Energy Efficiency Services In Australia

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ABSTRACT

In 1995 and 1997, the author and associates were commissioned by the Australian government to undertake a study of the energy efficiency services industry (EESI). Energy efficiency services were considered to be any services provided to clients that improve the efficiency with which gas and electricity are used. The studies focused particularly on how the EESI has been affected by recent structural changes in the electricity and gas supply industries, and on new developments and new types of services. The information is intended to be used by the government as an input to the development of new energy efficiency policy in the context of the National Greenhouse Response Strategy (NGRS).

This paper describes the services offered by both energy supply companies and independent service providers in Australia. The effects of the introduction of competition to electricity and gas markets is analysed. Both positive and negative outcomes are identified, discussed and quantified in some areas. The emergence of new approaches such as energy performance contracting and energy facilities management are discussed.

Introduction

The Australian government has made a commitment to provide substantial funds for new programs to encourage reductions in greenhouse gas emissions. However, in the past many government programs directed at achieving social objectives, such as energy conservation and improved environmental outcomes, have not been successful. One important input to designing future programs for success is an understanding of the industry that supplies related services and the market in which that industry operates.

Energy sector reform has had a significant impact on the way in which energy efficiency services are provided within Australia. Prior to reform, such initiatives were primarily sponsored by state-owned utilities. The structural separation of utilities and introduction of market based mechanisms provide a system which is intended to facilitate a robust and commercially motivated energy efficiency industry. As well, government sponsored energy efficiency programs continue as an adjunct to industry initiatives. Nevertheless, the energy market reforms underway in Australia are rather novel, and there remains some concern that the community's interest in energy efficiency may not be fully addressed under these new structures. For this reason, ongoing assessment of the provision of energy efficiency services is a requisite to informed policy development.

Against this background, Commonwealth, State and Territory governments, through the Australian and New Zealand Minerals and Energy Council (ANZMEC) have committed to regularly and publicly assess national energy production and use against the criterion of achieving cost-effective and competitive delivery of energy efficiency services. The results of these assessments are intended

to be used to provide the basis for reviewing policy, programs and regulation related to energy efficiency in Australia.

Recent Historical Context

In early 1996 ACIL Economics and Policy and Redding Energy Management submitted the first of the two reports commissioned by ANZMEC. The brief for this study was for a comprehensive review of the provision of energy efficiency services in restructured energy markets and can be regarded as preliminary to the more specific industry survey study completed in late 1997. The report included a review of the status of the EESI in Australia at that time.

The energy efficiency services terminology was relatively new at that time, but it could be said that prior to restructuring of electricity markets in Australia the EESI comprised primarily:

- companies that provided conventional energy management services (primarily energy audit and retrofit services); and
- utility and government energy efficiency programs and services.

Many of the former state-owned integrated utilities had some form of energy management or energy efficiency service activity. The most developed example of this was in the state of Victoria where the former State Electricity Commission's demand management program provided some tens of millions of dollars in incentives for energy efficiency investigations and investments in the three years prior to the break-up of the utility.

In regard to services provided by utilities the 1995/96 study found that a by-product of the intense restructuring of the electricity and gas industries in many states was something of a hiatus in utility activity in the area of energy management and energy efficiency services. Victoria was the most extreme example of this as it was first the leader in the development of utility demand management activity and was subsequently the state with the most vigorous approach to market reform of the electricity and gas industries.

The demand management programs operated by the electricity utilities, although they were never well developed when compared to the US model, did provide incentives to customers that had the effect of generating business for energy management companies. The business was arranged either indirectly, or else directly through agreements between selected energy management companies and the utility. The main business generated through utility subsidies was energy audits of commercial and industrial premises. In early 1996 it was clear that there had been a decline in demand for conventional energy management services caused by the winding down of utility programs. However, there was some evidence of an underlying interest by many utilities in the provision of energy efficiency services. A late 1995 survey of utilities by the Productivity Commission (then Bureau of Industry Economics) resulted in 38 utilities indicating that they had some form of energy efficiency service activity in place (Dempster McCann & Travis 1996).

Changes in the EESI between the Two Surveys (December 1995 and September 1997)

A listing of energy efficiency service providers in Australia was compiled in order to gain an understanding of the general characteristics of the EESI. This listing showed companies that had an entry in the Yellow Pages directory on the Internet under the heading: *Energy Conservation and Management Consultants and/or Services*. This business category description was reasonably close to the broad definition of energy efficiency services provided by ANZMEC for the study and gave a reasonable indication of companies that identify themselves as being energy efficiency service providers (EESPs). The listing included all entries in all capital city regions in Australia. The following table summarises the findings for both studies.

Categories of Energy Efficiency Service Providers

Category	1996	1997	
RAS*	54	NA	Energy efficiency services is main business & previously registered (Registered Auditor Specialist)
RAG*	44	NA	Previously registered, but this is not the main business (Registered Auditor General)
S	30	37	Specialist in the provision of energy efficiency services
C	22	19	Consultant - non-specific
HEM	26	15	Supplier of energy management control systems (Hardware: Energy Management)
HL	11	6	Supplier of energy-efficient lighting (Hardware: Lighting)
H	21	13	Energy efficient equipment supplier - non-specific (Hardware)
TC	10	8	Tariff consultant
I	4	1	Equipment installer
A	8	4	Architect
RAS-HEM	5		Supplier of energy management control systems & previously registered
-	14	8	Could not be categorised
NEW		62	
TOTAL	249	173	

* Registry no longer maintained.

As at September 1997, there were a total of 173 EESPs listed. This compared with around 249 EESPs identified in the comparable list in the 1996 study. Of the 173 companies included in the 1997 listing, 62 were new entries that commenced business after the beginning of 1996. Conversely, of the 249 companies included in the previous list, 138 were not included in the current list as they do not have a current listing under the relevant category in the Yellow Pages directory.

The firms for which provision of energy efficiency services was the main business were relatively small, ranging from individual consultants to a small number of larger companies with offices in several states and, in one case, up to perhaps 50 staff.

The registered energy auditors for whom energy auditing was a minor part of the business, were typically general engineering consultants or engineering consultants in the building mechanical and electrical services field. This included the very large national engineering firms for which provision of energy efficiency services was a small part of the total business. By 1997, many of these companies had ceased to promote their energy efficiency service capabilities.

There were a large number of firms involved in the manufacture and supply of products that identified themselves as being in the energy efficiency services business. Many of these were suppliers of electronic energy management control systems. Most of these companies supplied systems for control of lighting and HVAC systems for buildings while some also offered control systems for industrial processes.

Tariff consultants are energy service providers but not energy efficiency service providers. They reduce client's energy costs but do not affect the efficiency with which energy is used. As noted in the following section, involvement of consultants in this area has become far more widespread and more complex. For contestable customers, tariff analysis is now just part of the process of development and negotiation of supply contracts. Many of the more substantial consulting firms who previously were primarily specialists in the provision of energy efficiency services, now also provide services to clients to assist them in energy supply negotiations.

The 1997 Survey

For the 1997 study, a telephone survey was undertaken of all companies and organisations in all capital cities with a Yellow Pages listing under the heading Energy Management Consultants and Services. A standardised format for the survey was used but with some flexibility to pursue lines of inquiry as they arose. The survey was designed to focus on clarifying the nature and dimensions of new developments in the EESI. The survey was not based on statistical sampling methods, but was designed to provide an indicative set of measures which could be compared over an extended period of time in subsequent studies of this nature. (It should be noted that the telephone survey was only one aspect of the study. In addition, face-to-face interviews were held with the key industry participants in the main markets. This included performance contractors, the major energy management and facilities management firms, and large corporations with in-house energy efficiency services. Detailed profiles of these companies and their energy efficiency service activities were included in the study report, particularly for performance contractors.)

There were a total of 219 items in the listings. After removing companies that were no longer in business (16) and some that were not relevant to the study, the total number of companies contacted was 199. Where companies had offices in several states, all offices were included in the survey. Taking this into account, the number of companies reduces to 173. Sixty seven responses were obtained representing a response rate of 34%. The responses to most of the questions were analysed quantitatively but no attempt was made to estimate the reliability of the results.

The survey was in two parts. The first part sought factual information concerning the energy efficiency services offered to the market while the second part sought views and judgements about the market for energy efficiency services. Information was sought in the following areas:

Part 1: Industry Profile

- Scale of energy efficiency services offered
- Significance of energy efficiency services to company's total business
- Types of energy efficiency services offered
- Energy end-use sectors to which services are offered.
- Market trend

Part 2: Market Perceptions

- Effect of restructuring of electricity and gas markets on demand for energy efficiency services
- Operation of the market for energy efficiency services
- Role of government in ensuring the market for energy efficiency services operates effectively
- Anticipated future developments.

1997 Survey Results

Two measures of the size and value of energy efficiency services offered by companies were included in the survey:

- Annual income from the provision of energy efficiency services
- Number of staff working full time in the provision of energy efficiency services.

Many companies were not willing or able to provide a figure for income derived from the energy efficiency services business and the responses obtained were considered to be insufficient to be representative. For the great majority of companies the total number of staff working in the area was small. Over 90% of companies had less than 10 people working in the energy efficiency services area (including equivalent full-time aggregate for staff who work part time in the area). 55% of all companies had one to three people with over half of these having only one. Assuming that the survey was representative of the total pool of listed companies, the responses indicate that there are around 1200 people in these companies working in the energy efficiency services industry in Australia (full time equivalent).

Significance of energy efficiency services to company's total business

Companies were asked to state what percentage of their total business was related to improving energy efficiency in the facilities or premises of clients. Over one third of companies were dedicated entirely to the provision of energy efficiency related services with a further third having this as their main (but not sole) business.

Types of energy efficiency services offered

Firms were broadly divided into service companies and product suppliers, although this distinction is becoming blurred as product suppliers move into the areas of facilities management and performance contracting. Approximately 75% of companies could be broadly categorised as service companies with the remainder being product suppliers. Virtually all the service companies offered energy audit capabilities. Nationally, about fifty percent of respondents had a stated capability to undertake project management for energy efficiency retrofits, while 18% were able to offer a comprehensive energy audit and implementation package. Other types of services offered included: energy management consulting, tariff consulting, energy efficient equipment design services, energy efficient architectural

services, cogeneration project development and consulting, renewable energy project development and consulting, maintenance services, and equipment testing services. Product suppliers included manufacturers, distributors, and retailers. The specific category of product that was most frequently nominated was commercial and industrial energy management control systems.

Project finance
About 20% of companies stated that they offered a finance facility for energy efficiency retrofit projects.

Sectors to which services are offered
The majority of companies offered services to the commercial and industrial sectors, while almost half offered services to the government sector. Around 20% of companies offered services to the domestic sector, and about 10% provided services to utility clients.

Market trend
Companies were asked to state whether their energy efficiency services business was decreasing, steady, or increasing. There was almost double the percentage of companies in the state of NSW indicating that their business was growing compared to other states. This seems likely to be related to the stronger government policies promoting energy efficiency in that state and the larger government expenditure on related programs. While 61% of companies in NSW indicated that their business was increasing, a further 28% indicated that their business was decreasing so clearly some companies were gaining market share while others were losing it. As other elements of the study found a very dramatic drop in the demand for energy audits it seems likely that the companies whose business was decreasing may have had energy auditing as their main source of business. This shifting in market shares was even more pronounced in Victoria where 36% of companies indicated their energy efficiency services business was increasing, while the same percentage indicated a decrease.

Market Perceptions

Effect of restructuring of electricity and gas markets on demand for energy efficiency services
Companies were asked whether changes in the electricity and gas markets in recent years had affected their energy efficiency services business. As may be expected, the percentage of companies who considered that their business had been affected by restructuring of electricity and gas markets was much higher in Victoria and NSW where market reform was more advanced than in other states. Companies who said that their business had been affected were then asked whether they had experienced a positive or negative effect on the level of demand. A much higher proportion of companies in Victoria and NSW indicated a negative effect than in other states. The proportion was highest in NSW. In Victoria, almost as many companies said that the effect of market restructuring had been positive, as said it had been negative.

New services
Companies were asked whether, as a result of energy supply market reform, they were offering any new types of services. About half the companies stated that they were. The most frequently nominated new service was assistance and advice for energy supply contract negotiation. This response was, as would be expected, primarily in NSW and Victoria as these were the only states with competitive retail markets for electricity at that time. Although this service has been resulting in very substantial cost

reductions for clients, it should be noted that this is not, in itself, an energy efficiency service within the meaning of the study. However, in at least some cases, the same service provider did also provide energy efficiency services to the client. Other new services nominated were: energy performance contracting, power factor correction, monitoring, technical support, and training.

Availability and access to services

Companies were also asked whether there were energy efficiency services that were no longer available or to which access was now more difficult. The proportion stating that access to some services is now more difficult was markedly higher in Victoria than in other states. In Victoria 48% said access to some services was now more difficult, while in NSW the figure was 27%, and for other states it was 15%. In Victoria and NSW about 50% of companies said some services had ceased to be available while in other states the figure was 29%. Responses to these questions focused almost completely on free services that were previously provided by governments, government agencies, and government-owned energy utilities that are now no longer available or no longer free. It was frequently stated that energy suppliers no longer provide support to independent energy efficiency service providers and are not as cooperative as they once were. There were also more specific complaints that some energy supply companies were not providing information needed by independent service providers to effectively compete with the services offered to customers by the energy suppliers themselves. Reduced services from governments that were cited included:

- Termination of the federal Enterprise Energy Audit Program (EEAP) which provided audit subsidies
- Closing down of the Energy Research and Development Corporation (ERDC) which provided federal funding for energy efficiency R&D
- State government audit assistance and subsidies no longer available
- Energy Victoria now charges for some services that were once free (state government energy efficiency advisory service)
- Queensland government energy efficiency programs terminated
- South Australian government's rural energy efficiency programs terminated

Reduced services from energy utilities cited included:

- Energy Business Centre (Vic) no longer provides free information or services (operated by former government owned state electricity monopoly)
- Energy Management Centre (Vic) no longer provides free energy management services (operated by former government owned state gas utility monopoly)
- Closing down of Pacific Power Energy Services (NSW) and the centres it operated (operated by former state owned electricity monopoly)
- Reduced services from Integrated Energy Management Centre (formerly federally funded centre in state of Tasmania)
- Incentive programs terminated.

Operation of the market for energy efficiency services

Respondents were asked whether they considered that the market for energy efficiency services was 'operating effectively'. Nationally, 83% of respondents said it was not. The figure in NSW was lower than in other states with 29% of respondents saying that the market was operating effectively. These results probably indicate that respondents may have interpreted the question as "Is there sufficient demand for energy efficiency services?" If nothing else, the results seem to indicate a fairly high level

of dissatisfaction. Companies that responded in the negative were then asked to state what they considered the problem to be (ie: what they saw as the barriers and inhibitors to effective operation of the market for energy efficiency services). Many different reasons were given for the perceived lack of demand for energy efficiency services. The most common reason stated was lack of education or awareness in the market about the benefits and potential of energy efficiency (36% of respondents). Other reasons that were frequently mentioned were (in order of frequency):

- no government incentives or any major financial incentives;
- energy efficiency is a low priority for industry;
- lack of availability of finance for energy efficiency projects;
- electricity is too cheap, or is sold below cost, or is sold at "subsidised" prices; and
- lack of government policy or government support.

The percentage of respondents citing lack of government policy and support was twice as high in Victoria as in other states. The proportion of respondents citing lack of government incentives and financial incentives in NSW was only half what it was in other states reflecting the much higher level of government support for energy efficiency initiatives in that state. This was also the case for the most common reason given; lack of education and awareness.

Role of government in ensuring the market for energy efficiency services operates effectively

The survey asked whether the respondent considered that government 'has a role in ensuring that the market for energy efficiency services operates effectively'. The overwhelming response (93%) was that the government does have a role. Interestingly, the figure in NSW was slightly lower at 83%, while in Victoria 100% of respondents said government should have a role. Respondents were then asked to suggest what actions governments should take. By far the most prevalent response (65%) was that the government should provide funding and/or financial incentives such as subsidies or tax breaks. Other prevalent suggestions (in descending order of frequency) were:

- legislation and regulation to mandate energy efficiency levels
- government to lead by example (ie: energy efficiency retrofits to government buildings)
- changes in policy
- return to regulation of energy prices.

The percentage of respondents suggesting changes in government policy was far higher in other states (35%) than it was in NSW (6%) or Victoria (4%). Conversely, the percentage seeking a return to "tariff regulation" was much higher in NSW (17%) and Victoria (15%) than it was in other states (5%).

Anticipated future developments in the market for energy efficiency services

Respondents were asked what new developments they expected in the future in the market for energy efficiency services. Interestingly, virtually all responses focused on various technical innovations that were expected to gain increased market acceptance. These included: energy management control systems, the use of natural daylight in lighting systems, the use of external air in HVAC systems, and cogeneration. In particular it was frequently stated that there would be increasing use of computer linked on-line energy management systems, including remote monitoring and control via modem. Intelligent motor controls were also frequently mentioned. Another common theme was that energy efficiency would be increasingly designed into products and processes at the development stage.

Energy Efficiency Services Provided by Energy Suppliers

A major aspect of the 1997 study was the characterisation of the energy efficiency services activities of energy supply companies in Australia. In line with the objectives of the study, the focus was on NSW and Victoria where energy market reform was most advanced. (These are the two most populous states where Australia's two largest cities are located in the south-east region of the country.) Face-to-face exploratory interviews were held with all the energy supply companies based in Sydney and Melbourne and the study report included detailed profiles of the companies and their energy efficiency service activities. The following paragraphs summarise some of the key points from this part of the study for the NSW and Victorian markets.

NSW

There are six government owned electricity distribution franchise/retail companies in NSW. They are EnergyAustralia, Integral Energy, Great Southern Energy, NorthPower, Advance Energy, and Australian Inland Energy. The study focused particularly on the two large metropolitan distributors EnergyAustralia and Integral Energy for the reasons outlined previously. All of the NSW distributors are offering GreenPower products and a section of the report specifically addressed this issue. There are also nineteen other companies licensed to retail electricity to contestable customers in NSW. Some of these also have the capability to provide energy efficiency services.

The name of the former vertically integrated electricity supply monopoly in NSW was Pacific Power. This is now the name used by one of the three government-owned NSW generators. Pacific Power Energy Services, previously a business unit of Pacific Power, has been closed down. The energy management centres it formerly operated have also closed. The subsidiary consulting company Pacific Power (International) is specifically excluded from offering energy services under an industry agreement. However, the news was not all bad as the 1997 study found that EnergyAustralia had emerged as the leading utility provider of energy efficiency services in Australia.

EnergyAustralia

EnergyAustralia is the largest electricity distributor/retailer in Australia and is a large utility by world standards. It supplies one fifth of the Australian electricity market in a franchised distribution area of 22,275 square kilometres. Its franchise territory includes the eastern half of the Sydney metropolitan area and the north central NSW coast. There is a population of 3 million in its territory and it has 1.3 million direct customers including urban, rural, commercial and industrial customers from light manufacturing and agriculture to mining and heavy engineering operations. It has around 3800 employees and total assets are around $3.6 billion. Annual electricity sales are over 20,000 GWh and annual income is around $2 billion. EnergyAustralia is also a licensed retailer in Victoria and maintains a permanent office in Melbourne.

EnergyAustralia has a very open approach to participation in the electricity market. It commits extensive resources to media and communications activities and participates very actively in public debate. It is also worth noting that the new CEO appointed in August 1997 has stated that the company has had problems adjusting to changing market conditions. EnergyAustralia commits substantial

resources to the provision of energy services including significant energy efficiency-related services. It has considerably more in house capability in this area than any other Australian electricity retailer.

Energy services are regarded by the company as an at least potentially profitable business in their own right. It is pursuing business related to beyond-the-meter services for both large energy consumers and the mass market. A business strategy has been developed specifically for beyond-the-meter services. It divides the market conceptually into:

1. Commercial and Industrial Market, and
2. Mass Market

In the commercial and industrial market the range of services includes energy management services as well as energy equipment sales, energy equipment plant and rental, business service contracting, and specialist technical services. Energy efficiency related services include: energy audit services, greenhouse strategies, pre-construction energy audits, energy audit strategy implementation, cogeneration, energy management systems, and power factor correction. The mass market includes small business services as well as home services. An energy audit service is offered for small business. The major home service is the $16m appliance sales and service business but also includes energy rating of premises.

The types of services being provided nationally include energy audit/retrofit work, consulting, and energy efficient products including intelligent motor controls and heat pump hot water systems. Some projects are using remote communication via ripple control in conjunction with on-site intelligent controllers to allow special pricing arrangements on an individual contract basis.

EnergyAustralia's energy services staff reported the same market trend as most other service providers with comprehensive site-wide audits being replaced by brief project identification reviews followed by implementation of specific energy efficiency improvement projects. Demand is also moving away from specifically energy efficiency-related activity to the inclusion of this aspect in a more comprehensive provision of engineering services in areas where they have specific expertise.

The company reported that it had won some electricity supply contracts specifically on the basis of the energy efficiency services offered as part of the contract. Specific examples were given including a clothing factory and a university campus, both of which are located outside its franchise territory, as well as the statewide contract for a major chemical manufacturer. Sufficient contract details were provided to show that EnergyAustralia is offering these value-added services on a basis that makes their cost transparent rather than absorbing it into the electricity supply price. For the new tranche of contestable customers with smaller loads more streamlined arrangements are being established where retail customer supply managers are responsible for marketing energy efficiency services.

Australian Energy Solutions (AES), a business unit of EnergyAustralia, began operations as an energy performance contractor in early 1995. It focuses on sites where the annual energy cost is over $500,000. There are about 1000 such sites in Australia. At this stage the main focus is on health and education facilities. EnergyAustralia has invested heavily in AES. The company is now in its third year of operations and has only recently finalised its first three contracts. AES is the only company in Australia created specifically for the purpose of energy performance contracting. While commercial

development of the business has been slow, AES has been the main driver of the development of performance contracting in Australia, especially in the public sector.

Victoria

The are five electricity franchise distribution/retail companies in Victoria: CitiPower, Eastern Energy, PowerCor, Solaris, and United Energy. All these companies have been privately owned since 1995/96; in the main by US energy utility companies. The first study in early 1996 found that these companies were completely focused at that time on achieving internal operating efficiencies and on competing for contestable customers on price only. By late 1997, the situation was quite different. All the companies had strategies in place and some level of activity and capability to provide beyond-the-meter services including energy efficiency services. Also, the approaches being taken were not uniform. There were distinct differences between the energy services strategies of each company. There are also eleven licensed electricity retailers in Victoria. Most of these are subsidiaries of electricity distribution companies from other states that at this stage are still government owned.

Policy Issues and Conclusions

The principal forces acting on the EESI are:

- the restructuring and ownership changes in the utilities;
- the introduction of customer contestability in the retail electricity market;
- falling prices in the wholesale and retail electricity markets; and
- the nature of regulation in the various jurisdictions.

Energy Utilities. For energy utilities, the main issues appear to be:

- The role of retailers in a highly competitive market with many new entrants is still to be developed.
- There is a high level of awareness among contestable customers that lower-cost energy is available which lessens the incentive to invest in energy efficiency services.
- Regulatory structures are continuing to evolve. Examples include the NSW retail licence conditions and provisions in the National Electricity Code for demand side bidding, reserve contracts, and consideration of embedded generation and/or demand management as an alternative to network upgrades.

Private Sector Non-Utility EES Providers. For private sector non-utility EES providers, the main issues appear to be:

- The industry is in a period of transition, and existing players, which span a wide range from very small companies to very large, will need to cope with an environment of rapid change.
- New types of firms may provide competition, such as security companies, developers, companies with substantial building portfolios and telecoms.
- Government programs, which form a significant component of the private sector's work are in a state of flux.

Public Sector, Non-Utility EES Providers. Public sector agencies (non-utility) primarily concentrate on advisory services and funding support. Within that context, government agencies are continuing some programs, starting some new initiatives and winding back other programs. For example, new initiatives at the state and federal level include the Sustainable Energy Development Authority (SEDA) program in NSW, the federal Sustainable Energy Policy paper, and the Greenhouse Challenge. Also in the federal sphere, the Energy Efficiency Audit Program (EEAP) and the Energy R&D Corporation are ceasing operation. Agencies such as Energy Victoria continue to promote initiatives aimed at enhancing the role of energy efficiency at the industrial, commercial and residential levels.

As well, broader issues arise with respect to the newly developing regulatory environment under which the energy sector is to operate. Industry regulation has been largely separated from ownership and governance. The role of regulators in matters related to energy efficiency and demand management is still to be fully resolved. Even where regulators are not explicitly required to consider energy efficiency issues *per se*, they may be drawn into this issue through price determinations which must account for relevant costs of providing energy services in monopoly components of the industry. If energy efficiency programs become a factor, the regulator will need to determine if program costs are to be recouped *via* regulated charges and tariffs.

The over-riding issue is the manner in which the various broadly identified components of the EESI interact with each other, including: private sector EES providers; governments (in defining public policy, and as EES providers); and regulators (where issues related to the EESI come under their jurisdiction). This interaction of markets, government and regulation will continue to require evaluation as a concomitant to energy sector reform.

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