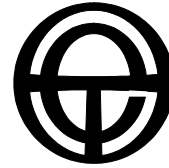


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**SUBMISSION
to**

Prime Minister's Task Group on Energy Efficiency

Issues Paper

3 May 2010

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Prime Minister's Task Group on Energy Efficiency Issues Paper

1. Introduction

Energy efficiency is Australia's greatest opportunity to immediately reduce greenhouse gas pollution while saving money and improving national productivity.¹

Energy efficiency can reward every enterprise, organisation and household in the nation through direct cost savings and other benefits. These savings come from reducing energy consumption in real terms, lowering the energy intensity of demand growth and improving energy network security. With electricity and gas prices rising rapidly, even without a price on carbon, the benefits of energy efficiency will increase for all energy consumers.

Energy efficiency is vital to a timely and orderly transition to a low-carbon economy and is one of the largest and cheapest ways to cut emissions. The International Energy Agency estimates 65 per cent of global emission cuts by 2020 will come from energy efficiency. Australia will need dedicated energy efficiency policies irrespective of what happens in other key climate change policy areas. Energy efficiency complements, and does not replace

- a carbon price;
- increased renewable, alternative and low carbon pollution energy generation;
- ongoing international negotiations for a global agreement on emissions reduction.

State and local government energy efficiency schemes over the last two decades have resulted in hundreds of small efforts to increase energy efficiency. But there are two major problems blocking the realisation of these into significant benefits. These are:

- the misalignment of energy policy and climate policy, in particular, as embodied in the National Electricity Market, and
- lack of Federal Government leadership.

With this in mind, we welcome the appointment of Australia's first Minister for Energy Efficiency and inclusion of energy efficiency as a portfolio responsibility within the Department of Climate Change in Canberra. In order for the Federal Government to deliver on its 2007 election commitment to be at the forefront of OECD energy efficiency improvement, the Prime Minister's Task Group on Energy Efficiency must make recommendations in the following action areas.

Energy efficiency key action areas should include:

- Set a mandatory national energy efficiency goal of zero new demand growth by 2020 with an annual 1.5% reduction to 2030 and beyond. This would represent a reduction of approximately 25% on business as usual growth in consumption

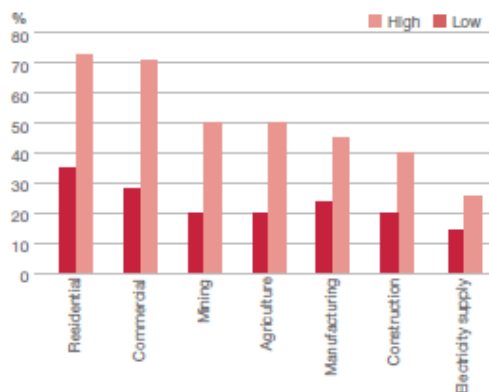
¹ Total Environment Centre and 35 other organisations, as at 28 April 2010. *Energy Efficiency Roundtable Communiqué*. Attached and at <http://www.tec.org.au/media-releases>

- Establish a National Energy Savings Scheme, based on the NSW model, expanded to include a peak demand management mandate on distribution networks
- Align energy policy goals with climate policy goals by merging these two portfolios
- Fix the National Electricity Market (NEM) to remove barriers to energy efficiency and demand management
- Accelerate the national roll-out of smart meters and fix network and retail regulation to ensure these are utilised to their full potential
- Build energy efficiency trade skills and workforce capabilities through national training programs
- Create strong incentives and regulatory drivers for energy efficiency in industry, commercial buildings and households
- Mandate stringent vehicle fuel consumption standards and recognise the contribution from recycling and materials resource efficiency
- Require best-practice energy efficiency in government operations

2. The size of the opportunity

According to the most comprehensive review of energy efficiency potential in Australia, energy use could be reduced by up to 70% in the residential and commercial sectors immediately using currently available technologies, with an average payback period of four years, and immediate economic benefits:

Percentage cost-effective energy consumption reduction potential across different sectors²



The vast potential that this and other analyses indicate is beginning to materialise in the real world. Recent reports from the Commonwealth Government Energy Efficiency Opportunities audit program have already identified over \$736 million in annual net financial benefits through energy efficiency initiatives, with just 226 companies having registered for the program at the time the *First Opportunities* report was published.³

² Energy Efficiency and Greenhouse Working Group, National Framework for Energy Efficiency (NFEF). 2003. *Towards a National Framework for Energy Efficiency – Issues and challenges discussion paper*, p.4. http://www.ret.gov.au/Documents/mce/energy-eff/nfee/_documents/nfee_discussio.pdf

³ Department of Resources, Energy and Tourism. 2010. *First Opportunities: A Look at Results from 2006-2008 for the Energy Efficiency Opportunities Program*, p.viii. http://www.ret.gov.au/energy/Documents/energyefficiencyopps/PDF/EEO_FirstOpportunitiesReport_2010_FINAL.pdf

A more recent ClimateWorks Australia report has identified energy efficiency opportunities from the industrial sector totaling 17 million tonnes of CO₂-e and \$1.7 billion in savings by 2020 from industrial energy efficiency alone.⁴

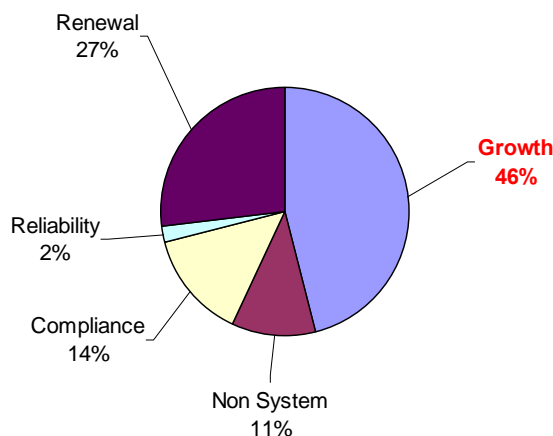
A 2007 Energy Futures Australia report⁵ for Total Environment Centre (TEC) showed that, *with the right policies that ensure behavioural changes*, a smart meter roll-out could achieve:

- Reduction in total (non-peak) electricity use by 4%-10%
- Reduction in greenhouse emissions by 19 million tonnes pa
- Reduction in total national greenhouse emissions by up to 3.5%

The potential for peak demand savings is even greater. Around a third of National Electricity Market network expenditure of \$40 billion over the next five years is for growth alone that could be avoided by energy efficiency and demand management. If these savings are not harnessed, electricity consumers will have to pay for many billions of dollars of avoidable network costs, as well as the costs of additional, unnecessary generation and future carbon costs.

Networks such as Integral Energy in NSW, for example, have soaring rates of unnecessary growth related capital expenditure. The graph below shows that 46% of Integral Energy's planned \$2,953 million capital expenditure over the next 5 years is just to meet new – avoidable – growth.⁶

Components of Integral Energy's Capital Expenditure Program⁷



⁴ 47% of total industry emissions reduction potential at average net savings of A\$100 per tCO₂-e. ClimateWorks Australia. 2010. *Low Carbon Growth Plan for Australia*, p.48. <http://www.climateworksaustralia.com/Low%20Carbon%20Growth%20Plan.pdf>

⁵ Energy Futures Australia. 2007. *Advanced Metering for Energy Supply in Australia*. http://www.tec.org.au/index.php?option=com_content&task=view&id=393&Itemid=325

⁶ Integral Energy. 2008. *Presentation on Regulatory Proposal to the Australian Energy Regulator 2009 to 2014*, p. 28.

⁷ Integral Energy. 2008. *Regulatory Proposal to the Australian Energy Regulator 2009 to 2014*, p. 10

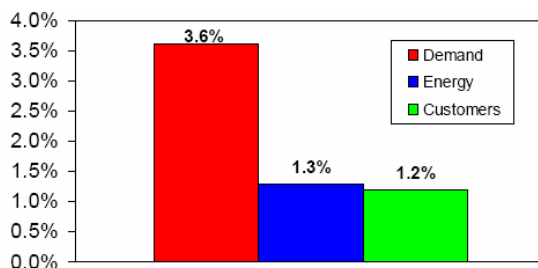
Peak demand spikes are a particular problem that could be alleviated, at least in part, by energy efficiency. In bringing down the overall level of consumption, energy efficiency also reduces peaks. Peak demand in the TransGrid/EnergyAustralia area of Inner Sydney Metropolitan indicates how infrequently maximum capacity is exceeded:

Peak Demand in the Inner Sydney Metropolitan Area⁸

Year	Top 50 MW	Top 100 MW
2005/06	1 day, 4 hrs total	2 days, 7 hrs total
2006/07	1 days, 0.5 hrs total	2 days, 3 hrs total
2007/08	1 days, 2.5 hrs total	2 days, 9 hrs total
2008/09	4 days, 8.5 hrs total	6 days, 21.5 hrs total

These spikes that drive expensive, inefficient augmentations not only occur infrequently, but are growing disproportionately compared to overall energy consumption. For 2009-2014 Integral forecasts peak demand growth (3.6% pa) to be three times higher than both growth in customer numbers and energy consumption (1.2% and 1.3% pa respectively), as illustrated below.⁹ As Integral admits, the differing growth rates between peak demand compared to customer numbers and energy consumption contribute to upward pressure on tariffs.¹⁰

Integral Energy Average Yearly Growth 2009-2014¹¹



In the residential sector, EnergyAustralia forecasts an even greater disparity between peak demand and consumption, with consumption growing at only 0.1% and peak demand growing at 3.7%, as illustrated below. As IPART has noted, the cost of providing distribution peak load can be around 400 times the cost of baseload.¹² This is why it is critical that demand management is considered in tandem with energy efficiency.

⁸ Energy Australia, and TransGrid. 2009. *Demand Management Investigation Report- Sydney Inner Metropolitan Area*, p.4, <http://www.transgrid.com.au/network/nsdm/Documents/Demand%20Management%20Investigation%20Report%20-%20Sydney%20Inner%20Metropolitan%20Area.pdf>

⁹ Integral Energy. 2008. *Regulatory Proposal to the Australian Energy Regulator 2009 to 2014*, p. 9

¹⁰ *Ibid.*

¹¹ *Ibid.* p. 18.

¹² IPART. 1999. *Regulation of network service providers - Discussion Paper DP-34*; IPART. 2002. *Inquiry into the role of demand management and other options in the provision of energy services - Interim Report, review report no. 02-1*, p. 6

Demand growth in EnergyAustralia's network area (2009-14)¹³



3. National action on energy efficiency

3.1 National target

A mandatory National Energy Efficiency Target of zero total energy growth by 2020 with an annual 1.5% reduction to 2030 and beyond would provide an achievable and measurable goal. This would represent a reduction of approximately 25% on business as usual growth in consumption.¹⁴

In the interim, Australia should immediately adopt a national target to save at least \$1 billion every year through energy efficiency, by 2012, as called for by Total Environment Centre, the Energy Efficiency Council (EEC) and the Australian Alliance to Save Energy (A2SE).¹⁵

3.2 National Energy Savings Scheme

Harmonisation of state-based energy savings schemes through a National Energy Savings Scheme would draw on long-term experience from NSW, Victoria and South Australia. The NSW Energy Savings Scheme (ESS), with the highest target and drawing from residential, commercial and industrial sectors, should be used as the model. Such a scheme would place an obligation on Australian electricity retailers to acquire or generate and then surrender a specified amount of Energy Savings Certificates that represent a verified amount of energy savings. The legislated target would be based on rigorous assessment of the amount of energy efficiency available, and should increase proportionately through five-yearly review processes. Regulation could be carried out by either the Independent Pricing and Regulatory Tribunal (IPART, the existing NSW regulator) or the Australian Energy Regulator.

The NSW ESS has an energy efficiency target of 0.4 per cent of total electricity sales, which will increase to 4 per cent in 2014.¹⁶ In 2009, after only 6 months of operation, it reduced electricity use by 226,679 MWh, with most reductions coming from the industrial and commercial sectors.¹⁷ The major benefit of adopting the NSW ESS model is that it has had many years to overcome teething problems throughout its previous incarnation as the NSW Greenhouse Gas Abatement Scheme (GGAS). Since 2003 GGAS and the ESS have been subject to rigorous standards, auditing and reporting by IPART.

In order to capture the currently untapped potential of peak demand reductions, a National Energy Savings Scheme should be expanded to include a specific mandate on

¹³ EnergyAustralia. 2008. *Regulatory Proposal*, p. 43.

¹⁴ Based on an average annual growth rate of 2.5%.

¹⁵ TEC, EEC, A2SE. 2010. *Call for \$1 billion a year energy savings*. Attached and at <http://www.tec.org.au/ge-latest-news/867-call-for-1-billion-a-year-energy-savings>

¹⁶ Industry and Investment NSW. 2010. *Energy Savings Scheme*. Retrieved April 29, 2010, from <http://www.industry.nsw.gov.au/energy/sustainable/efficiency/scheme>

¹⁷ Stone, D. (2010, April). Trading Efficiencies. *WME*, 21 (3), p. 30.

electricity distribution networks to acquire or generate and then surrender peak demand savings. Modelling of peak demand management opportunities across the National Electricity Market would be followed by a legislated requirement for networks to annually surrender Demand Management Certificates that represent a verified amount of peak demand reduction. To ensure that the peak demand reductions were as cost-effective as possible, Demand Management Certificates could be targeted to constrained areas that are subject to proposed (and expensive) augmentation within 5 to 10 years.

3.3 Fix the National Electricity Market

Current and future energy efficiency programs external to the NEM are rendered ineffective by its misaligned policy and regulation that drives increased consumption instead of savings. Current NEM incentives encourage generators, networks and retailers to sell more, not less electricity.¹⁸ Australia's energy ministers, led by Federal Minister for Energy Martin Ferguson, are maintaining a system that discourages energy efficiency and promotes poor investments. The Federal Government should intervene..

A recent report for TEC by McLennan Magasanik Associates (MMA) *Role of the NEM in responding to climate change policies*¹⁹ shows that:

- efficient and clean development is being frustrated by the energy market framework;²⁰
- there are stark conflicts between the objectives of the NEM and climate change policies;²¹
- the lack of an environmental objective for the National Electricity Market (NEM) has constrained opportunities for demand reduction and energy efficiency.²²

In particular, the report found that:

- The current approach to networks encourages increasing energy sales in the short term and expanding the regulated asset base in the long term, both of which are largely dependent on demand. This counters any incentive to reduce demand.²³
- There are no direct pricing signals designed to draw a strong demand side response and the low energy prices that do exist do not provide a strong incentive for demand reductions.²⁴
- There is no evidence that the procedures for the National Transmission Planner include relevant support for demand side planning.²⁵

¹⁸ In particular, see Headberry Partners and Bob Lim & Co. 2008. *Does current electricity network regulation actively minimise demand side responsiveness in the NEM?* Prepared for Total Environment Centre. Attached and at http://www.tec.org.au/component/docman/doc_download/310-hlim-price-cap-report

¹⁹ Commissioned by Total Environment Centre with support from the National Electricity Consumers Advocacy Panel

²⁰ McLennan Magasanik Associates. *Role of the NEM in responding to climate change policies*. 2009. p. 13. Attached and at http://www.tec.org.au/component/docman/doc_download/345-mma-nem-report

²¹ *Ibid.* p. 3.

²² *Ibid.* p. 23.

²³ *Ibid.* p.27.

²⁴ *Ibid.* p.37.

²⁵ *Ibid.* p.33.

- Solutions that lower peak demand or provide distributed generation may be more efficient and environmentally friendly, but encounter significant barriers.²⁶
- The incentives provided in the regulatory framework encourage network owners to grow their assets.²⁷
- Network augmentation is preferred over potentially more efficient non-network solutions, including embedded generation, distributed generation and demand side alternatives.²⁸
- The cross-ownership of both generators and retailers by individual companies creates a perverse incentive to sell as much energy as possible during times of high prices. This works against efforts to achieve a more efficient level of electricity generation transmission and distribution.²⁹
- In practice the NEM is price-driven and short-term, with supply meeting demand rather than trying to reduce demand.³⁰

The report concludes that energy ministers have not fully exploited their role to provide national leadership so that broader convergence issues and environmental impacts are effectively integrated into energy sector decision making.³¹

The report also found that the goals of the energy market conflict with climate change policies at the highest level through its lack of an environmental objective and subsequent rules.³² The table on the next page outlines these conflicts.

²⁶ Ibid. p.36.

²⁷ Ibid. p.36.

²⁸ Ibid. p.47.

²⁹ Ibid. p.68.

³⁰ Ibid. p.73.

³¹ Ibid. p. 20.

³² Ibid. p. 3.

Comparison of goals of the NEM, CPRS and RET ³³

Scheme: ► Objectives ▼	NEM	Carbon Scheme	Pollution Reduction	Renewable Energy Target
Global response to emission reduction	No	Yes: indirectly through setting an example in reduction policy	Yes: indirectly through setting an example in emission reduction	Yes: indirectly through setting an example in renewable energy policy
Local response to emission reduction	No	Yes: the issue of local emission reduction	Yes: the issue of local emission permits	Yes: the target itself guarantees local emission reduction
Ecological sustainability	No	Yes: implied by emission reduction	Yes: implied by emission reduction	Yes: implied by reduction in carbon emission from thermal power displaced
Economic efficiency	Yes	Yes: cost effective reduction	Yes: cost effective emission reduction	Yes: traded certificates provide for coordination of investment to minimise costs
Efficient prices	Yes	Yes: implied by emission reduction	Yes: implied by cost-effective emission reduction	Yes: traded certificates provide for transparent pricing and cost discovery
Addressing disadvantage	No	Yes: for those adversely affected by the Scheme	Yes: for those adversely affected by the Scheme	No
Quality of supply	Yes	Yes: implied by processes for emission measurement	Yes: implied by processes for emission measurement	Yes: implied by standards for certificate recognition and supported by the penalty regime
Reliability of supply	Yes	Not applicable	Not applicable	Not applicable
Security of supply	Yes	Not applicable	Not applicable	Not applicable
Safety in production and delivery	Yes	Not applicable	Not applicable	Not applicable

It is likely that, as with the proposed CPRS and the RET, a National Energy Savings Target and Scheme would be undermined in a similar way by the National Electricity Market.

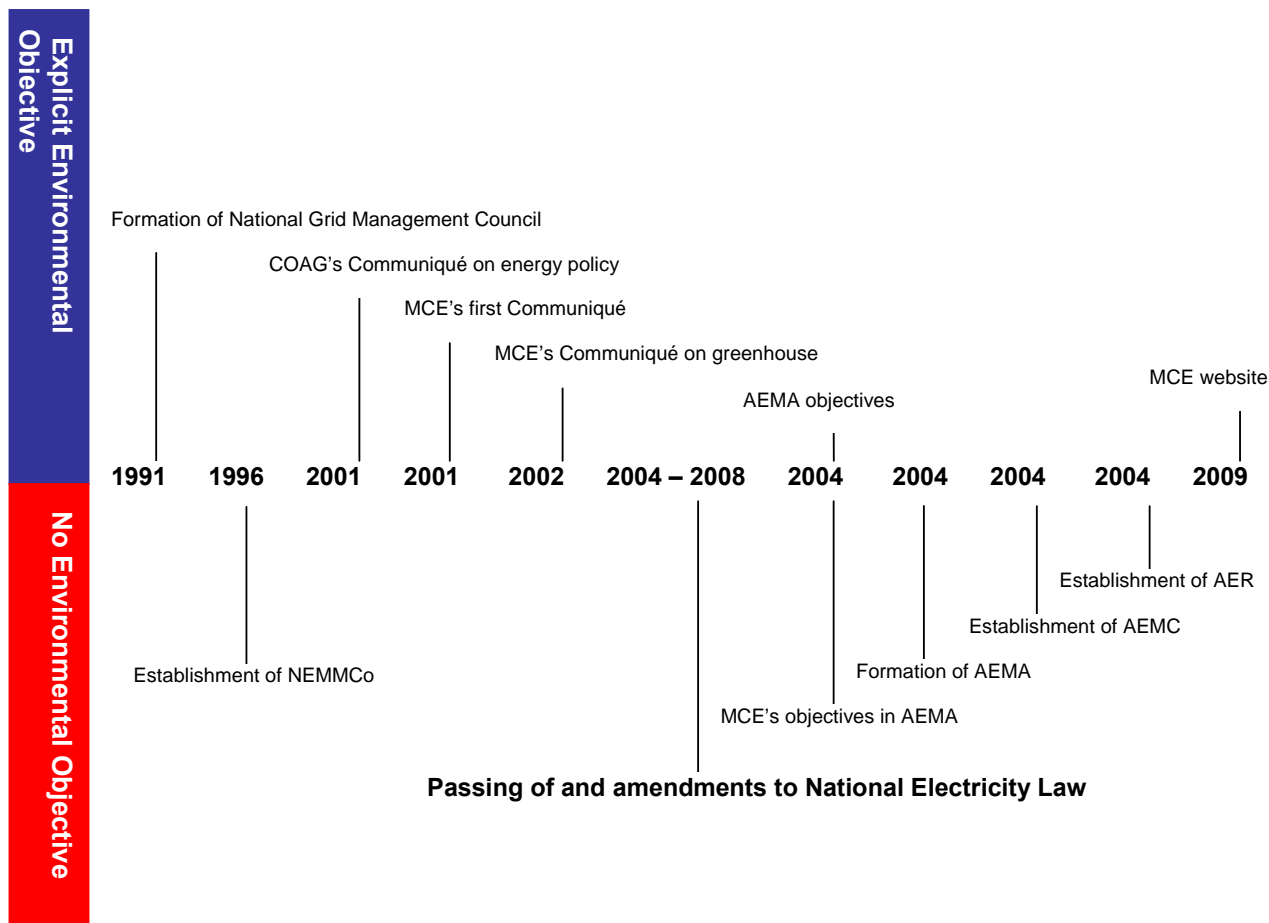
3.3.1 Need for an environmental and/or energy efficiency objective in the National Electricity Law (NEL)

Environmental objectives have been articulated for the NEM since 1991 but have not been included in the critical piece of legislation, the National Electricity Law. As the timeline on the next page illustrates, this was not the aim of COAG when it established the energy market.³⁴

³³ Ibid. p.3.

³⁴ Ibid. p. 8-13.

Changing Emphasis on Environmental Objectives



Under the current National Electricity Law, market policy bodies and regulators are prevented from taking environmental issues into account, and the 'long term interests of consumers' is officially interpreted to reflect only a narrow economic concept. In addition, regulators are required to adhere to a questionable principle of treating energy savings on a 'level playing field' (that in any case does not exist in reality) with generation options. This is absurd in the light of Australia's climate policy and the vast benefits that energy savings can offer Australians both in terms of reduced electricity bills and reduced greenhouse emissions and carbon costs.

Changes in NEM regulatory decisions would be more easily accomplished if the National Electricity Law adopted an environmental sub-objective, requiring regulators to transparently consider benefits beyond narrow economic theories that externalise the costs of greenhouse emissions, and an energy savings objective, that would mandate regulators to prioritise energy savings over augmentation and supply options.

3.3.2 Requiring networks to implement energy savings before augmentation

Such a prioritisation has been expressed in TEC's Rule Change Proposal to the Australian Energy Market Commission (AEMC).³⁵ The basis of the Rule change was to require transmission networks (and by extension, distribution networks) to implement energy savings before considering inefficient, peak-driven augmentation approaches. The Rule change comprised the following components:

1. Transmission network planning

Regulators to ensure that demand management solutions are prioritised and properly investigated in the planning stages of network development.

2. Annual Planning Reports

Networks be required to publish robust data on upcoming constraints that are relevant and useful to demand management service providers. This would inform the demand management market of upcoming opportunities and enable it to respond to these in an effective and timely manner.

3. DM Incentive

An explicit provision for the Australian Energy Regulator to develop and implement a demand side incentive scheme. This should address the chronic failure of networks to invest in cost-effective demand management.

4. Financial cover for DM investments

Energy regulator to clarify the circumstances in which networks can recover spending on demand management. This would create more certainty for networks regarding their ability to investigate, implement and recover demand management expenditure.

5. Revenue determinations

Revenue determinations for networks to ensure that demand management is prioritised ahead of the construction of more network infrastructure. Revenue determinations are an ideal process to facilitate demand management as this process allows regulators to closely scrutinise and modify future spending by networks.

6. Acknowledgment of modest DM expenditure

Small scale demand side activities are enabled even when unrelated to particular network constraints or when covering relatively modest amounts of load. Modest but widespread demand reductions can provide long term benefits by reducing the need for a range of possible future network as well as generation augmentations.

7. Effective prudence reviews

Prudence reviews by the regulator must assess past capital expenditure. These should specifically and thoroughly assess the extent to which transmission networks have implemented, and not ignored, an adequate level of demand management. Such reviews are critical to ensure that transmission networks do not ignore demand management solutions at the expense of electricity consumers.

³⁵ Total Environment Centre. 2007. *Rule Change Package: Demand Management and Transmission Networks*. <http://www.aemc.gov.au/Electricity/Rule-changes/Completed/Demand-Management.html>

8. Regulatory Test

The Rules should specify that the Regulatory Test require demand management options to be investigated *before* augmentation options. This is likely to ensure that a more appropriate level of transmission networks' resources and attention are directed to DM before augmentation planning is underway.

9. Short-term and long-term price for DM

A price is set for demand management within the market pool. Setting a price for demand management will encourage greater investment in and facilitate growth of demand management aggregation as a market commodity. A market mechanism that provides the opportunity for proponents to bid into the market would encourage new demand management entrants and promote competition for existing demand management businesses.

Networks vociferously opposed these proposals and in response the AEMC approved approximately 5% of the Rule change proposal in the form of slightly improved information disclosure by networks. Unless there is an explicit directive from COAG and the Ministerial Council for Energy, and the NEL objective is amended to target energy savings, it is unlikely that other attempts to capture the full potential of these savings will be successful.

3.3.3 Risk Reward Incentive Mechanism

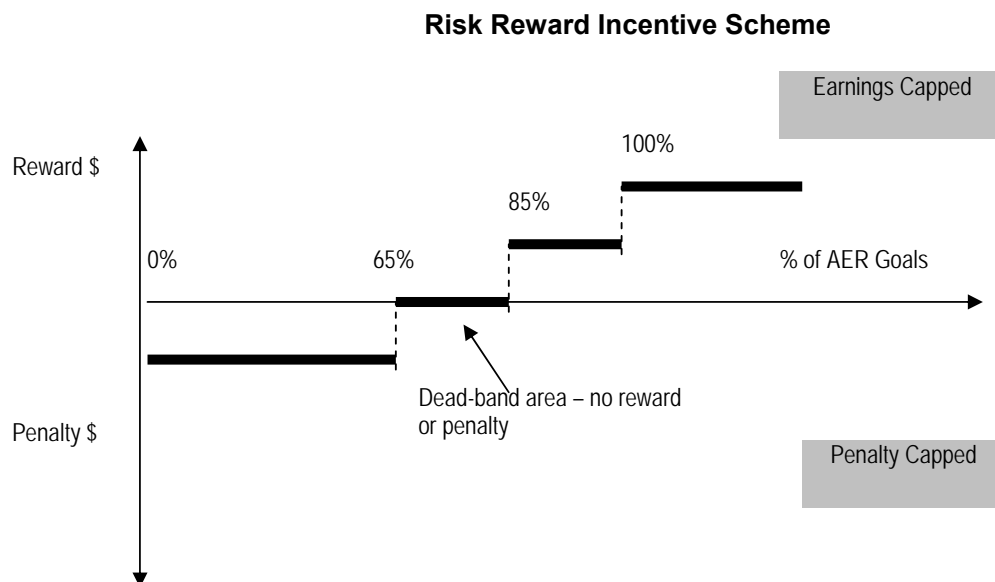
Another approach for regulators, if freed from the shackles of the National Electricity Law objective, would be a Risk Reward Incentive Mechanism (RRIM) for networks, as currently implemented by Californian regulators. The RRIM seeks to align consumer and network interests with incentives for achieving, and penalties for failing to meet energy efficiency goals, which includes reduction of peak demand.³⁶ Based on this methodology, the AER could apply these incentives in a three stage process:

1. Establish the potential energy savings reductions available to transmission and distribution networks through a combination of:
 - innovative pricing (including smart meters and ToU pricing);
 - demand reduction projects (eg retrofitting shopping malls, factories etc);
 - power factor correction; and,
 - demand-side response (using aggregators to contract interruptible load).
2. Set savings goals (MW and MWh reductions), incentive payments and penalties for each network business
 - ensuring that penalties are taken out of revenue above that required for approved capital and operating costs – i.e.: profit
 - with a 'dead-band' range between 65% and 85% of goals where no benefit or penalty applies
 - earnings and penalties capped at a certain amount.

³⁶ California Public Utilities Commission. 2009. *Energy Efficiency and Conservation Programs: Report to the Legislature*.

3. Measurement and verification to determine level of payment or benefit.

The diagram below indicates the reward-penalty system.



3.4 Smart meters and smart grid

The \$100 million SmartGrid, SmartCity exercise is a marginal, laboratory-scale exercise compared to the \$42 billion anti-efficiency, expansion exercise currently being undertaken by the networks. It is also dominated by the supply-side industry, the goals of which are at odds with the reduction of energy consumption. Likewise, the smart meter roll-out exercise has placed reducing consumption and emissions as the lowest priority, behind reduced manual meter-reading costs and other concerns. As with other energy market problems, this is caused by the capture of these policies by energy ministers and departments instead of those with a focus on climate change and efficiency.

The misaligned goals have resulted in poor decisions, such as:

- no requirement for consumer interface
- no requirements for retailers to offer innovative pricing products
- no requirements for consumers to move off flat tariffs
- no requirements for networks to utilise advanced controls (such as remote cycling of energy intensive products)
- the lock in of 'net' only measurement meters when it is likely that the rest of Australia will eventually follow the NSW and ACT lead and adopt 'gross' feed-in-tariffs (meaning every household with roof-top solar will have to pay an extra \$200-\$300 for a new meter)

To rectify these problems the NEM must be fixed, as noted above, and Government roll-outs of smart meters must be fact-tracked and widely expanded, incorporating business customers on top of residential customers, and accompanied by the implementation of time-of-use pricing.

As noted above, a national smart meter roll-out could achieve:³⁷

- Reduction in total (non-peak) electricity use by 4%-10%
- Reduction in greenhouse emissions by 19 million tonnes pa
- Reduction in total national greenhouse emissions by up to 3.5%

However, the roll-out needs to focus on achieving maximum greenhouse benefits rather than merely meeting industry demands. The following is required:

- Minimum functionality to include advanced communications (eg: information display, remote interface for users)
- Regulators to require retailers to offer innovative, time-of-use pricing
- Regulators to ensure that networks offer direct load-control programs
- Expand the roll-out to businesses
- Minimum functionality to include ability to meter gross solar PV generation
- Fast-track the roll-out to ensure savings opportunities are rapidly harnessed

Time-of-use tariffs must be phased in to replace the predominant flat electricity tariffs, in order to better reflect the wide variations in the cost of providing electricity. While flat tariffs are sometimes defended as protecting vulnerable consumers, the effect is often to impose avoidable costs on all consumers to pay for large investment in centralised generation and networks to meet occasional peak demand.³⁸

Given the dominance of peak demand growth in driving proposed network and generation investment decisions, it is crucial that electricity pricing is fundamentally reformed, in terms of both retail and network prices.³⁹

3.5 Industrial and large energy users

The Energy Efficiency Opportunities program has already identified 67.7 PJ of energy savings potential per year – emissions reductions of 6.4 MtCO₂-e.⁴⁰ However, the program does not mandate that the companies implement the identified savings. Voluntary implementation is typically ineffective as energy users have a variety of competing uses for capital, and this is reflected by the limited uptake of energy efficiency measures by industry so far. The Energy Efficiency Opportunities Act should be amended to require all companies that consume more than 7,000 GJs per year to audit their energy use and implement all energy savings options with less than four years payback.

The recent ClimateWorks Australia report that identified 17 MtCO₂-e of potential energy efficiency savings suggested major improvements are available through improved control systems and processes, reduction of duplicated or oversized equipment, upgrade of

³⁷ Energy Futures Australia. 2007. *Advanced Metering for Energy Supply in Australia*.

³⁸ Dunstan, C, Langham, E, and Ison, N. *20 Policy Tools for Developing Distributed Energy, Working Paper 4.2, Ver. 1*. CSIRO Intelligent Grid Research Program by the Institute for Sustainable Futures, University of Technology, Sydney. http://igrid.net.au/sites/igrid.net.au/files/images/IGrid%20Policy%20Tools%20for%20Distributed%20Energy%20Working%20Paper%204%202%20Version%201%200_1.pdf

³⁹ Ibid.

⁴⁰ Department of Resources, Energy and Tourism. 2010. *First Opportunities: A Look at Results from 2006-2008 for the Energy Efficiency Opportunities Program*, p.viii.

motor systems, decrease of energy losses in boilers and steam distribution systems, waste heat recovery for pre-heating or other uses, and building utilities.

TEC supports the following energy efficiency policies for the industrial sector, as put forward by the EEC:⁴¹

3.5.1 Minimum energy improvement targets

Almost every large energy user has extensive opportunities for energy efficiency improvement. Every EEO participant should be required to improve their energy efficiency by a minimum 1 per cent per annum between 2010 and 2020. Companies that cannot satisfactorily demonstrate that they cannot meet this target, and fail to meet their target should be penalised through a reduction in free permits or direct regulation.

3.5.2 Incentives for going beyond regulation

Supporting companies to go beyond minimum requirements will deliver major benefits to the economy. A scheme that brings down the cost of projects with longer payback periods would drive energy efficiency that would otherwise fail to happen. Further incentives beyond the National Energy Savings Scheme could comprise of a National Energy Savings Fund or targeted tax breaks. Incentives should diminish over time so that, for example, in the first year all projects with over a 2 year payback would be eligible, in the second year projects with over a 3 year payback would be eligible, and so on.

3.5.3 Creation of internal energy efficiency funds

Companies often fail to invest in energy efficiency due to giving it insufficient priority in allocation of capital. There are a range of options to address this. All companies, including generators, captured in the first two rounds of the National Greenhouse and Energy Reporting System be subject to a 5 per cent tax on energy. However, companies would be exempt from this tax if they spend the equivalent of 5 per cent of their annual energy spend each year on energy efficiency and carbon reduction projects. This would have the effect of creating an internal energy efficiency fund in large energy users.

3.5.4 Standards for new or expanded operations

Most European states have mandated efficient design for new or expanded operations (including plant and mine-sites). New or expanded operations should be required to demonstrate that they have implemented international best-practice energy efficiency standards and all opportunities for energy efficiency that have a payback of less than four years, in line with the guidelines and assessment protocols set out in the EEO program.

3.6 Commercial building energy efficiency

Based on 2005-06 data, energy consumption in the building sector (both residential and commercial) accounted for 19% of total energy consumption in Australia, while greenhouse gas emissions from the sector account for 23% of all emissions, of which roughly 10% come from commercial buildings.⁴²

⁴¹ EEC. 2010. *Submission to Prime Minister's Task Group on Energy Efficiency – Issues Paper*, p.14.

⁴² Senate Economics Legislation Committee. 2010. *Safe Climate (Energy Efficient Non-Residential Buildings Scheme) Bill*, p.5. http://www.aph.gov.au/Senate/committee/economics_ctte/energy_efficient_buildings_09/report/report.pdf

Despite buildings producing close to a quarter of national greenhouse gas emissions, Australia's current approach to building efficiency is piecemeal at best. Current programs that target information flows, such as the upcoming Mandatory Disclosure of Commercial Office Building Energy Efficiency, only target one of the many market barriers to energy efficiency. It is critical that other barriers, such as competing priorities for capital and split incentives, are targeted.

ClimateWorks suggests that 16 MtCO₂-e of emissions can be reduced from commercial buildings largely through energy efficiency, at a net savings to society of around A\$99 per tonne, or \$1.58 billion in savings.⁴³ Further, the Australian Sustainable Built Environment Council (ASBEC) have estimated that fully realising the building sector's energy efficiency potential would save the economy around \$38 billion annually by 2050.⁴⁴

3.6.1 Safe Climate (Energy Efficient Non-Residential Buildings Scheme) Bill 2009

Existing commercial buildings represent a large, untapped resource for energy efficiency. TEC's Existing Buildings Project has highlighted this potential, having already reached its initial target of encouraging 10 per cent of Australia's investment grade office buildings to reduce their carbon footprint by up to 40 per cent below the market average by 2012.⁴⁵

With such significant, demonstrable and affordable savings on offer, TEC was disappointed to see that the Safe Climate (Energy Efficient Non-Residential Buildings Scheme) Bill 2009 was not supported by the Senate Economics Committee, and would suggest that the Committee did not provide adequate justification for its refusal to endorse the Bill. The Scheme remains one means of targeting the barriers to energy efficiency in the commercial building sector, and would serve as an important and timely means of achieving emissions reductions, particularly given the uncertain future of the CPRS. The scheme has further merit in that it allows for integration into a federal emissions trading scheme at a later stage, or continued operation as a stand-alone program.

3.6.2 Building standards

The Building Code of Australia needs to be improved to adopt international best practice mandatory efficiency standards for all new commercial buildings. As a start, the 5 star NABERS standard should be mandated for all new commercial buildings, and minimum standards should be set for all other buildings (e.g. schools, hospitals, warehouses) in line with optimal energy savings potential. All commercial buildings should be required to meet acceptable environmental performance standards at the time of sale or lease.⁴⁶

Moving forward, the Building Code should be reviewed annually to continually improve the efficiency measures required to gain the mandatory star rating, in line with development and availability of energy efficiency technology.

3.6.3 Green depreciation

⁴³ ClimateWorks Australia. 2010. *Low Carbon Growth Plan for Australia*, p.63.

⁴⁴ ASBEC. 2008. *The Second Plank: Building a Low Carbon Economy With Energy Efficient Buildings*, . http://www.asbec.asn.au/files/ASBEC%20CCTG%20Second%20Plank%20Report%202.0_0.pdf

⁴⁵ TEC. 2009. *TEC's EBP Wins Climate Change Leadership Award*. Retrieved April 30, 2010 from <http://www.tec.org.au/climate-change/783-tecs-ebp-wins-climate-change-leadership-award>

⁴⁶ Vincent, J., and Wakeham, M. 2009. *Plan B: An Agenda for Immediate Climate Action*. <http://www.greenpeace.org/raw/content/australia/resources/reports/climate-change/planb-110609.pdf>

Accelerated or 'green' depreciation would provide for accelerated depreciation for buildings that meet a specified environmental standard, thus offering financial incentive for the uptake of green practices in commercial buildings.⁴⁷

3.6.4 Research and development tax concessions

The Green Building Council of Australia (GBCA) reports that the current research and development (R&D) tax concessions of 125% do not provide sufficient incentive for Australian companies to invest in green building R&D activities. TEC supports the GBCA's call for an increase in R&D tax concessions to 250%, in order to adequately incentivise innovation in green building practices.⁴⁸

3.7 Residential building energy efficiency

The Building Code of Australia must also be improved to adopt international best practice mandatory efficiency standards for all new residential buildings. As a start, a zero-emissions standard should be mandated for all new residential buildings, with allowance for emissions offsets through residential renewable microgeneration or the purchasing of GreenPower.

The Federal Government should work with the states to implement a national retrofit program that aims to reach most existing Australian homes. As a start, TEC supports a previous call for a green makeover for 5 million homes nationally in the next five years (roughly half of the housing stock).⁴⁹

Such a program could combine and coordinate existing residential energy efficiency initiatives, and should include the following measures:

- Household audits and retrofit services for energy smart technologies that cover insulation, energy efficient lighting, weather sealing, installation of solar hot water systems or heat pump systems, installation of high efficiency showerheads, dual flush toilet systems, tap flow controllers and fridge upgrades.
- Innovative financing arrangements for home owners to allow repayment of capital costs from savings on energy bills.
- Targeted assistance for vulnerable households. Vulnerable consumers, particularly low-income families and the elderly, face the worst effects of climate change, now and into the future, and are particularly sensitive to increased energy prices. It is crucial that government policies provide targeted assistance to help disadvantaged and vulnerable households reduce their energy bills.⁵⁰

TEC is disappointed to see that the insulation component of the Renewable Energy Bonus Scheme (the Home Insulation Program) has been discontinued. Insulation retrofits based on the established environmental and social benefits they provide should be

⁴⁷ Green Building Council of Australia. 2008. *Submission to the 2009-2010 Federal Budget*.
<http://www.gbca.org.au/uploads/90/1882/2009%20Federal%20Budget%20Submission%20final.pdf>

⁴⁸ Green Building Council of Australia. 2008. *Submission in Response to the Green Paper on the Carbon Pollution Reduction Scheme*, p. 25.

⁴⁹ http://www.gbca.org.au/uploads/GBCA%20CPRS%20Green%20Paper%20Submission%20Sep%202008%20_Final_.pdf

⁴⁹ Vincent, J., and Wakeham, M. 2009. *Plan B: An Agenda for Immediate Climate Action*, p.4.
<http://www.greenpeace.org/raw/content/australia/resources/reports/climate-change/planb-110609.pdf>

⁵⁰ CANA. 2007. *Turning Down the Heat: A Climate Change Action Agenda for Australia*, p. 9.
<http://www.cana.net.au/sites/default/files/TurningDowntheHeatWebforPrint.pdf>

recommended under more rigorous regulatory standards and improved Government oversight.⁵¹ Though the program suffered implementation problems, it must be recognised that the 1.5 million homes that have already been insulated will save more than 15 million tonnes of CO₂-e emissions over 10 years, based on the conservative government modelling. The benefits are substantial in terms of reduced electricity bills, reduced network congestion, reduced greenhouse emissions and reduced carbon costs.⁵²

3.8 Appliances and equipment

The Issues Paper has recognised that households account for around 11% of Australia's final energy use. A quarter of the average household's greenhouse emissions are the result of inefficient appliances and equipment.⁵³

The Minimum Energy Performance Standards (MEPS) program needs to be significantly extended and strengthened, including the banning of the least efficient appliances and equipment, and the introduction of a One-Watt standby industry standard for all new appliances. MEPS should be regularly reviewed to ensure the standard promoted is the most efficient available, and to keep up with technological improvements. TEC hopes to see such outcomes arise from the (previously Department of the Environment, Water, Heritage and the Arts) consultation around expanded national legislation for appliance energy efficiency, initiated early 2010.⁵⁴

In August 2000, all Australian jurisdictions agreed to:⁵⁵

... pursue efficiencies in standby power consumption of energy-consuming products, through support for the International Energy Agency's One-Watt program, and endorse its incorporation into the ... program of work.

Despite this announcement almost ten years ago, the One-Watt standby standard does not yet appear to have been legislated. Standby accounts for at least 10% of household energy consumption, making a One-Watt standby standard a major contributor to mitigating escalating household energy use and rising electricity bills.

3.8.1 Air conditioners

Air conditioners are estimated to make up 6% of residential electricity consumption in Australia in 2005, increasing to 9% in 2020⁵⁶ (for heating and cooling), as a result of increased ownership and usage. This translates into an estimated 3819 kt CO₂-e in 2005, and 5270 kt CO₂-e by 2020.⁵⁷ Air conditioners in particular contribute greatly to peak load issues, the problems of which are discussed in Section 2 of this submission. Studies

⁵¹ For example, see <http://www.healthyhousing.org.nz/>

⁵² Department of the Prime Minister and Cabinet. 2009. *Nation Building Economic Stimulus Plan: Commonwealth Coordinator-General's Progress Report*, p.21.

http://www.economicstimulusplan.gov.au/documents/rtf/ESP_Project_Report_August.doc

⁵³ *Ibid.* p. 29.

⁵⁴ Commonwealth of Australia. 2010. *Consultation Regulation Impact Statement: National Legislation for Appliance and Equipment Minimum Energy Performance Standards (MEPS) and Energy Labelling*. Retrieved April 29, 2010, from <http://www.energyrating.gov.au/library/details201001-ris-national-MEPS-labelling.html>

⁵⁵ MCE. 2002. *Money Isn't All You're Saving: Australia's Standby Power Strategy 2002-2012*, p.7.

<http://www.energyrating.gov.au/library/pubs/200212-standby.pdf>

⁵⁶ Equipment Energy Strategies (EES). 2009. *Equipment Energy Efficiency Committee – Decision Regulatory Impact Statement: Air Conditioner MEPS and Energy Labelling*, p.1. <http://www.energyrating.gov.au/library/pubs/200921-ac-decision-ris.pdf>

⁵⁷ *Ibid.* p.25.

suggest air conditioners can account for 30% to 50% of total state demand on days of extreme weather.⁵⁸

A forthcoming standard is expected to define the physical connections and communications protocols necessary to realise certain demand response functionality available with some air conditioners on the market.⁵⁹ Either this or a separate standard must require that *only* air conditioners with demand response capabilities be made available in Australia, in order to ensure consistency with the smart grid goals discussed in Section 3.4 of this submission, and in order to realise the energy efficiency and emissions reduction opportunities available for air conditioners. Energex air conditioner cycling trials utilising demand response functionality (remote communications) illustrated the incredible energy savings potential on offer, achieving a 17% peak demand reduction in the trial community.⁶⁰

3.9 Transport energy use efficiency

The Issues Paper recognises the huge proportion of Australia's final energy use that the transport sector represents – 39%. Transport accounts for 14% (82 MtCO₂-e) of Australia's GHG emissions in 2010, with road transport accounting for the majority of this (87%).⁶¹ In 2005 Australia had the third highest per-capita levels of greenhouse pollution from the transport sector, behind only the United States and Canada,⁶² and its road transport sector is among the most emissions intensive per capita in the world (i.e. 4t of CO₂ per person, versus 3t OECD average).⁶³

3.9.1 Provide incentives for sustainable transport

Several environmental organisations have previously called for an innovative package of measures to maximise opportunities for sustainable transport, and provide incentives for Australians to use sustainable transport whenever possible.⁶⁴ Such a package would include:

- Offering tax deductions or higher rebates for those who purchase six or twelve-monthly travel passes.
- Investing in public transport across our cities, as well as intra and interstate public transport infrastructure including fast rail alternatives.
- Firm targets to ensure public transport is accessible, reliable, frequent, connected, fast, comfortable, safe and affordable.

⁵⁸ EES. 2005. In EES. 2009. *Equipment Energy Efficiency Committee – Decision Regulatory Impact Statement: Air Conditioner MEPS and Energy Labelling*

⁵⁹ The provisional title for the Standard, which is being developed by committee EL-054, is AS4755.3.3-*Interaction of Demand Response Enabling Devices and Electrical Products: Operational Instructions and Connections for Air Conditioners*. It is due to be released for public comment in May 2008.

⁶⁰ Energex. 2008. *Time for a Cool Change*, p.4.
http://www.energex.com.au/trial/pdf/8159_cool_change_results_report_summer_2008.pdf;
Energex. 2010. *Cool Change: Energy Smart Suburbs*. Retrieved April 29, 2010, from
<http://www.energex.com.au/trial/index.html#0910>

⁶¹ ClimateWorks Australia. 2010. *Low Carbon Growth Plan for Australia*, p.71.

⁶² World Resources Institute. 2005. *Navigating the Numbers: Greenhouse Gas Data and International Climate Policy*, p.65.
http://pdf.wri.org/navigating_numbers.pdf

⁶³ Garnaut, R. 2008. *The Garnaut Climate Change Review: Final Report*.

⁶⁴ Vincent, J., and Wakeham, M. 2009. *Plan B: An Agenda for Immediate Climate Action*.
<http://www.greenpeace.org/raw/content/australia/resources/reports/climate-change/planb-110609.pdf>

- Significantly increase train, tram and bus services through increased rolling stock, better use of current infrastructure, and investment in infrastructure upgrades and extensions.
- Significant commitment to developing an integrated and connected cycling network across our cities and regional centres coupled with end-of-journey facilities to encourage mode shift to cycling, particularly for short trips.
- Investment in our rail freight network and development of intermodal hubs across our cities and regions to facilitate a widespread mode shift from road to rail freight.
- Development of freight efficiency programs including Collaborative Distribution programs whereby companies share logistics and distribution networks, services and facilities to cut distribution and supply chain

3.9.2 Remove subsidies that encourage car use

In 2007-2008 an estimated \$1.22 billion was spent on subsidising car use through salary-sacrificing and fringe benefit tax (FBT) concessions.⁶⁵ Tax arrangements that allow the cost of a car lease to be salary sacrificed and the rate of taxation to decline as vehicle kilometers increase encourages car use. The statutory percentage of FBT declines as kilometers traveled increase, providing a tax incentive to maximise kilometers traveled.⁶⁶

This form of tax concession is not available to other forms of transport, such as public transport or cycling. A House of Representatives Standing Committee report in 2005 recommended the current regulations regarding salary packaging of cars and FBT concessions be reviewed with a view to removing incentives for greater car use and extending incentives to other modes of transport.⁶⁷

The Federal Government must also review the current and planned subsidies (via excise exemption) on petrol and diesel under the Fuel Tax Credits Scheme, with a view to redirecting these subsidies towards sustainable transport modes or sustainable renewable fuels.

3.9.3 Mandatory vehicle fuel efficiency and emissions standards for manufacturers

Mandatory vehicle fuel efficiency and emissions standards offer the largest opportunity in the transport sector, at A\$60 net savings to society in 2020 per tonne of CO₂-e saved.⁶⁸ Voluntary targets have clearly failed, with Australian vehicle fuel efficiency standards struggling to reach the voluntary target of 6.8L/100km by 2010, and generally little agreement under the voluntary national average fuel consumption (NAFC) target.

The United States' target for fuel efficiency is approximately 6.6L/100 km by 2016,⁶⁹ while the Jamison Group has recommended a target of 5L/100 km by 2015, to be met in

⁶⁵ Commonwealth of Australia. 2005. *Tax Expenditures Statement*.

⁶⁶ CANA. 2007. *Turning Down the Heat: A Climate Change Action Agenda for Australia*, p. 45.
<http://www.cana.net.au/sites/default/files/TurningDowntheHeatWebforPrint.pdf>

⁶⁷ House of Representatives Standing Committee on Environment and Heritage. 2005. *Sustainable Cities report*.

⁶⁸ ClimateWorks Australia. Op. cit. p.71.

⁶⁹ United States White House Press Secretary. 2009. *President Obama Announces National Fuel Efficiency Policy*.
http://www.whitehouse.gov/the_press_office/President-Obama-Announces-National-Fuel-Efficiency-Policy/. Calculations converted from 35.3 miles per gallon to 6.6 litres per 100 km.

incremental stages,⁷⁰ as comparable to European and Japanese standards. TEC supports the Jamison Group's call that no passenger vehicle be sold in Australia by 2015 unless they achieve a standard of less than 5L/100km – such a measure offers substantial fuel cost and GHG emission savings.

The EU is reducing average emissions intensity for new passenger vehicles from 160g/km to 130g/km in 2012,⁷¹ putting it amongst the world's leading regions on emissions intensity, and bringing financial savings to vehicle owners.⁷² Australia should look to adopt a similar target for emissions intensity, and set emissions standards into the future that drives continual improvement.

3.9.4 Alternative power technology

Regulation and incentives are required to encourage the adoption of cleaner vehicles. The introduction of hybrid and electric vehicles can reduce emissions by 1 MtCO₂-e at an average cost of A\$124 per tonne.⁷³ Battery charging and switching infrastructure needs establishing to speed up transition to electric vehicle technology.

3.10 Recycling and materials efficiency

Recycling generates energy and greenhouse emissions savings, in part through avoided resource extraction, materials production and manufacturing processes. Recycling activities in Australia generates over 202 terajoules of energy savings benefits, in terms of delivered electricity, process heat, transport and miscellaneous energy inputs.⁷⁴ This represents 8.8 million tonnes of CO₂-e savings – the commercial and industrial sector accounts for 61% of these savings, while the construction and demolition sector represent 25% of the emissions savings.⁷⁵

- Recycling should be accorded a role in energy savings schemes;
- Consideration should be given to proposals from the National Recycling Initiative including accelerated depreciation and addition use of waste levy funds for infrastructure.

3.11 Government energy efficiency

The Commonwealth Government has made strong public commitments to demonstrate leadership in energy efficiency, but there has been little progress to date. TEC supports the EEC's call to upgrade the energy efficiency of government operations, incorporating the following four key policies:⁷⁶

⁷⁰ Jamison Group. 2008. *A Roadmap for Alternative Fuels in Australia: Ending our Dependence on Oil*, p.53. http://www.mynrma.com.au/cps/rde/xbcr/mynrma/Jamison_Group_Alternative_Fuels_report_July_2008.pdf?cpsessionid=SID-49BA5638-1F4345E5

⁷¹ European Union. 2009. *EU Insight*. <http://www.eurunion.org/News/eunewsletters/EUInsight/2009/EUInsight-Auto-Feb2009.pdf>

⁷² Australian Conservation Foundation. 2008. *Submission on Vehicle Fuel Efficiency*, p.5. <http://www.environment.gov.au/settlements/transport/publications/vfe-paper/submissions/49acf.pdf>

⁷³ ClimateWorks Australia. Op. cit. p.72.

⁷⁴ Hyder Consulting. 2008. *Australian Recycling Values – A net benefits assessment. Final Report for the Australian Council of Recyclers*, p.iv. <http://www.acor.org.au/pdfs/Recycling%20Values%20-%20Net%20Benefit%20Study%20280708.pdf>

⁷⁵ Ibid. p.15.

⁷⁶ EEC. 2010. *Submission to Prime Minister's Task Group on Energy Efficiency – Issues Paper*, p.17.

- **Commit to a clear funding path** for energy efficiency, such as internal loan schemes or third-party finance. In general governments should provide access to capital equivalent to 25 per cent of their annual gas and electricity bill each year over 5 years. For example, if a government had an annual energy bill of \$100 million they should provide access to at least \$25 million of finance per annum over five years, on top of any loan repayments if a rolling fund is used. As it will take a year or more for some agencies to be in a position to seek finance, funds allocated in early years should be quarantined for later use.
- **Mandate agencies to upgrade the energy efficiency** of their top energy using sites by 2012, accounting for 30 percent of their energy use, and by 2020 cover off on their remaining major sites, to cover 80 per cent of agency energy use.
- **Appoint one agency to lead on energy efficiency** in each government and provide them with the resources to assist agencies to implement energy efficiency.
- **All agencies to publicly report their progress** on an annual basis, and publicly disclose NABERS tenancy ratings for all owned or leased offices over 1000m²