AUSTRALASIAN ENERGY PERFORMANCE CONTRACTING ASSOCIATION

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Submission to the Productivity Commission Inquiry into Energy Efficiency

Australasian Energy Performance Contracting Association

November 2004

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Introduction

As the *Issues Paper* (Productivity Commission 2004) noes on page 10, this Inquiry is considering only subset of energy efficiency potential as an important step towards the incorporation of energy efficiency into mainstream Government policy.

Its focus on measures that are cost effective for producers or consumers means that it is not considering measures that have net societal benefits that cannot be captured by individuals or businesses. AEPCA supports the BCSE contention that it is important that the Productivity Commission emphasises this in its report, so that the Inquiry's conclusions can be put into context. This means where the Inquiry concludes there is a case for Government intervention, the justification for action is strong, as it has passed tough criteria.

However, where the Inquiry does not find a case for intervention, this is not a strong argument against Government intervention, as other benefits that are not captured by individuals have not been considered. It simply means that further analysis is required before the action can be rejected.

AEPCA, along with the Insulation Council of Australia and New Zealand (ICANZ) and the BSE have commissioned a report by the Allen Consulting Group that provides an overall economics-based review of the key aspects of relevance to this Inquiry, such as the existence and nature of the energy efficiency gap, policy options, and related issues. This report forms a substantive part of AEPCA's submission and is attached.

Further AEPCA's submission builds on the BCSE submission. While endorsing the analysis, conclusions and recommendations of the BSE submission, this AEPCA submission focuses on specific issues concerning Energy Performance Contracting (EPCs) in the context of the broader energy efficiency issues in that EPCs are a key mechanism for delivering energy efficiency outcomes in key sectors of the economy.

Energy Performance Contracting

The efficient use of energy should be the cornerstone of the energy policy of all governments. Energy Efficiency improves productivity, economic competitiveness, avoids supply and transmission infrastructure investments, provides employment, economic growth, export opportunities and cost effective greenhouse abatement. And all at a net economic benefit.

The benefits and barriers to energy efficiency are well understood, they have been the subject of numerous reports and studies both in Australia and overseas.

Energy efficiency is critical to avoiding power blackouts in hot weather. Energy-efficient buildings, appliances and equipment use less power in hot conditions, and reduce the load on the electricity supply infrastructure. This not only reduces the risk of loss of economic output, it also reduces the investment required to expand supply and transmission infrastructure. The more efficient use of energy is also not only critical in significantly reducing greenhouse emissions; it also reduces water usage in generation reserving this critical resource for agriculture and people.

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Energy Performance Contracting (EPC) has been proven to be an effective mechanism for improving energy efficiency across a wide range of facilities. Over $100 million of energy system upgrades have now been completed using this method. In addition it has created jobs in a new energy services sector of the economy. Please refer to the attached summary of market barriers addressed by EPCs.

This submission focuses on the further contribution that can be made through EPC and how energy efficiency improvements can be realised through an effective program of implementation.

Defining Energy Efficiency

The *Issues Paper* also notes that it is possible to consider energy efficiency in energy supply, as well as at end use. The overall energy efficiency of energy supply and use can be considered by using *primary energy* (the amount of raw energy harvested) per unit of useful output as an indicator. Using primary energy takes into account all conversion, delivery and point-of-use losses. This is particularly important where different types of energy sources are being compared. For example, on-site cogeneration (production of heat and power on-site) typically increases end-use energy per unit of useful output, but reduces primary energy per unit of useful output, because energy that would normally be wasted at the power station is utilised in processes on the site.

AEPCA strongly recommends that the Productivity Commission should use primary energy as its measure when evaluating energy efficiency improvement.

It should also be noted that, apart from where a high proportion renewable energy is being used, changes in greenhouse gas emissions from energy efficiency improvements and fuel switching at point of use are (within about 30%) roughly equivalent to changes in primary energy consumption. The difference is due to the variation in greenhouse intensity per unit of energy of the various primary fuels – oil, gas and coal. So using greenhouse impacts as an indicator of energy efficiency is actually much closer to the primary energy efficiency than using end-use efficiency, as it takes into account conversion and delivery losses. For example, using resistive electric heating instead of gas uses about 25% less end-use energy, but generates around three times as much greenhouse gas and also uses about three times as much primary energy if average grid electricity is used. So using end-use energy as an indicator can send quite perverse signals about overall energy use.

Indeed, one of the problems AEPCA identified with the NFEE analysis was that it relied upon end-use energy to set policy priorities. This led to a greater focus on large industry, which uses a high proportion of gas, coal and oil at point of use, than would have been justified if primary energy or greenhouse gas emissions had been used as the criterion. Much of the energy used in the commercial and residential sectors is in the form of electricity. As greenhouse intensive coal accounts for 80 per cent of power generation in Australia, improving efficiency in the commercial and residential sectors would have the greatest greenhouse pay-offs.

It is important to note the key role of the built environment in energy consumption and further the high rates of growth within this sector. Energy Consumption of commercial buildings alone is forecast to more than double by 2010 (compared to a 1990 baseline year) according to AGO studies. Further commercial buildings in Australia are relatively inefficient

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and the property industry is highly resistive to moving from a least first cost procurement practice to whole of life cost procurement assessments.

The 'Efficiency Gap' and Rational Behaviour

The gap between identified potential for cost-effective energy efficiency improvement and actual response is often described at the 'efficiency gap'. The Commission asks to what extent this gap results from rational response (such as hidden transaction costs), real world circumstances and inertia such as sunk costs of plant and equipment.

The attached Allen Consulting Group report shows clearly that, while part of the efficiency gap can be linked to rational behaviour, a substantial part of it results from the impact of barriers such as market failures, behavioural norms, imperfections within and between organisations, and so on.

Actions of governments have the potential to address both the 'rational' and 'irrational' aspects of the energy efficiency gap. Since 'rational' application of, for example, a high discount rate reflects a perception of a high level of risk, government actions that reduce risk, or perception of risk, can shift the threshold for action. Government action can also overcome barriers and impediments that would otherwise block adoption of energy efficiency.

The Scope for Cost-Effective Energy Efficiency Improvements

The scope for cost-effective energy efficiency improvements is vast and, with appropriate policy support, this potential can be increased. Cost effective is defined in this cost as having a positive Net Present Value (NPV) over the life cycle using a discount rate of 2.5% above the long term bond rate (this is a similar definition used by the Australian Building Codes Board).

The scope for cost-effective efficiency improvement also grows as costs fall, technology improves and we become smarter at capturing the opportunities. Well-structured policy should be designed to adapt as the potential improves so as to ensure ongoing continuous improvement. A well-designed energy rating scale must therefore provide mechanisms for increasing stringency as best practice improves as well as ensuring that the ratings reflect actual performance. It should also reward better performers.

AEPCA jointly sponsored the recent *Clean Energy Futures* study (Saddler et al, 2004). In this study, it is estimated that energy efficiency measures could halve the projected baseline energy growth to 2040. The criteria used for these measures were that they had to be commercially available today, and that they would be cost-effective under the conditions and energy prices expected in 2040. The study was deliberately very conservative with regard to energy efficiency, but still showed that it had a very important role to play. A copy of the Clean Energy Futures report has been previously presented to the Commission. The key findings of the report are summarised in the two graphs below:

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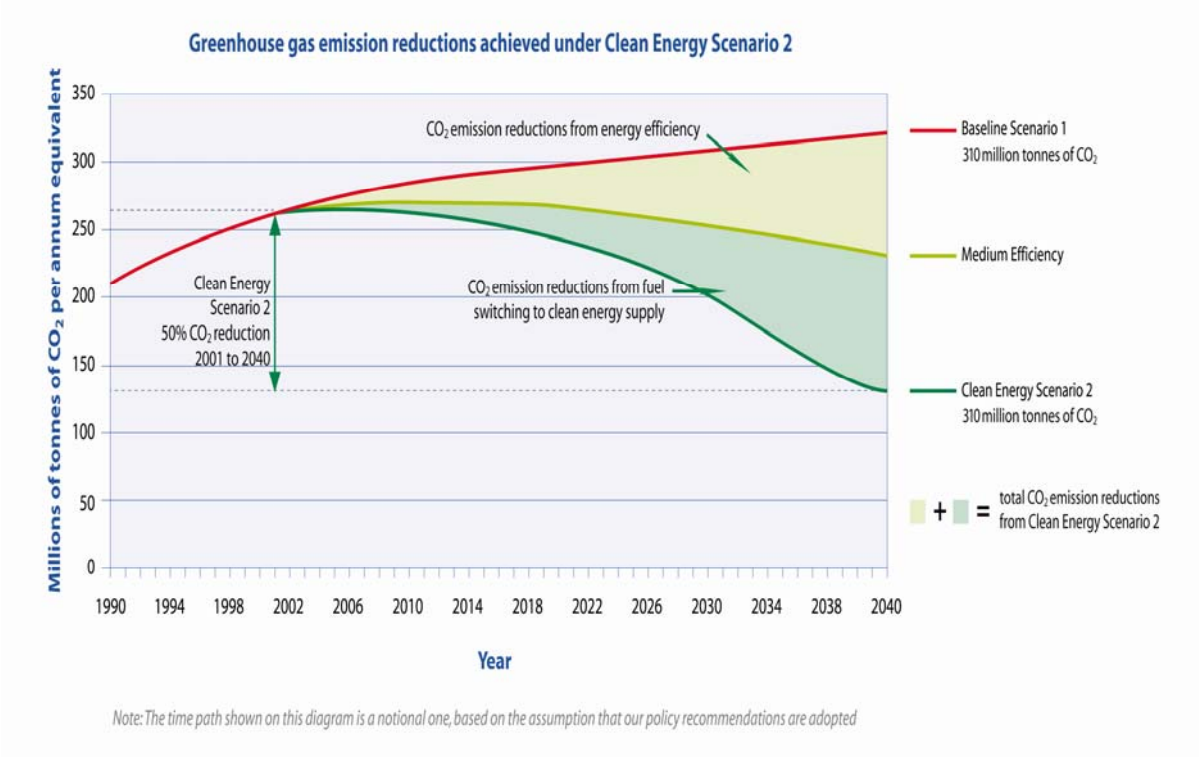
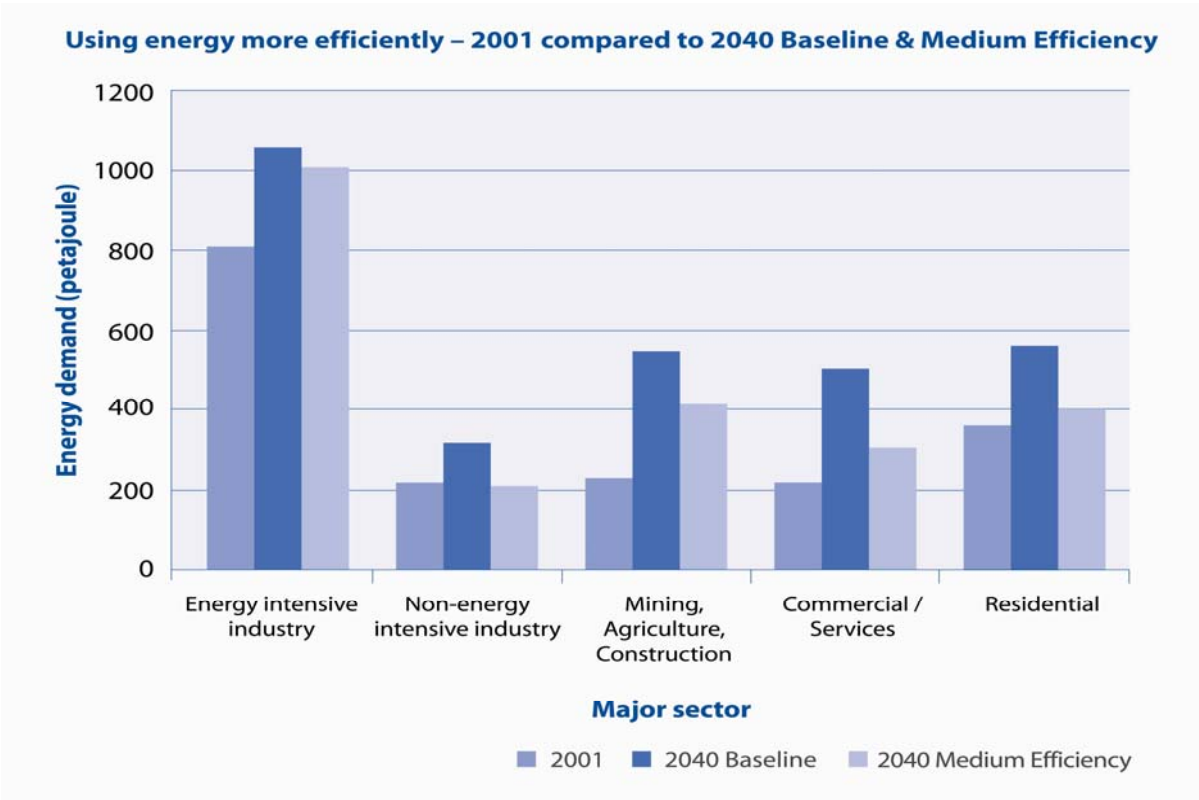


Note: The time path shown on this diagram is a notional one, based on the assumption that our policy recommendations are adopted



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Energy Efficiency Contribution to Australia's Growing Energy Demand

The Commonwealth Energy White Paper predicted Electrical Energy Consumption to increase 50% from 197TWh in 2003 to 290Thw in 2020. In real dollar terms this will mean that national spending on electrical energy will increase from almost $20b in 2003 to more than $29b in 2020. The White paper also highlighted the need for an investment of $37b was required to meet this increased demand under Business as Usual. The current Business as Usual projections are for demand for electrical energy to increase at a rate of 2.3% pa from 2003 through to 2020.

A program that increased the efficient use of the electrical energy at a rate of 1% pa of national electrical energy consumption would deliver $3.6b (in real dollars) in annual savings by 2020. This would reduce National Energy Consumption by 36TWh to 255 TWh compared to Business as Usual (these figures are after allowances have been made for distribution losses i.e. savings would be approximately 12% higher at the point of generation). Analysis supporting this claim is attached to this submission. This is a conservative target compared to the Clean Energy Futures and uses more conservative growth figures for energy consumption than the Energy White Paper.

Put another way, a program that increased the efficient use of the electrical energy at a rate of 1% pa of national consumption would offset 38% of new energy demand resulting in avoided infrastructure investment of approximately $14b. This in turn would result in an additional $850m to $1b in avoided annual interest costs. The greenhouse abatement resulting from such a program would be worth an additional $540m per annual in carbon credits (at today's EU trading prices).

Contribution of Energy Performance Contracting (EPC) to Australia's Growing Energy Demand

The Energy Performance Contracting industry has the potential to contribute a minimum 10% of such a 1% national Energy Efficiency program. The industry is currently estimated to have annual sales of approximately $40m per year and is projected to grow at 20% pa under the correct policy environment.

Approximately 60% of annual EPC sales are related to electrical Energy Efficiency improvements. In terms of energy cost savings, this means that by 2012 the EPC industry could contribute 10% of the savings required to deliver an increase in the efficient use of the electrical energy at a rate of 1% pa of national consumption.

*By 2020 the EPC industry could, under the correct policy environment, deliver in excess of $50m of new, guaranteed annual electrical energy savings nationally per year. Cumulatively these savings by 2020 would avoid the need to invest in four 1000MW generators***.**

The contribution of Energy Efficiency and Energy Performance Contracting to meeting national electricity demand are summarised in the following chart:

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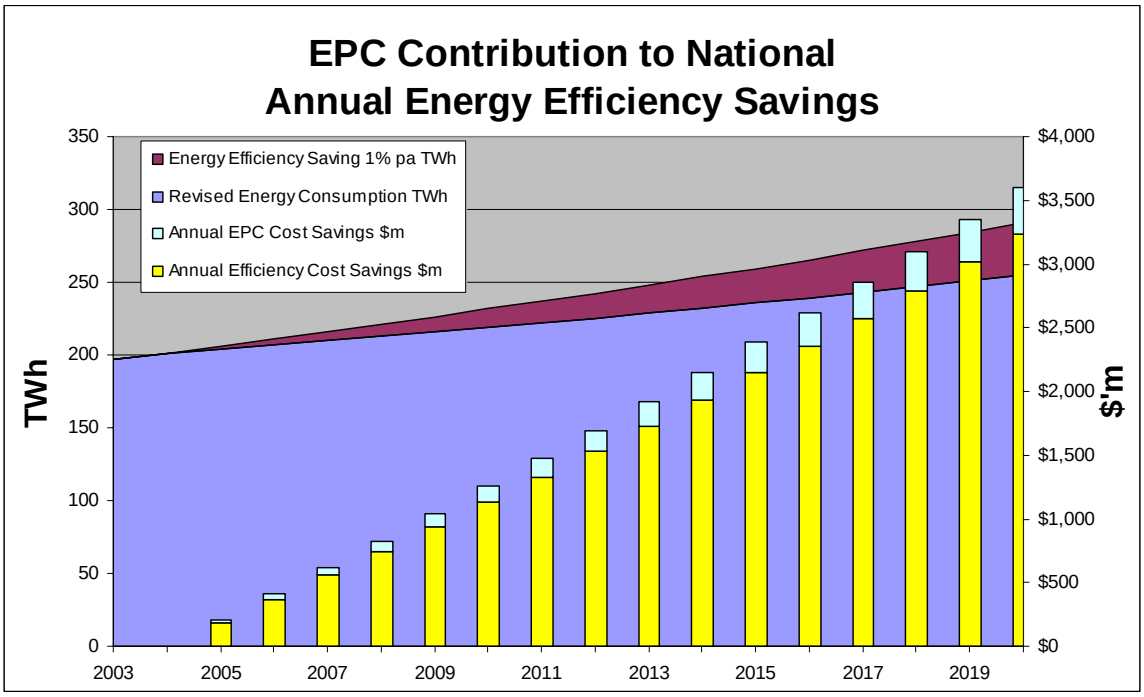

The Economic Benefits and Costs

Studies such as those mentioned above typically consider the direct savings on energy bills when assessing the cost-effectiveness of energy efficiency measures. But experience shows that there are often substantial non-energy benefits from energy efficiency measures, such as improved comfort, productivity, increased production capacity, and so on. For example, one US study showed that when non-energy benefits of energy efficiency measures in the steel industry were considered, the average payback period was cut from 4.2 years to 1.9 years (Worrell, 2004).

The US report “Green Building Cost and Financial Benefits” by Gregory H. Kats (copy attached) quantifies the various non energy related cost savings and benefits of green buildings. The key point is that energy efficiency accounts for only around 10% of the total economic benefits. A summary table of these benefits is reproduced below:

Energy Savings	$5.79/ft2
Emissions Value	$1.18/ft2
Water Value	$0.51/ft2
Waste Value (1 yr construction)	$0.03/ft2
Commissioning O&M	$8.47/ft2
Productivity and Health	$$36.89 -$55.33/ft2
Green Premium	($4.0/ft2)
20 Yr NPV	$48.87-$67.31/ft2

More research is needed to help qualify these additional cost savings and to provide a sound engineering basis for including these savings and benefits in the cost/benefit analysis of energy efficiency projects.

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Many of the costs of energy efficiency measures are associated with transaction costs, high prices (often due to low production volume and lack of mainstream acceptance). These costs can be reduced by effective policy intervention by government. A good example of the potential is the introduction of Minimum Energy Performance Standards for household refrigerators. The cost-benefit study for the Regulatory Impact Statement showed that MEPS was cost-effective, despite assumed increases in appliance price. In reality, showroom prices of MEPS compliant refrigerators are actually similar to those of competing products. Further, the Australian Greenhouse Office has shown that the appliance and equipment efficiency program has delivered large energy savings and greenhouse emission reductions at a cost of -$30 per tonne – this is equivalent to around a one year payback period. Clearly it would still be cost-effective to drive much more aggressive energy efficiency improvements.

It is also AEPCA view that distortions in the taxation system that offer 100% tax deductibility for maintenance and repair, but only standard depreciation rates for upgrades in energy efficiency. This distorts investment discissions and

The Effect of Cost-Effective Energy Efficiency Measures on Greenhouse Gas Emission

The *Clean Energy Futures* report also presents a conservative view of the greenhouse benefits of cost-effective energy efficiency measures. Clearly the externality of the impact Climate Change cannot be ignored and the benefit of energy efficiency in delivering abatement at a profit not a cost must be considered within the national policy context. The report identifies Energy Efficiency as accounting for about half of required emissions reductions for long term stabilisation of atmospheric CO2. In addition, avoiding expansion of conventional energy supply systems will reduce pollution of land, water and air associated with mining, processing, delivery, conversion and use of fossil fuels.

The NFEE modelling highlighted the following economic and greenhouse benefits from polices that delivered an adoption rate of 50% uptake of 4 year average payback energy efficiency projects:

- Real GDP $1.8 billion higher
- Employment increased by around 9000
- A 9% reduction in stationary final energy consumption (-213 PJ)
- A 9% reduction in greenhouse emissions from the stationary energy sector i.e. 32MT

The very real threat posed by global warming suggest that a national target should be set that delivers even higher reductions in energy use and greenhouse emissions. As a greenhouse abatement strategy energy efficiency has the lowest overall cost to the economy every effort should be made to maximise the savings delivered using this strategy.

Impact of 'Rebound Effect' '

AEPCA, like the BCSE, believes that rebound impacts from improving energy efficiency have been overstated. There are a number of possible outcomes of

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improving energy efficiency ranging from large rebound effects to large amplification effects. Policies, education and information can influence the outcome. For example, driving aggressive mandatory energy efficiency standards with quite long payback periods diverts money towards investment in energy efficiency and away from other economic activity, reducing the rebound effect. Through changing the behaviour of product and service suppliers, it can also transform the outcome into an amplification effect. Promoting investment in businesses that offer energy efficient products and services can build this sector of the economy, displacing businesses that deliver inefficient alternatives.

It is also important to recognise that economic models often incorporate past relationships between sectors so that they may overstate rebound effects. For example, if in recent history energy intensive activity has grown faster than the rest of the economy, then allocating money freed up by energy savings across the economy based on past experience will 'drive' more rapid growth of energy intensive industry in the modelling when there may be no other reason to expect such growth. This seems to be a significant factor in modelling the impacts of response to climate change on the Australian economy.

AEPCA endorses the discussion of the "rebound effect" included in the BCSE submission.

Barriers to Energy Efficiency and Their Impacts

Many papers have addressed these issues and copies of key reports have been provided to the Commissioners. Barriers to Energy Efficiency are well documented in the NFEE Discussion Paper and the BCSE and AEPCA NFEE Submissions. AEPCA specifically refers to the AEPCA NFEE submission previously provided to the Commission.

The attached report by the Allen Consulting Group includes a detailed discussion of barriers and policy measures to address these. These barriers are pervasive, and have a very major impact on adoption of energy efficiency. The *Issues Paper* identifies many of the barriers and discusses their potential impacts on energy efficiency improvement.

The lack of national vision and long term Energy Efficiency targets is a major issue in understanding barriers to the uptake of Energy Efficiency. This is reflected in the low priority afforded Energy Efficiency and the assumption that Energy Efficiency gains will occur under "business as usual" scenarios. This is in turn reflected in the perception that Energy Efficiency is simply a matter of picking up the $100 bills lying on the factory floor – a perception that oversimplifies and trivializes the issue and the impact of market barriers. The reality is that it is extremely difficult to see the $100 bills (i.e. opportunities) or to pick them up if they are glued to the floor (i.e. if there is no easy mechanism to implement energy efficiency projects).

A startling demonstration of the impact of barriers is the NFEE modelling of a 50% uptake over 12 years of Energy Efficiency measures with an average payback period of 2.3 years i.e. a 43% rate of return still requires significant market intervention rather than being Business as Usual.

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Barriers that specifically impact the Energy Performance Contracting Industry include:

1. Limited access to capital and a long budgetary cycle often leading to energy audit reports and proposal being outdated prior to funding being approved.
2. Limited access to technical resources especially those required to cover the wide variety of disciplines that make up Energy Efficiency (mechanical, electrical, water, waste, co-generation, greenhouse abatement, facilities management, maintenance, equipment upgrades, project management & renewable energy)
3. High transaction costs in aggregating, measuring and verifying relatively small savings from multiple technologies and/or sites
4. Energy Efficiency tenders based on lowest common denominator to enable an apples for apples comparison (rather than maximizing savings)
5. Picking low hanging (short payback) fruit makes it even more difficult to undertake longer payback projects.
6. A lack of standards and industry development (including a lack of standard processes, contracts, accredited suppliers, facilitators, M&V, etc.)
7. The traditional procurement process for Energy Efficiency that involves an energy audit where the auditor is not accountable for project outcomes
8. Energy Efficiency is a non-core activity concerning a small percentage of costs (despite directly affecting bottom line profits)
9. Perceived high risk results in a requirement for Energy Efficiency projects to deliver high rates of return
10. A failure to incorporate externalities including Greenhouse and Demand Management impacts
11. A failure of accurate price signals including a failure of full DSM avoided costs to be passed through and barriers to Energy Efficiency savings accessing the NEM
12. High transaction costs for Demand Side actions compared to supply side options including aggregation cost, M&V costs, facilitation costs of reaching end users, risks to aggregators of not meeting minimum levels of savings and information failures
13. The widespread use of Least First Cost procurement processes
14. Owner tenant split incentives
15. Limited Minimum performance standards for products, buildings and appliances

Rationale for Government Intervention

A compelling case for Government intervention being warranted is made very effectively in the attached Allen Consulting Group Report. If market distortions are removed then the market can and will deliver energy efficiency improvement. But this will require government intervention to create new mechanisms.

Further some distortions such as rural energy price subsidies, lack of price signals to buyers of air conditioners which add enormous peak demand cost imposts in all consumers, the outcomes of historical subsidies to fossil fuels, taxation mechanisms (including discrimination against investment in efficient technologies and against small

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projects that compete with large supply-side projects eligible for taxation incentives), NEM and other impediments to Demand Management and so on are unlikely to be fully removed in the short term. This means that there is also a compelling case for compensating subsidies to be applied which again requires Government action.

Other reasons for Government Intervention are:

- Where failure to capture energy efficiency opportunities in one sector would increase costs of compliance with other policies (such as greenhouse policies) for other sectors and for society overall, Government should act in the interests of society.
- If individuals and businesses are being harmed (either in financial or other ways) by their failure to capture energy efficiency measures, governments may act to reduce harm.
- Where widespread action would reduce the costs for individuals (both now and in the future) – for example, governments have traditionally required households to contribute to the cost (and even mandated connection) to sewage schemes and electricity grids in order to share the burden and maximise the benefits.
- If costs that are not included in present prices should be considered – eg carbon costs

Further, water used in power stations (electricity and gas production) in Australia, according to ABS 1997, was 1307.8 Gigalitres, or 6% of Australia's total water use. By comparison households accounted for 8% is Australia's water use. Significant savings in water use can be made through implementing energy efficiency initiatives that will result in decreased use of electrical and gas energy.

Many precedents for government intervention and the rationale for this intervention have been made in regarding to water supply and use and these apply equally to energy.

Costs and Benefits of Government Intervention

To date, the cost of government intervention to support energy efficiency has typically been a small percentage of the benefits produced. The benefits of appliance energy efficiency schemes relative to their costs (hundreds of millions of dollars per annum by 2010), alone, would offset a major investment in energy efficiency programs. Of course this investment will return further benefits worth many times the original investment.

Six case studies are presented below which demonstrated the cost effective application of government intervention

1. NSW SEDA program

A key element of the SEDA Energy Smart program was the use of EPC's as a delivery mechanism. Key elements of the program that saw approximately $30m invested in energy efficiency in NSW government operations are:

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1. Facilitating EPC uptake with agencies (including preliminary feasibility studies, developing and evaluating EOI's, developing M&V plans and independent technical support).
2. Development of standard contracts and processes
3. Use of accredited or pre-qualified ESCO's
4. Clear and short approval cycle for capital funding from Treasury with pre-defined financial hurdle rates for projects with guaranteed savings (EPC's).

2. Queensland Government Energy Management

The Queensland Government have recognized the contribution EPC's can make to reducing energy consumption and delivering cost savings to government agencies and enterprises. The key policy initiatives taken to deliver the outcomes are:

1. Setting clear and measurable targets: $20m in annual energy cost savings to the Queensland Government by 2008.
2. GEMs staff facilitating EPC uptake with agencies (including preliminary feasibility studies, developing and evaluating EOI's.
3. Development of standard contracts and processes
4. Industry capacity building to ensure capacity to deliver results
5. Use of accredited or pre-qualified ESCO's
6. Clear and short approval cycle for capital funding from Treasury with pre-defined financial hurdle rates for projects with guaranteed savings (EPC's).

3. New York Demand Management Fund

This Demand Side Energy Management program has delivered a $100m reduction in annual energy savings since 1998. Current projects are expected to double these annual energy cost savings to $200m per year.

Details of the New York Energy $mart Program Evaluation and Status Report is available on NYSERDA's web site: www.nyserda.org, a copy of the executive summary report is attached to this submission.

The overarching conclusion of the evaluation effort finds that the Program has fostered and accelerated market development in the areas of Energy Efficiency, peak load reduction, and renewable energy that would not have occurred absent the Program. Key outcomes of the program are:

1. The investment of approximately $350 million in the New York Energy $mart portfolio has brought about an estimated additional investment of $850 million, for a total of $1.2 billion, in public and private sector energy- and efficiency-related investment in the State as of December 31, 2003 – when fully implemented, the Program is expected to have resulted in a total of $2.8 billion of new investment in the State. The Program has created an average of 3,500 jobs annually over the 1998 through December 31, 2003 period. 1

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2. The Program is expected to create an average of 5,500 jobs annually over the full eight-year Program period (1998-2006).
3. The Program has reduced annual electricity use in the State by about 1,000 GWh as of year-end 2003, contributing to the State's standing as the most energy-efficient state in the nation on a per capita basis in 2003. Annual savings is expected to reach 2,700 GWh annually when the Program is fully implemented.
4. The Program has enabled electricity customers to reduce their coincident peak demand by up to 880 megawatts (MW). These savings include peak demand reductions from implementing Energy Efficiency measures and callable reductions available when required by the New York Independent System Operator (NYISO) – enhancing the stability and reliability of the State's electricity grid, potentially shielding New York ratepayers from price increases associated with insufficient energy capacity and energy shortfalls at the time of peak demand.
5. The annual energy bill savings for participating customers is estimated to be $140 million for Program activities through year-end 2003, including electricity, oil, and natural gas savings from Energy Efficiency and peak load management services provided. Assuming that the installed energy-efficiency measures will continue to save ratepayers money for an average of ten years, the $1.4 billion in savings compares favourably to the $350 million investment to date through the Program. Participating customers' bill savings is expected to increase to $380 million annually when the Program is fully implemented. Total energy cost savings for all customers, including non-participating customers, is estimated to be $196 million for Program activities through yearend 2003, increasing to $420 million to $435 million at full implementation.
6. The Program has contributed to improving energy diversity in the State by reducing electricity use and peak demand.
7. The Program is helping to improve the State's air quality by reducing air pollutant emissions from the combustion of fossil fuels.
8. The Program has begun to transform markets and end-use consumer decision-making in support of greater and sustainable levels of Energy Efficiency that would not have occurred absent the Program.

4. Toronto Better Buildings Partnership

This program has improved energy efficiency in 440 commercial buildings in Toronto covering 4,000,000m2 generating energy sot savings of $16m pa. The program has delivered a total economic impact of $132m and created 4000 jobs.

On the basis of these results the program now has a target of improving energy efficiency in 40,000,000m2 of commercial buildings in Toronto creating $3b in cost savings and 3Mt of greenhouse abetment while creating 90,000 new jobs in the 2008 to 2012 period. As with other similar programs, key elements include a panel of 36 pre-qualified energy management firms who use a turnkey delivery to provide guaranteed savings to end-users.

For further details please contact Nestor Uhera at the Better Buildings Partnership (nuhera@toronto.ca) or the website at www.torontobbp.on.ca

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5. US Federal Energy Management Program and Performance Contracting (FEMP*)*

Energy Savings Performance Contracts (ESPCs) are contracts through which private energy service companies (ESCOs) provide energy-efficiency improvements to federal buildings at little or no additional cost to the US federal government.

Although Energy Efficiency improvements to US federal buildings save taxpayers money over time, they require an up-front investment. US Federal appropriations do not provide enough funds for federal agencies to reap the large potential savings from Energy Efficiency investments. Thus the US Congress has authorized federal agencies to turn to the private sector for investment capital. Energy Service Companies (ESCOs) finance and help implement energy-saving improvements to federal buildings through Energy Savings Performance Contracts (ESPCs). The contractor is paid out of the resulting stream of energy bill savings. Thus the federal agency pays no upfront capital costs for the upgrade, and the payments are guaranteed not to exceed the energy bill savings. The government retains any savings that exceed the ESPC payments during the duration of the contract, and retains all savings once the contract is complete.

According to the Alliance to Save Energy's report, Leading by Example, the federal government wastes $1 billion a year in energy use in buildings alone. ESPCs provided $298 million for energy improvements to federal facilities in 2001, over 40 percent of all funding to reduce the waste.

However, the authority for federal agencies to enter into ESPCs expired on September 30, 2003. As a result, new ESPC contracts and many task orders on existing contracts lapsed. The lapse in ESPC authority is costing the federal government millions of dollars in energy savings every month. In the private sector, the lapse is harming the many businesses involved in the ESPC program, including contract providers, financiers, and product suppliers.

A two-year extension of authority for the federal government to enter into Energy Savings Performance Contracts (ESPCs) was therefore authorised and became law when passed by Congress and signed by President Bush October 28. ESPCs allow federal agencies to upgrade the efficiency of their buildings and pay the contractor over an extended time period by using the money saved on energy bills. This important financing tool allows the federal government, America's biggest single energy user, to increase its Energy Efficiency without spending tax dollars.

A presentation on the US GEMP program is attached to this submission.

6. The Case for Energy Efficiency Public Benefit Fund

The New Mother Lode: The Potential for More Efficient Electricity Use in the Southwest report in the Hewlett Foundation Energy Series (November 2002) examines the potential for and benefits from increasing the efficiency of electricity use in the southwest states of Arizona, Colorado, Nevada, New Mexico, Utah, and Wyoming. The study models two scenarios, a "business as usual" Base Scenario and a High Efficiency Scenario that gradually increases the efficiency of electricity use in homes and workplaces during 2003- 2020.

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The report identifies major regional benefits of pursuing the High Efficiency Scenario that include:

1. Reducing total electricity consumption 18 percent (41,400 GWh/yr) by 2010 and 33 percent (99,000 GWh/yr) by 2020;
2. Eliminating the need to construct thirty-four 500 megawatt power plants or their equivalent by 2020;
3. Saving consumers and businesses $28 billion net between 2003-2020, or about $4,800 per current household in the region;
4. Increasing regional employment by 58,400 jobs (about 0.45 percent) and regional personal income by $1.34 billion per year by 2020;
5. Saving 25 billion gallons of water per year by 2010 and nearly 62 billion gallons per year by 2020; and reducing carbon dioxide emissions, the main gas contributing to human-induced global warming, by 13 percent in 2010 and 26 percent in 2020, relative to the emissions of the Base Scenario.

The report found that these significant benefits could be achieved with a total investment of nearly $9 billion in efficiency measures during 2003-2020 (2000 $). The total economic benefit during this period is estimated to be about $37 billion, meaning the benefit-cost ratio is about 4.2. The efficiency measures on average would have a cost of $0.02 per kWh saved.

The High Efficiency Scenario was based on the accelerated adoption of cost-effective energy efficiency measures, including more efficient appliances and air conditioning systems, more efficient lamps and other lighting devices, more efficient design and construction of new homes and commercial buildings, efficiency improvements in motor systems, and greater efficiency in other devices and processes used by industry. The report noted that these measures are all commercially available but under utilized today. Accelerated adoption of these measures cannot eliminate all the electricity demand growth anticipated by 2020 in the Base Scenario, but it could eliminate most of it.

The High Efficiency Scenario indicated slightly different savings levels among the six states. The savings potential in 2010 equals 17 percent in Colorado and Utah, 18 percent in Arizona and Nevada, and 19 percent in New Mexico and Wyoming. The savings potential in 2020 equals 31 percent in Colorado, Nevada, and Utah, 34 percent in Arizona, and 36 percent in New Mexico and Wyoming.

The study acknowledges that the High Efficiency future will not happen on its own. While some utility, state, and local energy efficiency programs are advancing energy efficiency in the region, these programs are relatively limited in scope and budget. The study recommends new and expanded initiatives to achieve the High Efficiency future and its benefits, including:

1. Adopting Systems Benefit Charges or Energy Efficiency Performance Standards to expand utility-based energy efficiency programs;
2. Providing utilities with financial incentives to implement energy efficiency programs;

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3. Reforming utility rates to encourage greater energy efficiency;
4. Upgrading to state-of-the-art building codes and promoting the construction of highly efficient new buildings that exceed these codes;
5. Adopting minimum efficiency standards on products not yet covered by national standards;
6. Providing sales tax or income tax credits for innovative energy-efficient technologies;
7. Expanding participation in industrial voluntary commitment programs;
8. Adopting “best practices” in public sector energy management;
9. Expanding energy efficiency training and technical assistance programs; and
10. Incorporating energy efficiency initiatives in pollution control strategies.

Implementing a combination of these policies could result in achieving the full savings potential identified in this study, 18 percent savings by 2010 and 33 percent saving by 2020 for the region as a whole. The report notes that the time has come for the southwest to “mine” this most attractive energy resource—greater energy efficiency.

The report also examines the adoption of an Energy Efficiency Performance Standard (EEPS) as a means of achieving much greater energy efficiency through utility-sponsored programs in the southwest states. An EEPS would specify energy savings targets and timetables for distribution utilities, rather than specifying funding levels. It would then be left to the utilities to achieve the savings targets, spending as little money as necessary. As part of this policy, it may be possible to establish a market for energy savings certificates or credits, thereby enabling independent developers of energy efficiency projects (e.g., energy service companies, ESCOs) to participate in and benefit from the energy savings requirements. A variation on the EEPS concept is being implemented in Texas where utility restructuring legislation adopted in 1999 requires that electric utilities implement energy programs sufficient to save at least 10 percent of their projected load growth (Kushler and Witte 2001). The EEPS approach is also being implemented in some European countries including the United Kingdom and Italy (Pavan 2002). It is a promising approach in that it could lead to substantial electricity savings at lower cost than the SBC (what does this stand for) approach. In order to effectively implement an EEPS, both reliable and practical procedures for monitoring and verifying energy savings are needed.

Considerable progress has been made in the United States and other countries in developing such procedures due to the need to evaluate the energy savings from projects implemented by ESCOs as well as energy efficiency programs more generally (DOE 2001).

The report also examines providing Utilities with Financial Incentives to Implement Effective Energy Efficiency Programs.

Many utilities resist operating vigorous end-use energy efficiency programs because it reduces their sales and revenues in the short run (Cowart 2001). Therefore, utility regulators or legislatures in states such as California, Massachusetts, Minnesota, New York, and Oregon have adopted policies that

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allow utilities to benefit financially from operating effective energy efficiency programs. These financial incentives, sometimes known as shareholder incentives, reward utilities based on the level of energy savings produced and/or cost effectiveness of their energy efficiency programs. For example, utilities in California, Massachusetts, New York, and Oregon were allowed to keep 8-27 percent of the net economic benefits produced by their energy efficiency programs during the mid-1990s (Stoft, Eto, and Kito 1995). In practical terms, this meant a very small rate increase once the net benefits and shareholder incentive level were determined. In most states, the financial incentives are offered in conjunction with energy efficiency program spending or savings requirements.

To illustrate how this policy can work, Pacific Gas and Electric Co. spent $224 million on energy efficiency and load management programs in 1992 (2.9% of their revenues). After the impacts and net benefits of the program were analysed and approved by the California PUC, the utility was allowed to collect $44.9 million in shareholder incentives in addition to recovering program.

The above case studies both demonstrate the case and the outcomes achievable for active government intervention via suitable regulatory and policy programs.

Organisational Barriers and the Cost of Overcoming Them

The myriad of internal barriers to adoption of cost-effective energy efficiency measures have been widely documented and made available to the Commission. Perhaps the starkest demonstration of this is a well know industry leader in Energy Efficiency. The company implemented an energy efficiency program backed with a first year budget of $500,000. Despite very successful, award winning outcomes and returns of better than 50% on the investments, the budget was reduced to zero in year two of the program.

Organisational and cultural barriers also exist within government, particularly within economic and industry portfolios. Examples of the kinds of barriers arising from the culture within government include:

1. Increase in tax deductions for exploration for oil with no matching incentive for people to invest in cars and trucks that use less oil
2. Energy supply projects eligible for ‘large project’ status and associated benefits while large numbers of small energy efficiency investments fail to gain matching benefits
3. The assessment of innovation potential in the Government’s recent White Paper on energy categorised all energy efficiency as ‘fast follower’ status instead of ‘market leader’ – presumably this will influence allocation of RD&D funds away from energy efficiency and towards other areas designated to have greater potential.
4. While coordination of energy efficiency policy and programs potentially reduces the costs and time spent in delivery and enhances compliance, the reality is often far from this. However history shows very long delays or complete failures in the delivery of such energy efficiency programs when attempts have been made to coordinate programs nationally.

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5. Most national processes lead to “lowest common denominator” outcomes rather than ‘best practice’, as leaders compromise in response to jurisdictions that are less committed
6. Increased influence of vested interest groups and reduced influence of community also occur as the process shifts towards the national level. The reality is that the strongest supporters of energy efficiency tend to be dispersed – they include energy users, community groups and small businesses. These groups struggle to compete against the powerful nationally organised groups and institutions who play critical roles in national processes
7. Problems with allocation of adequate resources also occur commonly in national processes, as each jurisdiction tries to capture maximum benefits at minimum cost

Within business, a particular cultural barrier seems to be the focus on cashflow over net benefit to the business. Some, like Hugh Morgan, CEO of the Business Council of Australia, describe this as ‘short termism’ that is leading to loss of long term value in Australian business. This distortion is driven by short employment contracts, pressures to make sure balance sheets look good in the short term.

In this context, it is not surprising if a finance manager prefers to repair equipment than to upgrade its efficiency, or even invest in more efficient (and probably more productive) replacement equipment. The repair can claim 100% tax deductibility that year, and leaves cashflow looking good while the CFO can claim (s) is a success. But the alternative investment is more likely to secure a successful future for the business – but the business can only claim depreciation.

Another cultural issue is that capital funding is treated very differently from recurrent funding. Further, where the recurrent cost of energy is relatively small for most businesses, capital investments in new equipment are seen as major issues. In a context where technical staff are generally not very good at putting strong business cases, and energy is a minor issue, it is not surprising that there is a reluctance to invest in energy efficiency.

Policy Directions and Recommendation

An important and first step is to commit to energy efficiency targets.

The target could be stated in a number of different ways and in the Clean Energy Future study we believe that energy consumption growth should be limited to a minimum 25 per cent increase in 2040 compared to 2001. Given that electricity supply dominates greenhouse emissions a separate target needs to be established for electricity use.

The target could be stated in a number of different ways. The Clean Energy Future study suggests that energy consumption growth should be limited to a minimum 25 per cent increase in 2040 compared to 2001. Given that electricity supply dominates greenhouse emissions a separate target needs to be established for electricity use.

AEPCA recommends a National Energy Savings Target for electrical energy that increases the efficient use of the electrical energy at a rate of 1% pa of national

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electrical energy consumption or put another way, a target of reducing national energy consumption by 36TWh by 2020 compared to the Business as Usual case.

AEPCA endorses the five broad elements needed for an effective energy efficiency strategy, these are set out below.

1. Australian Governments should explore whether Energy Efficiency can be made more economically viable and how electricity prices could be set to reflect the full environmental costs of delivering it by improved pricing. To the extent that Energy is underpriced because of the failure to take account of environmental externalities associated with its delivery, current levels of Energy Efficiency are likely to be sub-optimal. AEPCA therefore recommends that broad-based market signals be introduced to drive new investment in energy efficiency. Two major types of signal can be used, preferably in combination:
    a. A greenhouse market signal, such as a comprehensive emissions trading scheme. While this will provide a significant signal to large energy consumers, it is likely that, to limit administrative cost and complexity, emissions trading will focus on large emitters and energy conversion facilities and, as such, will be seen by smaller consumers as just a small increase in energy price. This is likely to have little impact on their behaviour. Further, for business development reasons, power stations seem more likely to try to limit their greenhouse costs by reducing the greenhouse intensity of their electricity, rather than by encouraging customers to buy less of the product they sell. So, while emissions trading is important, it is unlikely to be sufficient to drive energy efficiency at point of use.
    b. An energy efficiency certificate trading scheme, such as the 'white' certificate schemes being developed overseas, or a scheme focused on energy suppliers, for example a scheme similar to the NSW Greenhouse Abatement Scheme (with fair treatment of demand side action). Creation of a tangible market in energy efficiency certificates, especially one that offers deeming (that is, creates certificates covering the lifetime of the efficiency measure) at time of installation provides a way of focusing attention on energy efficiency. Deeming also provides a way of reducing the negative impact on adoption rates due to application of high discount rates by investors, as it provides a lifecycle benefit 'up front'

2. Make energy markets work for customers:
    a. It is now widely recognised that reformed energy markets are failing to facilitate active involvement from the demand side. This is leading to over-investment in supply-side solutions. Price signals to energy customers should reflect their impact on network investments. Benefits provided by energy efficiency investments should be rewarded. DSM solutions to meet energy demand – of all levels of sophistication – should be rewarded equally with network solutions, through the following measures:
        i. Require electricity distributors to develop strategies and implement pricing approaches that encourage energy efficiency and implementation of greenhouse abatement activities;

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ii. Charge customers for the impact that they have on electricity system costs, specifically on a peak demand[1] basis.
iii. Require distribution businesses to provide a series of standard offer rates that are available to energy efficiency, and other demand management options (including embedded generation). This would take the form of a negative congestion price that would be available for any activity that resulted in a reduction of power consumption. This creates a standard forward price, to which energy efficiency and DSM proponents would respond.

b. Establishment of Energy Conservation DSM Fund to support the development and implementation of demand side and local generation alternatives to network augmentation. Financing for the DSM fund could be sourced from a number of areas, including as a proportion of future capital expenditure a $/kWh charge or as $/kW on peak power needs. The funds need to be administered by an organisation independent of the distribution businesses and government.

c. Remove distortions beyond energy markets that work against energy efficiency. For example, installation of an airconditioner for a business attracts the higher depreciation rate for machinery, while installing building improvements such as double glazing attracts the lower depreciation rate for buildings. And, of course, the cost of the extra electricity wasted by the airconditioner is tax deductible. Similarly, where a business replaces or repairs faulty equipment with similar equipment, it can claim the cost as maintenance, and receive a full tax deduction in that year. But if they upgrade efficiency, the Tax Office considers this to be a capital investment, so the business can only claim depreciation. For businesses focused on cash flow, this is a major barrier.

3. Regulate for minimum energy performance in the built environment. It is now accepted by State and Commonwealth Governments, and by the building industry itself, that regulation is essential if building energy performance is to be improved. However, regulation should extend beyond just the building envelope: the NSW Government's BASIX system provides a useful model of how this could be done.

   Further, it is critical that regulation includes mechanisms for ensuring accountability based on actual performance. The Australian Building Greenhouse rating Scheme's commitment agreement provides a model for linking development and construction of buildings to accountability for performance, and this approach must be applied more widely. There is also an urgent need to apply regulation to renovations and existing buildings.

   The Australian Building Greenhouse Rating scheme (ABGR) is the most widely used building energy performance rating tool in Australia having been adopted by most governments at most levels. It relies on the measuring the actual annual energy performance of a building. Other rating tools such as the Green Buildings Council of Australia 'green star" rating tool suite rely on design intent and as such have the potential of distorting market outcomes. The ACCC have also been asked to examine the potential for such a design intent rating scheme to mislead the market about the final performance of a building. AEPCA strongly recommends the use of performance based rating systems that measure actual performance.

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Any design intent rating system must include make good clauses to ensure that actual performance matches the claimed design intent.

The Ministerial Council on Energy's has agreed to introduce requirements for disclosure of energy performance at time of resale and leasing. However, it is important that this disclosure goes beyond a design-based building thermal rating (such as EERSOP in ACT) and reflects the efficiencies and likely running costs of fixed equipment such as water heaters, lighting and space conditioning, as well as any on-site generation such as PV. These factors feed into energy bills, so that an effective disclosure mechanism could play an important role in improving the competitiveness of business tenants, and improving equity for residential tenants. It is also desirable that there be incentives to move beyond basic compliance with regulations. AEPCA also draws the Commissions attention to a submission by Exergy Australia Limited that examines in detail the issue of performance rating tools and AEPCA endorses this report.

4. Drive a more energy efficient manufacturing industry. The energy efficiency performance of Australian business is not outstanding; indeed the NFEE claimed that it is below average for developed countries. While Australia's relatively low energy prices account for part of the explanation, programs such as Energy Efficiency Best Practice and state government programs have shown that there is substantial potential for cost-effective savings, many of which also add to business success by improving product quality or plant productivity. A combination of requirements for implementation of economic energy efficiency measures (based on experience of programs such as EPA Victoria's greenhouse requirements for industrial licence holders) and information, analysis and demonstration are needed. Appropriate policy measures include:
    a. Mandatory requirement for large energy users to undertake energy audits and report on performance, be required to undertake investment if meets minimum four year pay-back.
    b. Development of cogeneration targets and incentives to support the assessment and implementation of cogeneration
    c. Support the funding of feasibility studies for cogeneration and innovation in energy efficiency based on the SEAV Business Energy Innovation Initiative (BEII) model.
    d. Re-institute funding support for the successful Energy Efficiency Best Practice Program that worked on an industry basis to improve energy efficiency.

5. Develop the emerging energy services industry. This means building capacity within energy consuming businesses, suppliers and installers of products and services. To achieve this requires a multi-faceted approach that includes creating sustained demand for energy efficient goods and services by driving commercialisation, innovation and regulation, while providing training and education.

AEPCA Specific EPC Recommendations

.While practices should as much as possible reflect the so-called "externalities" – or the true environmental costs of delivering electricity –pricing alone is not enough to

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ensure allocation was efficient. Full externality pricing is at best a longer-term goal and Governments should therefore consider other ways to manage Energy use, such as developing trading regimes and even introducing regulatory controls.

With the emphasis on Energy Performance Contracting, AEPCA recommends the following key strategies to drive significant improvements in Australian energy efficiency:

1. An emphasis of Energy Efficiency policy should be on Governments driving innovation, capturing economies of scale and ensuring increased rates of adoption of energy efficient technologies and services through proven techniques, especially energy performance contracts. Energy Performance Contracting is a delivery vehicle that can and does guaranty energy efficiency outcomes.
2. That in order to drive technology based energy efficiency solutions, especially those relating to the built environment, requires a mandatory approach energy and greenhouse performance standards.
3. More research is needed to help qualify the additional cost savings and benefits from green and sustainable buildings so as to provide a sound engineering basis for including these savings and benefits in the cost/benefit analysis of energy efficiency projects.
6. Develop an effective Energy Efficiency industry through an Industry Development Program that includes the development of the Energy Performance Contracting Industry as a key delivery vehicle for Energy Efficiency. Building industry capacity and capability involves:
    a. Development of standards and accreditation
    b. Provision of training
    c. Development of effective ***performance*** based rating tools
    d. Development of toolkits and resources for various end-user sectors such as; local government, process industries, community facilities, retail buildings, commercial buildings, etc.
    e. Support for promotion and marketing to end use customers
    f. Support for the funding of cogeneration feasibility studies and energy performance contract facilitators.

    A US report released during 2003 on International Energy Services Companies (ESCOs) calculated the total amount of ESCO activity outside the U.S. in 2001 was between US$560 million and US$620 million. This was approximately one-half to one-third of the ESCO revenues in the U.S. for 2002. The report also noted that persistent barriers inhibit many cost-effective energy-efficiency projects and prevent the full development of the ESCO industry internationally. The report found that strategic actions are needed for fostering the development of the ESCO industry. These actions together with AEPCA recommendations form the basis of an EPC Industry Development Action Plan:

    a. Increase information about energy-efficiency projects, financing opportunities, and services offered by ESCOs.

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b. Ensure that ESCOs provide a qualified and reliable service through government recognition and adoption of national training and accreditation schemes run by AEPCA.

c. Create more information for financial institutions, and provide incentives to the "first movers" in this sector.

d. Standardize contracts, process and a Best Practice Guide for private sector EPC's.

e. Standardize measurement and verification for ESCO projects.

f. Conduct ESCO demonstration case study projects in various end user sectors.

g. Promote energy performance contracting in local, regional, and federal government infrastructure.

h. Judicious use of DM funding to provide financial incentive mechanisms to accelerate progress where other incentives don't provide impetus. (eg: financial incentives for sub metering, subsidized interest loans, offset payments to reduce transaction costs and Facilitator funding)

i. Implementing energy efficiency projects through programs such as the Energy Smart SEDA programs

j. R&D and Commercialisation programs

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Attachments to the AEPCA Submission:

Allen Consulting Group Report

Clean Energy Futures Study –Communications Summary

Barriers to Energy Efficiency and Energy Performance Contracting

Cost & Benefits of Green Buildings - Summary

New Mother Lode Report

NY Energy $mart Program Report

US FEMP Performance Contracting Presentation

Energy Efficiency Best Practice EPC Brochure