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Australian CRC for Renewable Energy
ACRE Energy Policy Group

Towards a National Framework for Energy Efficiency – Issues and Challenges

SERGO Submission – *Executive Summary*
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The Energy Efficiency and Greenhouse Working Group (E2G2) established under the CoAG Ministerial Council on Energy is developing a National Framework for Energy Efficiency (NFEE), and recently released a Discussion paper on NFEE issues and challenges. This seeks information and input from stakeholders on how to effectively address the key barriers, challenges and opportunities which are outlined in the paper.

This submission by the Sustainable Energy Research Group of the University of NSW (SERGO) draws upon a range of energy policy work in electricity restructuring, energy efficiency and environmental markets undertaken by our group over the last decade. It also draws upon some of the outcomes of a joint SERGO and ACRE Energy Policy Group one-day workshop, *Energy Efficiency: Policy in Practice,* which was held at UNSW on 4 March 2004.[2]

Key Requirements

Common themes that emerge from analysis of the various policy tools and experiences in their implementation, suggest the following key requirements for successful energy efficiency policy:

- No single policy instrument is able to deliver appropriate levels of energy efficiency improvement. What is needed is a pragmatic approach within a visionary policy framework that contains a coherent package of policy instruments.
- Policy implementation must be of consistently high quality, capturing synergies, recognising the laws of physics & chemistry, and containing sound monitoring and review processes to learn from experience.

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[2] See the UNSW ERGO website at www.ergo.ee.unsw.edu.au for more information on this ongoing work, and the recent Energy Efficiency: Policy in Practice workshop.

- Retail electricity market design must be improved, with enhanced support for demand-side decision-making in recognition of its complex, interlinked nature.
- There must be commitment from the top.

Background

Despite the evident benefits and great potential of energy efficiency, policy intervention to promote energy efficiency is required, because:

- Many of the benefits are market externalities – that is, their environmental and social 'values' are public goods.
- Retail electricity markets are dysfunctional in their design and do not support informed and efficient demand-side decision-making.
- There is widespread market failure in end-use decision-making, as users fail to undertake cost-effective efficiency options either because they are not greatly motivated by energy prices or are poorly equipped to respond to price signals.
- The ability to improve end-use energy efficiency, and the costs and benefits associated with doing so, are often spread between many players such as government planners, infrastructure providers, equipment manufacturers, service providers and owners as well as the actual energy end-users.

The reasons for poor decision-making are complex and include:

- a poor understanding of energy efficiency by key decision makers, compounded by difficulty in visualizing outcomes and hence capturing media or community attention,
- little motivation for many energy consumers– the relatively low cost of energy, the effort required to contemplate energy efficiency options and the risks in implementing them means decisions are often driven by other priorities,
- a range of institutional barriers to action for even informed and motivated decision makers, including electricity industry restructuring that has defined the role of a retailer to be an electricity sales agent rather than a facilitator of cost-effective end-use energy services, and
- the need for coordination amongst numerous decision makers in order to achieve many of the available energy efficiency improvements.

For the purposes of discussion, it is useful to classify energy efficiency policy options according to scope, target and mode of influence:

Scope:

- broad measures that aim to 'reach' across many and diverse economic sectors (eg. Energy Efficiency Certificate Trading (EECT)) which, in principle, seem to be a powerful means of 'pricing' energy efficiency into energy markets. However, there is only very limited experience worldwide with their use, there are serious difficulties to be overcome in their design (see Appendix A) and they would almost certainly not be sufficient alone
- mechanisms targeted at particular sectors or technologies (eg. Minimum Energy Performance Standards (MEPS) for particular appliances)

Target:

- the use (operation) of existing assets,
- investment choices in new infrastructure and equipment (by end-users, electricity generators, distributors and retailers, building and equipment designers and manufacturers, the construction

industry, financial institutions and government planners), to ensure long-lived assets are as efficient as possible and do not lock in high levels of energy consumption for decades to come
- R&D and innovation to widen the range of investment choices over the medium to longer-term.

Mode of influence:
- support mechanisms such as the provision of information, encouragement and assistance in decision making (eg. consumer information centres, R&D funding), which are typically voluntary and have typically been the most widely implemented energy efficiency policy measures to date. They can provide useful learning experiences for early mover individuals and firms, and a 'policy frontier' for policy makers,[3]
- control or regulatory mechanisms (eg. MEPS or electricity retailer licence conditions), which move all decision makers towards more efficient energy choices, and
- market mechanisms that change the effective 'price' seen by decision makers for different energy options (eg. EECT, tax credits and subsidies). Market mechanisms can be usefully separated according to whether or not they make use of tradable instruments, to provide additional flexibility to scheme participants.

This submission discusses some of the key policy mechanisms that are likely to be required in any effective energy efficiency policy framework. Some of our recommendations flow from the presentations and discussion at the policy workshop referred to above, however we do not claim consensus amongst workshop participants for the views presented here. The measures considered are:
- The impact of electricity industry restructuring on improved energy efficiency
- Government Leadership by example through government energy management programs
- Regulation: Minimum Energy Performance Standards and Building Ratings Schemes
- Energy Efficiency Certificate Trading.

For each mechanism a brief description is provided, along with some of the design and implementation lessons that have emerged from experiences to date. This is followed by discussion of possible ways to move forward.

Discussion and recommendations

- ***Enhancements to electricity industry restructuring:***

The rationale for electricity industry restructuring depends critically on informed decision-making by energy buyers. However, the dysfunctional nature of retail electricity markets, for example uniform tariff policies motivated by the essential good nature of electricity supply, a historically low level of market knowledge or involvement and wide ranging consumer misconceptions about energy supply, create particular barriers to informed demand-side decision making. This has been exacerbated by the specification of the role of retailers as electricity sales agents rather than facilitators of cost-effective end-use energy services.[4] Thus far greater attention should now be paid to retail market design and demand-side decision-making. In particular, the role of retailers in the restructured energy industries should be re-specified as energy service facilitators.

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[3] See, for example, Dowlatabadi, H., Boyd, D. and MacDonald, J. 2003. From vacuous debate to informed policy: the case for adaptive climate policy. *UBC Sustainable Development Research Institute Discussion Paper*, March.

[4] See Hugh Outhred's presentation to *the Energy Efficiency: Policy in Practice* Workshop.

- ***Government leadership by example:***

Governments have a long history of implementing energy management programs, with varying degrees of success. Such programs allow government to reduce its own energy consumption, associated costs and production of greenhouse gases, support a local sustainable energy services industry, and lead by example, thus both demonstrating the potential and providing valuable information on appropriate design and implementation of energy efficiency programs in the wider community.

Some recent Australian programs have achieved significant reductions in energy use, greenhouse emissions and costs.[5] Success is strongly influenced by key aspects of design and implementation, including: the scope of operations covered; targets, standards and timelines; responsibility for implementation; assistance with implementation (financial and other resources); support for renewable energy; reporting arrangements; and the auditing/review process. There may be benefits in tailored targets for different departments, particularly if they are seen to be part of an overall long term strategy. Ongoing support, combined with personnel and management training and appropriate incentives or penalties is needed, as programs are otherwise often forgotten soon after their introduction. Flexibility in approach may be useful, so that performance contracting, green power purchase or "internal energy savings or emissions trading" can be used to deal for instance with energy use in transport fleets one year or buildings in another.

- ***Command and control regulation:***

Some of the greatest successes in energy efficiency policy, as measured by their impact on energy use, come from 'command and control' regulatory programs. These can reduce the transaction costs and effort required by individual decision makers to choose optimal levels of energy use, by effectively taking some energy efficiency decisions at the societal level – for example, legislated building standards and equipment MEPS. In addition, there is a clear perception amongst practitioners that industry and regulators lag behind community expectations of sustainable development, making regulation an acceptable approach.

The role of regulation for energy efficiency is highlighted by the UK Energy Savings Trust which notes that "Price based mechanisms, in general, will not address the information and consumer related barriers to energy efficiency investment – here regulatory solutions tend to be more effective." In particular, "Neo-classical economic conceptions of regulation as inherently less efficient than market based instruments cannot be applied to energy efficiency, because of the extent of market failure… In practice, some examples of regulation have proved very cost-effective".[6] The UK *Energy White Paper* includes higher building and product standards and encouraging innovation in its major policy proposals.[7] Similarly for Australia, the focus of energy efficiency policy should be on regulatory approaches, supplemented by other measures to ensure that all opportunities in all sectors are captured.

- ***Minimum Energy Performance Standards (MEPS):***

Electrical appliance use has increased significantly in recent decades and MEPS is a proven and effective mechanism which has seen progressive improvements in the efficiency of appliances around the world.[8] MEPS deals with measurable components, not holistic systems. It removes the worst performing appliances from the market, but does not drive the best. Also, applying MEPS to a

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[5] See Robert Passey's presentation to *the Energy Efficiency: Policy in Practice* Workshop.

[6] Energy Savings Trust. 2002. Putting Climate Change at the Heart of Energy Policy. *Submission to the UK Energy White Paper*. London.

[7] UK DTI. 2003. *Energy White Paper: Our energy future – creating a low carbon economy*. UK DTI report. London.

[8] See, for example, Tony Marker's presentation for the *Energy Efficiency, Policy in Practice* workshop.

particular product is a detailed and time consuming process and standards cannot easily be changed. Its application is further complicated by the need for agreement from federal, state and territory governments.

MEPS are under development for additional items, but their incremental impact will decline as the main energy using appliances are covered. MEPS need to be considered for gas appliances and for second hand appliances. Alternative mechanisms could also be considered, such as financial incentives for appliance efficiency, sectoral approaches or putting the onus on equipment suppliers, rather than government, to show their appliances are efficient and so suitable for sale.

- ***Mandated Building Rating Schemes:***

It is estimated that some 40% of world energy use occurs in buildings and there are many cost effective options for energy efficiency improvements. A range of building ratings tools, targeting environmental impact and energy use, is available and being used across Australia, although there is no strategic framework underlying their application. In addition, there appears to be little structure or consistency in on-going monitoring and auditing of the effectiveness of the different tools. The process for applying any tool used where multiple jurisdictions are involved can become very complex and may limit the otherwise desirable aim of consistent approaches across jurisdictions.

Important for the long term success of building ratings tools in delivering energy reduction outcomes is the need for an over-arching sustainable building policy and the use of life cycle design principles. To prevent rating schemes acting as ceilings on building performance, internal feedback loops are required that improve the baseline as experience grows.[9] Benchmarking needs to be based on actual rather than modelled performance and all data should be in the public domain.

- ***Energy Efficiency Certificate Trading (EECT):***

In an EECT scheme, certificates are issued for reductions in energy use, according to a predetermined set of rules. The policy intent is to implement the most cost-effective energy efficiency measures, although, in practice, EECT schemes will merely select the cheapest certificates approved by the regulator. The success of EECT schemes in delivering the policy intent depends on the willingness of end-users to change their choices in a way that enhances efficiency. However, EECT schemes operate by offering a financial incentive (through cash flow provided by certificates) to decision makers who we know already ignore many apparently cost-effective energy efficiency options.

Moreover, there are complexities in defining energy efficiency, and in baseline setting, measurement, verification, certification, trading arrangements and acquittal of certificates.[10] One of the greatest challenges is proving additionality – that is, energy savings beyond 'business-as-usual'. This requires hypothetical baselines, which in turn require considerable abstraction as well as risks of error and non-repeatability. There is not yet enough practical experience to know how important these issues will be in practice, what other issues may arise, nor how effective or efficient EECT schemes will be in delivering energy efficiency compared with other policy options. Given these challenges, EECT schemes require cautious and careful implementation. They should therefore not be relied on as the key policy instrument at this point in time.

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[9] See Peter Graham and Steven King's presentation for the *Energy Efficiency, Policy in Practice* workshop.

[10] Iain MacGill and Hugh Outhred. 2003. Energy Efficiency Certificate Trading and the NSW Greenhouse Benchmarks scheme, Draft UNSW ERGO Discussion Paper 0301. April.