantages in supporting low income households to become more energy efficient?

95. Any national Energy Savings Initiative that specifically targets low income households must contain a method by which energy retailers or third parties can easily and reliably identify low income households. What options are there for a low income household to be identified as such?

Incentives to encourage savings in low income households

An energy efficiency obligation with an incentive mechanism for low income homes would reward scheme participants for undertaking activity in low income households. The incentives could take multiple forms. One option is a certificate 'multiplier', specifying that activities in low income households accrue more credit than in other sectors, or that a particular activity, which is effective in low income homes, generates more credits than others.

This method has not been used in Australian schemes to date but, in principle, would function similarly to the way that small-scale renewable energy projects are credited under the Renewable Energy Target (RET). Under the RET, small-scale renewable energy projects, such as household rooftop solar panels, generate three times the number of Renewable Energy Certificates than large scale projects (with this multiplier being scaled down over time). The effect of the multiplier has been to incentivise the installation of more small-scale projects than would have otherwise occurred.

Another option that has not been trialled in existing Australian schemes could be the creation of methodologies that credit particular activities designed specifically for low income households, for example a deemed savings methodology for a package of activities in low income households. The methodology might include both technical energy efficiency upgrades and householder engagement (such as information, advice and referral) aimed at changing how households use energy.

A scheme without sub-targets or incentives for low income households

Noting the existence of a range of energy efficiency and broader support programs for low income households, and the associated costs of designing a scheme with sub-targets or incentives, a third option may be to design a scheme with neither sub-targets nor incentives. Such a scheme may or may not attempt to reduce pressure on energy prices by explicitly targeting the factors that are presently driving energy prices rises, such as peak demand (Chapter 6).

Under this option, low income households would still enjoy the shared benefits that a national Energy Savings Initiative delivers for the whole community. In the absence of specific incentives or sub-targets, low income households would be treated identically to other parts of the community and, therefore, may not receive energy efficiency improvements directly. However, the Brotherhood of St Laurence has found that the Victorian Energy Efficiency Target (VEET), which has no low-income household ring-fence, has still supported substantial energy efficiency improvements in low income households.[25] If this option was taken up, other policies or programs would be used to directly tackle barriers to energy efficiency improvement that are particular to low-income households.

96. Is there evidence to suggest that any of the above design options would be more or less effective in assisting low income households to improve their energy efficiency and manage their energy costs?

97. Can you provide evidence of additional costs or benefits for incorporating a specific requirement for low income households in a national Energy Savings Initiative?

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[1] Australian Bureau of Statistics, *Household Expenditure Survey, Australia: Summary of Results, 2009-10, Table 3: Gross Income Quintile, Household Expenditure,* cat. no. 6530.0, 6 September 2011, p. 32.

[2] CSIRO, *Energy Affordability, Living Standards and Emissions Trading: Assessing the social impacts of achieving deep cuts in Australian greenhouse emissions - Report to The Climate Institute, & The National Institute of Economic and Industry Research (NIEIR)*, 2008. Q1-Q5 represent average household expenditure by equivilised disposable income quintiles (that is, by household income adjusted for number of adults and children in the household). Couple family is the average for all couple households with at least one dependent child.

[3] Australian Bureau of Statistics, *Household Expenditure Survey, Australia: Summary of Results, 2009-10, Table 30: Financial stress indicators by equivalised disposable income quintile*, cat. no. 6530.0, 6 September 2011, p. 59.

[4] M Croucher, 'Potential problems and limitations of energy conservation and energy efficiency', *Energy Policy*, vol 39, 2011, pp. 5795-5799.

[5] KPMG, Brotherhood of St Lawrence and Ecos Corporation , *A national energy efficiency program to assist low income households*, Report to the Commonwealth Government, September 2008, viewed on 15 November 2011, <http://www.bsl.org.au/pdfs/KPMG_national_energy_efficiency_program_low-income_households.pdf>.

[6] R Garnaut, Garnaut Climate Change Review - Update 2011: Update paper eight: Transforming the electricity sector, Canberra, 2011, viewed on 15 November 2011, < http://www.garnautreview.org.au/update-2011/update-papers/up8-transforming-electricity-sector.pdf>.

[7] Australian Bureau of Statistics, *Household Income and Income Distribution, Australia, 2009-10*, ABS cat no. 6523.0, (detailed tables).

[8] Australian Bureau of Statistics, *Household Income and Income Distribution, Australia, 2009-10*, ABS cat. no. 6523.0, (detailed tables).

[9] For a discussion of higher electricity prices for remote communities in South Australia, see: Department of Transport Energy and Infrastructure – Energy Division and KPMG, *Review of the Remote Areas Energy Supply Scheme*, 2011, p. 1, viewed on 15 November 2011, <http://www.sa.gov.au/upload/franchise/Water,%20energy%20and%20environment/energy/energy_supply/Remote%20Areas%20Energy%20Supply%20Scheme%20Final%20Report%20-%20EXCLUDNG%20APPENDIX%20A.pdf>.

[10] Since energy efficiency skills and services are poorly categorised in traditional labour-force surveys, there are few published assessments of its city vs regional/remote distribution. However, remote parts of Australia will be exempted from the proposed Residential Building Mandatory Disclosure scheme on account of that 'persons living in remote areas (however 'remote' might be defined) may not be readily able to gain access to assessors in their area, or that the cost of obtaining an assessment might outweigh the potential benefits due to higher costs associated with engaging an assessor in a remote area'. Source: Ministerial Council on Energy, *Residential Building Mandatory Disclosure Scheme – Consultation Regulation Impact Statement, Attachment C*, July 2011, viewed on 9 November 2011, <http://www.ret.gov.au/Documents/mce/_documents/2011bulletins/AttachmentC-Remote-Housing-Issues-Paper.pdf>.

[11] C Elliot & E Stratford, *Energy Efficiency Measures in Low Income Households: A Report for the Tasmanian Government*, Sustainable Communities Research Group, University of Tasmania, 2009.

[12] National Energy Retail Law (South Australia) Act 2000, s43(1).

[13] Government of Western Australia, Office of Energy, *Rebates and assistance: Residents*, viewed on 8 November 2011, <http://www.energy.wa.gov.au/2/3743/64/residents.pm>.

[14] For example, see: AGL, *Staying Connected Program*, viewed on 8 November 2011, <http://www.agl.com.au/home/billing-and-payments/Pages/Staying-Connected-Program.aspx>; and TRUenergy, *Hardship Policy*, viewed on 8 November 2011, <http://www.truenergy.com.au/residential/youraccount/hardshippolicy.xhtml>.

[15] Queensland Government, Department of Employment, Economic Development and Innovation, *Rebates and Concessions*, viewed on 8 November 2011, <http://www.deedi.qld.gov.au/energy/rebates-and-concessions.htm>; and New South Wales Government, *Information for energy consumers: Energy rebates*, viewed on 8 November 2011, <http://www.trade.nsw.gov.au/energy/customers/rebates>.

[16] Australian Government, *Securing a Clean Energy Future – The Australian Government's climate change plan*, Canberra, July 2011, p. 83.

[17] For example, see Kildonan Uniting Care's program: Kildonan Uniting Care *Energy Efficiency Audits*, viewed on 8 November 2011, < http://www.kildonan.unitingcare.org.au/energy_services.php>; and the NSW Government's No interest loans scheme program managed by Good Shepherd Youth & Family Service: NSW Government, *No interest loans scheme program – NSW NILS® services*, viewed on 8 November 2011, < http://www.fairtrading.nsw.gov.au/About_us/Grants/No_interest_loan_scheme_program.html>.

[18] Brotherhood of St. Lawrence, *Brotherhood Green,* viewed on 23 November 2011, <http://www.bsl.org.au/Brotherhood-Green>.

[19]Kildonan Uniting Care, *Response to the Carbon Pollution Reduction Scheme Green Paper*, viewed on 22 November 2011, <http://www.climatechange.gov.au/en/submissions/cprs-green-paper/~/media/submissions/greenpaper/0841-kildonan-uniting-care.ashx>; and K Bevan, *Power On Program*, Presentation to the National Energy Saving Initiative Low Income Household workshop, Adelaide, November 2011.

[20] For the purposes of the REES, 'Priority group' households are defined in the *Electricity (General) Regulations 1997* s7AE.

[21] Essential Services Commission of South Australia, *Residential Energy Efficiency Scheme (REES) Targets* 2011, viewed on 22 November 2011, <http://www.escosa.sa.gov.au/article/newsdetail.aspx?p=16&id=753>.

[22] Essential Services Commission of South Australia, *REES* FAQs, viewed on 22 November 2011, <http://www.escosa.sa.gov.au/electricity-overview/residential-energy-efficiency-scheme-rees-/rees-faqs.aspx>.

[23] M Philipson, *Low Income Aspects of REES*, Presentation to National Energy Saving Initiative Low Income Household workshop Adelaide, November 2011.

[24] UK Department of Energy & Climate Change, *Insulation for the nation – 3.5 million more homes to be lagged*, press release, pn10/075, viewed on 11 November 2011, <http://www.decc.gov.uk/en/content/cms/news/pn10_075/pn10_075.aspx>.

[25] J Thwaites, D Sullivan and V Johnson, *National Energy Savings Initiative*, Presentation to the National Energy Saving Initiative Low Income Household workshop, Adelaide, November 2011.

6 Peak demand

6.1 *Peak demand growth as a driver of electricity prices*

Investment requirements for new electricity generation and network infrastructure are largely driven by the expected highest demand of the year, or 'forecast peak demand', as supply capacity must reliably exceed demand at all times to avoid load shedding. Electricity demand is highly variable and peak demand may only occur for a few hours a year (usually driven by energy intensive air conditioning during a succession of very hot days). Peak demand is often 1.4 times higher than average demand,[1] so a large proportion of electricity infrastructure is under-utilised much of the time. It is estimated that 25 per cent of retail electricity costs are derived from peak events that occur over a period of less than 40 hours per year – clearly this is an inefficient utilisation of capital.

Since 2005 peak demand in the National Electricity Market (NEM) has grown by 3.5 per cent annually and is forecast by the Australian Energy Market Operator (AEMO) to grow by a further 2.6 per cent each year through to 2020.[2] This projected growth is a significant contributor to growth needed in network infrastructure, with more than $39 billion of approved capital expenditure planned for the five years following 2010,[3] and investment in new generation assets of between $40 billion and $120 billion over the next 20 years, much of which is likely to be peaking generation.[4]

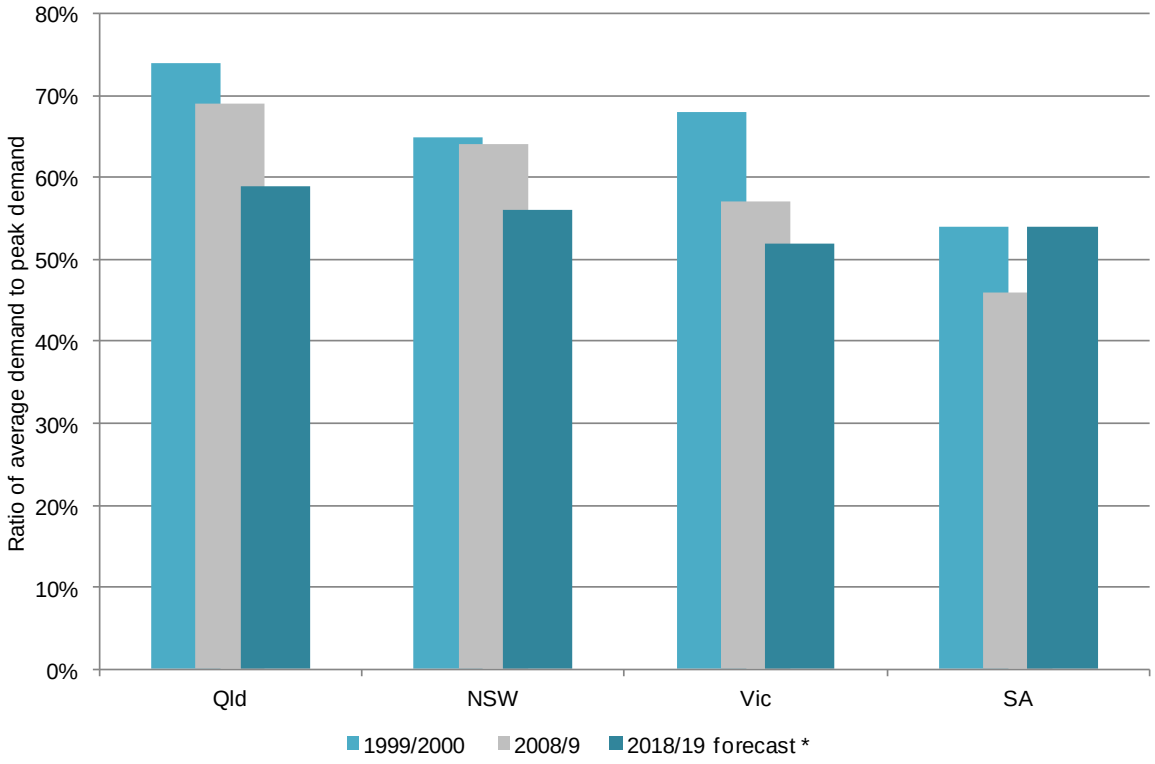
In contrast to the annual 2.6 per cent of peak demand growth, total energy consumption is forecast to grow at only 2.3 per cent annually to 2020.[5] Some recent figures even suggest that total annual electricity consumption may actually be dropping in some sectors,[6] potentially due to recent economic changes and increasing energy efficiency uptake.

In the South West Interconnected System (SWIS) trends are similar. Residential electricity prices have risen by 50 per cent in the last two years.[7] This is attributed to rising electricity generation fuel costs, the need to construct new generators and the significant investments required to ensure that electricity distribution systems can cope during periods of peak electricity demand, in the context of strong increases in overall demand.[8] In addition, recent increases reflect a transition towards more cost reflective pricing.

Declining capital utilisation is a contributor to rising electricity prices. This is shown in Figure 6.1. However, declining network capacity utilisation could also reflect changes in reliability standards in addition to peak demand issues.

It should be noted that peak demand is a problem more particular to electricity networks as opposed to gas networks. Gas networks have the ability to pack or 'store' some level of gas in the pipelines, which reduces the problem of peakiness of demand.

Figure 6.1: Capacity utilisation of network infrastructure[9]



* 50 per cent POE, medium growth

Source: Australian Energy Market Operator (AEMO) submission to Prime Minister's Task Group On Energy Efficiency – Issues Paper

6.2 *Types of peak demand*

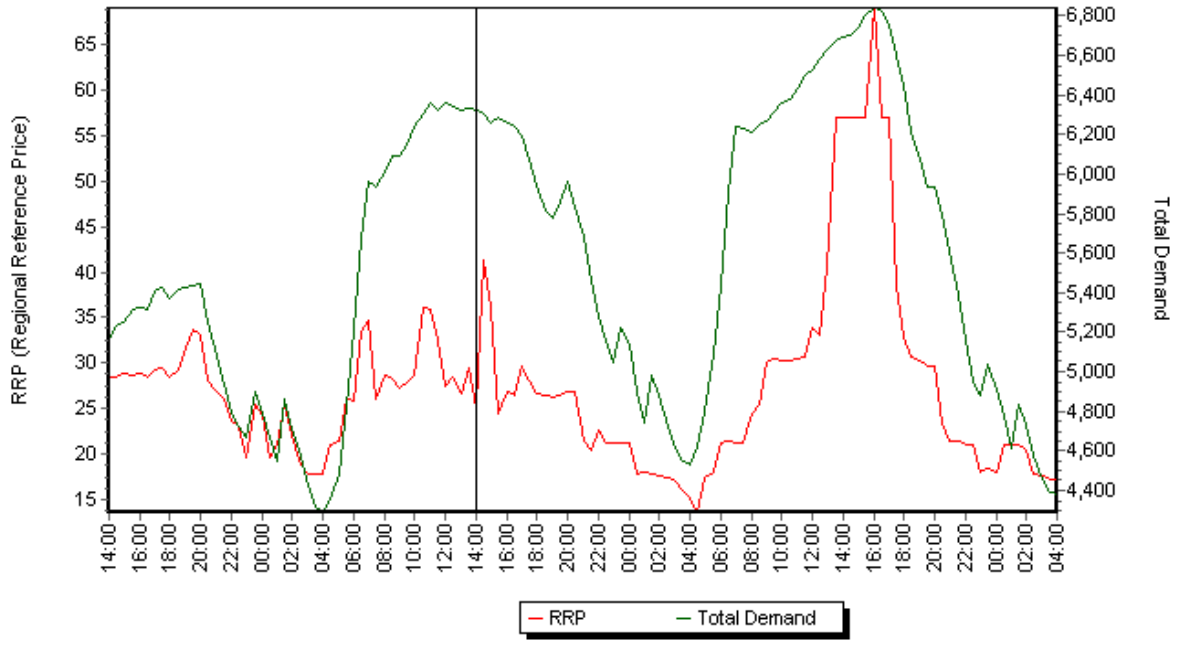
There are two types of peak demand that occur in electricity markets:

- *Wholesale market peaks:* arise during periods of high demand *across the system*, relative to available electricity generation capacity.
- *Network peaks:* arise when demand within a *local section* of an electricity network is high relative to local network capacity. Different sections of network may peak at different times of day.

Wholesale market peaks

In the NEM, the wholesale price of electricity is set every 30 minutes and varies with demand throughout a day, week, month, quarter and year. Figure 6.2 shows an example of this. Regular high prices create an investment signal for additional generation or demand side participation in the market.[10] This additional capacity or participation then places downwards pressure on wholesale price volatility.

Figure 6.2: An example of wholesale price over a day in Victoria



Source: Australian Energy Market Operator 30 Minute Demand and Price period 13/11/2011 14:00 to 16/11/2011) 04:00

Growth in wholesale market peak demand can also increase the volatility of the wholesale market, which causes an increase in the risks that retailers face in purchasing electricity at wholesale prices and selling at set tariffs. The increased wholesale price and hedging costs incurred by retailers for risk management then gets passed through to consumers in the form of higher electricity prices. As shown in Figure 1.1 in Chapter 1, the wholesale energy market component of the supply chain contributes around 35 to 40 per cent of a standard residential bill. [11]

It is important to note that the SWIS is different to the NEM, with more limited wholesale trading, and has therefore developed a separate mechanism to ensure reliable supply in the wholesale market (the 'capacity mechanism').[12] In contrast, the NEM is an energy only market which provides trading incentives for market participants to derive value from addressing wholesale market peaks.

Network peak demand

Network peaks generally affect distribution networks[13] and can be independent of wholesale market peaks, occurring at different times. For example, wholesale market peaks generally occur towards the mid-afternoon, driven by aggregate commercial activity, but local distribution network peaks in residential areas are often later in the afternoon or evening as people return home from school and work.

To ensure reliability, networks are expanded as the local forecast peak demand outstrips the capacity of the distribution network. Network expansions can be quite large and ‘‘lumpy’ investments[14] and network planning and approval timeframes are in five-year cycles, such that the impact of changes in demand on decisions must be considered in terms of threshold volumes and timing.[15] As shown in Figure 1.1 in Chapter 1, the network component is rising, and currently contributes around 44-53 per cent of a standard residential bill.[16]

6.3 *Energy consumers' response to peak demand reduction incentives*

A range of activities and services exist through which energy consumers may benefit from responding to signals to reduce peak demand, including:

- *time-of-use and critical-peak pricing:* energy retailers or networks may offer tariffs with incentives to shift demand to off-peak periods; or payments or discounts in return for a limited ability to ask the end user to reduce demand for a certain period of time.
- *direct load control:* consumers may allow an energy supplier or other service provider to remotely adjust certain appliances/equipment at peak times for an incentive or discount (for example air-conditioning or hot water systems).
- *efficient appliances/equipment:* some appliances make a large contribution to peak load (such as air-conditioning). Substitution with more efficient models can reduce peak demand.
- *distributed generation:* users with on-site generation (such as back-up systems) may be contracted as peak generation to support localised network peaks.

There are also pilots demonstrating that consumers may respond to voluntary requests to reduce peaks where there is a risk of community costs such as blackouts.[17] Additionally there are network management activities which can reduce peaks, such as rebalancing of feeder loads.

The availability and uptake of peak response activities has been relatively low and has largely been taken up by large energy users. Consumers have historically tended to be passive parties in the electricity market. There has been some evidence that peak response services suffer from many of the same barriers as wider energy efficiency opportunities (see Chapter 1), such as information barriers, lack of materiality and lack of service providers.[18] Given the likely presence of some of the same barriers, an appropriately designed Energy Savings Initiative may offer an avenue to address low peak response uptake.

There are also a range of additional barriers, such as:

- *Lack of appropriate metering:* Time-of-use metering (interval or smart meters, or equivalents such as multiple circuits) is necessary to offer consumers time-reflective pricing. While most large energy users have time-of-use metering, most small consumers (households and small business) do not.
- *Organisational or structural barriers for supply side businesses:* Supply side businesses have a range of conflicting incentives which may limit the offering of peak reduction programs. For example, where supplier suffer performance penalties or market exposure they can be concerned about the reliability of consumer responses; and retailers often vertically integrate with peak generation to manage the peak demand risk, reducing incentives to put downwards pressure on peak prices.

A large amount of work is underway within the energy market reform processes to investigate mechanisms to support efficient 'demand-side participation' (DSP). This includes the current 'Power of Choice' review by the Australian Energy Market Commission.[19]

To date, transparency around the level and range of peak response in the NEM has been an issue. The regulatory framework for energy markets must balance a range of sometimes conflicting objectives, such as reliability and cost effectiveness, to ensure that the market can efficiently determine outcomes which are in the long term interests of consumers. Due to the complexity of these frameworks, it can take years to adjust incentives and years further to determine the resultant effect.

A peaking mechanism under an Energy Savings Initiative may offer an opportunity to overcome market barriers and expedite the market's natural process of reaching an appropriate level of peak response; and to develop an emerging peak response sector. An Energy Savings Initiative may be able to achieve this within a transitional scheme, without creating more permanent market-distorting incentives in energy market regulatory frameworks. Conversely, without careful design, an Energy Savings Initiative scheme implemented outside of the energy market framework could also create conflicting or inconsistent incentives, and add complexity for energy market participants.

98. Do you see risks in implementing incentives designed to reduce peak demand outside of energy market frameworks?

99. Do you have evidence or examples to forward the case that certain activities should or should not be incorporated in a potential Energy Savings Initiative peaking component? In particular:

- ***active demand response mechanism (such as load control)***
- ***passive mechanisms that change the load profile overtime (such as high efficiency air conditioning)***

- *load shifting (where there may be no energy saved and greenhouse gas emissions may increase)*
- *distributed generation or fuel switching (and which fuels), or*
- *network management activities?*

6.4 *Design considerations for a national Energy Savings Initiative that explicitly targets peak demand*

While there is some evidence that peak demand response programs suffer from many of the same barriers as wider energy efficiency and that potential benefits could be available from addressing peak demand, there is relatively little precedent for designing an Energy Savings Initiative styled scheme with a peak demand component. Further, such a component raises a range of significant design challenges and may add significant complexity and related risks.

Metrics

Peak demand reduction is measured as capacity in megawatts (or megavolt-amperes (MVA)), unlike energy efficiency which can be measured in an energy-use metric like megawatt-hours (MWh) or converted to carbon abatement (tonnes of carbon dioxide equivalent ($MtCO_2e$). Sometimes reductions in peak demand may not result in total energy use reductions, as some peak response activities may shift energy use to another time, for example, where a consumer chooses to delay activities like running a washing machine from peak price periods to off-peak periods

This makes it hard to directly compare the benefits of energy efficiency and peak reduction in the same scheme, unless (for example) a potentially complex financial measure becomes the central metric. This is a major challenge in coherently integrating peak demand requirements or incentives into a wider energy efficiency scheme, particularly one with certificate trading. For example a ring-fenced target or multiplier may become overly complex without a common metric. One option may be to consider peak reduction measures as a separate obligation within an Energy Savings Initiative.

Objectives

In reference to Section 2.1 on the potential objectives of an Energy Savings Initiative scheme, not all of the example objectives would support the inclusion of a peak demand component. Where the overall objective had a focus on exerting downward pressure on electricity prices, supporting low income households (through downwards pressure on network charges), or increasing the productivity of energy infrastructure, a peak demand component could be a possible design feature.

Even within these objectives, a peak demand sub-scheme could vary widely, particularly in being designed to target reductions in wholesale market peaks, network peaks, or both. These different focuses are likely to have significant implications for wider scheme design, including the relevant obligation point, the types of activities included and the temporal focus of benefits, as well as scheme costs and benefits.

An Energy Savings Initiative designed to reduce wholesale market peaks may value peak demand reductions anywhere across the market; and may be designed to engage with retail businesses' risk management practices. Retailers may also get value from demand management at times other than the wholesale market peaks, as part of managing a portfolio of supply options.

By contrast, an Energy Savings Initiative designed to target network peak demand would need to target peak-reduction activity in local areas which require near-term network augmentation in order to have an impact on network costs. This would require at least some involvement of network providers, to identify priority local areas; manage reliability concerns; and integrate benefits into network planning. Careful consideration of potential impacts of any scheme on network regulatory arrangements and planning processes would be critical for any benefits to flow through to network prices in the short-medium term.

Consideration of the objective also needs to consider a *temporal* element. Benefits from different scheme designs and activities will vary over time. Passive forms of demand response (like energy efficient air-conditioning) may have synergies with a wider energy efficiency obligation scheme, but peak reduction benefits are likely to be longer term. Active forms of demand response (such as load control that can respond to a remote signal) may have stronger short term benefits on peaking and prices, but in some cases may provide a less enduring benefit (for example where local contracts are used to defer a network augmentation for only a few years).

Over the longer term, a scheme aimed at addressing one form of peaking may also have some beneficial effects upon the other. For example, a scheme aimed at local network peaks may aggregate over time to impact wider wholesale market peaks. Conversely, participants in a scheme aimed at wholesale market peaks could be geographically dispersed, but over time sufficient numbers of participants begin to defer some network augmentations.

Table 6.1 demonstrates that depending on the objective chosen, the strategy employed for a peak demand component and the outcomes accrued may vary markedly. The design of a peak demand component also depends upon the objective behind implementing an Energy Savings Initiative. This is outlined in Table 6.2 below.

Table 6.1: Different motivations for demand side action require different strategies and have different outcomes

Objective	Abatement	Wholesale market peak reductions	Network peak demand reductions
Motivation:	Reduce greenhouse gas emissions	Additional risk management tool Reduce price excursions Protect supply reliability	Defer capital expenditure for system augmentation Reduce load at risk Reduce transmission charges
Strategies:	Reduced consumption Increased energy efficiency Fuel switching	Temporary and irregular load shedding, load reduction, load shifting or fuel substitution	Temporary and irregular load shedding, load reduction, load shifting or fuel substitution
Main outcomes:	Reduced greenhouse gas emissions Lower end-user bills (possibly)	Lower risk management costs Reduced contract prices or cash payments for customers Reduced wholesale price volatility (potentially lower forward contract prices) Increased supply system reliability	Lower capital expenditure Lower distribution tariffs

Table 6.2: Different demand-side objectives impose different requirements for demand-side action

Objective	Abatement	Wholesale market peak reduction	Network peak demand reduction	Reduction of network load at risk
Location	Virtually anywhere on the grid.	Anywhere on the grid that is experiencing high pool or ancillary services prices.	Location specific. Only in those portions of the system that require augmentation within 3-5 years.	Location specific. Only where load exceeds applicable capacity rating.
Timing	Virtually any time, except when marginal generation is cleaner than the DM alternative and non-storable	Whenever high prices occur	At peak demand periods on these parts of the system	Whenever load exceed application capacity rating
Amount	Any amount is valuable and all kWh are worth the same	Even small amounts may be valuable, and all kWh are worth the same	Specific quantum of firm DM must be available before the time the system element would need to be in service	Any amount is valuable, but risk is not eliminated until a specific quantum is achieved

100. Can you provide evidence, in terms of benefits or risks, that a national Energy Savings Initiative which targeted peak demand should focus upon reducing local network peaks to defer augmentations; or on reducing wholesale market peaks and defer peaking generation?

101. Should such a scheme target peak demand reductions that will maximise downward pressure on electricity prices in the near- to mid-term, or focus more broadly on peak demand reductions wherever they are available?

102. In the case of a scheme focused on network deferral, how should networks be involved to ensure local near-term augmentations are effectively targeted? How should peak demand reductions be valued and integrated with planning and regulatory determinations to ensure that downwards pressure on network prices are captured in the near- to mid-term?

103. Where a scheme has some impact on both network and market peaks, should both be rewarded, and if so, how should these benefits be calculated?

6.5 *Examples of peak demand targeting schemes*

There is a wide array of potential scheme designs. A number of examples are provided below as illustrations, grouped under three broad categories.

Schemes that provide incentives to promote peak demand reductions within a general energy efficiency scheme:

- Incorporation of peak demand benefits into a broad energy efficiency obligation scheme by providing additional credit for the peak demand reduction impacts of eligible activities (for example, air conditioning).
- A requirement that a fixed proportion of the activity within a wider energy efficiency obligation scheme achieve material peak demand reduction (a target within a target or 'ring fencing').

Sub schemes that create separate obligations on a party to achieve specified reductions in peak demand:

- A separate sub scheme with targets and obligations related to achieving a specified amount of wholesale market peak demand reduction.
- A separate sub scheme with targets and obligations related to achieving a specified amount of network peak demand reduction in specific locations.
- A separate sub scheme (as the two above) with the addition of a scale of incentives to encourage the obligated party to exceed the targeted level of peak demand reduction.

- A separate sub scheme in which retailers or distributors negotiate the amount of peak demand reduction they will achieve.
- A separate sub scheme that sets a target or cap for peak demand (or peak demand growth) that should not be exceeded.

A sub scheme component that directly purchases peak demand reducing activities within a specified budget

- A program which provides incentives for retailers or distributors to bid to deliver the most cost-effective peak reductions activities.

104. Of the above examples of scheme designs, which, if any, are likely to drive greater benefits and uptake of demand response activities? Which options have higher risks and complexity? Please provide supporting evidence.

105. Could a peak demand Energy Savings Initiative be integrated into a wider Energy Savings Initiative (such as a national energy efficiency obligation scheme), or could it be one or more sub-schemes, with separately targeted obligations or incentives? What implications will this have for complexity, eligible activities and metrics?

106. Could a peak demand-focused Energy Savings Initiative be a mandated obligation with penalties, an obligation with penalties and incentives, an opt-in initiative with targets and incentives, a voluntary code, or something else? Who could be the obligated party in a peak demand focused scheme?

107. Should there be any restrictions on the types of entities that could act as a provider of peak demand reduction services? What certainty over peak energy reduction outcomes is desired as compared to certainty of the costs imposed by the scheme? How might this relate to reducing energy costs?

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[1] Data from 2008-09: Australian Energy Market Operator, *An Introduction To Australia's National Electricity Market*, July 2010, p. 9; Australian Energy Regulator, '*State Of The Energy Market 2009*', Australian Competition and Consumer Commission, 2009, p. 73.

[2] Australian Energy Market Commission, *Strategic Priorities for Energy Market Development*, Sydney, 23 August 2011, p. 4.

[3] Australian Energy Regulator, *State of the Energy Market 2010*, Melbourne, 2010, p. 54.

[4] Australian Energy Market Operator, *2010 National Transmission Network Development Plan*, Melbourne, 2010 p. 35.

[5] Australian Energy Market Commission, *Strategic Priorities for Energy Market Development*, Sydney, 2011, p. 8.

[6] Independent Pricing and Regulatory Tribunal, *Electricity, Gas and Water — Research Report: Residential energy and water use in Sydney, the Blue Mountains and Illawarra*, December 2010, p. 3.

[7] Government of Western Australia, Office of Energy, *Tariff and Concession Framework Review: Issues Paper,* 2011, p. 8.

[8] Government of Western Australia, Office of Energy, *Tariff and Concession Framework Review: Issues Paper,* 2011, p. 8.

[9] Australian Energy Market Operator, *Submission to the Prime Minister's Task Group On Energy Efficiency – Issues Paper*, viewed on 15 November 2011, <http://www.climatechange.gov.au/en/government/submissions/closed-consultations/pm-task-group/~/media/submissions/pm-taskforce/papers/125-aemo.ashx>.

[10] Demand side participation (DSP) refers to the ability of consumers to make informed choices about how much electricity they use at different times. These choices should efficiently reflect the value they obtain from using electricity services. Examples of DSP can include, but are not limited to, such measures as electricity conservation, peak demand shifting, fuel switching, utilisation of distributed generation and energy efficiency.

[11] Australian Energy Market Commission, *Final Report: Future Possible Retail Electricity Price Movements: 1 July 2010 to 30 June 2013*, 30 November 2010, p. 3.

[12] For further information, see: Independent Market Operator, *Capacity in the SWIS*, viewed on 15 November 2011, <www.imowa.com.au/rc-capacity-in-the-swis>.

[13] Transmission networks are the poles and wires which transport electricity at high voltage from the generation source to large end users and distribution businesses. Distribution networks transport electricity at lower voltages, linking the transmission systems to end users.

[14] Network augmentation is 'lumpy' as a network does not just build infrastructure to deal with the forecast demand increases in the following year, but rather for a much longer time scale. This leads to large and infrequent investments in network augmentation.

[15] The AER has recently submitted a Rule change proposal to the AEMC which addresses, among other issues, concerns surrounding energy network under- and over-spends of the capital revenue derived from their revenue determination. See: Australian Energy Regulator, *Promoting efficient investment – Protecting consumers from paying more than necessary: Executive briefing, Energy network regulation reform*, 2011, p. 3, viewed on 16 November 2011, < http://www.aemc.gov.au/Media/docs/AER%20Executive%20Briefing-a44b14bc-a016-4b5e-bb0b-f5a9d6996082-0.PDF>.

[16] Australian Energy Market Commission, *Final Report: Future Possible Retail Electricity Price Movements: 1 July 2010 to 30 June 2013*, 30 November 2010, p. 3.

[17] NERA Economic Consulting, *Cost Benefit Analysis of Smart Metering and Direct Load Control - Work Stream 4: Consumer Impacts, Phase 2 Consultation Report*, Report for the Ministerial Council on Energy Smart Meter Working Group, 29 February 2008, pp. 134-35, viewed on 15 November 2011, <http://www.ret.gov.au/Documents/mce/_documents/Smart%20Metering%20CBA%20Phase%202%20Stream%204%20-%20consumers%20-%20NERA%20200802292008030415302 6.pdf>.

[18] Australian Energy Market Commission, *Power of Choice - giving consumers options in the way they use electricity*, Issues paper, Sydney, 15 July 2011, pp. i-ii.

[19] See: Australian Energy Market Commission, *Power of choice – Stage 3 DSP review*, viewed on 15 November 2011, <http://www.aemc.gov.au/Market-Reviews/Open/Stage-3-Demand-Side-Participation-Review-Facilitating-consumer-choices-and-energy-efficiency.html>.

Appendix A: Submission cover sheet

National Energy Savings Initiative Issues Paper

SUBMISSION COVER SHEET
(not for publication)

Australian Government

Please complete and submit this form with your submission to:

Post:
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Please note:

- For submissions made by individuals, all personal details other than your name and the State or Territory in which you reside will be removed from your submission before it is published on Department of Climate Change and Energy Efficiency's website.
- Copyright in submissions resides with the author(s).
- Submissions will be placed on the website, shortly after receipt, unless prior contact has been made concerning material supplied in confidence. **Submissions will remain on our website as public documents indefinitely.**

Appendix B: Quick reference guide to existing energy efficiency obligations

	New South Wales	Victoria	South Australia
Scheme	NSW Energy Savings Scheme (ESS)	Victorian Energy Efficiency Target Scheme (VEET) Publicly referred to as the Energy Saver Incentive, or ESI.	Residential Energy Efficiency Scheme (REES)
Target type	State wide energy saving target. Measured as percentage of total retail electricity sales.	State wide greenhouse gas abatement target. Measured as megatons of avoided GHG emissions.	Three targets: Energy efficiency activities Energy efficiency activities for priority group households. Energy audits for priority group households.
Target level	Starting at 0.5 per cent of annual liable NSW electricity sales in 2009, increasing to 4 per cent by 2014, continuing to 2020. NSW Government estimates that by 2014 8.5 million megawatt hours of electricity will be saved. (8.5 Mt CO2-e).	VEET operates in 3 year phases. Phase One target: -2.7 megatons of avoided lifetime greenhouse gas each year for three years. Each phase lasts three years. Phase Two: 5.4 megatons of avoided lifetime greenhouse gas each year for three years.	REES runs in 3 year phases. Targets have been set for each year of the first two phases. **Energy efficiency activities (ktCO2e)** **2009 2010 2011 2012 2013 2014** *155 235 255 255 335 410*

<table>
<tr><th></th><th>New South Wales</th><th>Victoria</th><th>South Australia</th></tr>
<tr><td>Scheme</td><td>NSW Energy Savings Scheme (ESS)</td><td>Victorian Energy Efficiency Target Scheme (VEET)</td><td>Residential Energy Efficiency Scheme (REES)</td></tr>
<tr><td>Sub-targets</td><td>No sub-target</td><td>No sub-target</td><td>35% of an obliged retailer’s annual energy efficiency activity target to be achieved in priority group households.
Energy audits to be delivered in Priority group households
energy audits sub-targets
2009 2010 2011 2012 2013 2014
3000 5000 5000 5667 5667 5667</td></tr>
<tr><td>Fuel coverage</td><td>Electricity</td><td>Electricity and gas</td><td>Electricity and gas</td></tr>
<tr><td>Obligated parties</td><td>Electricity retailers and large energy users.</td><td>Electricity and gas retailers who supply to more than 5,000 customers in Victoria.</td><td>Energy retailers (electricity and gas) who supply more than 5000 residential customers in SA.</td></tr>
<tr><td>Trading</td><td>Yes, freely between certificate creators and obligated parties.</td><td>Yes, between registered VEET certificate account holders.</td><td>Trading of energy credits amongst obliged energy retailers.</td></tr>
</table>

	New South Wales	Victoria	South Australia
Scheme	NSW Energy Savings Scheme (ESS)	Victorian Energy Efficiency Target Scheme (VEET)	Residential Energy Efficiency Scheme (REES)
Certificates	Yes – Energy Savings Certificates (ESCs or 'eskies')	Yes – Energy Savings Certificates (ESCs or 'eskies') Yes – Victorian Energy Efficiency Certificates (VEECs)	No certificates
Banking	Yes - unlimited	Yes, though a banked certificate cannot be older than 6 years from the date of installation activity	Yes - Obligated parties may 'bank' their eligible activity to meet target for subsequent years if in excess of current target.
Borrowing	Limited – obligated parties may carry forward to the next year a shortfall of up to 10% of their liability for a given year	None	Obligated parties may meet only 90% of their obligation in a given year without penalty, though the shortfall must be made up the following year.
Sectors where activity can be undertaken	Residential, commercial and industrial sectors	Residential sector, extending to business after 2011. (Excludes sites captured by the Victorian Environment Protection Authority's (EPA) Environment and Resource Efficiency Plan (EREP) program).	Residential sector only
Methodologies used	Deeming, calculation, and combination	Currently limited to deeming	To date, deeming only

	United Kingdom	France	Italy
Scheme	Carbon Emissions Reduction Target (CERT)	Energy Saving Certificate Scheme (ESC)	Italian White Certificate Scheme
Target type	Energy saving target, measured in megatons of avoided GHG emissions.	Reduction in energy intensity.	Primary energy saving target expressed in tonnes of oil equivalent (Mtoe).
Target level	293 Mt CO2-e by December 2012. 130 terra watt hour reduction in electricity consumption.	Energy intensity reduction of 2 per cent per year until 2015, increasing to 2.5 per cent to 2030. First Period: FY 2007/ FY 2009 54 terawatt hours Second Period: 2011-14 345 terawatt hours	2.9 Mtoe in 2009
Sub-targets	Sub-target: Priority group 68 per cent savings from insulation 40 per cent total saving from low-income / vulnerable groups 15 per cent from 'Super Poverty Group'	None	None
Fuel coverage	Electricity and gas	Electricity, gas, heating oil, transport fuels	Electricity, gas and heating oil

	United Kingdom	France	Italy
Scheme	Carbon Emissions Reduction Target (CERT)	Energy Saving Certificate Scheme (ESC)	Italian White Certificate Scheme
Obligated parties	Electricity and gas retailers	Suppliers of electricity, gas and heating fuel, motor fuel suppliers	Distributors of electricity and gas
Trading	Restricted	Yes	Yes
Certificates	No	Yes	Yes
Sectors where activity can be undertaken	Residential only.	All sectors including transport, excluding EU ETS.	All stationary energy consumers

Appendix C: List of acronyms

ABS	Australian Bureau of Statistics
ACP	Accredited certificate provider (NSW)
AEMO	Australian Energy Market Operator
AiG	Australian Industry Group
ASBEC	Australian Sustainable Built Environment Council
CERT	United Kingdom's Carbon Emissions Reduction Target
CFL	compact fluorescent light
DSP	demand side participation
EEO	Energy Efficiency Opportunities Initiative (Cth)
EITE	emissions-intensive trade-exposed
ESC	Energy Savings Certificates (NSW)
ESI	Energy Savings Initiative
ESS	Energy Savings Scheme (NSW)
GGAS	Greenhouse Gas Reduction Scheme (NSW)
GJ	Gigajoules
HESS	Home Energy Saver Scheme
JCP	Jobs and Competitiveness Program (Cth)
ktCO2e	kilo tonnes of carbon dioxide equivalent
kWh	kilowatt hours
LIEEP	Low Income Energy Efficiency Program (Cth)
LNG	liquid Natural Gas
LPG	liquefied petroleum gas
LRET	Large-scale Renewable Energy Target (Cth)
MEPS	minimum energy performance standards
MRET	Mandatory Renewable Energy Target (Cth)
MtCO2e	mega tonnes of carbon dioxide equivalent
MW	megawatt
MWh	megawatt hours
NABERS	National Australian Built Environment Rating System
NEM	National Electricity Market

REES	South Australian Residential Energy Efficiency Scheme
RET	Renewable Energy Target (Cth)
SME	Small and medium enterprise
SRES	Small-scale Renewable Energy Scheme (Cth)
SWIS	Western Australia's South West Interconnect System
tCO2e	tonnes of carbon dioxide equivalent
UK CRC	United Kingdom's Carbon Reduction Commitment Energy Efficiency Scheme
VEET	Victorian Energy Efficiency Target

Appendix D: Terms of Reference: National Energy Savings Initiative Working Group

1. The national Energy Savings Initiative Working Group ('the ESI Working Group') will prepare a report for the Minister for Climate Change and Energy Efficiency and the Minister for Resources and Energy on possible design options for a national Energy Savings Initiative (ESI, or 'white certificate scheme').

2. In preparing its report, the ESI Working Group will consider and advise upon possible design options for a national ESI that would:

   2.1 be economically efficient and environmentally effective;

   2.2 complement the carbon pricing mechanism and the Renewable Energy Target (RET), in line with the Council of Australian Governments' Complementarity Principles (Attachment A);

   2.3 be capable of delivering energy efficiency improvements at least as great as those being delivered by the New South Wales Energy Savings Scheme (ESS), the Victorian Energy Efficiency Target (VEET) and the South Australian Residential Energy Efficiency Scheme (REES);

   2.4 complement wider Australian energy market development objectives, including effective retail competition; efficient network regulation; and increasing efficient demand-side participation;

   2.5 be capable of supporting the deployment of a broad spectrum of technologies; and

   2.6 be capable of delivering energy efficiency improvements across all sectors, including the commercial, industrial and residential sectors.

3 The ESI Working Group will also consider and advise upon options for using a national ESI to create an incentive or requirement to undertake energy efficiency improvements in low income homes, and ways to reduce peak electricity demand.

4 The ESI Working Group will also consider how a national ESI could streamline the delivery of energy efficiency improvements by replacing existing white certificate programs.

5 The ESI Working Group will consider and advise upon possible implementation arrangements for a national ESI, including arrangements for ensuring a smooth transition from existing State-based schemes.

6 In considering possible design options, the ESI Working Group may examine:

   6.1 lessons learned from existing State and Territory energy efficiency programs, including the ESS, the VEET and the REES;

6.2 international energy efficiency programs, trends in energy efficiency policy, and recommendations of foreign and international organisations, such as the International Energy Agency;

6.3 impacts and interactions between a national ESI and:

a. the carbon price mechanism;

b. the RET;

c. the National Electricity Market, South West Interconnected System and other relevant energy markets; and

d. other regulatory obligations including, but not limited to, the National Greenhouse and Energy Reporting Scheme, the Energy Efficiency Opportunities program and the Greenhouse and Energy Minimum Standards scheme; and

6.4 the co-benefits of certain energy efficiency improvements, including reductions in non-greenhouse gas air pollution, health benefits, improved energy security, reduced energy costs for households, and infrastructure savings.

7 In considering possible design options, the ESI Working Group must examine the views and ideas of experts, and key stakeholders including representatives of the energy industry, end users, States, Territories, industry, environment and community groups.

8 The ESI Working Group will release one or more Issues Papers in 2011 and, before the end of March 2012, will present its report that updates the Minister for Climate Change and Energy Efficiency and the Minister for Resources and Energy on possible design options that warrant more detailed consideration.

ATTACHMENT A

COUNCIL OF AUSTRALIAN GOVERNMENTS' COMPLEMENTARITY PRINCIPLES

Complementary measures should be assessed against the following principles.

1. The measures are targeted at a market failure that is not expected to be adequately addressed by the carbon price mechanism or that impinges on its effectiveness in driving emissions reductions.

   - *For example, research and development failures, common use infrastructure issues, information failures and excess market power.*

   Complementary measures should adhere to the principles of efficiency, effectiveness, equity and administrative simplicity and be kept under review. They may include:

   a) measures targeted at a market failure in a sector that is not covered by the carbon price mechanism.

   b) measures for where the price signals provided by the carbon price mechanism are insufficient to overcome other market failures that prevent the take-up of otherwise cost-effective abatement measures.

   c) measures targeted at sectors of the economy where price signals may not be as significant a driver of decision making (e.g. land use and planning).

   d) some measures in (a) or (b) may only need to be transitional depending on expected changes in coverage or movements in the carbon price.

2. Complementary measures should be tightly targeted to the market failure identified in the above criteria that are amenable to government intervention. Where the measures are regulatory they should meet best-practice regulatory principles, including that the benefits of any government intervention should outweigh the costs.

3. Complementary measures may also be targeted to manage the impacts of the carbon price mechanism on particular sectors of the economy (for example to address equity or regional development concerns). Where this is the case, in line with regulatory best-practice, the non-abatement objective should be clearly identified and it should be established that the measure is the best method of attaining the objective.

4. Where measures meet the above criteria, they should generally be implemented by the level of government that is best able to deliver the measure. In determining this, consideration should be given to which level of government has responsibility as defined by the Constitution or convention/practice, the regulatory and compliance costs that will be imposed on the community, and how the delivery of the measure is best coordinated or managed across jurisdictions.